CAMPUS PARK PROJECT

APPENDIX C

TRAFFIC IMPACT STUDY

SPA 03-008, GPA 03-004, R03-014, VTM 5338 RPL7,
S 07-030, S 07-031, LOG No. 03-02-059
State Clearinghouse No. 2005011092

for the

DRAFT FINAL SUBSEQUENT
ENVIRONMENTAL IMPACT REPORT

DECEMBER 3, 2010

FINAL ENVIRONMENTAL IMPACT REPORT
TRAFFIC IMPACT STUDY
INFORMATION FOR THE READER

This document consists of the Traffic Impact Study (TIS) for the Campus Park Project (Proposed Project or Project) and analyzes transportation/circulation-related elements associated with construction and operation of the Project. Since circulation of the Project Draft Environmental Impact Report (EIR) and associated technical reports, refinements in Project description have been implemented in response to comments received.

The majority of Project refinements occur west of future Horse Ranch Creek Road and all of them would be south of proposed Harvest Glen Lane. The majority of the developed uses and their construction footprints (residential, office professional, recreational and commercial) remain the same as previously analyzed.

South of future Harvest Glen Lane and west of future Horse Ranch Creek Road, the Proposed Project has been refined to: (1) eliminate some development areas, (2) modify specifics of development detail in some areas, and (3) eliminate the potential for connection to an off-site future wastewater treatment plant (WTP) to be constructed by others. Specifics of road design improvements also vary.

Overall, primary design changes result in 325 fewer multi-family (MF) homes (a reduction of 41 percent), and an increase in the biological open space preserve of 20.7 acres (or 11 percent). See Figure A for a comparison of the Project evaluated in the Draft EIR with the current plan.

Project refinements relevant to this technical report are addressed below.

Relevant Refinements to Project Description

Changes have been made to on- and off-site portions of future Pala Mesa Drive, Pankey Road and on-site Pankey Place. With regard to Pala Mesa Drive/Pankey Road, modifications resulted from a request by the abutting Campus Park West Project to shift a portion of the alignment, and this shift has been worked out in coordination with the Department of Public Works. For on-site Pankey Place, modifications are related to deletion of MF-4 on the south side of the road, and retention of open space. These modified alignments have also resulted in some changes to roadway design specifics.

The relevant portions of on-site Pala Mesa Drive/Pankey Road were described as a collector with a right-of-way width of 84 feet, four 12-foot travel lanes and two 6-foot wide landscaped areas and an eight-foot-wide decomposed granite trail on the west side of the roadway within 20-foot-wide landscaped areas. North of Pankey Place, the road was described as a light collector, with a 30-foot-wide pavement and trails, with future expansion of this segment to be completed by the adjacent planned Campus Park West Project. Current design assumes the portion of Pala Mesa Drive/Pankey Road from SR 76 through the bridge over Horse Ranch Creek would be 40 feet in width within a 60-foot right-of-way. North of the bridge, portions on Campus Park West property would be paved to 28 feet in width within a 40-foot-wide right-of-way.

As noted above, the Draft EIR and circulated Traffic Impact Study included two MF residential areas (MF-1 and MF-4) west of future Horse Ranch Creek Road and north of SR 76. These areas were proposed to contain a total of 300 residential units sited on a total of 21.1 acres. Both have been eliminated and now would largely be in open space. Within the MF-2 area east of future Horse Ranch Creek Road and south of future Harvest Glen Lane, the style of housing has been changed to match that of Draft EIR MF-3 (now renamed MF-1), and the density of housing has been lessened. Together, these changes result in 325 fewer MF residential units than previously assumed.

Finally, two mitigation scenarios for cumulative Project effects were addressed in the Draft TIS. One is the payment of Transportation Impact Fees (TIF), the standard required mitigation to address incremental adverse effects (cumulative impacts). Under this scenario, the County collects fees from all new development within a community and uses the funds to address traffic improvements as needed. A second cumulative scenario also was proposed—use of an equivalent amount of money to implement a series of specific circulation upgrades. With the refined Project, reduced traffic effects, and recent construction of this segment of SR 76, an alternative scenario upgrade (potential modification to the intersection of SR 76/Old Highway 395) would be addressed through TIF payment.

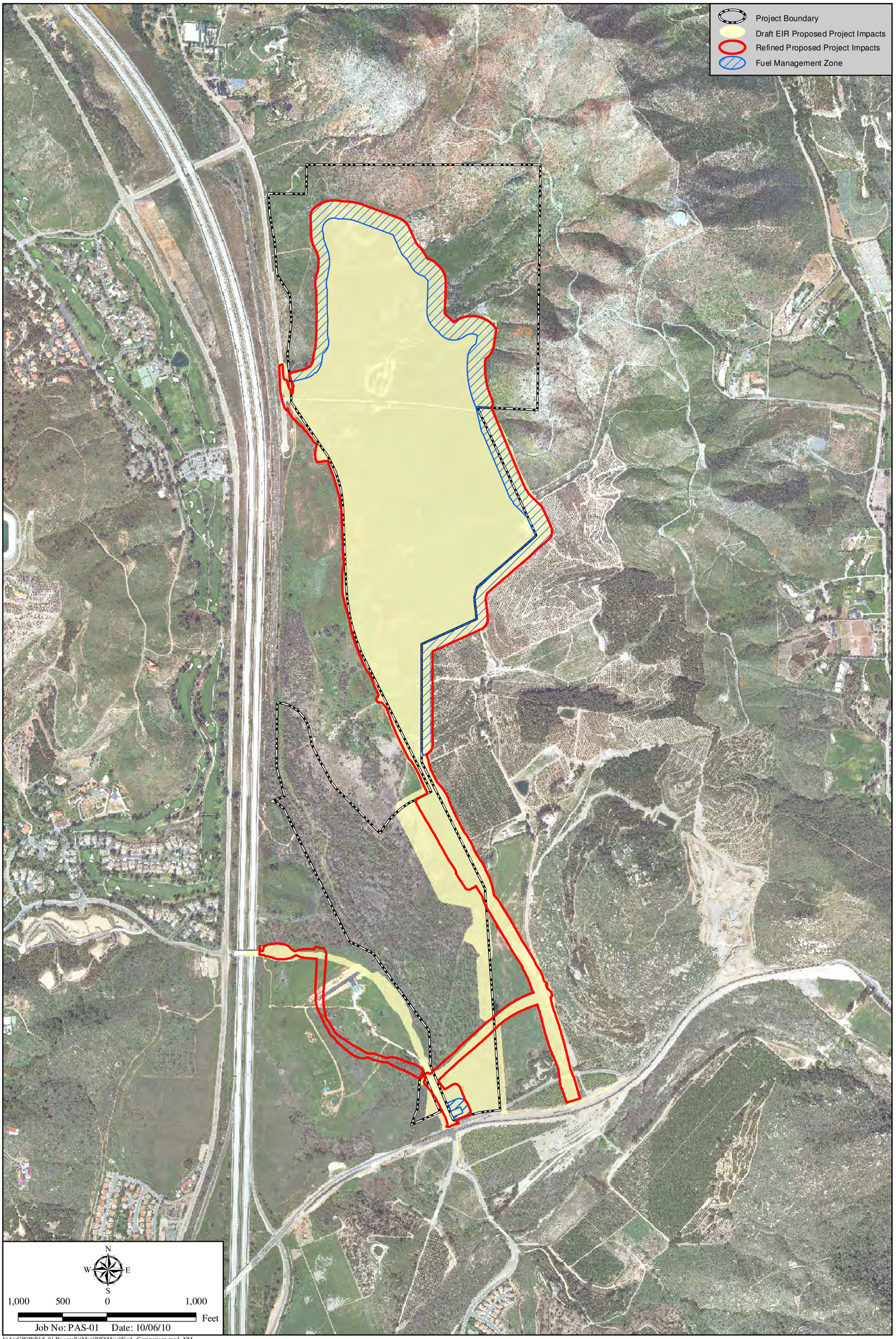
Technical Analysis Modifications Based on Project Description Refinements

With regard to traffic and circulation, shifts in specific right-of-way location do not affect the carrying capacity of the roads, both of which are still designed to accommodate anticipated traffic. No change is required to traffic analyses for this change.

The elimination of 325 MF residential units affects the amount of traffic generated by the Project. Revised generation evaluation was completed, as documented in the August 30, 2010 memorandum attached to this information for the reader.

The reduction in traffic generation had beneficial effects on identified Project direct impacts to intersections (the SR 76/I-15 northbound on-ramp and Old Highway 395/Reche Road) as well as Project segment impacts on SR 76 from: (1) South Mission road to Gird Road, (2) Sage Road to Old Highway 395, (3) I-15 southbound to I-15 northbound on-ramps, and (4) future Horse Ranch Creek Road to Couser Canyon Road. Although the specifics of Project-related impacts have been minimized, no direct effects fell below County-identified significance thresholds for the noted transportation facilities based on the lower traffic generation. As a result, the mitigation identified in the circulated TIS would still be required and implemented. Similarly, the mitigation for cumulative impacts continues to propose TIF payment as the likely mitigation scenario. The approved TIS constitutes a conservative analysis of potential Project-related traffic impacts, and no changes to the report are required beyond the information attached here. No change to environmental design considerations or significance conclusions reached in conformance with the California Environmental Quality Act would occur.

Each of the above-cited and additional specific revisions are now included as part of the public record and will be before the Board of Supervisors during their consideration of the Project.



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Impact Comparison

CAMPUS PARK

HELIX

Figure A

LOS Engineering, Inc.
Traffic and Transportation

MEMO

12760 High Bluff Drive, Suite 300, San Diego, CA 92130
Phone 619-890-1253, Fax 619-374-7247

August 30, 2010

To: Mr. David Davis
Passerelle
402 W. Broadway, Suite 1320
San Diego, California 92101

From: Justin Rasas

RE: Campus Park Revised Project Traffic Generation

The purpose of this memo is to document the new traffic generation with the proposed revised project and to determine if any of the prior direct traffic impacts would be reduced with the lower traffic generation.

The revised project is a reduction of 325 dwelling units. The approved traffic study analyzed the potential impact of 1,076 dwelling units along with commercial, office, park and sports complex. The revised project is proposed at 751 dwelling units with the remaining uses unchanged. The revised project is calculated to generate less traffic; therefore, the approved traffic study with the higher traffic generation is conservative. The decrease in traffic associated with the revised project is shown as negative values in the following table.

Revised Project Traffic Generation

Proposed							AM				PM	
Land Use	Rate	Size & Units		ADT	%	Split	IN	OUT	%	Split	IN	OUT
Residential - Single Family	10 /DU	521	DU	5,210	8%	0.3 0.7	125	292	10%	0.7 0.3	365	156
Residential - Multi Family	8 /DU	230	DU	1,840	8%	0.2 0.8	29	118	10%	0.7 0.3	129	55
Town Center (Neighborhood Shopping)	120 /KSF	61,200	SF	7,344	4%	0.6 0.4	176	118	10%	0.5 0.5	368	367
Office (more than 100KSF)	17 /KSF	157,000	SF	2,669	13%	0.9 0.1	312	35	14%	0.2 0.8	75	298
Neighborhood Park	5 /Acre	3.6	Acres	18	4%	0.5 0.5	0	0	8%	0.5 0.5	1	1
Neighborhood Park (Sports Complex)	50 /Acre	5.2	Acres	260	4%	0.5 0.5	5	5	8%	0.5 0.5	10	10
		Revised Project		**17,341**			**647**	**568**			**948**	**887**
		Approved Traffic Impact Study (TIS)		19,941			689	734			1,130	965
Delta (negative represent reduction of trip over appoved TIS)				**-2,600**			**-42**	**-166**			**-182**	**-78**

Source: SANDAG *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region,* April 2002. DU - Dwelling Unit; SF - Square Feet; KSF - 1,000 sf; ADT-Average Daily Traffic; Split-percent inbound and outbound.

The approved project has two direct intersection impacts at SR-76/I-15 NB Ramp and at Old Highway 395/Reche Road. At SR-76/I-15 NB Ramp the revised project delay was 62.8 (0.9 seconds less than the approved project), but still resulting in more than a 2.0 second delay increase. At Old Hwy 395/Reche Road, the revised project delay was 67.6 (10.3 seconds less than the approved project), but still resulting in more than a 2.0 second delay increase. The revised project did not reduce the intersections delay to below the required threshold. Therefore, the two direct impacts remain unchanged. LOS calculations are attached.

The approved project has segment impacts on SR-76 from S. Mission Rd to Gird Rd, from Sage Rd to Old Hwy 395, from I-15 SB Ramps to I-15 NB Ramps, and from Horse Ranch Creek Road to Couser Canyon Rd. The revised project did not reduce the SR-76 delays to

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MEMO

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below the required threshold. Therefore, the direct impacts remain unchanged as shown in the tables below.

AM peak hour SR-76 LOS (Existing + Project)

Campus Park AM Volumes (approved project)

State Route 76	Lanes in	AM (Eastbound)					Project						AM (Westbound)					Project					
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig
S Mission Rd to Via Monserate	1	745	EB	950	0.78	D	47	792	0.83	D	0.05	No	901	WB	950	0.95	E	46	947	1.00	E	0.05	Yes
Via Monserate to Gird Rd	1	808	EB	950	0.85	D	49	857	0.90	E	0.05	Yes	895	WB	950	0.94	E	51	946	1.00	E	0.05	Yes
Gird Rd to Sage Rd	1	740	EB	950	0.78	D	49	789	0.83	D	0.05	No	542	WB	950	0.57	C	51	593	0.62	C	0.05	No
Sage Rd to Old Hwy 395	1	760	EB	950	0.80	D	49	809	0.85	D	0.05	No	534	WB	950	0.56	C	51	585	0.62	C	0.05	No
Old Hwy 395 to I-15 SB Ramps	2	1507	EB	2050	0.74	D	24	1531	0.75	D	0.01	No	665	WB	2028	0.33	B	18	683	0.34	B	0.01	No
I-15 SB Ramps to I-15 NB Ramps	1	844	EB	950	0.89	E	83	927	0.98	E	0.09	Yes	539	WB	950	0.57	C	157	696	0.73	D	0.17	No
I-15 NB Ramps to Pankey Rd	2	559	EB	3100	0.18	A	201	760	0.25	A	0.06	No	606	WB	3030	0.20	A	228	834	0.28	A	0.08	No
Pankey Rd to Horse Ranch Creek Rd	2	589	EB	1806	0.33	B	220	809	0.45	B	0.12	No	540	WB	2028	0.27	A	219	759	0.37	B	0.11	No
Horse Ranch Creek Rd to Rice Cyn	1	588	EB	950	0.62	C	40	628	0.66	C	0.04	No	539	WB	950	0.57	C	45	584	0.61	C	0.05	No
Rice Cyn to Couser Cyn	1	589	EB	950	0.62	C	38	627	0.66	C	0.04	No	540	WB	950	0.57	C	40	580	0.61	C	0.04	No

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

Campus Park AM Volumes (revised project) spot analysis for highlighted cells

State Route 76	Lanes in	AM (Eastbound)					Project						AM (Westbound)					Project					
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig
S Mission Rd to Via Monserate	1	745	EB	950	0.78	D	47	792	0.83	D	0.05	No	901	WB	950	0.95	E	36	937	0.99	E	0.04	Yes
Via Monserate to Gird Rd	1	808	EB	950	0.85	D	48	856	0.90	E	0.05	Yes	895	WB	950	0.94	E	40	935	0.98	E	0.04	Yes
Gird Rd to Sage Rd	1	740	EB	950	0.78	D	49	789	0.83	D	0.05	No	542	WB	950	0.57	C	51	593	0.62	C	0.05	No
Sage Rd to Old Hwy 395	1	760	EB	950	0.80	D	49	809	0.85	D	0.05	No	534	WB	950	0.56	C	51	585	0.62	C	0.05	No
Old Hwy 395 to I-15 SB Ramps	2	1507	EB	2050	0.74	D	24	1531	0.75	D	0.01	No	665	WB	2028	0.33	B	18	683	0.34	B	0.01	No
I-15 SB Ramps to I-15 NB Ramps	1	844	EB	950	0.89	E	82	926	0.97	E	0.09	Yes	539	WB	950	0.57	C	157	696	0.73	D	0.17	No
I-15 NB Ramps to Pankey Rd	2	559	EB	3100	0.18	A	201	760	0.25	A	0.06	No	606	WB	3030	0.20	A	228	834	0.28	A	0.08	No
Pankey Rd to Horse Ranch Creek Rd	2	589	EB	1806	0.33	B	220	809	0.45	B	0.12	No	540	WB	2028	0.27	A	219	759	0.37	B	0.11	No
Horse Ranch Creek Rd to Rice Cyn	1	588	EB	950	0.62	C	40	628	0.66	C	0.04	No	539	WB	950	0.57	C	45	584	0.61	C	0.05	No
Rice Cyn to Couser Cyn	1	589	EB	950	0.62	C	38	627	0.66	C	0.04	No	540	WB	950	0.57	C	40	580	0.61	C	0.04	No

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

PM peak hour SR-76 LOS (Existing + Project)

Campus Park PM Volumes (approved project)

State Route 76	Lanes in	PM (Eastbound)					Project						PM (Westbound)					Project					
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig
S Mission Rd to Via Monserate	1	1064	EB	950	1.12	F	73	1137	1.20	F	0.08	Yes	618	WB	950	0.65	C	64	682	0.72	D	0.07	No
Via Monserate to Gird Rd	1	1077	EB	950	1.13	F	79	1156	1.22	F	0.08	Yes	786	WB	950	0.83	D	67	853	0.90	E	0.07	Yes
Gird Rd to Sage Rd	1	645	EB	950	0.68	C	79	724	0.76	D	0.08	No	742	WB	950	0.78	D	67	809	0.85	D	0.07	No
Sage Rd to Old Hwy 395	1	638	EB	950	0.67	C	79	717	0.75	D	0.08	No	768	WB	950	0.81	D	67	835	0.88	E	0.07	Yes
Old Hwy 395 to I-15 SB Ramps	2	816	EB	2050	0.40	B	32	848	0.41	B	0.02	No	1258	WB	2028	0.62	C	33	1291	0.64	C	0.02	No
I-15 SB Ramps to I-15 NB Ramps	1	718	EB	950	0.76	D	135	853	0.90	E	0.14	Yes	1153	WB	950	1.21	F	199	1352	1.42	F	0.21	Yes
I-15 NB Ramps to Pankey Rd	2	696	EB	3100	0.22	A	343	1039	0.34	B	0.11	No	820	WB	3030	0.27	A	282	1102	0.36	B	0.09	No
Pankey Rd to Horse Ranch Creek Rd	2	631	EB	1806	0.35	B	346	977	0.54	C	0.19	No	897	WB	2028	0.44	B	307	1204	0.59	C	0.15	No
Horse Ranch Creek Rd to Rice Cyn	1	631	EB	950	0.66	C	61	692	0.73	D	0.06	No	897	WB	950	0.94	E	66	963	1.01	F	0.07	Yes
Rice Cyn to Couser Cyn	1	526	EB	950	0.55	C	55	581	0.61	C	0.06	No	930	WB	950	0.98	E	61	991	1.04	F	0.06	Yes

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

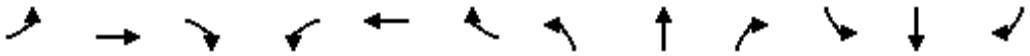
Campus Park PM Volumes (revised project) spot analysis for highlighted cells

State Route 76	Lanes in	PM (Eastbound)					Project						PM (Westbound)					Project					
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig
S Mission Rd to Via Monserate	1	1064	EB	950	1.12	F	64	1128	1.19	F	0.07	Yes	618	WB	950	0.65	C	64	682	0.72	D	0.07	No
Via Monserate to Gird Rd	1	1077	EB	950	1.13	F	69	1146	1.21	F	0.07	Yes	786	WB	950	0.83	D	64	850	0.89	E	0.07	Yes
Gird Rd to Sage Rd	1	645	EB	950	0.68	C	79	724	0.76	D	0.08	No	742	WB	950	0.78	D	67	809	0.85	D	0.07	No
Sage Rd to Old Hwy 395	1	638	EB	950	0.67	C	79	717	0.75	D	0.08	No	768	WB	950	0.81	D	64	832	0.88	E	0.07	Yes
Old Hwy 395 to I-15 SB Ramps	2	816	EB	2050	0.40	B	32	848	0.41	B	0.02	No	1258	WB	2028	0.62	C	33	1291	0.64	C	0.02	No
I-15 SB Ramps to I-15 NB Ramps	1	718	EB	950	0.76	D	118	836	0.88	E	0.12	Yes	1153	WB	950	1.21	F	187	1340	1.41	F	0.20	Yes
I-15 NB Ramps to Pankey Rd	2	696	EB	3100	0.22	A	343	1039	0.34	B	0.11	No	820	WB	3030	0.27	A	282	1102	0.36	B	0.09	No
Pankey Rd to Horse Ranch Creek Rd	2	631	EB	1806	0.35	B	346	977	0.54	C	0.19	No	897	WB	2028	0.44	B	307	1204	0.59	C	0.15	No
Horse Ranch Creek Rd to Rice Cyn	1	631	EB	950	0.66	C	61	692	0.73	D	0.06	No	897	WB	950	0.94	E	58	955	1.01	F	0.06	Yes
Rice Cyn to Couser Cyn	1	526	EB	950	0.55	C	55	581	0.61	C	0.06	No	930	WB	950	0.98	E	53	983	1.03	F	0.06	Yes

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

In summary, the revised project did not eliminate any of the approved project direct impacts because the reductions in delay were less than required to fall below the threshold that identifies a direct impact.

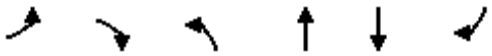
HCM Signalized Intersection Capacity Analysis
7: Pala Rd (SR-76) & I-15 NB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	594	331	0	0	538	132	380	4	300	0	0	0
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1775	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1775	1417			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	625	348	0	0	566	139	400	4	316	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	26	0	0	246	0	0	0
Lane Group Flow (vph)	625	348	0	0	566	113	0	404	70	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	37.0	70.0			29.0	29.0		22.0	22.0			
Effective Green, g (s)	37.0	70.0			29.0	29.0		22.0	22.0			
Actuated g/C Ratio	0.37	0.70			0.29	0.29		0.22	0.22			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	586	1304			540	411		391	312			
v/s Ratio Prot	c0.39	0.19			c0.30							
v/s Ratio Perm						0.08		0.23	0.05			
v/c Ratio	1.07	0.27			1.05	0.27		1.03	0.22			
Uniform Delay, d1	31.5	5.5			35.5	27.4		39.0	32.0			
Progression Factor	0.94	0.31			1.00	1.00		1.00	1.00			
Incremental Delay, d2	47.7	0.1			51.9	0.4		54.3	1.6			
Delay (s)	77.4	1.8			87.4	27.7		93.3	33.6			
Level of Service	E	A			F	C		F	C			
Approach Delay (s)		50.4			75.7			67.1			0.0	
Approach LOS		D			E			E			A	

Intersection Summary			
HCM Average Control Delay	62.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
15: Reche Rd & Old Hwy 395



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	205	215	246	188	183	152
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	216	226	259	198	193	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	988	273	353			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	988	273	353			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	70	79			
cM capacity (veh/h)	215	766	1206			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	442	259	198	353
Volume Left	216	259	0	0
Volume Right	226	0	0	160
cSH	340	1206	1700	1700
Volume to Capacity	1.30	0.21	0.12	0.21
Queue Length 95th (ft)	518	20	0	0
Control Delay (s)	186.3	8.8	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	186.3	5.0		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	67.6		
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

Campus Park (TM 5338 & GPA 03-004)
San Diego County (Fallbrook)
August 11, 2008
Revised February 19, 2009
Revised May 12, 2009

Traffic Impact Study

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Job #727

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Glossary of Terms and Acronyms

ADT ..... Average Daily Traffic
AKA ..... Also Known As
Caltrans ..... California Department of Transportation
CEQA ..... California Environmental Quality Act
CMP ..... Congestion Management Program
DPW ..... Department of Public Works
EB ..... Eastbound
GP2020 ..... General Plan 2020
HCM ..... Highway Capacity Manual
ITE ..... Institute of Traffic Engineers
LOS ..... Level of Service
MPH ..... Miles per Hour
MUTCD ..... Manual on Uniform Traffic Control Devices
NB ..... Northbound
PFE ..... Public Facilities Element
RAS ..... Regional Arterial System
SANDAG ..... San Diego Association of Governments
SB ..... Southbound
TIS ..... Traffic Impact Study(1)
V/C ..... Volume to Capacity Ratio
WB ..... Westbound

Notes: (1) a traffic study can be referred to as a Traffic Impact Study or a Traffic Impact Analysis. A TIS designation is used throughout this report because the County of San Diego Guidelines for Determining Significance references TIS for traffic studies.

Executive Summary
Campus Park (TM 5338 & GPA 03-004)

The Campus Park Project is a mixed use development with 521 single-family dwelling units, 555 multi-family units, a town center with 61,200 square feet of commercial uses, 157,000 square feet of office space and a neighborhood park with a sports complex. The site consists of 416.1 gross acres and is located just north of SR-76 and approximately 0.25 miles east of Interstate 15 in the Fallbrook Community Planning area of San Diego County, California. The project site is generally vacant.

The project trip generation was calculated using SANDAG trip rates from the *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002. The project is calculated to generate 19,941 ADT, 1,423 AM peak hour trips, and 2,095 PM peak hour trips.

Project trips were distributed based on a SANDAG Series 11 traffic model. The SANDAG traffic model documented a 33% internal capture rate; however, at the request of Caltrans and to be conservative, the 33% was rounded down to 30%. The internal capture rate reflects the percentage of vehicles that would stay within the Traffic Analysis Zones (TAZs) located northeast of I-15 and SR-76 (Pala Road). These combined land uses create the equivalent of a small town where residents have retail, office, commercial, schools, and social attractions all within a short drive, a reasonable walking distance, or a short bike ride.

Cumulative projects were accounted for through a general plan summary approach where SANDAG provided a Series 10 Year 2030 model that included all cumulative projects that are consistent with the current land use plan, all non-consistent cumulative projects that will require a variance such as a General Plan Amendment, and all Casino projects that have been submitted to the County. This cumulative traffic model approach is currently being utilized by the County for the GP Update. In addition to the aforementioned approach, ninety five (95) nearby cumulative projects were reviewed in detail. Roadway improvements already under construction (widening of SR-76 from 2 to 4 lanes by the Granite Construction Company) or roadway improvements needed to achieve access to the project (Horse Ranch Creek Road, Pala Mesa Drive, Pankey Place and all associated internal intersections) were incorporated into the analysis. Other roadway improvements are planned by the Pala Tribe and Caltrans; however, these improvements were not incorporated into the analysis. The other significant cumulative projects include (with cumulative project reference):

1) Meadowood (#1)
2) Campus Park West (#2)
3) Pala Mesa Resort (#11)
4) Palomar College (#26)
5) Warner Ranch (#45)
6) Pauma Tribe (#46)
7) Pala Shopping Center (#90)
8) Gregory Landfill (#95)

The reader should note that this is a conservative (i.e., assessed impacts are greater) cumulative analysis in that it includes all of the traffic projected as resulting from cumulative projects but does not assume the mitigation proposed by these other projects. In other words, the analysis is conservative because existing, rather than projected improved roadway conditions, provide the basis for analysis. The reader should also note that applications submitted to the County, and included within projected cumulative conditions, frequently assume higher densities (with higher associated traffic generation) than what is ultimately allowed following project approval. This also contributes to the conservative nature of the analysis.

The horizon year (2030) analysis is based on roadway conditions per the adopted County Circulation Element. All of the roadways with cumulative impacts are calculated to operate at acceptable levels of service with the roadway conditions identified under horizon year (2030) conditions with the exception of Pankey Road south of SR-76; however, this segment is calculated to operate at acceptable levels of service with implementation of a TIF proposed mitigation measure. Since the segment of Pankey Road south of SR-76 is calculated to operate at LOS F with or without the project, the project is not preventing the County's Circulation Element roadway network from operating at its planned LOS as stated in the Public Facilities Element policy.

The project is calculated to have direct impacts at two intersections and along four contiguous state route segments (six individual segments) that are mitigated to below a level of significance with implementation of the recommended mitigation measures. SR-76 from I-15 easterly a distance of approximately 1.4 miles is currently being widened from 2 to 4 lanes. Because this improvement is underway and anticipated to be completed by the end of 2009, the final 4 lane scenario was incorporated into the analysis. The project applicant understands that the portion of SR-76 being widened by Granite needs to be completed to not be an impact by the Campus Park project. The project will not come on-line without SR-76 east of I-15 being widened by Granite.

The cumulative impacts can be mitigated through participation in the County of San Diego 2008 TIF Program Update. Furthermore, the project applicant proposes to construct new roadways and intersections to provide access to and through the project site. Six of the proposed off-site intersection improvements are not due to direct impacts, thus the applicant will construct these improvements and receive a TIF credit for the amount of the improvement or pay the TIF without constructing the improvement. A summary of direct and cumulative impacts is shown in **Table E-1**.

TABLE E-1: IMPACT SUMMARY TABLE

Facility	Direct Impact Locations	Cumulative Impact Locations
Intersections	1) SR-76/I-15 NB Ramp (#7) 2) Old Hwy 395/Reche Road (#15)	1) SR-76/Melrose Dr 2) SR-76/E Vista Way 3) SR-76/North River Rd 4) SR-76/Olive Hill Rd 5) SR-76/S Mission Rd 6) SR-76/Via Monserate 7) SR-76/Gird Rd 8) SR-76/Sage Road 9) SR-76/Old Hwy 395 10) SR-76/I-15 SB Ramp 11) SR-76/I-15 NB Ramp 12) SR-76/Pankey Road 13) SR-76/Rice Canyon Road 14) SR-76/Couser Canyon Road 15) Mission Rd at Old Hwy 395 16) Mission Road at I-15 SB Ramp 17) Mission Road at I-15 NB Ramp 18) Old Hwy 395/Reche Rd 19) Old Hwy 395/Stewart Canyon Rd 20) Old Hwy 395/Pala Mesa Dr 21) Old Hwy 395/Dulin Rd 22) Reche Rd/Live Oak Park Rd
Segments and State Routes	1) SR-76 (S Mission Rd to Gird Rd) 2) SR-76 (Sage Rd to Old Hwy 395) 3) SR-76 (I-15 SB Ramp to I-15 NB Ramp) 4) SR-76 (Horse Ranch Creek Rd to Couser Canyon Rd)[1]	1) Old Hwy 395 from E Mission Rd to W Lilac Rd 2) Reche Rd from Green Canyon Norte to Gird Rd 3) Pankey Rd from SR-76 to Shearer Crossing 4) Pala Mesa Dr from Wilt Rd/Sage Rd to Old Hwy 395 5) SR-76 Melrose Dr to Old Hwy 395 6) SR-76 from I-15 SB Ramp to I-15 NB Ramp 7) SR-76 from Horse Ranch Creek Rd to Pala Mission Rd[2]
Freeways	None	None
Ramps	None	None
Various Roadways Elements	Modification to roadway standards have been submitted or approved for Horse Ranch Creek Road GP Update Boulevard Standard, driveway spacing, and sight distance triangles.	None

Notes: (1) Impact is only between Granite Driveway and Couser Canyon Road; however, segment is labeled from Horse Ranch Creek Road to match segment limits used in this study. (2) Impact is only between Granite Driveway and Pala Mission Road; however, segment is labeled from Horse Ranch Creek Road to match segment limits used in this study.

1.0 Introduction

This report describes the existing roadway network in the vicinity of the project site and includes a review of the existing and proposed activities for weekday peak AM and PM periods, and daily traffic conditions when the project is completed. The format of this study includes the following chapters:

1.0 Introduction
2.0 Existing Conditions
3.0 Project Impact Analysis
4.0 Impact Summary
5.0 Summary of Project Impacts & Mitigation
6.0 References
7.0 List of Preparers and Persons and Organizations Contacted

1.1 Purpose of the Report

The purpose of this traffic impact study is to determine and analyze potential traffic impacts for the proposed project. This report is a technical CEQA document to the Campus Park EIR.

1.2 Project Location and Description

The project is located on the northeast corner of I-15/SR-76 in the Fallbrook Planning area of San Diego County, California. The location of the project is shown in **Figure 1.**

The project is planned with 521 single-family dwelling units, 555 multi-family units, a town center with 61,200 square feet of commercial uses, 157,000 square feet of office space and neighborhood park including a sports complex. The site consists of 416.1 gross acres. The project site is generally vacant. A preliminary site plan is shown in **Figure 2**. The map of the Traffic Impact Study (TIS) area is shown in **Figure 3.**

A General Plan Amendment (GPA) is also being submitted under separate cover that documents the proposed changes to the County's Circulation Element Plan. The proposed amendments to the Circulation Element Plan as shown in **Figure 4** include:

1) Relocation of SC 2602 to Horse Ranch Creek Road
2) Reclassification of SC 2602 to General Plan Update Boulevard Standard
3) Relocation of SC 160 to a new alignment from Old Highway 395 to Pankey Place
4) Reclassification of Pala Mesa Drive between SR-76 and Pankey Place to a Collector
5) Relocation of SC 160 to a new alignment from Pala Mesa Drive to Horse Ranch Creek Road as a Light Collector

Figure 1: Project Location

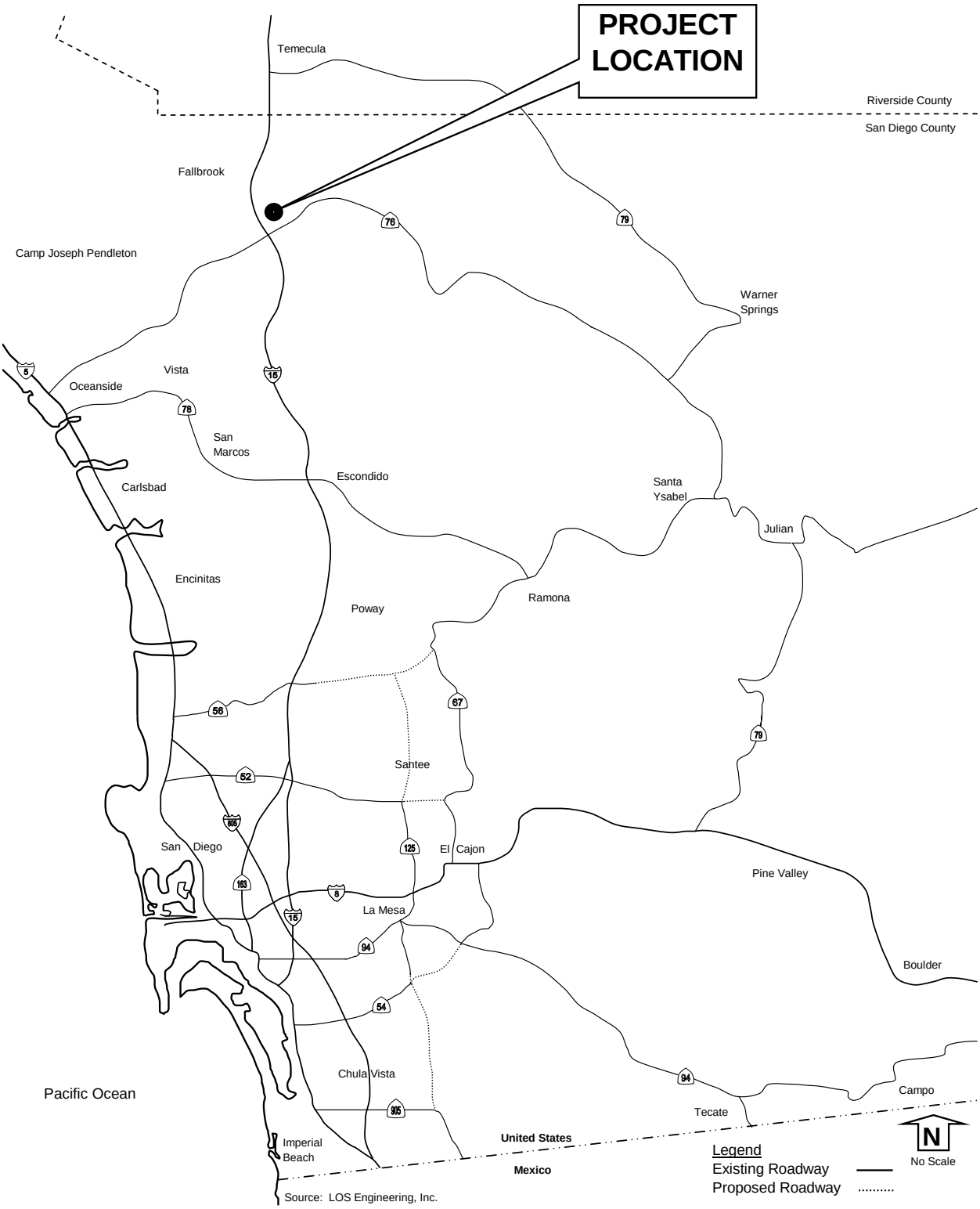
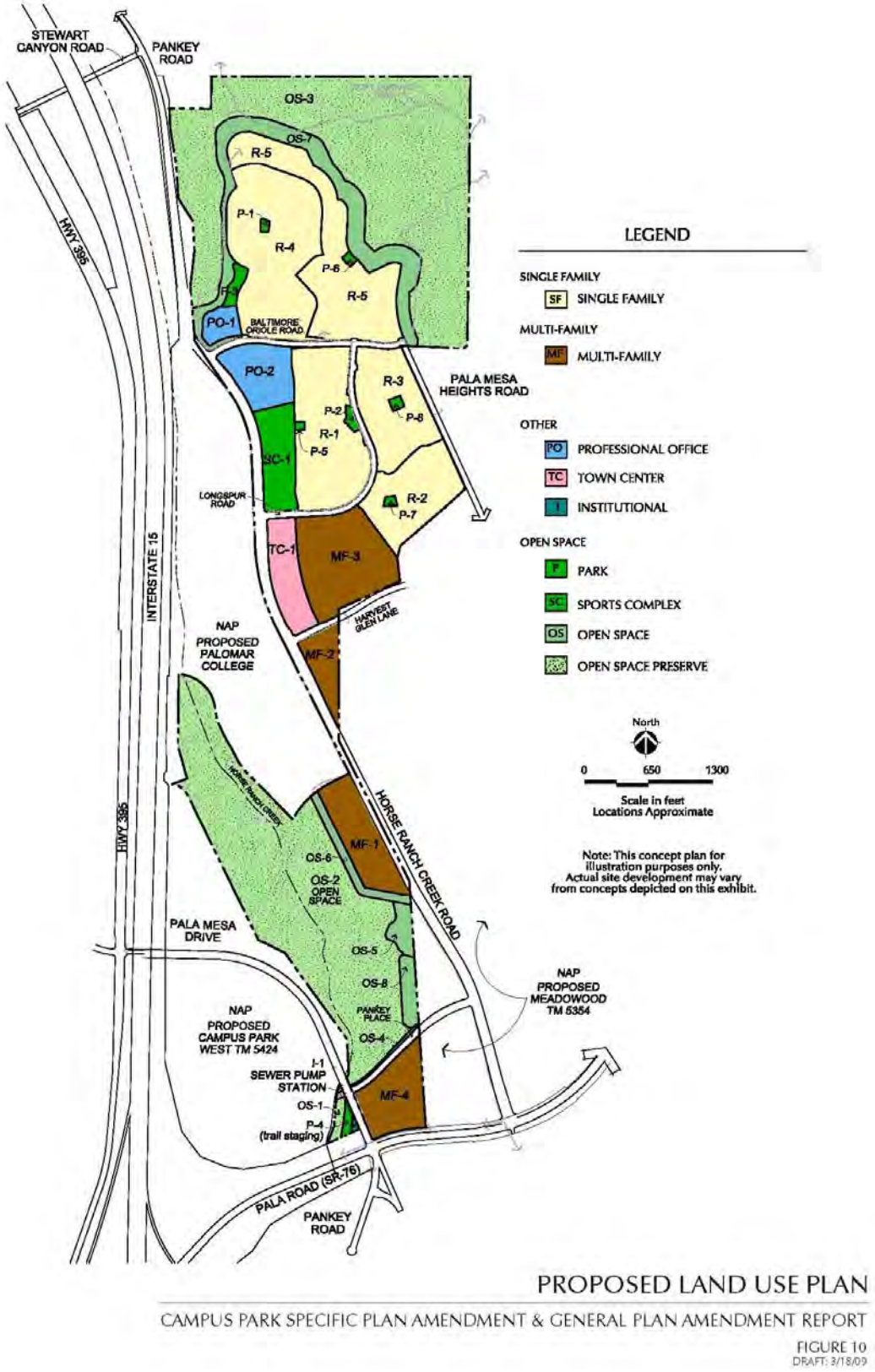


Figure 2: Site Plan



Source: Passerelle

Figure 3: TIS Study Area

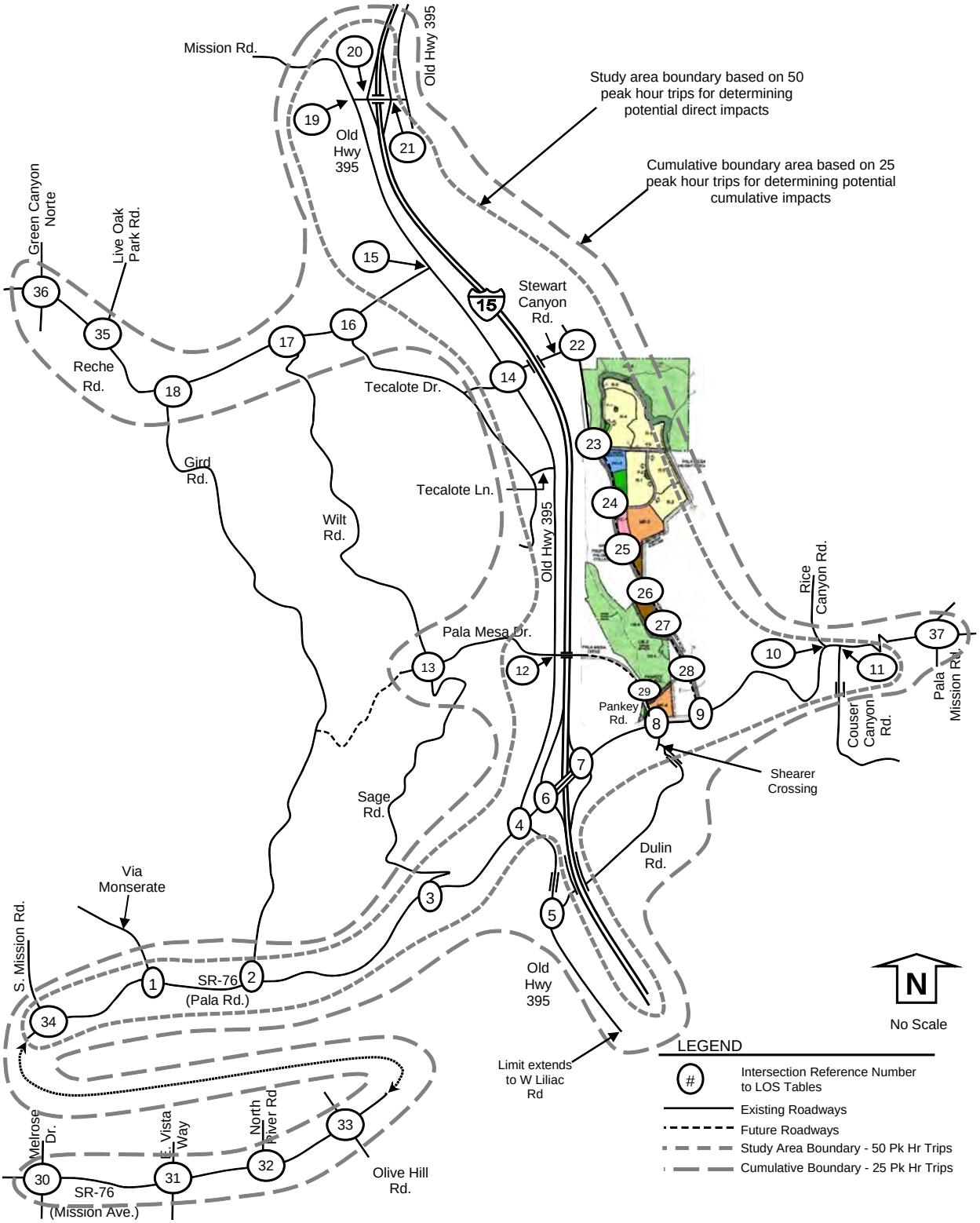
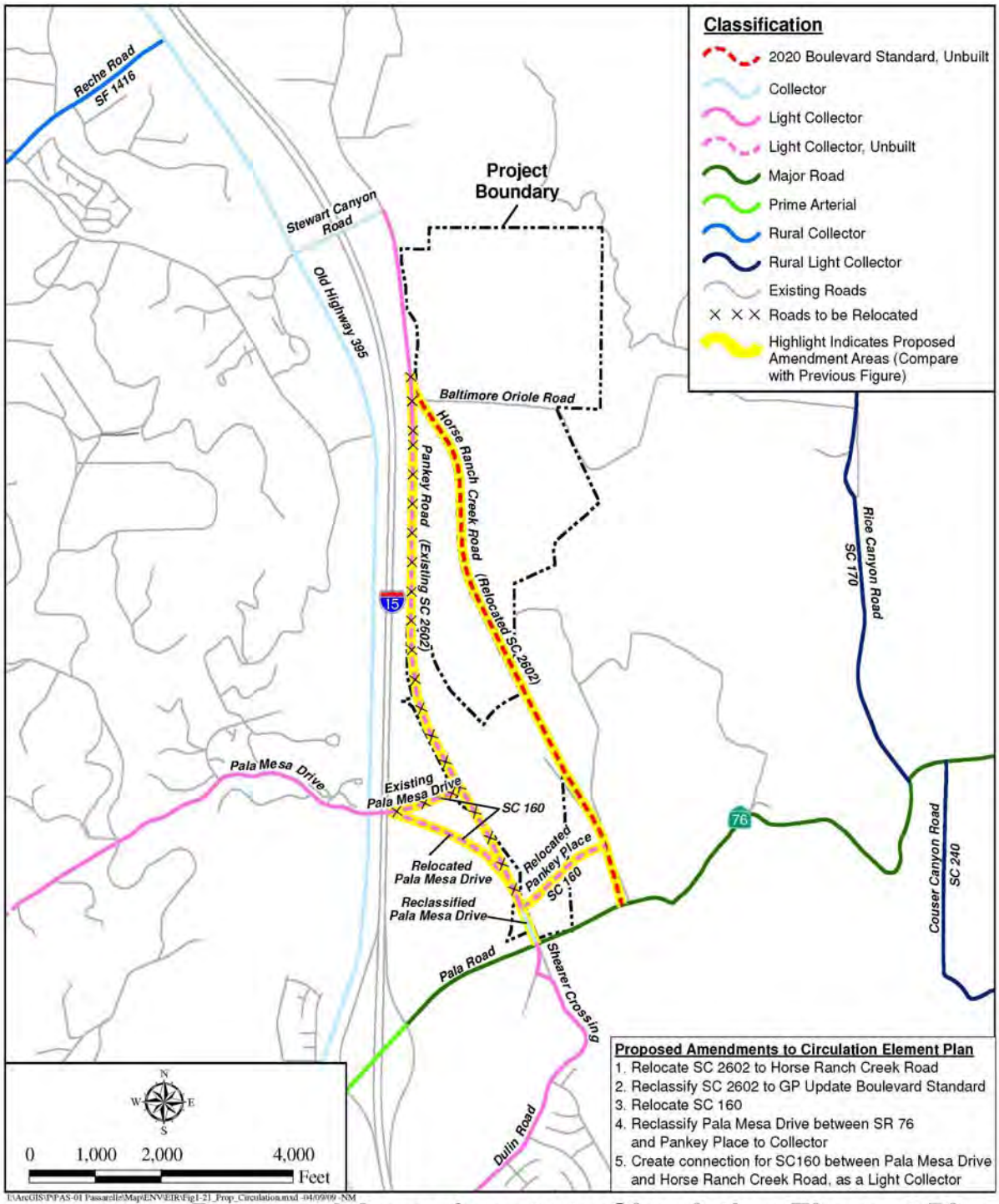


Figure 4: Proposed Changes to County's Circulation Element Plan



Proposed Amendments to Circulation Element Plan

CAMPUS PARK PROJECT

HELIX

Figure 1-21

1.3 Summary of Significance Criteria

This section describes traffic impact significance criteria, which is based on the County of San Diego *Guidelines for Determining Significance and Report Format & Content Requirements Transportation and Traffic*, December 5, 2007, the County of San Diego General Plan Public Facilities Element (Part XII), and the San Diego Association of Governments Congestion Management Program.

1.3.1 County of San Diego Guidelines for Determining Significance

Based on the County of San Diego *Guidelines for Determining Significance and Report Format & Content Requirements Transportation and Traffic*, December 5, 2007, a project may have a direct and/or cumulative impact if the significance criteria are exceeded, as shown in **Table 1**.

TABLE 1: COUNTY OF SAN DIEGO SIGNIFICANT TRAFFIC IMPACT THRESHOLDS

Measures of Significant Project Impacts to Congestion Allowable Increases on Congested Roads and Intersections					
	Road Segments			Intersections	
Operations	2-Lane Road	4-Lane Road	6-Lane Road	Signalized	Un-signalized
LOS E	200 ADT	400 ADT	600 ADT	Delay of 2 seconds	20 peak hour trips on a critical movement
LOS F	100 ADT	200 ADT	300 ADT	Delay of 1 second, or 5 peak hour trips on a critical movement	5 peak hour trips on a critical movement

Source: County of San Diego *Guidelines for Determining Significance* Tables 1 & 2. Note: A critical movement is one that is experiencing excessive queues. By adding proposed project trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes any trips must mitigate it's share of the cumulative impacts. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity. On-site roadways are required to be at LOS C or better.

A direct impact would occur when the significance criteria are exceeded. If the proposed project exceeds the values provided in the above table, then the individually proposed project would result in a direct traffic impact. Specific improvements to mitigate direct impacts must be identified.

A cumulative impact would occur when two conditions are met: 1) build-out of all near-term projects results in a cumulative traffic impact and 2) the amount of traffic generated by the individual proposed project contributes (even in a small part) to that cumulative impact. Both conditions must be met for an individual project to result in a cumulative traffic impact. If the traffic generated from all the near-term projects (cumulative projects) would result in a cumulative traffic impact then condition one is met. If the total amount of traffic generated exceeds the values provided in the above table, then condition two is met and the individually proposed project would result in a cumulative traffic impact.

Potential mitigation measures may include traffic signal improvements, physical road improvements, street re-striping and parking prohibitions, fair-share contributions, and transportation demand management programs.

1.3.2 County of San Diego General Plan Public Facilities Element (Part XII)

The County of San Diego *Guidelines for Determining Significance and Report Format and Content Requirements Transportation and Traffic* dated December 5, 2007 includes a summary of the Public Facilities Element of the San Diego County General Plan as follows:

> "The County of San Diego General Plan Public Facilities Element establishes policies and implementation measures regarding the assessment and mitigation of traffic impacts of new development. One of the goals of the Public Facilities Element (PFE) is to provide "A safe, convenient, and economical integrated transportation system including a wide range of transportation modes (PFE, page XII-4-18)." The PFE also identifies an objective in the Transportation Section to provide a "Level of Service C or better on County Circulation Element roads (PFE, page XII-4-18)." The PFE, however, establishes LOS D as an off-site mitigation threshold for discretionary projects. When an existing Level of Service is already D, "a LOS of D may be allowed (PFE, page XII-4-18)." According to the PFE, projects that significantly increase congestion on roads operating at LOS E or LOS F must provide mitigation. According to the PFE, this mitigation can consist of a fair-share contribution to an established program or project to mitigate the project's impacts. If impacts cannot be mitigated, the project will be denied unless a specific statement of overriding findings is made pursuant to Sections 15091 and 15093 of the State CEQA Guidelines to approve the project as proposed."

The County of San Diego significance criteria is consistent with the aforementioned summary of PFE Policy 1.1, which requires mitigation for projects that significantly increase congestion on roads operating at LOS E or LOS F.

PFE Policy 1.2 states "General Plan Amendments and Rezones shall be reviewed to ensure that any proposed increases in density or intensity of use will not prevent the planned Circulation Element road system from operating at its planned Level of Service at build out." The project applicant proposes a General Plan Amendment.

In summary, the County of San Diego traffic impact significance criteria covers the significance criteria identified in PFE policies 1.1 and 1.2.

1.3.3 SANDAG Congestion Management Program Criteria

The San Diego Association of Governments (SANDAG) Congestion Management Program (CMP) is intended to determine if a large project (greater than 2,400 ADT or more than 200 peak hour trips) will adversely impact the CMP transportation system. A CMP analysis is included because this project is calculated to generate more than 2,400 ADT and more than 200 peak hour trips. A CMP analysis is required on the Regional Arterial System (RAS), which includes the following in the vicinity of the project site:

1) I-15,
2) SR-76, and
3) Old Highway 395.

All of the above have been included in the analysis. A copy of CMP RAS listing is included in

Appendix A.

Based on the County of San Diego *Guidelines for Determining Significance and Report Format & Content Requirements Transportation and Traffic*, December 5, 2007, the CMP significance criteria are shown in **Table 2**.

TABLE 2: SANDAG CMP SIGNIFICANT TRAFFIC IMPACT THRESHOLDS

Level of Service with Project	Allowable Increase Due to Project Impacts					
	Freeways		Roadway Segments		Intersections	Ramps with> 15 min Delay
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
E & F	0.01	1	0.02	1	2	2

Source: County of San Diego *Guidelines for Determining Significance* Table 5. V/C = Volume to capacity ratio. Speed measured in miles per hour. Delay = Average stopped delay per vehicle measured in seconds, or minutes. LOS: Level of Service. ADT = Average Daily Trips.

With regard to freeways as referenced in Table 2, the lead agency typically refers to Caltrans for determination of impacts and potential mitigation measures. The following section describes Caltrans' criteria.

1.3.4 CALTRANS' Criteria

Caltrans' *Guide for the Preparation of Traffic Impact Studies*, December 2002, outlines recommended procedures for traffic study contents but does not identify specific traffic impact thresholds. Caltrans staff has indicated that there is a desire to maintain freeway operations between LOS C and D levels.

Specific traffic impact thresholds are typically identified by local Caltrans staff. For the San Diego region, Caltrans' staff has previously indicated that an impact to a freeway is generally identified when project traffic causes the operations to drop one letter grade (i.e. from LOS E to LOS F).

Since the lead agency is the County of San Diego, the aforementioned Caltrans' criteria are included for reference to assist Caltrans in their evaluation.

2.0 Existing Conditions

This section describes the existing study area street system: existing peak hour intersection volumes with Level of Service (LOS), existing daily roadway volumes with LOS, and existing parking, transit and on-site circulation conditions.

2.1 Existing Transportation Conditions

In the vicinity of the project, only the roadways where the project would add 25 or more peak hour trips for potential cumulative impacts and 50 or more peak hour trips for potential direct impacts were analyzed as part of this study. The 50 peak hour project trip study area is utilized for existing + project, horizon year, and horizon year + project conditions (scenarios where the project will add 50 peak hour trips to determine potential direct impacts). The 25 peak hour study area is used for existing, existing + cumulative, and existing + cumulative + project conditions (scenarios where potential cumulative impacts are calculated). The existing transportation conditions are described for the larger 25 peak hour study area, which include::

I-15 in the vicinity of the project is classified as a *Freeway* on the September 2005 San Diego County Circulation Element map. A copy of the September 2005 San Diego County Circulation Element Map showing the study area roadways is included in **Appendix B**. I-15 from Rainbow Valley Boulevard to Escondido Highway (Old Highway 395) is constructed as an eight lane freeway with a center divider. The travel lanes are generally 12 feet in width and the shoulders are generally 10 to 12 feet in width. The posted speed limit is 70 MPH along I-15 in the vicinity of the project.

SR-76 from Melrose Drive to S. Mission Road is classified as a *Expressway;* from S. Mission Road to I-15, SR-76 is classified as a *Prime Arterial with bike lanes* and from I-15 to Pala Mission Road, SR-76 is classified as a *Major Road with bike lanes* on the September 2005 San Diego County Circulation Element map. SR-76 from Melrose Drive to S. Mission Road is generally constructed as a two-lane un-divided roadway (one travel lane of approximately 12 feet in each direction) with shoulder widths ranging from one to five feet (total pavement width ranges from approximately 26 feet to approximately 34 feet). SR-76 from S. Mission Road to Old Highway 395 is generally constructed as a two-lane un-divided roadway (one travel lane of approximately 12 feet in each direction) with shoulder widths ranging from two to eight feet (total pavement width ranges from approximately 28 feet to approximately 40 feet). From Old Highway 395 to I-15 southbound ramps, SR-76 is constructed within approximately 76 feet of pavement with a center two way left turn lane of approximately 12 feet, two travel lanes in each direction for approximately 24 feet, and a paved shoulder in each direction of approximately eight feet. From I-15 southbound ramps to I-15 northbound ramps, SR-76 is constructed within approximately 56 feet of pavement with one travel lane of approximately 13 feet in each direction, a back to back left turn lane of approximately 14 feet, and a shoulder of approximately eight feet for each travel direction. From I-15 northbound ramps to Pala Mission Road, SR-76 is constructed within approximately 28 feet with one travel lane of approximately 12 feet in each direction and a shoulder of approximately two feet in each direction. Speed limit signs of 55 MPH were observed on the segments between Melrose Drive and North River Road. Additionally, several horizontal alignment signs from the Manual on Uniform Traffic Control Devices (MUTCD) are posted along SR-76. The 85th percentile speeds are summarized at the end of this section.

SR-76 from the I-15 NB Ramp easterly a distance of approximately 1.4 miles is currently being widened from 2 to 4 lanes (photos included at the end of Appendix B). This widening is anticipated to be completed by the end of 2009, which is prior to Campus Park approvals. Therefore, the State Route 76 segment analyses used 2 lanes for existing conditions and 4 lanes for all other scenarios.

SR-76 has two identified widening projects that include the Caltrans SR-76 Middle Project (from approximately Melrose Drive to S Mission Road) and the Caltrans SR-76 East Project (from approximately S. Mission Road to the I-15 NB Ramp, including interchange improvements). Caltrans' fact sheets are included at the end of Appendix B. On 10/24/08, the SANDAG Board approved the redistribution of funds between SR-76 corridor projects to fully fund the construction phase of the Caltrans SR-76 Middle Project. The estimated completion date for the Caltrans SR-76 Middle Project is 2012. The Caltrans SR-76 East Project has identified TransNet as a funding source and the current estimate of completion is 2015.

Dulin Road from Old Highway 395 to Shearer Crossing is classified as a *Light Collector* on the September 2005 San Diego County Circulation Element map. The northern portion of Dulin Road becomes Shearer Crossing and is also classified as a *Light Collector* on the September 2005 San Diego County Circulation Element map. Dulin Road/Shearer Crossing from Old Highway 395 to Pankey Road is generally constructed as a two lane un-divided roadway (one travel lane of approximately 12 feet in each direction) within approximately 40 feet of pavement. A short portion of Dulin Road just east of Old Highway 395 is constructed with four lanes (2 lanes in each direction). Dulin Road, in general, has one travel lane of approximately 12 feet in each direction along with a parking lane of approximately eight feet on each side of the roadway within the residential community of Lake Rancho Viejo. The posted speed limit is 25 MPH. The 85th percentile speeds are summarized at the end of this section.

Horse Ranch Creek Road is a proposed roadway that will connect to the existing portion of Pankey Road that exists south of Stewart Canyon Road to SR-76 along a new alignment. The applicant proposes to construct Horse Ranch Creek Road per GP Update Circulation Element "Boulevard" standards and has submitted a request for a modification to a road standard under separate cover. The proposed Horse Ranch Creek Road will replace the existing Pankey Road that is classified as a *Light Collector* on the September 2005 San Diego County Circulation Element map. The project applicant will be responsible for constructing this segment of Horse Ranch Creek Road before obtaining occupancy permits.

Old Highway 395 from Mission Road to Dulin Road is classified as a *Collector with bike lanes* and from Dulin Road to W. Lilac Road is classified as a *Rural Collector with bike lanes* on the September 2005 San Diego County Circulation Element map. From Mission Road to Dulin Road, Old Highway 395 is generally constructed as a two-lane un-divided roadway (one travel lane of approximately 12 feet in each direction) with shoulder widths ranging from two to eight feet (total pavement width ranges from approximately 28 feet to approximately 40 feet). The posted speed limit on Old Highway 395 from Mission Road to SR-76 is 55 MPH. Between Dulin Road and W. Lilac Road, Old Highway 395 is generally constructed as a two-lane un-divided roadway (one travel lane of approximately 12 feet in each direction) with shoulder widths ranging from two to six feet (total pavement width ranges from approximately 28 feet to approximately 36 feet). A posted speed limit was not observed on this segment of Old Highway 395 south of Dulin Road. The 85th percentile speeds are summarized at the end of this section.

Pankey Road from Stewart Canyon Road to Dulin Road is classified as a *Light Collector* on the September 2005 San Diego County Circulation Element map. From Stewart Canyon Road to a terminus cul-de-sac approximately 0.7 miles to the south, Pankey Road is constructed with approximately 32 feet of pavement with a northbound travel lane of approximately 20 feet and southbound travel lane of approximately 12 feet. From SR-76 north to an existing bridge over Horse Ranch Creek, Panky Road is within approximately 40 feet of pavement (including over the bridge) and one travel lane in each direction (no posted speed limits were observed). From SR-76 south to Shearer Crossing (connects to Dulin Road), Panky Road is constructed with approximately 40 feet of pavement and one travel lane in each direction. No posted speed limits were observed. The 85th percentile speeds are summarized at the end of this section.

Pala Mesa Drive from Sage Rd/Wilt Rd to Pankey Road is classified as a *Light Collector* on the September 2005 San Diego County Circulation Element map. Pala Mesa Drive between Sage Rd/Wilt Rd and Old Hwy 395 is generally constructed within approximately 24 feet of pavement with one travel lane in each direction; however, some portions closer to Wilt Rd/Sage Rd narrow to approximately 19 feet of pavement. A posted speed limit was not observed on this segment. The 85th percentile speeds are summarized at the end of this section. Pala Mesa Drive east of Old Highway 395 currently exists as a bridge over I-15 that is closed to traffic. From Old Highway 395 to Pankey Place, the Pala Mesa Drive alignment is proposed to be realigned. The new alignment is shown throughout the various figures located within this report and will be a 2 lane light collector designed per County Standards to the satisfaction of the Department of Public Works (DPW). The project applicant will be responsible for constructing this segment of Pala Mesa Drive before obtaining occupancy permits.

Reche Road from Green Canyon Road/Green Canyon Norte to Gird Road is classified as a *Rural Collector* and from Gird Road to Old Highway 395 is classified as a *Rural Collector with Bike Lanes* on the September 2005 San Diego County Circulation Element map. Reche Road from Green Canyon Road/Green Canyon Norte to Old Highway 395 is generally constructed as a two-lane un-divided roadway (one travel lane of approximately 12 feet in each direction) within approximately 26 to 28 feet of pavement. The posted speed limit is 45 MPH. The 85th percentile speeds are summarized at the end of this section.

Pankey Place (aka Street R) is a proposed roadway that will connect the new Pala Mesa Drive extension (from the existing Pala Mesa Drive bridge over I-15 down to Pankey Place) to the new Horse Ranch Creek Road. Pankey Place (aka Street R) is proposed as a two lane light collector to be designed per County Standards to the satisfaction of the DPW. The project applicant will be responsible for constructing this segment of Street R (aka Pankey Place) before obtaining occupancy permits.

Stewart Canyon Road from Old Highway 395 to Pankey Road is classified as a *Collector* on the September 2005 San Diego County Circulation Element map. Stewart Canyon Road from Old Highway 395 to Pankey Road is generally constructed as a two-lane un-divided roadway within approximately 40 feet of pavement. A posted speed limit was not observed on this segment. The 85th percentile speeds are summarized at the end of this section.

The existing roadway conditions are shown in **Figures 5a and 5b**. The 85th percentile speeds for the aforementioned roadways are summarized in **Table 3** with data included in **Appendix C.**

Figure 5a: Existing Roadway Conditions

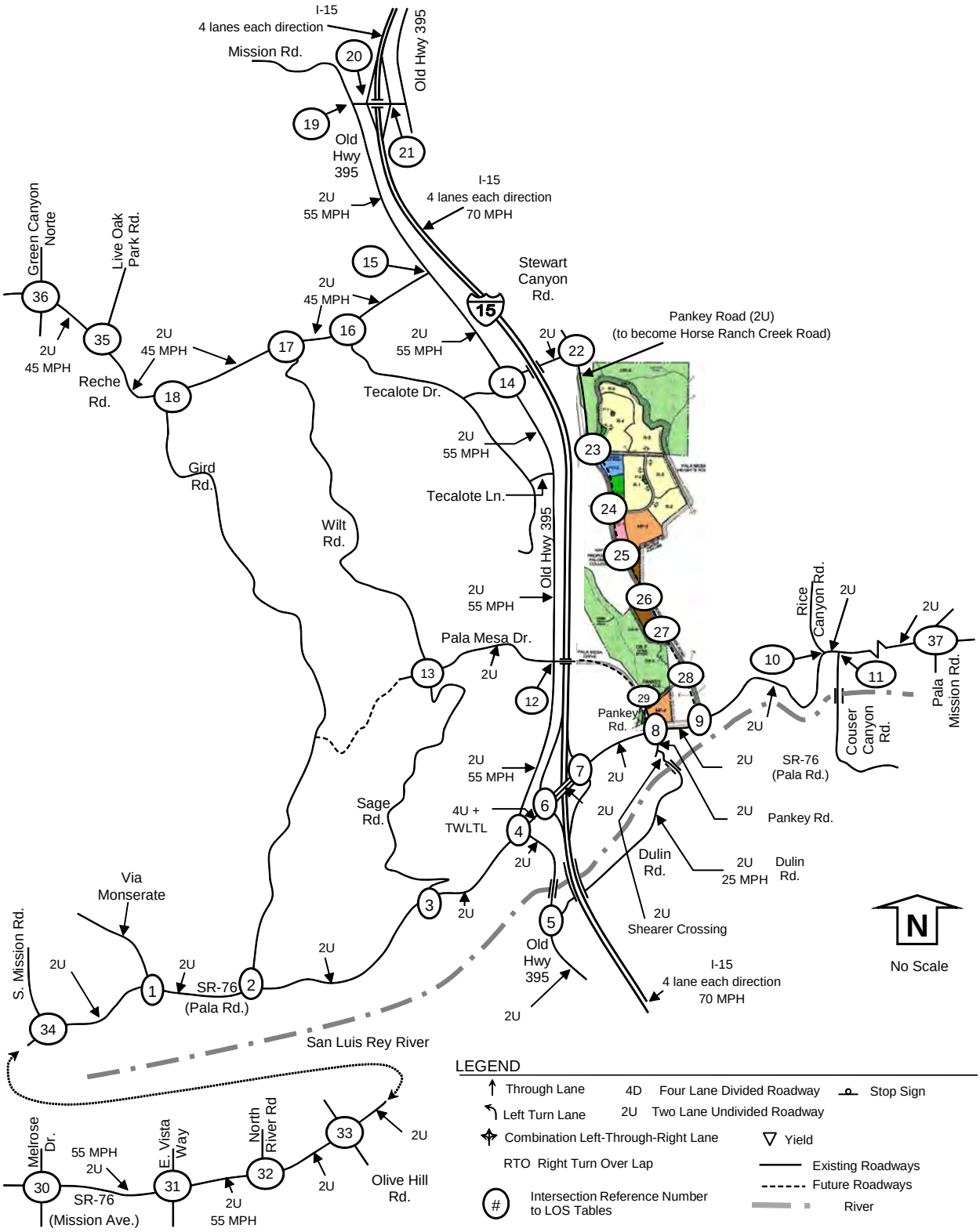


Figure 5b: Existing Roadway Conditions

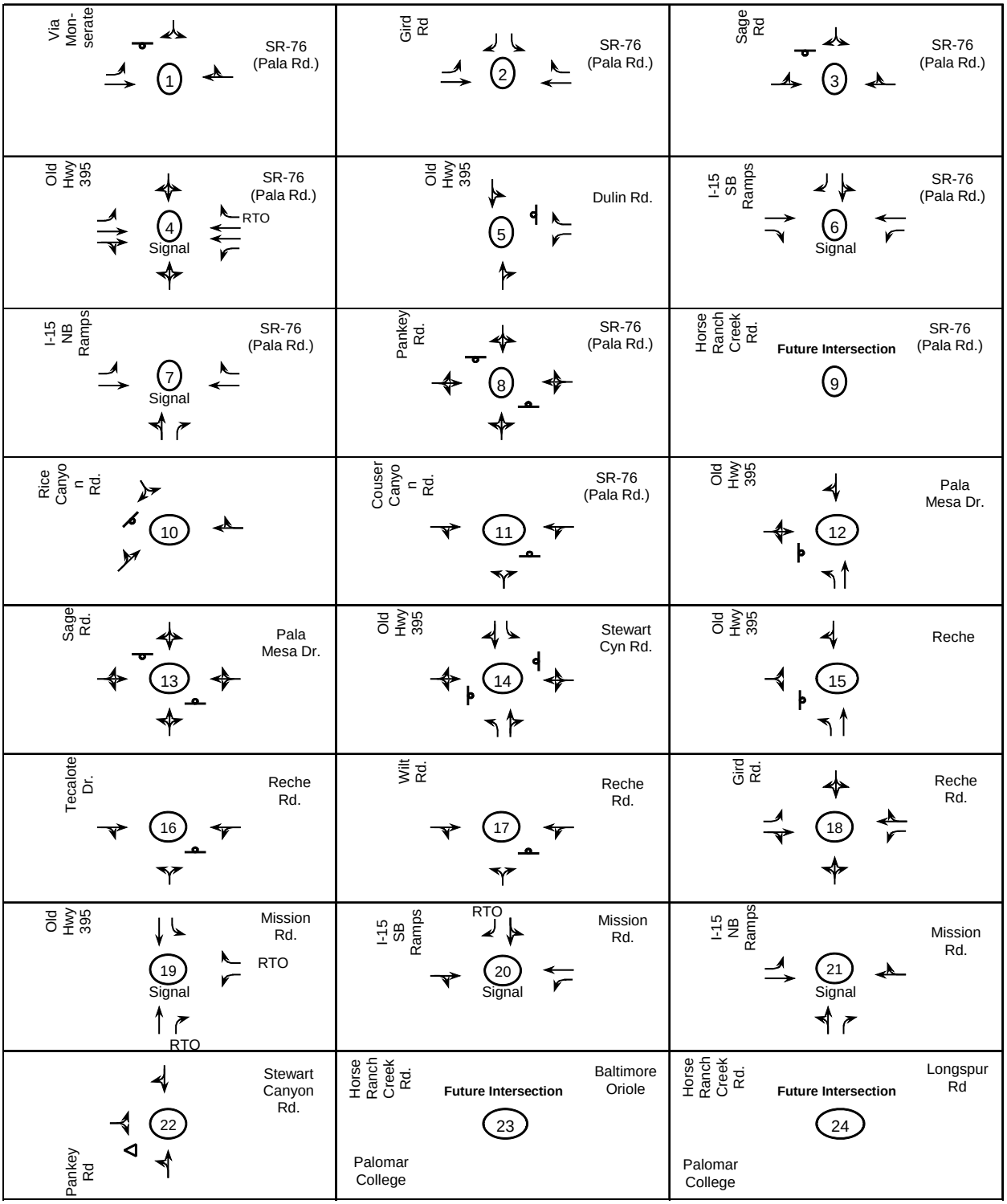


Figure 5c: Existing Roadway Conditions

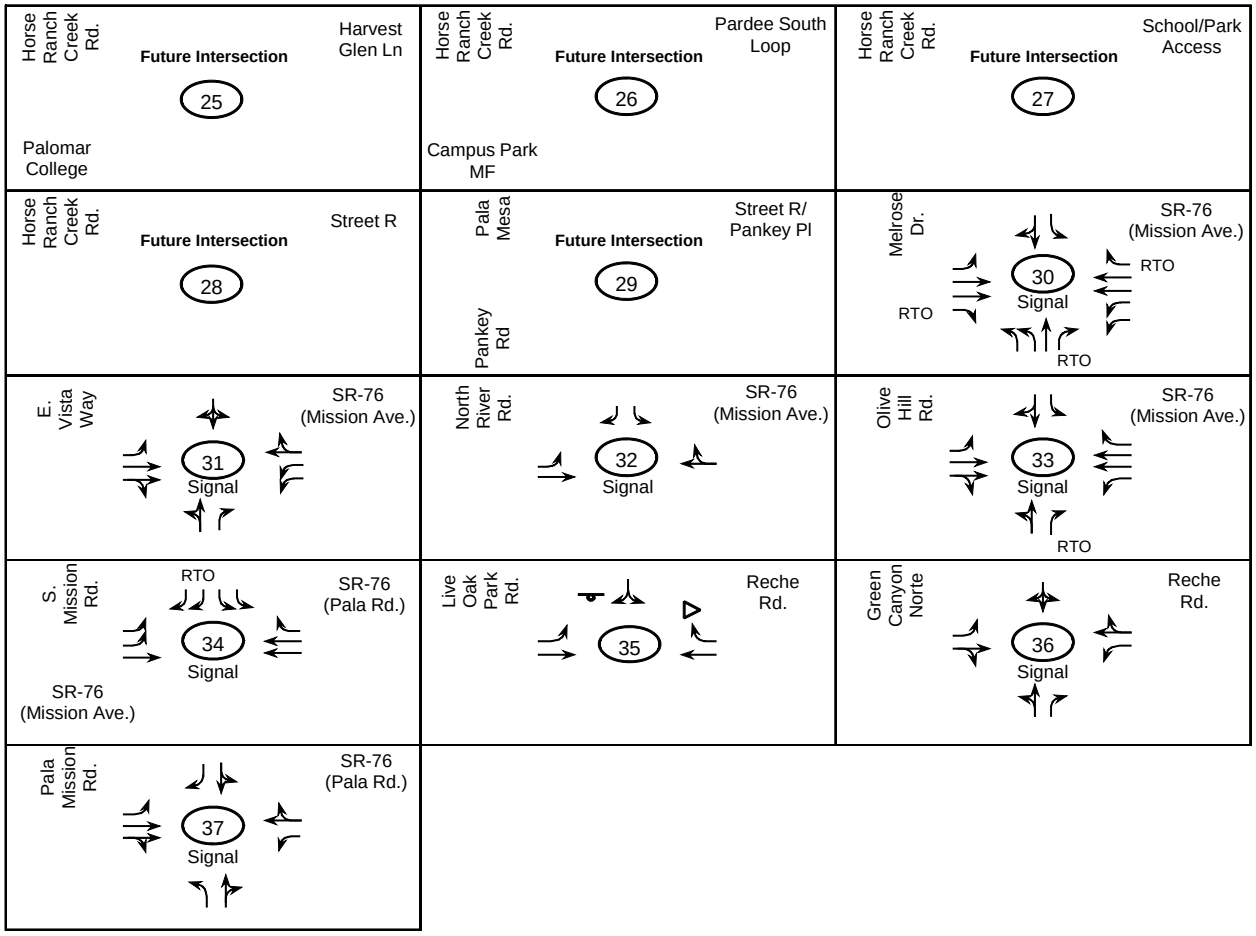


TABLE 3: STUDY AREA ROADWAY SPEEDS – 85TH PERCENTILE

Segment	85th Percentile Speed (MPH) and Direction	
SR-76		
Melrose Drive to E Vista Way	Eastbound 49 MPH	Westbound 59 MPH
E Vista Way to North River Road	Eastbound 49 MPH	Westbound 51 MPH
North River Road to Olive Hill Road	Eastbound 52 MPH	Westbound 49 MPH
Olive Hill Road to S Mission Road	Eastbound 44 MPH	Westbound 44 MPH
S Mission Road to Via Monerate	Eastbound 49 MPH	Westbound 49 MPH
Via Monserate to Gird Road	Eastbound 50 MPH	Westbound 53 MPH
Gird Road to Sage Road	Eastbound 58 MPH	Westbound 55 MPH
Sage Road to Old Highway 395	Eastbound 53 MPH	Westbound 50 MPH
Old Highway 395 to I-15 SB Ramp	Eastbound 42 MPH	Westbound 41 MPH
I-15 SB Ramp to I-15 NB Ramp	Eastbound 42 MPH	Westbound 36 MPH
I-15 NB Ramp to Pankey Road	Eastbound 65 MPH	Westbound 58 MPH
Pankey Road to Horse Ranch Creek Road	Eastbound 65 MPH	Westbound 58 MPH
Horse Ranch Creek Road to Rice Canyon Road	Eastbound 48 MPH	Westbound 39 MPH
Rice Canyon Road to Couser Canyon Road	Eastbound 44 MPH	Westbound 45 MPH
Couser Canyon Road to Pala Mission Road	Eastbound 51 MPH	Westbound 52 MPH
Dulin Road		
Old Highway 395 to Pankey Road	Eastbound 42 MPH	Westbound 44 MPH
Old Highway 395		
East Mission Road to Reche Road	Northbound 54 MPH	Southbound 57 MPH
Reche Road to Stewart Canyon Road	Northbound 57 MPH	Southbound 54 MPH
Stewart Canyon Road to Tecalote Lane	Northbound 57 MPH	Southbound 60 MPH
Tecalote Lane to Pala Mesa Drive	Northbound 59 MPH	Southbound 61 MPH
Pala Mesa Drive to SR-76 (Pala Road)	Northbound 54 MPH	Southbound 59 MPH
SR-76 (Pala Road) to Dulin Road	Northbound 59 MPH	Southbound 59 MPH
Dulin Roat to W. Lilac Road	Northbound 63 MPH	Southbound 56 MPH
Reche Road		
Green Canyon Norte to Live Oak Park Road	Eastbound 39 MPH	Westbound 43 MPH
Live Oak Park Road to Gird Road	Eastbound 38 MPH	Westbound 42 MPH
Gird Road to Wilt Road	Eastbound 44 MPH	Westbound 47 MPH
Wilt Road to Tecalote Road	Eastbound 50 MPH	Westbound 49 MPH
Tecalote Drive to Old Highway 395	Eastbound 46 MPH	Westbound 44 MPH
Stewart Canyon Road		
Old Hwy 395 to Horse Ranch Creek Road	Eastbound 43 MPH	Westbound 41 MPH
Pankey Road		
South of Stewart Canyon Road	Northbound 40 MPH	Southbound 38 MPH
SR-76 (Pala Road) to Dulin Road	Northbound 30 MPH	Southbound 30 MPH
Pala Mesa Road		
Wilt Road/Sumac Road to Old Hwy 395	Eastbound 32 MPH	Westbound 35 MPH

MPH: Miles Per Hour

2.1.1 Existing Traffic Volumes and Level of Service

Existing AM and PM peak hour intersection volumes (with count dates) for the following intersections were collected for this study:

1) SR-76 (Pala Rd) / Via Monserate – Thursday (12/18/2008)
2) SR-76 (Pala Rd) / Gird Rd – Thursday (12/18/2008)
3) SR-76 (Pala Rd) / Sage Rd – Thursday (12/18/2008)
4) SR-76 (Pala Rd) / Old Highway 395 – Tuesday (1/6/2009)
5) Old Highway 395 / Dulin Rd - Wednesday (12/5/2007)
6) SR-76 (Pala Rd) / I-15 SB Ramp – Thursday (12/18/2008)
7) SR-76 (Pala Rd) / I-15 NB Ramp – Thursday (12/18/2008)
8) SR-76 (Pala Rd) / Pankey Road – Tuesday (12/4/2007)
9) SR-76 (Pala Rd) / Horse Ranch Creek Rd – Future Intersection

10) SR-76 (Pala Rd) / Rice Canyon Rd – Tuesday (1/6/2009)
11) SR-76 (Pala Rd) / Couser Canyon Rd – Tuesday (1/6/2009)
12) Old Highway 395 / Pala Mesa Dr – Tuesday (1/6/2009)
13) Pala Mesa Dr / Wilt Road / Sage Rd – Tuesday (1/6/2009)
14) Old Highway 395 / Stewart Canyon Rd – Thursday (12/11/2008)
15) Old Highway 395 / Reche Rd – Thursday (12/11/2008)
16) Reche Rd / Tecalote Dr – Thursday (12/11/2008)
17) Reche Rd / Wilt Rd – Thursday (12/11/2008)
18) Reche Rd / Gird Rd – Thursday (12/11/2008)
19) Mission Rd / Old Highway 395 – Thursday (12/11/2007)
20) Mission Rd / I-15 SB Ramp – Thursday (12/18/2008)
21) Mission Rd / I-15 NB Ramp – Thursday (12/18/2008)
22) Stewart Canyon Rd / Pankey Rd – Thursday (12/18/2008)
23) SR-76 (Mission Rd) / Melrose Dr – Thursday (11/13/2008)
24) SR-76 (Mission Rd) / E. Vista Rd – Thursday (11/13/2008)
25) SR-76 (Mission Rd) / North River Rd – Thursday (11/11/2008)
26) SR-76 (Mission Rd) / Olive Hill Rd – Thursday (11/13/2008)
27) SR-76 (Mission Rd) / S. Mission Rd – Thursday (11/13/2008)
28) Reche Rd / Live Oak Park Rd – Tuesday (11/18/2008)
29) Reche Rd / Green Canyon Norte – Tuesday (11/18/2008)
30) SR-76 (Pala Rd) / Pala Mission Rd – Wednesday (11/19/2008)

The following street segment volumes (with count dates) were analyzed as part of this study:

1) SR-76 (Mission Rd) from Melrose Dr to E Vista Way – Tuesday (11/18/2008)
2) SR-76 (Mission Rd) from E Vista Way to North River Rd – Wednesday (11/12/2008)
3) SR-76 (Mission Rd) from North River Rd to Olive Hill Rd – Tuesday (11/11/2008)
4) SR-76 (Mission Rd) from Olive Hill Rd and S Mission Rd – Wednesday (11/12/2008)
5) SR-76 (Pala Rd) from S Mission Rd to Via Monserate – Tuesday (11/18/2008)
6) SR-76 (Pala Rd) from Via Monserate to Gird Road – Tuesday (1/6/2009)
7) SR-76 (Pala Rd) from Gird Road to Sage Road – Tuesday (1/6/2009)
8) SR-76 (Pala Rd) from Sage Road to Old Highway 395 – Tuesday (1/6/2009)
9) SR-76 (Pala Rd) from Old Highway 395 to I-15 SB Ramp – Tuesday (1/6/2009)
10) SR-76 (Pala Rd) from I-15 SB Ramp to I-15 NB Ramp - Tuesday (1/6/2009)
11) SR-76 (Pala Rd) from I-15 NB Ramp to Pankey Road – Tuesday (1/6/2009)
12) SR-76 (Pala Rd) from Pankey Road to Horse Ranch Creek Rd – Tuesday (1/6/2009)
13) SR-76 (Pala Rd) from Horse Ranch Creek Rd to Rice Canyon Rd – Tuesday (1/6/2009)
14) SR-76 (Pala Rd) from Rice Canyon Rd to Couser Canyon Rd – Tuesday (1/6/2009)
15) SR-76 (Pala Rd) from Couser Canyon Rd to Pala Mission Rd – Wednesday (11/12/2008)
16) Dulin Road from Old Highway 395 to Pankey Road – Thursday (12/11/2008)
17) Old Highway 395 from East Mission Road to Reche Road – Tuesday (1/6/2009)
18) Old Highway 395 from Reche Road to Stewart Canyon Road – Tuesday (1/6/2009)
19) Old Highway 395 from Stewart Canyon Road to Tecalote Lane – Thursday (12/11/2008)
20) Old Highway 395 from Tecalote Lane to Pala Mesa Drive – Thursday (12/11/2008)
21) Old Highway 395 from Pala Mesa Drive to SR-76 (Pala Rd) – Thursday (12/11/2008)
22) Old Highway 395 from SR-76 (Pala Rd) to Dulin Road – Thursday (12/11/2008)
23) Old Highway 395 from Dulin Road to W. Lilac Road – Thursday (12/11/2008)

24) Pala Mesa Drive from Wilt Rd/Sage Rd to Old Hwy 395 – Thursday (8/28/2008)
25) Reche Road from Green Canyon Norte to Live Oak Park Rd – Wednesday (11/12/2008)
26) Reche Road from Live Oak Park Rd to Gird Road – Tuesday (1/6/2009)
27) Reche Road from Gird Road to Wilt Road – Tuesday (1/6/2009)
28) Reche Road from Wilt Road to Tecalote Drive – Tuesday (1/6/2009)
29) Reche Road from Tecalote Drive to Old Highway 395 – Tuesday (1/6/2009)
30) Stewart Canyon Road from Old Highway 395 to Pankey Rd – Thursday (12/11/2008)
31) Pankey Road south of Stewart Canyon Rd – Thursday (12/11/2008)
32) Pankey Road from SR-76 (Pala Rd) to Shearer Crossing/Dulin Road – Thursday (12/13/2007)

The following freeway segment volumes (from Caltrans web site documenting year 2007 volumes) were analyzed as part of this study:

1) I-15 from Rainbow Valley Boulevard to Mission Road
2) I-15 from Mission Road to SR-76 (Pala Rd)
3) I-15 from SR-76 (Pala Rd) to Escondido Highway (Old Highway 395)

Additionally, the following State Route segment volumes (from SANDAG Hwy Coverage documenting year 2007 volumes) were analyzed as part of this study:

1) SR-76 from Melrose Drive to E. Vista Way
2) SR-76 from E. Vista Way to North River Road
3) SR-76 from North River Road to Olive Hill Road
4) SR-76 from Olive Hill Road to Mission Road
5) SR-76 from Mission Road to Via Monserate
6) SR-76 from Via Monserate to Gird Road
7) SR-76 from Gird Road to Sage Road
8) SR-76 from Sage Road to Old Hwy 395
9) SR-76 from Old Hwy 395 to I-15 SB Ramp
10) SR-76 from I-15 SB Ramp to I-15 NB Ramp
11) SR-76 from I-15 NB Ramp to Pankey Road
12) SR-76 from Pankey Road to Horse Ranch Creek Road
13) SR-76 from Horse Ranch Creek Road to Rice Canyon Road
14) SR-76 from Rice Canyon Road to Couser Canyon Road
15) SR-76 from Couser Canyon Road to Pala Mission Road

The existing AM, PM, and ADT volumes are shown on **Figures 6a, 6b and 6c**. Please note that the south leg of SR-76 at Pankey Road was currently closed as part of the current SR-76 widening from 2 to 4 lanes east of I-15; therefore, the previous count from 12/4/07 was utilized. Roadway count data, freeway data, Caltrans freeway factors, and pictures of the current widening of SR-76 are included in **Appendix D**. The LOS calculated for the intersections, roadway segments, state route segments, and freeway segments are shown in **Tables 4a, 4b, 5, 6a, 6b, and 7**, respectively. SR-76 from the I-15 NB Ramp easterly a distance of approximately 1.4 miles is being widened from 2 to 4 lanes. The state route LOS for this portion is reported both under current 2 lane conditions (Table 6a) and when completed with 4 lanes (Table 6b). The SR-76 peak hour volumes and capacities reported in Table 6a and 6b are included at the end of Appendix D.

Figure 6a: Existing Volumes

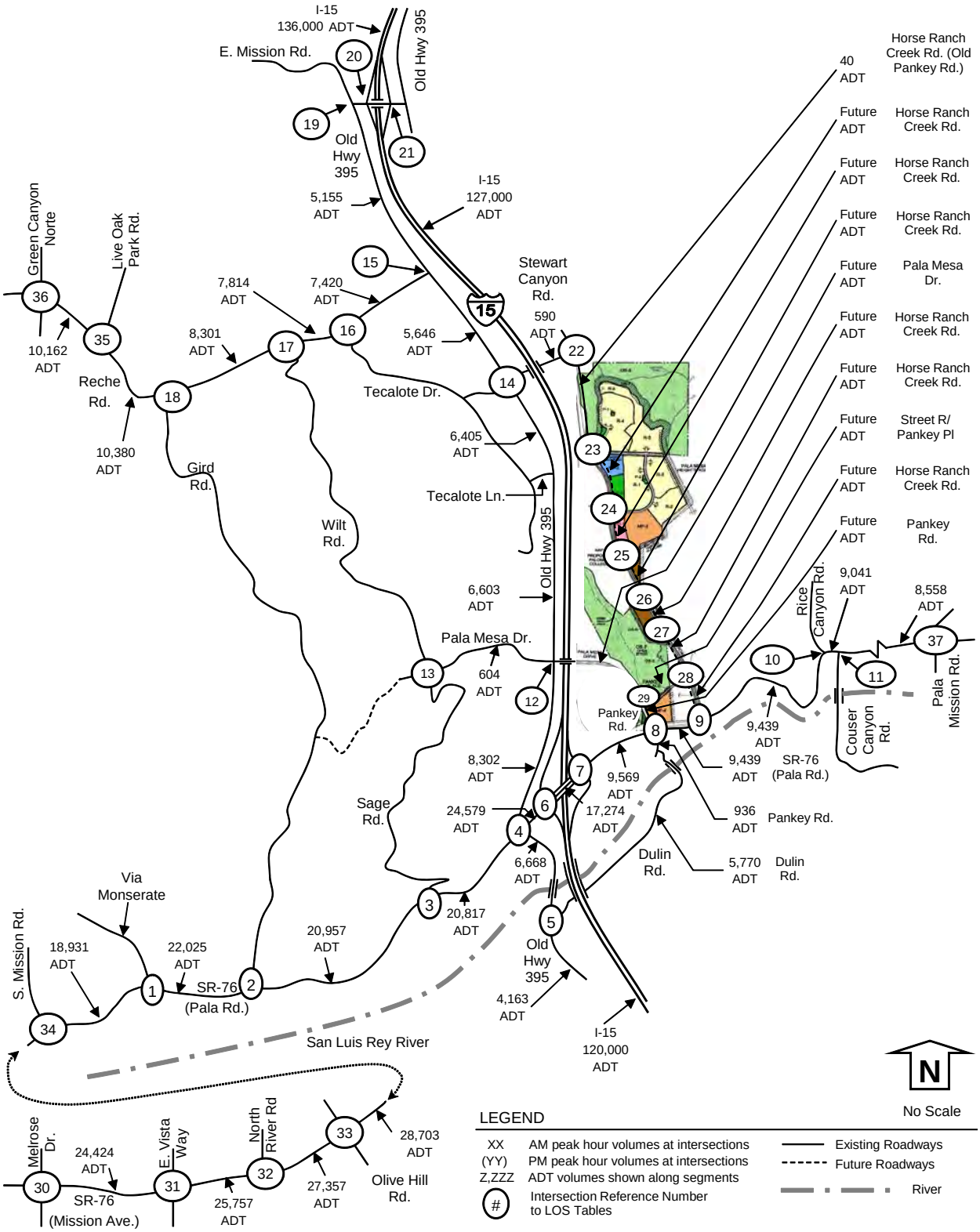


Figure 6b: Existing Volumes

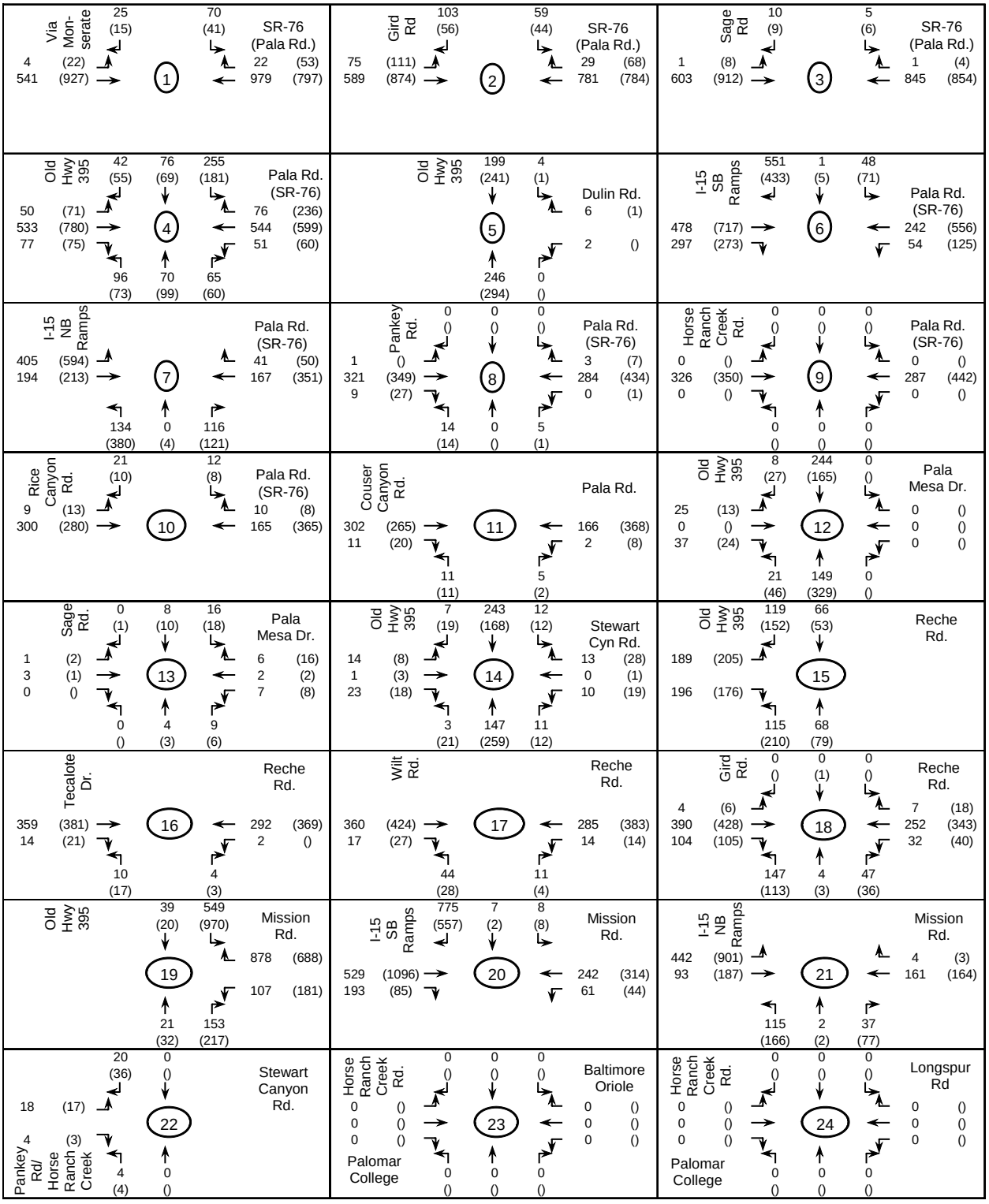


Figure 6c: Existing Volumes

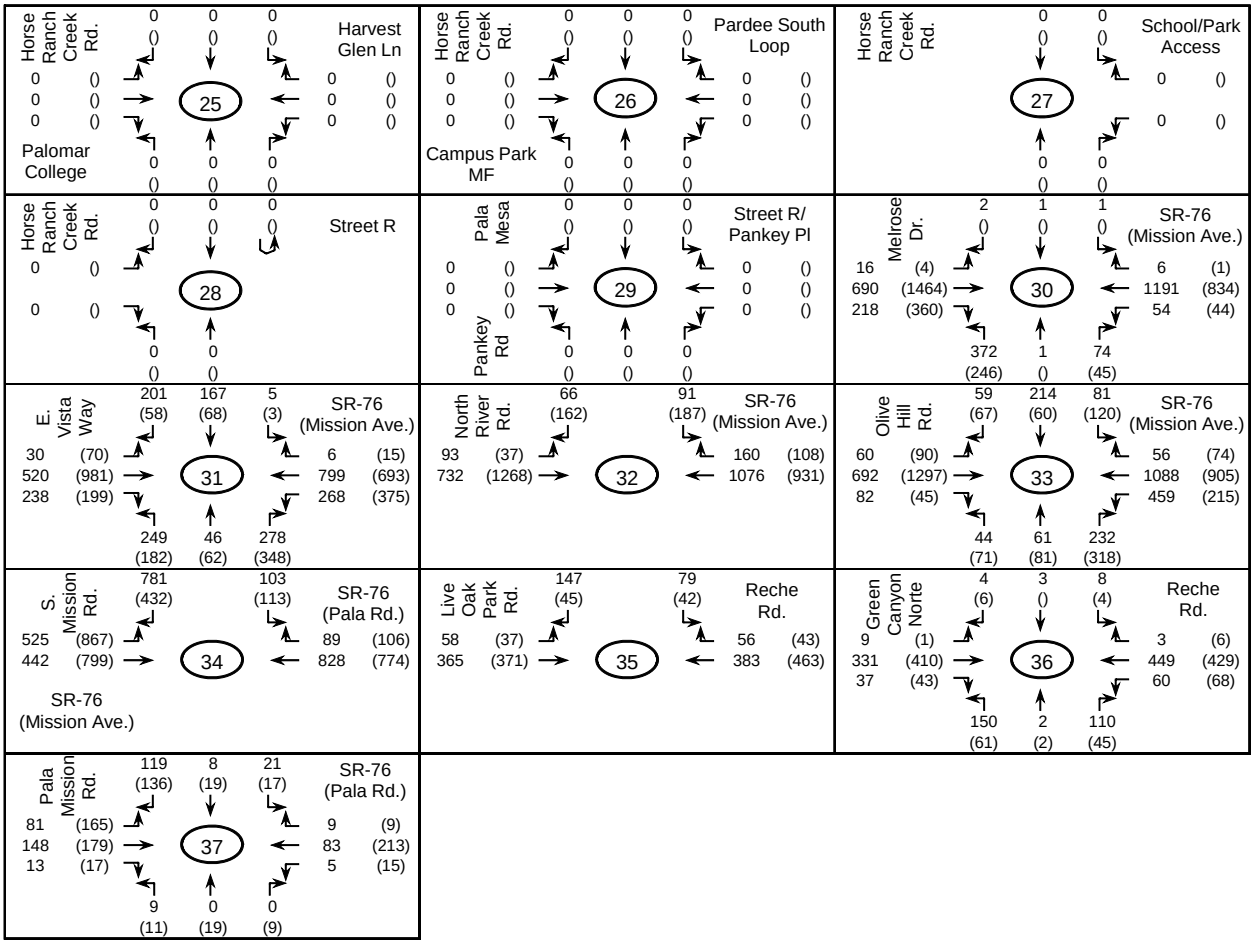


TABLE 4A: EXISTING INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Peak Hour	Existing Delay[2]	Existing LOS[3]
1) SR-76 (Pala Rd) at	SB LR	AM	86.1	**F**
Via Monserate (U)	SB LR	PM	91.4	**F**
	All	AM	5.0	A
	All	PM	2.9	A
2) SR-76 (Pala Rd) at	All	AM	12.9	B
Gird Rd (S)	All	PM	12.6	B
3) SR-76 (Pala Rd) at	SB LR	AM	22.6	C
Sage Rd (U)	SB LR	PM	33.0	D
	All	AM	0.2	A
	All	PM	0.4	A
4) SR-76 (Pala Rd) at	All	AM	29.7	C
Old Hwy 395 (S)	All	PM	30.2	C
5) Old Hwy 395 at	WB LR	AM	10.1	B
Dulin Rd (U)	WB LR	PM	11.2	B
6) SR-76 (Pala Rd) at	All	AM	27.5	C
I-15 SB Ramps (S)	All	PM	26.4	C
7) SR-76 (Pala Rd) at	All	AM	22.4	C
I-15 NB Ramps (S)	All	PM	43.6	D
8) SR-76 (Pala Rd) at	NB LTR	AM	12.2	B
Pankey Road (U)	NB LTR	PM	14.6	B
	SB LTR	AM	0.0	A
	SB LTR	PM	0.0	A
9) SR-76 (Pala Rd) at	DNE	AM	DNE	NA
Horse Ranch Crk Rd	DNE	PM	DNE	NA
10) SR-76 (Pala Rd) at	SB LR	AM	10.5	B
Rice Canyon Road (U)	SB LR	PM	12.4	B
11) SR-76 (Pala Rd) at	NB LR	AM	11.4	B
Couser Canyon Road (U)	NB LR	PM	13.5	B
12) Old Highway 395 at	EB LTR	AM	11.0	B
Pala Mesa Dr (U)	EB LTR	PM	11.1	B
	WB LTR	AM	DNE	NA
	WB LTR	PM	DNE	NA
13) Pala Mesa Dr at	NB LTR	AM	8.6	A
Sage Road (U)	SB LTR	AM	9.0	A
	NB LTR	PM	8.7	A
	SB LTR	PM	9.1	A
14) Old Highway 395 at	WB LTR	AM	10.8	B
Stewart Canyon Road (U)	WB LTR	PM	11.9	B
15) Old Highway 395 at	EB LR	AM	18.4	C
Reche Road (U)	EB LR	PM	35.9	**E**
	All	AM	10.6	B
	All	PM	17.6	B
16) Reche Road at	NB LR	AM	13.1	B
Tecalote Dr (U)	NB LR	PM	15.0	C
17) Reche Road at	NB LR	AM	14.8	B
Wilt Road (U)	NB LR	PM	17.2	C
18) Reche Road at	All	AM	14.4	B
Gird Road (S)	All	PM	13.9	B
19) Mission Road at	SB L	AM	12.4	B
Old Highway 395 (S)	SB L	PM	30.4	C
20) Mission Road at	SB LTR	AM	27.3	C
I-15 SB Ramps (S)	SB LTR	PM	26.0	C
21) Mission Road at	All	AM	17.2	B
I-15 NB Ramps (S)	All	PM	37.5	D

Continued on next page

TABLE 4B: EXISTING INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Peak Hour	Existing Delay[2]	Existing LOS[3]
22) Stewart Canyon Rd at	EB LR	AM	8.7	A
HRCR/Pankey Road (U)	EB LR	PM	8.7	A
23) Horse Ranch Crk Rd at	WB LR	AM	DNE	NA
Baltimore Oriole (U)	WB LR	PM	DNE	NA
24) Horse Ranch Crk Rd at	All-Way	AM	DNE	NA
Longspur Rd (U)	All-Way	PM	DNE	NA
25) Horse Ranch Crk Rd at	All-Way	AM	DNE	NA
Harvest Glen Ln (U)	All-Way	PM	DNE	NA
26) Horse Ranch Crk Rd at	WB LR	AM	DNE	NA
Pardee South Loop (U)	WB LR	PM	DNE	NA
27) Horse Ranch Crk Rd at	WB LR	AM	DNE	NA
School/Park Access (U)	WB LR	PM	DNE	NA
28) Horse Ranch Crk Rd	All-Way	AM	DNE	NA
at Street R (U)	All-Way	PM	DNE	NA
29) Pankey/Pala Mesa Dr	WB LR	AM	DNE	NA
at Street R (U)	WB LR	PM	DNE	NA
30) SR-76 (Mission Ave) at	All	AM	30.3	C
Melrose Drive (S)	All	PM	26.3	C
31) SR-76 (Mission Ave) at	All	AM	60.9	**E**
E. Vista Way (S)	All	PM	48.4	D
32) SR-76 (Mission Ave) at	All	AM	61.7	**E**
North River Rd (S)	All	PM	29.7	C
33) SR-76 (Mission Ave) at	All	AM	53.8	D
Olive Hill Rd (S)	All	PM	52.9	D
34) SR-76 (Mission Ave) at	All	AM	18.9	B
S. Mission Rd (S)	All	PM	21.5	C
35) Reche Rd at	SB LR	AM	23.0	C
Live Oak Park Rd (U)	SB LR	PM	18.0	C
36) Reche Rd at	All	AM	21.3	C
Green Canyon Norte (S)	All	PM	21.0	C
37) SR-76 (Pala Rd.) at	All	AM	29.3	C
Pala Mission Rd. (S)	All	PM	32.4	C

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized 2) Delay - HCM Control Delay in seconds. 3) LOS: Level of Service.
DNE: Does Not Exist. NA: Not Applicable.

TABLE 5: EXISTING SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Classification Circulation Element (9/05)	Existing Daily Volume	# of lanes	LOS E Capacity	V/C	LOS
Dulin Road						
Old Highway 395 to Pankey Road	Light Collector	5,770	2	16,200	0.36	C
Old Highway 395						
East Mission Road to Reche Road	Collector	5,155	2	16,200	0.32	C
Reche Road to Stewart Canyon Road	Collector	5,646	2	16,200	0.35	C
Stewart Canyon Road to Tecalote Lane	Collector	6,405	2	16,200	0.40	C
Tecalote Lane to Pala Mesa Drive	Collector	6,603	2	16,200	0.41	C
Pala Mesa Drive to SR-76 (Pala Road)	Collector	8,302	2	16,200	0.51	D
SR-76 (Pala Road) to Dulin Road	Collector	6,668	2	16,200	0.41	C
Dulin Road to W. Lilac Road	Rural Collector	4,163	2	16,200	0.26	C
Reche Road						
Green Canyon Norte to Live Oak Park Road	Rural Collector	10,162	2	16,200	0.63	D
Live Oak Park Road to Gird Road	Rural Collector	10,380	2	16,200	0.64	D
Gird Road to Wilt Road	Rural Collector	8,301	2	16,200	0.51	D
Wilt Road to Tecalote Road	Rural Collector	7,814	2	16,200	0.48	D
Tecalote Drive to Old Highway 395	Rural Collector	7,420	2	16,200	0.46	D
Stewart Canyon Road						
Old Hwy 395 to Horse Ranch Creek Rd	Collector	590	2	16,200	0.04	A
Pankey Road						
Stewart Canyon Rd to Baltimore Oriole (#23)	Light Collector	40	2	16,200	0.00	A
Break in Pankey Road						
Street R/Pankey Place to SR-76 (Pala Rd)	Light Collector	Minimal	NA	NA	NA	NA
SR-76 (Pala Road) to Shearer Crossing	Light Collector	936	2	16,200	0.06	A
Pala Mesa Drive						
Wilt Rd/Sage Rd to Old Highway 395	Light Collector	604	2	16,200	0.04	A

Notes: Classification per September 2005 Circulation Element Maps. Daily volume is a 24 hour volume.
LOS: Level of Service. V/C: Volume to Capacity ratio. NA: Not Applicable.

TABLE 6A: EXISTING STATE ROUTE VOLUMES AND LEVEL OF SERVICE (WITHOUT GRANITE IMPROVEMENT)

State Route 76	Lanes in	AM (Eastbound)					AM (Westbound)					PM (Eastbound)					PM (Westbound)				
Study Limits (direct & cumulative)	each dir	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS
Melrose Dr to E. Vista Way	1	999	EB	1300	0.77	D	1469	WB	1300	1.13	**F**	1456	EB	1300	1.12	**F**	1001	WB	1300	0.77	D
E. Vista Way to North River Rd	1	718	EB	950	0.76	D	1040	WB	950	1.09	**F**	1107	EB	950	1.17	**F**	652	WB	950	0.69	C
North River Rd to Olive Hill Rd	1	852	EB	950	0.90	**E**	1200	WB	950	1.26	**F**	1176	EB	950	1.24	**F**	781	WB	950	0.82	D
Olive Hill Rd to S Mission Rd	1	1031	EB	950	1.09	**F**	1245	WB	950	1.31	**F**	1457	EB	950	1.53	**F**	1069	WB	950	1.13	**F**
S Mission Rd to Via Monserate	1	745	EB	950	0.78	D	901	WB	950	0.95	**E**	1064	EB	950	1.12	**F**	618	WB	950	0.65	C
Via Monserate to Gird Rd	1	808	EB	950	0.85	D	895	WB	950	0.94	**E**	1077	EB	950	1.13	**F**	786	WB	950	0.83	D
Gird Rd to Sage Rd	1	740	EB	950	0.78	D	542	WB	950	0.57	C	645	EB	950	0.68	C	742	WB	950	0.78	D
Sage Rd to Old Hwy 395	1	760	EB	950	0.80	D	534	WB	950	0.56	C	638	EB	950	0.67	C	768	WB	950	0.81	D
Old Hwy 395 to I-15 SB Ramps	2	1507	EB	2050	0.74	D	665	WB	2028	0.33	B	816	EB	2050	0.40	B	1258	WB	2028	0.62	C
I-15 SB Ramps to I-15 NB Ramps	1	844	EB	950	0.89	**E**	539	WB	950	0.57	C	718	EB	950	0.76	D	1153	WB	950	1.21	**F**
I-15 NB Ramps to Pankey Rd	1	559	EB	950	0.59	C	606	WB	950	0.64	C	696	EB	950	0.73	D	820	WB	950	0.86	**E**
Pankey Rd to Horse Ranch Creek Rd	1	589	EB	950	0.62	C	540	WB	950	0.57	C	631	EB	950	0.66	C	897	WB	950	0.94	**E**
Horse Ranch Creek Rd to Rice Cyn	1	588	EB	950	0.62	C	539	WB	950	0.57	C	631	EB	950	0.66	C	897	WB	950	0.94	**E**
Rice Cyn to Couser Cyn	1	589	EB	950	0.62	C	540	WB	950	0.57	C	526	EB	950	0.55	C	930	WB	950	0.98	**E**
Couser Cyn to Pala Mission Rd	1	634	EB	950	0.67	C	357	WB	950	0.38	B	434	EB	950	0.46	B	950	WB	950	1.00	**F**

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

TABLE 6B: EXISTING STATE ROUTE VOLUMES AND LEVEL OF SERVICE (WITH GRANITE IMPROVEMENT)

State Route 76	Lanes in	AM (Eastbound)					AM (Westbound)					PM (Eastbound)					PM (Westbound)				
Study Limits (direct & cumulative)	each dir	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS
Melrose Dr to E. Vista Way	1	999	EB	1300	0.77	D	1469	WB	1300	1.13	**F**	1456	EB	1300	1.12	**F**	1001	WB	1300	0.77	D
E. Vista Way to North River Rd	1	718	EB	950	0.76	D	1040	WB	950	1.09	**F**	1107	EB	950	1.17	**F**	652	WB	950	0.69	C
North River Rd to Olive Hill Rd	1	852	EB	950	0.90	**E**	1200	WB	950	1.26	**F**	1176	EB	950	1.24	**F**	781	WB	950	0.82	D
Olive Hill Rd to S Mission Rd	1	1031	EB	950	1.09	**F**	1245	WB	950	1.31	**F**	1457	EB	950	1.53	**F**	1069	WB	950	1.13	**F**
S Mission Rd to Via Monserate	1	745	EB	950	0.78	D	901	WB	950	0.95	**E**	1064	EB	950	1.12	**F**	618	WB	950	0.65	C
Via Monserate to Gird Rd	1	808	EB	950	0.85	D	895	WB	950	0.94	**E**	1077	EB	950	1.13	**F**	786	WB	950	0.83	D
Gird Rd to Sage Rd	1	740	EB	950	0.78	D	542	WB	950	0.57	C	645	EB	950	0.68	C	742	WB	950	0.78	D
Sage Rd to Old Hwy 395	1	760	EB	950	0.80	D	534	WB	950	0.56	C	638	EB	950	0.67	C	768	WB	950	0.81	D
Old Hwy 395 to I-15 SB Ramps	2	1507	EB	2050	0.74	**D**	665	WB	2028	0.33	B	816	EB	2050	0.40	B	1258	WB	2028	0.62	C
I-15 SB Ramps to I-15 NB Ramps	1	844	EB	950	0.89	**E**	539	WB	950	0.57	C	718	EB	950	0.76	D	1153	WB	950	1.21	**F**
I-15 NB Ramps to Pankey Rd	2	559	EB	3100	0.18	A	606	WB	3030	0.20	A	696	EB	3100	0.22	A	820	WB	3030	0.27	A
Pankey Rd to Horse Ranch Creek Rd	2	589	EB	1806	0.33	B	540	WB	2028	0.27	A	631	EB	1806	0.35	B	897	WB	2028	0.44	B
Horse Ranch Creek Rd to Rice Cyn	1	588	EB	950	0.62	C	539	WB	950	0.57	C	631	EB	950	0.66	C	897	WB	950	0.94	**E**
Rice Cyn to Couser Cyn	1	589	EB	950	0.62	C	540	WB	950	0.57	C	526	EB	950	0.55	C	930	WB	950	0.98	**E**
Couser Cyn to Pala Mission Rd	1	634	EB	950	0.67	C	357	WB	950	0.38	B	434	EB	950	0.46	B	950	WB	950	1.00	**F**

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

TABLE 7: EXISTING (2006) FREEWAY VOLUMES AND LEVEL OF SERVICE

Freeway	I-15				I-15				I-15			
Segment	Rainbow Valley Blvd to Mission Rd				Mission Rd to SR-76 (Pala Rd)				SR-76 to Escondido Hwy (Old 395)			
Existing (Year 2006)												
ADT	136,000				127,000				120,000			
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Number of Lanes	4	4	4	4	4	4	4	4	4	4	4	4
Capacity (1)	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400
K Factor (2)	0.0619	0.0619	0.0738	0.0738	0.0619	0.0619	0.0738	0.0738	0.0590	0.0590	0.0723	0.0723
D Factor (3)	0.1653	0.8347	0.6398	0.3602	0.1653	0.8347	0.6398	0.3602	0.1989	0.8011	0.6955	0.3045
Truck Factor (4)	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.8977	0.8977	0.8977	0.8977
Peak Hour Volume	1,515	7,650	6,991	3,936	1,415	7,143	6,528	3,675	1,569	6,318	6,722	2,943
Volume to Capacity	0.161	0.814	0.744	0.419	0.150	0.760	0.694	0.391	0.167	0.672	0.715	0.313
LOS	A	D	C	A	A	C	C	A	A	C	C	A

Notes: (1) Capacity of 2,350 passenger cars per hour per lane (pcphpl) from Caltrans' Guide for the Preparation of Traffic Impact Studies, Dec 2002. (2) Latest K factor from Caltrans (based on 2005 data), which is the percentage of Annual Average Daily Traffic (AADT) in both directions. (3) Latest D factor from Caltrans (based on 2005 data), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2000 data).

Under existing conditions, all study intersections and roadways were calculated to operate at LOS D or better with the exception of the:

Intersections

1) Intersection of SR-76 (Pala Rd) / Via Monserate (LOS F AM & PM for minor leg critical movement; however, overall intersection is at LOS A AM & PM)
2) Intersection of Old Highway 395 / Reche Road (LOS E PM for minor leg critical movement; however, overall intersection is at LOS B AM & PM)
3) Intersection of SR-76 (Mission Ave) / E. Vista Way (LOS E AM)
4) Intersection of SR-76 (Mission Ave) / North River Road (LOS E AM)

State Routes

1) State Route 76 from Melrose Dr to E. Vista Way (LOS F AM & PM)
2) State Route 76 from E. Vista Way to North River Rd (LOS F AM & PM)
3) State Route 76 from North River Rd to Olive Hill Rd (LOS F AM & PM)
4) State Route 76 from Olive Hill Rd to S Mission Rd (LOS F AM & PM)
5) State Route 76 from S Mission Rd to Via Monserate (LOS E AM & LOS F PM)
6) State Route 76 from Via Monserate to Gird Rd (LOS E AM & LOS F PM)
7) State Route 76 from I-15 SB Ramp to I-15 NB Ramp (LOS E AM & LOS F PM)
8) State Route 76 from I-15 NB Ramp to Pankey Road (LOS E PM)
9) State Route 76 from Pankey Road to Horse Ranch Creek Rd (LOS E PM)
10) State Route 76 from Horse Ranch Creek Rd to Rice Canyon Rd (LOS E PM)
11) State Route 76 from Rice Canyon Rd to Couser Canyon Rd (LOS E PM)
12) State Route 76 from Couser Canyon Rd to Pala Mission Rd (LOS F PM)

Existing LOS calculations are included in **Appendix E**.

2.2 Existing Parking, Transit and On-site Circulation

The project site is generally vacant. No nearby transit service routes are published.

3.0 Project Impact Analysis

3.1 Analysis Methodology

The project study area is generally determined by the limits or extent of where 50 or more peak hour project trips would travel in either direction for direct impact calculations and where 25 peak hour project trips would travel in each direction for cumulative impact calculations, which are documented in the San Diego County *Report Format & Content Requirements Transportation and Traffic*, December 5, 2007.

The traffic analyses prepared for this study were based on the *2000 Highway Capacity Manual* (HCM) operations analysis using Level of Service (LOS) evaluation criteria. The operating conditions of the study intersections, roadway segments, and highway segments are measured using the HCM LOS designations, which range from A through F. LOS A represents the best operating condition and LOS F denotes the worst operating condition. The individual LOS criteria for each roadway component are described below.

3.1.1 Intersections

The study intersections were analyzed based on the **operational analysis** outlined in the 2000 HCM. This process defines LOS in terms of **average control delay** per vehicle, which is measured in seconds. LOS at the intersections were calculated using the computer software program Synchro 6.0 (Trafficware Corporation, 2003). These calculations incorporate potential pedestrian calls to cross an intersection. A pedestrian call includes a single person, group of people, or persons with a horse or other domesticated animal crossing an intersection. The HCM LOS for the range of delay by seconds for un-signalized and signalized intersections is described in **Table 8**.

TABLE 8: UN-SIGNALIZED AND SIGNALIZED INTERSECTION LEVEL OF SERVICE (HCM 2000)

Level of Service	Un-Signalized Average Control Delay (seconds/vehicle)	Signalized Average Control Delay (seconds/vehicle)
A	0-10	0-10
B	> 10-15	> 10-20
C	> 15-25	> 20-35
D	> 25-35	> 35-55
E	> 35-50	> 55-80
F	> 50	> 80

Source: Highway Capacity Manual 2000.

3.1.2 Roadway Segments

The roadway segments were analyzed based on the functional classification of the roadway using the County of San Diego *Average Daily Vehicle Trips* capacity lookup table. The roadway segment capacity and LOS standards used to analyze roadway segments are summarized in **Table 9**.

TABLE 9: ROADWAY SEGMENT DAILY CAPACITY AND LOS (COUNTY OF SAN DIEGO)

Circulation Element Road Classification	CROSS SECTION	LOS A	LOS B	LOS C	LOS D	LOS E
Expressway	126/146	<36,000	<54,000	<70,000	<86,000	<108,000
Prime Arterial	102/122	<22,200	<37,000	<44,600	<50,000	<57,000
Major Road	78/98	<14,800	<24,700	<29,600	<33,400	<37,000
Collector	64/84	<13,700	<22,800	<27,400	<30,800	<34,200
Town Collector	54/74	<3,000	<6,000	<9,500	<13,500	<19,000
Light Collector	40/60	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Collector	40/84	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Light Collector	40/60	<1,900	<4,100	<7,100	<10,900	<16,200
Recreational Parkway	40/100	<1,900	<4,100	<7,100	<10,900	<16,200
Rural Mountain	40/100	<1,900	<4,100	<7,100	<10,900	<16,200
Non-Circulation Roads						
Residential Collector	40/60	NA	NA	<4,500	NA	NA
Residential Road	36/56	NA	NA	<1,500	NA	NA

Source: County of San Diego Department of Public Works *Public Road Standards* July 14, 1999.

3.1.3 State Route Segments

The state route segments were analyzed using a Volume to Capacity (V/C) ratio as outlined in the 2000 HCM. This approach is consistent with the County's current method for reporting segment operations for state routes and is consistent with the method using in the General Plan Update. This methodology is used by Caltrans and SANDAG because the analysis focuses on the directional commuter peak periods (AM & PM), which is a more detailed analysis than an overall Average Daily Trip (ADT) analysis. The V/C ratio formulas and associated LOS were provided by SANDAG (included in **Appendix F**) and are shown in **Table 10**.

TABLE 10: STATE ROUTE LEVEL OF SERVICE (SANDAG)

Measure of Effectiveness	LOS A - C	LOS D	LOS E	LOS F
Volume/Capacity Ratio	0.00 - 0.70	0.71 - 0.85	0.86 - 0.99	> 1.00

Source: SANDAG.

3.1.4 Freeway Segments

The freeway segments were analyzed based on a multilane highway LOS criteria using a Volume to Capacity (V/C) ratio as outlined in the 2000 HCM. The accepted methodology by Caltrans for the analysis of freeway sections is to use the most current edition of the HCM as noted on page 5 of Caltrans' *Guide for the Preparation of Traffic Impact Studies*, December 2002, which also documents a maximum service flow rate of 2,350 passenger cars per hour per lane. The freeway LOS operations are based on the SANDAG's *2006 Congestion Management Program* Update (July 2006) V/C ratios as summarized below in **Table 11**. An excerpt from the SANDAG CMP and the Caltrans maximum service flow rate are both included in **Appendix G**.

TABLE 11: FREEWAY LEVEL OF SERVICE (SANDAG)

Measure of Effectiveness	LOS A - C	LOS D	LOS E	LOS F
Volume/Capacity Ratio	0.00 - 0.79	0.80 - 0.92	0.93 - 1.00	> 1.00

Source: *2006 SANDAG Congestion Management Program*, page 113.

3.2 Project Traffic Generation

This section describes the anticipated interim construction traffic generation and the final product traffic generation.

3.2.1 Construction Traffic Generation

Construction traffic will consist of workers and delivery trucks primarily accessing the site from SR-76 via I-15. An estimated maximum of 80 workers and 24 daily truck deliveries are anticipated during each construction phase. The construction is anticipated to occur over a ten year period. The project is designed to have the earthwork balanced; therefore, no import or export of soil is anticipated.

The construction traffic would result in a temporary increase in traffic on local area roadways; however, the amount of temporary traffic will be less than the final product described in the next section and analyzed within this study. Projecting the potential construction delays on specific roadway segments for the full ten years would be speculative and would not result in the planned implementation of standard traffic control procedures. When needed, traffic control plans will be submitted under separate cover for related roadway construction projects.

3.2.2 Final Product Traffic Generation

The final traffic generation was calculated using SANDAG rates from the *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002. Based on SANDAG rates the project is calculated to generate 19,941 ADT, 1,423 AM peak hour trips (689 inbound and 734 outbound), and 2,095 PM peak hour trips (1,130 inbound and 965 outbound) as shown in **Table 12**.

TABLE 12: PROJECT TRAFFIC GENERATION

Proposed								AM					PM	
Land Use	Rate	Size & Units		ADT	%	Split		IN	OUT	%	Split		IN	OUT
Residential - Single Family	10 /DU	521	DU	**5,210**	8%	0.3	0.7	**125**	**292**	10%	0.7	0.3	**365**	**156**
Residential - Multi Family	8 /DU	555	DU	**4,440**	8%	0.2	0.8	**71**	**284**	10%	0.7	0.3	**311**	**133**
Town Center (Neighborhood Shopping)	120 /KSF	61,200	SF	**7,344**	4%	0.6	0.4	**176**	**118**	10%	0.5	0.5	**368**	**367**
Office (more than 100KSF)	17 /KSF	157,000	SF	**2,669**	13%	0.9	0.1	**312**	**35**	14%	0.2	0.8	**75**	**298**
Neighborhood Park	5 /Acre	3.6	Acres	**18**	4%	0.5	0.5	**0**	**0**	8%	0.5	0.5	**1**	**1**
Neighborhood Park (Sports Complex)	50 /Acre	5.2	Acres	**260**	4%	0.5	0.5	**5**	**5**	8%	0.5	0.5	**10**	**10**
Total				**19,941**				**689**	**734**				**1,130**	**965**

Source: SANDAG *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region,* April 2002. DU - Dwelling Unit; SF - Square Feet; KSF - 1,000 sf; ADT-Average Daily Traffic; Split-percent inbound and outbound.

The project traffic generation shown above in Table 12 is the most accurate information available at the time this analysis was prepared. Use of other variables such as acreage for the commercial elements was not used because the more accurate and specific building sizes are known and therefore were used.

3.2.3 Project Alternatives Traffic Generation

In addition to the proposed project, there are five project alternatives included in the draft EIR. These include: 1) Existing Plan Alternative, 2) Single Family Alternative, 3) Biological Reduced Footprint Alternative, 4) General Plan Update Draft Land Use Map Alternative, and 5) General Plan Update Board Referral Map Alternative. Site plans for each alternative are included in **Appendix H**.

Alternatives 2 and 3 are calculated to have less traffic than the proposed project while Alternatives 1, 4, and 5 are calculated to have more traffic than the proposed project.

Alternatives 2 and 3 have less daily and less peak hour traffic than the proposed project; therefore, similar roadway improvements for the proposed project can be expected for Alternatives 2 and 3.

A more detailed study would be required to determine if additional mitigation measures would be required for Alternatives 1, 4, and 5.

Overall, the proposed project is calculated to generate less traffic than the Existing Plan Alternative. A comparison of the calculated traffic generation between the alternatives is shown in **Table 13**.

TABLE 13: PROJECT ALTERNATIVES – TRAFFIC GENERATION

Land Use	Rate	Size & Units		ADT	%	Split		AM IN	AM OUT	%	Split		PM IN	PM OUT
Proposed Project														
Residential - Single Family	10 /DU	521	DU	5,210	8%	0.3	0.7	125	292	10%	0.7	0.3	365	156
Residential - Multi Family	8 /DU	555	DU	4,440	8%	0.2	0.8	71	284	10%	0.7	0.3	311	133
Town Center (Neighborhood Shopping)	120 /KSF	61,200	SF	7,344	4%	0.6	0.4	176	118	10%	0.5	0.5	368	367
Office (more than 100KSF)	17 /KSF	157,000	SF	2,669	13%	0.9	0.1	312	35	14%	0.2	0.8	75	299
Neighborhood Park	5 /Acre	3.6	Acres	18	4%	0.5	0.5	0	0	8%	0.5	0.5	1	1
Neighborhood Park (Sports Complex)	50 /Acre	5.2	Acres	260	4%	0.5	0.5	5	5	8%	0.5	0.5	10	10
Proposed Project Total				**19,941**				**690**	**733**				**1,130**	**966**
1) Existing Plan Alternative														
Residential - Single Family	10 /DU	63	DU	630	8%	0.3	0.7	15	35	10%	0.7	0.3	45	19
Office (more than 100KSF)	17 /KSF	825,000	SF	14,025	13%	0.9	0.1	1640	182	14%	0.2	0.8	393	1571
Industrial Park	8 /KSF	1,150,000	SF	9,200	11%	0.9	0.1	910	101	12%	0.2	0.8	221	883
Neighborhood Park	5 /Acre	0.6	Acres	3	4%	0.5	0.5	0	0	8%	0.5	0.5	0	0
Alternative 1 Total				**23,858**				**2,565**	**318**				**659**	**2,473**
2) Single Family Alternative														
Residential - Single Family	10 /DU	751	DU	7,510	8%	0.3	0.7	180	421	10%	0.7	0.3	526	225
Town Center (Neighborhood Shopping)	120 /KSF	61,200	SF	7,344	4%	0.6	0.4	176	118	10%	0.5	0.5	368	367
Office (more than 100KSF)	17 /KSF	157,000	SF	2,669	13%	0.9	0.1	312	35	14%	0.2	0.8	75	299
Neighborhood Park	5 /Acre	4.9	Acres	25	4%	0.5	0.5	0	0	8%	0.5	0.5	1	1
Neighborhood Park (Sports Complex)	50 /Acre	8.5	Acres	425	4%	0.5	0.5	9	9	8%	0.5	0.5	17	17
Alternative 2 Total				**17,973**				**677**	**581**				**987**	**910**
3) Biological Reduced Footprint Alternative														
Residential - Single Family	10 /DU	390	DU	3,900	8%	0.3	0.7	93	218	10%	0.7	0.3	273	117
Residential - Multi Family	8 /DU	255	DU	2,040	8%	0.2	0.8	33	131	10%	0.7	0.3	143	61
Town Center (Neighborhood Shopping)	120 /KSF	61,200	SF	7,344	4%	0.6	0.4	176	118	10%	0.5	0.5	368	367
Office (more than 100KSF)	17 /KSF	157,000	SF	2,669	13%	0.9	0.1	312	35	14%	0.2	0.8	75	299
Neighborhood Park	5 /Acre	1.1	Acres	6	4%	0.5	0.5	0	0	8%	0.5	0.5	0	0
Neighborhood Park (Sports Complex)	50 /Acre	8.5	Acres	425	4%	0.5	0.5	9	9	8%	0.5	0.5	17	17
Alternative 3 Total				**16,384**				**623**	**510**				**876**	**861**
4) General Plan Update Draft Land Use Map Alternative														
Residential - Single Family	10 /DU	248	DU	2,480	8%	0.3	0.7	59	139	10%	0.7	0.3	174	74
Residential - Multi Family	8 /DU	1,059	DU	8,472	8%	0.2	0.8	136	542	10%	0.7	0.3	594	254
Town Center (Neighborhood Shopping)	120 /KSF	188,000	SF	22,560	4%	0.6	0.4	541	361	10%	0.5	0.5	1128	1128
Office (less than 100KSF)	20 /KSF	40,000	SF	800	14%	0.9	0.1	100	11	13%	0.2	0.8	21	83
Neighborhood Park	5 /Acre	2.1	Acres	11	4%	0.5	0.5	0	0	8%	0.5	0.5	0	0
Neighborhood Park (Sports Complex)	50 /Acre	8.5	Acres	425	4%	0.5	0.5	9	9	8%	0.5	0.5	17	17
Alternative 4 Total				**34,748**				**845**	**1,062**				**1,934**	**1,557**
5) General Plan Update Board Referral Map Alternative														
Residential - Single Family	10 /DU	404	DU	4,040	8%	0.3	0.7	96	226	10%	0.7	0.3	283	121
Residential - Multi Family	8 /DU	258	DU	2,064	8%	0.2	0.8	33	132	10%	0.7	0.3	145	62
Town Center (Neighborhood Shopping)	120 /KSF	188,000	SF	22,560	4%	0.6	0.4	541	361	10%	0.5	0.5	1128	1128
Office (less than 100KSF)	20 /KSF	40,000	SF	800	14%	0.9	0.1	100	11	13%	0.2	0.8	21	83
Neighborhood Park	5 /Acre	2.6	Acres	13	4%	0.5	0.5	0	0	8%	0.5	0.5	1	1
Neighborhood Park (Sports Complex)	50 /Acre	8.5	Acres	425	4%	0.5	0.5	9	9	8%	0.5	0.5	17	17
Alternative 5 Total				**29,902**				**779**	**740**				**1,595**	**1,412**

Source: SANDAG *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region,* April 2002. DU - Dwelling Unit; SF - Square Feet; KSF - 1,000 sf; ADT-Average Daily Traffic; Split-percent inbound and outbound.

3.3 Project Distribution and Assignment

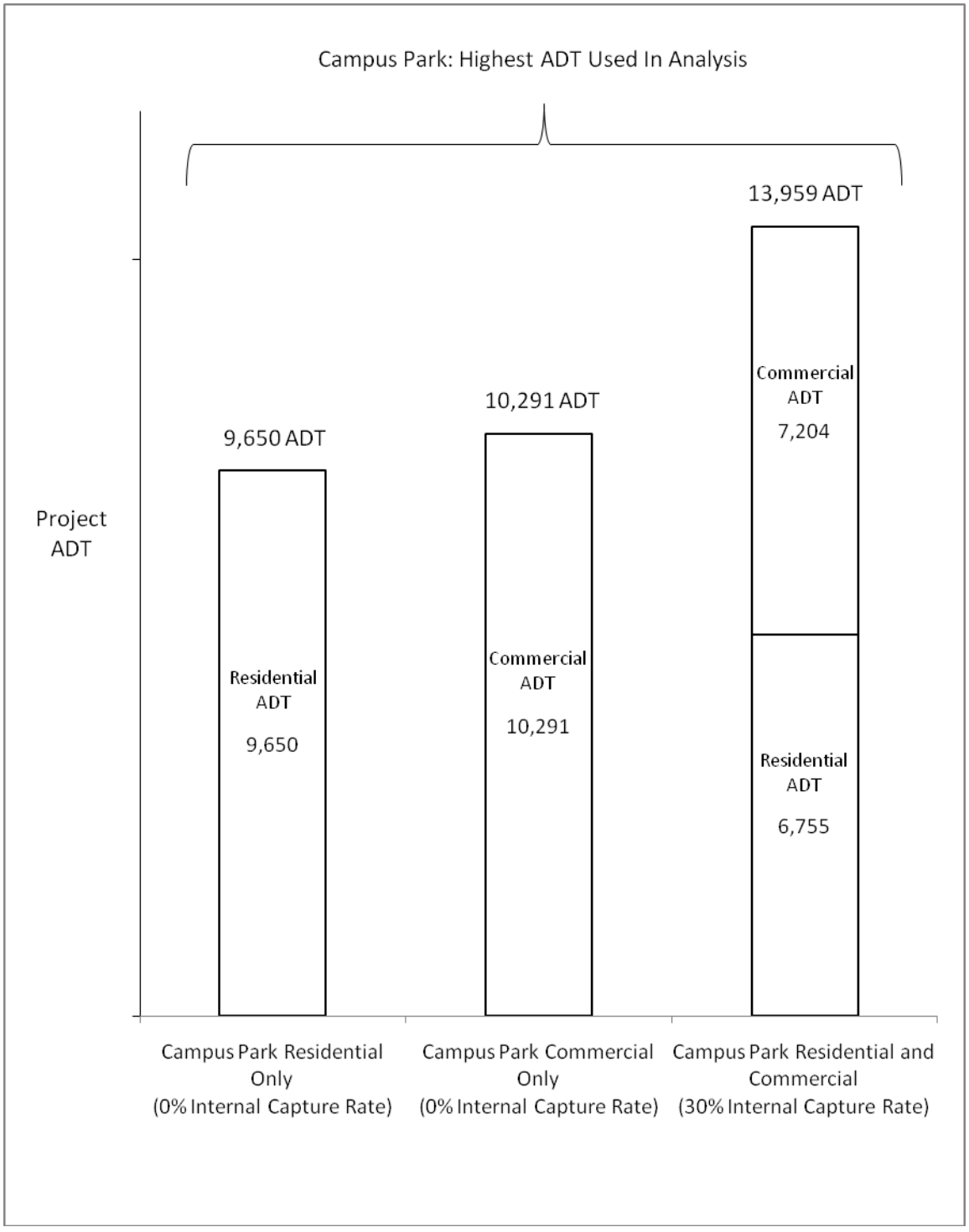
Project trips were distributed based on a SANDAG Series 11 traffic model (a folded copy is included in a pocket at the back of the appendix – after the last appendix page). The Series 11 model is based on a regional model per the 2007 Regional Transportation Plan, not the County's General Plan Update model.

The SANDAG traffic model documented a 33% internal capture rate; however, to be conservative and based on a Caltrans request, the 33% was rounded down to 30%. The internal capture rate reflects the percentage of vehicles that would stay within the Traffic Analysis Zones (TAZs) located northeast of I-15 and SR-76. These TAZs included Campus Park (mixed-use), Campus Park West (mixed-use), Meadowood, and Palomar College. Campus Park West includes developments south of SR-76; however, the 30% internal capture rate was not based on traffic using this commercial area south of SR-76. These combined land uses create the equivalent of a small town where residents have retail, office, commercial, schools, and social attractions all within a short drive, a reasonable walking distance, or a short bike ride. Supporting documentation for the 30% internal capture rate, a County general acceptance letter, and a Caltrans email acceptance are included in **Appendix I**.

The internal capture rate will vary based on the level of mixed-use development and will increase as the commercial uses are built. The residential portion is planned to be constructed first. If the near-term scenario is analyzed with only residential uses (9,650 ADT – without an internal capture rate), then this scenario would have less traffic than the combined residential and commercial (13,959 ADT – with internal capture rate). In other words, the Campus Park residential and commercial uses generate less traffic individually with a 0% internal capture rate than when combined with a 30% internal capture rate as shown in **Figure 7**. A conservative analysis was chosen where the combined residential and commercial uses with a 30% internal capture rate were used for both the near-term and long-term scenarios. This means that the analysis covers the condition where all the residential units are built and then as the commercial is constructed the internal capture evolves to reach the 30% internal capture rate.

The SANDAG model assigned approximately 20% of the residential trips to/from the north and approximately 10% of the commercial trips to/from the north via Stewart Canyon Road. This trip distribution is directly from the SANDAG traffic model, which uses Stewart Canyon Road for more direct access routes to/from the north on I-15 and into and out of Fallbrook (via Reche Rd and E Mission Rd). The center of Campus Park is approximately 1.8 miles from the interchange of I-15/SR-76. Thus, traveling through the I-15/SR-76 interchange to/from the north would add approximately 3.6 miles to the trip and require passing through more intersections.

Figure 7: Project Traffic Generation by Internal Capture Rate



3.3.1 Near-Term Distribution and Assignment (30% Internal Capture Rate)

The near-term scenario documents the condition where only Campus Park is constructed and includes individual residential and commercial distributions. As described previously, the 30% internal capture rate was applied to this scenario as this reflected the highest project ADT (residential + commercial with a 30% internal capture rate) as compared to the individual residential or individual commercial uses.

One significant distribution adjustment to the SANDAG Select Zone Assignment (SZA) was the local absorption to the TAZ just south of SR-76 at Pankey Road. This 16% distribution was re-distributed out to and along I-15. All other distribution percentages are almost verbatim from the SANDAG plot. The near-term residential distribution is shown in **Figures 8a, 8b and 8c**. The near-term residential assignment is shown in **Figures 9a, 9b, and 9c**. The near-term commercial distribution is shown in **Figures 10a, 10b and 10c** with the assignment shown in **Figures 11a, 11b and 11c**. The near-term combined residential and commercial assignment is shown in **Figures 12a, 12b and 12c**.

3.3.2 Long-Term Distribution and Assignment (30% Internal Capture Rate)

The long-term distribution includes a residential and commercial component. As described previously, the 30% internal capture rate was applied to this scenario as this reflect the highest project ADT (residential + commercial with a 30% internal capture rate) as compared to the individual residential or individual commercial components.

All of the long-term distribution percentages are almost verbatim from the SANDAG plot. The long-term residential distribution is shown in **Figures 13a, 13b, and 13c** with the assignment shown in **Figures 14a, 14b, and 14c**. The long-term commercial distribution is shown in **Figures 15a, 15b, and 15c** with the assignment shown in **Figures 16a, 16b, and 16c**. The long-term combined residential and commercial assignment is shown in **Figures 17a, 17b and 17c**.

Figure 8a: Near-Term Residential Distribution (30% Internal Capture Rate)

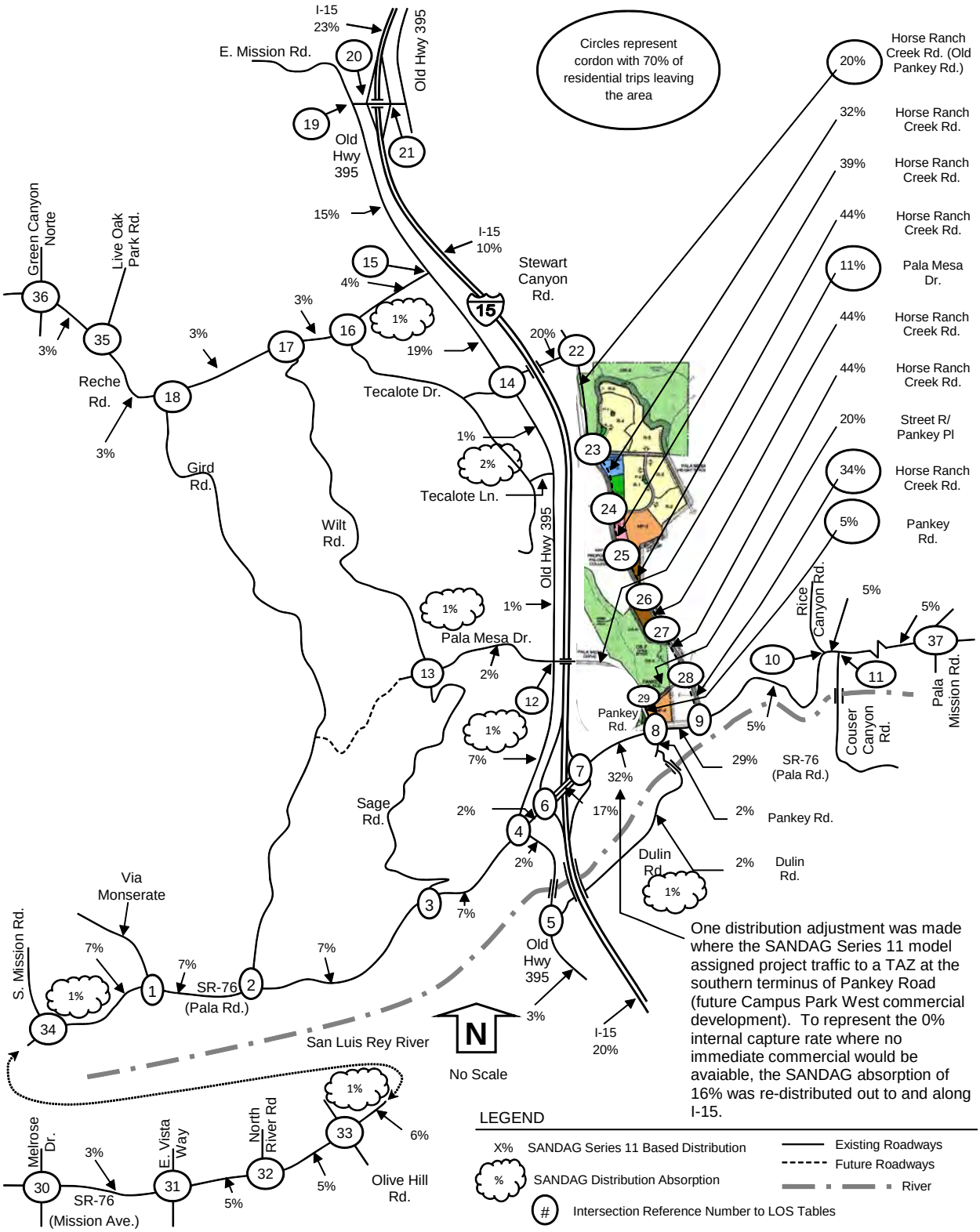


Figure 8b: Near-Term Residential Distribution (30% Internal Capture Rate)

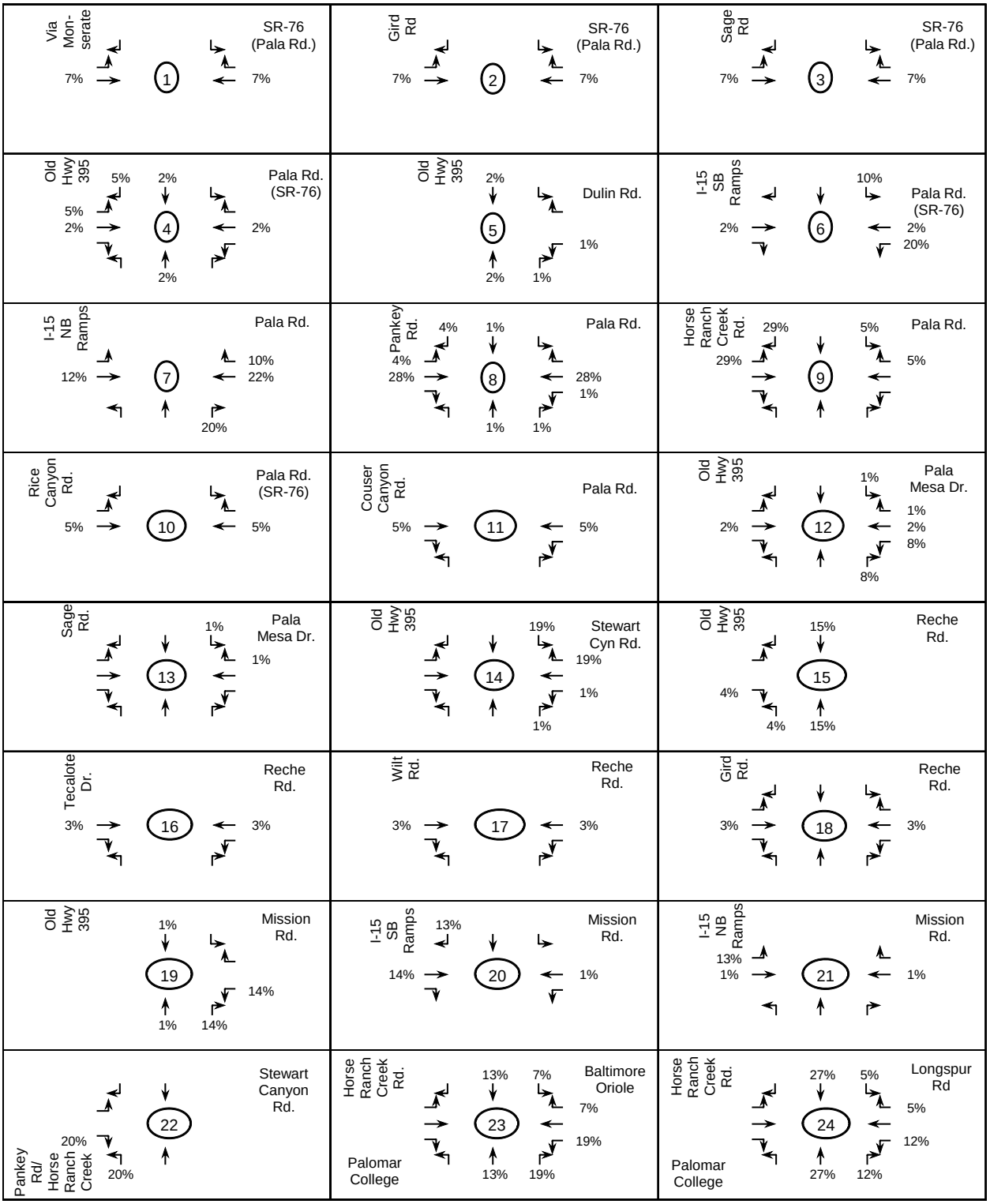
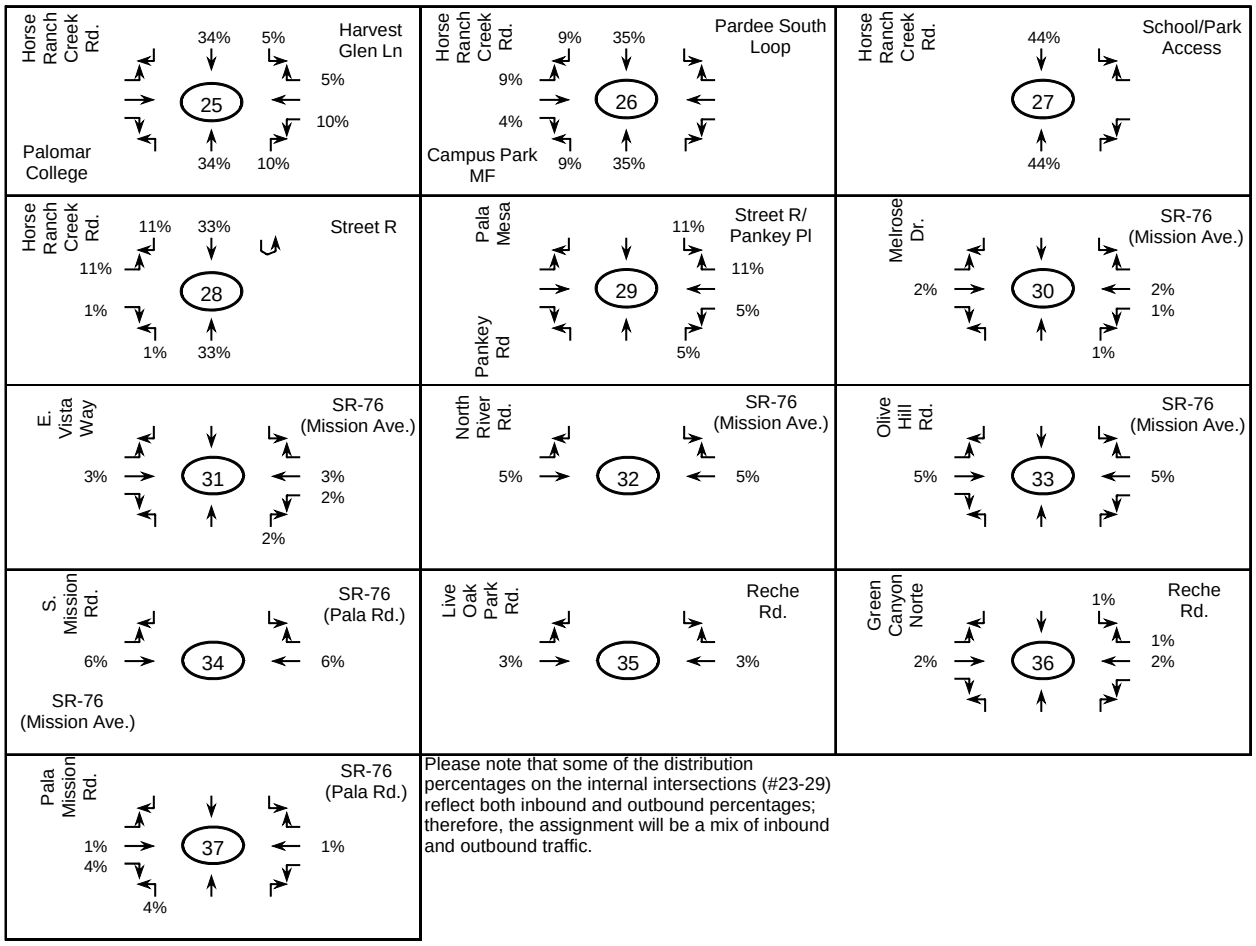


Figure 8c: Near-Term Residential Distribution (30% Internal Capture Rate)



Please note that some of the distribution percentages on the internal intersections (#23-29) reflect both inbound and outbound percentages; therefore, the assignment will be a mix of inbound and outbound traffic.

Figure 9a: Near-Term Residential Assignment (30% Internal Capture Rate)

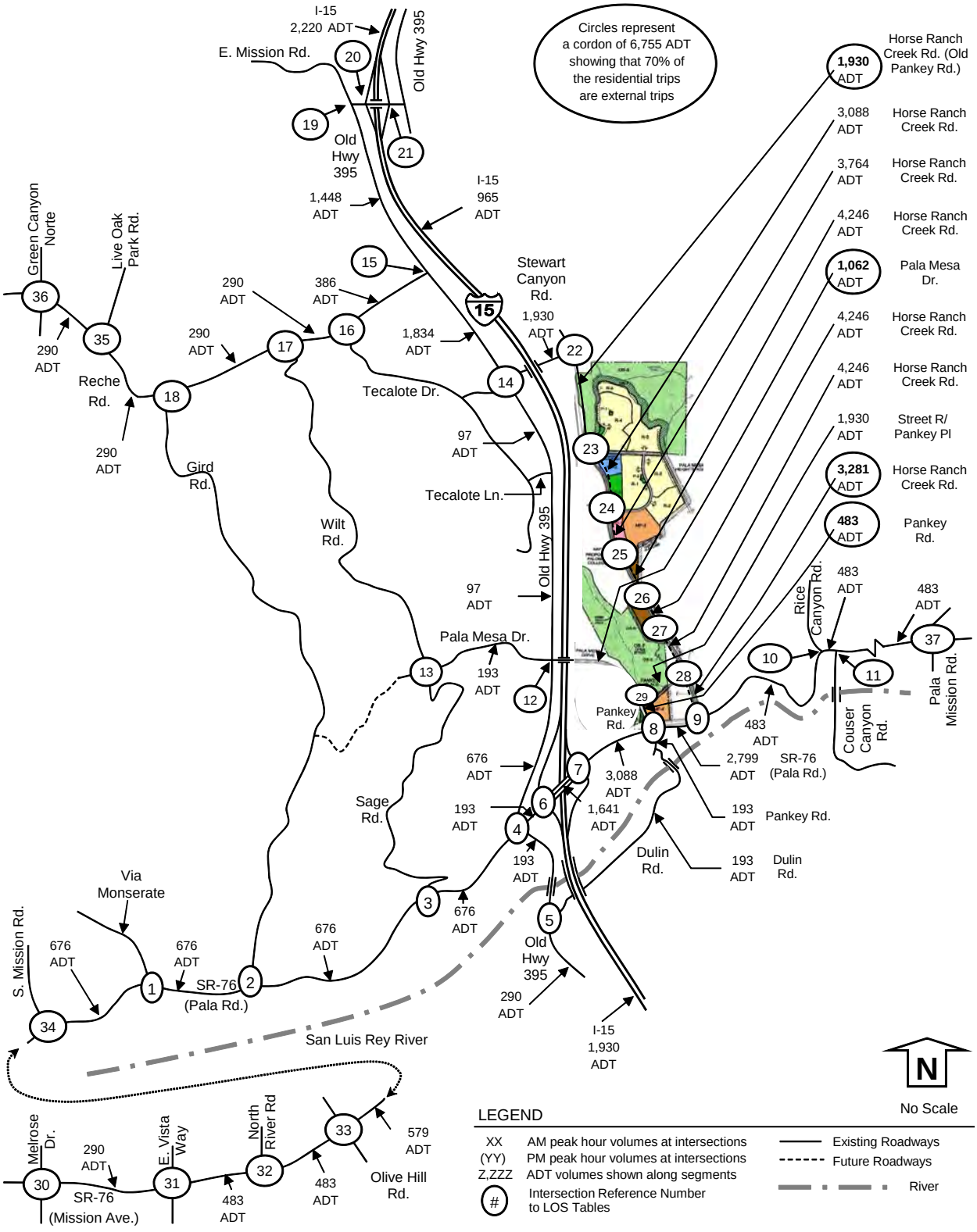


Figure 9b: Near-Term Residential Assignment (30% Internal Capture Rate)

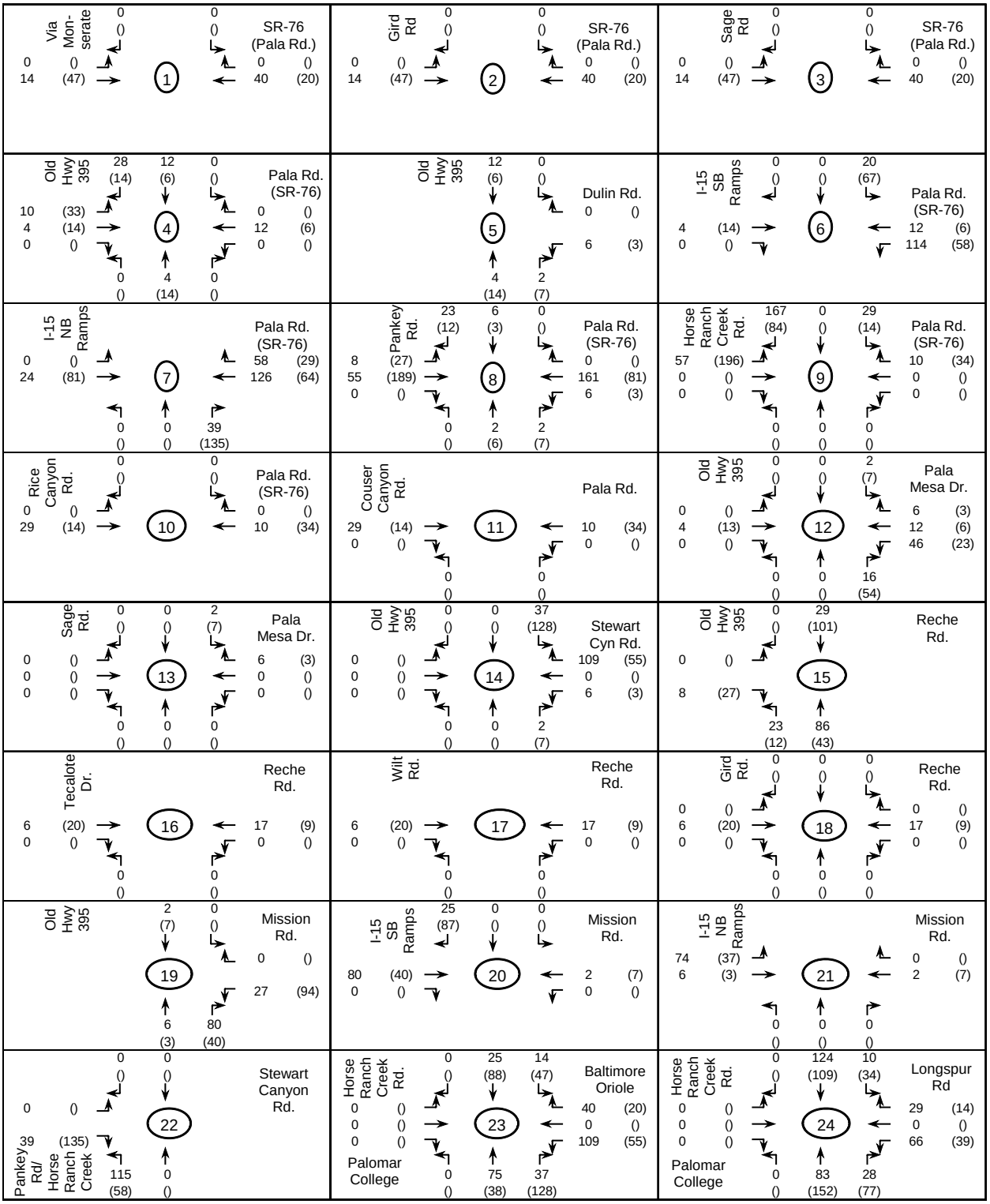


Figure 9c: Near-Term Residential Assignment (30% Internal Capture Rate)

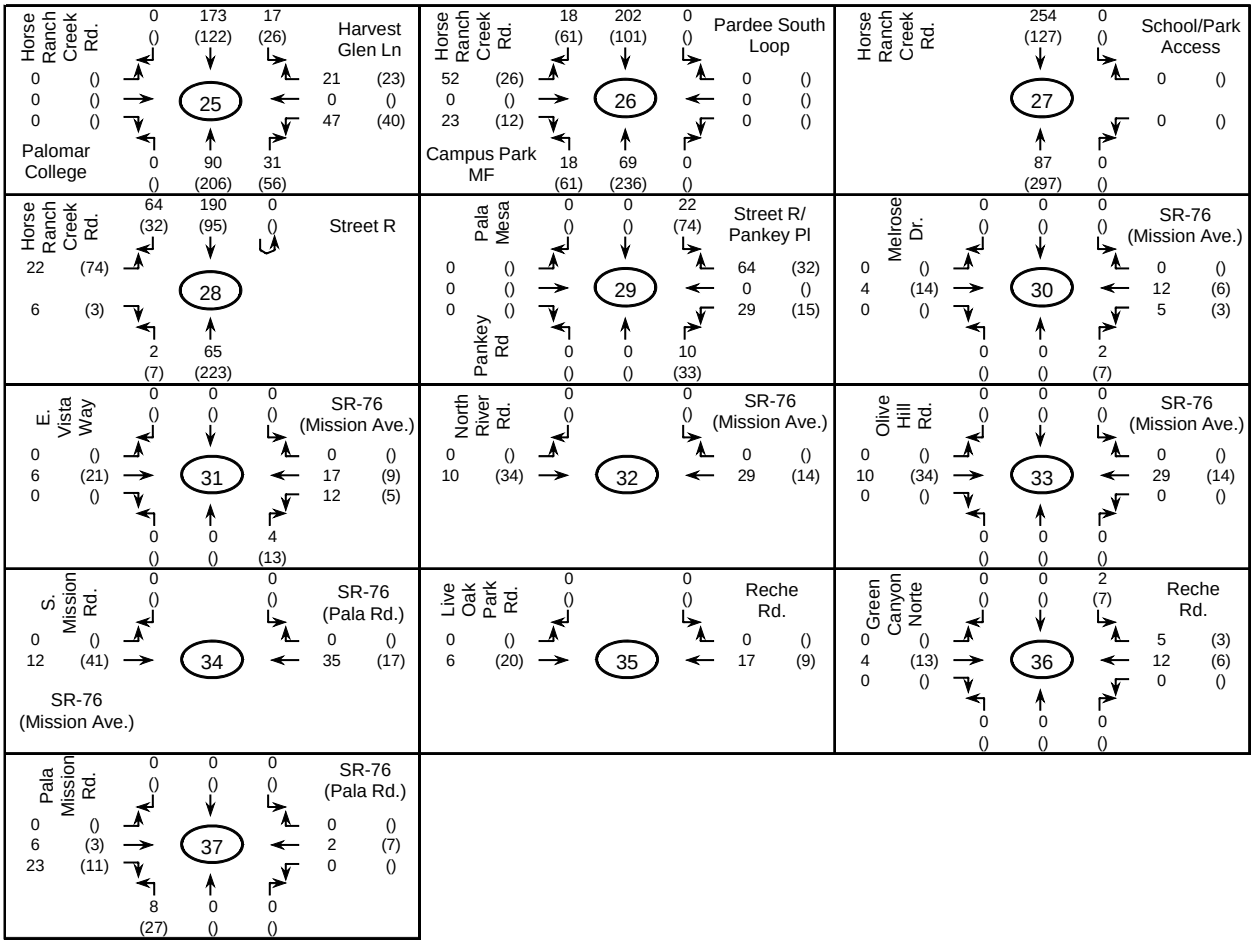


Figure 10a: Near-Term Commercial Distribution (30% Internal Capture Rate)

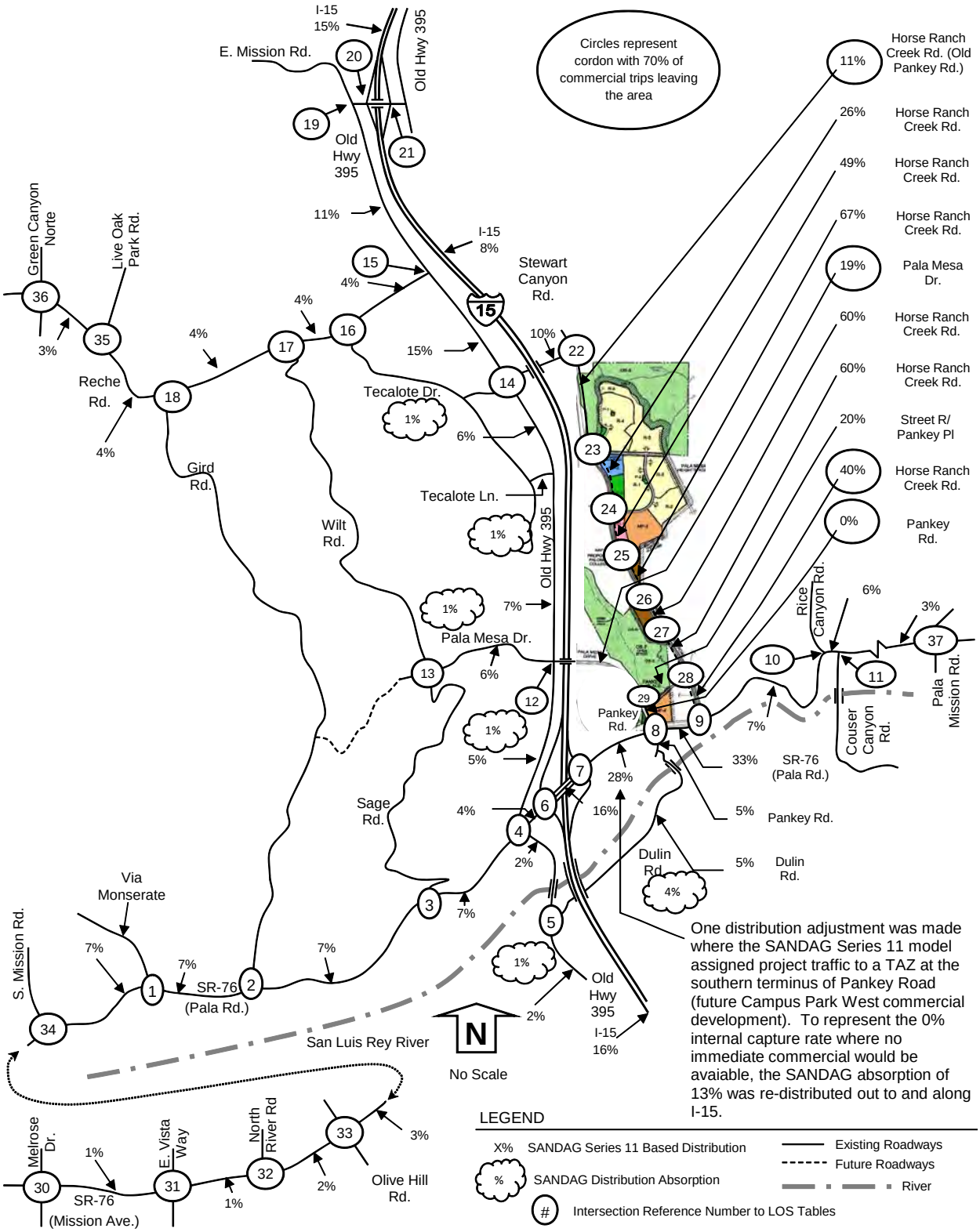


Figure 10b: Near-Term Commercial Distribution (30% Internal Capture Rate)

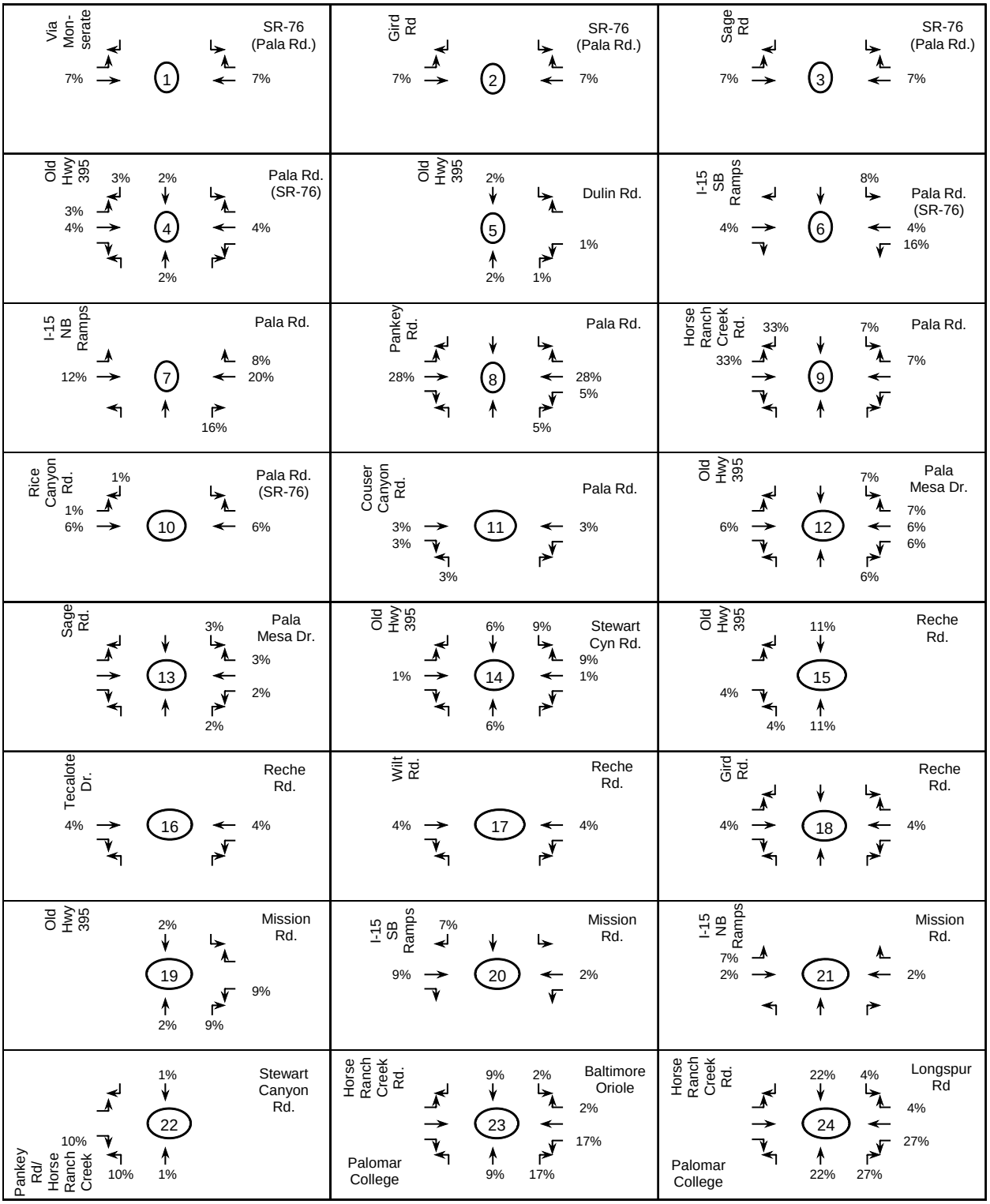


Figure 10c: Near-Term Commercial Distribution (30% Internal Capture Rate)

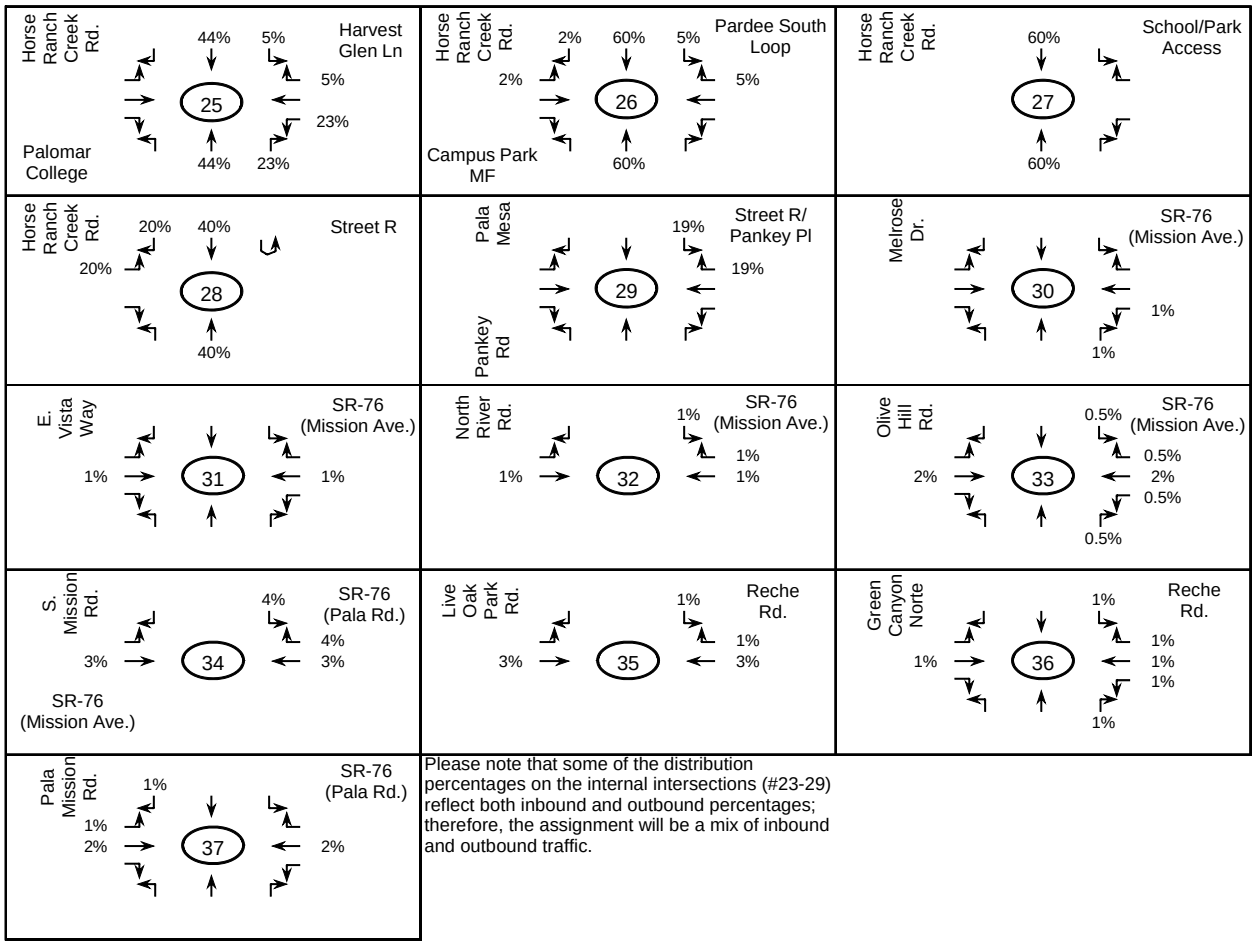


Figure 11a: Near-Term Commercial Assignment (30% Internal Capture Rate)

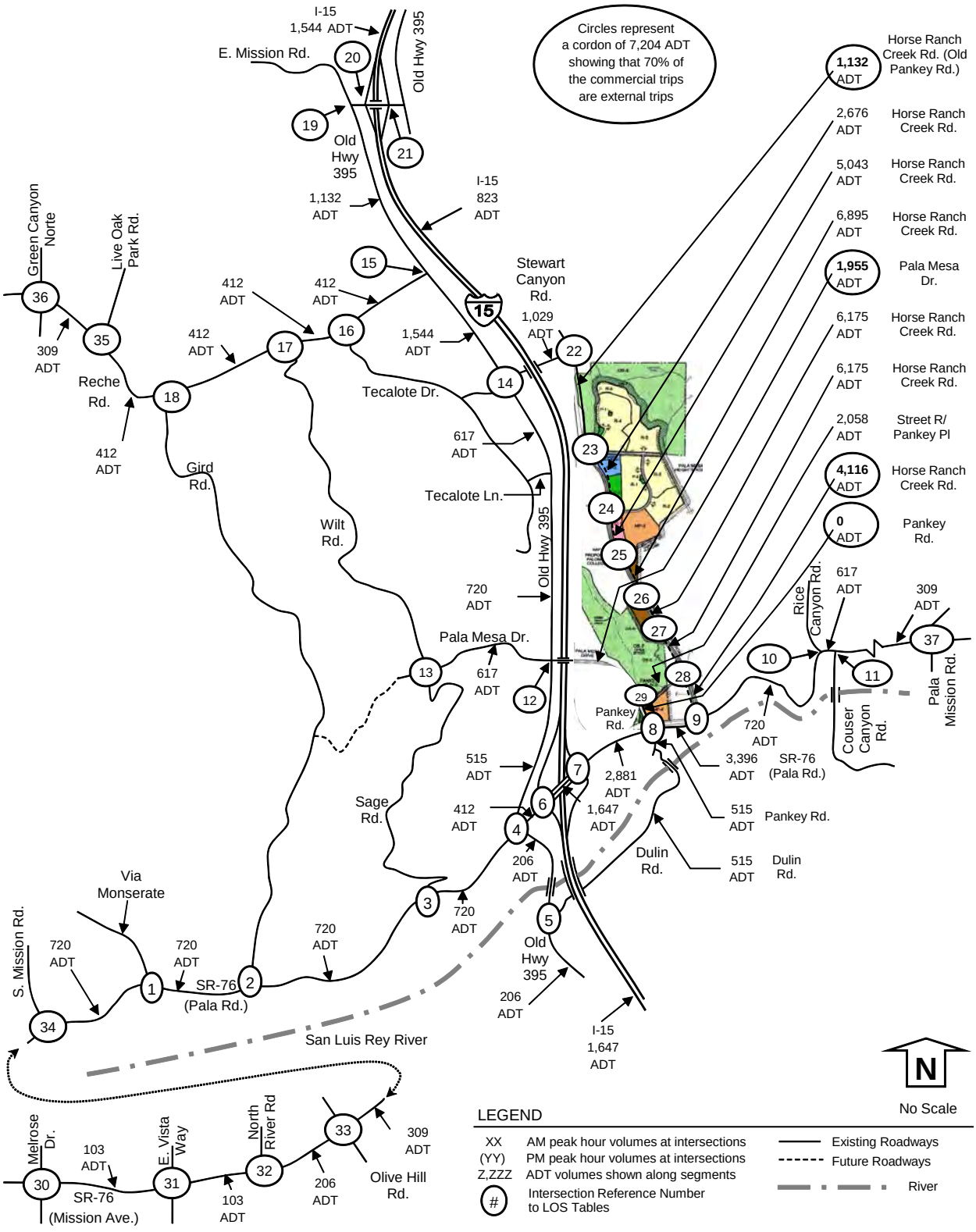


Figure 11b: Near-Term Commercial Assignment (30% Internal Capture Rate)

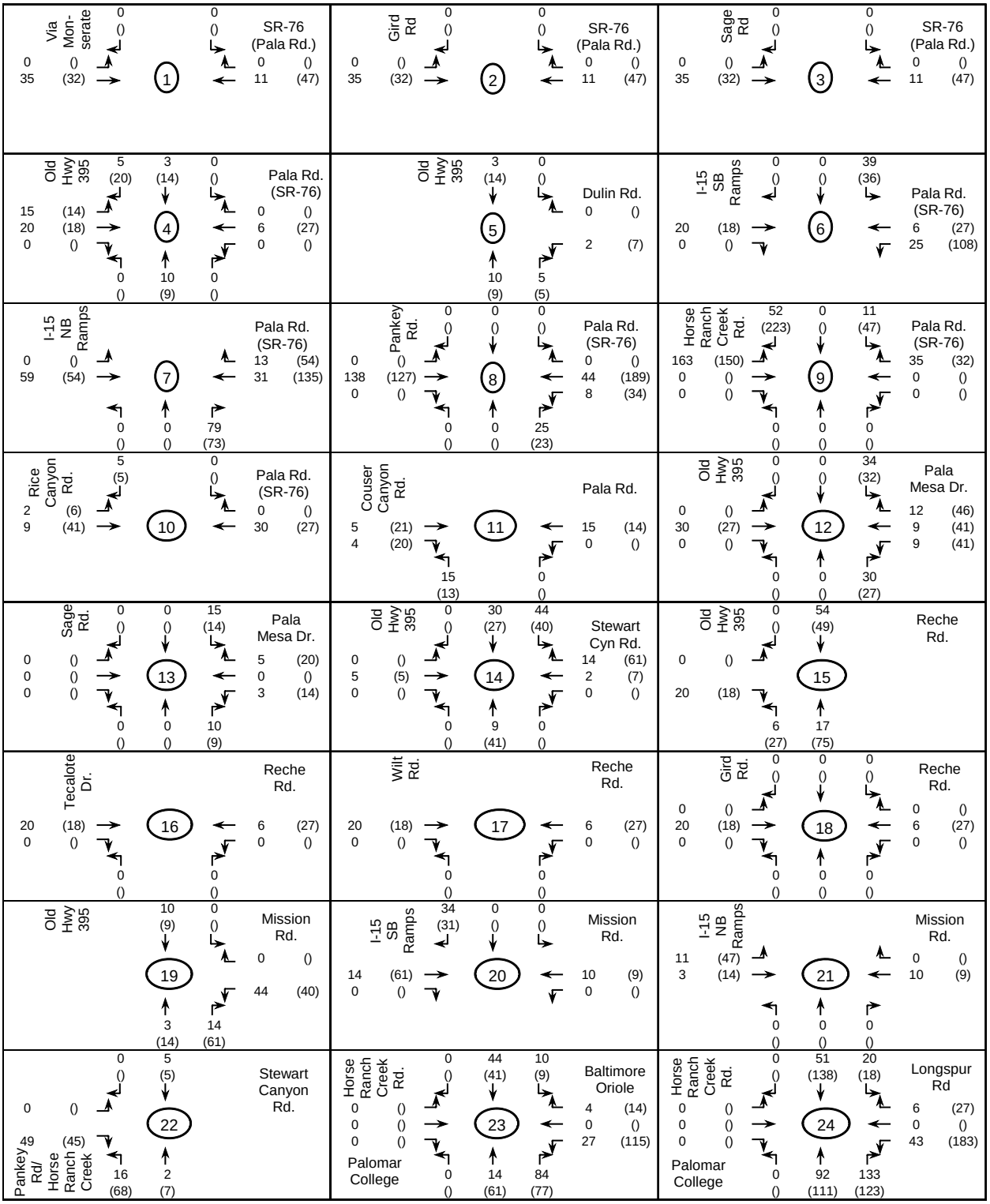


Figure 11c: Near-Term Commercial Assignment (30% Internal Capture Rate)

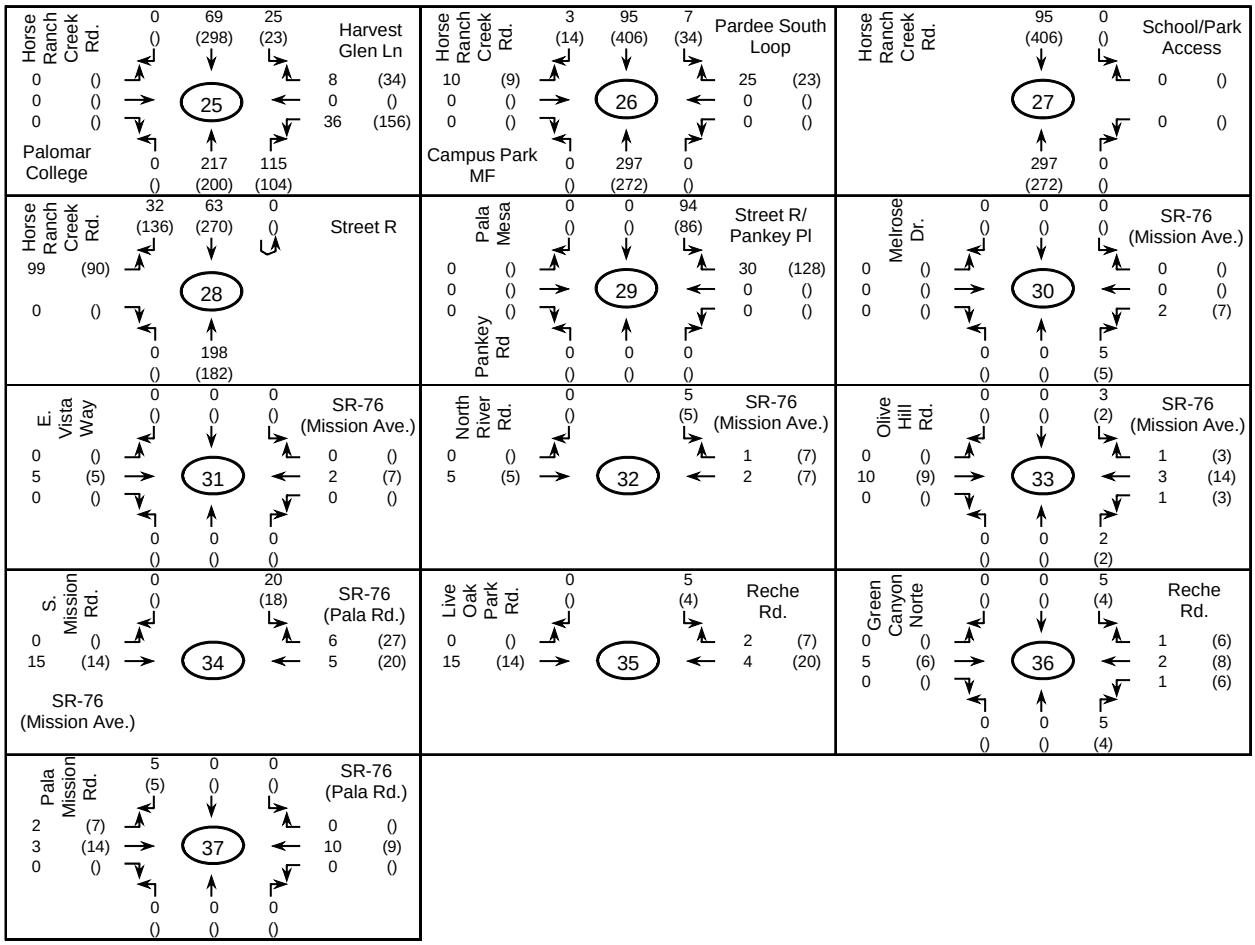


Figure 12a: Near-Term Residential and Commercial Assignment (30% Internal Capture Rate)

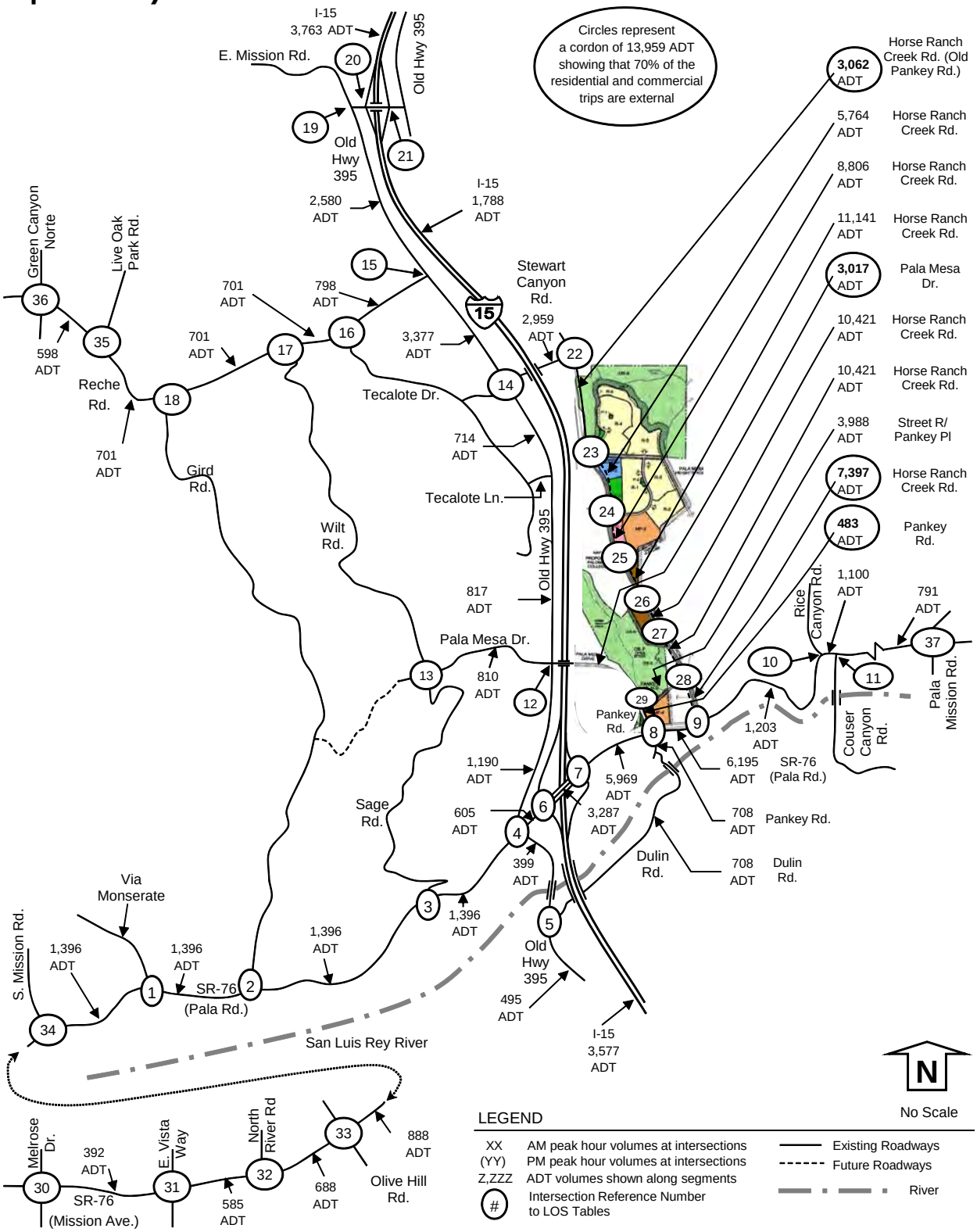


Figure 12b: Near-Term Residential and Commercial Assignment (30% Internal Capture Rate)

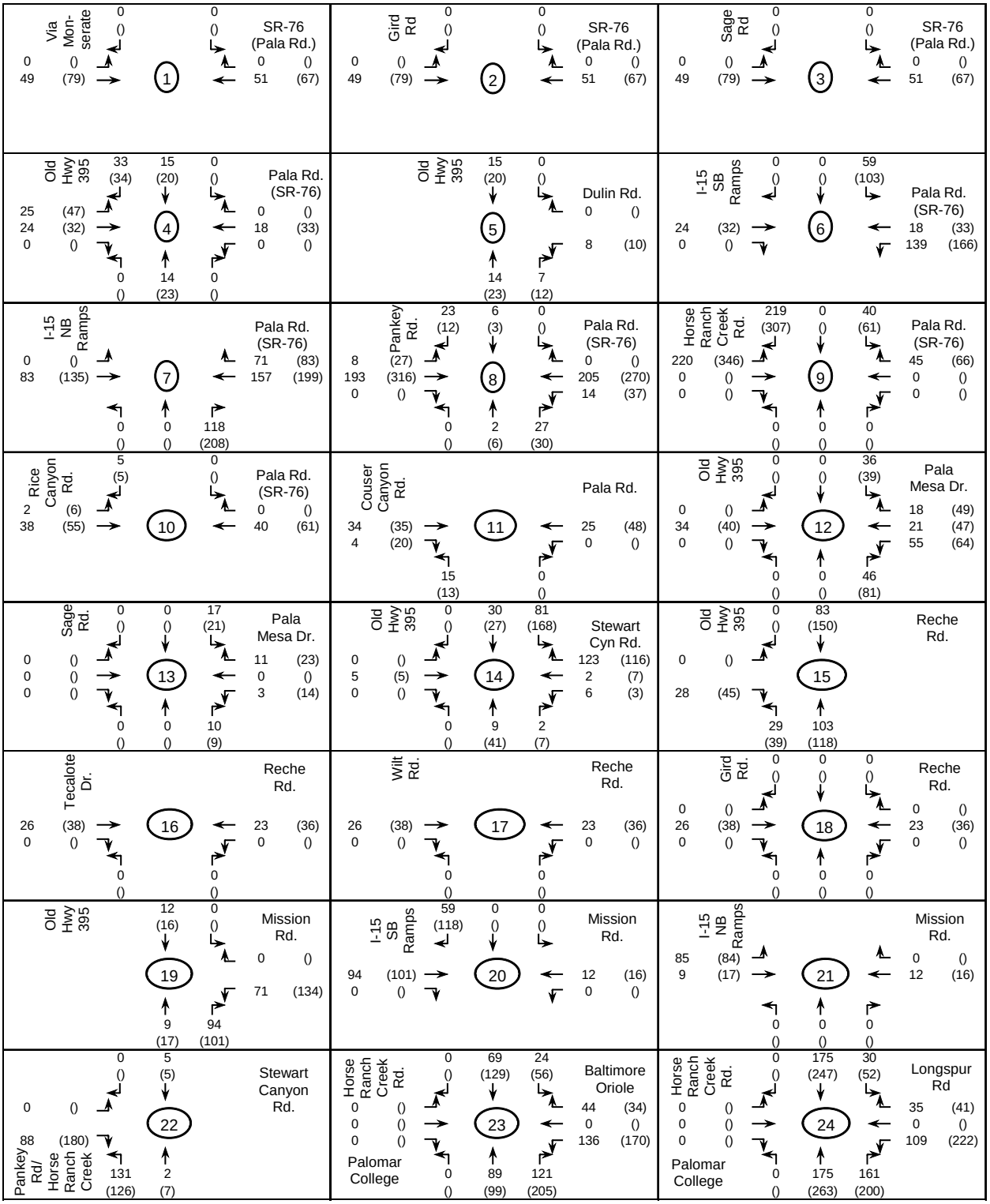


Figure 12c: Near-Term Residential and Commercial Assignment (30% Internal Capture Rate)

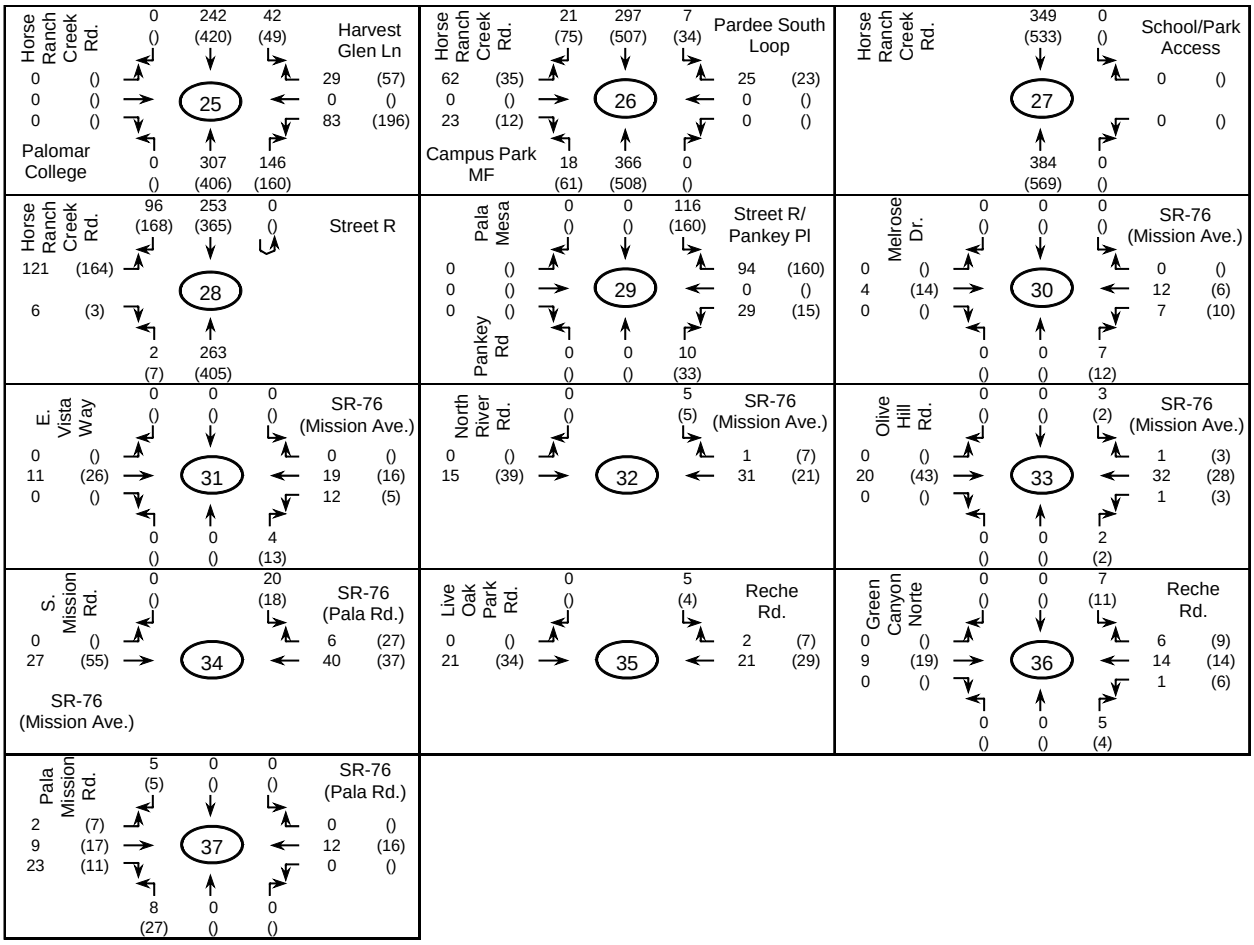


Figure 13a: Long-Term Residential Distribution (30% Internal Capture Rate)

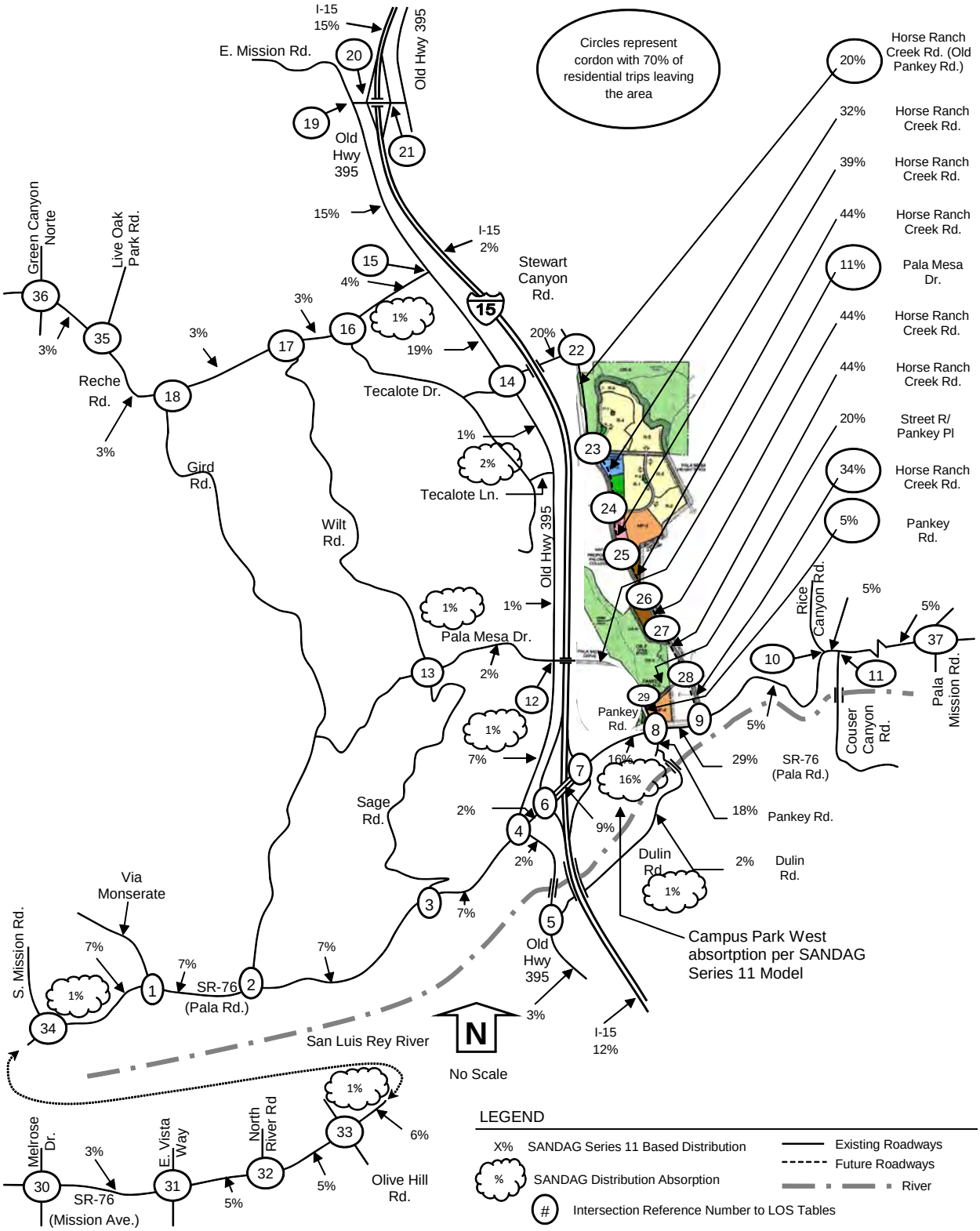


Figure 13b: Long-Term Residential Distribution (30% Internal Capture Rate)

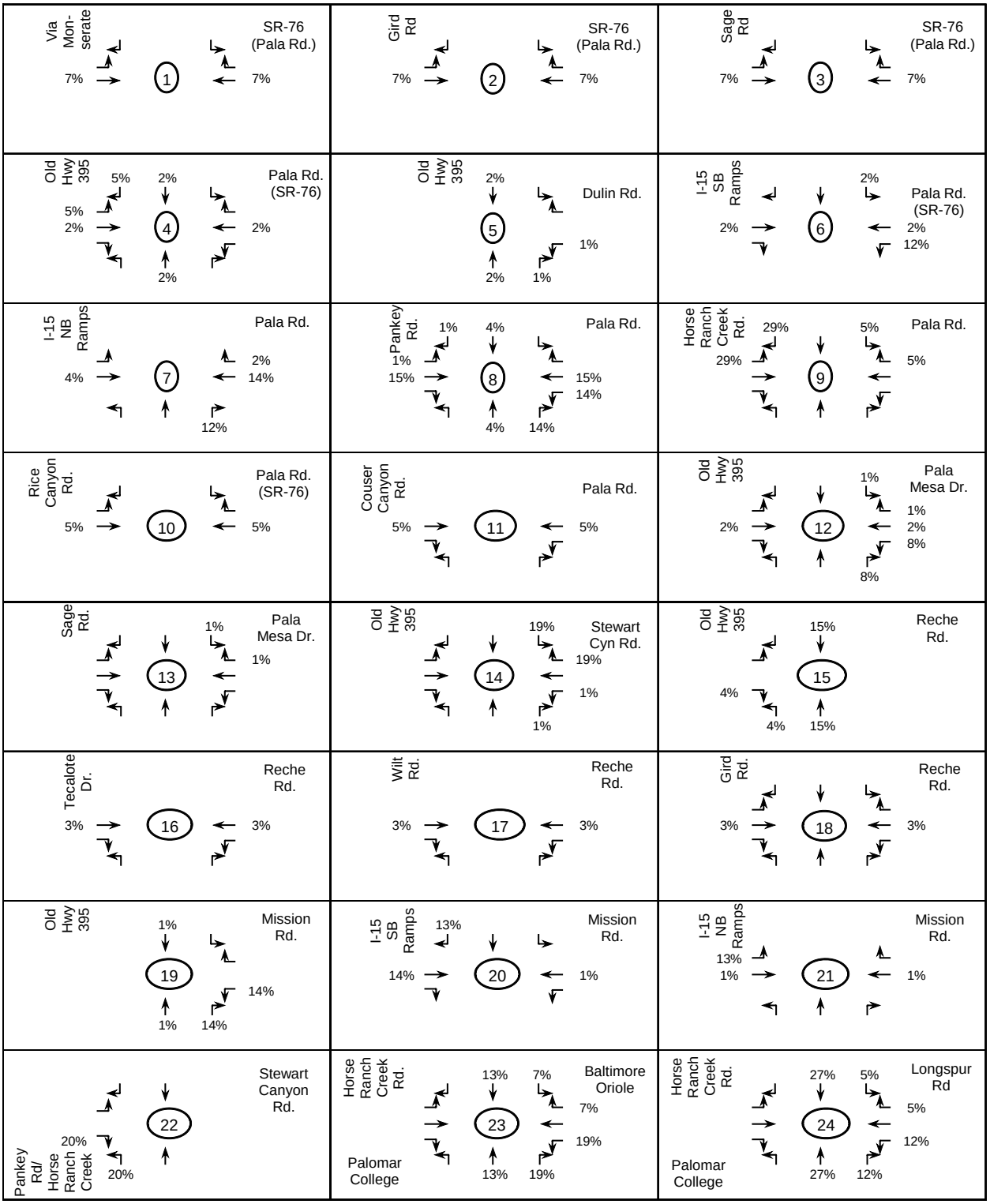
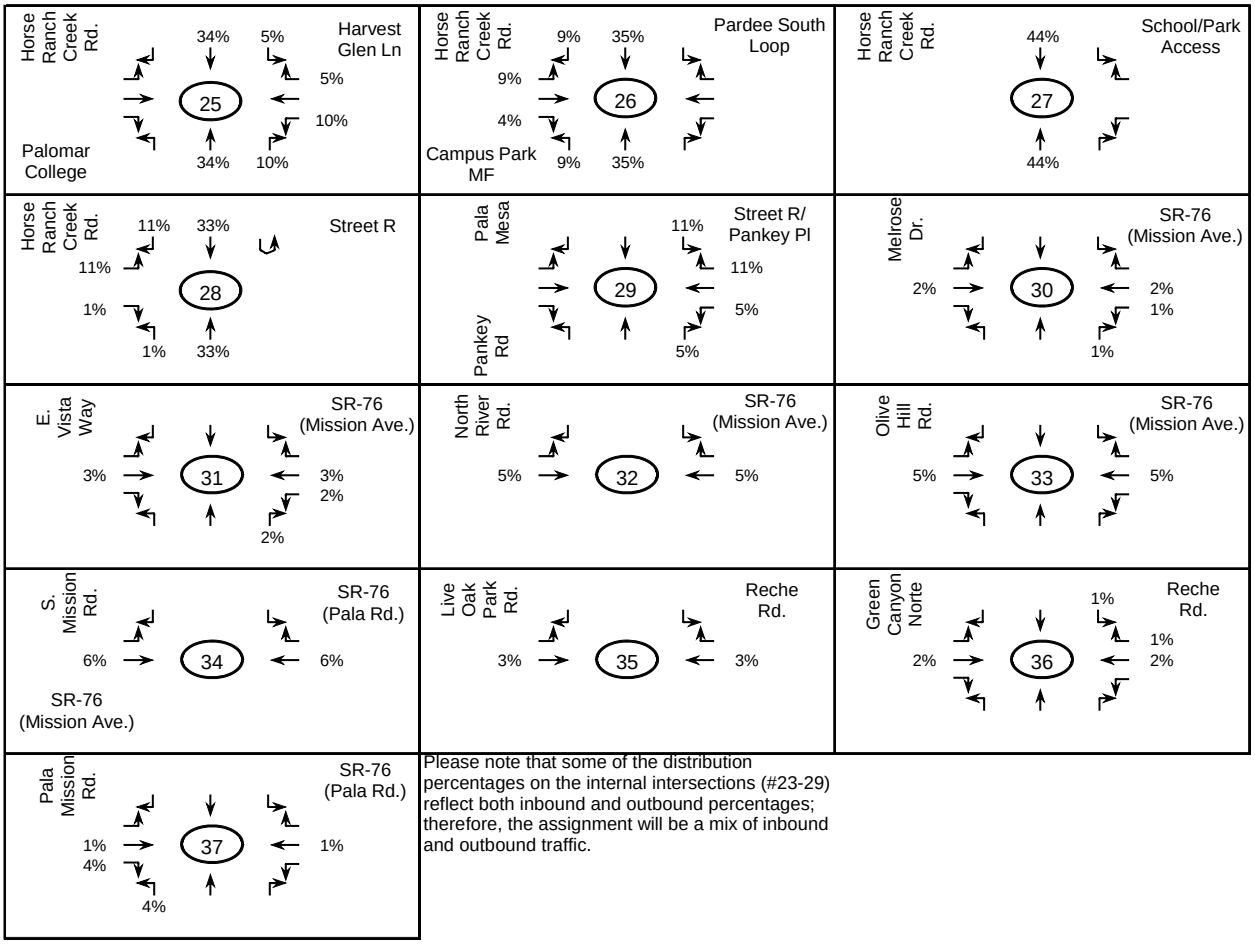


Figure 13c: Long-Term Residential Distribution (30% Internal Capture Rate)



Please note that some of the distribution percentages on the internal intersections (#23-29) reflect both inbound and outbound percentages; therefore, the assignment will be a mix of inbound and outbound traffic.

Figure 14a: Long-Term Residential Assignment (30% Internal Capture Rate)

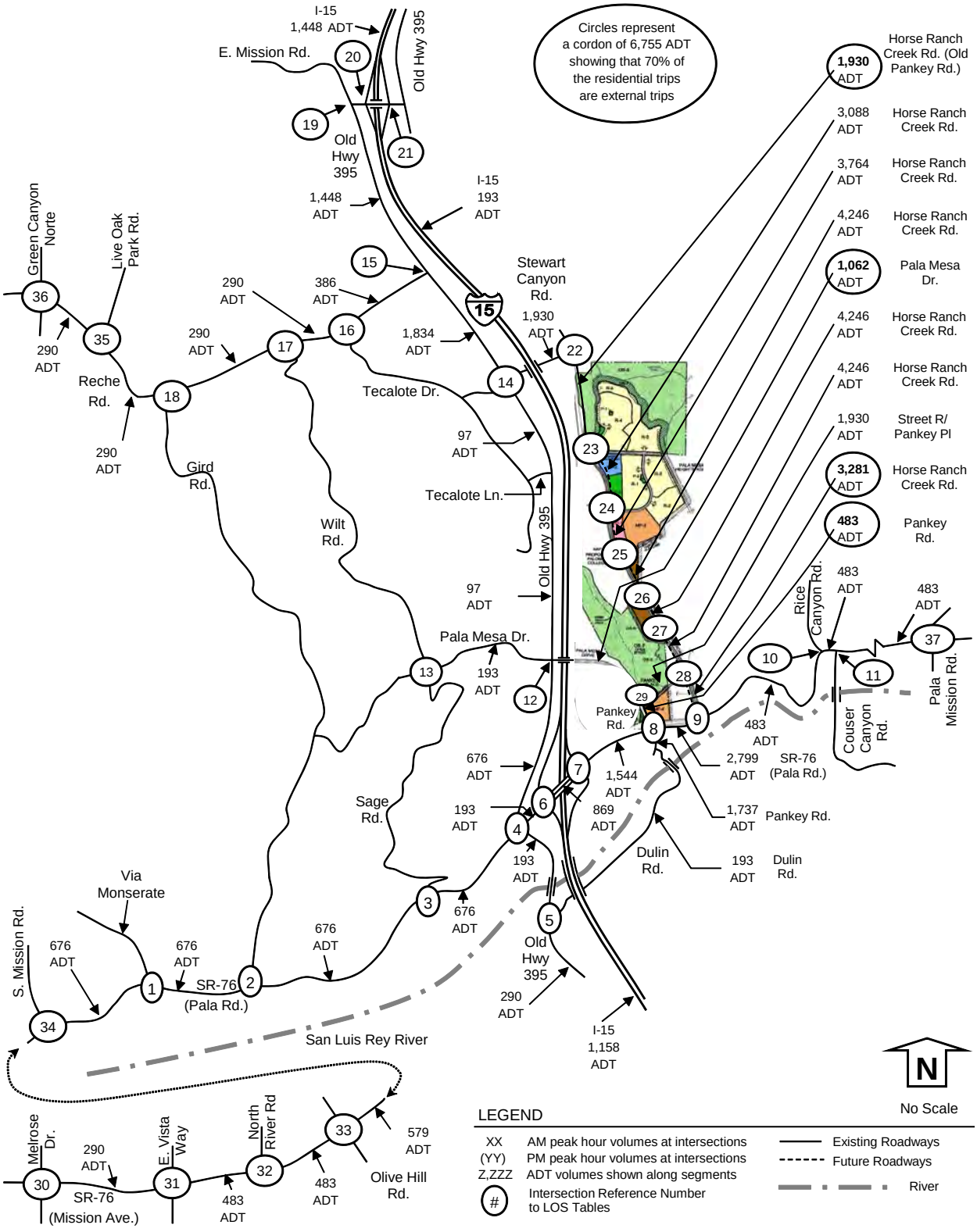


Figure 14b: Long-Term Residential Assignment (30% Internal Capture Rate)

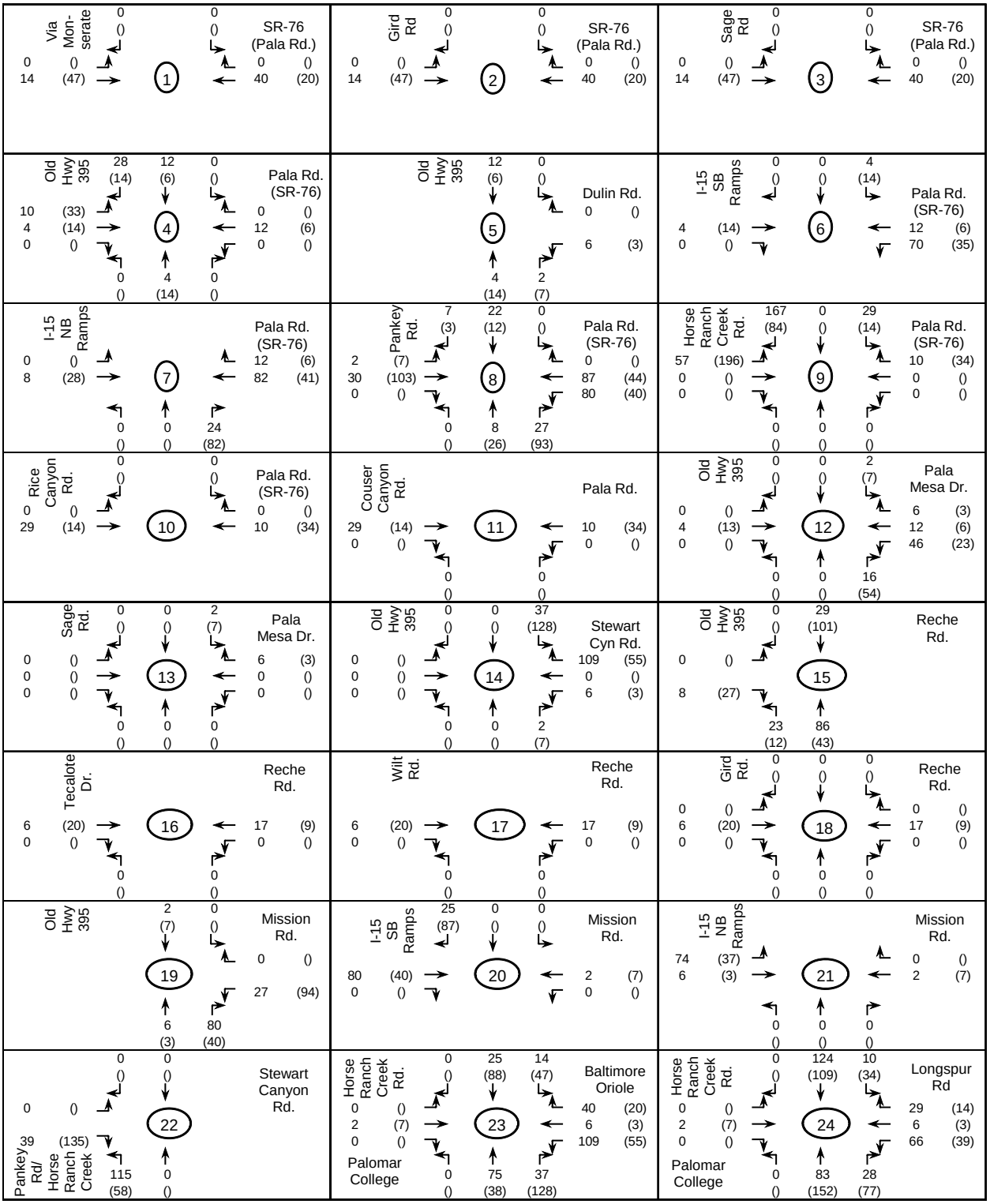


Figure 14c: Long-Term Residential Assignment (30% Internal Capture Rate)

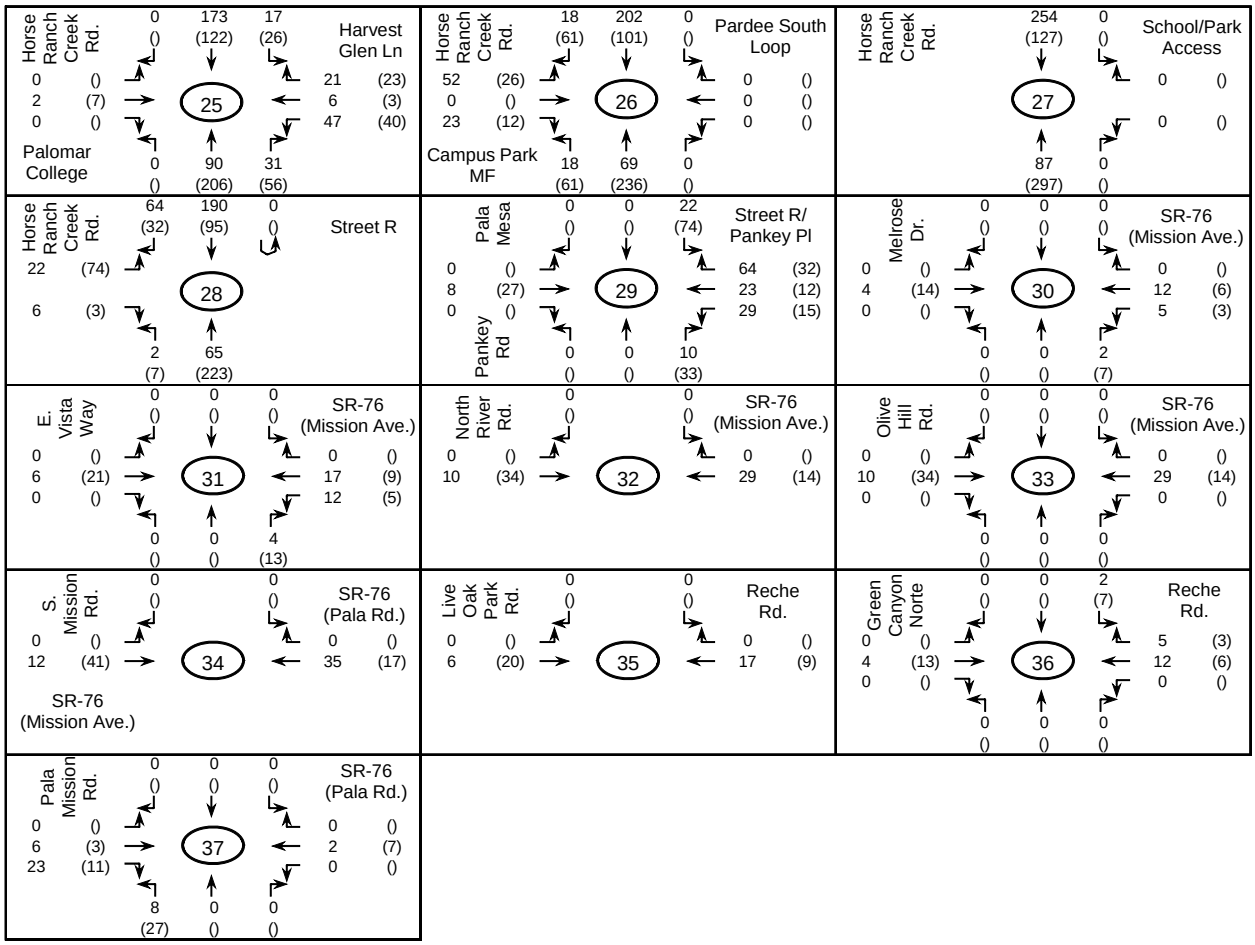


Figure 15a: Long-Term Commercial Distribution (30% Internal Capture Rate)

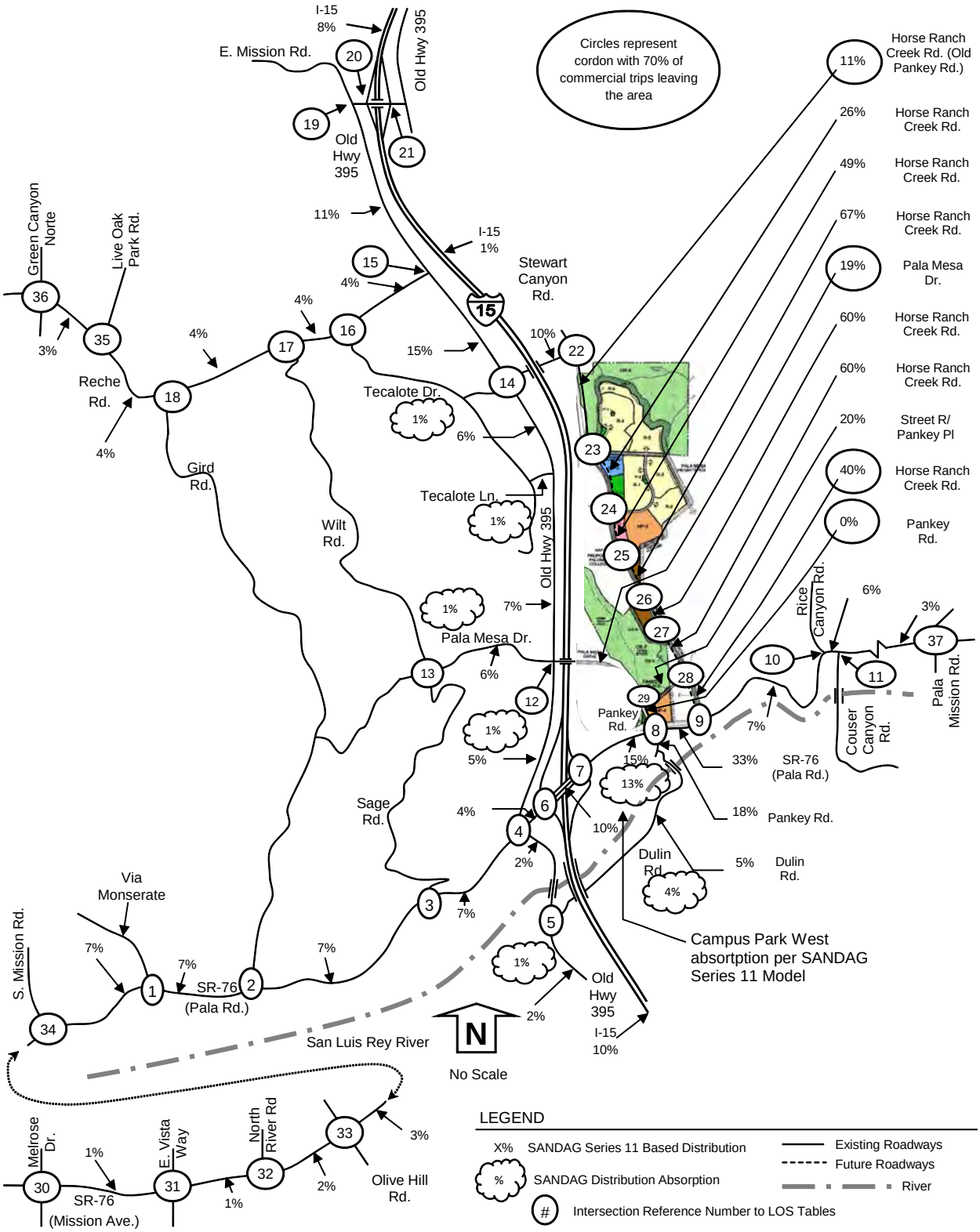


Figure 15b: Long-Term Commercial Distribution (30% Internal Capture Rate)

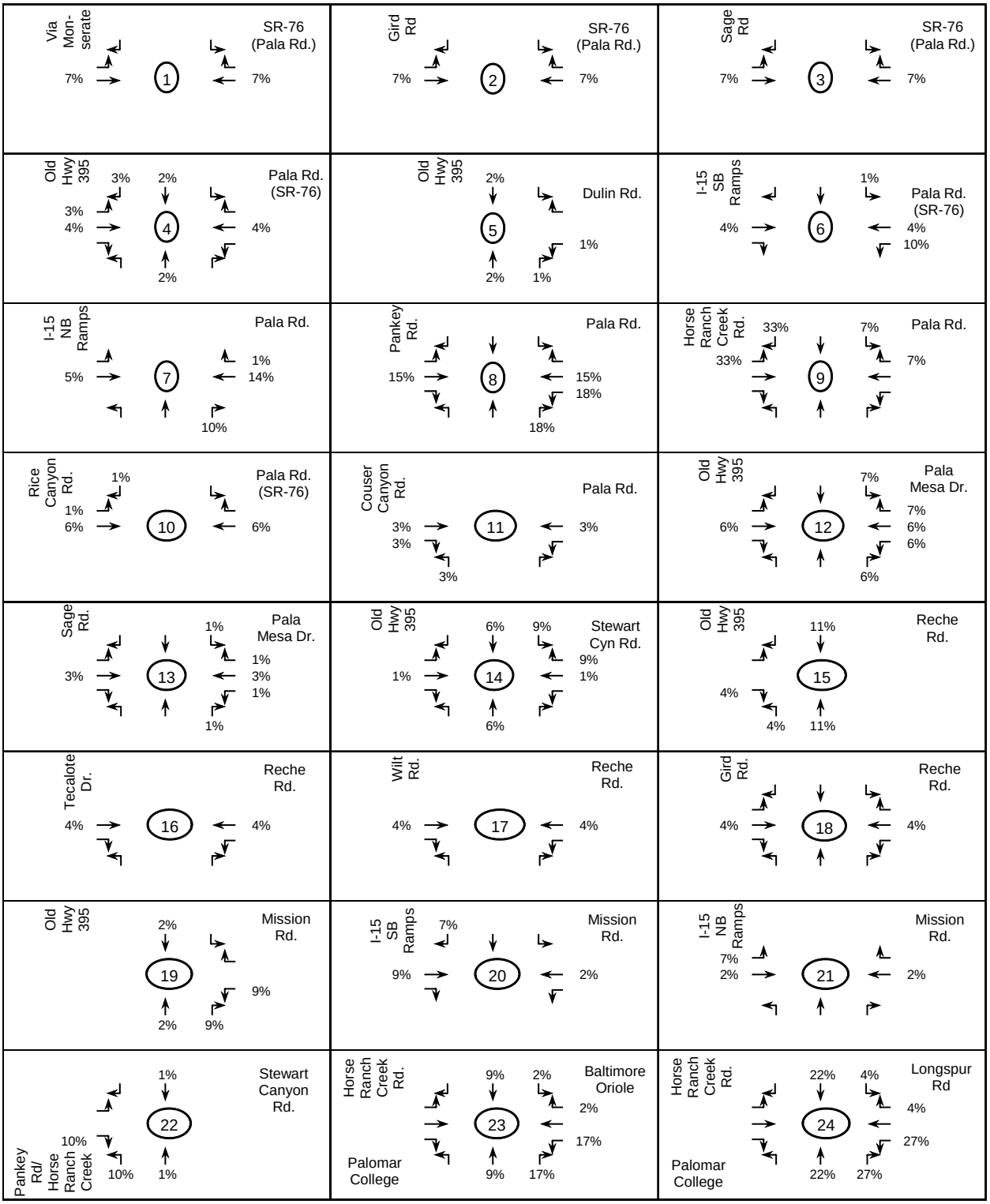


Figure 15c: Long-Term Commercial Distribution (30% Internal Capture Rate)

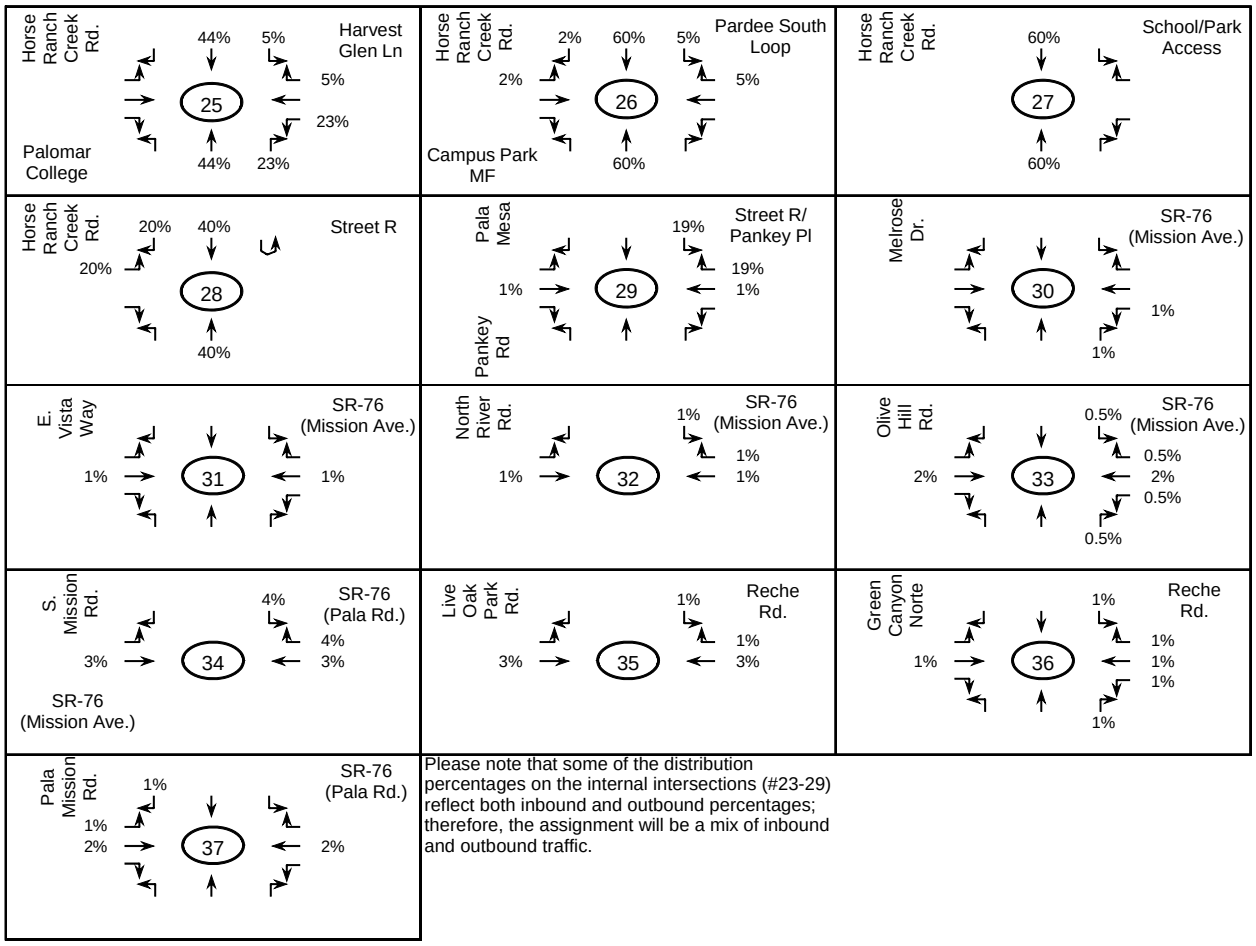


Figure 16a: Long-Term Commercial Assignment (30% Internal Capture Rate)

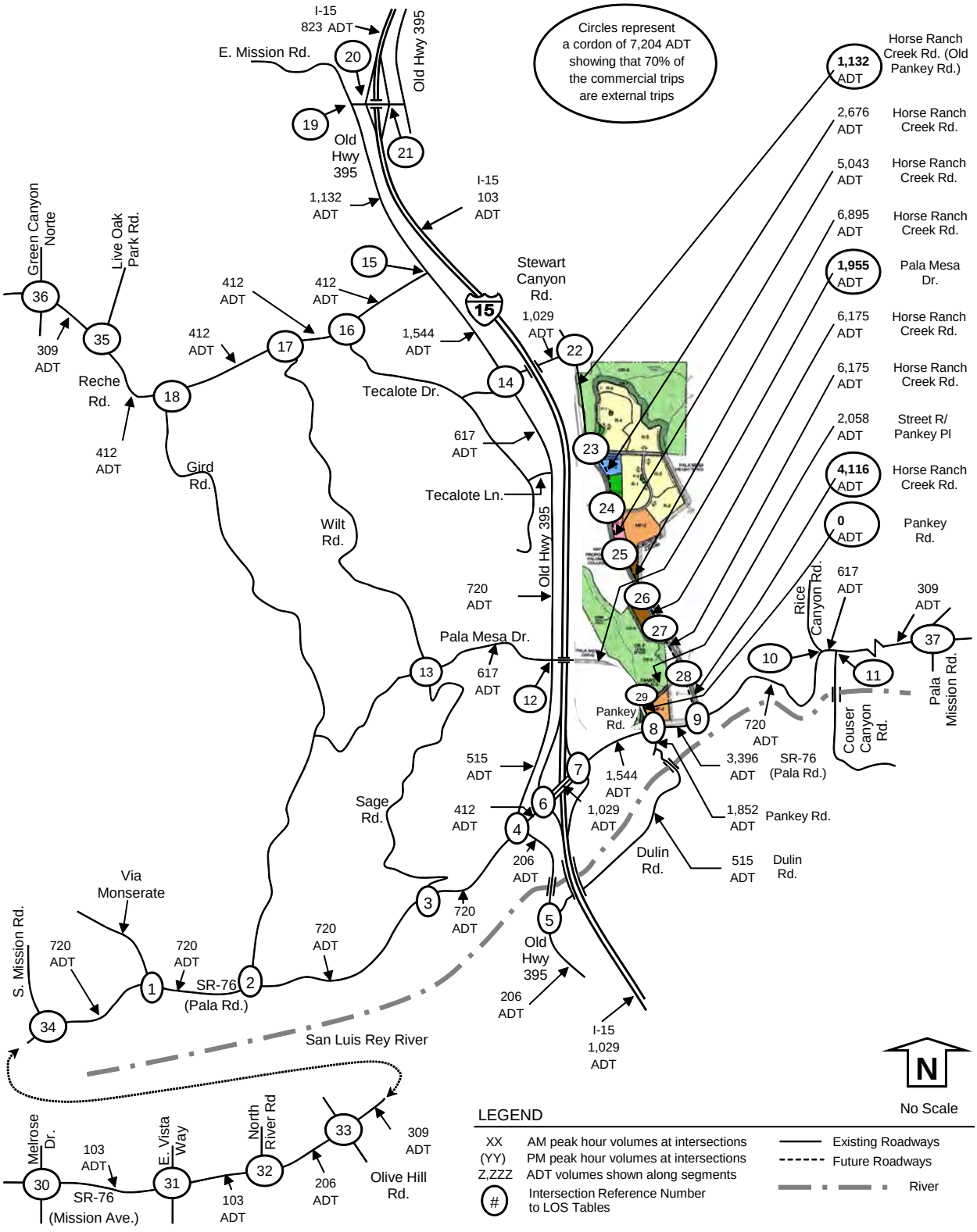


Figure 16b: Long-Term Commercial Assignment (30% Internal Capture Rate)

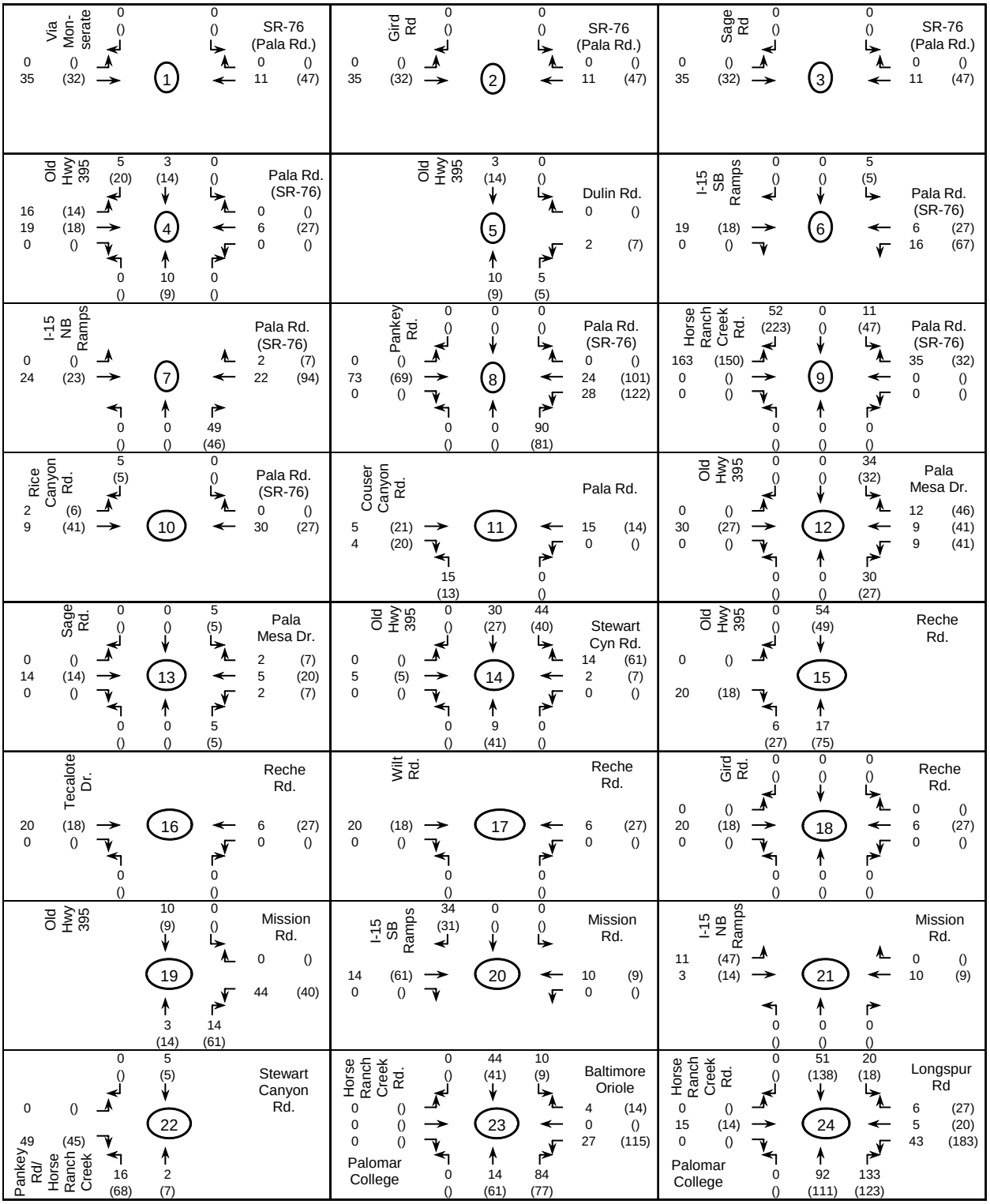


Figure 16c: Long-Term Commercial Assignment (30% Internal Capture Rate)

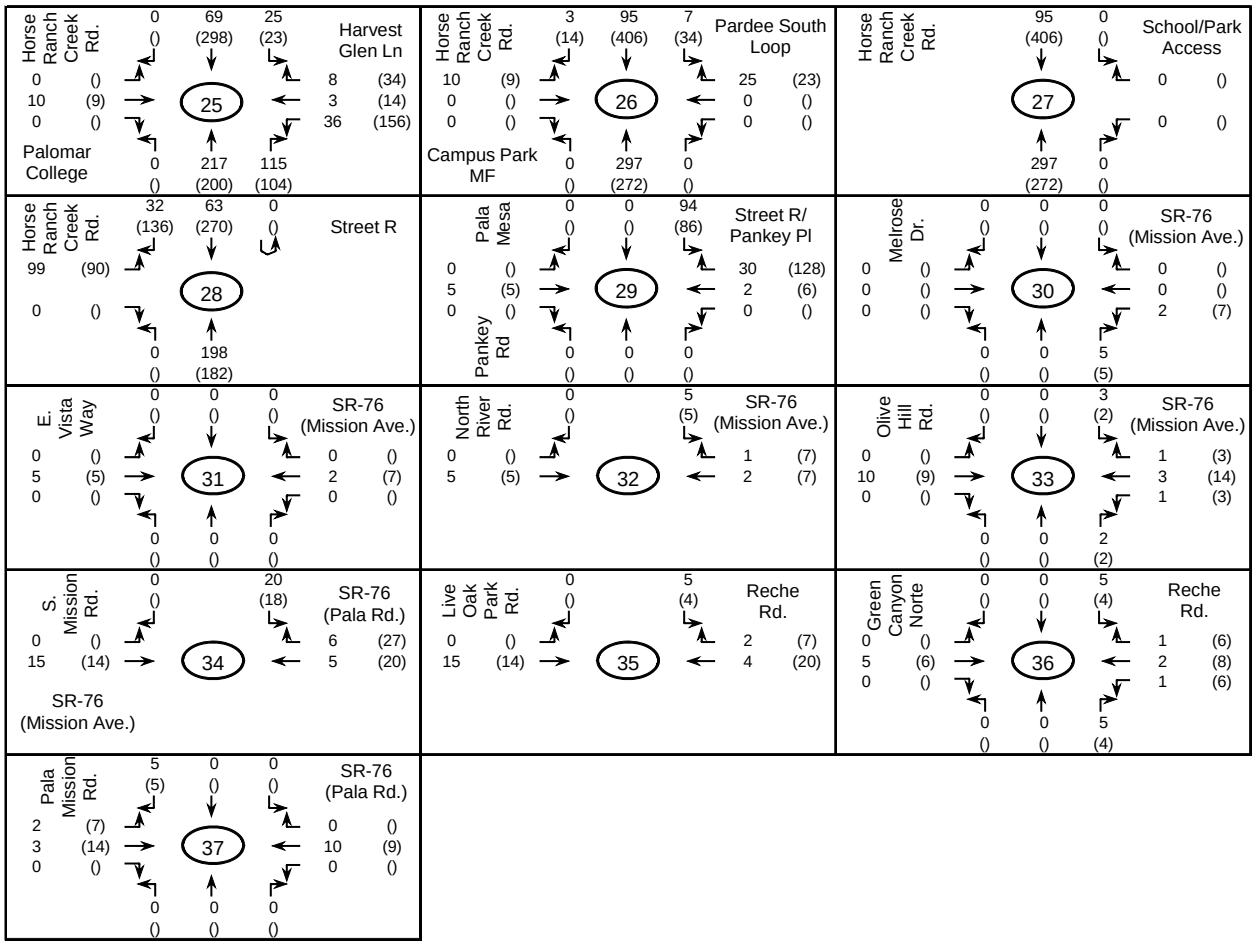


Figure 17a: Long-Term Residential and Commercial Assignment (30% Internal Capture Rate)

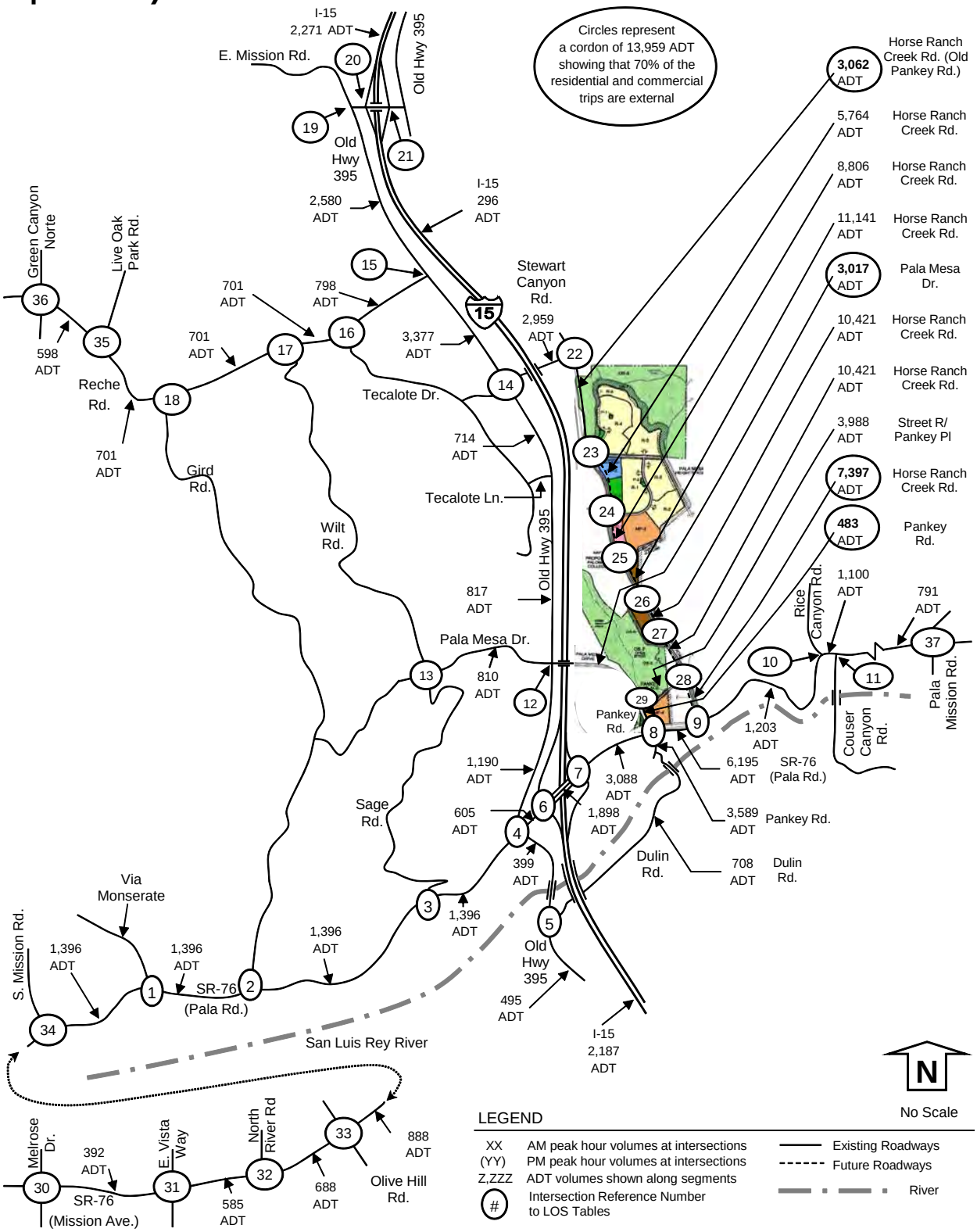


Figure 17b: Long-Term Residential and Commercial Assignment (30% Internal Capture Rate)

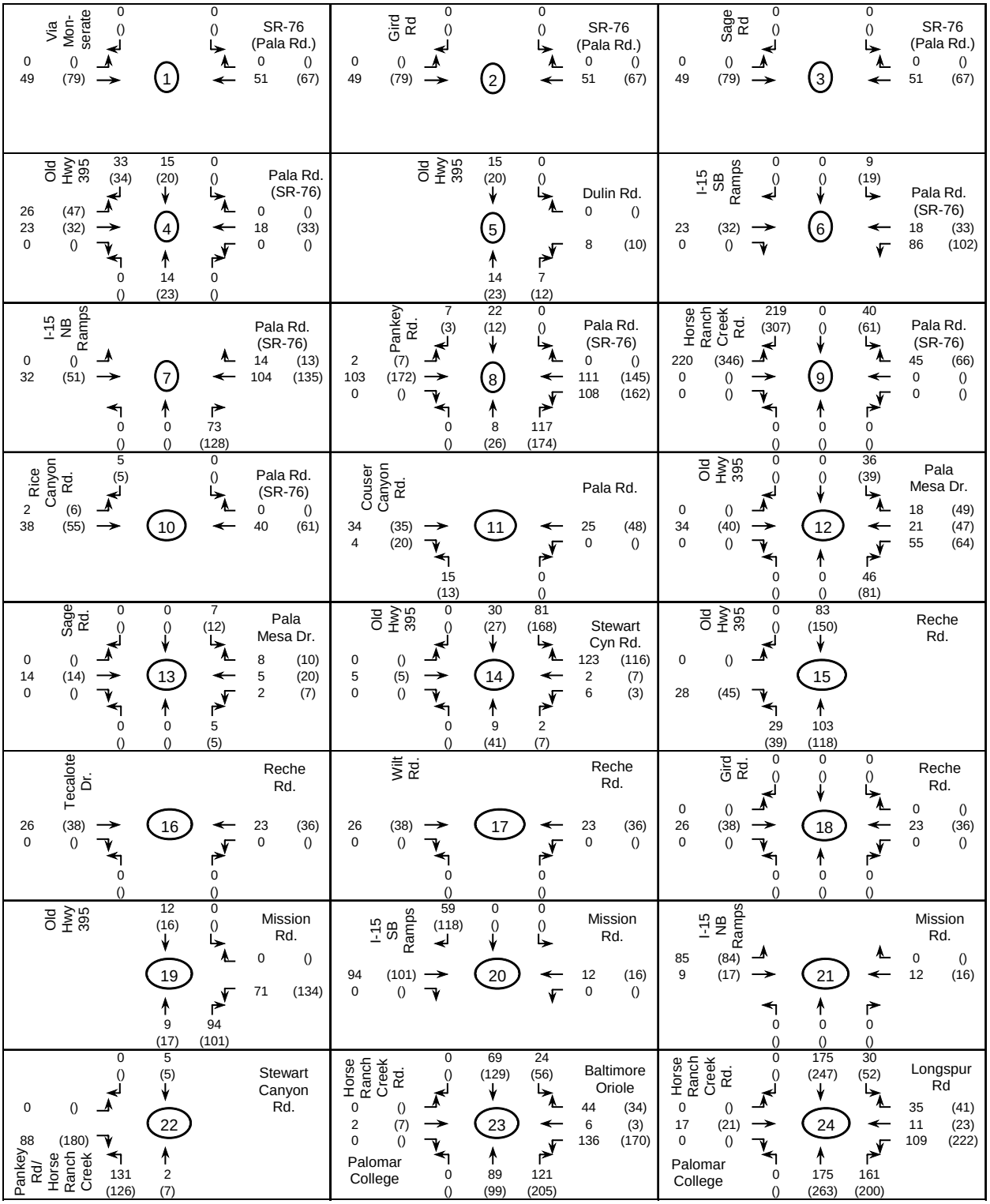
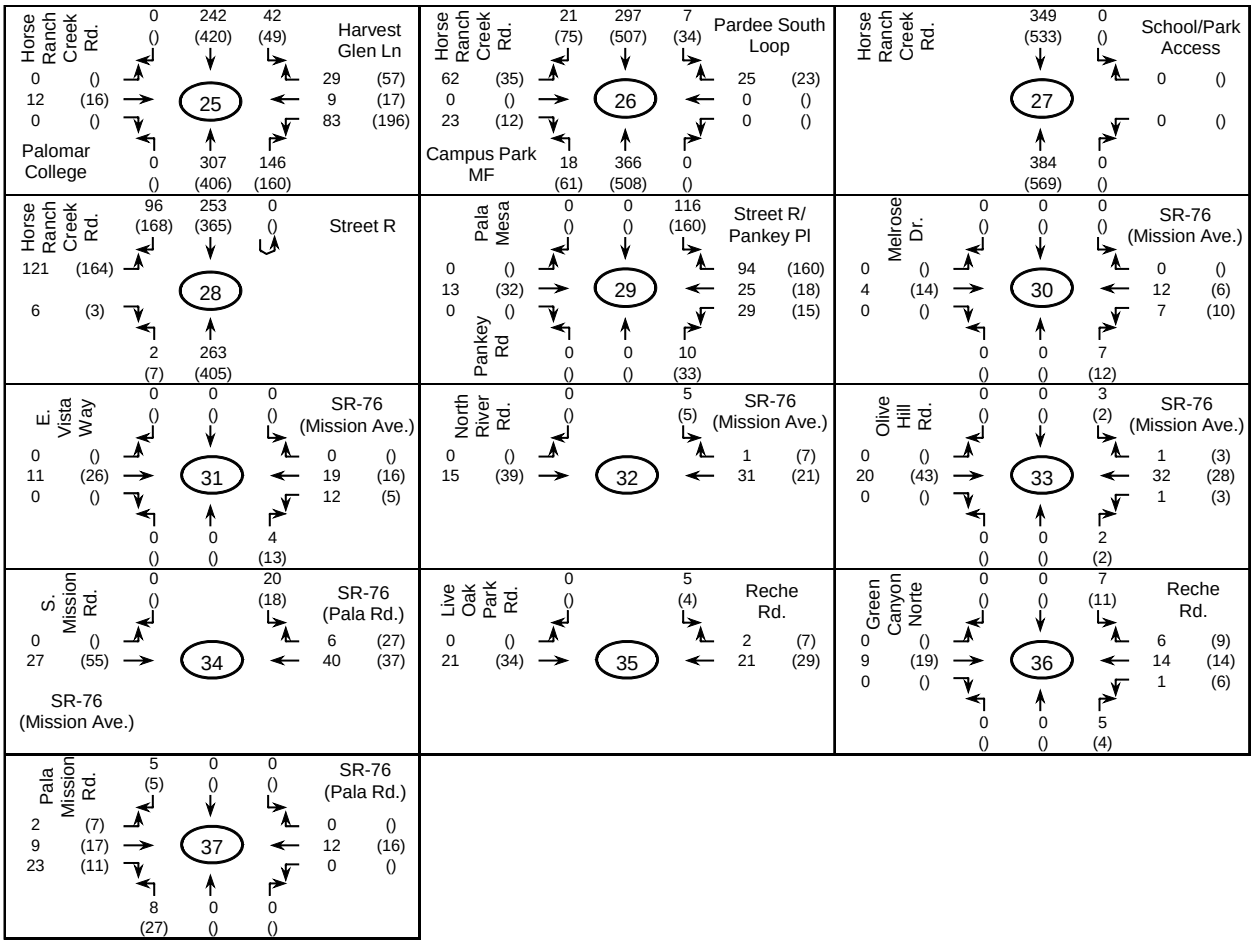


Figure 17c: Long-Term Residential and Commercial Assignment (30% Internal Capture Rate)



3.4 Existing + Project Conditions

This section will summarize the analysis for the addition of project traffic onto the existing background traffic for AM, PM and ADT conditions. The near-term project assignment is used in this scenario. The traffic analysis criteria are the same as outlined in Section 2.1.

If the Campus Park applicant is first to proceed (between Meadowood and Palomar College), then the applicant will construct the following: Horse Ranch Creek Road from Pankey south of Stewart to SR-76; Pala Mesa Drive from Old Highway 395 to SR-76; Pankey Place (AKA Street R) from Pala Mesa Drive to Horse Ranch Creek Road, and intersections #9, 23, 24, 25, 26, 28, and 29 (additional details in Section 5.4). Additionally, SR-76 from I-15 easterly a distance of approximately 1.4 miles is currently being widened from 2 to 4 lanes (photos included in Appendix D). Because this improvement is anticipated to be completed before Campus Park will reach occupancy, SR-76 from I-15 to Horse Ranch Creek Road was analyzed as 4 lanes under existing + project conditions. The proposed improvements by the applicant if first to proceed, as used in this existing + project analysis are shown in **Figures 18a, 18b, and 18c**.

The applicant proposes to construct Horse Ranch Creek Road per General Plan Update Circulation Element "Boulevard" standards and has submitted a request for a modification to a road standard under separate cover. Therefore, the segment operations shown in Table 12 reflect a Boulevard threshold capacity for Horse Ranch Creek Road with analysis as either under capacity or over capacity. The operation capacity is limited to this under or over capacity because the GP Update Circulation Element has yet to be adopted. Horse Ranch Creek Road will create a new intersection with SR-76 at station 984+67 $\pm$ to which Caltrans has agreed with the proposed location and has indicated such in a letter dated January 11, 2007. A copy of the proposed GP Update Circulation Element Standards for a Boulevard and a copy of the Caltrans letter accepting the Horse Ranch Creek Road intersection location at SR-76 are included in **Appendix J**.

The northern portion of Horse Ranch Creek Road will connect to and transition from a Light Collector to a Boulevard at the intersection of Horse Ranch Creek Road and Baltimore Oriole (intersection #23). The geometric transition details are included on the Vesting Tentative Map; however, the overall transition works by restricting the northbound and southbound travel to one lane in each direction with as needed turn lanes. This intersection transition is shown at the end of Appendix H.

The peak hour intersection volumes and daily traffic volumes for this scenario of existing + project are shown in **Figures 19a, 19b, and 19c**. Please note that the study area is based on the County of San Diego criteria of where the project will add 50 or more peak-hour trips in either direction to the existing roadway traffic. This means that intersections 5, 13, 16, 17, 18, 30, 31, 32, 33, 35, 36, 37 and roadway segments of Dulin Road from Old Highway 395 to Pankey Road, Old Highway 395 from Stewart Canyon Road to Tecalote Lane, Old Highway 395 from SR-76 to W. Lilac Road, Reche Road from Green Canyon Norte to Old Highway 395, Pankey Road from SR-76 to Dulin Road, Pala Mesa Drive from Wilt Rd/Sage Rd to Old Highway 395, SR-76 from Melrose Drive to S. Mission Road, and SR-76 from Couser Canyon Road to Pala Mission Road are not analyzed under existing + project conditions because the project will add less than 50 peak-hour trips in either direction to these intersections and roadway segments. However, these aforementioned

intersections and segments are analyzed under cumulative conditions.

The LOS calculated for the study intersections, roadway segments, state route segments, and freeway segments are shown in **Tables 14, 15, 16a, 16b, and 17**, respectively. Horse Ranch Creek Road may be constructed in phases; therefore, the minimum number of lanes required with only Campus Park traffic was analyzed and shown in Table 15.

Figure 18a: Existing + Project Roadway Conditions

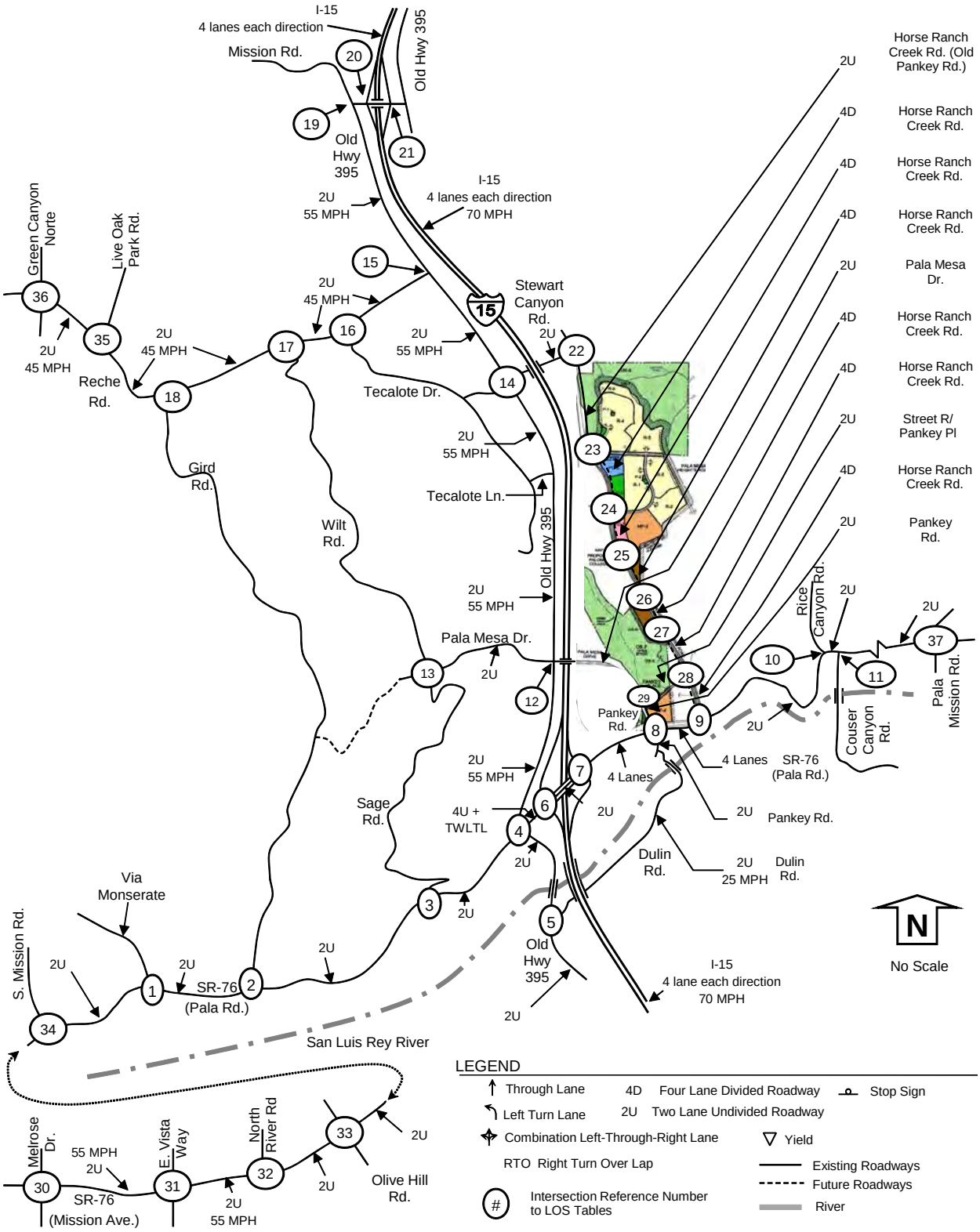


Figure 18b: Existing + Project Roadway Conditions

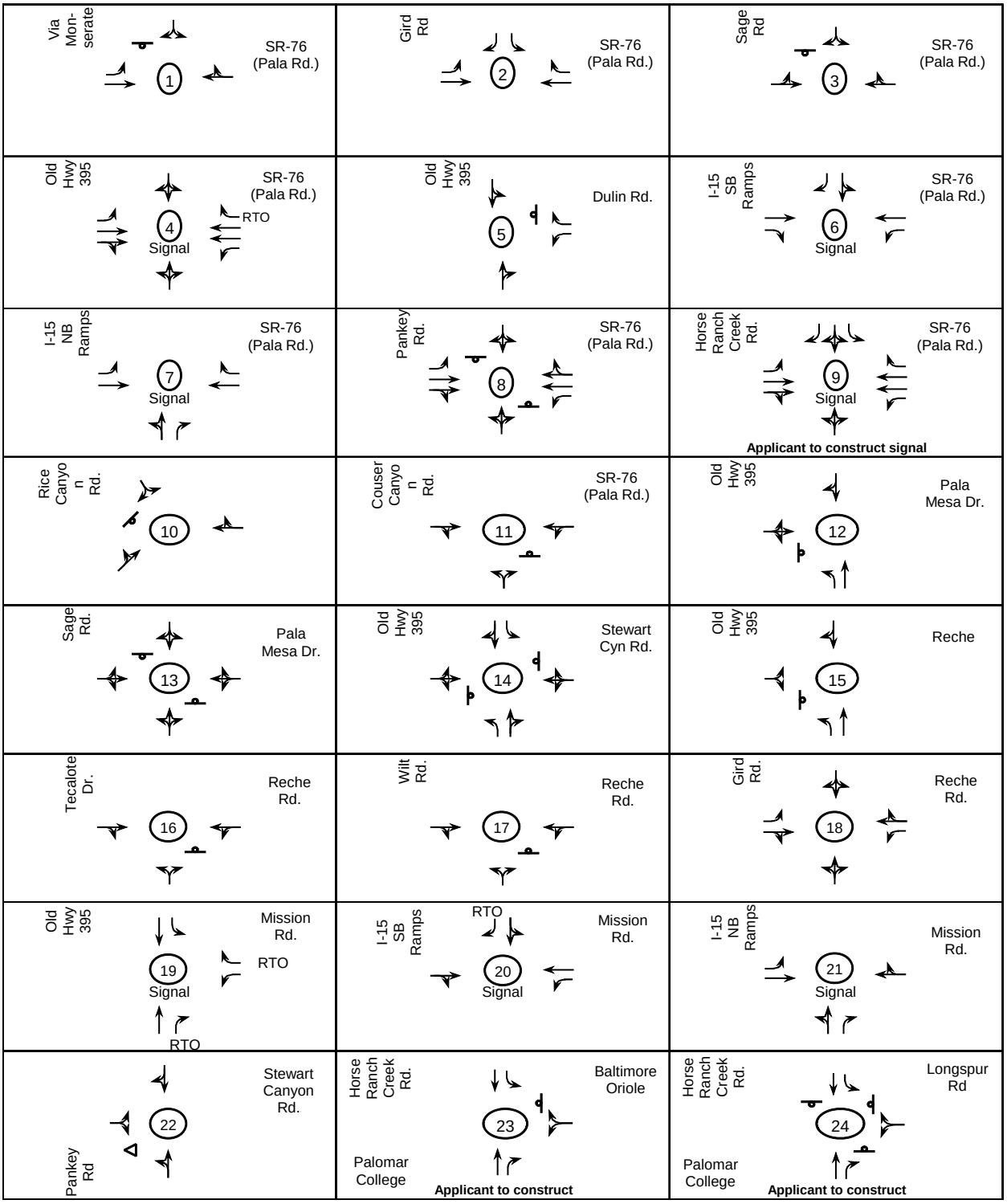


Figure 18c: Existing + Project Roadway Conditions

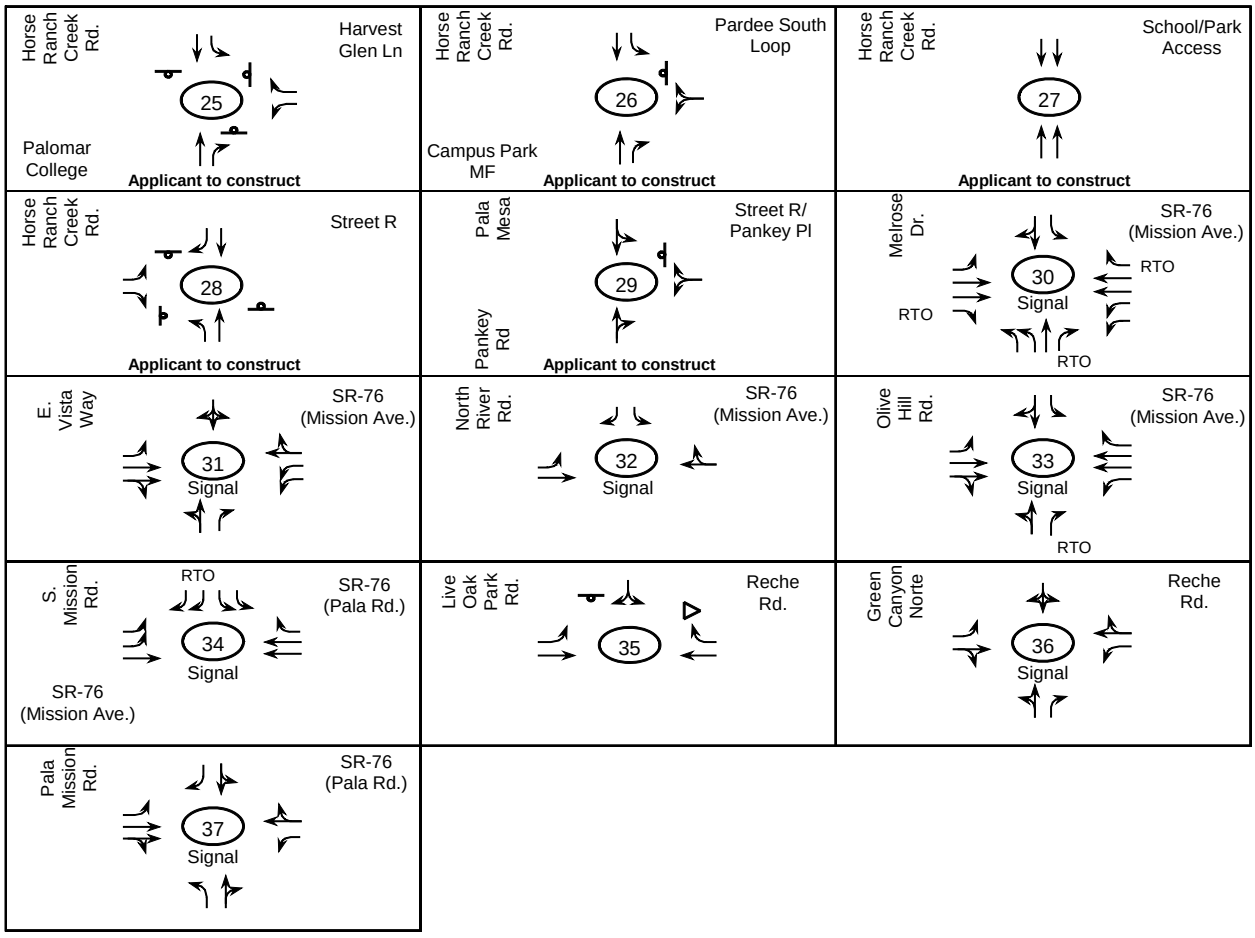


Figure 19a: Existing + Project Volumes (30% internal capture rate)

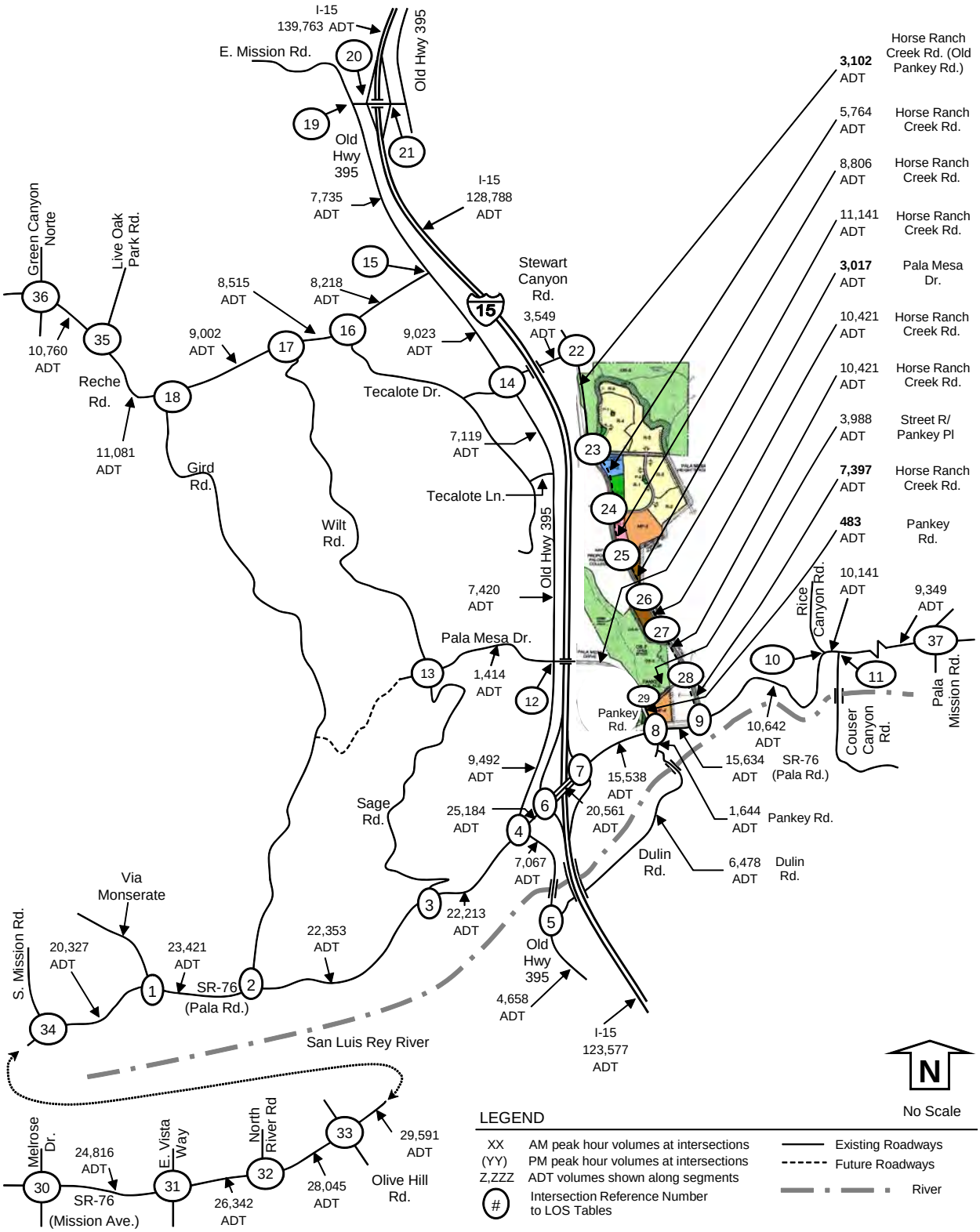


Figure 19b: Existing + Project Volumes (30% internal capture rate)

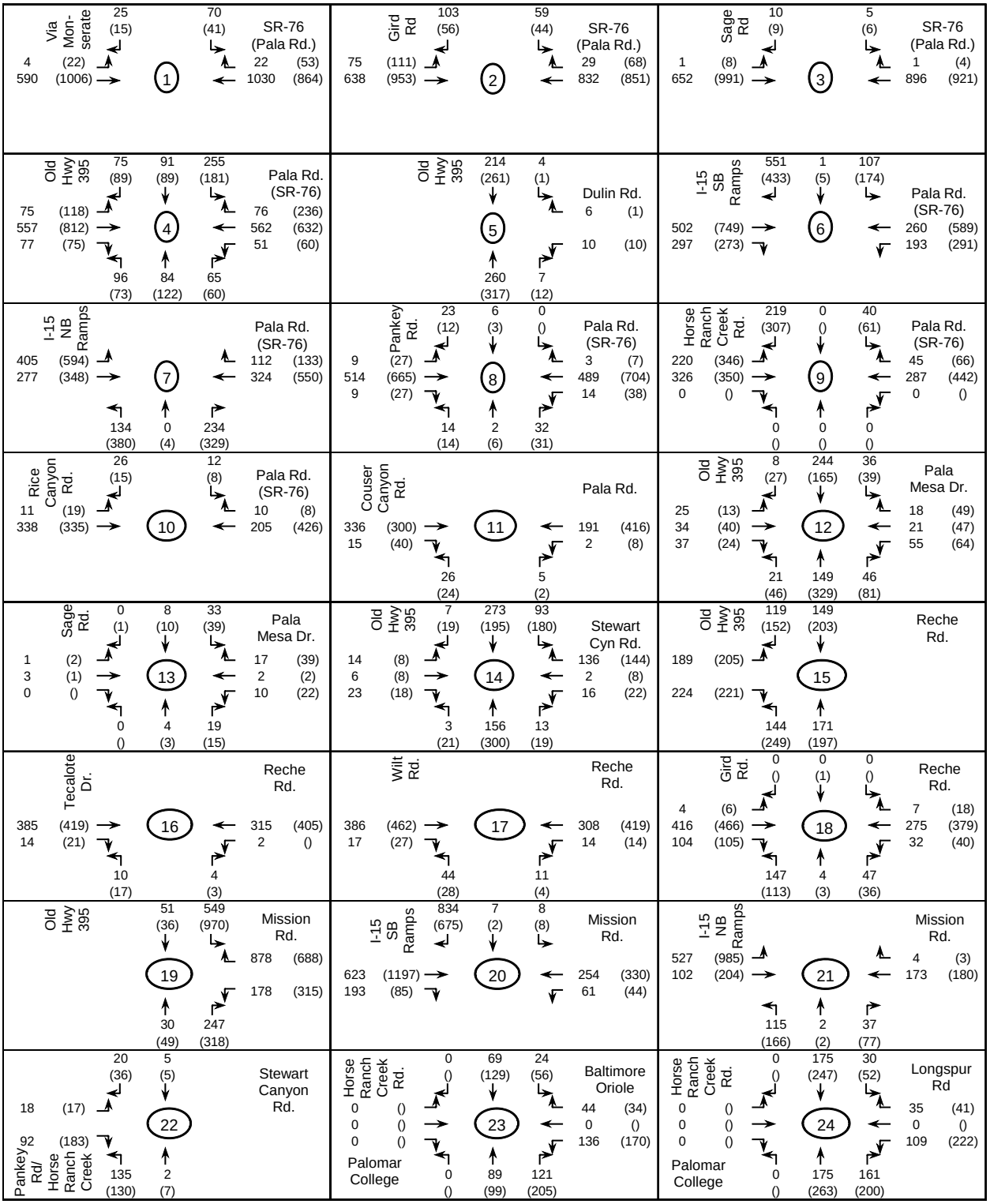


Figure 19c: Existing + Project Volumes (30% internal capture rate)

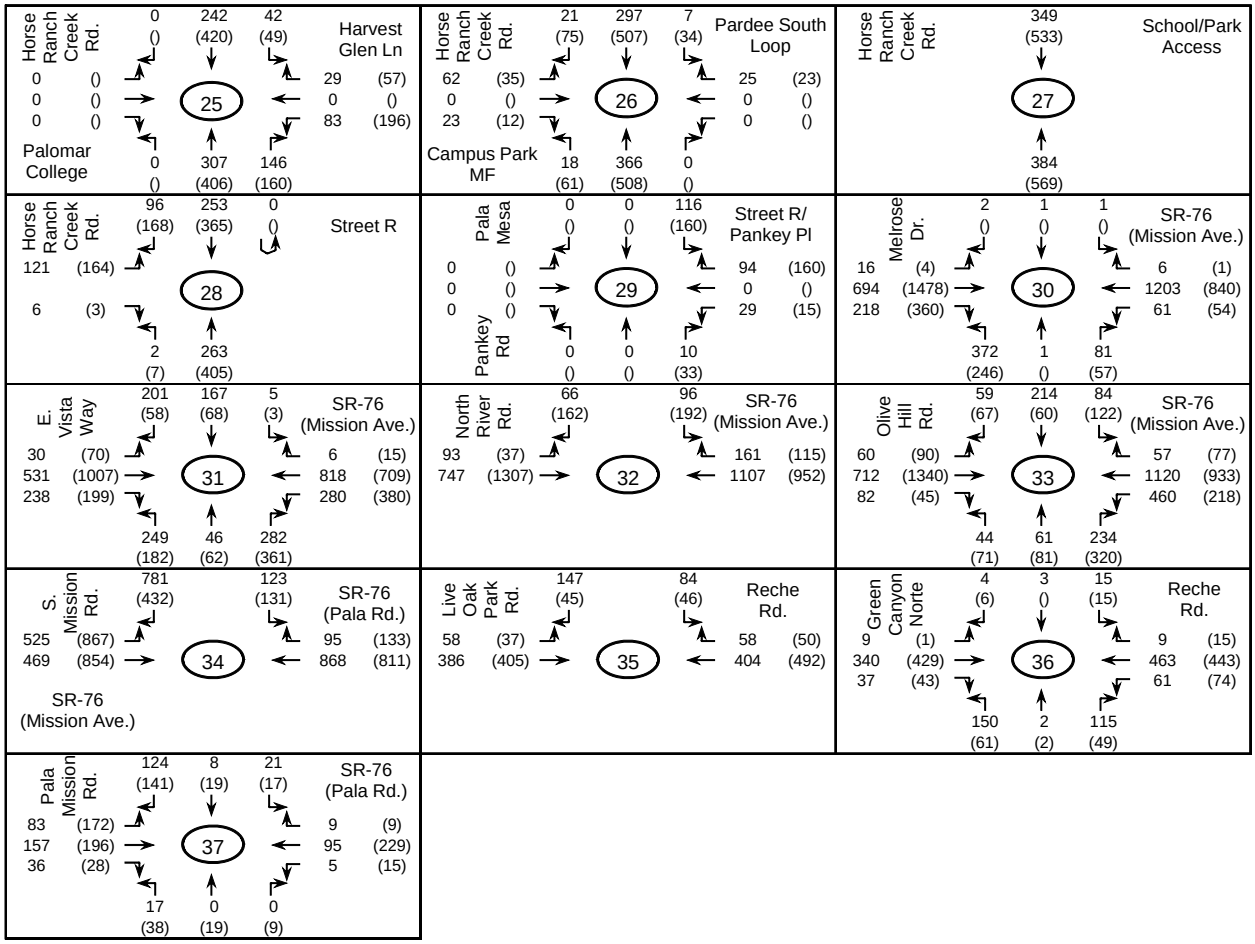


TABLE 14: EXISTING + PROJECT INTERSECTION LEVEL OF SERVICE (PRIOR TO MITIGATION)

Intersection & (Analysis)[1]	Move-ment	Peak Hour	Existing		Existing + Project				County	CMP
			Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	CM Vol[5]	Sig[6]	Sig[7]
1) SR-76 (Pala Rd) at	SB LR	AM	86.1	**F**	118.7	**F**	NA	0	No	NA
Via Monserate (U)	SB LR	PM	91.4	**F**	138.0	**F**	NA	0	No	NA
	All	AM	5.0	A	6.5	A	1.5	NA	NA	No
	All	PM	2.9	A	4.0	A	1.1	NA	NA	No
2) SR-76 (Pala Rd) at	All	AM	12.9	B	13.6	B	0.7	NA	No	No
Gird Rd (S)	All	PM	12.6	B	13.6	B	1.0	NA	No	No
3) SR-76 (Pala Rd) at	SB LR	AM	22.6	C	24.9	C	NA	0	No	NA
Sage Rd (U)	SB LR	PM	33.0	D	39.8	**E**	NA	0	No	NA
	All	AM	0.2	A	0.3	A	0.1	NA	NA	No
	All	PM	0.4	A	0.5	A	0.1	NA	NA	No
4) SR-76 (Pala Rd) at	All	AM	29.7	C	33.9	C	4.2	NA	No	No
Old Hwy 395 (S)	All	PM	30.2	C	36.3	C	6.1	NA	No	No
6) SR-76 (Pala Rd) at	All	AM	27.5	C	29.1	C	1.6	NA	No	No
I-15 SB Ramps (S)	All	PM	28.4	C	28.9	C	0.5	NA	No	No
7) SR-76 (Pala Rd) at	All	AM	22.4	C	28.6	C	6.2	NA	No	No
I-15 NB Ramps (S)	All	PM	46.7	D	63.7	**E**	17.0	NA	**Yes**	**Yes**
8) SR-76 (Pala Rd) at	NB LTR	AM	12.2	B	15.0	B	NA	29	No	No
Pankey Road (U)	NB LTR	PM	14.6	B	26.2	D	NA	36	No	No
	SB LTR	AM	0.0	A	13.1	B	NA	29	No	No
	SB LTR	PM	0.0	A	17.8	C	NA	15	No	No
9) SR-76 (Pala Rd) at	All	AM	DNE	NA	16.1	B	NA	NA	No	No
Horse Ranch Creek Rd (S)	All	PM	DNE	NA	20.3	C	NA	NA	No	No
10) SR-76 (Pala Rd) at	SB LR	AM	10.5	B	10.8	B	0.3	5	No	No
Rice Canyon Road (U)	SB LR	PM	12.4	B	13.1	B	0.7	5	No	No
11) SR-76 (Pala Rd) at	NB LR	AM	11.4	B	12.6	B	1.2	15	No	No
Couser Canyon Road (U)	NB LR	PM	13.5	B	15.5	C	2.0	13	No	No
12) Old Highway 395 at	EB LTR	AM	11.0	B	14.2	B	NA	34	No	No
Pala Mesa Dr (U)	EB LTR	PM	11.1	B	18.2	C	NA	40	No	No
East leg completed	WB LTR	AM	DNE	NA	17.5	C	NA	94	No	No
with project	WB LTR	PM	DNE	NA	24.3	C	NA	160	No	No
14) Old Highway 395 at	WB LTR	AM	10.8	B	11.3	B	NA	131	No	No
Stewart Canyon Road (U)	WB LTR	PM	11.9	B	16.7	C	NA	126	No	No
15) Old Highway 395 at	EB LR	AM	18.4	C	39.5	**E**	NA	20	**Yes**	NA
Reche Road (U)	EB LR	PM	35.9	**E**	219.2	**F**	NA	45	**Yes**	NA
	All	AM	10.6	B	17.6	B	7.0	NA	NA	No
	All	PM	17.6	B	77.9	**F**	60.3	NA	NA	**Yes**
19) Mission Road at	SB L	AM	12.2	B	12.8	B	0.6	NA	No	No
Old Highway 395 (S)	SB L	PM	27.3	C	40.7	D	13.4	NA	No	No
20) Mission Road at	SB LTR	AM	20.6	C	34.8	D	14.2	NA	No	No
I-15 SB Ramps (S)	SB LTR	PM	19.3	B	36.6	D	17.3	NA	No	No
21) Mission Road at	All	AM	17.2	B	19.0	B	1.8	NA	No	No
I-15 NB Ramps (S)	All	PM	37.5	D	49.1	D	11.6	NA	No	No
22) Stewart Canyon Rd at	EB LR	AM	8.7	A	9.3	A	NA	88	No	No
HRCR/Pankey Road (U)	EB LR	PM	8.7	A	9.6	A	NA	180	No	No
23) Horse Ranch Crk Rd at	WB LR	AM	DNE	NA	10.9	B	NA	No	No	No
Baltimore Oriole (U)	WB LR	PM	DNE	NA	13.3	B	NA	No	No	No
24) Horse Ranch Crk Rd at	All-Way	AM	DNE	NA	8.7	A	NA	No	No	No
Longspur Rd (U)	All-Way	PM	DNE	NA	11.9	B	NA	No	No	No
25) Horse Ranch Crk Rd at	All-Way	AM	DNE	NA	10.1	B	NA	No	No	No
Harvest Glen Ln (U)	All-Way	PM	DNE	NA	20.8	C	NA	No	No	No
26) Horse Ranch Crk Rd at	WB LR	AM	DNE	NA	10.7	B	NA	No	No	No
Pardee South Loop (U)	WB LR	PM	DNE	NA	11.9	B	NA	No	No	No
27) Horse Ranch Crk Rd at	WB LR	AM	DNE	NA	0.0	A	NA	No	No	No
School/Park Access (U)	WB LR	PM	DNE	NA	0.0	A	NA	No	No	No
28) Horse Ranch Crk Rd	All-Way	AM	DNE	NA	10.1	B	NA	No	No	No
at Street R (U)	All-Way	PM	DNE	NA	16.1	C	NA	No	No	No
29) Pankey/Pala Mesa Dr	WB LR	AM	DNE	NA	9.4	A	NA	No	No	No
at Street R (U)	WB LR	PM	DNE	NA	9.5	A	NA	No	No	No
34) SR-76 (Mission Ave) at	All	AM	18.9	B	19.4	B	0.5	NA	No	No
S. Mission Rd (S)	All	PM	21.5	C	22.1	C	0.6	NA	No	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized 2) Delay - HCM Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) CM Vol: Critical Movement Volume used to show project volumes on the critical movement. 6) County Sig: is the project have a calculated impact based on the critical volume (Yes or No). 7) CMP Sig: Congention Mangement Program significant impact based on CMP criteria (Yes or No). DNE: Does Not Exist. NA: Not Applicable

TABLE 15: EXISTING + PROJECT SEGMENT ADT VOLUMES AND LEVEL OF SERVICE (PRIOR TO MITIGATION)

Segment	Sept 2005 Circulation Element Class.	Existing					Project	Existing + Project					County	CMP
		Daily Volume	# of Lanes	LOS E Capacity	V/C	LOS	Daily Volume	Daily Volume	LOS E Capacity	V/C	LOS	Change in V/C	Sig Impact?	Sig Impact?
Old Highway 395														
East Mission Road to Reche Road	Collector	5,155	2	16,200	0.318	C	2,580	7,735	16,200	0.477	D	0.159	No	No
Reche Road to Stewart Canyon Road	Collector	5,646	2	16,200	0.349	C	3,377	9,023	16,200	0.557	D	0.208	No	No
Stewart Canyon Road to Tecalote Lane	Collector	6,405	2	16,200	0.395	C	714	7,119	16,200	0.439	D	0.044	No	No
Tecalote Lane to Pala Mesa Drive	Collector	6,603	2	16,200	0.408	C	817	7,420	16,200	0.458	D	0.050	No	No
Pala Mesa Drive to SR-76 (Pala Road)	Collector	8,302	2	16,200	0.512	D	1,190	9,492	16,200	0.586	D	0.073	No	No
Stewart Canyon Road														
Old Hwy 395 to Horse Ranch Creek Rd	Collector	590	2	16,200	0.036	A	2,959	3,549	16,200	0.219	B	0.183	No	No
Pankey Road														
Street R/Pankey Place to SR-76 (Pala Rd)	Collector	NA	(2)	0	NA	NA	483	483	16,200	0.03	A	NA	No	No
SR-76 (Pala Road) to Shearer Crossing	Light Collector	936	2	16,200	0.058	A	708	1,644	16,200	0.10	A	0.044	No	No
Horse Ranch Creek Road														
Stewart Canyon Rd to Baltimore Oriole (#23)	Light Collector	40	(2)	16,200	0.002	A	3,062	3,102	16,200	0.19	B	0.154	No	No
Baltimore Oriole (#23) to Longspur Rd (#24)	(Boulevard 4.2A)	NA	(4)	NA	NA	NA	5,764	5,764	27,000	0.21	Un	0.213	No	No
Longspur Rd (#24) to Harvest Glen Ln (#25)	(Boulevard 4.2A)	NA	(4)	NA	NA	NA	8,806	8,806	27,000	0.33	Un	0.326	No	No
Harvest Glen Ln (#25) to Intersection (#26)	(Boulevard 4.2A)	NA	(4)	NA	NA	NA	11,141	11,141	27,000	0.41	Un	0.413	No	No
Intersection (#26) to Park/School (#27)	(Boulevard 4.2A)	NA	(4)	NA	NA	NA	10,421	10,421	27,000	0.39	Un	0.386	No	No
Park/Sch (#27) to Street R/Pankey Pl (#28)	(Boulevard 4.2A)	NA	(4)	NA	NA	NA	10,421	10,421	27,000	0.39	Un	0.386	No	No
Street R/Pankey Pl (#28) to SR-76 (Pala Rd)	(Boulevard 4.2A)	NA	(4)	NA	NA	NA	7,397	7,397	27,000	0.27	Un	0.274	No	No
Pala Mesa Drive														
Old Highway 395 to Street R/Pankey Pl	(Light Collector)	0	(2)	16,200	0.000	A	3,017	3,017	16,200	0.19	B	0.186	No	No
Street R/Pankey Place														
Pala Mesa/Pankey to Horse Ranch Creek Rd	(Light Collector)	0	(2)	16,200	0.000	A	3,988	3,988	16,200	0.25	B	0.246	No	No

Notes: (proposed classification) or (proposed # of lanes). LOS: Level of Service. V/C: Volume to Capacity ratio. CMP: Congestion Managmement Program (SANDAG).
Daily volumes is a 24 hour volume. LOS for proposed classification is identified as "Un" as under capacity and "Ov" for over capacity. NA: Not Applicable.

TABLE 16A: EXISTING + PROJECT STATE ROUTE VOLUMES AND LEVEL OF SERVICE AM (PRIOR TO MITIGATION, BUT WITH GRANITE IMPROVEMENT)

State Route 76	Lanes in	AM (Eastbound)					Project				Change In		AM (Westbound)					Project				Change In	
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig
Mission Rd to Via Monserate	1	745	EB	950	0.78	D	47	792	0.83	D	0.05	No	901	WB	950	0.95	**E**	46	947	1.00	E	0.05	**Yes**
Via Monserate to Gird Rd	1	808	EB	950	0.85	D	49	857	0.90	**E**	0.05	**Yes**	895	WB	950	0.94	**E**	51	946	1.00	**E**	0.05	**Yes**
Gird Rd to Sage Rd	1	740	EB	950	0.78	D	49	789	0.83	D	0.05	No	542	WB	950	0.57	C	51	593	0.62	C	0.05	No
Sage Rd to Old Hwy 395	1	760	EB	950	0.80	D	49	809	0.85	D	0.05	No	534	WB	950	0.56	C	51	585	0.62	C	0.05	No
Old Hwy 395 to I-15 SB Ramps	2	1507	EB	2050	0.74	D	24	1531	0.75	D	0.01	No	665	WB	2028	0.33	B	18	683	0.34	B	0.01	No
I-15 SB Ramps to I-15 NB Ramps	1	844	EB	950	0.89	**E**	83	927	0.98	**E**	0.09	**Yes**	539	WB	950	0.57	C	157	696	0.73	D	0.17	No
I-15 NB Ramps to Pankey Rd	2	559	EB	3100	0.18	A	201	760	0.25	A	0.06	No	606	WB	3030	0.20	A	228	834	0.28	A	0.08	No
Pankey Rd to Horse Ranch Creek Rd	2	589	EB	1806	0.33	B	220	809	0.45	B	0.12	No	540	WB	2028	0.27	A	219	759	0.37	B	0.11	No
Horse Ranch Creek Rd to Rice Cyn	1	588	EB	950	0.62	C	40	628	0.66	C	0.04	No	539	WB	950	0.57	C	45	584	0.61	C	0.05	No
Rice Cyn to Couser Cyn	1	589	EB	950	0.62	C	38	627	0.66	C	0.04	No	540	WB	950	0.57	C	40	580	0.61	C	0.04	No

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

TABLE 16B: EXISTING + PROJECT STATE ROUTE VOLUMES AND LEVEL OF SERVICE PM (PRIOR TO MITIGATION, BUT WITH GRANITE IMPROVEMENT)

State Route 76	Lanes in	PM (Eastbound)					Project				Change In		PM (Westbound)					Project				Change In	
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig
Mission Rd to Via Monserate	1	1064	EB	950	1.12	**F**	73	1137	1.20	**F**	0.08	**Yes**	618	WB	950	0.65	C	64	682	0.72	D	0.07	No
Via Monserate to Gird Rd	1	1077	EB	950	1.13	**F**	79	1156	1.22	**F**	0.08	**Yes**	786	WB	950	0.83	D	67	853	0.90	**E**	0.07	**Yes**
Gird Rd to Sage Rd	1	645	EB	950	0.68	C	79	724	0.76	D	0.08	No	742	WB	950	0.78	D	67	809	0.85	D	0.07	No
Sage Rd to Old Hwy 395	1	638	EB	950	0.67	C	79	717	0.75	D	0.08	No	768	WB	950	0.81	D	67	835	0.88	**E**	0.07	**Yes**
Old Hwy 395 to I-15 SB Ramps	2	816	EB	2050	0.40	B	32	848	0.41	B	0.02	No	1258	WB	2028	0.62	C	33	1291	0.64	C	0.02	No
I-15 SB Ramps to I-15 NB Ramps	1	718	EB	950	0.76	D	135	853	0.90	**E**	0.14	**Yes**	1153	WB	950	1.21	**F**	199	1352	1.42	**F**	0.21	**Yes**
I-15 NB Ramps to Pankey Rd	2	696	EB	3100	0.22	A	343	1039	0.34	B	0.11	No	820	WB	3030	0.27	A	282	1102	0.36	B	0.09	No
Pankey Rd to Horse Ranch Creek Rd	2	631	EB	1806	0.35	B	346	977	0.54	C	0.19	No	897	WB	2028	0.44	B	307	1204	0.59	C	0.15	No
Horse Ranch Creek Rd to Rice Cyn	1	631	EB	950	0.66	C	61	692	0.73	D	0.06	No	897	WB	950	0.94	**E**	66	963	1.01	**F**	0.07	Yes
Rice Cyn to Couser Cyn	1	526	EB	950	0.55	C	55	581	0.61	C	0.06	No	930	WB	950	0.98	**E**	61	991	1.04	**F**	0.06	Yes

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

TABLE 17: EXISTING + PROJECT FREEWAY VOLUMES AND LEVEL OF SERVICE (PRIOR TO MITIGATION)

Freeway	I-15				I-15				I-15			
Segment	Rainbow Valley Blvd to Mission Rd				Mission Rd to SR-76 (Pala Rd)				SR-76 to Escondido Hwy (Old 395)			
Existing (Year 2006)												
ADT	136,000				127,000				120,000			
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Number of Lanes	4	4	4	4	4	4	4	4	4	4	4	4
Capacity (1)	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400
K Factor (2)	0.0619	0.0619	0.0738	0.0738	0.0619	0.0619	0.0738	0.0738	0.059	0.059	0.0723	0.0723
D Factor (3)	0.1653	0.8347	0.6398	0.3602	0.1653	0.8347	0.6398	0.3602	0.1989	0.8011	0.6955	0.3045
Truck Factor (4)	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.8977	0.8977	0.8977	0.8977
Peak Hour Volume	1,515	7,650	6,991	3,936	1,415	7,143	6,528	3,675	1,569	6,318	6,722	2,943
Volume to Capacity	0.161	0.814	0.744	0.419	0.150	0.760	0.694	0.391	0.167	0.672	0.715	0.313
LOS	A	D	C	A	A	C	C	A	A	C	C	A
Project Pk Hr Vol	156	118	167	221	71	59	83	103	118	139	208	166
Existing + Project												
Peak Hour Volume	1,671	7,768	7,158	4,157	1,486	7,202	6,611	3,778	1,687	6,457	6,930	3,109
Volume to Capacity	0.178	0.826	0.761	0.442	0.158	0.766	0.703	0.402	0.179	0.687	0.737	0.331
LOS	A	D	C	B	A	C	C	A	A	C	C	A
Increase in V/C	0.017	0.013	0.018	0.024	0.008	0.006	0.009	0.011	0.013	0.015	0.022	0.018
Direct Impact?	No	No	No	No	No	No	No	No	No	No	No	No
CMP Impact?	No	No	No	No	No	No	No	No	No	No	No	No

Notes: (1) Capacity of 2,350 passenger cars per hour per lane (pcphpl) from Caltrans' Guide for the Preparation of Traffic Impact Studies, Dec 2002. (2) Latest K factor from Caltrans (based on 2005 data), which is the percentage of Annual Average Daily Traffic (AADT) in both directions. (3) Latest D factor from Caltrans (based on 2005 data), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2000 data). CMP: Congestion Management Program impact.

Under existing + project conditions, direct impacts are calculated based on the County of San Diego significance criteria where the project will add 50 or more directional peak hour trips at the following eight locations (two intersections and six state routes):

Intersections

1) Intersection of SR-76 (Pala Rd) / I-15 NB Ramp (LOS E PM)
2) Intersection of Old Highway 395 / Reche Road (LOS E AM & LOS F PM)

State Routes

1) State Route 76 (Pala Rd) from S. Mission Road to Via Monserate (LOS E AM & LOS F PM)
2) State Route 76 from Via Monserate to Gird Rd (LOS E AM & LOS F PM)
3) State Route 76 from Sage Rd to Old Hwy 395 (LOS E PM)
4) State Route 76 from I-15 SB Ramp to I-15 NB Ramp (LOS E AM & LOS F PM)
5) State Route 76 from Horse Ranch Creek Rd to Rice Canyon Rd (LOS F PM)
6) State Route 76 from Rice Canyon Rd to Couser Canyon Rd (LOS F PM)

Existing + project LOS calculations are included in **Appendix K.**

3.5 Cumulative Conditions

This section will document the cumulative conditions.

3.5.1 Cumulative Projects

Cumulative projects were accounted for through a general plan summary approach where SANDAG provided a Series 10 Year 2030 model that included all cumulative projects that are consistent with the current land use plan, all inconsistent cumulative projects that will require a variance such as a General Plan Amendment, and all Casino projects that have been submitted to the County. This cumulative traffic model approach is currently being utilized by the County for the General Plan Update.

In addition to the aforementioned approach, a review of San Diego County records, ninety five (95) nearby cumulative projects were identified, which are anticipated to generate traffic and use identical roadways as the project. The criteria for identifying the cumulative projects are included below with a list of the cumulative projects included in **Table 18.**

1) Geographic boundary based on proximity to study roadways and to roadways that will feed toward or away from our project location (i.e. radius around project site and buffer around adjacent transportation corridors). The buffer was applied to SR-76 from Olive Hill Road to just past Cole Grade Road and to Old Highway 395 from approximately the Rainbow area down to the Bonsall area.
2) Reviewed available cumulative projects within this study area. Withdrawn or denied cumulative projects were removed.
3) These cumulative projects are considered to be cumulatively considerable from a CEQA stand point as they represent major projects contributing to the traffic study boundary. This includes TPMs within the study boundary to provide a comprehensive approach.
4) Casino projects that are not listed in the DPLU/DPW cumulative traffic binders were researched and included.
5) Non daily traffic generators were excluded (i.e. cell sites).
6) Projects requiring GPAs (i.e. Meadowood, Campus Park West, Warner Ranch, Pala Mesa Resort) and Casino projects were confirmed as being included in the Cumulative Map model by reviewing the list of inconsistent and Casino projects included in **Appendix L**.

TABLE 18: CUMULATIVE PROJECTS

#	Project Reference	Project Name	Location	Area (acres)	Proposed Improvements
1	TM 5354 GPA 04-02	Meadowood	Just north of SR 76, 0.25 mile east of I-15	389.8	Mixed-use development, including: 355 single family dwelling units, 503 multi-family dwelling units, an Elementary School and a small neighborhood park.

#	Project Reference	Project Name	Location	Area (acres)	Proposed Improvements
2	TM 5424, S 05-014, SPA 05-001 GPA 05-003 REZ 05-005	Campus Park West	Northeast quadrant of I-15 and SR 76	118.5	Mixed-use development including approximately 395 MFR units, 110,000 s.f. General Commercial, 10 acres Highway Commercial and 300,000 s.f. Office Professional. Located mostly north of SR-76 with a portion south of SR-76.
3	TM 5187 RPL[11] SPA 99-005 MUP 99-020 REZ 99-020 MUP/REZ 04-024	Pala Mesa Highlands	West of Old Highway 395 between Pala Mesa Drive and Via Belamonte	84.6	Maximum of 130 SFR. Density 1.6 DU/acre. Lot sizes vary from 5,500 s.f. to 23,500 s.f., two parks totaling 4.3 acres, trails, 36.5 acres of open space. SPA to allow clustering.
4	TM 4729 RPL[3] TE	Tedder TM	South side of Pala Mesa Drive, west of I-15 and east of Daisy Lane	29.5	Split lot into 13 SFR lots, ranging in size from 1.0 to 6.43 acres net.
5	TPM 20830	Hukari subdivision	Northern terminus of Mountain View Road and West Lilac Road on west side of Bonsall	30	Minor residential subdivision with road improvements. 4 SFR lots plus one remainder lot (3.4 to 7.7 net acres each).
6	TM 5532 S 07-012	Fallbrook Ranch	East of Old Highway 395 and Sterling View Drive (at Mission Road), Fallbrook		11 SFR lots
7	MUP 03-127	Los Willows Inn and Spa	532 Stewart Canyon Road		Add additional units to a Bed and Breakfast
8	TPM 20411	Reeve TPM	2987 Sumac Road, Fallbrook	8.8	Minor residential subdivision. 3 SFR lots (2-acres minimum).
9	TPM 20491	Evans TPM	West side of Sage Road between Sumac Road and Pala Road, Fallbrook	4.10	Minor subdivision into 2 residential/ agricultural parcels (2.00 and 2.10 acres). Private septic system.
10	TPM 20841	Bridge Pac West I TPM	3321 Sage Road, Fallbrook	15.90	Minor residential subdivision. 4 SFR lots plus one remainder lot (2.04, 2.08, 2.12, 2.14 and remainder 7.08 net acres each).

#	Project Reference	Project Name	Location	Area (acres)	Proposed Improvements
11	SPA 03-005 R 00-000 MUP 00-000 P 74-120W[1] P 74-121M[10]; MUP 03-006; MUP 04-005	Pala Mesa Resort	2001 Old Highway 395 at Tecalote Lane, north of SR 76 and immediately west of I-15, Fallbrook	181.2	Specific Plan Amendment for modification and construction of new recreation and resort-related facilities. Addition of 186 resort rooms and wedding facility. Expansion of resort by 6 acres.
12	TPM 20431 S 98-006	Lung TPM	Citrus Drive and Calle Canonero, Fallbrook	10.7	Minor residential subdivision. 2 SFR lots (6.7 and 4.0 acres)
13	TPM 20440	Chipman TPM	East side of Citrus Lane between Peony Drive and Dos Ninos, Fallbrook	13.54	Minor residential subdivision. 4 SFR lots plus one remainder lot, ranging from 2.13 to 2.85 net acres each and remainder 4.00 net acres. Septic system.
14	TPM 20484	Bierman TPM	4065 Calle Canonero, Fallbrook, south of Vern Drive and west of Lorita Lane	9.91	Minor residential subdivision. 4 SFR lots, ranging from 2.01 to 2.19 net acres each. Septic system.
15	S 04-026	Cooke Residence	3974 Citrus Drive between Wilt Road and Vern Drive	N/A	4,723 s.f. SFR
16	TPM 20581	Treister TPM	Donut-shaped parcel surrounding 401 Ranger Road, Fallbrook	21.81	Minor residential subdivision. 4 SFR lots plus one remainder lot.
17	TPM 20793 03-02-068	Mission Ridge Road TPM	235 Mission Ridge Road east of I-15 off Mission Road, Fallbrook	19.55	Minor residential subdivision. 4 SFR lots.
18	TM 5413	Rancho Alegre TPM	West side of Ranger Road approx. 0.4 mile north of Reche Road	70	Part of 116-acre subdivision (33 lots). This project consists of 20 lots in the eastern portion of property and proposes a different street alignment, grading, and lot arrangement.
19	TPM 20853	Rarick TPM	3261 Reche Road, Fallbrook	8.77	Minor residential subdivision. 4 SFR lots (ranging from 2.02 to 2.25 acres each). Septic system.
20	TPM 20936	Fernandez TPM	3838 Foxglove Lane, Fallbrook	10.4	Minor residential subdivision. 4 SFR lots. Minimum lot size 2 acres. 2 existing SFR on site.

#	Project Reference	Project Name	Location	Area (acres)	Proposed Improvements
21	TPM 20944	Rabuchin TPM	4065 Calle Canonero, Fallbrook	9.91	Subdivision of 2 lots into 4 SFR lots. Existing SFR on site
22	NA	Pala Casino	Pala Road and Pala Mission Road	TBD	187,300 s.f. casino, hotel, theater.
23	MUP 87-021 RPL[2] REZ P87-001 RPL[2]	Rosemary's Mountain/ Palomar Aggregates Quarry	North side of SR 76, 1.25 miles east of I-15	96.4	Aggregate rock quarry and processing plants for concrete and asphalt. Approximately 22 million tons of rock would be mined over 20 years. Realignment of SR 76 from Project site west to I-15. Reclamation Plan to designate lower portion of site as water storage reservoir after completion of mining activities.
24	TPM 20542	Patapoff Minor Residential Subdivision	Southern end of Rainbow Hills Road	59.1	Subdivide property into four parcels of 4.3 acres, 4.2 acres, 9.6 acres, 8 acres, and a 33-acre parcel
25	TM 5321	Prominence at Pala	Pala Del Norte Road. 1/3 mile north of SR-76 and approximately two miles west of the Pala Indian Reservation	346.6	Subdivide the property into 30 SFR and two open space lots ranging in size from 4 to 96 acres
26	NA	Palomar College N. Education Center District Master Plan	East side of I-15 between Pankey Road and Pala Mesa Heights Drive	85	New Community College campus to serve approximately 12,000 students, to include classroom and administration buildings, parking, open space, athletic fields, and off-site road, water and sewer improvements.
27	NA	Caltrans Realign-ment of SR 76	From I-15 to west of Rice Canyon Road	NA	Realignment and widening of roadway, improvements to northbound I-15 on- and off-ramp.
28	NA	San Luis Rey Municipal Water District (SL RMWD) Water, Wastewater & Recycled Water Master Plan	SLRMWD service area and vicinity, north and south of SR-76 between I-15 and Pala Temecula Road	Over 3,000	Exploration of pipeline and water storage options.

#	Project Reference	Project Name	Location	Area (acres)	Proposed Improvements
29	TM 5231		Canonita Drive and Old Hwy 395, Fallbrook	30.48	39 condo units
30	TM 5276		Aqueduct Road and Via Urner, Bonsall	12.8	8 SFR lots
31	TM 5346		Old Hwy 395 and Via Urner, Bonsall	38.4	9 SFR lots
32	TM 5410	Marquart Ranch	West Lilac Road and Mesa Lilac Road, Bonsall	44.2	9 SFR lots. Includes improvements to West Lilac Road and Mesa Lilac Road, and drainage improvements.
33	TM 5449	Fallbrook Oaks	Reche Road and Ranger Road, Fallbrook	26	19 SFR lots
34	TM 5469	Ridge Creek Drive	Ridge Creek east of Live Oak Park Road and Ridge Drive, Fallbrook	30.4	14 SFR lots
35	TM 5499	Club Estates	SR 76 east of Cole Grade Road at Pauma Valley Drive	48.3	31 SFR lots
36	TM 5540; MUP 07-007	Oak Tree Ranch TM	15560 Spring Valley Road	9.95	24 SFR
37	TM 5545	Turnbull TM	32979 Temet Drive	22.9	17 lots
38	TPM 20913	Wexler TPM		2.54	4 lots
39	TM 5223 MUP 00-030	Shadow Run Ranch	Shadow Run Ranch, SR-76 and Adams Drive, Pala	263	54 SFR lots and 2 open space lots. MUP filed concurrently for Planned Residential Development that would cluster residential development on minimum 2-acre lots.
40	TPM 20896	Diana Acres	Adams Drive off SR-76, Pauma Valley		3 lots
41	TPM 20804	Hunter Subdivsion	15550 Adams Drive	7.5	3 lots
42	TPM 20538	Burge TPM	34487 Citracado Drive, Pala	12.58	4 lots plus remainder
43	MUP 99-001	Pauma Valley Packing Company	34188 Hampton Road	4.14	Packing and processing

#	Project Reference	Project Name	Location	Area (acres)	Proposed Improvements
44	TM 5223; MUP 00-030	Shadow Run Ranch/ Schoepe-Pauma TM	15040 Adams Drive	263.17	13 lots
45	TM 5508	Warner Ranch	Pala-Pauma	513	732 SFR lots, 168 condo units, community park, fire station lot
46	CASINO	Pauma Casino and Hotel	Approximately 11 miles east of I-15 along SR-76		400 room hotel and 171,000 s.f. casino
47	TPM 20451	De Jong/Pala Minor Subdivision	Canonita Drive between I-15 and Tecalote Drive	5.62	Minor residential subdivision. 3 SFR lots (1.03, 2.06 and 2.31 net acres each).
48	TPM 20800	Crossroads Investors Minor Subdivision	Ranger Road, Fallbrook	15.5	Minor residential subdivision. 4 SFR lots plus one remainder lot. Existing SFR and grove on site
49	TM 5217/5225/ 5227/5228 MUP 00-027	Chaffin/Red Mountain Ranch Sub-divisions	Rainbow Glen Road and Red Mountain Dam Road, Fallbrook	455.9	TM 5217: Residential development with 29 SFR lots (2.28 to 18.33 acres) and 2 biological open space zones. TM 5225: 55 acres divided into 6 SFR lots (8.1 to 13.9 acres). TM 5227: 44.5 acres divided into 4 SFR lots (8.08 to 13.71 acres each). TM 5228: 19.1 acres divided into 2 lots (8.4 and 10.7 acres).
50	TPM 20505	John Collins TPM	Margarita in Fallbrook	8.29	2 lots
51	TPM 21085	Brannon Trust TPM Remai	411 Yucca Road, Fallbrook		4+ lots
52	TPM 20976	Dien N Do TPM	405 Ranger Road		4+ lots
53	TPM 20373	Tim Rosa TPM	2973 Los Alisos Drive	13	4 lots plus remainder
54	TPM 20427	Leising TPM	1246 Via Vista	10.83	4 lots
55	TPM 20434	Atteberry TPM	1166 Sierra Bonita	9	3 lots
56	TPM 20980	Johnson TPM	3035 Trelawney Lane		2 lots
57	TPM 20381	Chipman TPM	Camino Zasa, Fallbrook	24.5	4 lots plus remainder
58	TPM 21047	American Lotus Bhuddist Association TPM	Reche Road at Rabbit Hill, Fallbrook		4 lots plus remainder lot

#	Project Reference	Project Name	Location	Area (acres)	Proposed Improvements
59	TM 5547	Reche Road TM	3129 Reche Road, Bonsall	33.5	12 SFR lots
60	TM 5158; RPL3	Palisades Estates	3880 Dos Niños Road/Elevado Road	408.4	51 lots
61	TPM 19742	Dion TPM and time extension	3562 Canonita Drive	7.5	2 lots
62	TPM 20476	Patricia Daniels TPM	3609 Canonita Road, Fallbrook	13.2	4 lots plus remainder
63	TPM 20443	Cameron Subdivision	2644 Vista de Palomar, Fallbrook. North side of Vista de Palomar between Post Hill and Via Rancheros	11.31	Minor residential subdivision. 3 SFR lots (2.22, 2.44 and 6.37 acres each). Septic system.
64	TPM 20473	Tesla Gray TPM	East end of Vista de Palomar, and north end of Old Post Road, Fallbrook	28.91	Minor residential subdivision. 4 SFR lots plus one remainder lot. Future development of 5 SFR
65	TPM 20592	Aspel TPM	3107 Old Post Road, Fallbrook	7.32	Minor residential subdivision. 2 SFR lots (2.09 and 5.20 acres each).
66	TPM 20317	James Patapoff TPM	2639 Via Alicia, Fallbrook	16.8	Subdivision of 16.8 acres into 4 lots plus a remainder lot
67	TPM 20503	Yew Tree Spring Water Corporation	3573 Diego Estates Drive, Fallbrook	7.48	3 residential lots
68	TPM 20610	Haugh, Granger TPM	Fallbrook	12.94	4 lots
69	TPM 20614; RPL1	Brown, Lee & Karen, TPM	3850 Gird Road	6.46	3 lots
70	TPM 20648	Pepper Drive TPM	3926 Flowerwood Lane	1.39	4 residential lots
71	TM 4971	Surf Properties TM	3545 Vista Corona	46.89	15 lots
72	TM 4908	Brook Hills TM	4061 La Cañada Road, Fallbrook	96.71	35 lots

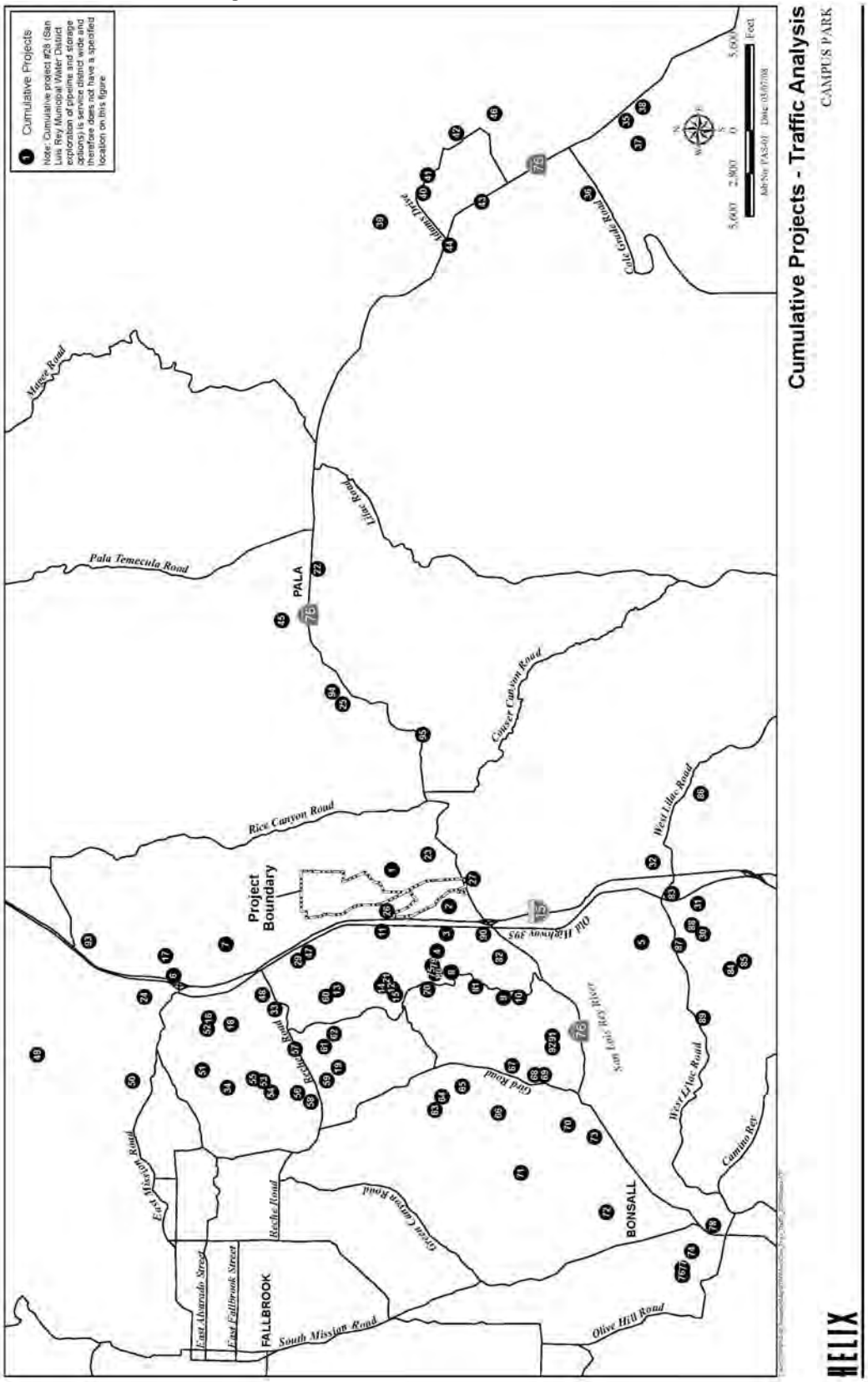
#	Project Reference	Project Name	Location	Area (acres)	Proposed Improvements
73	MUP 02-011	Latter-Day Saints/Via Monserate	Fallbrook	7.96	17,000 sq. ft. church and meeting rooms
74	TM 4976; RPL4	Leeds and Strausss TM	North side of Olive Hill Road, near intersection with SR-76, Bonsall	45.76	17 SFR lots – TM time extension until 09/13/2009
75	TM 5398	Murray Davidson	3956 Pala Mesa Road, Bonsall	4.28	7 lots
76	TPM 20173	Shamrock Partners TPM	Shamrock Road, Bonsall	10	3 lots
77	TPM 20851	Crook TPM	32179 Shamrock Road		5 lots
78	TPM 20729	Tabata Bonsall TPM RPL1	5546 Mission Road	33.75	4 lots
79	TPM 20874	Berezousky TPM (311 Same as one in original latch)	4040 Pala Mesa Drive, Fallbrook	3.11	Subdivision of 3.11 acre into 4 residential lots. Existing SFR on site
80	TPM 20932	Murray Davidson TPM	3956 Pala Mesa Road, Fallbrook		Subdivision of 1 lot into 4 SFR lots plus a remainder lot
81	TPM 21076	Sumac TPM	3111 Sumac Road		4 lots
82	S 03-024	Janikowski SFR	9686 Pala Road (SR 76), Fallbrook, on north side of SR 76	5.12	3,200 s.f. SFR
83	TPM 19827	Kratochvid TPM; expired map	Old Highway 395	12.3	4 lots
84	TPM 20319	Kohl TPM	7641 Mount Ararat Way, Bonsall	9.71	4 lots plus remainder
85	TPM 20541	Woodhead TPM	Mt. Ararat Way, Bonsall	12.54	4 lots plus remainder
86	TPM 20596	Rockefeller TPM	9590 Lilac Way, VC	5	2 lots
87	TPM 20763	McNulty TPM	32171 Dos Niñas	5.19	2 lots
88	TPM 20799	Stehly Caminito Quieto TPM	32009 Camto Quieto at West Lilac Road	11.69	4 lots

#	Project Reference	Project Name	Location	Area (acres)	Proposed Improvements
89	TPM 20845	Sanders TPM	West Lilac Road, 1.25 miles west of Old Highway 395		4 lots plus remainder lot
90	S 02-061	Pala Shopping Center	On Old Highway 395 just northwest of the intersection of I-15 and SR 76	3.88	Addition of 5 commercial buildings to an existing commercial site with grocery store.
91	TM 5489	Monserate TM	3624 Monserate Hill Road	24.6	7 SFR
92	TPM 21075	Dimitri, Diffendale, and Kirk TPM	Monserate Hill Road and Monserate Place		4 lots
93	TPM 20994	Madrigal TPM	1055 Rainbow Valley Boulevard near Old Hwy 395		3 lots
94	MUP 07-009	Singh Power Plant	4 miles NE of I-15 on Pala Del Norte Road, north of SR 76	8.5	Power Generation facility
95	37-AA-0032	Gregory Landfill	Approximately 3.5 miles east of I-15 on SR-76	1,770	Landfill site for solid waste

TM = Tentative Map; S = Site Plan; REZ = Rezone; MUP = Major Use Permit; TPM = Tentative Parcel Map; ZAP = Minor Use Permit; RPL = Replacement Map; MFR = multi-family residential; SFR = single-family residential
NA = Not available

The individual cumulative project locations are shown on **Figure 20**. The higher plot volumes from the SANDAG Series 10 Year 2030 cumulative map and Series 11 model were used for the analysis (volume comparison tables and plot volumes are included at the end of Appendix L). Manual adjustments were made to the traffic model output along Horse Ranch Creek Road, Pala Mesa Drive, and Pankey Place/Street R based on detailed driveway locations and residential connector streets for Meadowood and Palomar College instead of relying on the traffic models limited number of centroid connectors that can concentrate segment volumes. The combined cumulative project volumes are shown on **Figures 21a, 21b, and 21c**.

Figure 20: Cumulative Project Locations



Source: Helix

Figure 21a: Cumulative Project Volumes

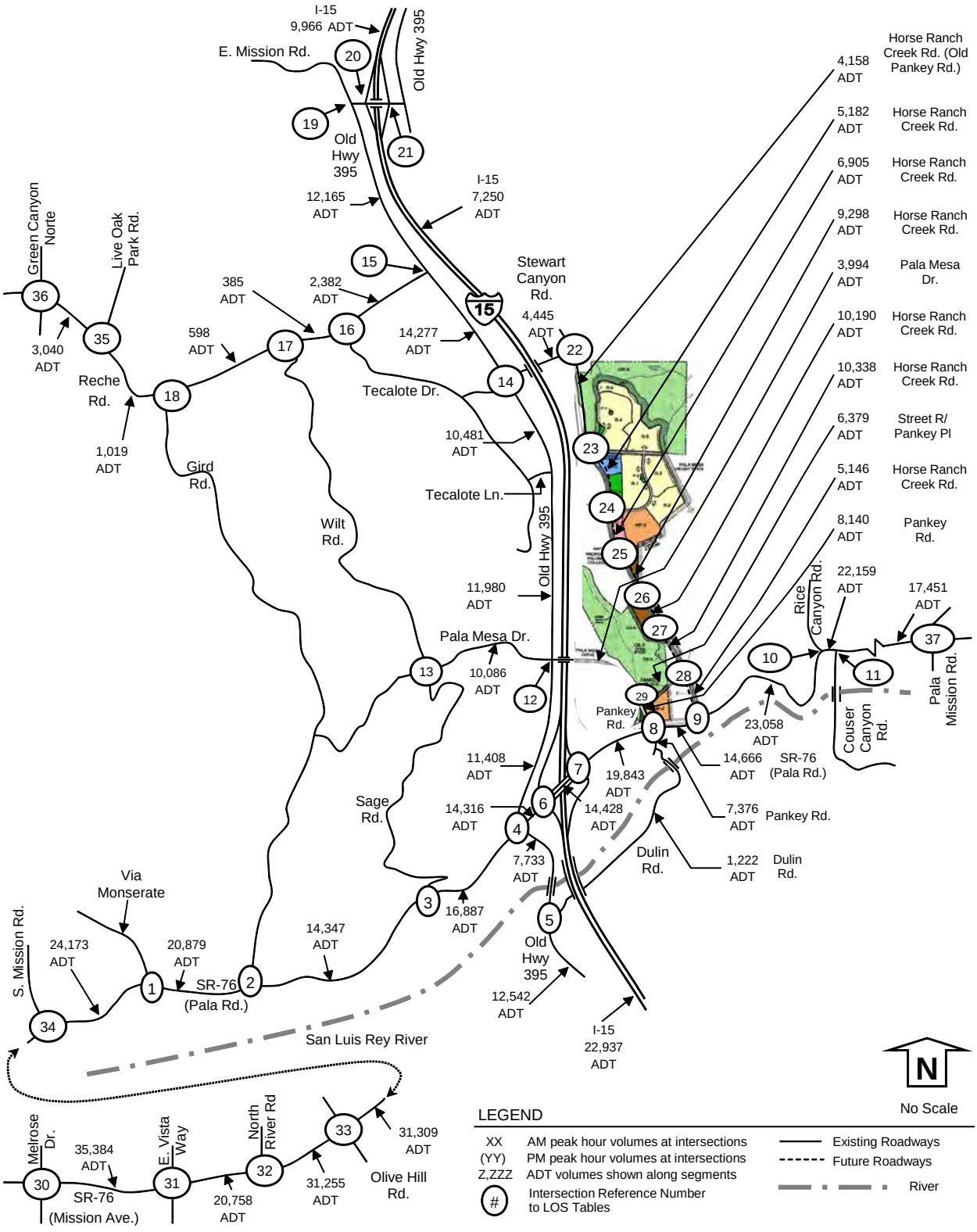


Figure 21b: Cumulative Project Volumes

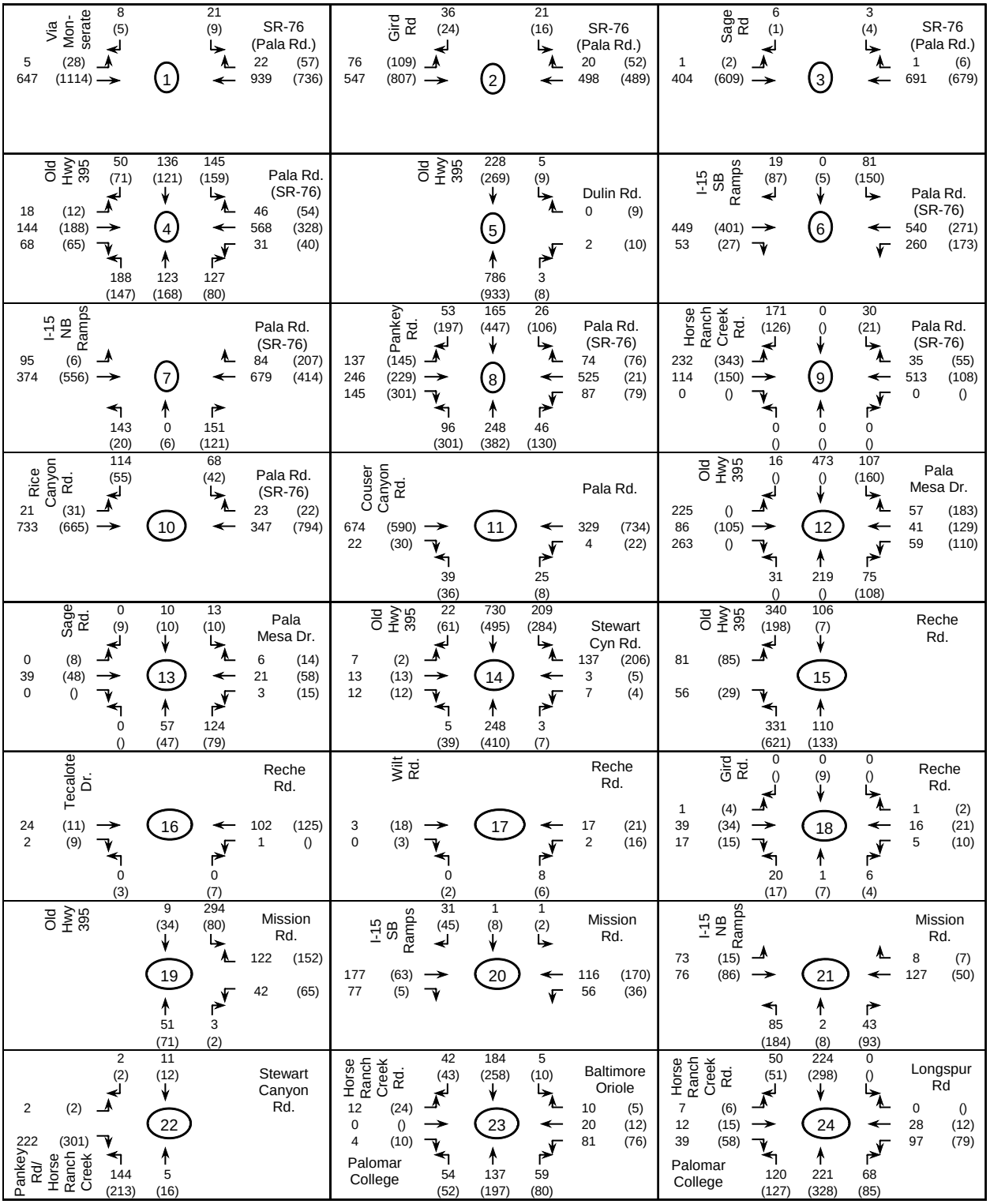
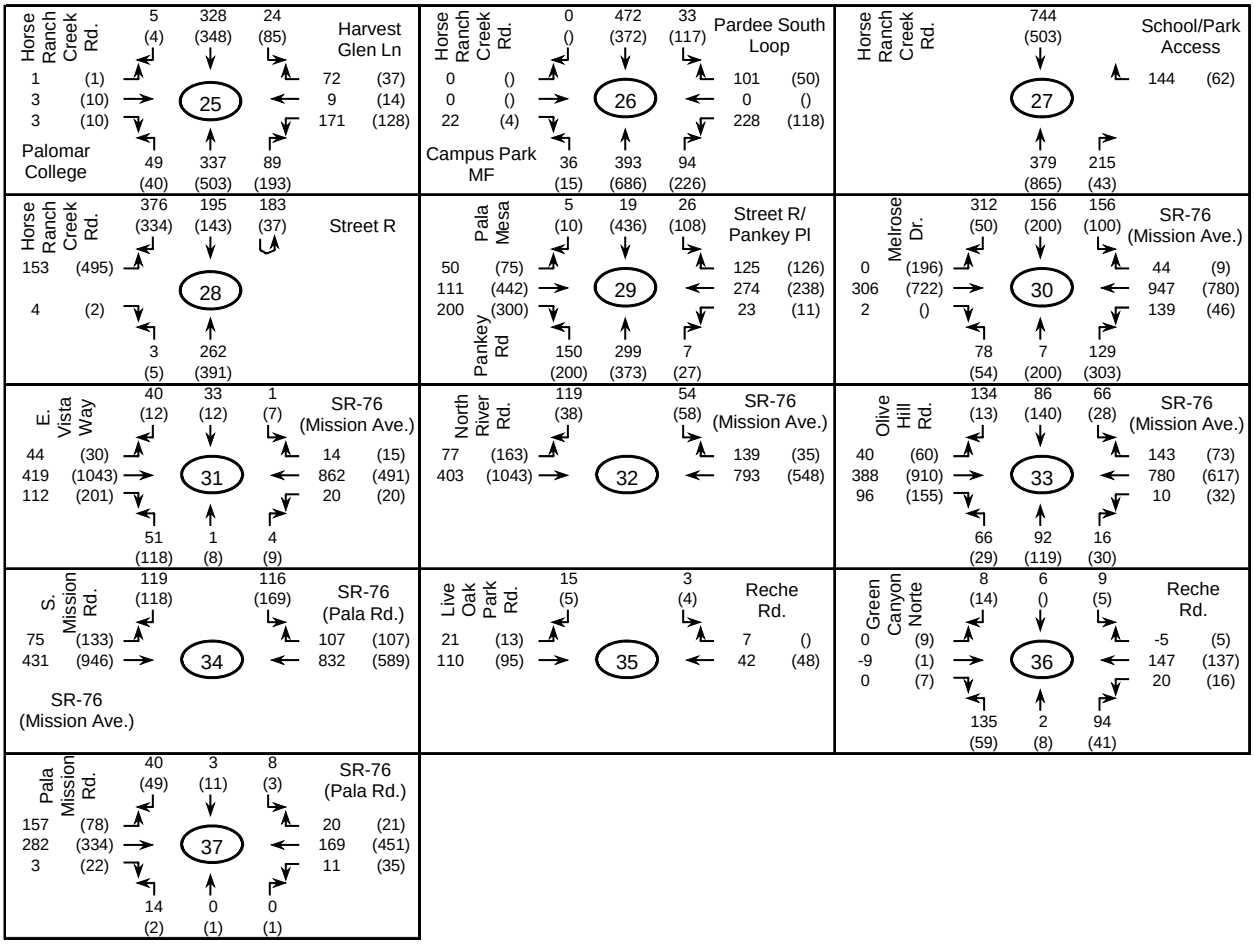


Figure 21c: Cumulative Project Volumes



3.5.2 Existing + Cumulative Conditions Analysis

The existing + cumulative traffic conditions were determined by adding the SANDAG traffic model cumulative traffic volumes onto the existing traffic. The previously described 95 cumulative projects are included in the SANDAG model.

Roadway improvements already under construction (widening of SR-76 from 2 to 4 lanes by the Granite Construction Company) or roadway improvements needed to achieve access to the project (Horse Ranch Creek Road, Pala Mesa Drive, Pankey Place and all associated internal intersections) were incorporated into the analysis. These configurations are shown in **Figures 22a, and 22b**. Other roadway improvements are planned by the Pala Tribe and Caltrans; however, these improvements were not incorporated into the analysis. Documents describing the planned improvements by other cumulative project applicants are included in **Appendix M**. The other cumulative project improvements not included in this analysis include (with a brief summary of the improvement):

1) Pala Tribe (various improvements along SR-76)
2) Palomar College (Horse Ranch Creek Road and other off-site)
3) Caltrans SR-76 Middle Project (widen SR-76 to 4 lanes from Melrose Drive to S. Mission Road)
4) Caltrans SR-76 East Project (widen SR-76 to 4 lanes from S. Mission Road to the easterly ramps at I-15, including the interchange).

Unknown improvements from other cumulative projects that will generate significant amounts of traffic are also not included. The other significant cumulative projects include (with cumulative project reference):

1) Meadowood (#1)
2) Campus Park West (#2)
3) Pala Mesa Resort (#11)
4) Palomar College (#26)
5) Warner Ranch (#45)
6) Pauma Tribe (#46)
7) Pala Shopping Center (#90)
8) Gregory Landfill (#95)

The reader should note that this is a conservative (i.e., assessed impacts are greater) cumulative analysis in that it includes all of the traffic projected as resulting from cumulative projects but does not assume the mitigation proposed by these other projects. In other words, the analysis is conservative because existing, rather than projected improved roadway conditions, provide the basis for analysis. The reader should also note that applications submitted to the County, and included within projected cumulative conditions, frequently assume higher densities (with higher associated traffic generation) than what is ultimately allowed following project approval.

The peak hour intersection volumes and daily traffic volumes for this scenario of existing + cumulative projects are shown in **Figures 23a, 23b, and 23c**. The LOS calculated for the intersections, roadway segments, state route segments, and freeway segments are shown in **Tables 19a, 19b, 20, 21, and 22**, respectively.

Figure 22a: Existing + Cumulative Planned Roadway Improvements

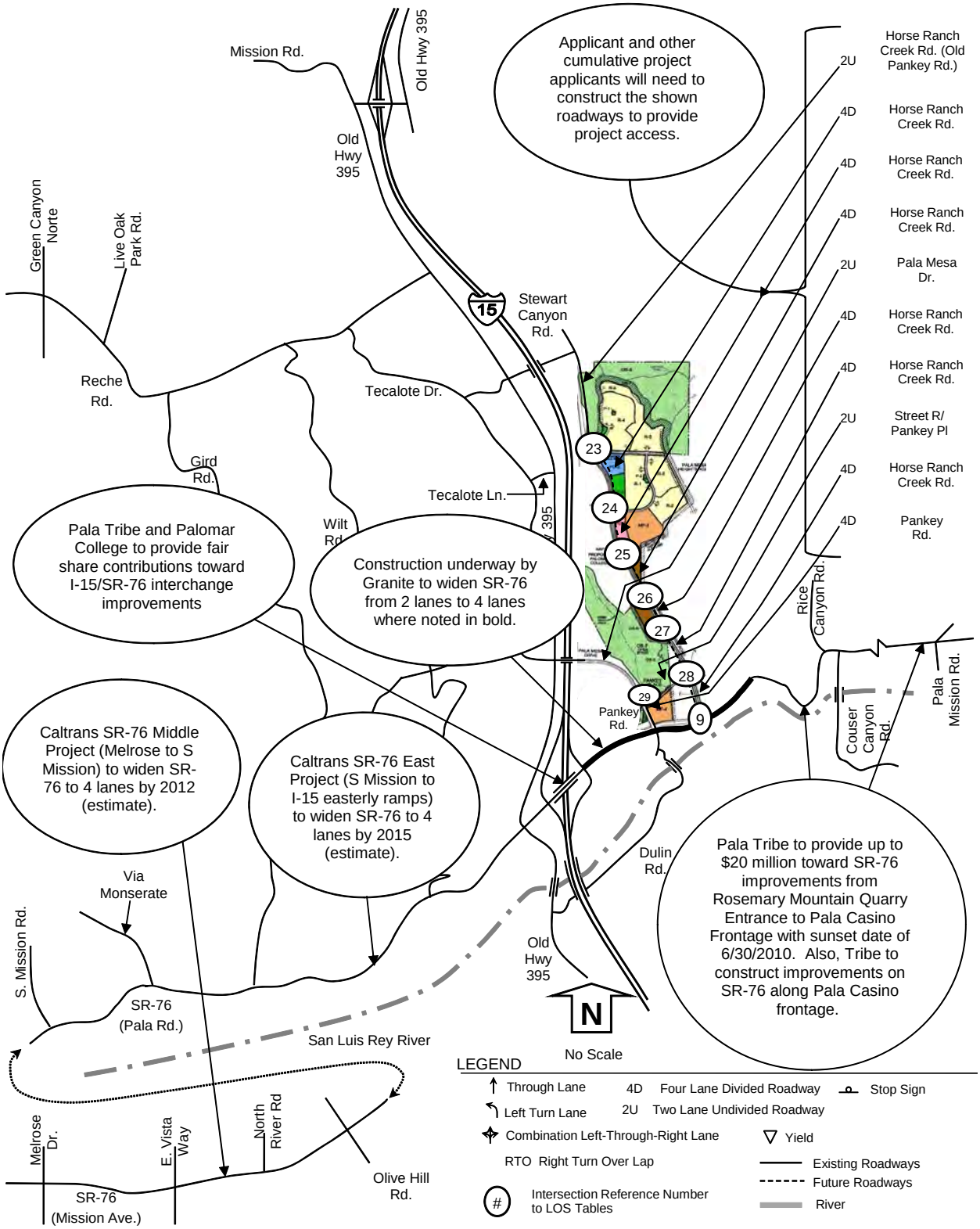


Figure 22b: Existing + Cumulative Planned Roadway Improvements

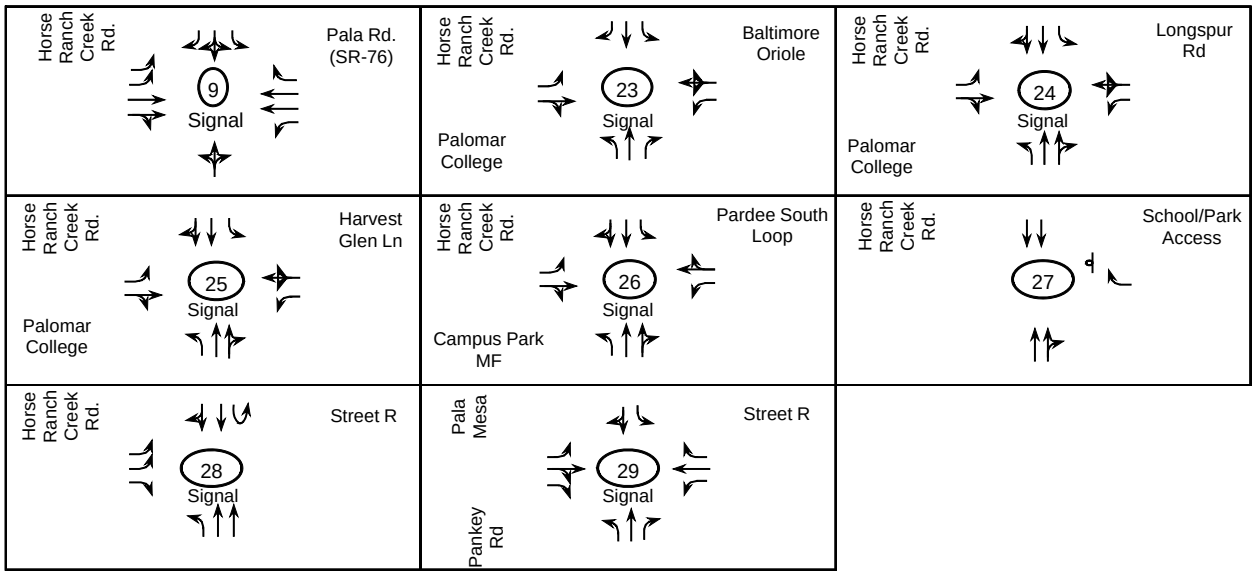


Figure 23a: Existing + Cumulative Volumes

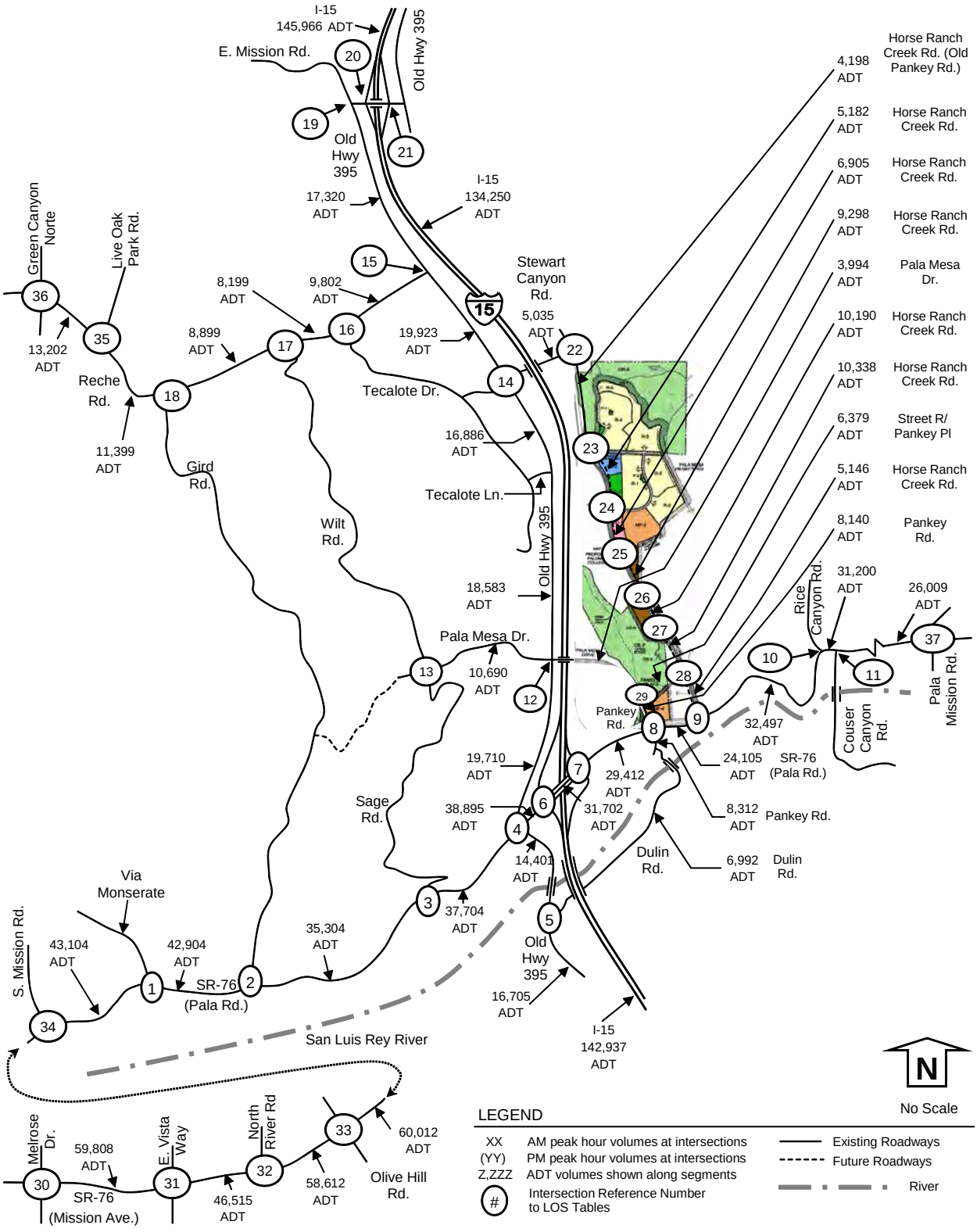


Figure 23b: Existing + Cumulative Volumes

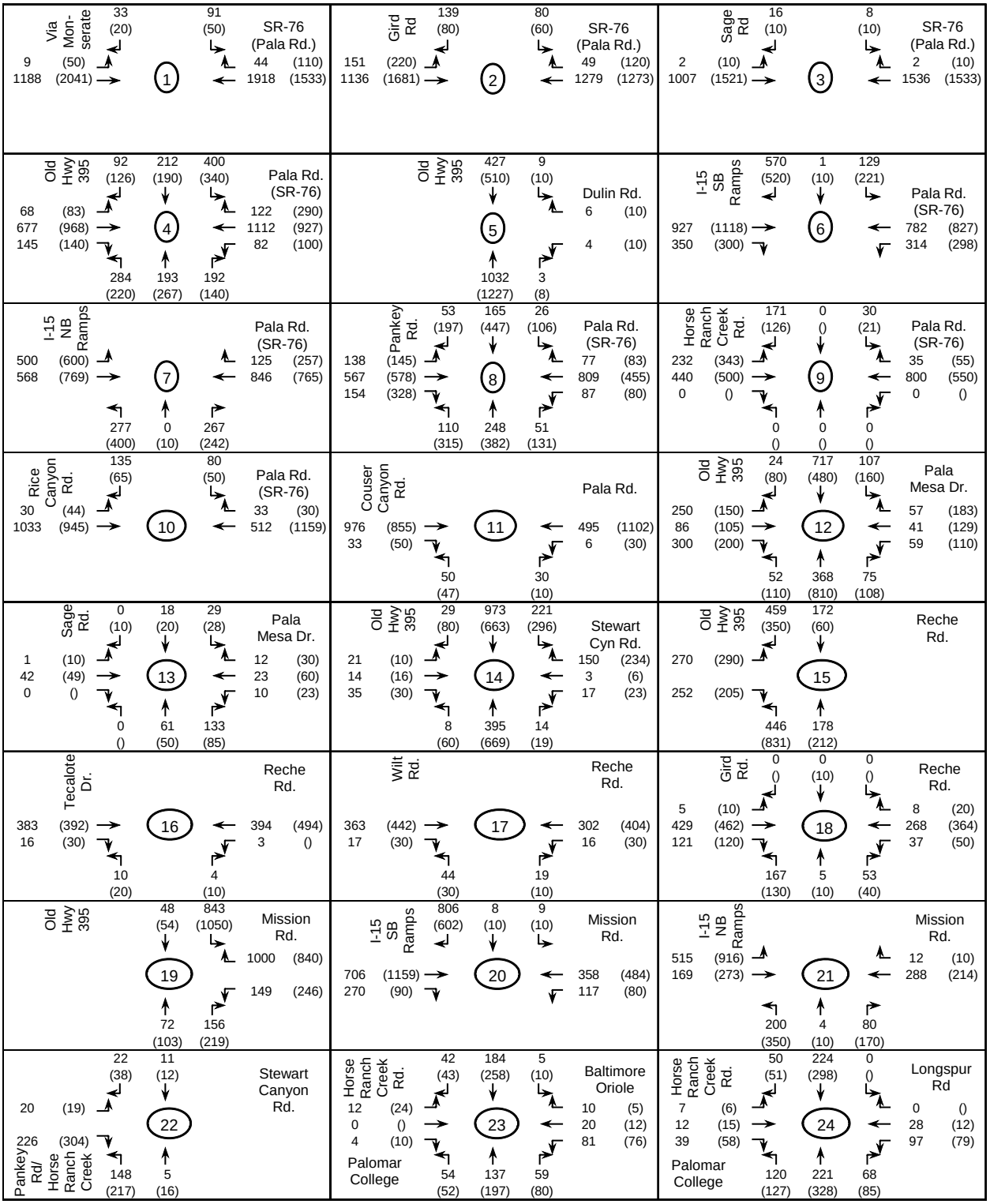


Figure 23c: Existing + Cumulative Volumes

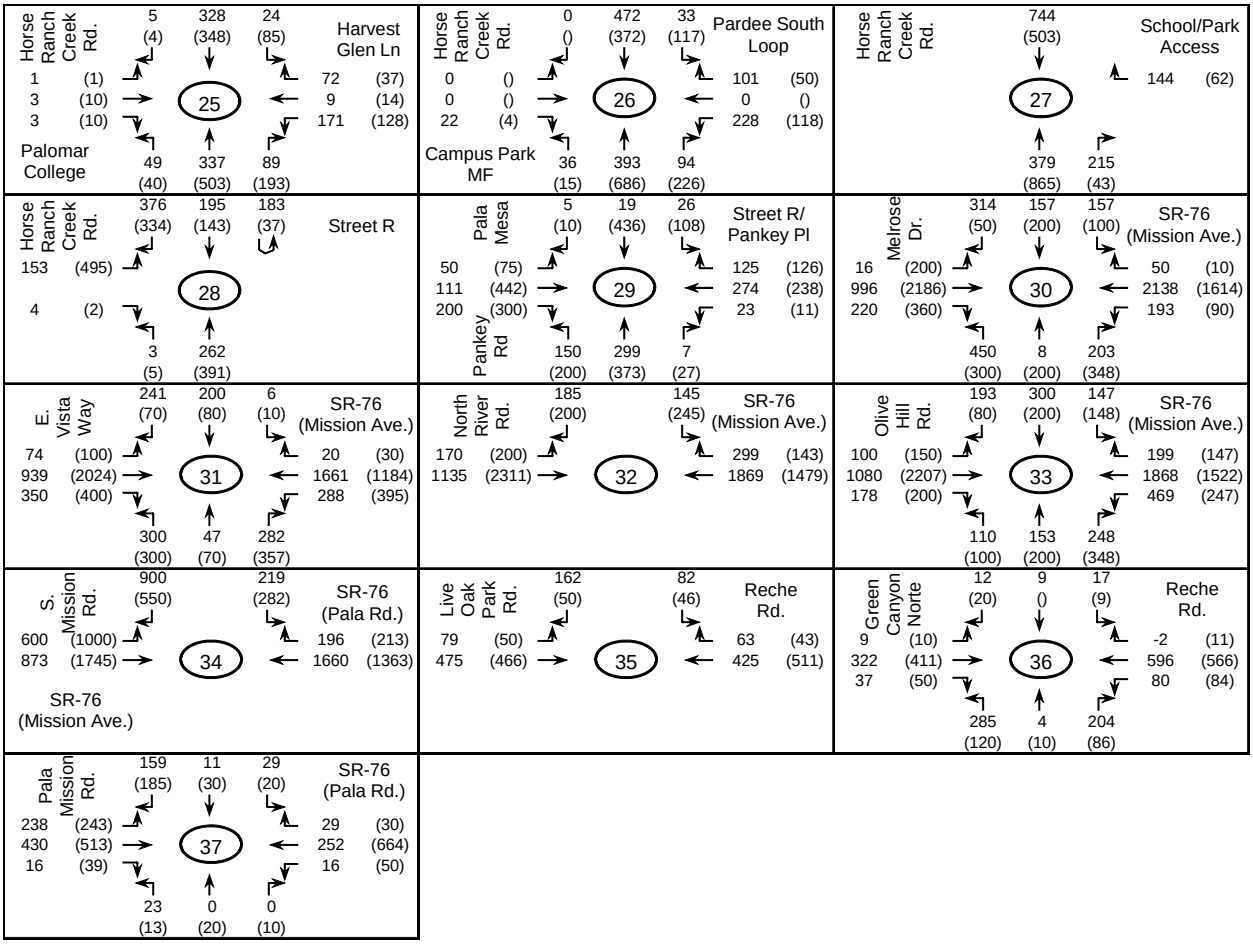


TABLE 19A: EXISTING + CUMULATIVE INTERSECTION LEVEL OF SERVICE (PRIOR TO MITIGATION)

Intersection and (Analysis)[1]	Movement	Peak Hour	Existing + Cumulative Delay[2]	Existing + Cumulative LOS[3]
1) SR-76 (Pala Rd) at	SB LR	AM	>500	**F**
Via Monserate (U)	SB LR	PM	>500	**F**
	All	AM	>500	**F**
	All	PM	>500	**F**
2) SR-76 (Pala Rd) at	All	AM	43.4	D
Gird Rd (S)	All	PM	97.7	**F**
3) SR-76 (Pala Rd) at	SB LR	AM	125.8	**F**
Sage Rd (U)	SB LR	PM	>500	**F**
	All	AM	1.2	A
	All	PM	3.5	A
4) SR-76 (Pala Rd) at	All	AM	246.9	**F**
Old Hwy 395 (S)	All	PM	232.4	**F**
5) Old Hwy 395 at	WB LR	AM	25.6	D
Dulin Rd (U)	WB LR	PM	40.6	**E**
6) SR-76 (Pala Rd) at	All	AM	88.9	**F**
I-15 SB Ramps (S)	All	PM	120.2	**F**
7) SR-76 (Pala Rd) at	All	AM	73.3	**E**
I-15 NB Ramps (S)	All	PM	107.9	**F**
8) SR-76 (Pala Rd) at	NB LTR	AM	>500	**F**
Pankey Road (U)	NB LTR	PM	>500	**F**
	SB LTR	AM	29.7	C
	SB LTR	PM	165.9	**F**
9) SR-76 (Pala Rd) at	All	AM	16.3	B
Horse Ranch Creek Rd (U)	All	PM	15.3	B
10) SR-76 (Pala Rd) at	SB LR	AM	154.3	**F**
Rice Canyon Road (U)	SB LR	PM	472.0	**F**
11) SR-76 (Pala Rd) at	NB LR	AM	55.0	**F**
Couser Canyon Road (U)	NB LR	PM	233.2	**F**
12) Old Highway 395 at	EB LTR	AM	>500	**F**
Pala Mesa Dr (U)	EB LTR	PM	>500	**F**
	WB LTR	AM	>500	**F**
	WB LTR	PM	>500	**F**
13) Pala Mesa Dr at	NB LTR	AM	9.9	A
Sage Road (U)	SB LTR	AM	11.3	B
	NB LTR	PM	10.0	B
	SB LTR	PM	11.3	B
14) Old Highway 395 at	WB LTR	AM	118.1	**F**
Stewart Canyon Road (U)	WB LTR	PM	>500	**F**
15) Old Highway 395 at	EB LR	AM	>500	**F**
Reche Road (U)	EB LR	PM	>500	**F**
	All	PM	>500	**F**
	All	PM	>500	**F**
16) Reche Road at	NB LR	AM	14.6	B
Tecalote Dr (U)	NB LR	PM	16.2	C
17) Reche Road at	NB LR	AM	14.8	B
Wilt Road (U)	NB LR	PM	18.2	C
18) Reche Road at	All	AM	15.7	B
Gird Road (S)	All	PM	15.0	B
19) Mission Road at	SB L	AM	45.1	D
Old Highway 395 (S)	SB L	PM	105.2	**F**
20) Mission Road at	SB LTR	AM	56.2	**E**
I-15 SB Ramps (S)	SB LTR	PM	41.6	D
21) Mission Road at	All	AM	26.5	C
I-15 NB Ramps (S)	All	PM	84.8	**F**

Continued On Next Page

TABLE 19B: EXISTING + CUMULATIVE INTERSECTION LEVEL OF SERVICE (PRIOR TO MITIGATION)

Intersection and (Analysis)[1]	Movement	Peak Hour	Existing + Cumulative Delay[2]	Existing + Cumulative LOS[3]
22) Stewart Canyon Rd at	EB LR	AM	9.9	A
HRCR/Pankey Road (U)	EB LR	PM	10.7	B
23) Horse Ranch Crk Rd at	WB LR	AM	13.7	B
Baltimore Oriole (U)	WB LR	PM	13.6	B
24) Horse Ranch Crk Rd at	All-Way	AM	17.4	B
Longspur Rd (U)	All-Way	PM	15.7	B
25) Horse Ranch Crk Rd at	All-Way	AM	15.5	B
Harvest Glen Ln (U)	All-Way	PM	15.9	B
26) Horse Ranch Crk Rd at	WB LR	AM	15.9	B
Pardee South Loop (U)	WB LR	PM	14.7	B
27) Horse Ranch Crk Rd at	WB LR	AM	11.8	B
School/Park Access (U)	WB LR	PM	12.7	B
28) Horse Ranch Crk Rd	All-Way	AM	6.8	A
at Street R (U)	All-Way	PM	8.5	A
29) Pankey/Pala Mesa Dr	WB LR	AM	23.2	C
at Street R (U)	WB LR	PM	34.8	C
30) SR-76 (Mission Ave) at	All	AM	128.2	**F**
Melrose Drive (S)	All	PM	78.0	**E**
31) SR-76 (Mission Ave) at	All	AM	276.0	**F**
E. Vista Way (S)	All	PM	254.9	**F**
32) SR-76 (Mission Ave) at	All	AM	308.6	**F**
North River Rd (S)	All	PM	256.5	**F**
33) SR-76 (Mission Ave) at	All	AM	232.6	**F**
Olive Hill Rd (S)	All	PM	176.8	**F**
34) SR-76 (Mission Ave) at	All	AM	39.6	D
S. Mission Rd (S)	All	PM	80.3	**F**
35) Reche Rd at	SB LR	AM	36.8	**E**
Live Oak Park Rd (U)	SB LR	PM	22.8	C
36) Reche Rd at	All	AM	26.5	C
Green Canyon Norte (S)	All	PM	24.3	C
37) SR-76 (Pala Rd.) at	All	AM	35.2	D
Pala Mission Rd. (S)	All	PM	40.4	D

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized 2) Delay - HCM Control Delay in seconds. 3) LOS: Level of Service.
DNE: Does Not Exist. NA: Not Applicable

TABLE 20: EXISTING + CUMULATIVE SEGMENT ADT VOLUMES AND LEVEL OF SERVICE (PRIOR TO MITIGATION)

Segment	Sept 2005 Circulation Element Class.	Existing # of Lanes [Proposed by Other Projects]	Existing + Cumulative			
			Daily Volume	LOS E Capacity	V/C	LOS
Dulin Road						
Old Highway 395 to Pankey Road	Light Collector	2	6,992	16,200	0.43	C
Old Highway 395						
East Mission Road to Reche Road	Collector	2	17,320	16,200	1.07	**F**
Reche Road to Stewart Canyon Road	Collector	2	19,923	16,200	1.23	**F**
Stewart Canyon Road to Tecalote Lane	Collector	2	16,886	16,200	1.04	**F**
Tecalote Lane to Pala Mesa Drive	Collector	2	18,583	16,200	1.15	**F**
Pala Mesa Drive to SR-76 (Pala Road)	Collector	2	19,710	16,200	1.22	**F**
SR-76 (Pala Road) to Dulin Road	Collector	2	14,401	16,200	0.89	**E**
Dulin Road to W. Lilac Road	Rural Collector	2	16,705	16,200	1.03	**F**
Reche Road						
Green Canyon Norte to Live Oak Park Road	Rural Collector	2	13,202	16,200	0.81	**E**
Live Oak Park Road to Gird Road	Rural Collector	2	11,399	16,200	0.70	**E**
Gird Road to Wilt Road	Rural Collector	2	8,899	16,200	0.55	D
Wilt Road to Tecalote Road	Rural Collector	2	8,199	16,200	0.51	D
Tecalote Drive to Old Highway 395	Rural Collector	2	9,802	16,200	0.61	D
Stewart Canyon Road						
Old Hwy 395 to Horse Ranch Creek Rd	Collector	2	5,731	16,200	0.35	C
Pankey Road						
Street R/Pankey Place to SR-76 (Pala Rd)	(Collector)	[Pappas 4 lanes]	8,326	34,200	0.24	A
SR-76 (Pala Road) to Shearer Crossing	Light Collector	2	7,175	16,200	0.44	D
Horse Ranch Creek Road						
Stewart Canyon Rd to Baltimore Oriole (#23)	Light Collector	2	4,831	16,200	0.30	C
Baltimore Oriole (#23) to Longspur Rd (#24)	(Boulevard 4.2A)	[PPP 4 lanes]	5,436	27,000	0.20	Un
Longspur Rd (#24) to Harvest Glen Ln (#25)	(Boulevard 4.2A)	[PPP 4 lanes]	6,705	27,000	0.25	Un
Harvest Glen Ln (#25) to Intersection (#26)	(Boulevard 4.2A)	[PPP 4 lanes]	9,092	27,000	0.34	Un
Intersection (#26) to Park/School (#27)	(Boulevard 4.2A)	[PPP 4 lanes]	10,925	27,000	0.40	Un
Park/Sch (#27) to Street R/Pankey Pl (#28)	(Boulevard 4.2A)	[PPP 4 lanes]	11,186	27,000	0.41	Un
Street R/Pankey Pl (#28) to SR-76 (Pala Rd)	(Boulevard 4.2A)	[PPP 4 lanes]	6,188	27,000	0.23	Un
Pala Mesa Drive						
Wilt Rd/Sage Rd to Old Highway 395	(Light Collector)	2	10,690	16,200	0.66	D
Old Highway 395 to Street R/Pankey Pl	(Light Collector)	2	4,405	16,200	0.27	C
Street R/Pankey Place						
Pala Mesa/Pankey to Horse Ranch Creek Rd	(Light Collector)	2	6,219	16,200	0.38	C

Notes: (proposed GP classification). [proposed party to implement improvement. PPP = Pardee, Passerelle, and Palomar]
[Granite 4 lanes until their driveway] LOS: Level of Service. V/C: Volume to Capacity ratio. Daily volumes is a 24 hour volume.
LOS for proposed classification is classification is identiified as "Un" as under capacity and "Ov" for over capacity.

TABLE 21: EXISTING + CUMULATIVE STATE ROUTE VOLUMES AND LEVEL OF SERVICE

State Route 76	Lanes in	E+C	AM (Eastbound)				E+C	AM (Westbound)				E+C	PM (Eastbound)				E+C	PM (Westbound)			
Study Limits (cumulative)	each dir	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS
Melrose Dr to E. Vista Way	1	1357	EB	1300	1.04	**F**	2397	WB	1300	1.84	**F**	2625	EB	1300	2.02	**F**	1711	WB	1300	1.32	**F**
E. Vista Way to North River Rd	1	1172	EB	950	1.23	**F**	1953	WB	950	2.06	**F**	2020	EB	950	2.13	**F**	1398	WB	950	1.47	**F**
North River Rd to Olive Hill Rd	1	1371	EB	950	1.44	**F**	2389	WB	950	2.51	**F**	2550	EB	950	2.68	**F**	1583	WB	950	1.67	**F**
Olive Hill Rd to S Mission Rd	1	1471	EB	950	1.55	**F**	2527	WB	950	2.66	**F**	2521	EB	950	2.65	**F**	1814	WB	950	1.91	**F**
S Mission Rd to Via Monserate	1	1045	EB	950	1.10	**F**	1687	WB	950	1.78	**F**	2200	EB	950	2.32	**F**	1437	WB	950	1.51	**F**
Via Monserate to Gird Rd	1	1091	EB	950	1.15	**F**	1745	WB	950	1.84	**F**	1998	EB	950	2.10	**F**	1294	WB	950	1.36	**F**
Gird Rd to Sage Rd	1	1082	EB	950	1.14	**F**	1288	WB	950	1.36	**F**	1321	EB	950	1.39	**F**	1169	WB	950	1.23	**F**
Sage Rd to Old Hwy 395	1	1169	EB	950	1.23	**F**	1310	WB	950	1.38	**F**	1444	EB	950	1.52	**F**	1381	WB	950	1.45	**F**
Old Hwy 395 to I-15 SB Ramps	2	1319	EB	2050	0.64	C	1247	WB	2028	0.61	C	1454	EB	2050	0.71	C	1498	WB	2028	0.74	D
I-15 SB Ramps to I-15 NB Ramps	1	939	EB	950	0.99	**E**	837	WB	950	0.88	E	1222	EB	950	1.29	**F**	1086	WB	950	1.14	**F**
I-15 NB Ramps to Pankey Rd	2	641	EB	3100	0.21	A	817	WB	3030	0.27	A	1106	EB	3100	0.36	B	780	WB	3030	0.26	A
Pankey Rd to Horse Ranch Creek Rd	2	384	EB	1806	0.21	A	965	WB	2028	0.48	B	934	EB	1806	0.52	C	1050	WB	2028	0.52	C
Horse Ranch Creek Rd to Rice Cyn	1	564	EB	950	0.59	C	1139	WB	950	1.20	**F**	1219	EB	950	1.28	**F**	1291	WB	950	1.36	**F**
Rice Cyn to Couser Cyn	1	1686	EB	950	1.77	**F**	800	WB	950	0.84	D	977	EB	950	1.03	**F**	1282	WB	950	1.35	**F**
Couser Cyn to Pala Mission Rd	1	823	EB	950	0.87	**E**	653	WB	950	0.69	C	813	EB	950	0.86	D	1203	WB	950	1.27	**F**

Source: SANDAG Year 2030 Cumulative Map. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service. E: Existing. C: Cumulative

TABLE 22: EXISTING + CUMULATIVE FREEWAY VOLUMES AND LEVEL OF SERVICE (PRIOR TO MITIGATION)

Freeway	I-15				I-15				I-15			
Segment	Rainbow Valley Blvd to Mission Rd				Mission Rd to SR-76 (Pala Rd)				SR-76 to Escondido Hwy (Old 395)			
Existing (Year 2006)												
ADT	136,000				127,000				120,000			
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Number of Lanes	4	4	4	4	4	4	4	4	4	4	4	4
Capacity (1)	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400	9400
K Factor (2)	0.0619	0.0619	0.0738	0.0738	0.0619	0.0619	0.0738	0.0738	0.059	0.059	0.0723	0.0723
D Factor (3)	0.1653	0.8347	0.6398	0.3602	0.1653	0.8347	0.6398	0.3602	0.1989	0.8011	0.6955	0.3045
Truck Factor (4)	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.8977	0.8977	0.8977	0.8977
Peak Hour Volume	1514.87	7649.51	6990.58	3935.61	1414.62	7143.29	6527.97	3675.17	1568.69	6318.13	6721.8	2942.9
Volume to Capacity	0.16116	0.81378	0.74368	0.41868	0.15049	0.75992	0.69446	0.39098	0.16688	0.67214	0.71508	0.31307
LOS	A	D	C	A	A	C	C	A	A	C	C	A
Cumulative Pk Hr Vol	311	305	419	464	198	252	343	283	710	956	1340	816
Existing+Cumulative												
Peak Hour Volume	1825.87	7954.51	7409.58	4399.61	1612.62	7395.29	6870.97	3958.17	2278.69	7274.13	8061.8	3758.9
Volume to Capacity	0.19424	0.84622	0.78825	0.46804	0.17156	0.78673	0.73095	0.42108	0.24241	0.77384	0.85764	0.39988
LOS	A	D	C	B	A	C	C	B	A	C	D	A

Notes: (1) Capacity of 2,350 passenger cars per hour per lane (pcphpl) from Caltrans' Guide for the Preparation of Traffic Impact Studies, Dec 2002. (2) Latest K factor from Caltrans (based on 2005 data), which is the percentage of Annual Average Daily Traffic (AADT) in both directions. (3) Latest D factor from Caltrans (based on 2005 data), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2000 data).

Under existing + cumulative conditions, all study intersections and roadway segments were calculated to operate at LOS D with the exception of:

Intersections

1) Intersection of SR-76 (Pala Rd) / Via Monserate (LOS F AM & PM)
2) Intersection of SR-76 (Pala Rd) / Gird Rd (LOS F PM)
3) Intersection of SR-76 (Pala Rd) / Sage Rd (LOS F AM & PM)
4) Intersection of SR-76 (Pala Rd) / Old Highway 395 (LOS F AM & PM)
5) Intersection of Old Highway 395 / Dulin Rd (LOS E PM)
6) Intersection of SR-76 (Pala Rd) / I-15 SB Ramp (LOS F AM & PM)
7) Intersection of SR-76 (Pala Rd) / I-15 NB Ramp (LOS E AM & LOS F PM)
8) Intersection of SR-76 (Pala Rd) / Pankey Rd (LOS F AM & PM)
9) Intersection of SR-76 (Pala Rd) / Rice Canyon Rd (LOS F AM & PM)
10) Intersection of SR-76 (Pala Rd) / Couser Canyon Rd (LOS F AM & PM)
11) Intersection of Old Highway 395 / Pala Mesa Dr (LOS F AM & PM)
12) Intersection of Old Highway 395 / Stewart Canyon Rd (LOS F AM & PM)
13) Intersection of Old Highway 395 / Reche Rd (LOS F AM & PM)
14) Intersection of Mission Rd / Old Highway 395 (LOS F PM)
15) Intersection of Mission Rd / I-15 Southbound Ramp (LOS E AM)
16) Intersection of Mission Rd / I-15 Northbound Ramp (LOS F PM)
17) Intersection of SR-76 (Mission Ave) / Melrose Dr (LOS F AM & LOS E PM)
18) Intersection of SR-76 (Mission Ave) / E. Vista Way (LOS F AM & PM)
19) Intersection of SR-76 (Mission Ave) / North River Rd (LOS F AM & PM)
20) Intersection of SR-76 (Mission Ave) / Olive Hill Rd (LOS F AM & PM)
21) Intersection of SR-76 (Mission Ave) / S Mission Rd (LOS F PM)
22) Intersection of Reche Rd / Live Oak Park Rd (LOS E AM)

Segments

1) Segment of Old Hwy 395 from E Mission Rd to Reche Rd (LOS F)
2) Segment of Old Hwy 395 from Reche Rd to Stewart Canyon Rd (LOS F)
3) Segment of Old Hwy 395 from Stewart Canyon Rd to Tecalote Ln (LOS F)
4) Segment of Old Hwy 395 from Tecalote Ln to Pala Mesa Dr (LOS F)
5) Segment of Old Hwy 395 from Pala Mesa Dr to SR-76 (LOS F)
6) Segment of Old Hwy 395 from SR-76 to Dulin Rd (LOS E)
7) Segment of Old Hwy 395 from Dulin Rd to W Lilac Rd (LOS F)
8) Segment of Reche Rd from Green Canyon Norte to Live Oak Park Rd (LOS E)
9) Segment of Reche Rd from Live Oak Park Rd to Gird Rd (LOS E)

State Routes

10) State Route 76 from Melrose Dr to E Vista Way (LOS F AM & PM)
11) State Route 76 from E Vista Way to North River Rd (LOS F AM & PM)
12) State Route 76 from North River Rd to Olive Hill Rd (LOS F AM & PM)
13) State Route 76 from Olive Hill Rd to S Mission Rd (LOS F AM & PM)
14) State Route 76 from S Mission Rd to Via Monserate (LOS F AM & PM)
15) State Route 76 from Via Monserate to Gird Rd (LOS F AM & PM)
16) State Route 76 from Gird Rd to Sage Rd (LOS F AM & PM)
17) State Route 76 from Sage Rd to Old Hwy 395 (LOS F AM & PM)
18) State Route 76 from I-15 SB Ramp to I-15 NB Ramp (LOS E AM & LOS F PM)
19) State Route 76 from Horse Ranch Creek Rd to Rice Canyon Rd (LOS F AM & PM)
20) State Route 76 from Rice Canyon Rd to Couser Canyon Rd (LOS F AM & PM)
21) State Route 76 from Couser Canyon Rd to Pala Mission Rd (LOS E AM & LOS F PM)

Existing + cumulative LOS calculations are included in **Appendix N.**

3.6 Existing + Cumulative + Project Conditions (Prior to Mitigation)

This scenario accounts for the addition of project traffic onto existing + cumulative traffic for AM, PM and ADT conditions. The long-term project assignment is used in this scenario. The peak hour intersection volumes and daily traffic volumes for this scenario of existing + cumulative + project conditions are shown in **Figures 24a, 24b, and 24c**. The LOS calculated for the intersections, roadway segments, state highway segments, and freeway segments are shown in **Tables 23a, 23b, 24, 25a, 25b, and 26**, respectively.

Under existing + cumulative + project conditions, all study intersections and roadways were calculated to operate at LOS D with the exception of the following to which the project is calculated to have a cumulative impact:

Intersections

1) Intersection of SR-76 (Pala Rd) / Via Monserate (LOS F AM & PM)
2) Intersection of SR-76 (Pala Rd) / Gird Rd (LOS F PM)
3) Intersection of SR-76 (Pala Rd) / Sage Rd (LOS F AM & PM)
4) Intersection of SR-76 (Pala Rd) / Old Highway 395 (LOS F AM & PM)
5) Intersection of Old Highway 395 / Dulin Rd (LOS F PM)
6) Intersection of SR-76 (Pala Rd) / I-15 SB Ramp (LOS F AM & PM)
7) Intersection of SR-76 (Pala Rd) / I-15 NB Ramp (LOS F AM & PM)
8) Intersection of SR-76 (Pala Rd) / Pankey Rd (LOS F AM & PM)
9) Intersection of SR-76 (Pala Rd) / Rice Canyon Rd (LOS F AM & PM)
10) Intersection of SR-76 (Pala Rd) / Couser Canyon Rd (LOS F AM & PM)
11) Intersection of Old Highway 395 / Pala Mesa Dr (LOS F AM & PM)
12) Intersection of Old Highway 395 / Stewart Canyon Rd (LOS F AM & PM)
13) Intersection of Old Highway 395 / Reche Rd (LOS F AM & PM)
14) Intersection of Mission Rd / Old Highway 395 (LOS F PM)
15) Intersection of Mission Rd / I-15 Southbound Ramp (LOS E AM & LOS F PM)
16) Intersection of Mission Rd / I-15 Northbound Ramp (LOS F PM)
17) Intersection of SR-76 (Mission Ave) / Melrose Dr (LOS F AM & PM)
18) Intersection of SR-76 (Mission Ave) / E. Vista Way (LOS F AM & PM)
19) Intersection of SR-76 (Mission Ave) / North River Rd (LOS F AM & PM)
20) Intersection of SR-76 (Mission Ave) / Olive Hill Rd (LOS F AM & PM)
21) Intersection of SR-76 (Mission Ave) / S Mission Rd (LOS F PM)
22) Intersection of Reche Rd / Live Oak Park Rd (LOS E AM)

Segments

1) Segment of Old Hwy 395 from E Mission Rd to Reche Rd (LOS F)
2) Segment of Old Hwy 395 from Reche Rd to Stewart Canyon Rd (LOS F)
3) Segment of Old Hwy 395 from Stewart Canyon Rd to Tecalote Ln (LOS F)
4) Segment of Old Hwy 395 from Tecalote Ln to Pala Mesa Dr (LOS F)
5) Segment of Old Hwy 395 from Pala Mesa Dr to SR-76 (LOS F)
6) Segment of Old Hwy 395 from SR-76 to Dulin Rd (LOS E)
7) Segment of Old Hwy 395 from Dulin Rd to W Lilac Rd (LOS F)
8) Segment of Reche Rd from Green Canyon Norte to Live Oak Park Rd (LOS E)

9) Segment of Reche Rd from Live Oak Park Rd to Gird Rd (LOS E)
10) Segment of Pankey Rd from SR-76 to Shearer Crossing (LOS E)
11) Segment of Pala Mesa Dr from Wilt Rd/Sage Rd to Old Hwy 395 (LOS E)

State Routes

1) State Route 76 from Melrose Dr to E Vista Way (LOS F AM & PM)
2) State Route 76 from E Vista Way to North River Rd (LOS F AM & PM)
3) State Route 76 from North River Rd to Olive Hill Rd (LOS F AM & PM)
4) State Route 76 from Olive Hill Rd to S Mission Rd (LOS F AM & PM)
5) State Route 76 from S Mission Rd to Via Monserate (LOS F AM & PM)
6) State Route 76 from Via Monserate to Gird Rd (LOS F AM & PM)
7) State Route 76 from Gird Rd to Sage Rd (LOS F AM & PM)
8) State Route 76 from Sage Rd to Old Hwy 395 (LOS F AM & PM)
9) State Route 76 from I-15 SB Ramp to I-15 NB Ramp (LOS F AM & PM)
10) State Route 76 from Horse Ranch Creek Rd to Rice Canyon Rd (LOS F AM & PM)
11) State Route 76 from Rice Canyon Rd to Couser Canyon Rd (LOS E AM & LOS F PM)
12) State Route 76 from Couser Canyon Rd to Pala Mission Rd (LOS F PM)

Existing + cumulative + project LOS calculations and SR-76 peak hour volumes are included in **Appendix O.**

Figure 24a: Existing + Cumulative + Project Volumes

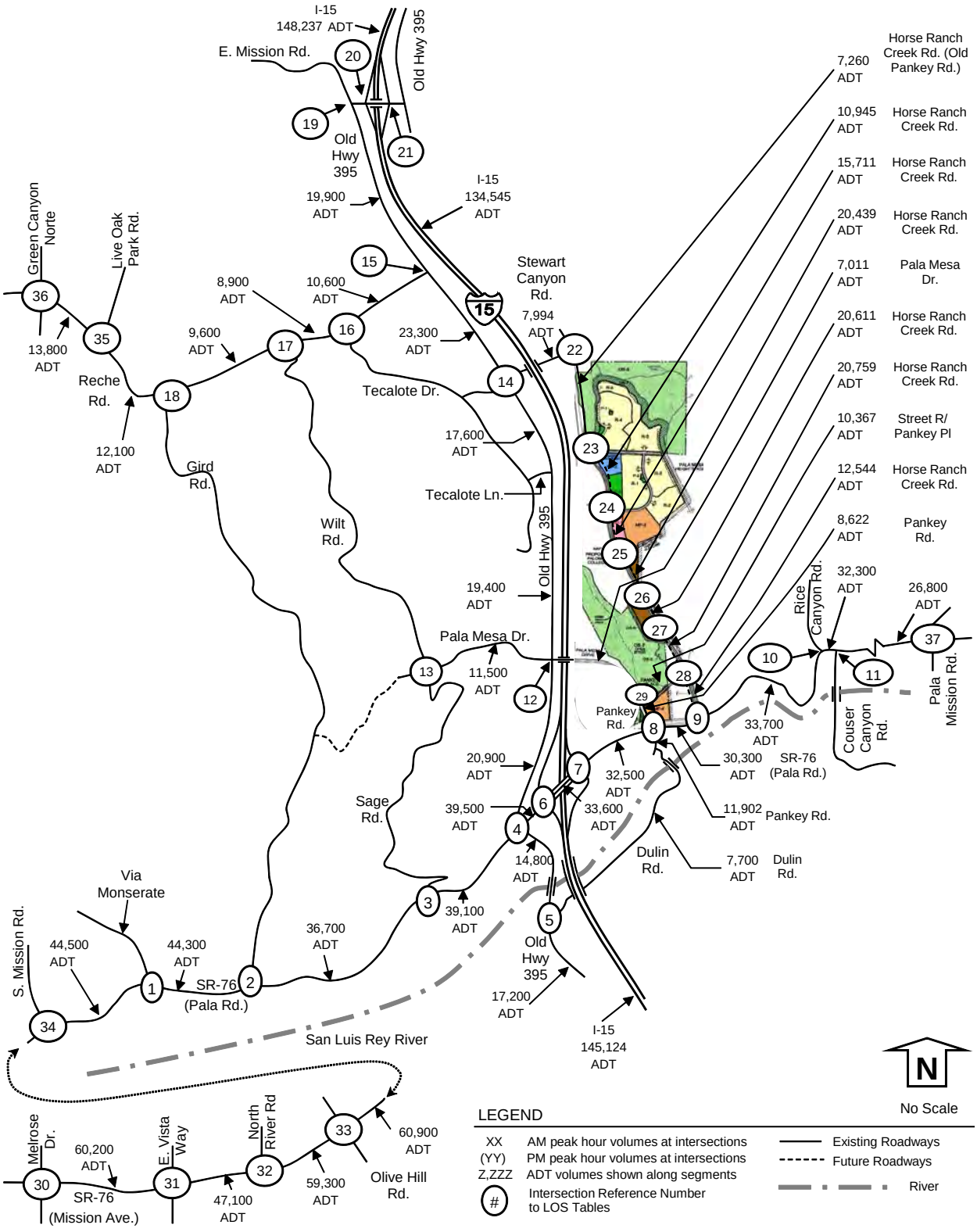


Figure 24b: Existing + Cumulative + Project Volumes

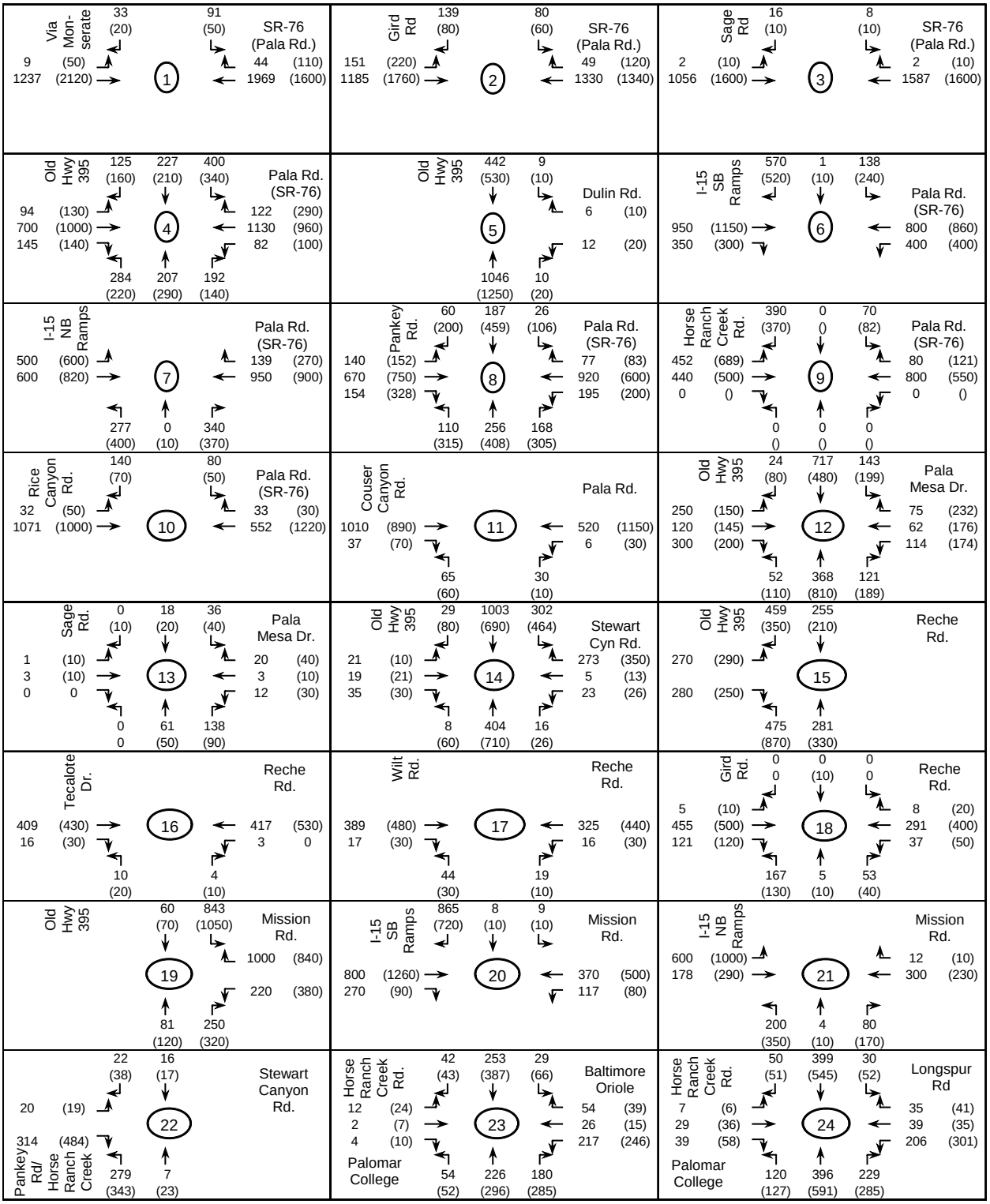


Figure 24c: Existing + Cumulative + Project Volumes

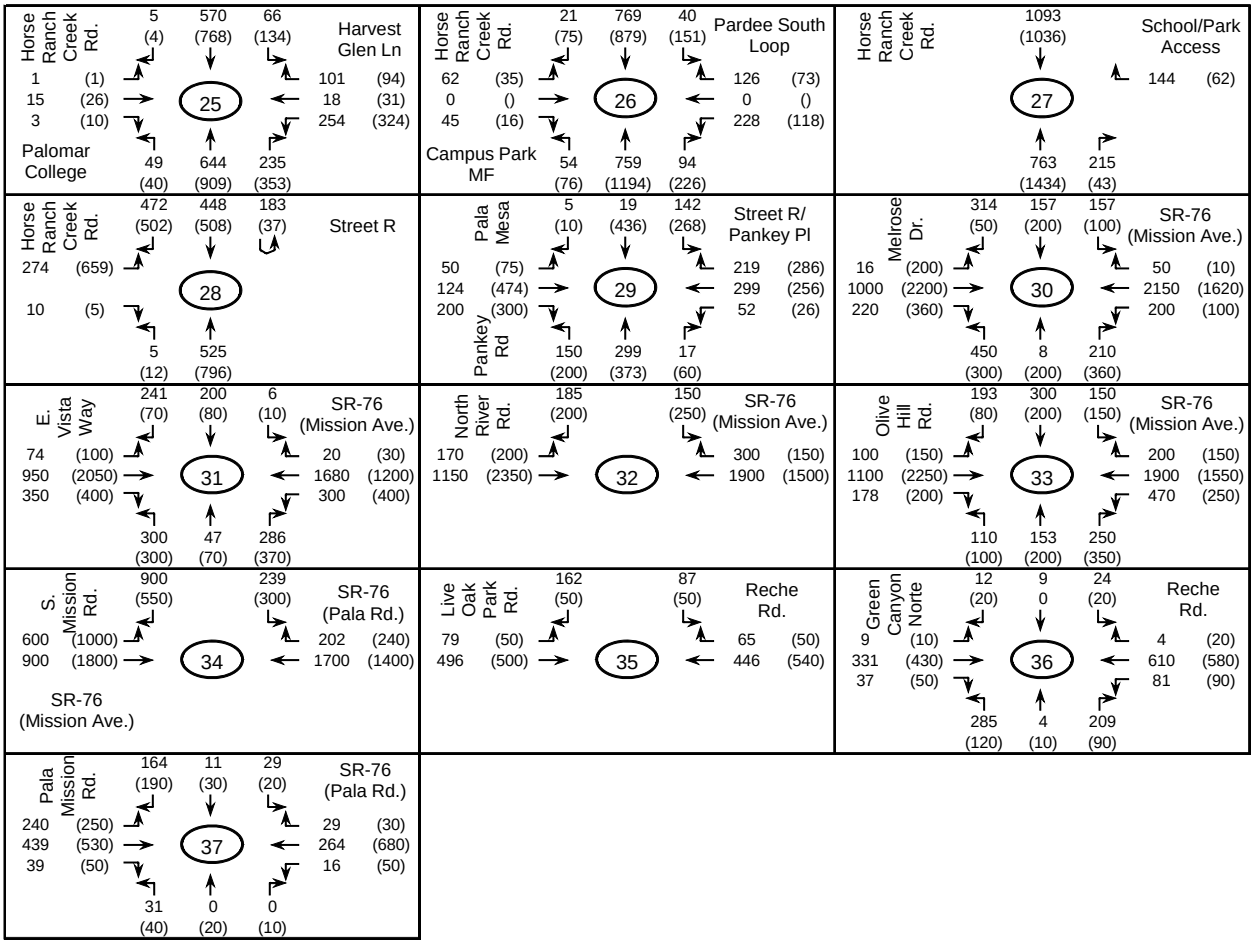


TABLE 23A: EXISTING +CUMULATIVE + PROJECT INTERSECTION LEVEL OF SERVICE (PRIOR TO MITIGATION)

Intersection and (Analysis)[1]	Movement	Peak Hour	Existing		Existing + Cumulative + Project			
			Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	Cumulative[5]
1) SR-76 (Pala Rd) at	SB LR	AM	86.1	**F**	>500	**F**	>2.0	**Yes**
Via Monserate (U)	SB LR	PM	91.4	**F**	>500	**F**	>2.0	**Yes**
	All	AM	5.0	A	>500	**F**	>2.0	**Yes**
	All	PM	2.9	A	>500	**F**	>2.0	**Yes**
2) SR-76 (Pala Rd) at	All	AM	12.9	B	51.5	D	38.6	No
Gird Rd (S)	All	PM	12.6	B	118.0	**F**	105.4	**Yes**
3) SR-76 (Pala Rd) at	SB LR	AM	22.6	C	154.9	**F**	132.3	**Yes**
Sage Rd (U)	SB LR	PM	33.0	D	>500	**F**	>2.0	**Yes**
	All	AM	0.2	A	1.4	A	1.2	No
	All	PM	0.4	A	4.6	A	4.2	No
4) SR-76 (Pala Rd) at	All	AM	29.7	C	268.7	**F**	239.0	**Yes**
Old Hwy 395 (S)	All	PM	30.2	C	266.1	**F**	235.9	**Yes**
5) Old Hwy 395 at	WB LR	AM	11.2	B	32.9	D	21.7	No
Dulin Rd (U)	WB LR	PM	12.9	B	56.4	**F**	43.5	**Yes**
6) SR-76 (Pala Rd) at	All	AM	27.5	C	107.0	**F**	79.5	**Yes**
I-15 SB Ramps (S)	All	PM	28.4	C	140.1	**F**	111.7	**Yes**
7) SR-76 (Pala Rd) at	All	AM	22.4	C	86.6	**F**	64.2	**Yes**
I-15 NB Ramps (S)	All	PM	46.7	D	121.1	**F**	74.4	**Yes**
8) SR-76 (Pala Rd) at	NB LTR	AM	12.2	B	>500	**F**	>2.0	**Yes**
Pankey Road (U)	NB LTR	PM	14.6	B	>500	**F**	>2.0	**Yes**
	SB LTR	AM	0.0	A	>500	**F**	>2.0	**Yes**
	SB LTR	PM	0.0	A	>500	**F**	>2.0	**Yes**
9) SR-76 (Pala Rd) at	All	AM	DNE	NA	20.9	C	NA	No
Horse Ranch Creek Rd (U)	All	PM	DNE	NA	22.6	C	NA	No
10) SR-76 (Pala Rd) at	SB LR	AM	10.5	B	211.4	**F**	>2.0	**Yes**
Rice Canyon Road (U)	SB LR	PM	12.4	B	>500	**F**	>2.0	**Yes**
11) SR-76 (Pala Rd) at	NB LR	AM	11.4	B	86.2	**F**	74.8	**Yes**
Couser Canyon Road (U)	NB LR	PM	13.5	B	427.4	**F**	>2.0	**Yes**
12) Old Highway 395 at	EB LTR	AM	11.0	**B**	>500	**F**	>2.0	**Yes**
Pala Mesa Dr (U)	EB LTR	PM	11.1	**B**	>500	**F**	>2.0	**Yes**
	WB LTR	AM	DNE	NA	>500	**F**	>2.0	**Yes**
	WB LTR	PM	DNE	NA	>500	**F**	>2.0	**Yes**
13) Pala Mesa Dr at	NB LTR	AM	8.6	A	9.9	A	1.3	No
Sage Road (U)	SB LTR	AM	9.0	A	11.4	B	2.4	No
	NB LTR	PM	8.7	A	10.0	B	1.3	No
	SB LTR	PM	9.1	A	11.4	B	2.3	No
14) Old Highway 395 at	WB LTR	AM	10.8	B	>500	**F**	>2.0	**Yes**
Stewart Canyon Road (U)	WB LTR	PM	11.9	B	>500	**F**	>2.0	**Yes**
15) Old Highway 395 at	EB LR	AM	18.4	C	>500	**F**	>2.0	**Yes**
Reche Road (U)	EB LR	PM	35.9	**E**	>500	**F**	>2.0	**Yes**
	All	PM	10.6	B	>500	**F**	>2.0	**Yes**
	All	PM	17.6	B	>500	**F**	>2.0	**Yes**
16) Reche Road at	NB LR	AM	13.1	B	15.2	C	2.1	No
Tecalote Dr (U)	NB LR	PM	15.0	C	17.5	C	2.5	No
17) Reche Road at	NB LR	AM	14.8	B	15.6	C	0.8	No
Wilt Road (U)	NB LR	PM	17.2	C	19.8	C	2.6	No
18) Reche Road at	All	AM	14.4	B	15.9	B	1.5	No
Gird Road (S)	All	PM	13.9	B	15.3	B	1.4	No
19) Mission Road at	SB L	AM	12.2	B	54.8	D	42.6	No
Old Highway 395 (S)	SB L	PM	27.3	C	111.8	**F**	84.5	**Yes**
20) Mission Road at	SB LTR	AM	20.6	C	75.6	**E**	55.0	**Yes**
I-15 SB Ramps (S)	SB LTR	PM	19.3	B	88.2	**F**	68.9	**Yes**
21) Mission Road at	All	AM	17.2	B	31.8	C	14.6	No
I-15 NB Ramps (S)	All	PM	37.5	D	109.6	**F**	72.1	**Yes**

Continued On Next Page

TABLE 23B: EXISTING +CUMULATIVE + PROJECT INTERSECTION LEVEL OF SERVICE (PRIOR TO MITIGATION)

Intersection and	Movement	Peak	Existing		Existing + Cumulative + Project			
(Analysis)[1]		Hour	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	Cumulative[5]
22) Stewart Canyon Rd at	EB LR	AM	8.7	A	11.1	B	2.4	No
HRCR/Pankey Road (U)	EB LR	PM	8.7	A	13.7	B	5.0	No
23) Horse Ranch Crk Rd at	WB LR	AM	DNE	NA	17.8	B	NA	No
Baltimore Oriole (U)	WB LR	PM	DNE	NA	17.7	B	NA	No
24) Horse Ranch Crk Rd at	All-Way	AM	DNE	NA	21.4	C	NA	No
Longspur Rd (U)	All-Way	PM	DNE	NA	24.2	C	NA	No
25) Horse Ranch Crk Rd at	All-Way	AM	DNE	NA	17.7	B	NA	No
Harvest Glen Ln (U)	All-Way	PM	DNE	NA	26.0	C	NA	No
26) Horse Ranch Crk Rd at	WB LR	AM	DNE	NA	18.3	B	NA	No
Pardee South Loop (U)	WB LR	PM	DNE	NA	24.6	C	NA	No
27) Horse Ranch Crk Rd at	WB LR	AM	DNE	NA	15.2	C	NA	No
School/Park Access (U)	WB LR	PM	DNE	NA	18.1	C	NA	No
28) Horse Ranch Crk Rd	All-Way	AM	DNE	NA	11.3	B	NA	No
at Street R (U)	All-Way	PM	DNE	NA	15.1	B	NA	No
29) Pankey/Pala Mesa Dr	WB LR	AM	DNE	NA	24.8	C	NA	No
at Street R (U)	WB LR	PM	DNE	NA	43.3	D	NA	No
30) SR-76 (Mission Ave) at	All	AM	30.3	C	129.5	**F**	99.2	**Yes**
Melrose Drive (S)	All	PM	26.3	C	80.7	**F**	54.4	**Yes**
31) SR-76 (Mission Ave) at	All	AM	60.9	**E**	281.7	**F**	220.8	**Yes**
E. Vista Way (S)	All	PM	48.4	D	261.1	**F**	212.7	**Yes**
32) SR-76 (Mission Ave) at	All	AM	61.7	**E**	317.1	**F**	255.4	**Yes**
North River Rd (S)	All	PM	29.7	C	267.3	**F**	237.6	**Yes**
33) SR-76 (Mission Ave) at	All	AM	53.8	D	239.7	**F**	185.9	**Yes**
Olive Hill Rd (S)	All	PM	52.9	D	184.1	**F**	131.2	**Yes**
34) SR-76 (Mission Ave) at	All	AM	18.9	B	42.1	D	23.2	No
S. Mission Rd (S)	All	PM	21.5	C	88.0	**F**	66.5	**Yes**
35) Reche Rd at	SB LR	AM	23.0	C	45.3	**E**	22.3	**Yes**
Live Oak Park Rd (U)	SB LR	PM	18.0	C	26.3	D	8.3	No
36) Reche Rd at	All	AM	21.1	C	27.3	C	6.2	No
Green Canyon Norte (S)	All	PM	21.0	C	26.0	C	5.0	No
37) SR-76 (Pala Rd.) at	All	AM	29.3	C	35.8	D	6.5	No
Pala Mission Rd. (S)	All	PM	32.4	C	42.6	D	10.2	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized 2) Delay - HCM Control Delay in seconds. 3) LOS: Level of Service.
4) Delta is the increase in delay from project. 5) Does the project add cumulatively to an existing cumulative impact (yes or no)?

TABLE 24: EXISTING + CUMULATIVE + PROJECT SEGMENT ADT VOLUMES AND LEVEL OF SERVICE (PRIOR TO MITIGATION)

Segment	Classification (as proposed)	Existing				Cumulative	Project	Existing + Cumulative + Project				
		Daily Volume	LOS E Capacity	V/C	LOS	Daily Volumes	Daily Volumes	Daily Volume	LOS E Capacity	V/C	LOS	Cumulative Impact?
Dulin Road												
Old Highway 395 to Pankey Road	Light Collector	5,770	16,200	0.36	C	1,222	708	7,700	16,200	0.48	D	No
Old Highway 395												
East Mission Road to Reche Road	Collector	5,155	16,200	0.32	C	12,165	2,580	19,900	16,200	1.23	**F**	**Yes**
Reche Road to Stewart Canyon Road	Collector	5,646	16,200	0.35	C	14,277	3,377	23,300	16,200	1.44	**F**	**Yes**
Stewart Canyon Road to Tecalote Lane	Collector	6,405	16,200	0.40	C	10,481	714	17,600	16,200	1.09	**F**	**Yes**
Tecalote Lane to Pala Mesa Drive	Collector	6,603	16,200	0.41	C	11,980	817	19,400	16,200	1.20	**F**	**Yes**
Pala Mesa Drive to SR-76 (Pala Road)	Collector	8,302	16,200	0.51	D	11,408	1,190	20,900	16,200	1.29	**F**	**Yes**
SR-76 (Pala Road) to Dulin Road	Collector	6,668	16,200	0.41	C	7,733	399	14,800	16,200	0.91	**E**	**Yes**
Dulin Road to W. Lilac Road	Rural Collector	4,163	16,200	0.26	C	12,542	495	17,200	16,200	1.06	**F**	**Yes**
Reche Road												
Green Canyon Norte to Live Oak Park Road	Rural Collector	10,162	16,200	0.63	D	3,040	598	13,800	16,200	0.85	**E**	**Yes**
Live Oak Park Road to Gird Road	Rural Collector	10,380	16,200	0.64	D	1,019	701	12,100	16,200	0.75	**E**	**Yes**
Gird Road to Wilt Road	Rural Collector	8,301	16,200	0.51	D	598	701	9,600	16,200	0.59	D	No
Wilt Road to Tecalote Road	Rural Collector	7,814	16,200	0.48	D	385	701	8,900	16,200	0.55	D	No
Tecalote Drive to Old Highway 395	Rural Collector	7,420	16,200	0.46	D	2,382	798	10,600	16,200	0.65	D	No
Stewart Canyon Road												
Old Hwy 395 to Horse Ranch Creek Rd	Collector	590	16,200	0.04	A	4,445	2,959	7,994	16,200	0.49	D	No
Pankey Road												
Street R/Pankey Place to SR-76 (Pala Rd)	(Collector)	0	34,200	0.00	A	8,140	483	8,622	34,200	0.25	A	No
SR-76 (Pala Road) to Shearer Crossing	Light Collector	936	16,200	0.06	A	7,376	3,589	11,902	16,200	0.73	**E**	**Yes**
Horse Ranch Creek Road												
Stewart Canyon Rd to Baltimore Oriole (#23)	Light Collector	40	16,200	0.00	A	4,158	3,062	7,260	16,200	0.45	D	No
Baltimore Oriole (#23) to Longspur Rd (#24)	(Boulevard 4.2A)	0	27,000	0.00	Un	5,182	5,764	10,945	27,000	0.41	Un	No
Longspur Rd (#24) to Harvest Glen Ln (#25)	(Boulevard 4.2A)	0	27,000	0.00	Un	6,905	8,806	15,711	27,000	0.58	Un	No
Harvest Glen Ln (#25) to Intersection (#26)	(Boulevard 4.2A)	0	27,000	0.00	Un	9,298	11,141	20,439	27,000	0.76	Un	No
Intersection (#26) to Park/School (#27)	(Boulevard 4.2A)	0	27,000	0.00	Un	10,190	10,421	20,611	27,000	0.76	Un	No
Park/Sch (#27) to Street R/Pankey Pl (#28)	(Boulevard 4.2A)	0	27,000	0.00	Un	10,338	10,421	20,759	27,000	0.77	Un	No
Street R/Pankey Pl (#28) to SR-76 (Pala Rd)	(Boulevard 4.2A)	0	27,000	0.00	Un	5,146	7,397	12,544	27,000	0.46	Un	No
Pala Mesa Drive												
Wilt Rd/Sage Rd to Old Highway 395	(Light Collector)	604	16,200	0.04	A	10,086	810	11,500	16,200	0.71	**E**	**Yes**
Old Highway 395 to Street R/Pankey Pl	(Light Collector)	0	16,200	0.00	A	3,994	3,017	7,011	16,200	0.43	C	No
Street R/Pankey Place												
Pala Mesa/Pankey to Horse Ranch Creek Rd	(Light Collector)	0	16,200	0.00	A	6,379	3,988	10,367	16,200	0.64	D	No

Notes: (proposed classification). LOS: Level of Service. V/C: Volume to Capacity ratio. Daily volumes is a 24 hour volume. LOS for proposed classification is identified as "Un" as under capacity and "Ov" for over capacity.

TABLE 25A: EXISTING + CUMULATIVE + PROJECT STATE ROUTE VOLUMES AND LEVEL OF SERVICE (AM)

State Route 76	Lanes in	E	AM (Eastbound)				C+P	E+C+P			v/c	Cumulative	E	AM (Westbound)				C+P	E+C+P			v/c	Cumulative
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	Vol	v/c	LOS	Delta	Impact?	Vol	Dir	Cap	v/c	LOS	Vol	Vol	v/c	Sig	Delta	Impact?
Melrose Dr to E. Vista Way	1	999	EB	1300	0.77	D	369	1368	1.05	**F**	0.28	**Yes**	1469	WB	1300	1.13	**F**	947	2416	1.86	**F**	0.73	**Yes**
E. Vista Way to North River Rd	1	718	EB	950	0.76	D	469	1187	1.25	**F**	0.49	**Yes**	1040	WB	950	1.09	**F**	944	1984	2.09	**F**	0.99	**Yes**
North River Rd to Olive Hill Rd	1	852	EB	950	0.90	**E**	539	1391	1.46	**F**	0.57	**Yes**	1200	WB	950	1.26	**F**	1221	2421	2.55	**F**	1.29	**Yes**
Olive Hill Rd to S Mission Rd	1	1031	EB	950	1.09	**F**	467	1498	1.58	**F**	0.49	**Yes**	1245	WB	950	1.31	**F**	1322	2567	2.70	**F**	1.39	**Yes**
S Mission Rd to Via Monserate	1	745	EB	950	0.78	D	347	1092	1.15	**F**	0.37	**Yes**	901	WB	950	0.95	**E**	832	1733	1.82	**F**	0.88	**Yes**
Via Monserate to Gird Rd	1	808	EB	950	0.85	D	332	1140	1.20	**F**	0.35	**Yes**	895	WB	950	0.94	**E**	901	1796	1.89	**F**	0.95	**Yes**
Gird Rd to Sage Rd	1	740	EB	950	0.78	D	391	1131	1.19	**F**	0.41	**Yes**	542	WB	950	0.57	**C**	797	1339	1.41	**F**	0.84	**Yes**
Sage Rd to Old Hwy 395	1	760	EB	950	0.80	D	458	1218	1.28	**F**	0.48	**Yes**	534	WB	950	0.56	**C**	827	1361	1.43	**F**	0.87	**Yes**
Old Hwy 395 to I-15 SB Ramps	2	1507	EB	2050	0.74	D	93	1600	0.78	D	0.05	No	665	WB	2028	0.33	B	600	1265	0.62	C	0.30	No
I-15 SB Ramps to I-15 NB Ramps	1	844	EB	950	0.89	**E**	178	1022	1.08	**F**	0.19	**Yes**	539	WB	950	0.57	**C**	455	994	1.05	**F**	0.48	**Yes**
I-15 NB Ramps to Pankey Rd	2	559	EB	3100	0.18	A	283	842	0.27	A	0.09	No	606	WB	3030	0.20	A	439	1045	0.34	B	0.14	No
Pankey Rd to Horse Ranch Creek Rd	2	589	EB	1806	0.33	B	193	782	0.43	B	0.11	No	540	WB	2028	0.27	A	644	1184	0.58	C	0.32	No
Horse Ranch Creek Rd to Rice Cyn	1	588	EB	950	0.62	C	194	782	0.82	D	0.20	No	539	WB	950	0.57	**C**	645	1184	1.25	**F**	0.68	**Yes**
Rice Cyn to Couser Cyn	1	589	EB	950	0.62	C	1135	1724	1.81	**F**	1.19	**Yes**	540	WB	950	0.57	C	300	840	0.88	**E**	0.32	**Yes**
Couser Cyn to Pala Mission Rd	1	634	EB	950	0.67	C	223	857	0.90	**E**	0.23	**Yes**	357	WB	950	0.38	B	321	678	0.71	D	0.34	No

Source: SANDAG Year 2030 Cumulative Map. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service. E: Existing. C: Cumulative. P: Project.

TABLE 25B: EXISTING + CUMULATIVE + PROJECT STATE ROUTE VOLUMES AND LEVEL OF SERVICE (PM)

State Route 76	Lanes in	E	PM (Eastbound)				C+P	E+C+P			v/c	Cumulative	E	PM (Westbound)				C+P	E+C+P			v/c	Cumulative
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	Vol	v/c	LOS	Delta	Impact?	Vol	Dir	Cap	v/c	LOS	Vol	Vol	v/c	Sig	Delta	Impact?
Melrose Dr to E. Vista Way	1	1456	EB	1300	1.12	F	1195	2651	2.04	F	0.92	Yes	1001	WB	1300	0.77	D	726	1727	1.33	F	0.56	Yes
E. Vista Way to North River Rd	1	1107	EB	950	1.17	F	952	2059	2.17	F	1.00	Yes	652	WB	950	0.69	C	767	1419	1.49	F	0.81	Yes
North River Rd to Olive Hill Rd	1	1176	EB	950	1.24	F	1417	2593	2.73	F	1.49	Yes	781	WB	950	0.82	D	830	1611	1.70	F	0.87	Yes
Olive Hill Rd to S Mission Rd	1	1457	EB	950	1.53	F	1119	2576	2.71	F	1.18	Yes	1069	WB	950	1.13	F	782	1851	1.95	F	0.82	Yes
S Mission Rd to Via Monserate	1	1064	EB	950	1.12	F	1209	2273	2.39	F	1.27	Yes	618	WB	950	0.65	C	883	1501	1.58	F	0.93	Yes
Via Monserate to Gird Rd	1	1077	EB	950	1.13	F	1000	2077	2.19	F	1.05	Yes	786	WB	950	0.83	D	575	1361	1.43	F	0.61	Yes
Gird Rd to Sage Rd	1	645	EB	950	0.68	C	755	1400	1.47	F	0.79	Yes	742	WB	950	0.78	D	494	1236	1.30	F	0.52	Yes
Sage Rd to Old Hwy 395	1	638	EB	950	0.67	C	885	1523	1.60	F	0.93	Yes	768	WB	950	0.81	D	680	1448	1.52	F	0.72	Yes
Old Hwy 395 to I-15 SB Ramps	2	816	EB	2050	0.40	B	670	1486	0.72	D	0.33	No	1258	WB	2028	0.62	C	273	1531	0.75	D	0.13	No
I-15 SB Ramps to I-15 NB Ramps	1	718	EB	950	0.76	D	639	1357	1.43	F	0.67	Yes	1153	WB	950	1.21	F	132	1285	1.35	F	0.14	Yes
I-15 NB Ramps to Pankey Rd	2	696	EB	3100	0.22	A	753	1449	0.47	B	0.24	No	820	WB	3030	0.27	A	242	1062	0.35	B	0.08	No
Pankey Rd to Horse Ranch Creek Rd	2	631	EB	1806	0.35	B	649	1280	0.71	C	0.36	No	897	WB	2028	0.44	B	460	1357	0.67	C	0.23	No
Horse Ranch Creek Rd to Rice Cyn	1	631	EB	950	0.66	C	649	1280	1.35	F	0.68	Yes	897	WB	950	0.94	E	460	1357	1.43	F	0.48	Yes
Rice Cyn to Couser Cyn	1	526	EB	950	0.55	C	506	1032	1.09	F	0.53	Yes	930	WB	950	0.98	E	413	1343	1.41	F	0.43	Yes
Couser Cyn to Pala Mission Rd	1	434	EB	950	0.46	B	414	848	0.89	E	0.44	Yes	950	WB	950	1.00	F	301	1251	1.32	F	0.32	Yes

Source: SANDAG Year 2030 Cumulative Map. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service. E: Existing. C: Cumulative. P: Project.

TABLE 26: EXISTING + CUMULATIVE + PROJECT FREEWAY VOLUMES AND LEVEL OF SERVICE (PRIOR TO MITIGATION)

Freeway	I-15				I-15				I-15			
Segment	Rainbow Valley Blvd to Mission Rd				Mission Rd to SR-76 (Pala Rd)				SR-76 to Escondido Hwy (Old 395)			
Existing (Year 2006)												
ADT	136,000				127,000				120,000			
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Number of Lanes	4	4	4	4	4	4	4	4	4	4	4	4
Capacity (1)	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400
K Factor (2)	0.0619	0.0619	0.0738	0.0738	0.0619	0.0619	0.0738	0.0738	0.0590	0.0590	0.0723	0.0723
D Factor (3)	0.1653	0.8347	0.6398	0.3602	0.1653	0.8347	0.6398	0.3602	0.1989	0.8011	0.6955	0.3045
Truck Factor (4)	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.8977	0.8977	0.8977	0.8977
Peak Hour Volume	1,515	7,650	6,991	3,936	1,415	7,143	6,528	3,675	1,569	6,318	6,722	2,943
Volume to Capacity	0.161	0.814	0.744	0.419	0.150	0.760	0.694	0.391	0.167	0.672	0.715	0.313
LOS	A	D	C	A	A	C	C	A	A	C	C	A
Project Pk Hr Vol	99	68	97	136	14	9	13	19	73	86	128	102
Existing + Project												
Peak Hour Volume	1,614	7,718	7,088	4,072	1,429	7,152	6,541	3,694	1,642	6,404	6,850	3,045
Volume to Capacity	0.172	0.821	0.754	0.433	0.152	0.761	0.696	0.393	0.175	0.681	0.729	0.324
LOS	A	D	C	B	A	C	C	A	A	C	C	A
Increase in V/C	0.011	0.007	0.010	0.014	0.001	0.001	0.001	0.002	0.008	0.009	0.014	0.011
County Impact?	No	No	No	No	No	No	No	No	No	No	No	No
CMP Impact?	No	No	No	No	No	No	No	No	No	No	No	No
Cumulative Pk Hr Vol	311	305	419	464	198	252	343	283	710	956	1340	816
Existing+Cumulative												
Peak Hour Volume	1,826	7,955	7,410	4,400	1,613	7,395	6,871	3,958	2,279	7,274	8,062	3,759
Volume to Capacity	0.194	0.846	0.788	0.468	0.172	0.787	0.731	0.421	0.242	0.774	0.858	0.400
LOS	A	D	C	B	A	C	C	B	A	C	D	A
Existing+Cumulative+Project												
Peak Hour Volume	1,925	8,023	7,507	4,536	1,627	7,404	6,884	3,977	2,352	7,360	8,190	3,861
Volume to Capacity	0.205	0.853	0.799	0.483	0.173	0.788	0.732	0.423	0.250	0.783	0.871	0.411
LOS	A	D	C	B	A	C	C	B	A	C	D	A
Increase in V/C	0.011	0.007	0.010	0.014	0.001	0.001	0.001	0.002	0.008	0.009	0.014	0.011
Cumulative Impact?	No	No	No	No	No	No	No	No	No	No	No	No

Notes: (1) Capacity of 2,350 passenger cars per hour per lane (pcphpl) from Caltrans' Guide for the Preparation of Traffic Impact Studies, Dec 2002. (2) Latest K factor from Caltrans (based on 2005 data), which is the percentage of Annual Average Daily Traffic (AADT) in both directions. (3) Latest D factor from Caltrans (based on 2005 data), which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2000 data). CMP: Congestion Management Program impact.

3.7 Horizon Year (2030) Conditions

This section describes the horizon year street system (based on the adopted County Circulation Element) and LOS operations. The SANDAG traffic model included the project, thus the horizon year (2030) volumes have the project traffic removed. A plan to plan analysis is typically conducted to determine if a general plan amendment or rezone would prevent the planned circulation element roadway from operating at its planned level of service under horizon year conditions. The plan to plan analysis was based on:

1) County roadway traffic volumes for the study area were compared between the Series 10 existing general plan model, the Series 10 general plan update model, and the current SANDAG Year 2030 Series 11 model (a comparison table and plot volumes are included in **Appendix P**). The higher volumes between the traffic models were used for County roadways.
2) The proposed project with 19,941 ADT is less intense than the existing plan for the project site with 23,858 ADT as shown previously in Table 13.

The horizon year roadway conditions were based on the County of San Diego adopted Circulation Element. The horizon year traffic models are coded with network and roadway classifications reflecting the respective circulation elements. For the study area under horizon year conditions, the segment of Pala Mesa Drive between Gird Road and Wilt Road is connected. A future new freeway interchange at I-15/Stewart Canyon Road is not coded in the traffic modes as the County and SANDAG have not identified a need for this interchange at this time (documentation included in **Appendix Q).** The horizon year segment and intersection configurations are shown in **Figures 25a, 25b, and 25c**. The study area is based on the extent of where 50 peak hour directional project trips will travel to determine potential impacts.
The horizon year intersection volumes were factored up from existing turn moves based on the increase in ADT for each intersection approach with some volume balancing applied at the freeway interchanges. The peak hour intersection volumes and daily traffic volumes are shown in **Figures 26a, 26b, and 26c**.

The study area is based on the limit of where 50 peak hour project trips will travel. The LOS calculated for the intersections, roadway segments, state route segments, and freeway segments are shown in **Tables 27, 28, 29, and 30**, respectively. The freeway segment analysis included a directional split based on SANDAG Series 11 traffic model. The other Caltrans factors were not adjusted for horizon year conditions. A copy of the SANDAG Series 11 splits for I-15 is included in **Appendix R**.

Under horizon year (2030) conditions, all study intersections and roadways were calculated to operate at LOS D with the exception of the following (LOS calculations are included in **Appendix S)**:

1) Segment of Pankey Road from SR-76 to Shearer Crossing (LOS F)
2) Freeway segment of I-15 from Rainbow Valley Blvd to Mission Road (LOS E & F AM & LOS F PM)
3) Freeway segment of I-15 from Mission Road to SR-76 (LOS F PM)
4) Freeway segment of I-15 from SR-76 to Escondido Highway Old 395 (LOS E & F PM)

Figure 25a: Horizon Year (2030) Roadway Conditions

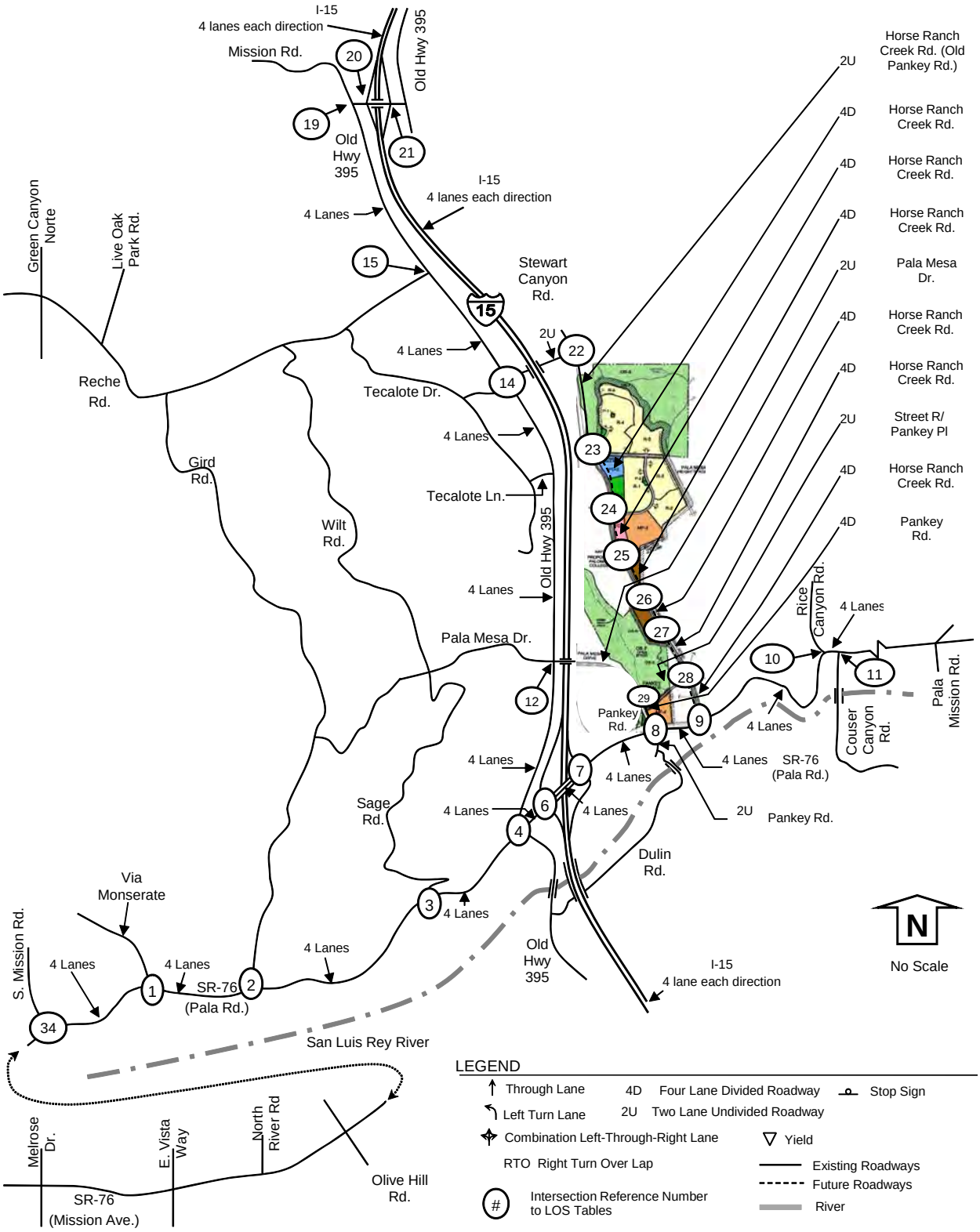


Figure 25b: Horizon Year (2030) Roadway Conditions

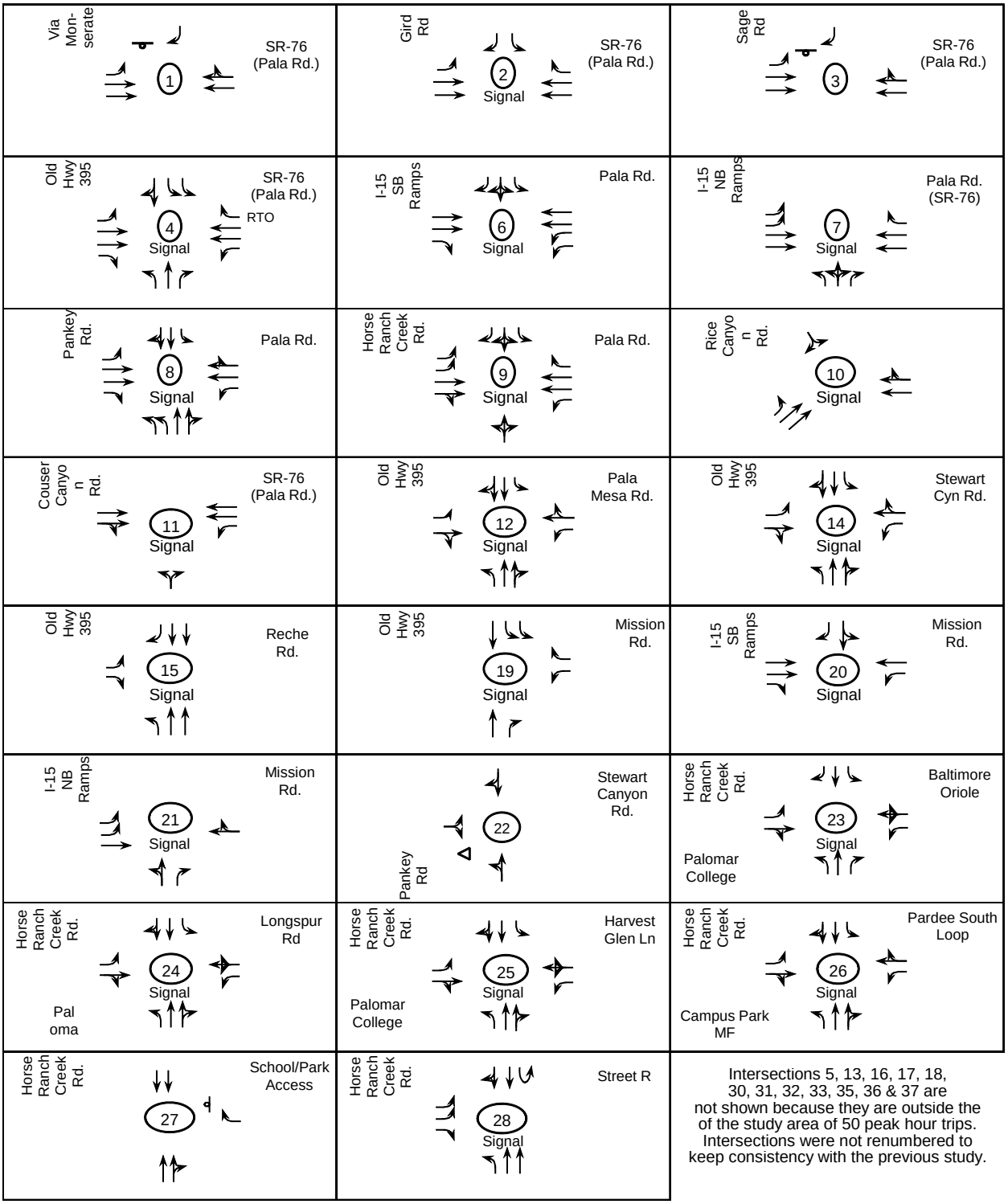
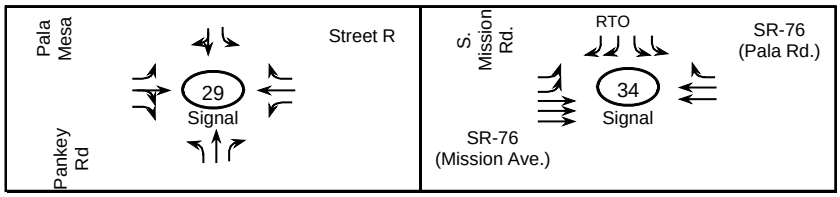


Figure 25c: Horizon Year (2030) Roadway Conditions



Intersections 5, 13, 16, 17, 18, 30, 31, 32, 33, 35, 36 & 37 are not shown because they are outside the of the study area of 50 peak hour trips. Intersections were not renumbered to keep consistency with the previous study.

Figure 26a: Horizon Year (2030) Volumes

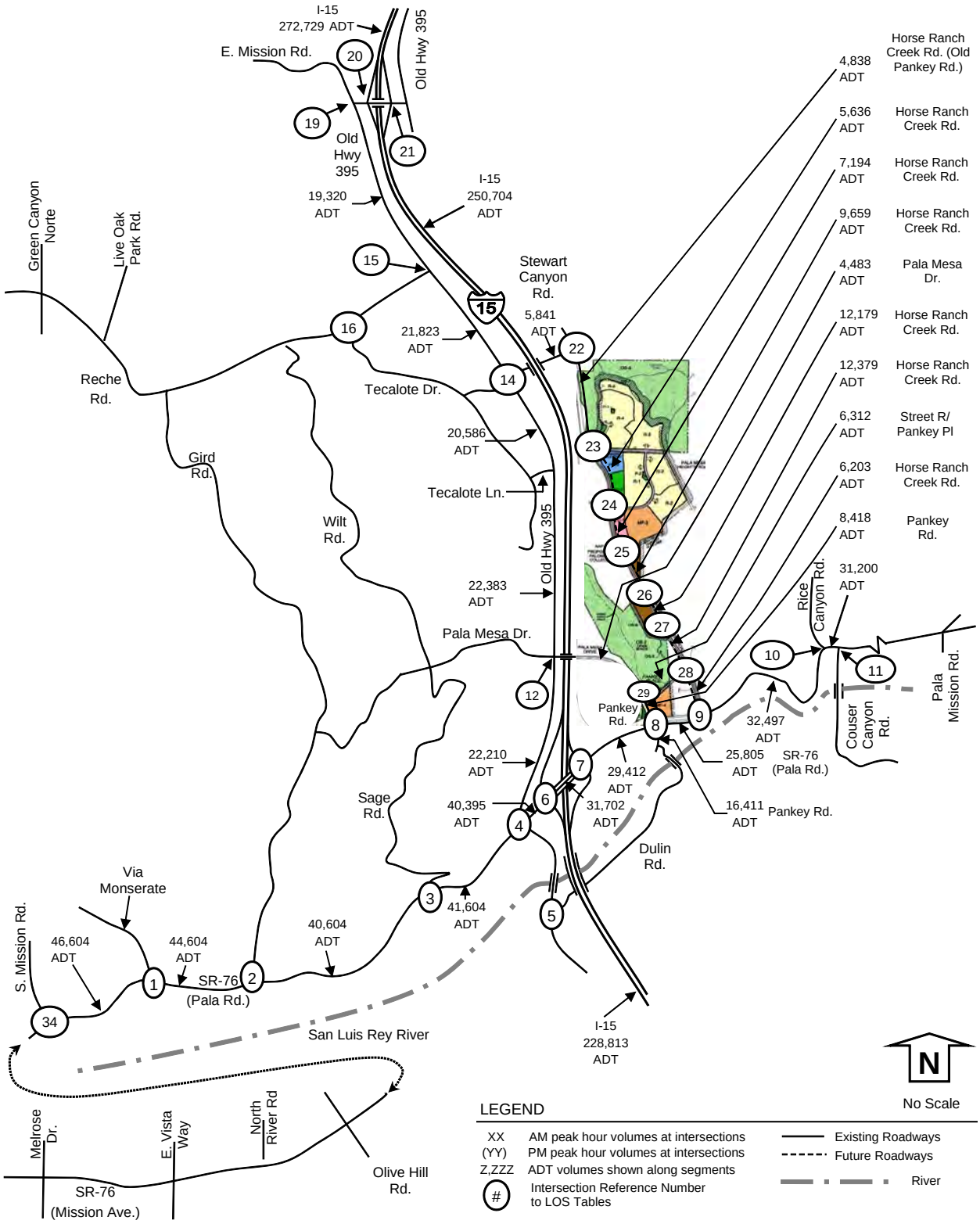
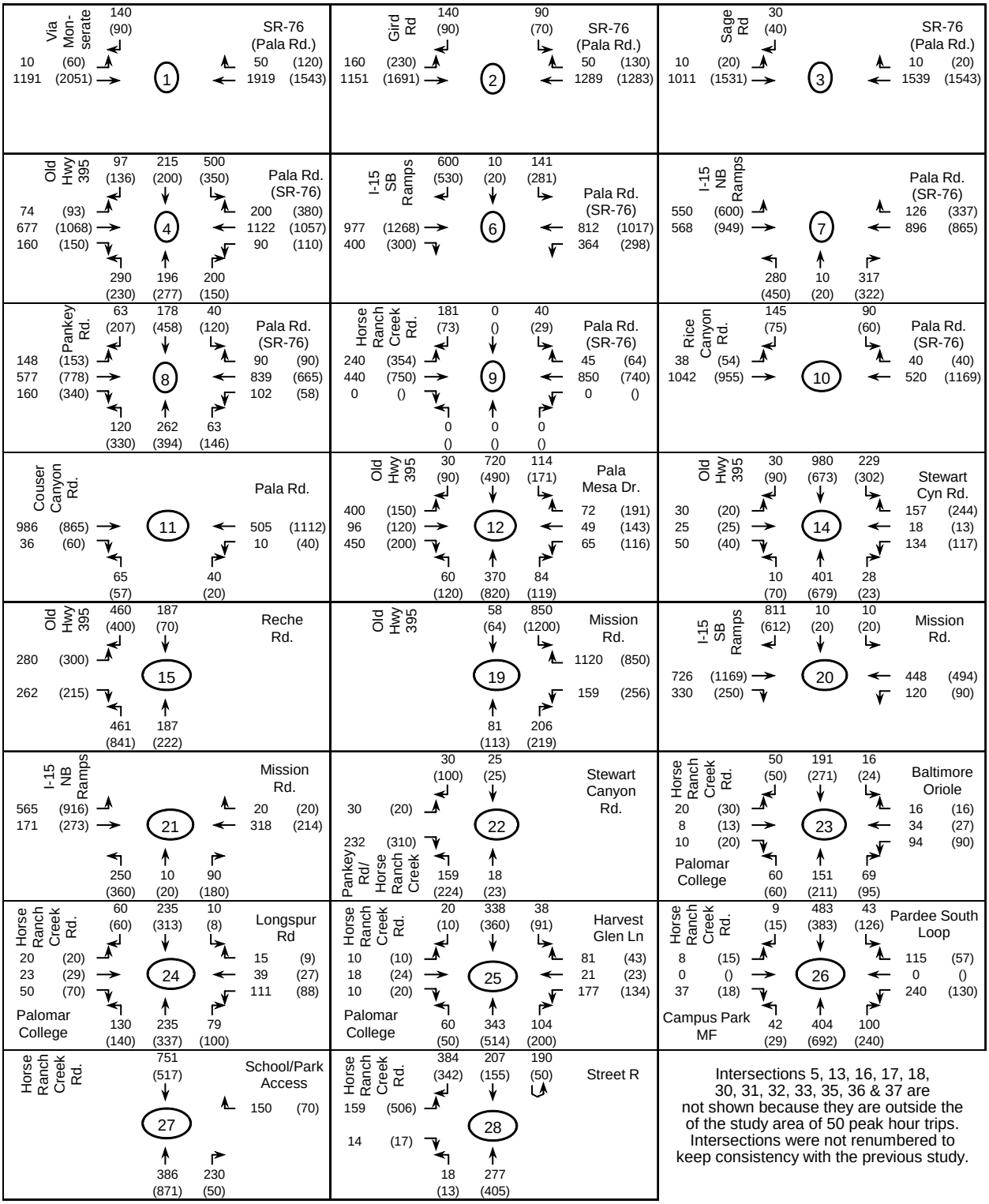
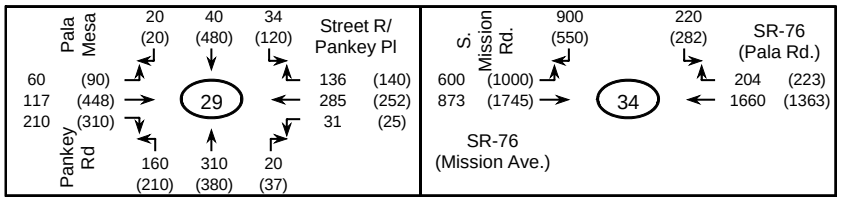


Figure 26b: Horizon Year (2030) Volumes



Intersections 5, 13, 16, 17, 18, 30, 31, 32, 33, 35, 36 & 37 are not shown because they are outside the of the study area of 50 peak hour trips. Intersections were not renumbered to keep consistency with the previous study.

Figure 26c: Horizon Year (2030) Volumes



Intersections 5, 13, 16, 17, 18, 30, 31, 32, 33, 35, 36 & 37 are not shown because they are outside the of the study area of 50 peak hour trips. Intersections were not renumbered to keep consistency with the previous study.

TABLE 27: HORIZON YEAR (2030) INTERSECTION LEVEL OF SERVICE

Intersection and (Analysis)[1]	Movement	Peak Hour	Horizon Year (2030) Delay[2]	LOS[3]
1) SR-76 (Pala Rd) at	SB R	AM	24.3	C
Via Monserate (U)	SB R	PM	19.4	C
2) SR-76 (Pala Rd) at	All	AM	12.3	B
Gird Rd (S)	All	PM	12.6	B
3) SR-76 (Pala Rd) at	SB R	AM	17.5	C
Sage Rd (U)	SB R	PM	17.1	C
4) SR-76 (Pala Rd) at	All	AM	43.4	D
Old Hwy 395 (S)	All	PM	40.6	D
6) SR-76 (Pala Rd) at	All	AM	33.6	C
I-15 SB Ramps (S)	All	PM	32.6	C
7) SR-76 (Pala Rd) at	All	AM	36.8	D
I-15 NB Ramps (S)	All	PM	41.2	D
8) SR-76 (Pala Rd) at	All	AM	23.3	C
Pankey Road (S)	All	PM	34.9	C
9) SR-76 (Pala Rd) at	All	AM	16.9	B
Horse Ranch Creek Rd (S)	All	PM	15.1	B
10) SR-76 (Pala Rd) at	All	AM	8.3	A
Rice Canyon Road (S)	All	PM	8.2	A
11) SR-76 (Pala Rd) at	All	AM	7.4	A
Couser Canyon Road (S)	All	PM	5.5	A
12) Old Highway 395 at	All	AM	28.3	C
Pala Mesa Dr (S)	All	PM	36.5	D
14) Old Highway 395 at	All	AM	20.5	C
Stewart Canyon Road (S)	All	PM	23.0	C
15) Old Highway 395 at	All	AM	22.3	C
Reche Road (S)	All	PM	45.1	D
19) Mission Road at	All	AM	24.2	C
Old Highway 395 (S)	All	PM	28.5	C
20) Mission Road at	All	AM	28.3	C
I-15 SB Ramps (S)	All	PM	18.4	B
21) Mission Road at	All	AM	20.7	C
I-15 NB Ramps (S)	All	PM	26.7	C
22) Stewart Canyon Rd at	EB LR	AM	10.5	B
HRCR/Pankey Road (U)	EB LR	PM	11.5	B
23) Horse Ranch Crk Rd at	All	AM	16.0	B
Baltimore Oriole (S)	All	PM	16.8	B
24) Horse Ranch Crk Rd at	All	AM	22.4	C
Longspur Rd (S)	All	PM	18.9	B
25) Horse Ranch Crk Rd at	All	AM	18.4	B
Harvest Glen Ln (S)	All	PM	18.7	B
26) Horse Ranch Crk Rd at	All	AM	15.5	B
Pardee South Loop (S)	All	PM	16.8	B
27) Horse Ranch Crk Rd at	WB R	AM	12.0	B
School/Park Access (U)	WB R	PM	12.9	B
28) Horse Ranch Crk Rd	All	AM	11.0	B
at Street R (S)	All	PM	10.9	B
29) Pankey/Pala Mesa Dr	All	AM	22.4	C
at Street R (S)	All	PM	38.6	D
34) SR-76 (Mission Ave) at	All	AM	38.8	D
S. Mission Rd (S)	All	PM	34.5	C

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized 2) Delay - HCM Control Delay in seconds. 3) LOS: Level of Service.

TABLE 28: HORIZON YEAR (2030) SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Existing Classification (proposed)	Horizon Year (2030) Daily Volume	LOS E Capacity	V/C	LOS
Old Highway 395					
East Mission Road to Reche Road	Collector	19,320	34,200	0.56	B
Reche Road to Stewart Canyon Road	Collector	21,823	34,200	0.64	B
Stewart Canyon Road to Tecalote Lane	Collector	20,586	34,200	0.60	B
Tecalote Lane to Pala Mesa Drive	Collector	22,383	34,200	0.65	B
Pala Mesa Drive to SR-76 (Pala Road)	Collector	22,210	34,200	0.65	B
Stewart Canyon Road					
Old Hwy 395 to Horse Ranch Creek Rd	Collector	5,841	34,200	0.17	A
Pankey Road					
Street R/Pankey Place to SR-76 (Pala Rd)	Collector	8,418	34,200	0.25	A
SR-76 (Pala Road) to Shearer Crossing	Light Collector	16,411	16,200	1.01	**F**
Horse Ranch Creek Road					
Stewart Canyon Rd to Baltimore Oriole (#23)	Light Collector	4,838	16,200	0.30	C
Baltimore Oriole (#23) to Longspur Rd (#24)	(Boulevard 4.2A)	5,636	27,000	0.21	Un
Longspur Rd (#24) to Harvest Glen Ln (#25)	(Boulevard 4.2A)	7,194	27,000	0.27	Un
Harvest Glen Ln (#25) to Intersection (#26)	(Boulevard 4.2A)	9,659	27,000	0.36	Un
Intersection (#26) to Park/School (#27)	(Boulevard 4.2A)	12,179	27,000	0.45	Un
Park/Sch (#27) to Street R/Pankey Pl (#28)	(Boulevard 4.2A)	12,379	27,000	0.46	Un
Street R/Pankey Pl (#28) to SR-76 (Pala Rd)	(Boulevard 4.2A)	6,203	27,000	0.23	Un
Pala Mesa Drive					
Old Highway 395 to Street R/Pankey Pl	Light Collector	4,483	16,200	0.28	C
Street R/Pankey Place					
Pala Mesa/Pankey to Horse Ranch Creek Rd	Light Collector	6,312	16,200	0.39	C

Notes: (proposed GP Update classification). LOS: Level of Service. V/C: Volume to Capacity ratio. Daily volumes is a 24 hour volume.
Horse Ranch Creek Road LOS for proposed classification per GP Update is noted as "Un" as under capacity and "Ov" for over capacity.

TABLE 29: HORIZON YEAR (2030) STATE ROUTE ADT VOLUMES AND LEVEL OF SERVICE

State Route 76	Lanes in	2030	AM (Eastbound)				2030	AM (Westbound)				2030	PM (Eastbound)				2030	PM (Westbound)			
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS	Vol	Dir	Cap	v/c	LOS
S Mission Rd to Via Monserate	2	1045	EB	3164	0.33	B	1794	WB	3300	0.54	C	2200	EB	3300	0.67	C	1437	WB	2122	0.68	C
Via Monserate to Gird Rd	2	1091	EB	3300	0.33	B	1765	WB	3162	0.56	C	1998	EB	2912	0.69	C	1294	WB	3300	0.39	B
Gird Rd to Sage Rd	2	1082	EB	3300	0.33	B	1610	WB	2912	0.55	C	1599	EB	3300	0.48	B	1169	WB	2912	0.40	B
Sage Rd to Old Hwy 395	2	1169	EB	1904	0.61	C	1600	WB	3300	0.48	B	1596	EB	1904	0.84	D	1381	WB	3300	0.42	B
Old Hwy 395 to I-15 SB Ramps	2	1319	EB	3030	0.44	B	1247	WB	2028	0.61	C	1454	EB	3030	0.48	B	1498	WB	2028	0.74	D
I-15 SB Ramps to I-15 NB Ramps	2	939	EB	3030	0.31	A	837	WB	3030	0.28	A	1222	EB	3030	0.40	B	1086	WB	3030	0.36	B
I-15 NB Ramps to Pankey Rd	2	641	EB	3100	0.21	A	817	WB	3030	0.27	A	1106	EB	3100	0.36	B	780	WB	3030	0.26	A
Pankey Rd to Horse Ranch Creek Rd	2	542	EB	1806	0.30	A	965	WB	1956	0.49	B	934	EB	1806	0.52	C	1050	WB	2028	0.52	C
Horse Ranch Creek Rd to Rice Cyn	2	722	EB	1806	0.40	B	1139	WB	1956	0.58	C	1219	EB	1806	0.67	C	1291	WB	2028	0.64	C
Rice Cyn to Couser Cyn	2	802	EB	3100	0.26	A	1684	WB	2382	0.71	C	977	EB	3100	0.32	B	1282	WB	2382	0.54	C

Source: SANDAG, higher volumes used btw Series 10 (2030) Cumulative Map and Series 11 (2030) coverage. Notes: Dir = Direction. Vol = Volume. Cap = Capacity.

v/c = volume to capacity ratio. LOS = Level of Service.

limits based on where 50 peak hour trips will travel, which does not extend to Olive Hill as shown in Figure 16c (intersection #33)..

TABLE 30: HORIZON YEAR (2030) FREEWAY VOLUMES AND LEVEL OF SERVICE

Freeway Segment	I-15 Rainbow Valley Blvd to Mission Rd				I-15 Mission Rd to SR-76 (Pala Rd)				I-15 SR-76 to Escondido Hwy (Old 395)			
SANDAG (Horizon Year)												
ADT	275,000				251,000				231,000			
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Number of Lanes	4	4	4	4	4	4	4	4	4	4	4	4
Capacity (1)	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400
K Factor (2)	0.0619	0.0619	0.0738	0.0738	0.0619	0.0619	0.0738	0.0738	0.0590	0.0590	0.0723	0.0723
D Factor (3)	0.5064	0.4936	0.5064	0.4936	0.5075	0.4925	0.5075	0.4925	0.4917	0.5083	0.4917	0.5083
Truck Factor (4)	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.8977	0.8977	0.8977	0.8977
Peak Hour Volume	9,384	9,147	11,188	10,905	8,584	8,330	10,234	9,931	7,465	7,717	9,148	9,457
Volume to Capacity	1.00	0.97	1.19	1.16	0.91	0.89	1.09	1.06	0.79	0.82	0.97	1.01
LOS	**F**	**E**	**F**	**F**	D	D	**F**	**F**	C	D	**E**	**F**

Notes: (1) Capacity of 2,350 passenger cars per hour per lane from Caltrans' Guide for the Preparation of Traffic Impact Studies, Dec 2002. (2) Latest K factor from Caltrans (based on 2005 data), which is the percentage of Annual Average Daily Traffic (AADT) in both directions. (3) D factor from SANDAG Series 11 split for year 2030, which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2000 data).

3.8 Horizon Year (2030) + Project Conditions

This section describes the horizon year (2030) + project conditions for AM, PM, and daily traffic conditions. The study area is based on the extent of where 50 peak hour directional project trips will travel to determine potential impacts. Because the project TAZ has the traffic coded in the traffic model, the horizon year (2030) roadway volumes already have the project volumes embedded. The long-term project assignment is used in this scenario. The peak hour intersection volumes and daily traffic volumes are shown in **Figures 27a, 27b, and 27c**.
The LOS calculated for the intersections, roadway segments, state route segments, and freeway segments are shown in **Tables 31, 32, 33a, 33b, and 34**, respectively. As shown in Tables 33a and 33b, SR-76 is calculated to operate at LOS D or better with 2 travel lanes in each direction along the project frontage (generally from Pankey Road to Horse Ranch Creek Road). To account for the future possibility of acceleration/deceleration lanes (i.e. a 4+2 lane scenario), a graphic is included in **Appendix T** that shows adequate right-of-way for a potential 4+2 lane scenario along the project frontage. Horizon year (2030) + project LOS calculations are included in **Appendix U**.

Under horizon year (2030) + project conditions, all study intersections and roadways were calculated to operate at LOS D with the exception of the following:

1) Segment of Pankey Road from SR-76 to Shearer Crossing (LOS F)
2) Freeway segment of I-15 from Rainbow Valley Blvd to Mission Road (LOS E & F AM & LOS F PM)
3) Freeway segment of I-15 from Mission Road to SR-76 (LOS F PM)
4) Freeway segment of I-15 from SR-76 to Escondido Highway (LOS E & F PM)

Of the aforementioned locations, the project is calculated to have a cumulative impact to the segment of Pankey Road from SR-76 to Shearer Crossing (LOS F). Since this segment is calculated to operate at LOS F with or without the project, the project is not preventing the County's Circulation Element roadway network from operating at its planned level of service as stated in the Public Facilities Element policy.

Figure 27a: Horizon Year (2030) + Project Volumes

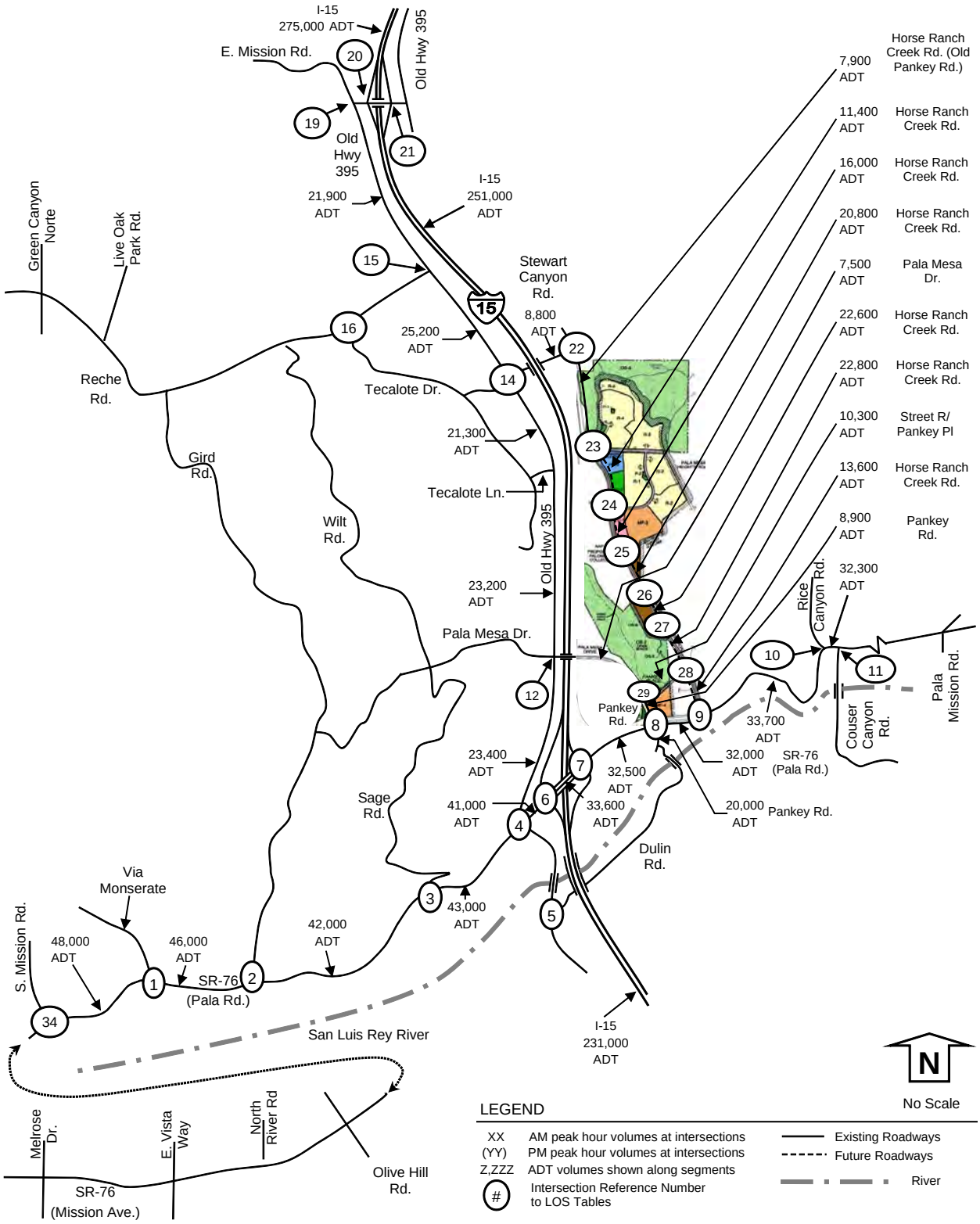
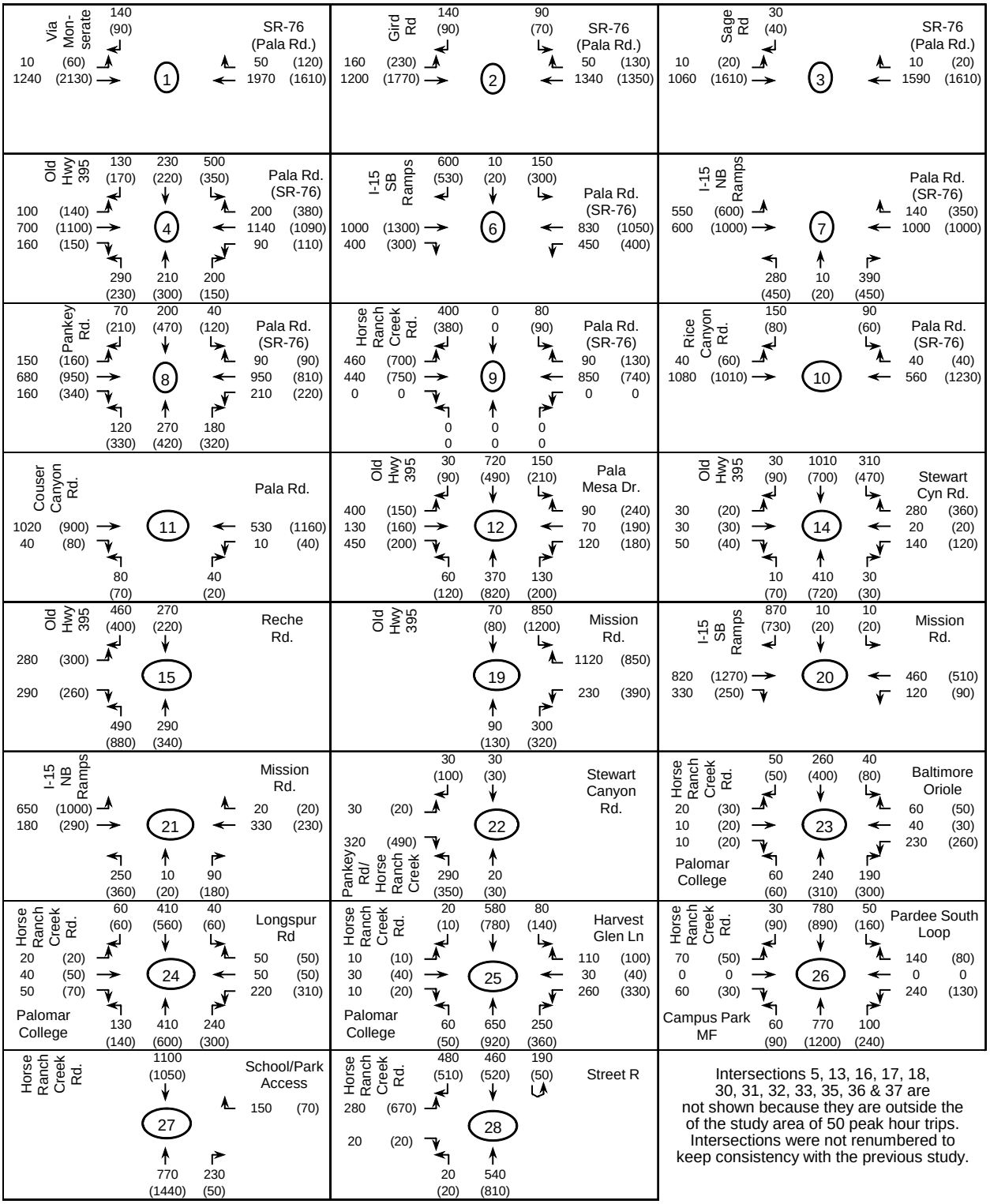
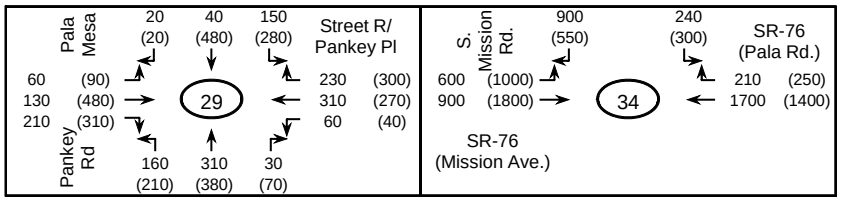


Figure 27b: Horizon Year (2030) + Project Volumes



Intersections 5, 13, 16, 17, 18, 30, 31, 32, 33, 35, 36 & 37 are not shown because they are outside the of the study area of 50 peak hour trips. Intersections were not renumbered to keep consistency with the previous study.

Figure 27c: Horizon Year (2030) + Project Volumes



Intersections 5, 13, 16, 17, 18, 30, 31, 32, 33, 35, 36 & 37 are not shown because they are outside the of the study area of 50 peak hour trips. Intersections were not renumbered to keep consistency with the previous study.

TABLE 31: HORIZON YEAR (2030) + PROJECT INTERSECTION LEVEL OF SERVICE

Intersection & (Analysis)[1]	Move-ment	Peak Hour	Horizon Year (2030) Delay[2]	Horizon Year (2030) LOS[3]	Horizon Year (2030) + Project Delay[2]	Horizon Year (2030) + Project LOS[3]	Horizon Year (2030) + Project Delta[4]	Horizon Year (2030) + Project CM Vol[5]	County Sig[6]	CMP Sig[7]
1) SR-76 (Pala Rd) at	SB R	AM	24.3	C	25.3	C	1.0	0	No	No
Via Monserate (U)	SB R	PM	19.4	C	19.7	C	0.3	0	No	No
2) SR-76 (Pala Rd) at	All	AM	12.3	B	12.5	B	0.2	NA	No	No
Gird Rd (S)	All	PM	12.6	B	13.0	B	0.4	NA	No	No
3) SR-76 (Pala Rd) at	SB R	AM	17.5	C	17.6	C	0.1	0	No	No
Sage Rd (U)	SB R	PM	17.1	C	17.9	C	0.8	0	No	No
4) SR-76 (Pala Rd) at	All	AM	43.4	D	51.0	D	7.6	NA	No	No
Old Hwy 395 (S)	All	PM	40.6	D	47.8	D	7.2	NA	No	No
6) SR-76 (Pala Rd) at	All	AM	33.6	C	34.0	C	0.4	NA	No	No
I-15 SB Ramps (S)	All	PM	32.6	C	34.1	C	1.5	NA	No	No
7) SR-76 (Pala Rd) at	All	AM	36.8	D	41.2	D	4.4	NA	No	No
I-15 NB Ramps (S)	All	PM	41.2	D	41.3	D	0.1	NA	No	No
8) SR-76 (Pala Rd) at	All	AM	23.3	C	27.8	C	4.5	NA	No	No
Pankey Road (S)	All	PM	34.9	C	45.4	D	10.5	NA	No	No
9) SR-76 (Pala Rd) at	All	AM	16.9	B	21.8	C	4.9	NA	No	No
Horse Ranch Creek Rd (S)	All	PM	15.1	B	22.9	C	7.8	NA	No	No
10) SR-76 (Pala Rd) at	All	AM	8.3	A	8.5	A	0.2	NA	No	No
Rice Canyon Road (S)	All	PM	8.2	A	8.6	A	0.4	NA	No	No
11) SR-76 (Pala Rd) at	All	AM	7.4	A	7.7	A	0.3	NA	No	No
Couser Canyon Road (S)	All	PM	5.5	A	5.7	A	0.2	NA	No	No
12) Old Highway 395 at	All	AM	28.3	C	34.2	C	5.9	NA	No	No
Pala Mesa Dr (S)	All	PM	36.5	D	52.3	D	15.8	NA	No	No
14) Old Highway 395 at	All	AM	20.5	C	22.6	C	2.1	NA	No	No
Stewart Canyon Road (S)	All	PM	23.0	C	39.9	D	16.9	NA	No	No
15) Old Highway 395 at	All	AM	22.3	C	23.3	C	1.0	NA	No	No
Reche Road (S)	All	PM	45.1	D	50.9	D	5.8	NA	No	No
19) Mission Road at	All	AM	24.2	C	27.5	C	3.3	NA	No	No
Old Highway 395 (S)	All	PM	28.5	C	37.8	D	9.3	NA	No	No
20) Mission Road at	All	AM	28.3	C	36.8	D	8.5	NA	No	No
I-15 SB Ramps (S)	All	PM	18.4	B	27.7	C	9.3	NA	No	No
21) Mission Road at	All	AM	20.7	C	22.8	C	2.1	NA	No	No
I-15 NB Ramps (S)	All	PM	26.7	C	29.9	C	3.2	NA	No	No
22) Stewart Canyon Rd at	EB LR	AM	10.5	B	12.2	B	1.7	88	No	No
HRCR/Pankey Road (U)	EB LR	PM	11.5	B	15.5	C	4.0	180	No	No
23) Horse Ranch Crk Rd at	All	AM	16.0	B	17.5	B	1.5	NA	No	No
Baltimore Oriole (S)	All	PM	16.8	B	19.6	B	2.8	NA	No	No
24) Horse Ranch Crk Rd at	All	AM	22.4	C	23.6	C	1.2	NA	No	No
Longspur Rd (S)	All	PM	18.9	B	24.9	C	6.0	NA	No	No
25) Horse Ranch Crk Rd at	All	AM	18.4	B	22.2	C	3.8	NA	No	No
Harvest Glen Ln (S)	All	PM	18.7	B	30.2	C	11.5	NA	No	No
26) Horse Ranch Crk Rd at	All	AM	15.5	B	18.9	B	3.4	NA	No	No
Pardee South Loop (S)	All	PM	16.8	B	27.3	C	10.5	NA	No	No
27) Horse Ranch Crk Rd at	WB R	AM	12.0	B	15.6	C	3.6	0	No	No
School/Park Access (U)	WB R	PM	12.9	B	18.7	C	5.8	0	No	No
28) Horse Ranch Crk Rd	All	AM	11.0	B	11.8	B	0.8	NA	No	No
at Street R (S)	All	PM	10.9	B	15.7	B	4.8	NA	No	No
29) Pankey/Pala Mesa Dr	All	AM	22.4	C	27.0	C	4.6	NA	No	No
at Street R (S)	All	PM	38.6	D	48.0	D	9.4	NA	No	No
34) SR-76 (Mission Ave) at	All	AM	38.8	D	41.2	D	2.4	NA	No	No
S. Mission Rd (S)	All	PM	34.5	C	36.2	D	1.7	NA	No	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized 2) Delay - HCM Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) CM Vol: Critical Movement Volume used to show project volumes on the critical movement. 6) County Sig: is the project have a calculated impact based on the critical volume (Yes or No). 7) CMP Sig: Congention Mangement Program significant impact based on CMP criteria (Yes or No). DNE: Does Not Exist. NA: Not Applicable.

TABLE 32: HORIZON YEAR (2030) + PROJECT SEGMENT ADT VOLUMES AND LEVEL OF SERVICE

Segment	Sept 2005 Circulation Element	Horizon Year (2030) Daily Volume	LOS E Capacity	V/C	LOS	Project Daily Volumes	Horizon Year (2030) + Project Daily Volume	LOS E Capacity	V/C	LOS	Change in V/C	Cumulative Impact?	CMP Impact?
Old Highway 395													
East Mission Road to Reche Road	Collector	19,320	34,200	0.56	B	2,580	21,900	34,200	0.64	B	0.08	No	No
Reche Road to Stewart Canyon Road	Collector	21,823	34,200	0.64	B	3,377	25,200	34,200	0.74	C	0.10	No	No
Stewart Canyon Road to Tecalote Lane	Collector	20,586	34,200	0.60	B	714	21,300	34,200	0.62	B	0.02	No	No
Tecalote Lane to Pala Mesa Drive	Collector	22,383	34,200	0.65	B	817	23,200	34,200	0.68	C	0.02	No	No
Pala Mesa Drive to SR-76 (Pala Road)	Collector	22,210	34,200	0.65	B	1,190	23,400	34,200	0.68	C	0.03	No	No
Stewart Canyon Road													
Old Hwy 395 to Horse Ranch Creek Rd	Collector	5,841	34,200	0.17	A	2,959	8,800	34,200	0.26	A	0.09	No	No
Pankey Road													
Street R/Pankey Place to SR-76 (Pala Rd)	Collector	8,418	34,200	0.25	A	483	8,900	34,200	0.26	A	0.01	No	No
SR-76 (Pala Road) to Shearer Crossing	Light Collector	16,411	16,200	1.01	**F**	3,589	20,000	16,200	1.23	**F**	0.22	**Yes**	**Yes**
Horse Ranch Creek Road													
Stewart Canyon Rd to Baltimore Oriole (#23)	Light Collector	4,838	16,200	0.30	C	3,062	7,900	16,200	0.49	D	0.19	No	No
Baltimore Oriole (#23) to Longspur Rd (#24)	(Boulevard 4.2A)	5,636	27,000	0.21	Un	5,764	11,400	27,000	0.42	Un	0.21	No	No
Longspur Rd (#24) to Harvest Glen Ln (#25)	(Boulevard 4.2A)	7,194	27,000	0.27	Un	8,806	16,000	27,000	0.59	Un	0.33	No	No
Harvest Glen Ln (#25) to Intersection (#26)	(Boulevard 4.2A)	9,659	27,000	0.36	Un	11,141	20,800	27,000	0.77	Un	0.41	No	No
Intersection (#26) to Park/School (#27)	(Boulevard 4.2A)	12,179	27,000	0.45	Un	10,421	22,600	27,000	0.84	Un	0.39	No	No
Park/Sch (#27) to Street R/Pankey Pl (#28)	(Boulevard 4.2A)	12,379	27,000	0.46	Un	10,421	22,800	27,000	0.84	Un	0.39	No	No
Street R/Pankey Pl (#28) to SR-76 (Pala Rd)	(Boulevard 4.2A)	6,203	27,000	0.23	Un	7,397	13,600	27,000	0.50	Un	0.27	No	No
Pala Mesa Drive													
Old Highway 395 to Street R/Pankey Pl	Light Collector	4,483	16,200	0.28	C	3,017	7,500	16,200	0.46	D	0.19	No	No
Street R/Pankey Place													
Pala Mesa/Pankey to Horse Ranch Creek Rd	Light Collector	6,312	16,200	0.39	C	3,988	10,300	16,200	0.64	D	0.25	No	No

Notes: (proposed GP Update classification). LOS: Level of Service. V/C: Volume to Capacity ratio. Daily volumes is a 24 hour volume.
Horse Ranch Creek Road LOS for proposed classification per GP Update is noted as "Un" as under capacity and "Ov" for over capacity.

TABLE 33A: HORIZON YEAR (2030) + PROJECT STATE ROUTE ADT VOLUMES AND LEVEL OF SERVICE (AM)

State Route 76 Study Limits	Lanes in each dir	2030 Vol	AM (Eastbound) Dir	Cap	v/c	LOS	P Vol	2030+P Vol	v/c	LOS	v/c Delta	Impact?	2030 Vol	AM (Westbound) Dir	Cap	v/c	LOS	P Vol	2030+P Vol	v/c	LOS	v/c Delta	Impact?
S Mission Rd to Via Monserate	2	1045	EB	3164	0.33	B	47	1092	0.35	B	0.01	No	1794	WB	3300	0.54	C	46	1840	0.56	C	0.01	No
Via Monserate to Gird Rd	2	1091	EB	3300	0.33	B	49	1140	0.35	B	0.01	No	1765	WB	3162	0.56	C	51	1816	0.57	C	0.02	No
Gird Rd to Sage Rd	2	1082	EB	3300	0.33	B	49	1131	0.34	B	0.01	No	1610	WB	3300	0.49	B	51	1661	0.50	B	0.02	No
Sage Rd to Old Hwy 395	2	1169	EB	1904	0.61	C	49	1218	0.64	C	0.03	No	1600	WB	3300	0.48	B	51	1651	0.50	B	0.02	No
Old Hwy 395 to I-15 SB Ramps	2	1319	EB	3030	0.44	B	24	1343	0.44	B	0.01	No	1247	WB	2028	0.61	C	18	1265	0.62	C	0.01	No
I-15 SB Ramps to I-15 NB Ramps	2	939	EB	3030	0.31	A	83	1022	0.34	B	0.03	No	837	WB	3030	0.28	A	157	994	0.33	B	0.05	No
I-15 NB Ramps to Pankey Rd	2	641	EB	3100	0.21	A	201	842	0.27	A	0.06	No	817	WB	3030	0.27	A	228	1045	0.34	B	0.08	No
Pankey Rd to Horse Ranch Creek Rd	2	542	EB	1806	0.30	A	220	762	0.42	B	0.12	No	965	WB	1956	0.49	B	219	1184	0.61	C	0.11	No
Horse Ranch Creek Rd to Rice Cyn	2	722	EB	1806	0.40	B	40	762	0.42	B	0.02	No	1139	WB	1956	0.58	C	45	1184	0.61	C	0.02	No
Rice Cyn to Couser Cyn	2	802	EB	2382	0.34	B	38	840	0.35	B	0.02	No	1684	WB	3100	0.54	C	40	1724	0.56	C	0.01	No

Source: SANDAG, higher volumes used btw Series 10 (2030) Cumulative Map and Series 11 (2030) coverage. Notes: Dir = Direction. Vol = Volume. Cap = Capacity.

v/c = volume to capacity ratio. LOS = Level of Service. P: Project.

limits based on where 50 peak hour trips will travel, which does not extend to Olive Hill as shown in Figure 16c (intersection #33).

TABLE 33B: HORIZON YEAR (2030) + PROJECT STATE ROUTE ADT VOLUMES AND LEVEL OF SERVICE (PM)

State Route 76 Study Limits	Lanes in each dir	2030 Vol	PM (Eastbound) Dir	Cap	v/c	LOS	P Vol	2030+P Vol	v/c	LOS	v/c Delta	Impact?	2030 Vol	PM (Westbound) Dir	Cap	v/c	LOS	P Vol	2030+P Vol	v/c	LOS	v/c Delta	Impact?
S Mission Rd to Via Monserate	2	2200	EB	3300	0.67	C	73	2273	0.69	C	0.02	No	1437	WB	2122	0.68	C	64	1501	0.71	C	0.03	No
Via Monserate to Gird Rd	2	1998	EB	2912	0.69	C	79	2077	0.71	D	0.03	No	1294	WB	3300	0.39	B	67	1361	0.41	B	0.02	No
Gird Rd to Sage Rd	2	1599	EB	3300	0.48	B	79	1678	0.51	B	0.02	No	1169	WB	2912	0.40	B	67	1236	0.42	B	0.02	No
Sage Rd to Old Hwy 395	2	1596	EB	2300	0.69	C	79	1675	0.73	D	0.03	No	1381	WB	3300	0.42	B	67	1448	0.44	B	0.02	No
Old Hwy 395 to I-15 SB Ramps	2	1454	EB	3030	0.48	B	32	1486	0.49	B	0.01	No	1498	WB	2028	0.74	D	33	1531	0.75	D	0.02	No
I-15 SB Ramps to I-15 NB Ramps	2	1222	EB	3030	0.40	B	135	1357	0.45	B	0.04	No	1086	WB	3030	0.36	B	199	1285	0.42	B	0.07	No
I-15 NB Ramps to Pankey Rd	2	1106	EB	3100	0.36	B	343	1449	0.47	B	0.11	No	780	WB	3030	0.26	A	282	1062	0.35	B	0.09	No
Pankey Rd to Horse Ranch Creek Rd	2	934	EB	1806	0.52	C	346	1280	0.71	C	0.19	No	1050	WB	2028	0.52	C	307	1357	0.67	C	0.15	No
Horse Ranch Creek Rd to Rice Cyn	2	1219	EB	1806	0.67	C	61	1280	0.71	C	0.03	No	1291	WB	2028	0.64	C	66	1357	0.67	C	0.03	No
Rice Cyn to Couser Cyn	2	977	EB	3100	0.32	B	55	1032	0.33	B	0.02	No	1282	WB	2382	0.54	C	61	1343	0.56	C	0.03	No

Source: SANDAG, higher volumes used btw Series 10 (2030) Cumulative Map and Series 11 (2030) coverage. Notes: Dir = Direction. Vol = Volume. Cap = Capacity.

v/c = volume to capacity ratio. LOS = Level of Service. P: Project.

limits based on where 50 peak hour trips will travel, which does not extend to Olive Hill as shown in Figure 16c (intersection #33).

TABLE 34: HORIZON YEAR (2030) + PROJECT FREEWAY VOLUMES AND LEVEL OF SERVICE

Freeway Segment	I-15 Rainbow Valley Blvd to Mission Rd				I-15 Mission Rd to SR-76 (Pala Rd)				I-15 SR-76 to Escondido Hwy (Old 395)			
SANDAG (Horizon Year)												
ADT	275,000				251,000				231,000			
Peak Hour	A M		P M		A M		P M		A M		P M	
Direction	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Number of Lanes	4	4	4	4	4	4	4	4	4	4	4	4
Capacity (1)	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400	9,400
K Factor (2)	0.0619	0.0619	0.0738	0.0738	0.0619	0.0619	0.0738	0.0738	0.0590	0.0590	0.0723	0.0723
D Factor (3)	0.5064	0.4936	0.5064	0.4936	0.5075	0.4925	0.5075	0.4925	0.4917	0.5083	0.4917	0.5083
Truck Factor (4)	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.9186	0.8977	0.8977	0.8977	0.8977
Peak Hour Volume	9,384	9,147	11,188	10,905	8,584	8,330	10,234	9,931	7,465	7,717	9,148	9,457
Volume to Capacity	1.00	0.97	1.19	1.16	0.91	0.89	1.09	1.06	0.79	0.82	0.97	1.01
LOS	**F**	**E**	**F**	**F**	D	D	**F**	**F**	C	D	**E**	**F**
Project Pk Hr Vol	99	68	97	136	14	9	13	19	73	86	128	102
SANDAG (Horizon Year + Project)												
Peak Hour Volume	9,483	9,215	11,285	11,041	8,598	8,339	10,247	9,950	7,538	7,803	9,276	9,559
Volume to Capacity	1.01	0.98	1.20	1.17	0.91	0.89	1.09	1.06	0.80	0.83	0.98	1.02
LOS	**F**	**E**	**F**	**F**	D	D	**F**	**F**	D	D	**E**	**F**
Increase in V/C	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
County Impact?	No	No	No	No	No	No	No	No	No	No	No	No
CMP Impact?	No	No	No	No	No	No	No	No	No	No	No	No

Notes: (1) Capacity of 2,350 passenger cars per hour per lane from Caltrans' Guide for the Preparation of Traffic Impact Studies, Dec 2002. (2) Latest K factor from Caltrans (based on 2005 data), which is the percentage of Annual Average Daily Traffic (AADT) in both directions. (3) D factor from SANDAG Series 11 split for year 2030, which when multiplied by K and ADT will provide peak hour volume. (4) Latest truck factor from Caltrans (based on 2000 data). CMP: Congestion Management Program.

3.9 Ramps

Per Caltrans' personnel, on-ramp meters are typically installed if demand warrants metering based on actual conditions. Thus, an on-ramp metering analysis was not done as part of this traffic study.

3.10 Congestion Management Program

To meet the CMP analysis requirements, a computerized traffic model was utilized and the CMP thresholds were applied to the study elements and shown in the appropriate LOS tables.

3.11 Hazards Due To An Existing Transportation Design Feature

Design standards are continually updated, and as such, existing roadways have been constructed per older standards creating potential hazards according to current standards.

State Route 76 has several potential hazards as identified in the *SR-76 East Corridor Study* prepared by Reservation Transportation Authority dated March 2007 (excerpts included in **Appendix V**). In vicinity of the project, the identified potential hazards on SR-76 include a curve correction from Post Mile (PM) 18.80 to 19.00 and left turn channelization at Rice Canyon Road PM 19.39.

3.12 Hazards To Pedestrians or Bicyclists

Any required improvements will be constructed to maintain existing conditions or meet County standards as they relate to pedestrians and bicyclists. New trails for pedestrians and bicyclists are proposed throughout the development. A trails graphic is included at the end of **Appendix W**.

The intersection calculations incorporate potential pedestrian calls to cross an intersection. A pedestrian call includes a single person, group of people, or persons with a horse or other domesticated animal crossing an intersection.

3.13 Parking Capacity

In addition to meeting the County parking requirements, the project provides an additional 423 parking spaces overall as shown in **Table 35**.

TABLE 35: PARKING CAPACITY

Area and Land Use		Parking Rate per County Code	Units or Size	Parking Required	Parking Provided
Multi-Family 1					
	Residential (3 BR)	2 spaces/unit	92 units	184	184
	Residential (2 BR)	1.5 spaces/unit	100 units	150	200
	Guest	0.2 spaces/unit	192 units	38	75
Multi-Family 2					
	Residential (3 BR)	2 spaces/unit	48 units	96	96
	Residential (2 BR)	1.5 spaces/unit	18 units	27	36
	Guest	0.2 spaces/unit	66 units	13	19
Multi-Family 3					
	Residential (3 BR)	2 spaces/unit	189 units	378	378
	Guest	0.2 spaces/unit	189 units	38	127
Multi-Family 4					
	Residential (3 BR)	2 spaces/unit	108 units	216	216
	Guest	0.2 spaces/unit	108 units	22	84
Professional Office 1					
	Office	4.5 spaces/1,000 sf	40,000 sf	180	189
Professional Office 2					
	Office	4.5 spaces/1,000 sf	117,000 sf	527	531
Town Center					
	Retail	4.5 spaces/1,000 sf	49,200 sf	221	237
	Restaurant	12 spaces/1,000 sf	12,000 sf	144	154
Sports Complex					
	Participant Sport	5 spaces/1,000 sf	2,400 sf	12	71
	Recreation Lot	None	NA	0	31
Pump Station/Staging Area					
	Pump Station & Staging Area	None	NA	0	41
		Total Required Parking and Provided Parking		**2,246**	**2,669**
			Additional Parking		**423**

NA: Not Applicable. Recreation lot and staging areas do no have rates identified in the County parking schedules.

3.14 Alternative Transportation

No nearby transit service routes are published; however, the project applicant will work with applicable transit authorities to promote transit service with bus turnouts that will serve the proposed project. Campus Park in combination with the surrounding projects will create the ideal General Plan Update transit area – a mixed-use development of residential, retail, office, park, and higher education uses. Transit services, including bus turn-outs, are planned along Horse Ranch Creek Road. Campus Park proposes to locate high density housing closer to the transit service. In addition, project trails and pathways will provide easy accessibility for all residents of Campus Park.

3.15 Project Access and On-Site Circulation

On-site circulation is proposed by several new roadways as shown on the vested tentative map/grading plans. All project roadway designs will be submitted under separate cover to meet County safety standards. Horse Ranch Creek Road shall be designed per General Plan Update Boulevard Standards. Pala Mesa Road and Pankey Place/Street R will be designed per current adopted County standards. The proposed internal roads and cul-de-sac streets would provide efficient on-site circulation and logical connections to Horse Ranch Creek Road. All internal streets would be constructed with streetlights and standard curbs and gutters and are designed to accommodate anticipated long-term traffic volumes. On-street parking would be permitted along both sides of all proposed internal roads and cul-de-sac streets. Parking would not be permitted along Horse Ranch Creek Road, Pala Mesa Drive, Pankey Place (aka Street R), Baltimore Oriole Road, Pala Mesa Heights Road, Longspur Road, and Harvest Glen Lane.

All intersection designs will also be submitted under separate cover to meet County safety standards. Off-site improvements to several area intersections and street segments are proposed to accommodate Project traffic and reduce traffic congestion in the Fallbrook area. The proposed off-site improvements are described in detail under Section 5.6.

4.0 Impact Summary

4.1 Impact Summary Table

The project is calculated to have direct and cumulative impacts based on the County of San Diego and Congestion Management Program significance criteria. There are several intersections and roadway segments that will be constructed by the applicant for access to the project site. Because these intersections and roadway segments currently do not exist, they could not be analyzed and identified as impacted locations. Therefore, the proposed intersections and roadway segments needed for access to the project site are described in Section 5. The direct and cumulative impact findings are summarized below in **Table 36**.

TABLE 36: IMPACT SUMMARY TABLE

Facility	Direct Impact Locations	Cumulative Impact Locations
Intersections	1) SR-76/I-15 NB Ramp (#7) 2) Old Hwy 395/Reche Road (#15)	1) SR-76/Melrose Dr 2) SR-76/E Vista Way 3) SR-76/North River Rd 4) SR-76/Olive Hill Rd 5) SR-76/S Mission Rd 6) SR-76/Via Monserate 7) SR-76/Gird Rd 8) SR-76/Sage Road 9) SR-76/Old Hwy 395 10) SR-76/I-15 SB Ramp 11) SR-76/I-15 NB Ramp 12) SR-76/Pankey Road 13) SR-76/Rice Canyon Road 14) SR-76/Couser Canyon Road 15) Mission Rd at Old Hwy 395 16) Mission Road at I-15 SB Ramp 17) Mission Road at I-15 NB Ramp 18) Old Hwy 395/Reche Rd 19) Old Hwy 395/Stewart Canyon Rd 20) Old Hwy 395/Pala Mesa Dr 21) Old Hwy 395/Dulin Rd 22) Reche Rd/Live Oak Park Rd
Segments and State Routes	1) SR-76 (S Mission Rd to Gird Rd) 2) SR-76 (Sage Rd to Old Hwy 395) 3) SR-76 (I-15 SB Ramp to I-15 NB Ramp) 4) SR-76 (Horse Ranch Creek Rd to Couser Canyon Rd)[1]	1) Old Hwy 395 from E Mission Rd to W Lilac Rd 2) Reche Rd from Green Canyon Norte to Gird Rd 3) Pankey Rd from SR-76 to Shearer Crossing 4) Pala Mesa Dr from Wilt Rd/Sage Rd to Old Hwy 395 5) SR-76 Melrose Dr to Old Hwy 395 6) SR-76 from I-15 SB Ramp to I-15 NB Ramp 7) SR-76 from Horse Ranch Creek Rd to Pala Mission Rd[2]
Freeways	None	None
Ramps	None	None
Various Roadways Elements	Modification to roadway standards have been submitted or approved for Horse Ranch Creek Road GP Update Boulevard Standard, driveway spacing, and sight distance triangles.	None

Notes: (1) Impact is only between Granite Driveway and Couser Canyon Road; however, segment is labeled from Horse Ranch Creek Road to match segment limits used in this study. (2) Impact is only between Granite Driveway and Pala Mission Road; however, segment is labeled from Horse Ranch Creek Road to match segment limits used in this study.

4.2 Road Segments

4.2.1 Guidelines for the Determination of Significance

Based on the San Diego County *Guidelines for Determining Significance and Report Format and Content Requirements Transportation and Traffic*, December 5, 2007, a project may have a direct and or cumulative impact if the significance criteria are exceeded as shown in **Table 37**.

TABLE 37: COUNTY OF SAN DIEGO SIGNIFICANT TRAFFIC IMPACT THRESHOLDS – ROAD SEGMENTS

Measures of Significant Project Impacts to Congestion Allowable Increases on Congested Roads			
	Road Segments		
Operations	2-Lane Road	4-Lane Road	6-Lane Road
LOS E	200 ADT	400 ADT	600 ADT
LOS F	100 ADT	200 ADT	300 ADT

Source: County of San Diego *Guidelines for Determining Significance* Table 1 from page 13.

A direct impact would occur when the significance criteria is exceeded. If the proposed project exceeds the values provided in the above table, then the individually proposed project would result in a direct traffic impact. Specific improvements to mitigate direct impacts must be identified.

A cumulative impact would occur when two conditions are met: 1) will build-out of all near-term projects result in a cumulative traffic impact and 2) does the amount of traffic generated by the individual proposed project contribute (even in a small part) to that cumulative impact. Both conditions must be met for an individual project to result in a cumulative traffic impact. If the traffic generated from all the near-term projects (cumulative projects) would result in a cumulative traffic impact then condition one is met. If the total amount of traffic generated exceeds the values provided in the above table, then condition two is met and the individually proposed project would result in a cumulative traffic impact. Fair-share contributions toward cumulative impacts may only be provided when a specific project and schedule for completion of the project has been identified.

The County of San Diego *Guidelines for Determining Significance and Report Format and Content Requirements Transportation and Traffic*, dated December 5, 2007 includes a summary of how a project's potential traffic impact would be perceptible to the average driver on roadway segments:

> "Based on these criteria [Table above], an impact from new development on an LOS E road would be reached when the increase in average daily trips (ADT) on a two-lane road exceeds 200 ADT. Using SANDAG's "Brief Guide for Vehicular Traffic Generation Rates for the San Diego Region" for most discretionary projects this would generate less than 25 peak hour trips. On average, during peak hour conditions, this would be only one additional car every 2.4 minutes. Therefore, the addition of 200 ADT, in most cases, would result in changes to traffic flow that would not be noticeable to the average driver and therefore would not constitute a significant impact on the roadway. Significance criteria were also established for four-lane and six-lane roads operating at LOS E and are based upon the above 24 hour ADT significance criterion established for two-lane roads.

The two-lane road criterion was doubled to determine impacts to four-lane roads and tripled to determine impacts to six-lane roads. This was considered to be conservative since the 24 hour per lane road capacity for a 4-lane road is more than double that of a two-lane road and the per lane capacity of a six-lane road is more than triple that of the two-lane road. For LOS E roads, the additional significance criteria are 400 ADT for a four-lane road and 600 ADT for a six-lane road. Similar to criterion for two-lane road, the 400 ADT for a 4-lane road and 600 ADT for a 6-lane road criteria would generate less than 25 per lane peak hour trips for most discretionary projects. On average, during peak hour conditions, this would be only one additional car per lane every 2.4 minutes. The addition of 200 ADT per lane (400 ADT for a 4 lane road or 600 for a 6-lane road), in most cases, would result in changes to traffic flow that would not be noticeable to the average driver and therefore would not constitute a significant impact on the roadway…"

"The second significance criteria listed in [Table above] addresses roadways presently operating at LOS F. Under LOS F congested conditions, small changes and disruptions to the traffic flow on County Circulation Element Road can have a greater effect on traffic operations when compared to other LOS conditions. In order to better account for potential effects of increased traffic on LOS F road more stringent significance criteria was established when compared to that for LOS E. Based on this guidance, an impact from new development on an LOS F road would be reached when the increase in average daily trips (ADT) on a two-lane road exceeds 100. Again, using SANDAG's "Brief Guide for Vehicular Traffic Generation Rates for the San Diego Region" for most discretionary projects this would generate less than 12.5 peak hour trips. On average, during peak hour conditions, this would be only one additional car every 4.8 minutes. The addition of 100 ADT, in most cases, would not be noticeable to the average driver and therefore would not constitute a significant impact on the roadway. The same approach used to determine significance criteria for four-lane and six-lane roads operating at LOS E was used to determine appropriate significance criteria for four-lane and six-lane road operating at LOS F. Based on this approach, the significance criteria for a four-lane road (200 ADT) and for a six-lane road (300 ADT) would generate less than 12.5 per lane peak hour trips for most discretionary projects. On average, during peak hour conditions, this would be only one additional car per lane every 4.8 minutes. The addition of 100 per lane ADT (200 ADT for a 4-lane and 300 ADT for a 6-lane road) would, in most cases, not be noticeable to the average driver and therefore would not constitute a significant impact on the roadway. In summary, under extremely congested LOS F conditions, small changes and disruptions to the traffic flow can significantly affect traffic operations and additional project traffic can increase the likelihood or frequency of these events. Therefore, the LOS F ADT significance criteria was set at 100 ADT (50% of the LOS E threshold) to provide a higher level of assurance that the traffic allowed under the threshold would not significantly impact traffic operation on the road segment."

4.2.2 Significance of Impacts Prior to Mitigation

Without mitigation the calculated direct and cumulative impacts as shown in Table 36 would cause delays beyond the amounts listed as allowable per the significance criteria.

4.3 Intersections (Signalized & Un-signalized)

4.3.1 Guidelines for the Determination of Significance

Based on the San Diego County *Guidelines for Determining Significance and Report Format and Content Requirements Transportation and Traffic*, December 5, 2007, a project may have a direct and or cumulative impact if the significance criteria are exceeded as shown in **Table 38**.

TABLE 38: COUNTY OF SAN DIEGO SIGNIFICANT TRAFFIC IMPACT THRESHOLDS - INTERSECTIONS

Measures of Significant Project Impacts to Congestion Allowable Increases on Congested Intersections		
	Intersections	
Operations	Signalized	Un-signalized
LOS E	Delay of 2 seconds	20 peak hour trips on a critical movement
LOS F	Delay of 1 second, or 5 peak hour trips on a critical movement	5 peak hour trips on a critical movement

Source: County of San Diego *Guidelines for Determining Significance* Table 2 from page 13. Note: A critical movement is one that is experiencing excessive queues.

A direct impact would occur when the significance criteria is exceeded. If the proposed project exceeds the values provided in the above table, then the individually proposed project would result in a direct traffic impact. Specific improvements to mitigate direct impacts must be identified.

A cumulative impact would occur when two conditions are met: 1) will build-out of all near-term projects result in a cumulative traffic impact and 2) does the amount of traffic generated by the individual proposed project contribute (even in a small part) to that cumulative impact. Both conditions must be met for an individual project to result in a cumulative traffic impact. If the traffic generated from all the near-term projects (cumulative projects) would result in a cumulative traffic impact then condition one is met. If the total amount of traffic generated exceeds the values provided in the above table, then condition two is met and the individually proposed project would result in a cumulative traffic impact. Fair-share contributions toward cumulative impacts may only be provided when a specific project and schedule for completion of the project has been identified.

The County of San Diego *Guidelines for Determining Significance and Report Format and Content Requirements Transportation and Traffic*, dated December 5, 2007 includes a summary of how a project's potential traffic impact would be perceptible to the average driver at intersection:

> "The significance criterion for signalized intersections listed in [Table above] allows an increase in the overall delay at an intersection operating at LOS E of two seconds. This is consistent with the capacity threshold contained in the SANDAG's CMP and guidelines established by the City of San Diego. A delay of two seconds is a small fraction of the typical cycle length for a signalized intersection that ranges between 60 and 120 seconds. The likelihood of increased queues forming due to the additional two seconds of delay is low. Therefore, an increased wait time of two seconds, on average, would result in changes to traffic flow that would not be noticeable to the average driver. Therefore the significance guideline for intersections operating at LOS E is two seconds."

"The primary significance criterion for signalized intersections operating at LOS F conditions was based upon increased delay at the intersection. Under LOS F congested conditions, small changes and disruptions to the traffic flow to signalized intersection can have a greater effect on overall intersection operations when compared to other LOS conditions. In order to better account for potential effects of increased traffic at signalized intersections operating at LOS F, a more stringent guideline was established when compared to signalized intersection operating at LOS E. A significance guideline of an increased delay of 1 second was established for signalized intersections operating at LOS F. An increase in the overall delay at an intersection of one second, on average, would result in changes to traffic flow that would not be noticeable to the average driver. Therefore the significance guideline for intersections operating at LOS F is 1 second."

"Signalized intersections operating at LOS F also have the potential for substantial queuing at specific turning movements that may detrimentally effect overall intersection and/or road segment operations. Thus, an increase of peak hour trips to a critical move was also established as a secondary significance criterion for signalized intersections. A critical movement would be a movement or a lane at an intersection that is experiencing queuing or substantial delay and is affecting the overall operation of the intersection. The increase in peak hour trips to a critical move is a measurement of how many cars can be added to an existing queue. The addition of five trips (peak hour) per critical movement will normally be considered a significant impact. This significance criterion was selected because the five additional trips spread out over the peak hour would not significantly increase the length of an existing queue and would not be noticeable to the average driver (one trip every 12 minutes or 720 seconds). For LOS E intersections, the 5 peak hour trips to a critical movement would not be noticeable to the average driver since the one additional trip during the 12 minute interval on average would clear the traffic signal cycles well within the 12 minute period. It should also be noted that if the 5 additional peak hour trips arrived at the same time, these trips would also clear the traffic cycle and existing queue lengths would be re-established."

"The significance guidelines for unsignalized intersections identify a minimum number of trips added to a critical movement at an unsignalized intersection. Since the operations of unsignalized intersections under congested conditions are heavily influenced by traffic volume increases on critical moves, the significance guidelines for unsignalized intersections were based upon the number of trips added to a critical movement. This guideline directly relates to the number of vehicles that can be added to an existing queue that forms at the intersection. A significance criteria of twenty trips (peak hour) per critical movement was used for LOS E conditions. Although delays drivers experience under LOS E conditions may be noticeable, they are not yet considered unacceptable. The twenty trips spread out over the peak hour would not likely cause the intersection delay or existing queue lengths to become unacceptable. The twenty trips (peak hour) would not be noticeable to the average driver. A significance guideline of five trips (peak hour) per critical movement was used for LOS F conditions. The five trips spread out over the peak hour would not significantly increase the length of an existing queue and would not be noticeable to the average driver."

"The operations of unsignalized intersections under congested conditions are heavily

influenced by traffic volumes increases on critical moves. Therefore, the significance guidelines for unsignalized intersections are based upon the number of peak hour trips added to a critical movement at that intersection. This guideline examines the number of vehicles that may be added to an existing queue that forms at the intersection by the additional traffic generated by a project. In LOS E situations, the delays that drivers experience are noticeable, but are not considered excessive. A peak hour increase of twenty trips to the critical movement of an unsignalized intersection would be, on average, one additional car every 3.0 minutes or 180 seconds. Assuming the average wait time for a vehicle in the critical movement queue is less than 3.0 minutes, which is typical for LOS E conditions, this would not be noticeable to the average driver and would not be considered a significant impact."

"For LOS F conditions, a significance threshold of five trips (peak hour) per critical movement was used. The five trips spread out over the peak hour would not significantly increase the length of an existing queue and would not be noticeable to the average driver. Five trips spread out over an hour would be one car every 12 minutes. This typically exceeds the average wait time in the queue and would not be noticeable to the average driver."

4.3.2 Significance of Impacts Prior to Mitigation

Without mitigation the calculated direct and cumulative impacts as shown in Table 36 would cause delays beyond the amounts listed as allowable per the significance criteria.

4.4 Ramps

Per Caltrans' personnel, on-ramp meters are typically installed if demand warrants metering based on actual conditions. Thus, an on-ramp metering analysis was not done as part of this traffic study.

4.5 Congestion Management Program

To meet the CMP analysis requirements, a computerized traffic model was utilized and the CMP thresholds were applied to the study elements and shown in the appropriate LOS tables.

4.6 Hazards Due To An Existing Transportation Design Feature

State Route 76 has several potential hazards as identified in the *SR-76 East Corridor Study* prepared by Reservation Transportation Authority dated March 2007. In vicinity of the project, the identified potential hazards on SR-76 include a curve correction from Post Mile (PM) 18.80 to 19.00 and left turn channelization at Rice Canyon Road PM 19.39. New alignments and widening of SR-76 east of I-15 are proposed by the Granite Construction Company and the Warner Ranch project applicant that will mitigate the aforementioned potential hazards.

4.7 Hazards To Pedestrians or Bicyclists

Any required improvements will be constructed to maintain existing conditions or meet County standards as they relate to pedestrians and bicyclists. New trails for pedestrians and bicyclists are proposed throughout the development. A trails graphic is included in **Appendix W**.

The intersection calculations incorporate potential pedestrian calls to cross an intersection. A pedestrian call includes a single person, group of people, or persons with a horse or other domesticated animal crossing an intersection.

4.8 Parking Capacity

The parking capacity exceeds the required parking by an additional 423 spaces as documented previously in Table 35. Required parking and provided parking for the various project elements are identified on the project plans.

4.9 Alternative Transportation

No nearby transit service routes are published; however, the project applicant will work with applicable transit authorities to promote transit service with bus turnouts that will serve the proposed project. Campus Park in combination with the surrounding projects will create the ideal General Plan Update transit area – a mixed-use development of residential, retail, office, park, and higher education uses. Transit service, including bus turn-outs, is planned along Horse Ranch Creek Road. Campus Park proposes to locate high density housing closer to the transit service. In addition, project trails and pathways will provide easy accessibility for all residents of Campus Park.

4.10 Project Access and On-Site Circulation

All project roadway designs will be submitted under separate cover to meet County safety standards. Horse Ranch Creek Road shall be designed per General Plan Update Boulevard Standards. Pala Mesa Road and Pankey Place/Street R will be designed per current adopted County standards. The proposed internal roads and cul-de-sac streets would provide efficient on-site circulation and logical connections to Horse Ranch Creek Road. All internal streets would be constructed with streetlights and standard curbs and gutters and are designed to accommodate anticipated long-term traffic volumes. On-street parking would be permitted along both sides of all proposed internal roads and cul-de-sac streets. Parking would not be permitted along Horse Ranch Creek Road, Pala Mesa Drive, Pankey Place (aka Street R), Baltimore Oriole Road, Pala Mesa Heights Road, Longspur Road, and Harvest Glen Lane.

All intersection designs will also be submitted under separate cover to meet County safety

standards. Off-site improvements to several area intersections and street segments are proposed to accommodate Project traffic and reduce traffic congestion in the Fallbrook area. The proposed off-site improvements are described in detail under Section 5.6.

4.10.1 Project Driveway Corner Sight Distance Analysis

Landmark Consulting will submit to the County of San Diego under separate cover sight distance triangles for the required intersections as related to driveway corner sight distance requirements.

4.10.2 Project Driveway Spacing Analysis

Landmark Consulting has submitted to the County of San Diego under separate cover a request for a modification to a road standard for the project as related to driveway spacing requirements. A copy of the approved modification to a roadway standard for driveway spacing requirements is included in **Appendix X**.

4.10.3 Project Landscaping Along Right-of-Way

The landscaping plan will be evaluated for safety under separate cover.

5.0 Summary of Project Impacts, Mitigation, and Design Features

The project is calculated to have direct and cumulative impacts based on the County of San Diego and Congestion Management Program significance criteria. This section describes the mitigation measures required to bring the calculated impacts to below a level of significance, and documents the intersections and roadways proposed for construction as part of the project. Additionally, the existing widening of SR-76 east of I-15 is described in this section because the additional capacity based on the widening was accounted for in the analysis.

5.1 Direct Project Impacts and Recommended Mitigation Measures

The project is calculated to have direct impacts at two intersections and along six state route segments.

The direct intersection impacts are calculated to operate at acceptable levels of service with the proposed mitigation measures as shown in **Table 39** (Intersection calculations and the signal warrant for Old Highway 395 at Reche Road are included in **Appendix Y**).

TABLE 39: DIRECT IMPACT INTERSECTION OPERATIONS WITH RECOMMENDED MITIGATION MESURES

Intersection & (Analysis)[1]	Move-ment	Peak Hour	Existing		Existing + Project				County Sig[6]	CMP Sig[7]
			Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delta[4]	CM Vol[5]		
7) SR-76 (Pala Rd) at	All	AM	22.4	C	28.6	C	6.2	NA	No	No
I-15 NB Ramps (S)	All	PM	46.7	D	63.7	**E**	17.0	NA	**Yes**	**Yes**
With Mitigation of adding a one clover leaf to the interchange (mitigates the impact as shown below with acceptable LOS)										
7) SR-76 (Pala Rd) at	All	AM			11.2	B	NA	NA	No	No
I-15 NB Ramps (S)	All	PM			21.4	C	NA	NA	No	No
15) Old Highway 395 at	EB LR	AM	18.4	C	39.5	**E**	NA	20	**Yes**	NA
Reche Road (U)	EB LR	PM	35.9	**E**	219.2	**F**	NA	45	**Yes**	NA
	All	AM	10.6	B	17.6	B	7.0	NA	NA	No
	All	PM	17.6	B	77.9	**F**	60.3	NA	NA	**Yes**
With Mitigation of installing a traffic signal with no additional lanes (mitigates the impact as shown below with acceptable LOS)										
15) Old Highway 395 at	All	AM	15.1	B	18.4	B	3.3	NA	No	No
Reche Road (S)	All	PM	18.5	B	26.5	C	8.0	NA	No	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized 2) Delay - HCM Control Delay in seconds. 3) LOS: Level of Service. 4) Delta is the increase in delay from project. 5) CM Vol: Critical Movement Volume used to show project volumes on the critical movement. 6) County Sig: is the project have a calculated impact based on the critical volume (Yes or No). 7) CMP Sig: Congention Mangement Program significant impact based on CMP criteria (Yes or No). DNE: Does Not Exist. NA: Not Applicable

Direct impacts to the six SR-76 segments are calculated to operate at acceptable levels of service with improvements proposed as part of the Caltrans SR-76 East Project. If Caltrans or the County does not construct these improvements before the Campus Park project issues certificates of occupancy, then these impacts would remain significant and unmitigated and the applicant would require overrides. The levels of service without and with the Caltrans and TIF mitigation measures are shown in **Table 40a and 40b**.

TABLE 40A: DIRECT IMPACT STATE ROUTE SEGMENT OPERATIONS WITH RECOMMENDED MITIGATION MESURES (AM)

State Route 76	Lanes in	AM (Eastbound)					Project				Change In		AM (Westbound)					Project				Change In	
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig	Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig
S Mission Rd to Via Monserate	1	745	EB	950	0.78	D	47	792	0.83	D	0.05	No	901	WB	950	0.95	**E**	46	947	1.00	E	0.05	**Yes**
Via Monserate to Gird Rd	1	808	EB	950	0.85	D	49	857	0.90	**E**	0.05	**Yes**	895	WB	950	0.94	**E**	51	946	1.00	E	0.05	No
I-15 SB Ramps to I-15 NB Ramps	1	844	EB	950	0.89	**E**	83	927	0.98	**E**	0.09	**Yes**	539	WB	950	0.57	C	157	696	0.73	D	0.17	No
With Mitigation of an additional one travel lane in each direction as part of the Caltrans SR-76 East project.																							
S Mission Rd to Via Monserate	2	745	EB	3164	0.24	A	47	792	0.25	A	0.01	No	901	WB	3300	0.27	A	46	947	0.29	A	0.01	No
Via Monserate to Gird Rd	2	808	EB	3300	0.24	A	49	857	0.26	A	0.01	No	895	WB	3162	0.28	A	51	946	0.30	A	0.02	No
I-15 SB Ramps to I-15 NB Ramps	2	844	EB	3030	0.28	A	83	927	0.31	A	0.03	No	539	WB	3030	0.18	A	157	696	0.23	A	0.05	No

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

TABLE 40B: DIRECT IMPACT STATE ROUTE SEGMENT OPERATIONS WITH RECOMMENDED MITIGATION MESURES (PM)

State Route 76	Lanes in	PM (Eastbound)					Project				Change In		PM (Westbound)					Project				Change In	
Study Limits	each dir	E Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig	E Vol	Dir	Cap	v/c	LOS	Vol	E+P	v/c	LOS	v/c	Sig
S Mission Rd to Via Monserate	1	1064	EB	950	1.12	**F**	73	1137	1.20	**F**	0.08	**Yes**	618	WB	950	0.65	C	64	682	0.72	D	0.07	No
Via Monserate to Gird Rd	1	1077	EB	950	1.13	**F**	79	1156	1.22	**F**	0.08	**Yes**	786	WB	950	0.83	D	67	853	0.90	**E**	0.07	**Yes**
Sage Rd to Old Hwy 395	1	638	EB	950	0.67	C	79	717	0.75	D	0.08	No	768	WB	950	0.81	D	67	835	0.88	**E**	0.07	**Yes**
I-15 SB Ramps to I-15 NB Ramps	1	718	EB	950	0.76	D	135	853	0.90	**E**	0.14	**Yes**	1153	WB	950	1.21	**F**	199	1352	1.42	**F**	0.21	**Yes**
With Mitigation of an additional one travel lane in each direction as part of the Caltrans SR-76 East project.																							
S Mission Rd to Via Monserate	2	1064	EB	3300	0.32	B	73	1137	0.34	B	0.02	No	618	WB	2122	0.29	A	64	682	0.32	B	0.03	No
Via Monserate to Gird Rd	2	1077	EB	2912	0.37	B	79	1156	0.40	B	0.03	No	786	WB	3300	0.24	A	67	853	0.26	A	0.02	No
Sage Rd to Old Hwy 395	2	638	EB	2300	0.28	A	79	717	0.31	B	0.03	No	768	WB	3300	0.23	A	67	835	0.25	A	0.02	No
I-15 SB Ramps to I-15 NB Ramps	2	718	EB	3030	0.24	A	135	853	0.28	A	0.04	No	1153	WB	3030	0.38	B	199	1352	0.45	B	0.07	No
Horse Ranch Creek Rd to Rice Cyn	1	631	EB	950	0.66	C	61	692	0.73	D	0.06	No	897	WB	950	0.94	**E**	66	963	1.01	**F**	0.07	**Yes**
Rice Cyn to Couser Cyn	1	526	EB	950	0.55	C	55	581	0.61	C	0.06	No	930	WB	950	0.98	**E**	61	991	1.04	**F**	0.06	**Yes**
With Mitigation of an additional one travel lane in each direction as part of the TIF program.																							
Horse Ranch Creek Rd to Rice Cyn	2	631	EB	1806	0.35	B	61	692	0.38	B	0.03	No	897	WB	2028	0.44	B	66	963	0.47	B	0.03	No
Rice Cyn to Couser Cyn	2	526	EB	3100	0.17	A	55	581	0.19	A	0.02	No	930	WB	2382	0.39	B	61	991	0.42	B	0.03	No

Source: SANDAG Hwycov 2007. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service.

5.2 Cumulative Project Impacts and Recommended Mitigation Measures

The project is calculated to have cumulative impacts at 22 intersections, on 11 individual roadway segments (4 contiguous segments), and along 12 individual state route segments (3 contiguous state route segments)

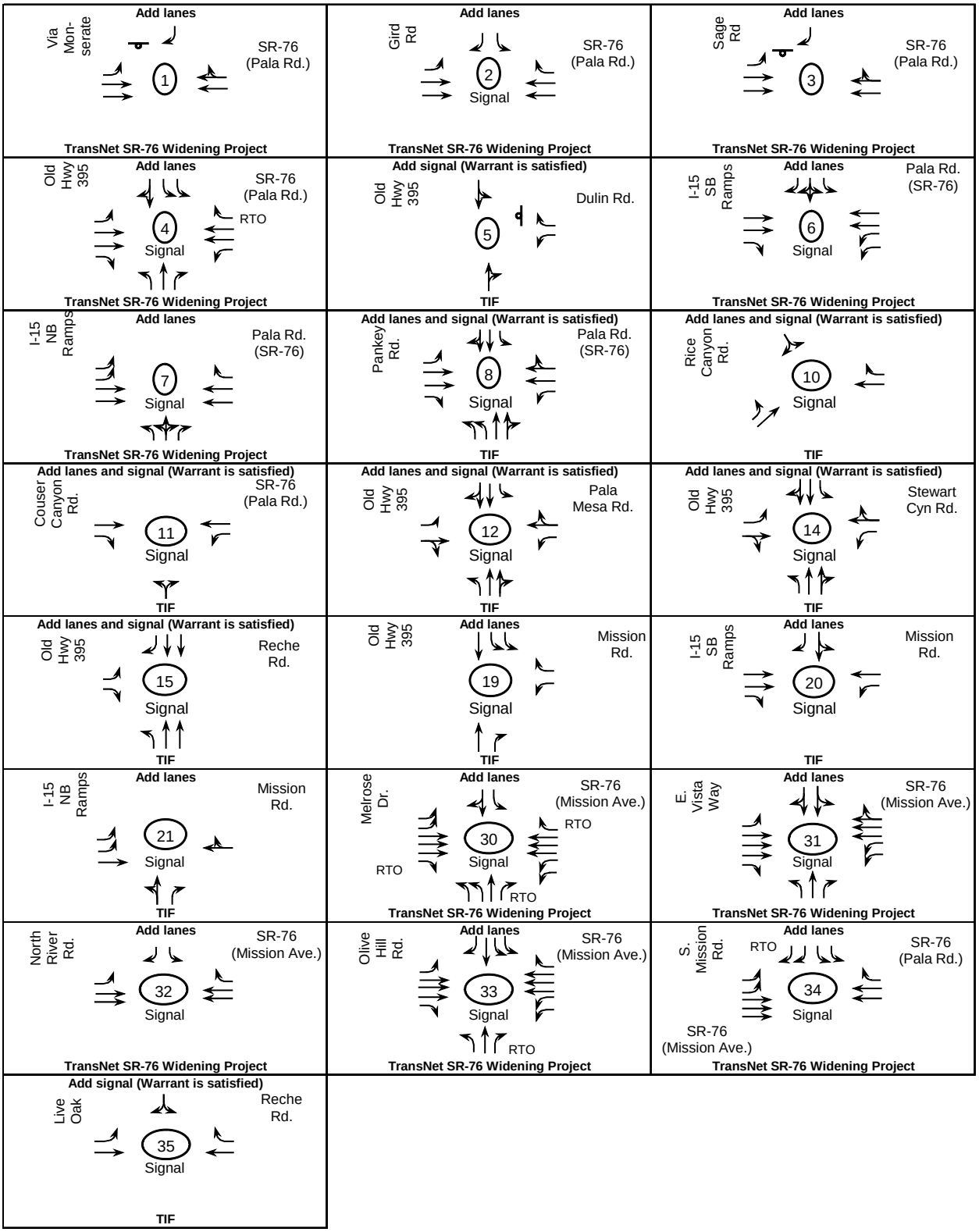
The cumulative intersection impacts are calculated to operate at acceptable levels of service with mitigation measures that would be part of the TransNet SR-76 widening or TIF improvements as shown in **Table 41** with proposed intersection lane configurations shown in **Figure 28**. The proposed intersection configurations proposed as part of the TransNet SR-76 widening project, the signal warrant calculations for the proposed signalizations, and intersection LOS calculations are included in **Appendix Z**.

TABLE 41: CUMULATIVE IMPACT INTERSECTION OPERATIONS WITH RECOMMENDED MITIGATION MEASURES

Intersection & (Analysis)[1]	Movement	Peak Hour	Existing+Cumulative+Project					Cumulative Impact?
			Without Mitigation		Mitigation (See Fig 27)	With Mitigation		
			Delay[2]	LOS[3]		Delay[2]	LOS[3]	
1) SR-76 (Pala Rd) at	SB LR	AM	>500	**F**		31.1	D	No
Via Monserate (U)	SB LR	PM	>500	**F**	Add	22.3	C	No
	All	AM	>500	**F**	lanes	0.8	C	No
	All	PM	>500	**F**		0.6	B	No
2) SR-76 (Pala Rd) at	All	AM	59.1	D	Add	11.8	B	No
Gird Rd (S)	All	PM	118.0	**F**	lanes	14.1	B	No
3) SR-76 (Pala Rd) at	SB LR	AM	40.2	**E**		17.6	C	No
Sage Rd (U)	SB LR	PM	39.3	**E**	Add	17.7	C	No
	All	AM	>500	**F**	lanes	0.2	A	No
	All	PM	>500	**F**		0.2	A	No
4) SR-76 (Pala Rd) at	All	AM	268.7	**F**	Add	44.1	D	No
Old Hwy 395 (S)	All	PM	266.1	**F**	lanes	42.9	D	No
5) Old Hwy 395 at	WB LR	AM	32.9	D	Install	2.4	A	No
Dulin Rd (U)	WB LR	PM	56.4	**F**	Traffic Signal	4.5	A	No
6) SR-76 (Pala Rd) at	All	AM	107.0	**F**	Add	25.3	C	No
I-15 SB Ramps (S)	All	PM	140.1	**F**	lanes	26.1	C	No
7) SR-76 (Pala Rd) at	All	AM	86.6	**E**	Add	29.1	C	No
I-15 NB Ramps (S)	All	PM	121.2	**F**	lanes	28.9	C	No
8) SR-76 (Pala Rd) at	NB LTR	AM	>500	**F**	Install			
Pankey Road (U)	NB LTR	PM	>500	**F**	AM	24.4	C	No
	SB LTR	AM	>500	**F**	PM	48.8	D	No
	SB LTR	PM	>500	**F**	Traffic Signal			
10) SR-76 (Pala Rd) at	SB LR	AM	211.4	**F**	Install	15.1	B	No
Rice Canyon Road (U)	SB LR	PM	>500	**F**	Traffic Signal	23.6	C	No
11) SR-76 (Pala Rd) at	NB LR	AM	86.2	**F**	Install	13.9	B	No
Couser Canyon Road (U)	NB LR	PM	427.4	**F**	Traffic Signal	14.6	B	No
12) Old Highway 395 at	EB LR	AM	>500	**F**	Install	29.9	C	No
Pala Mesa Dr (U)	EB LR	PM	>500	**F**	Traffic Signal	46.9	D	No
14) Old Highway 395 at	WB LTR	AM	>500	**F**	Install	17.3	B	No
Stewart Canyon Road (U)	WB LTR	PM	>500	**F**	Traffic Signal	25.2	C	No
15) Old Highway 395 at	EB LR	AM	>500	**F**	Install			
Reche Road (U)	EB LR	PM	>500	**F**	AM	23.3	C	No
	All	AM	>500	**F**	PM	46.7	D	No
	All	PM	>500	**F**	Traffic Signal			
19) Mission Road at	SB L	AM	54.8	D	Add	26.0	C	No
Old Highway 395 (S)	SB L	PM	113.0	**F**	lanes	31.8	C	No
20) Mission Road at	SB LTR	AM	75.6	**E**	Add	30.3	C	No
I-15 SB Ramps (S)	SB LTR	PM	87.5	**E**	lanes	23.2	C	No
21) Mission Road at	All	AM	31.8	C	Add	18.2	B	No
I-15 NB Ramps (S)	All	PM	95.8	**F**	lanes	27.9	C	No
30) SR-76 (Mission Ave) at	All	AM	129.5	**F**	Add	54.6	D	No
Melrose Drive (S)	All	PM	80.7	**F**	lanes	35.4	D	No
31) SR-76 (Mission Ave) at	All	AM	282.1	**F**	Add	39.8	D	No
E. Vista Way (S)	All	PM	261.1	**F**	lanes	53.6	D	No
32) SR-76 (Mission Ave) at	All	AM	317.1	**F**	Add	28.2	C	No
North River Rd (S)	All	PM	267.3	**F**	lanes	27.0	C	No
33) SR-76 (Mission Ave) at	All	AM	275.6	**F**	Add	44.5	D	No
Olive Hill Rd (S)	All	PM	184.1	**F**	lanes	54.6	D	No
34) SR-76 (Mission Ave) at	All	AM	61.4	**E**	Add	41.3	D	No
S. Mission Rd (S)	All	PM	88.0	**F**	lanes	36.2	D	No
35) Reche Rd at	SB LR	AM	45.3	**E**	Install	12.8	B	No
Live Oak Park Rd (U)	SB LR	PM	26.3	D	Traffic Signal	10.2	B	No

Notes: 1) Intersection Analysis - (S) Signalized, (U) Unsignalized 2) Delay - HCM Average Delay in seconds. 3) LOS: Level of Service.

Figure 28: Intersection Mitigation Measures for Cumulative Impacts



The cumulative segment impacts are calculated to operate at acceptable levels of service with mitigation measures that would be part of the TIF program, or require classification adjustments as noted in **Table 42**.

TABLE 42: CUMULATIVE IMPACT SEGMENT OPERATIONS WITH RECOMMENDED MITIGATION MEASURES

Segment	As built	Existing + Cumulative + Project				TIF mitigation (higher btw TIF & Circ Elem)	Existing + Cumulative + Project				
		Daily Volume	LOS E Capacity	V/C	LOS		Daily Volume	LOS E Capacity	V/C	LOS	Cumulative Impact?
Old Highway 395											
East Mission Road to Reche Road	2 lanes	19,900	16,200	1.23	**F**	Collector	19,900	34,200	0.58	B	No
Reche Road to Stewart Canyon Road	2 lanes	23,300	16,200	1.44	**F**	Collector	23,300	34,200	0.68	C	No
Stewart Canyon Road to Tecalote Lane	2 lanes	17,600	16,200	1.09	**F**	Collector	17,600	34,200	0.51	B	No
Tecalote Lane to Pala Mesa Drive	2 lanes	19,400	16,200	1.20	**F**	Collector	19,400	34,200	0.57	B	No
Pala Mesa Drive to SR-76 (Pala Road)	2 lanes	20,900	16,200	1.29	**F**	Collector	20,900	34,200	0.61	B	No
SR-76 (Pala Road) to Dulin Road	2 lanes	14,800	16,200	0.91	**E**	Collector	14,800	34,200	0.43	B	No
Dulin Road to W. Lilac Road	2 lanes	17,200	16,200	1.06	**F**	Collector	17,200	34,200	0.50	B	No
Reche Road											
Green Cny Norte to Live Oak Park Rd	2 lanes	13,800	16,200	0.85	**E**	Collector[1]	13,800	34,200	0.40	B	No
Live Oak Park Road to Gird Road	2 lanes	12,100	16,200	0.75	**E**	Town Collector	12,100	19,000	0.64	D	No
Pankey Road											
SR-76 (Pala Road) to Dulin Rd	2 lanes	11,902	16,200	0.73	**E**	Collector	11,902	34,200	0.35	A	No
Pala Mesa Drive											
Wilt Rd/Sage Rd to Old Highway 395	2 lanes	11,500	16,200	0.71	**E**	Town Collector[2]	11,500	19,000	0.61	D	No

Daily volume is a 24 hour volume. LOS: Level of Service. V/C: Volume to Capacity ratio. [1]Collector exceeds circulation element classification of rural collector and TIF recommended classification of town collector; however, collector cross section of 84 feet matches rural collector cross section of 84 feet. [2]Town Collector exceed circulation element classification of light collector; however, town collector requires 74 feet of ROW vs. the light collector ROW of 60 feet (an additional 14 feet).

The cumulative state route segment impacts are calculated to operate at acceptable levels of service with mitigation measures of widening from 2 to 4 lanes that are currently planned as part of the TransNet SR-76 widening project and the TIF program, and then eventual (unknown future date) widening to 6 lanes to match the current circulation element. SR-76 from Melrose Drive to S Mission Road has a current circulation element classification of Expressway (6 lane divided roadway) and when analyzed as such it is calculated to operate at acceptable levels of service. The TIF program provides an overall revenue program to address forecasted deficiencies; therefore, contribution to the TIF will provide sufficient mitigation for cumulative impacts to SR-76. The peak hour state route calculations are shown below in **Tables 43a and 43b** representing the current planned improvements while the County circulation element classification ADT calculations are shown in **Table 44** for the eventual improvements to match the circulation element classification (ADT volumes for SR-76 obtained from the Series 10 Cumulative Map traffic model are included in Appendix P).

TABLE 43A: CUMULATIVE IMPACT STATE ROUTE SEGMENT OPERATIONS WITH RECOMMENDED MITIGATION MEASURES (AM)

State Route 76	Lanes in	E	AM (Eastbound)				C+P	E+C+P			v/c	Cumulative	E	AM (Westbound)				C+P	E+C+P			v/c	Cumulative
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	Vol	v/c	LOS	Delta	Impact?	Vol	Dir	Cap	v/c	LOS	Vol	Vol	v/c	Sig	Delta	Impact?
Melrose Dr to E. Vista Way	2	999	EB	2356	0.42	B	369	1368	0.58	C	0.16	No	1469	WB	2010	0.73	D	947	2416	1.20	**F**	0.47	**Yes*** **
E. Vista Way to North River Rd	2	718	EB	2122	0.34	B	469	1187	0.56	C	0.22	No	1040	WB	1904	0.55	C	944	1984	1.04	**F**	0.50	**Yes*** **
North River Rd to Olive Hill Rd	2	852	EB	1904	0.45	B	539	1391	0.73	D	0.28	No	1200	WB	2122	0.57	C	1221	2421	1.14	**F**	0.58	**Yes*** **
Olive Hill Rd to S Mission Rd	2	1031	EB	2122	0.49	B	467	1498	0.71	C	0.22	No	1245	WB	1904	0.65	C	1322	2567	1.35	**F**	0.69	**Yes*** **
S Mission Rd to Via Monserate	2	745	EB	3164	0.24	A	347	1092	0.35	B	0.11	No	901	WB	2122	0.42	B	832	1733	0.82	D	0.39	No
Via Monserate to Gird Rd	2	808	EB	3300	0.24	A	332	1140	0.35	B	0.10	No	895	WB	3164	0.28	A	901	1796	0.57	C	0.28	No
Gird Rd to Sage Rd	2	740	EB	3300	0.22	A	391	1131	0.34	B	0.12	No	542	WB	2912	0.19	A	797	1339	0.46	B	0.27	No
Sage Rd to Old Hwy 395	2	760	EB	1904	0.40	B	458	1218	0.64	C	0.24	No	534	WB	3300	0.16	A	827	1361	0.41	B	0.25	No
Old Hwy 395 to I-15 SB Ramps	2	1507	EB	3030	0.50	B	93	1600	0.53	C	0.03	No	665	WB	2028	0.33	B	600	1265	0.62	C	0.30	No
I-15 SB Ramps to I-15 NB Ramps	2	844	EB	3030	0.28	A	178	1022	0.34	B	0.06	No	539	WB	3030	0.18	A	455	994	0.33	B	0.15	No
I-15 NB Ramps to Pankey Rd	2	559	EB	3100	0.18	A	283	842	0.27	A	0.09	No	606	WB	3030	0.20	A	439	1045	0.34	B	0.14	No
Pankey Rd to Horse Ranch Creek Rd	2	589	EB	1806	0.33	B	15	604	0.33	B	0.01	No	540	WB	1956	0.28	A	644	1184	0.61	C	0.33	No
Horse Ranch Creek Rd to Rice Cyn	2*	588	EB	1806	0.33	B	16	604	0.33	B	0.01	No	539	WB	1956	0.28	A	645	1184	0.61	C	0.33	No
Rice Cyn to Couser Cyn	2*	589	EB	3100	0.19	A	1135	1724	0.56	C	0.37	No	540	WB	2382	0.23	A	300	840	0.35	B	0.13	No
Couser Cyn to Pala Mission Rd	2**	634	EB	1900	0.33	B	223	857	0.45	B	0.12	No	357	WB	1900	0.19	A	321	678	0.36	B	0.17	No

Source: SANDAG Year 2030 Cumulative Map. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service. E: Existing. C: Cumulative. P: Project. *Mitigation of 2 lanes consistent with current circulation element (capacity from SANDAG coverage). **Mit consistent with current circulation element, capacity of 2 lanes based on doubling existing capacity of 950.
*** Cumulative impact mitigated when analyzed under current circulation element classification of Expressway (6 lane divided roadway).

TABLE 43B: CUMULATIVE IMPACT STATE ROUTE SEGMENT OPERATIONS WITH RECOMMENDED MITIGATION MEASURES (PM)

State Route 76	Lanes in	E	PM (Eastbound)				C+P	E+C+P			v/c	Cumulative	E	PM (Westbound)				C+P	E+C+P			v/c	Cumulative
Study Limits	each dir	Vol	Dir	Cap	v/c	LOS	Vol	Vol	v/c	LOS	Delta	Impact?	Vol	Dir	Cap	v/c	LOS	Vol	Vol	v/c	Sig	Delta	Impact?
Melrose Dr to E. Vista Way	2	1456	EB	2356	0.62	C	1195	2651	1.13	F	0.51	Yes***	1001	WB	2336	0.43	B	726	1727	0.74	D	0.31	No
E. Vista Way to North River Rd	2	1107	EB	2122	0.52	C	952	2059	0.97	E	0.45	Yes***	652	WB	1904	0.34	B	767	1419	0.75	D	0.40	No
North River Rd to Olive Hill Rd	2	1176	EB	1904	0.62	C	1417	2593	1.36	F	0.74	Yes***	781	WB	2122	0.37	B	830	1611	0.76	D	0.39	No
Olive Hill Rd to S Mission Rd	2	1457	EB	2122	0.69	C	1119	2576	1.21	F	0.53	Yes***	1069	WB	1904	0.56	C	782	1851	0.97	E	0.41	Yes***
S Mission Rd to Via Monserate	2	1064	EB	3300	0.32	B	1209	2273	0.69	C	0.37	No	618	WB	2122	0.29	A	883	1501	0.71	C	0.42	No
Via Monserate to Gird Rd	2	1077	EB	2912	0.37	B	1000	2077	0.71	D	0.34	No	786	WB	3300	0.24	A	575	1361	0.41	B	0.17	No
Gird Rd to Sage Rd	2	645	EB	3300	0.20	A	755	1400	0.42	B	0.23	No	742	WB	2912	0.25	A	494	1236	0.42	B	0.17	No
Sage Rd to Old Hwy 395	2	638	EB	1904	0.34	B	885	1523	0.80	D	0.46	No	768	WB	3300	0.23	A	680	1448	0.44	B	0.21	No
Old Hwy 395 to I-15 SB Ramps	2	816	EB	3030	0.27	A	670	1486	0.49	B	0.22	No	1258	WB	2028	0.62	C	273	1531	0.75	D	0.13	No
I-15 SB Ramps to I-15 NB Ramps	2	718	EB	3030	0.24	A	639	1357	0.45	B	0.21	No	1153	WB	3030	0.38	B	132	1285	0.42	B	0.04	No
I-15 NB Ramps to Pankey Rd	2	696	EB	3100	0.22	A	753	1449	0.47	B	0.24	No	820	WB	3030	0.27	A	242	1062	0.35	B	0.08	No
Pankey Rd to Horse Ranch Creek Rd	2	631	EB	1806	0.35	B	649	1280	0.71	C	0.36	No	897	WB	2028	0.44	B	460	1357	0.67	C	0.23	No
Horse Ranch Creek Rd to Rice Cyn	2*	631	EB	1806	0.35	B	649	1280	0.71	C	0.36	No	897	WB	2028	0.44	B	460	1357	0.67	C	0.23	No
Rice Cyn to Couser Cyn	2*	526	EB	3100	0.17	A	506	1032	0.33	B	0.16	No	930	WB	2382	0.39	B	413	1343	0.56	C	0.17	No
Couser Cyn to Pala Mission Rd	2**	434	EB	1900	0.23	A	414	848	0.45	B	0.22	No	950	WB	1900	0.50	B	301	1251	0.66	C	0.16	No

Source: SANDAG Year 2030 Cumulative Map. Notes: Dir = Direction. Vol = Volume. Cap = Capacity. v/c = volume to capacity ratio. LOS = Level of Service. E: Existing. C: Cumulative. P: Project. *Mitigation of 2 lanes consistent with current circulation element (capacity from SANDAG coverage). **Mit consistent with current circulation element, capacity of 2 lanes based on doubling existing capacity of 950.
*** Cumulative impact mitigated when analyzed under current circulation element classification of Expressway (6 lane divided roadway).

TABLE 44: CUMULATIVE IMPACT STATE ROUTE SEGMENT OPERATIONS WITH CIRCULATION ELEMENT MITIGATION

State Route	Classification	Existing + Cumulative + Project				
		Daily Volume	LOS E Capacity	V/C	LOS	Cumulative Impact?
SR76 (from Melrose Dr to E Vista Way)	Expressway (6D)	60,245	108,000	0.56	C	No
SR76 (from E Vista Way to North River Rd)	Expressway (6D)	47,108	108,000	0.44	B	No
SR76 (from North River Rd to Olive Hill Rd)	Expressway (6D)	59,327	108,000	0.55	C	No
SR76 (from Olive Hill Rd to S Mission Rd)	Expressway (6D)	60,858	108,000	0.56	C	No

LOS: Level of Service. V/C: Volume to Capacity ratio. Daily volumes is a 24 hour volume. 6D: 6 lane divided roadway

To mitigate the cumulative impacts, the project applicant proposes to pay into the Transportation Impact Fee (TIF) program.

The County of San Diego has developed an overall programmatic solution that addresses projected future road deficiencies in the unincorporated portion of San Diego County. This program includes the adoption of a TIF program to fund improvements to roadways necessary to mitigate potential cumulative impacts caused by traffic from future development. Based on SANDAG regional growth and land use forecasts, the SANDAG Regional Transportation Model was utilized to analyze projected build-out (year 2030) development conditions on the existing circulation element roadway network throughout the unincorporated area of the County. Based on the results of the traffic modeling, funding necessary to construct transportation facilities that will mitigate cumulative impacts from new development was identified. Existing roadway deficiencies will be corrected through improvement projects funded by other public funding sources, such as TransNet, gas tax, and grants. Potential cumulative impacts to the region's freeways have been addressed in SANDAG's Regional Transportation Plan (RTP). This plan, which considers freeway buildout over the next 30 years, will use funds from TransNET, state, and federal funding to improve freeways to projected level of service objectives in the RTP.

The proposed project generates 19,941 ADT. These trips will be distributed on circulation element roadways in the County that were analyzed by the TIF program, some of which currently or are projected to operate at inadequate levels of service. These project trips, therefore, contribute to a potential significant cumulative impact and mitigation is required. The potential growth represented by this project was included in the growth projections upon which the TIF project is based. Therefore, payment of the TIF, which will be required at issuance of building permits, in combination with other components of the program described above, will mitigate potential

cumulative impacts to less than significant. The applicant will request TIF credit for all allowable associated costs of roadway improvements that the project will construct to roadways listed in the January 2008 TIF update. An email from County staff documenting that cumulative impacts occurring to roadway segments and intersections located within the Fallbrook community can be fully mitigated by payment into the County's TIF Program is included in **Appendix AA**.

5.3 Horizon Year Impacts

The horizon year cumulative segment impact is calculated to operate at acceptable levels of service with a mitigation measure recommended within the TIF program as shown in **Table 45.**

TABLE 45: HORIZON YEAR (2030) + PROJECT SEGMENT VOLUMES AND LEVEL OF SERVICE WITH RECOMMENDED MITIGATION

Segment of Pankey Road	Sept 2005 Circulation Element	Horizon Year (2030)				Project	Horizon Year (2030) + Project					
		Daily Volume	LOS E Capacity	V/C	LOS	Daily Volumes	Daily Volume	LOS E Capacity	V/C	LOS	Change in V/C	Cumulative Impact?
Pankey Rd from SR-76 to Shearer Crossing	Light Collector	16,411	16,200	1.01	F	3,589	20,000	16,200	1.23	**F**	0.22	**Yes**
With mitigation of TIF recommended classification of Collector												
Pankey Rd from SR-76 to Shearer Crossing	Collector	16,411	34,200	0.48	B	3,589	20,000	34,200	0.58	B	0.10	No

LOS: Level of Service. V/C: Volume to Capacity ratio. Daily volumes is a 24 hour volume.

Since the segment of Pankey Road from SR-76 to Shearer Crossing is calculated to operate at LOS F with or without the project (before TIF mitigation), the project is not preventing the County's Circulation Element roadway network from operating at its planned level of service as stated in the Public Facilities Element policy.

5.4 Project Features/Improvements

As part of the project, the applicant proposes to construct the following on-site or project adjacent improvements:

1) Intersection of SR-76 at Horse Ranch Creek Road.

2) Six internal intersections (reference numbers 23, 24, 25, 26, 28, and 29).

3) Roadway segment of Horse Ranch Creek Road from SR-76 to the Baltimore Oriole Road (including the transition to Pankey Road located south of Stewart Canyon Road).

4) Roadway segment of Pankey Place (aka Street R) from Pala Mesa Drive to Horse Ranch Creek Road.

5) Roadway segment of Pala Mesa Drive from Old Highway 395 to Pankey Place (aka Street R).

6) Roadway segment of Pala Mesa Drive from Pankey Place (aka Street R) to SR-76.

Signal warrants for the proposed on-site intersections are included in **Appendix BB**.

Additionally, the applicant proposes to construct off-site improvements that include six intersections, which do not have direct impacts from the project traffic. The applicant will construct these improvements and receive a TIF credit for the amount of the improvement or pay the TIF without constructing the improvement. The six intersections and improvements include:

1) SR-76 at Old Highway 395 (additional NB and SB left turn lane),

2) SR-76 at I-15 SB Ramp (construct WB to SB loop ramp to I-15, restripe EB and WB travel to two lanes),

3) SR-76 at I-15 NB Ramp (construct EB to NB loop ramp to I-15, restripe EB and WB travel to two lanes),

4) SR-76 at Pankey Road (install traffic signal and add NB & SB left turn lanes),

5) Old Highway 395 at Pala Mesa Road (install traffic signal and add NB & SB through lanes, EB & WB left turn lanes), and

6) Old Highway 395 at Stewart Canyon Road (install traffic signal and add EB & WB left turn lanes).

5.5 Other Project Improvements

SR-76 is currently being widened from 2 to 4 lanes from the I-15 NB Ramp easterly a distance of approximately 1.4 miles. Since this widening is in the construction stage, the capacity of the completed improvement was incorporated in the analysis. Improvements by others (i.e. Caltrans, Palomar College, Pauma Tribe, or Pala Tribe) were not incorporated into the analysis for additional roadway capacity.

5.6 Direct Mitigation, Cumulative Mitigation, and Project Improvement Summary

The proposed mitigation for the direct and cumulative impacts, responsible party for the mitigation, significance after mitigation, project improvements, and other improvements currently being constructed are summarized below in multiple tables. Direct intersection impacts are shown in **Table 46** while the state route direct impacts are summarized in **Table 47**. Project improvements are outlined in **Table 48** while off-site improvements are summarized in **Table 49. Table 50** shows the cumulative intersection impacts and cumulative segment and state route impacts are shown in **Table 51**. **Table 52** shows improvements by others. Proposed mitigation measures and improvements are shown graphically in **Figure 29** (additional details for the off-site improvements, LOS calculations, and phasing are included in **Appendix CC**).

TABLE 46: SUMMARY OF DIRECT INTERSECTION IMPACTS

Direct Intersection Impacts	Mitigation	Responsible Party	Significance After Mitigation
1) SR-76 at I-15 NB Ramp (#7)	Construct loop on-ramp for EB SR-76 to NB I-15	Applicant	Direct impact mitigated to below a level of significance
2) Old Highway 395 at Reche Rd (#15)	Install traffic signal	Applicant	Direct impact mitigated to below a level of significance

TABLE 47: SUMMARY OF DIRECT STATE ROUTE IMPACTS

Direct State Route Impacts	Mitigation	Responsible Party	Significance After Mitigation
1) SR-76 (I-15 SB Ramp to I-15 NB Ramp)	Construct loop on-ramps at the intersection of SR-76/I-15 NB & SB Ramps and re-stripe bridge to 4 lanes	Applicant	Direct impact mitigated to below a level of significance.
2) SR-76 (from S Mission Rd to Gird Road)	Widen SR-76 from 2 to 4 lanes	TransNet SR-76 Widening	Direct impact mitigated to below a level of significance with TransNet improvements. Due to timing considerations, applicant will require overriding considerations if Campus Park proceeds before TransNet improvements
3) SR-76 (Sage Rd to Old Hwy 395)	Widen SR-76 from 2 to 4 lanes	TransNet SR-76 Widening	Direct impact mitigated to below a level of significance with TransNet improvements. Due to timing considerations, applicant will require overriding considerations if Campus Park proceeds before TransNet improvements
4) SR-76 (Horse Ranch Creek Road to Couser Canyon Road)	Widen SR-76 from 2 to 4 lanes	Caltrans	Direct impact mitigated to below a level of significance with future Caltrans improvements. Due to timing considerations, applicant will require overriding considerations if Campus Park proceeds before Caltrans improvements

TABLE 48: SUMMARY OF PROJECT IMPROVEMENTS BY APPLICANT

Project Features	Improvement	Responsible Party	Significance After Mitigation
1) INTERSECTION: SR-76 at Horse Ranch Creek Road (#9)	Construct traffic signal	Applicant	On-Site LOS C or better with proposed project feature
2) INTERSECTIONS: Six internal intersections (#23, 24, 25, 26, 28 and 29) along Horse Ranch Creek Road and Pankey Pl(aka Street R)	Construct intersections and install traffic signal when signal warrants are satisfied (1)	Applicant	On-Site LOS C or better with proposed project feature
3) SEGMENT: Horse Ranch Creek Road from SR-76 to Baltimore Oriole Road (including transition to Pankey Road located south of Stewart Canyon Road)	Construct 4 lane roadway per General Plan Update Boulevard Standards	Applicant	On-Site LOS C or better with proposed project feature
4) SEGMENT: Pankey Pl (aka Street R) from Pala Mesa Drive to Horse Ranch Creek Road	Construct 2 lane roadway	Applicant	On-Site LOS C or better with proposed project feature
5) SEGMENT: Pala Mesa Drive from Old Highway 395 to Pankey Pl (aka Street R)	Construct 2 lane roadway	Applicant	On-Site LOS C or better with proposed project feature

Project Features	Improvement	Responsible Party	Significance After Mitigation
6) SEGMENT: Pala Mesa Drive from Pankey Pl (aka Street R) to SR-76	Construct 4 lane roadway	Applicant	On-Site LOS C or better with proposed project feature

Notes: (1) If Campus Park is the only project to be constructed, then the aforementioned intersections are calculated to operate at acceptable LOS with stop control. When the other projects are constructed, then the traffic signals can be constructed per the MUTCD signal warrants calculations included in the Appendix.

TABLE 49: SUMMARY OF OFF-SITE IMPROVEMENTS BY APPLICANT

Project Features	Improvement	Responsible Party	Significance After Mitigation
1) SR-76 at Old Hwy 395 (#4)	Additional NB and SB left turn lane	Applicant	Less than significant
2) SR-76 at I-15 SB Ramp (#6)	Restripe EB and WB travel to two lanes	Applicant	Less than significant
3) SR-76 at I-15 NB Ramp (#7)	Construct EB to NB loop ramp to I-15, restripe EB and WB travel to two lanes	Applicant	Less than significant
4) SR-76 at Pankey Road (#8)	Install traffic signal and add NB & SB left turn lanes	Applicant	Less than significant
5) Old Hwy 395 at Pala Mesa Drive (#12)	Install traffic signal and add NB & SB through lanes, EB & WB left turn lanes	Applicant	Less than significant
6) Old Hwy 395 at Stewart Canyon Rd (#14)	Install traffic signal and add EB & WB left turn lanes	Applicant	Less than significant

TABLE 50: SUMMARY OF CUMULATIVE INTERSECTION IMPACTS

Cumulative Intersection Impacts	Mitigation	Responsible Party	Significance After Mitigation
1) SR-76 at Melrose Dr (#30)	Additional EB & WB left turn lane and through lane	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
2) SR-76 at E. Vista Way (#31)	Additional EB through and right turn lane, additional two WB through lanes, and additional NB and SB lanes	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
3) SR-76 at North River Road (#32)	Additional EB and WB through lanes and separate WB right turn lane	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
4) SR-76 at Olive Hill Road (#33)	Additional EB through and separate right turn lane, additional WB left lane and through lane, additional NB through lane, additional SB left turn lane and right turn lane	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
5) SR-76 at S. Mission Road (#34)	Two additional EB through lanes	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
6) SR-76 at Via Monserate (#1)	Additional EB & WB lanes with either a traffic signal or restriction to SB left turns	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
7) SR-76 at Gird Road (#2)	Additional EB & WB lanes	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
8) SR-76 at Sage Road (#3)	Additional EB & WB lanes with either a traffic signal or restriction to SB left turns	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance

Cumulative Intersection Impacts	Mitigation	Responsible Party	Significance After Mitigation
9) SR-76 at Old Hwy 395 (#4)	Additional EB right turn lane, additional NB left turn lane and through lane, additional dual SB left turn lanes	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
10) SR-76 at I-15 SB Ramp (#6)	Additional EB and WB through lanes and interchange modifications of either loop ramps or additional turn lanes	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
11) SR-76 at I-15 NB Ramp (#7)	Additional EB and WB through lanes and interchange modifications of either loop ramps or additional turn lanes	TIF TransNet SR-76 Widening	Cumulative impact mitigated to below a level of significance
12) SR-76 at Pankey Road (#8)	Install traffic signal and add EB & WB left turn lanes, additional NB dual left turn lanes and through lane, additional SB left turn lane and through lane	TIF	Cumulative impact mitigated to below a level of significance
13) SR-76 at Rice Canyon Road (#10)	Install traffic signal and add EB left turn lane and WB right turn lane	TIF	Cumulative impact mitigated to below a level of significance
14) SR-76 at Couser Canyon Road (#11)	Install traffic signal and add EB right turn lane and WB left turn lane	TIF	Cumulative impact mitigated to below a level of significance
15) Old Highway 395 at E Mission Road (#19)	Additional SB left turn lane	TIF	Cumulative impact mitigated to below a level of significance
16) Mission Road at I-15 SB Ramp (#20)	Additional EB through and EB right turn lane	TIF	Cumulative impact mitigated to below a level of significance
17) Mission Road at I-15 NB Ramp (#21)	Additional EB left turn lane	TIF	Cumulative impact mitigated to below a level of significance
18) Old Highway 395 at Reche Road (#15)	Install traffic signal and separate EB left turn lane, additional NB and SB through lanes, separate SB right turn lane	TIF	Cumulative impact mitigated to below a level of significance
19) Old Highway 395 at Stewart Canyon Road (#14)	Install traffic signal and add additional NB and SB through lanes, additional EB and WB left turn lane	TIF	Cumulative impact mitigated to below a level of significance
20) Old Highway 395 at Pala Mesa Drive (#12)	Install traffic signal and add additional NB and SB through lanes, additional EB and WB left turn lanes	TIF	Cumulative impact mitigated to below a level of significance
21) Old Hwy 395 at Dulin Rd (#5)	Install traffic signal	TIF	Cumulative impact mitigated to below a level of significance
22) Reche Rd at Live Oak Park Rd (#35)	Install traffic signal	TIF	Cumulative impact mitigated to below a level of significance

TABLE 51: SUMMARY OF CUMULATIVE SEGMENT AND STATE ROUTE IMPACTS

Cumulative Segment and State Route Impacts	Mitigation	Responsible Party	Significance After Mitigation
1) SEGMENT: Old Highway 395 (E Mission Rd to W. Lilac)	Widen Roadway to 4 lane Collector	TIF(1)	Cumulative impact mitigated to below a level of significance
2) SEGMENT: Reche Rd (Green Canyon Norte to Live Oak Park Rd)	Widen Roadway to 4 lane Collector	TIF(1)	Cumulative impact mitigated to below a level of significance
3) SEGMENT: Reche Rd (Live Oak Park Rd to Gird Rd)	Widen Roadway to Town Collector	TIF(1)	Cumulative impact mitigated to below a level of significance

Cumulative Segment and State Route Impacts	Mitigation	Responsible Party	Significance After Mitigation
4) SEGMENT: Pankey Rd (SR-76 to Shearer Crossing)	Widen Roadway to 4 Lane Collector	TIF(1)	Cumulative impact mitigated to below a level of significance
5) SEGMENT: Pala Mesa Dr (Wilt Rd/Sage Rd to Old Hwy 395)	Widen Roadway to Town Collector	TIF(1)	Cumulative impact mitigated to below a level of significance
6) STATE ROUTE: 76 (Melrose Dr to S Mission Rd)	Widen SR-76 from 2 to 6 lanes	TransNet SR-76 Widening TIF(1)	Cumulative impact mitigated to below a level of significance
7) STATE ROUTE: 76 (S Mission Road to Old Hwy 395)	Widen SR-76 from 2 to 4 lanes	TransNet SR-76 Widening TIF(1)	Cumulative impact mitigated to below a level of significance
8) STATE ROUTE: 76 (I-15 SB Ramp to I-15 NB Ramp)	Restripe SR-76 from 2 to 4 lanes	TransNet SR-76 Widening TIF(1)	Cumulative impact mitigated to below a level of significance
9) STATE ROUTE: 76 (Horse Ranch Creek Road to Pala Mission Road)	Widen SR-76 from 2 to 4 lanes	TIF(2)	Cumulative impact mitigated to below a level of significance

Notes: (1) The TIF program provides a comprehensive facility financing fee program that addresses forecasted deficiencies to SR-76 and other public street facilities. Applicant's contribution to the TIF will fully mitigate the Campus Park project cumulative impacts to SR-76 and other public street facilities. (2) For cumulative segment impacts to SR-76, east of Couser Canyon Road: The TIF Program mitigates for cumulative impacts on SR-76, west of Couser Canyon Road. Improvements to that segment, paid for by the TIF Program, will increase the operational efficiency of SR-76, west of Couser Canyon Road, and these improvements will provide improved operational characteristics on SR-76, east of Couser Canyon Road.

TABLE 52: SUMMARY OF IMPROVEMENTS BY OTHERS

Project Features	Improvement	Responsible Party	Significance After Mitigation
1) STATE ROUTE: 76 from I-15 NB Ramp easterly a distance of approximately 1.4 miles	Widen from 2 to 4 lanes	Granite Construction Company (completion 2009)	Improvement mitigates to below a level of significance

Figure 29a: Recommended Mitigation Measures and Improvements

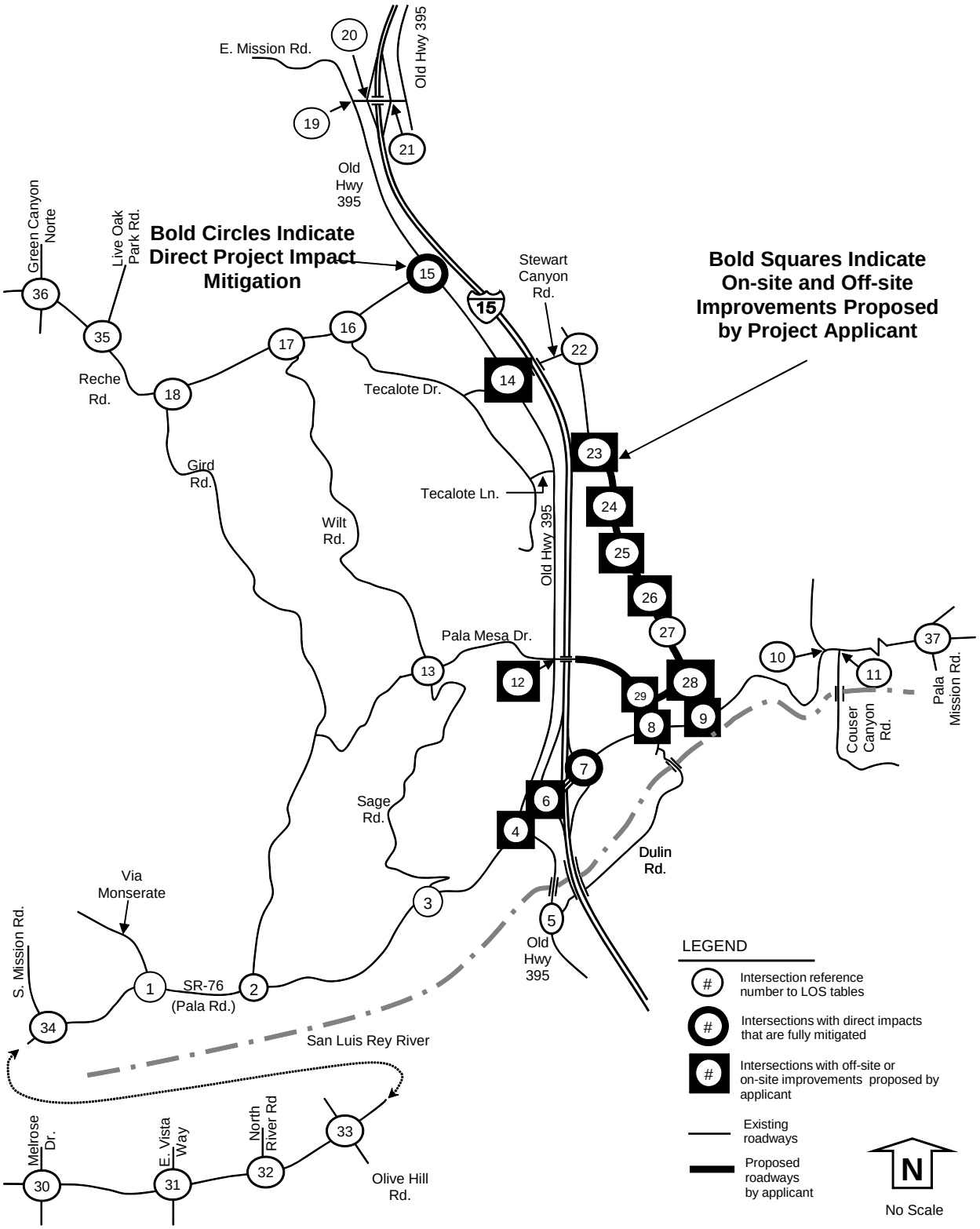


Figure 29b: Recommended Mitigation Measures and Improvements

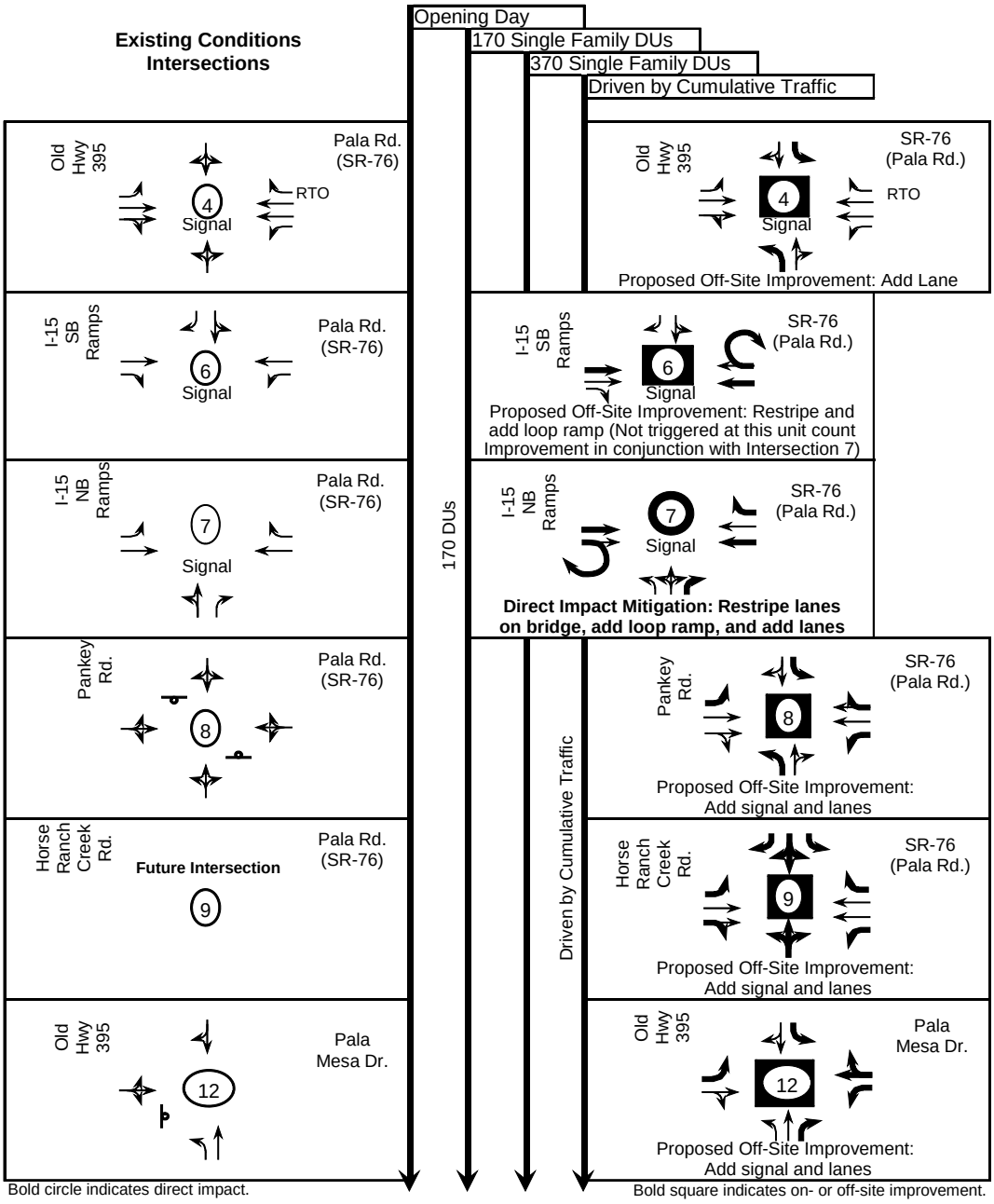


Figure 29c: Recommended Mitigation Measures and Improvements

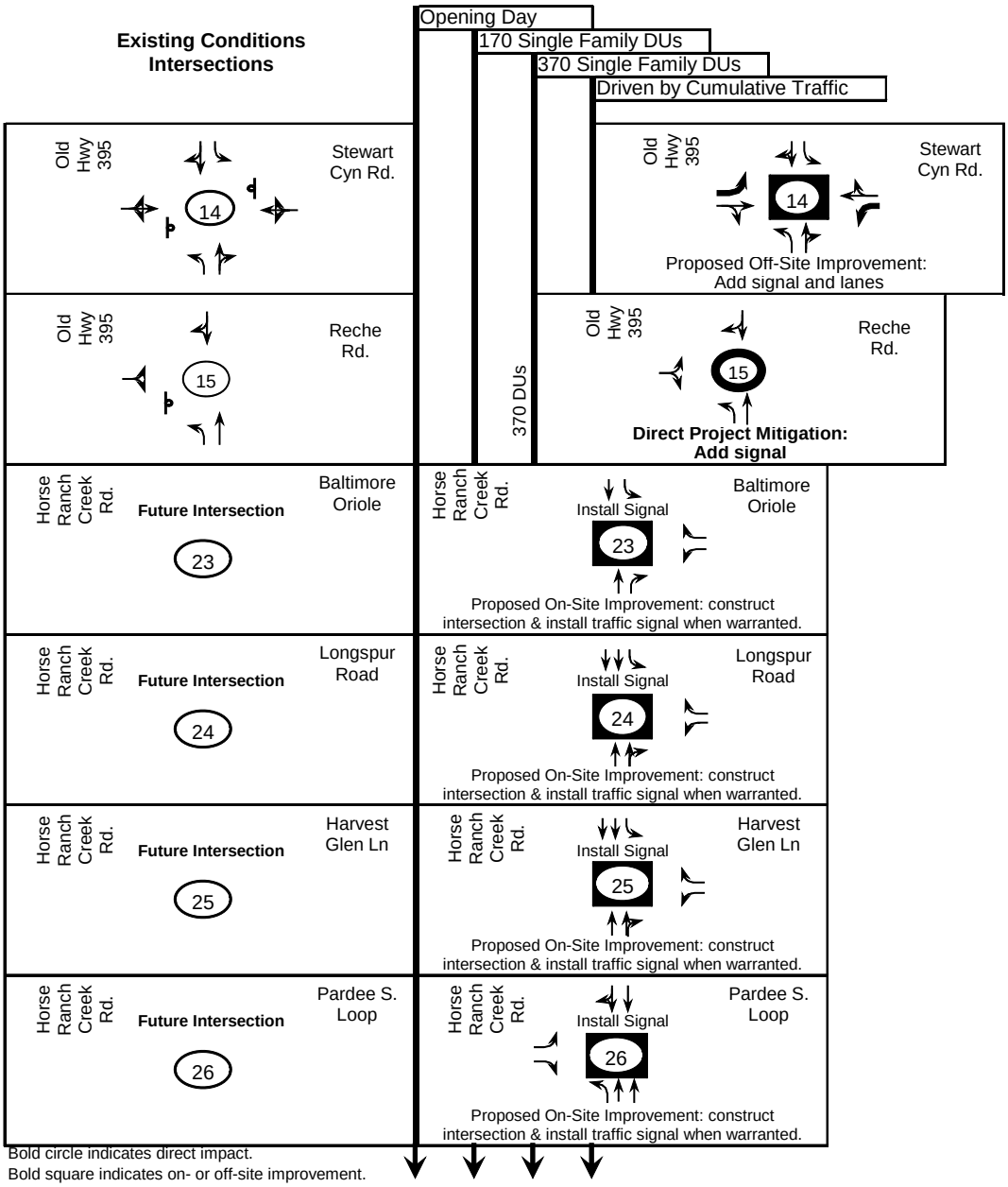
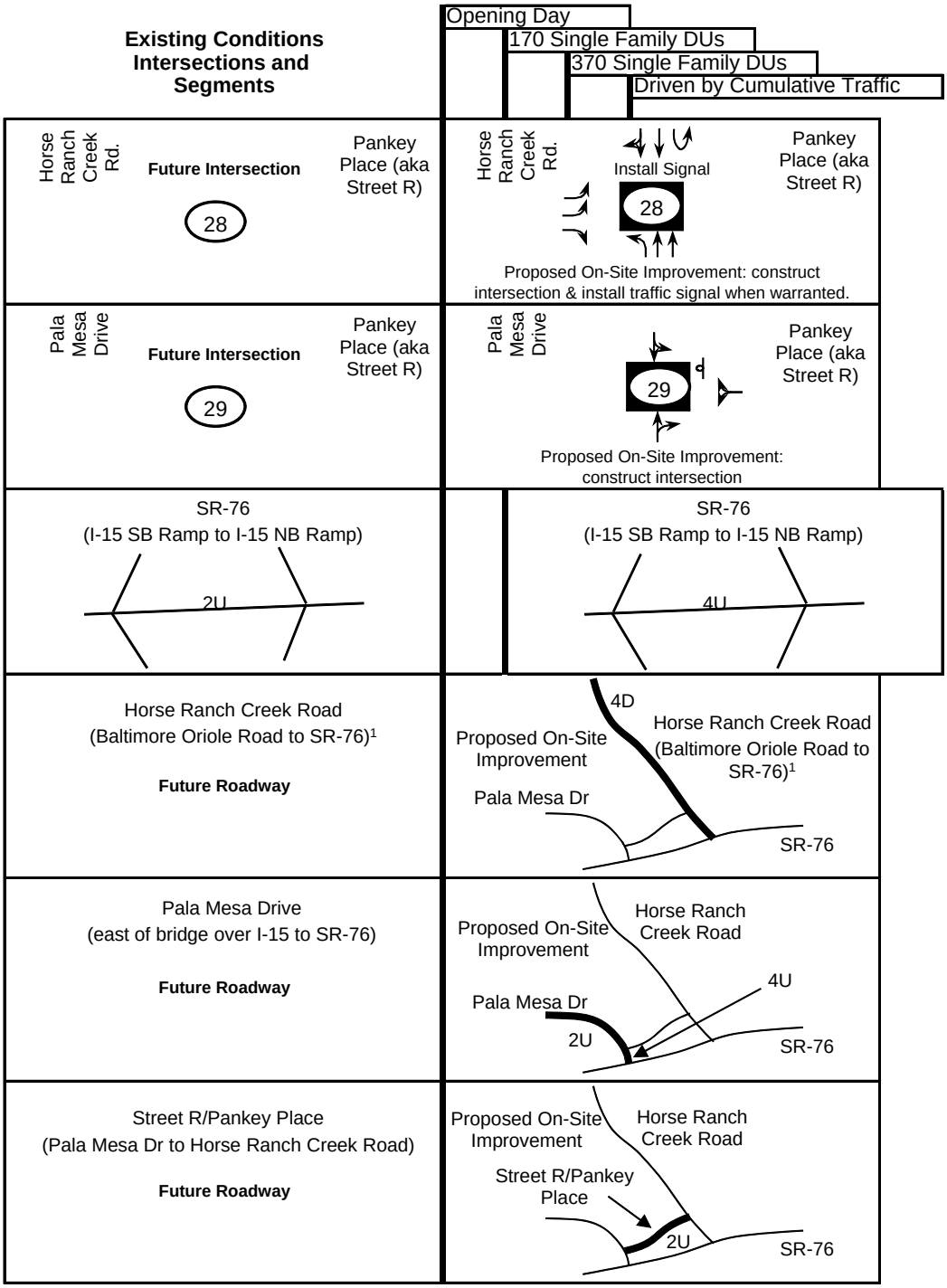


Figure 29d: Recommended Mitigation Measures and Improvements



Notes: 4D = 4 lane divided roadway, 2U = 2 lane divided roadway
(1) includes transition to Pankey Road located south of Stewart Canyon Road
Bold roadway lines indicate project feature by applicant

6.0 References

Caltrans. December 2002. *Guide for the Preparation of Traffic Impact Studies.*

County of San Diego. December 5, 2007. *County of San Diego Transportation and Traffic Report Format & Content Requirements Transportation and Traffic.*

San Diego Association of Governments (SANDAG). April 2002. *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*.

Trafficware Corporation, 2003. Synchro 6.0 computer software (build 612).

Transportation Research Board National Research Council Washington, D.C. 2000. *Highway Capacity Manual 2000*. CD ROM.

7.0 List of Preparers and Persons and Organizations Contacted

7.1 List of Preparers

Justin Rasas, P.E. (RCE 60690), LOS Engineering, Inc. Primary Author

Gaile Rasas, LOS Engineering, Inc. Support Engineer

7.2 Organizations Contacted

Caltrans – Maurice Eaton, Jacob Armstrong

County of San Diego - Nael Areigat, Nick Ortiz, Glenn Russell, Bob Citrano.

Helix Environmental Planning Inc. – Lisa Capper,

Landmark Consulting – Mark Brencick

Passerelle – Bruce Tabb, David Davis

SANDAG – Mike Calandra

Turning Point Traffic Service (data collection) – Mike Stutz

Appendix A

SANDAG Regional Arterial System Listing

401 B Street, Suite 800
San Diego, CA 92101-4231
(619) 699-1900
Fax (619) 699-1905
www.sandag.org

MEMBER AGENCIES
Cities of
Carlsbad
Chula Vista
Coronado
Del Mar
El Cajon
Encinitas
Escondido
Imperial Beach
La Mesa
Lemon Grove
National City
Oceanside
Poway
San Diego
San Marcos
Santee
Solana Beach
Vista
and
County of San Diego

ADVISORY MEMBERS
Imperial County
California Department of Transportation
Metropolitan Transit System
North County Transit District
United States Department of Defense
San Diego Unified Port District
San Diego County Water Authority
Southern California Tribal Chairmen's Association
Mexico

MEETING NOTICE AND AGENDA

CITIES/COUNTY TRANSPORTATION ADVISORY COMMITTEE (CTAC)

The CTAC may take action on any item appearing on this agenda.

Thursday, June 7, 2007

9:30 to 11:30 a.m.

SANDAG, Conference Room 8A
401 B Street, Suite 800
San Diego, CA 92101-4231

Chair: Greg Humora, City of La Mesa
Vice Chair: Vacant

Staff Contact: Charles "Muggs" Stoll
(619) 699-6945
(619) 699-0709 fax
mst@sandag.org

AGENDA HIGHLIGHTS

- REGIONAL ARTERIAL SYSTEM (RAS) UPDATE
- PUBLIC SCOPING MEETING FOR NOTICE OF PREPARATION OF AN EIR FOR THE 2007 RTP

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CITIES/COUNTY TRANSPORTATION ADVISORY COMMITTEE (CTAC)

Thursday, June 7, 2007

ITEM #		ACTION
1.	**INTRODUCTIONS**	
+2.	**MEETING SUMMARY (Greg Humora)** The summary for the May 3, 2007, meeting is attached. CTAC is asked to review and approve the meeting summary.	**APPROVE**
3.	**PUBLIC COMMENTS**	
+4.	**Regional Arterial System (RAS) Update (Heather Werdick)** Staff will report on actions taken at the June 1, 2007, Transportation Committee on the recommended modifications to the Regional Arterial System (RAS). The revised RAS will be included in the Draft 2007 Regional Transportation Plan (RTP).	**INFORMATION**
+5.	**PUBLIC SCOPING MEETING FOR NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE 2007 REGIONAL TRANSPORTATION PLAN (Shelby Tucker/Rob Rundle)** SANDAG, as the lead agency, will prepare an Environmental Impact Report (EIR) for the 2007 Regional Transportation Plan. This item will serve as a public scoping meeting allowing members of the Working Group and the public an opportunity to provide their views on the scope and content of the environmental information that will be addressed in the EIR.	**DISCUSSION**
6.	**NOMINATION AND ELECTION OF NEW CTAC COMMITTEE VICE CHAIR (Greg Humora)** With the recent departure of the current Vice Chair from the CTAC, and in accordance with the CTAC Charter, the committee is asked to nominate and elect a new Vice Chair to fill out the remaining term through calendar 2007.	**NOMINATION/ ELECTION**
7.	**ANNOUNCEMENTS** CTAC members are encouraged to share items of interest.	**INFORMATION**
8.	**UPCOMING MEETING** The next CTAC meeting is scheduled for Thursday, July 5, 2007, from 9:30 to 11:30 a.m.	**INFORMATION**

+ next to an agenda item indicates an attachment.

June 7, 2007

AGENDA ITEM NO.: **2**

Action Requested: APPROVE

MEETING SUMMARY, MAY 3, 2007

Introductions

Richard Leja (Vice Chair) chaired the meeting in Greg Humora's absence. Meeting participants introduced themselves.

Meeting Summaries

CTAC approved the meeting summaries from the April 5 and 12, 2007, meetings as written.

Public Comments

There were no comments from the public.

Form 700: Statement of Economic Interest

Charles "Muggs" Stoll (SANDAG) reminded members and alternates to turn in their Form 700 and noted that he had spoken to several of the members and alternates individually. He further noted that at this late date, members would not be allowed to participate at the June meeting if they do not turn in their forms as requested.

Statewide Capital Improvement Project (CIP) Benchmarking Study Presentation

Richard Leja (Vice Chair) made a presentation summarizing the fifth-year update to this study. Copies of the study can be downloaded at http://eng.lacity.org/techdocs/cabm/. The study involves cities throughout California and seeks to set benchmarking for two major factors:

1. How much does it cost?
2. How to do it better?

A question was raised as to whether environmental mitigation costs were included in the project costs. Mr. Leja responded that environmental mitigation costs were included.

Paul Vo (San Marcos) asked a question regarding whether the funding type was identified for the projects. Mr. Leja responded that funding types were not identified, but that it would be interesting to do so.

There was a request to get a copy of the presentation, and Mr. Stoll agreed to send the presentation via e-mail to all CTAC members and alternates.

Board of Directors Discussion on Stormwater Management

Shelby Tucker (SANDAG) made a presentation summarizing the planned Board of Directors Policy Forum on stormwater management scheduled for May 11, 2007. The proposed Policy Forum was a result of the Regional Comprehensive Plan's Integrated Regional Infrastructure Strategy, as stormwater management was a major issue identified without a dedicated funding source. After reviewing the outline for the Policy Forum, the CTAC members were asked for input. Mr. Leja offered that he believed that SANDAG could have a role in stormwater management by working to unite the region on the issue. The CTAC members were encouraged to provide further feedback and to attend the May 11, 2007, Board of Directors Policy Forum.

2007 Regional Transportation Plan (RTP)

Mike Hix (SANDAG) reported that the Transportation Committee and Board of Directors have accepted the staff recommendations for the Revenue Constrained and Reasonably Expected scenarios at their respective April meetings. These were the same recommendations that were presented at the last CTAC meeting on April 12, 2007. It was further reported that the Draft RTP will go back to the Board in June for approval to circulate with the Draft Environmental Impact Report (EIR) going to the Board in July. The EIR schedule would include a Public Hearing in the fall of this year, with formal adoption scheduled for November 2007.

Linda Marabian (City of San Diego) asked where the proposed increases in funding would come from for the Reasonably Expected scenario. Mr. Hix responded that the Board instructed staff to pursue options for funding and to include a "laundry list" of options in the Draft RTP.

Mr. Leja asked about the status of the Regional Arterial System (RAS) recommendations from the CTAC. Mr. Hix responded that a meeting was planned with the County of San Diego and that the issue would go back to the Transportation Committee in May/June.

***TransNet* Extension Bicycle and Pedestrian Provisions**

Stephan Vance (SANDAG) provided a summary of previous discussions regarding this issue and noted that several members of SANDAG's Bicycle-Pedestrian Working Group were in attendance to participate in the discussions.

Mr. Vance noted that one of the larger issues in the provisions relates to the recommendation for sidewalks on both sides of residential streets. He also noted that there were concerns regarding potential impacts to jurisdictions in programming transportation projects and how to properly document "leaving out" bicycle/pedestrian features.

Mr. Leja asked if doing a General Plan update to address the lack of new bicycle/pedestrian features was "good enough." Mr. Vance's response was that a General Plan update alone, without a more deliberate consideration of the bicycle/pedestrian issues would not meet the ordinance requirement to routinely accommodate bicycles and pedestrians.

Terry Rayback (County of San Diego) asked about the language on page 9 of the guidelines regarding bicycle or pedestrian master plans. Mr. Vance noted that if a situation were covered by an adopted master plan, there would not be a need to produce a public notice. Mr. Leja noted that the guidelines process would only be used if the project were to deviate from the guidelines or adopted master plan. It was also noted that the City of La Mesa currently has an adopted master plan and others were being worked on.

Steve Cresswell (City of Santee) suggested that the paragraph in the middle of page 9 be edited to remove "as a guide," in order to make the language more clear. Kathy Keehan (SD County Bicycle Coalition) expressed concern about whether a General Plan will adequately cover the appropriate level of detail needed to address the issue.

Larry Pierce (City of Vista) then expressed concern regarding the language on page 10, first paragraph, noting that an agency needs to consider reduced motor vehicle lane widths. When Mr. Cresswell highlighted the word "consider" in the language, Mr. Pierce expressed concern that defining that term would be difficult and might result in adversarial confrontations at the political level.

Frank Casteleneto (City of Poway) stated that they were already looking to minimize lane widths where they can and that the issue is not as significant as it seems. Jim Baross (Bicycle-Pedestrian Working Group) stated that he was concerned with linking the issue directly to the master plan as it would need to be very comprehensive.

Fred Luedtke (City of Escondido) asked if the process for SANDAG adoption of bicycle/pedestrian master plans had been established. Mr. Vance stated that it was still to be determined. He further stated that trying to make the master plans into a "free pass" will result in high scrutiny if there are exceptions to the guidelines. Mr. Rayback asked why the environmental process for a project couldn't be used to address this issue and that the County of San Diego was particularly concerned about how the guidelines will affect rural streets.

Mr. Casteleneto moved to recommend approval of the guidelines with the following revised second paragraph under "What Constitutes Adequate Accommodation of Bicyclists and Pedestrians," just after Table 1:

> Where a local jurisdiction has a bicycle or pedestrian master plan adopted by the city council or Board of Supervisors and approved by SANDAG, the local agency may use that plan to determine the appropriate means of accommodating bicyclists and pedestrians in a given project that is addressed in the plan, and at a minimum provide the facilities called for in the plan. These plans must be updated and approved no less than every five years to qualify as a means of satisfying this provision.

Frank Rivera (City of Chula Vista) seconded the motion.

The vote was ten in favor (Carlsbad, Chula Vista, Coronado, El Cajon, Escondido, Oceanside, Poway, City of San Diego, Santee, and Solana Beach) and four against (Encinitas, County of San Diego, San Marcos, and Vista). The motion for recommended approval of the guidelines was passed.

Announcements

Joseph Asuncion (Caltrans) stated that Caltrans is looking for feedback from the external relations committee meeting held in April 2007 at the Caltrans District 11 office. He also announced that he would be forwarding recent federal funding program announcements.

Mr. Leja announced that he had recently accepted an offer to work for Boyle Engineering and would be leaving his position at the City of San Diego. He thanked the CTAC members for all of the interactions they shared and looked forward to working with many of them in his new capacity.

TRANSPORTATION COMMITTEE

June 1, 2007

AGENDA ITEM NO.: **6**

Action Requested: ACCEPT

REGIONAL ARTERIAL SYSTEM UPDATE: PROPOSED MODIFICATIONS File Number 3000500

Recommendation

The Transportation Committee is asked to accept the revised Regional Arterial System for use in the Draft 2007 Regional Transportation Plan.

Introduction

The Regional Arterial System (RAS) constitutes the portion of the local street and road network which, in conjunction with the system of highways and transit services, provides for significant mobility throughout the region and accessibility between communities. First added to the Regional Transportation Plan (RTP) in 1989, it was last updated in 2003 as part of MOBILITY 2030.

At its October 20, 2006, meeting, the Transportation Committee approved the revised RAS screening criteria and directed staff to issue a call for modifications to the RAS. The intent of the updated criteria was to simplify the evaluation process without altering the basic function of the RAS. A call for modifications to the RAS was sent to all 18 cities and the County of San Diego. Submittals were due to SANDAG on December 15, 2006. Eight of the 19 jurisdictions submitted requests to add or modify 126 arterials and delete one arterial from the RAS.

The RAS update is particularly important this time because the *TransNet* Extension included an impact fee that must be spent on improvements to regional arterials. During the RAS updated process, SANDAG conferred with several agencies, and there is mutual agreement on the proposed changes to the RAS from all parties who submitted requests for modifications.

Discussion

Regional Arterial System Update

Regional planning agencies originally developed the RAS at the request of the Federal Highway Administration, identifying important arterials that support the regional highway network. The regional arterial network would provide additional capacity, especially in diverting intercommunity trips off the freeways. The RAS is modified as needed during each update of the RTP.

As part of the 2007 RTP process, RAS screening criteria were developed by the Transportation Project Evaluation Criteria Ad Hoc Working Group (TPEC). The TPEC is composed of representatives from a number of standing SANDAG working groups, including the Bicycle-Pedestrian Working Group (BPWG), Cities/County Transportation Advisory Committee (CTAC), Regional Freight Working Group, Regional Housing Working Group, Regional Planning Technical Working Group,

Regional Planning Stakeholders Working Group (SWG), as well as staff from the Caltrans, North County Transit District, and Metropolitan Transit System. The Transportation Committee approved the revised RAS screening criteria at its October 20, 2006, meeting.

Regional Arterial System Screening Criteria

Regional arterials are longer continuous routes that provide accessibility between communities within the region and which also may allow subregional trips to avoid freeway travel. In order to qualify for the updated RAS, arterials must meet at least one of four approved criteria shown below. The first criterion is that the arterial is already included in the existing RAS. Due to the passage of the *TransNet* sales tax extension, TPEC felt that unless a jurisdiction requested deletion of an arterial already in the RAS, the existing RAS should stay in place. This is because the *TransNet* Extension included an impact fee that was calculated based on the cost of improvements to the regional arterials included in MOBILITY 2030. Any additions to the network must meet one of the remaining three criteria:

- Provides parallel capacity in high-volume corridors to supplement freeways, state highways, and/or other regional arterials *(Corridor).*

- Provides capacity and a direct connection between freeways or other regional arterials, ensuring continuity of the freeway, state highways, and arterial network throughout the region without duplicating other regional facilities *(Cross-corridor).*

- Provides all or part of the route for existing or planned regional and/or corridor transit service that provides headways of 15 minutes or less during the peak period.

Regional Arterial System Evaluation

Eight jurisdictions submitted requests to add or modify 126 arterials and delete one arterial from the RAS. A map of the proposed modifications to the RAS is shown on Attachment 1. SANDAG staff evaluated all 126 arterials that were submitted against the criteria. The proposed modifications to the RAS were reviewed with CTAC, SWG, and the *TransNet* Independent Taxpayer Oversight Committee. SWG was generally supportive of the staff recommended RAS additions/modifications and had minor comments about the proposed modifications. Additional meetings were held with CTAC to further discuss the evaluation of arterials not initially recommended to be included in the RAS update. SANDAG staff and CTAC members agreed on a final evaluation that recommends 86 arterials be modified or added to the RAS. Of the 86 recommended to be added, 22 are extensions of existing regional arterials and 39 qualified as a result of regional transit service. The revised RAS would grow from 853 miles to 1,038 miles.

Forty arterials are not recommended to be added to the RAS. The arterials not recommended do not provide parallel capacity or connect to other regional arterials without duplicating other facilities. Additionally, these arterials are not considered regional in nature and do not serve regional or corridor transit service with headways of 15 minutes or less. A summary of recommended additions and modifications are shown in Attachment 2. It also is recommended by the City of Escondido that Mission Avenue from Centre City Parkway to Broadway be deleted from the RAS. Additionally, a list of existing regional arterials by jurisdiction is included as Attachment 3.

SANDAG conferred with several agencies regarding the evaluation of proposed modifications to the RAS. There is agreement on the recommended changes to the RAS among all agencies who requested additions or modifications.

Regional Arterial System Improvements

The *TransNet* Extension, passed by the voters as Proposition A in 2004, included the Regional Transportation Congestion Improvement Program (RTCIP). The purpose of the RTCIP is to ensure that new development directly invests in the region's transportation system to offset the negative impacts of growth on congestion and mobility. The RTCIP provides for the local collection of a fee per new dwelling unit starting by July 1, 2008, toward the RAS and related regional transportation facility improvements. Since the revenues generated from this new funding program are to be spent on improvements to the RAS, it is important to reevaluate and update the regional arterial network to provide the basis for these future expenditures. Improvements on the RAS can include new or widened arterials, traffic signal coordination and other traffic improvements, freeway interchange and related freeway improvements, railroad grade separations, and improvements required for express bus and rail transit.

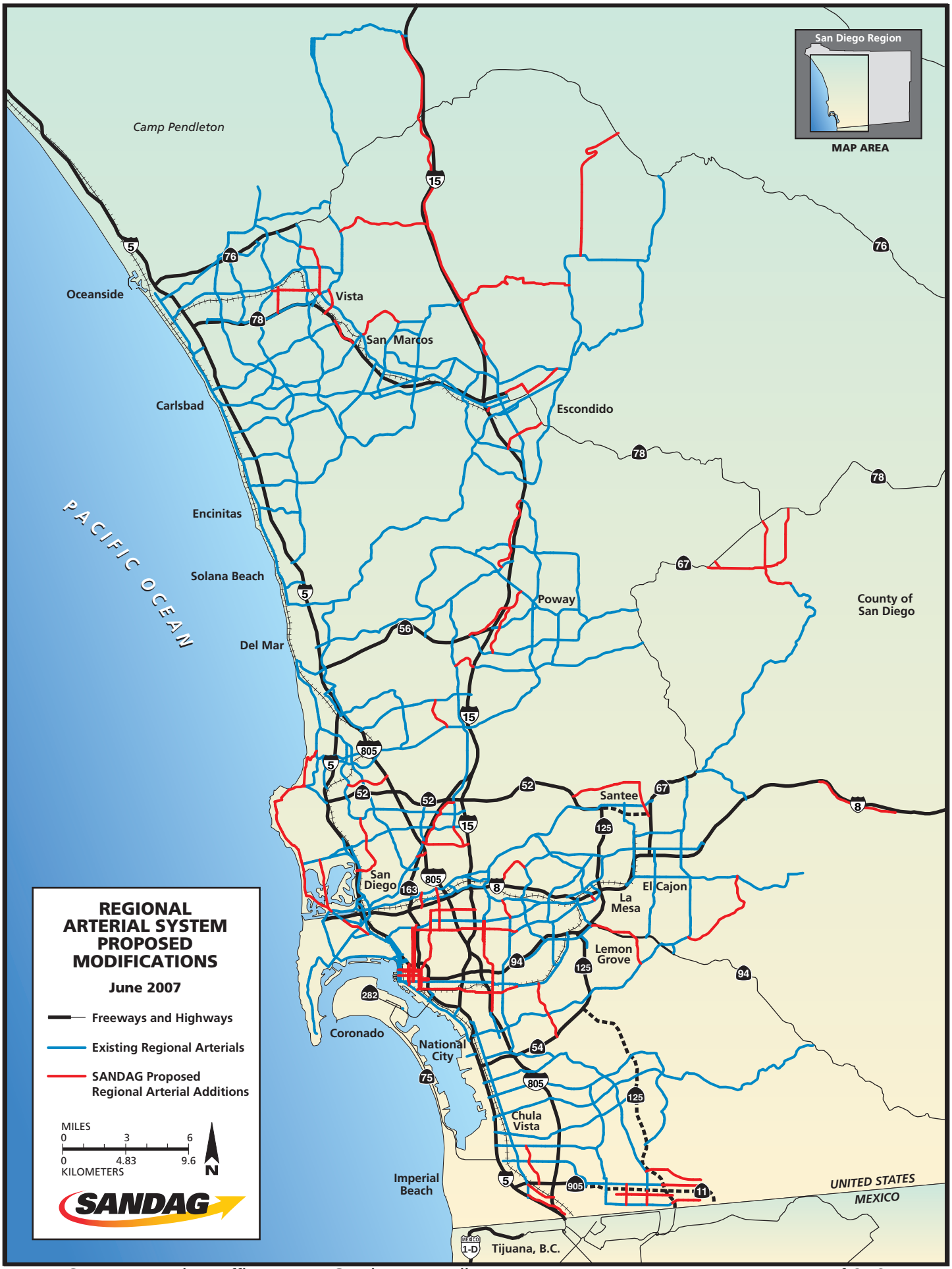
Next Steps

The updated RAS network will be included in the Draft 2007 RTP scheduled for release by the Board of Directors at its June 22, 2007, meeting.

BOB LEITER
Director of Land Use and Transportation Planning

Attachments: 1. Regional Arterial System Proposed Modifications Map
2. 2006 Regional Arterial System Update Summary of Proposed Additions and Modifications
3. Regional Arterials in MOBILITY 2030 by Jurisdiction

Key Staff Contact: Heather Werdick, (619) 699-6967, hwe@sandag.org


San Diego Region
MAP AREA
Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
Encinitas
Solana Beach
Del Mar
PACIFIC OCEAN
Poway
County of San Diego
Santee
El Cajon
La Mesa
Lemon Grove
San Diego
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
REGIONAL ARTERIAL SYSTEM PROPOSED MODIFICATIONS
June 2007
Freeways and Highways
Existing Regional Arterials
SANDAG Proposed Regional Arterial Additions
MILES
0 3 6
0 4.83 9.6
KILOMETERS
N
SANDAG

2006 Regional Arterial System Update
Summary of Proposed Additions/Modifications

	Arterial	Limits	Jurisdiction	SANDAG Recommended*
1	State Route 282	Alameda Avenue to Orange Street	Coronado	-
2	Autopark Way/Vineyard	Interstate 15 to Citracado Parkway	Escondido	-
3	Felicita/17th Avenue	Interstate 15 to State Route 78	Escondido	C
4	Grand Avenue	Second Avenue to State Route 78	Escondido	-
5	Hale Avenue	Washington Avenue to Interstate 15	Escondido	T
6	Lincoln/Ash Parkway	Broadway to Washington Avenue	Escondido	C
7	Mission Avenue	State Route 78 to El Norte Parkway	Escondido	-
8	Washington Avenue	State Route 78 to El Norte Parkway	Escondido	C
9	Baltimore Drive	Lake Murray Boulevard to University Avenue	La Mesa	-
10	Jackson Drive	La Mesa Boulevard to North City Limits	La Mesa	C
11	1st Avenue	Harbor Drive to Interstate 5	San Diego City	T
12	4th Avenue	Market Street to Washington Street	San Diego City	T
13	5th Avenue	Market Street to Washington Street	San Diego City	T
14	6th Avenue	Ash Street to State Route 163	San Diego City	T
15	10th Avenue	State Route 163 to Imperial Avenue	San Diego City	T
16	11th Avenue	G Street to State Route 163	San Diego City	T
17	47th Street	State Route 94 to Interstate 805	San Diego City	P, T
18	A Street	11th Avenue to Kettner Boulevard	San Diego City	C
19	Adams Avenue	Park Boulevard to Interstate 15	San Diego City	T
20	Aero Drive	State Route 163 to Interstate 15	San Diego City	C
21	Airway Road	Caliente to State Route 125	San Diego City	T
22	Ash Street	Harbor Drive to 10th Avenue	San Diego City	C
23	Auto Circle	Camino Del Rio North to Camino Del Rio South	San Diego City	C
24	Beyer Boulevard	Dairy Mart Road to East Beyer Boulevard	San Diego City	T
25	Beyer Way	Main Street to Palm Avenue	San Diego City	T
26	Britannia Boulevard	Otay Mesa Road to Siempre Viva Road	San Diego City	T
27	Broadway	Harbor Drive to 11th Avenue	San Diego City	T
28	Camino Ruiz	Mira Mesa Boulevard to Miramar Road	San Diego City	T
29	Carmel Mountain Road	Camino Del Norte - Rancho Penasquitos Boulevard	San Diego City	C
30	Carroll Canyon Road	Black Mountain Road to Scripps Ranch Parkway	San Diego City	-
31	Carroll Canyon Road	Sorrento Valley Road to Pacific Heights Boulevard	San Diego City	-
32	Clairemont Drive	Clairemont Mesa Boulevard to Interstate 5	San Diego City	T
33	Clairemont Mesa Boulevard	Interstate 15 to Santo Road	San Diego City	-
34	Collwood Boulevard	Montezuma Road to El Cajon Boulevard	San Diego City	T
35	Dennery Road	Palm Avenue to Del Sol Boulevard	San Diego City	-
36	East Beyer Boulevard	Camino de la Plaza to Beyer Boulevard	San Diego City	-
37	Euclid Avenue	Home Avenue to El Cajon Boulevard	San Diego City	-
38	F Street	State Route 94 to 10th Avenue	San Diego City	T
39	Fairmount Avenue	El Cajon Boulevard to State Route 94	San Diego City	P, T
40	Front Street	Interstate 5 to Market Avenue	San Diego City	T
41	G Street	State Route 94 to 10th Avenue	San Diego City	T
42	Governor Drive	Interstate 805 to Regents Road	San Diego City	P
43	Heritage Road	Otay Valley Road to City of Chula Vista	San Diego City	C
44	Home Avenue	State Route 94 to Euclid Avenue	San Diego City	-
45	Imperial Avenue	Park Boulevard to Valencia Parkway	San Diego City	T

* P: Meets Parallel Capacity Criterion
* C: Meets Direct Connection Criterion
* T: Meets Regional Transit Criterion

	Arterial	Limits	Jurisdiction	SANDAG Recommended*
46	Ingraham Street	Sunset Cliffs Boulevard to Grand Avenue	San Diego City	C, T
47	Kearny Villa Road	Aero Drive to State Route 52	San Diego City	T
48	La Jolla Boulevard	Pearl Street to Turquoise Street	San Diego City	T
49	La Jolla Shores Drive	Torrey Pines Road to North Torrey Pines Road	San Diego City	T
50	La Media Road	Otay Mesa Road to Siempre Viva Road	San Diego City	C
51	Midway Drive	West Point Loma Boulevard to Barnett Avenue	San Diego City	C
52	Mercy Road	Black Mountain Road to Interstate 15	San Diego City	C
53	Mesa College Drive	Interstate 805 to Marlesta Drive	San Diego City	T
54	Mission Boulevard	Loring Street to West Mission Bay Drive	San Diego City	T
55	Mission Center Road	Camino Del Rio North to Friars Road	San Diego City	C
56	Palm Avenue	State Route 75 to Interstate 805	San Diego City	C
57	Park Boulevard	Imperial Avenue to Adams Avenue	San Diego City	T
58	Park Village Road	Black Mountain Road to Camino Del Sur	San Diego City	-
59	Picador Boulevard	Palm Avenue to Interstate 905	San Diego City	T
60	Princess View Drive	Mission Gorge Road to Waring Road	San Diego City	-
61	Qualcomm Way	Interstate 8 to Friars Road	San Diego City	C
62	Rancho Carmel Drive	Carmel Mountain Road to Ted Williams Parkway	San Diego City	P
63	Ruffin Road	Balboa Avenue to Aero Drive	San Diego City	P
64	Sabre Springs Parkway	Ted Williams Parkway to Poway Road	San Diego City	P
65	Santo Road	Aero Drive to State Route 52	San Diego City	-
66	San Ysidro Boulevard	Dairy Mart Road to East Beyer Boulevard	San Diego City	T
67	Scripps Ranch Boulevard	Mira Mesa Boulevard to Pomerado Road	San Diego City	-
68	Texas Street	Interstate 8 to University Avenue	San Diego City	T
69	Tierrasanta Boulevard	Interstate 15 to Santo Road	San Diego City	-
70	Torrey Pines Road	Girard Avenue to La Jolla Parkway	San Diego City	T
71	University Avenue	State Route 163 to City of La Mesa	San Diego City	T
72	Waring Road	College Avenue to Interstate 8	San Diego City	C
73	West Bernardo Drive	Interstate 15 to Bernardo Center Drive	San Diego City	C
74	West Mission Bay Drive	Mission Boulevard to Sunset Cliffs Boulevard	San Diego City	T
75	West Point Loma Boulevard	Sports Arena Boulevard to Sunset Cliffs Boulevard	San Diego City	-
76	Woodman Street	State Route 54 to Imperial Avenue	San Diego City	C
77	Alpine Boulevard	Interstate 8/Dunbar Lane to Interstate 8/Willows Road	San Diego County	P
78	Airway Road	City of San Diego to Loop Road	San Diego County	-
79	Alta Road	Lone Star Road (extension) to Siempre Viva Road	San Diego County	-
80	Briarwood Road	Sweetwater Road to State Route 54	San Diego County	-
81	Buena Creek Road	S. Santa Fe Avenue to Blue Bird Canyon Trail	San Diego County	C
82	Campo Road	Spring Street to Sweetwater Springs/State Route 54	San Diego County	P
83	Chase Avenue/Hillsdale Road	City of El Cajon (Avocado Boulevard) to Jamacha Boulevard	San Diego County	-
84	Cole Grade Road	State Route 76 to Valley Center Road	San Diego County	C
85	Dye Road	State Route 67 to San Vicente Road	San Diego County	P
86	Dye Street	State Route 67 to Dye Road	San Diego County	P
87	Enrico Fermi Road	Lone Star Road (extension) to Siempre Viva Road	San Diego County	-
88	Fury Lane	Avocado Boulevard to Jamacha Road (State Route 54)	San Diego County	-
89	Gopher Canyon Road	E. Vista Way to Old Highway 395	San Diego County	C
90	Keyes Road (Southern Traffic Bypass)	San Vicente Road to State Route 78 (Julian Road)	San Diego County	P

* P: Meets Parallel Capacity Criterion
* C: Meets Direct Connection Criterion
* T: Meets Regional Transit Criterion

Arterial		Limits	Jurisdiction	SANDAG Recommended*
91	Lilac Road	Old Castle Road to Valley Center Road	San Diego County	-
92	Lone Star Road	City of San Diego to Loop Road	San Diego County	P
93	Los Coches Road	Woodside Avenue to Interstate 8	San Diego County	-
94	Mapleview Street (extension)	State Route 67 to Winter Gardens Boulevard	San Diego County	-
95	Monte Vista Drive	City of Vista to Buena Creek Road	San Diego County	-
96	Mountain Meadow Road	Interstate 15/Deer Springs Road to Valley Center Road	San Diego County	C
97	Old Castle Road	Interstate 15/Gopher Canyon Road to Lilac Road	San Diego County	-
98	Old Highway 80	Lake Jennings Park Road to Dunbar Lane	San Diego County	-
99	Old Highway 395/Champagne/N Centre City	E. Mission Road to City of Escondido	San Diego County	P
100	Otay Mesa Road	City of San Diego (Otay Mesa Road) to Loop Road	San Diego County	P
101	Proctor Valley Road/Melody Road	City of Chula Vista (Proctor Valley Road) to State Route 94	San Diego County	-
102	San Pasqual Road	Bear Valley Parkway (City of Escondido) to State Route 78	San Diego County	-
103	San Vicente Road/10th Street	State Route 67 (Main Street) to Wildcat Canyon Road	San Diego County	C
104	Siempre Viva Road	City of San Diego (Siempre Viva Road) to Loop Road	San Diego County	P
105	Stagecoach Lane	E Mission Road to S Mission Road	San Diego County	-
106	Steele Canyon Road	Willow Glen Drive to Campo Road (State Route 94)	San Diego County	-
107	Sweetwater Springs Boulevard	Jamacha Boulevard to State Route 94	San Diego County	C
108	Tavern Road	Interstate 8 to Alpine Boulevard	San Diego County	-
109	Via de la Valle	City of San Diego to Paseo Delicias	San Diego County	C
110	Willow Glen Drive	Jamacha Road to Dehesa Road	San Diego County	C
111	Woodside Avenue	City of Santee (Woodside) to Los Coches Road	San Diego County	-
112	Barham Drive	Twin Oaks Valley Road to Los Amigos	San Marcos	P
113	Nordhal Road	State Route 78 to Knob Hill Road	San Marcos	-
114	Magnolia Avenue	Mast Boulevard to Prospect Avenue/State Route 67	Santee	P
115	Mast Boulevard	State Route 52 to Magnolia Avenue	Santee	P
116	Emerald Drive	Sunset Drive to State Route 78	Vista	C
117	Escondido Avenue	State Route 78 to E. Vista Way	Vista	C
118	Escondido Avenue	S. Melrose Drive to State Route 78	Vista	-
119	La Mirada Drive	Sycamore Avenue to Poinsettia Avenue	Vista	-
120	Olive Avenue	Emerald Drive to Vista Village Drive	Vista	T
121	N. Melrose	State Route 78 to Bobier Drive	Vista	C, T
122	N. Santa Fe Avenue	Main Street to N. Melrose Drive	Vista	T
123	Poinsettia Avenue	Business Park Drive to La Mirada Drive	Vista	-
124	S. Melrose	Park Center Drive to State Route 78	Vista	T
125	Thibodo Road	Mar Vista Drive to Sycamore Avenue	Vista	P
126	Vista Village Drive	State Route 78 to Escondido Avenue	Vista	T

* P: Meets Parallel Capacity Criterion
* C: Meets Direct Connection Criterion
* T: Meets Regional Transit Criterion

Regional Arterials in MOBILITY 2030 by Jurisdiction

	Arterial	Limits	Jurisdiction
1	Cannon Road	Carlsbad Boulevard to Buena Vista Drive	Carlsbad
2	Carlsbad Boulevard	Eaton Street to La Costa Avenue	Carlsbad
3	Carlsbad Village Drive	Interstate 5 to Coast Boulevard/Coast Highway	Carlsbad
4	College Boulevard	City of Oceanside to Palomar Airport Road	Carlsbad
5	El Camino Real (S-11)	State Route 78 to Olivenhain	Carlsbad
6	Faraday Avenue	Melrose Drive to College Boulevard	Carlsbad
7	La Costa Avenue	Interstate 5 to El Camino Real	Carlsbad
8	Melrose Drive	City of Vista to Rancho Santa Fe Road	Carlsbad
9	Olivenhain Road	Los Pinos Circle to Rancho Santa Fe Road	Carlsbad
10	Palomar Airport Road	Carlsbad Boulevard to Business Park Drive	Carlsbad
11	Poinsettia Lane	Carlsbad Boulevard to Melrose Drive	Carlsbad
12	Rancho Santa Fe Road	Melrose Drive to Olivenhain Road	Carlsbad
13	Bonita Road	1st Avenue to Interstate 805	Chula Vista
14	Broadway	C Street to Main Street	Chula Vista
15	E Street	Interstate 5 to Bonita Road	Chula Vista
16	East H Street	Hilltop Drive to Mount Miguel Road	Chula Vista
17	H Street	Interstate 5 to Hilltop Drive	Chula Vista
18	Hunte Parkway	Proctor Valley Road to State Route 125	Chula Vista
19	L Street	Interstate 5 to Interstate 805	Chula Vista
20	La Media Road	Telegraph Canyon Road to State Route 905	Chula Vista
21	Main Street	Interstate 5 to Interstate 805	Chula Vista
22	Olympic Parkway	Interstate 805 to State Route 125	Chula Vista
23	Orange Avenue	Palomar Street to Interstate 805	Chula Vista
24	Otay Lakes Road	Bonita Road to Wueste Road	Chula Vista
25	Otay Valley Road (Main Street)	Interstate 805 to Heritage Road	Chula Vista
26	Palomar Street	Interstate 5 to Orange Avenue	Chula Vista
27	Paseo Ranchero (Heritage Road)	East H Street to Otay Mesa Road	Chula Vista
28	Proctor Valley Road	Mt. Miguel Road to Hunte Parkway	Chula Vista
29	Telegraph Canyon Road	Interstate 805 to Otay Lakes Road	Chula Vista
30	Willow Street	Sweetwater Road to Bonita Road	Chula Vista
31	State Route 75	City of San Diego to City of Imperial Beach	Coronado
32	Via de la Valle	Highway 101 to Jimmy Durante Boulevard	Del Mar
33	2nd Street	Greenfield Drive to Main Street	El Cajon
34	Avocado Avenue	Main Street to Chase Avenue	El Cajon
35	Avocado Boulevard	Chase Avenue to Dewitt Court	El Cajon
36	Ballantyne Street	Broadway to Main Street	El Cajon
37	Bradley Avenue	Marshall Avenue to County of San Diego	El Cajon
38	Broadway	State Route 67 to East Main Street	El Cajon
39	Cuyamaca Street	City of Santee to Marshall Avenue	El Cajon
40	E Main Street	Broadway to Greenfield Drive	El Cajon
41	El Cajon Boulevard	Chase Avenue to Washington Avenue	El Cajon
42	Fletcher Parkway	City of La Mesa to State Route 67	El Cajon
43	Greenfield Drive	East Main Street to Interstate 8	El Cajon
44	Jamacha Road	Main Street to Grove Road	El Cajon
45	Marshall Avenue	Cuyamaca to Fletcher Parkway	El Cajon

* included in Regional Arterial System contingent upon being designated as a 4-lane arterial by the County of San Diego.

	Arterial	Limits	Jurisdiction
46	Marshall Avenue	Fletcher Parkway to West Main Street	El Cajon
47	Marshall Avenue	West Main Street to Washington Avenue	El Cajon
48	Navajo Road	Fanita Drive to Fletcher Parkway	El Cajon
49	Washington Avenue	El Cajon Boulevard to Jamacha Road	El Cajon
50	West Main Street	Interstate 8 to Marshall Avenue	El Cajon
51	Coast Highway	City of Carlsbad to City of Solana Beach	Encinitas
52	El Camino Real	Olivenhain to Manchester Avenue	Encinitas
53	Encinitas Boulevard	Coast Highway 101 to El Camino Real	Encinitas
54	La Costa Avenue	Coast Highway 101 to Interstate 5	Encinitas
55	Leucadia Boulevard	Coast Highway 101 to El Camino Real	Encinitas
56	Manchester Avenue	El Camino Real to Interstate 5	Encinitas
57	Olivenhain Road	El Camino Real to Los Pinos Circle	Encinitas
58	Barham Drive	Los Amigos to Mission Road	Escondido
59	Centre City Parkway	Country Club Lane (Interstate 15) to South Escondido Boulevard/South Centre City Parkway (Interstate 15)	Escondido
60	Citracado Parkway	Centre City Parkway to State Route 78	Escondido
61	East Valley Parkway	Broadway to Valley Center Grade Road	Escondido
62	East Via Rancho Parkway	Broadway to Sunset Drive	Escondido
63	El Norte Parkway	Nordahl Road to Washington Avenue	Escondido
64	El Norte Parkway	Woodland Parkway to Rees Road	Escondido
65	Grand Avenue/2nd Avenue/Valley Boulevard	West Valley Parkway to East Valley Parkway	Escondido
66	Mission Avenue	Andreason Drive to Centre City Parkway	Escondido
67	Mission Road	Barham Drive to Andreason Drive	Escondido
68	Via Rancho Parkway	Del Dios Highway to Sunset Drive	Escondido
69	Washington Avenue	El Norte Parkway to East Valley Parkway	Escondido
70	West Valley Parkway	Claudan Road to Broadway	Escondido
71	State Route 75	City of Coronado to City of San Diego	Imperial Beach
72	70th Street	University Avenue to Colony Road	La Mesa
73	70th Street	Saranac Street to Interstate 8	La Mesa
74	El Cajon Boulevard	73rd Street to Interstate 8	La Mesa
75	Fletcher Parkway	Interstate 8 to City of El Cajon	La Mesa
76	Grossmont Center Drive	Interstate 8 to Fletcher Parkway	La Mesa
77	La Mesa Boulevard	University Avenue to Interstate 8	La Mesa
78	Lake Murray	Interstate 8 to Dallas Street	La Mesa
79	Massachusetts Avenue	State Route 94 to University Avenue	La Mesa
80	Spring Street	Interstate 8 to State Route 125	La Mesa
81	University Avenue	69th Street to La Mesa Boulevard	La Mesa
82	Broadway	Spring Street to Lemon Grove Avenue	Lemon Grove
83	College Avenue	Livingston Street to Federal Boulevard	Lemon Grove
84	Federal Boulevard	College Avenue to State Route 94	Lemon Grove
85	Lemon Grove Avenue	Viewcrest to State Route 94	Lemon Grove
86	Massachusetts Avenue	Broadway to State Route 94	Lemon Grove
87	Massachusetts Avenue	Lemon Grove Avenue to Broadway	Lemon Grove
88	Sweetwater Road	Broadway to Troy Street	Lemon Grove
89	30th Street	National City Boulevard to 2nd Street	National City
90	Euclid Avenue	Cervantes Avenue to Sweetwater Road	National City
91	Harbor Drive	City of San Diego to Interstate 5	National City

* included in Regional Arterial System contingent upon being designated as a 4-lane arterial by the County of San Diego.

	Arterial	Limits	Jurisdiction
92	National City Boulevard	Division Street to 30th Street	National City
93	Palm Avenue	Interstate 805 to 18th Street	National City
94	Paradise Valley Road	8th Street to Plaza Boulevard	National City
95	Plaza Boulevard	National City Boulevard to 8th Street	National City
96	Sweetwater Road	2nd Street to Plaza Bonita Center Way	National City
97	Coast Highway	Interstate 5 to Eaton Street	Oceanside
98	College Boulevard	North River Road to State Route 78	Oceanside
99	El Camino Real	Douglas Drive to State Route 78	Oceanside
100	Melrose Drive	State Route 76 to Rancho Santa Fe Road	Oceanside
101	Mission Avenue	Coast Highway to Frazee Road	Oceanside
102	North River Road	Douglas Drive to State Route 76	Oceanside
103	North Santa Fe Avenue	State Route 76 to Melrose Drive	Oceanside
104	Oceanside Boulevard	Hill Street to Melrose Drive	Oceanside
105	Rancho Del Oro Drive	State Route 78 to State Route 76	Oceanside
106	Vandegrift Boulevard	North River Road to Camp Pendleton	Oceanside
107	West Vista Way	Jefferson Street to Thunder Drive	Oceanside
108	Camino del Norte	World Trade Drive to Pomarado Road	Poway
109	Community Road	Twin Peaks Road to Scripps Poway Parkway	Poway
110	Espola Road	Summerfield Lane to Poway Road	Poway
111	Pomerado Road	Stonemill Drive to Gateway Park Road	Poway
112	Poway Road	Springhurst Drive to State Route 67	Poway
113	Scripps Poway Parkway	Springbrook to Sycamore Canyon Road	Poway
114	Ted Williams Parkway	Pomerado Road to Twin Peaks Road	Poway
115	Twin Peaks Road	Pomarado Road to Espola Road	Poway
116	32nd Street	Harbor Drive to Wabash Boulevard	San Diego City
117	54th Street	El Cajon Boulevard to Euclid Avenue	San Diego City
118	70th Street	Colony Road to Saranac Street	San Diego City
119	Balboa Avenue	Mission Bay Drive to Interstate 15	San Diego City
120	Barnett Avenue	Lytton Street to Pacific Highway	San Diego City
121	Bernardo Center Drive	Camino Del Norte to Interstate 15	San Diego City
122	Beyer Boulevard	Main Street to Dairy Mart Road	San Diego City
123	Black Mountain Road	Del Mar Heights to Carroll Canyon Road	San Diego City
124	Cabrillo Memorial Drive	Cochran Street to Cabrillo National Monument	San Diego City
125	Camino del Norte	Camino San Bernardo to World Trade Drive	San Diego City
126	Camino Del Rio North	Mission Center Road to Mission Gorge Road	San Diego City
127	Camino Ruiz	State Route 56 to Camino del Norte	San Diego City
128	Camino Santa Fe Avenue	Sorrento Valley Boulevard to Miramar Road	San Diego City
129	Canon Street	Rosecrans Street to Catalina Boulevard	San Diego City
130	Carmel Mountain Road	Sorrento Valley Road to El Camino Real	San Diego City
131	Carmel Valley Road	North Torrey Pines Road to El Camino Real	San Diego City
132	Catalina Boulevard	Canon Street to Cochran Street	San Diego City
133	Clairemont Mesa Boulevard	Interstate 15 to Regents Road	San Diego City
134	College Avenue	Navajo Road to Livingston Street	San Diego City
135	Convoy Street	Linda Vista Road to State Route 52	San Diego City
136	Ceasar E. Chavez Pkwy	Interstate 5 to Harbor Drive	San Diego City
137	Dairy Mart Road	State Route 905 to Interstate 5	San Diego City
138	Del Dios Highway	Via Rancho Parkway to Claudan Road	San Diego City

* included in Regional Arterial System contingent upon being designated as a 4-lane arterial by the County of San Diego.

	Arterial	Limits	Jurisdiction
139	Del Mar Heights Road	Interstate 5 to Carmel Valley Road	San Diego City
140	El Cajon Boulevard	Park Boulevard to 73rd Street	San Diego City
141	El Camino Real	Via de la Valle to Carmel Mountain Road	San Diego City
142	Euclid Avenue	54th Street to Cervantes Avenue	San Diego City
143	Fairmount Avenue	Interstate 8 to El Cajon Boulevard	San Diego City
144	Friars Road	Sea World Drive to Mission Gorge Road	San Diego City
145	Garnet Avenue	Balboa Avenue to Mission Bay Drive	San Diego City
146	Genesee Avenue	N. Torrey Pines Road to State Route 163	San Diego City
147	Gilman Drive	La Jolla Village Drive to Interstate 5	San Diego City
148	Grand Avenue	Mission Boulevard to Mission Bay Drive	San Diego City
149	Grape Street	North Harbor Drive to Interstate 5	San Diego City
150	Harbor Drive	Pacific Highway to City of National City	San Diego City
151	Hawthorn Street	Interstate 5 to North Harbor Drive	San Diego City
152	Heritage Road	Otay Mesa Road to Siempre Viva Road	San Diego City
153	Heritage Road	Otay Valley Road to City of Chula Vista	San Diego City
154	Imperial Avenue	Valencia Parkway to Lisbon Street	San Diego City
155	Kearny Villa Road	Pomarado Road to Waxie Way	San Diego City
156	Kettner Boulevard	Interstate 5 to India Street	San Diego City
157	La Jolla Parkway	Torrey Pines Road to Interstate 5	San Diego City
158	La Jolla Village Drive	North Torrey Pines Road to Interstate 805	San Diego City
159	Lake Murray Boulevard	Dallas Street to Navajo Road	San Diego City
160	Laurel Street	North Harbor Drive to Interstate 5	San Diego City
161	Lemon Grove Avenue	Lisbon Street to Viewcrest	San Diego City
162	Linda Vista Road	Morena Boulevard to Convoy Street	San Diego City
163	Lytton Street	Rosecrans Street to Barnett Avenue	San Diego City
164	Market Street	Harbor Drive to Euclid Avenue	San Diego City
165	Mira Mesa Boulevard	Interstate 805 to Interstate 15	San Diego City
166	Miramar Road	Interstate 805 to Interstate 15	San Diego City
167	Mission Bay Drive	Grand Avenue to Interstate 5	San Diego City
168	Mission Gorge Road	Interstate 8 to Highridge Road	San Diego City
169	Montezuma Road	Fairmount Avenue to El Cajon Boulevard	San Diego City
170	Morena Boulevard	Balboa Avenue to Interstate 8	San Diego City
171	Navajo Road	Waring Road to Fanita Drive	San Diego City
172	Nimitz Boulevard	Interstate 8 to Harbor Drive	San Diego City
173	North Harbor Drive	Rosecrans Street to Grape Street	San Diego City
174	North Torrey Pines Road (S-21)	Carmel Valley Road to La Jolla Village Drive	San Diego City
175	Ocean View Hills Parkway	Interstate 805 to State Route 905	San Diego City
176	Otay Mesa Road	State Route 905 to State Route 125	San Diego City
177	Pacific Highway	Sea World Drive to Harbor Drive	San Diego City
178	Paradise Valley Road	Plaza Boulevard to Meadowbrook Drive	San Diego City
179	Pomerado Road	Interstate 15 (north) to Interstate 15 (south)	San Diego City
180	Poway Road	Interstate 15 to Springhurst Drive	San Diego City
181	Rancho Bernardo Road	Interstate 15 to Summerfield Lane	San Diego City
182	Rancho Penasquitos Boulevard	State Route 56 to Interstate 15	San Diego City
183	Regents Road	Genesee Avenue to Clairemont Mesa Boulevard	San Diego City
184	Rosecrans Street	Interstate 8 to Canon Street	San Diego City
185	Ruffin Road	Kearny Villa Road to Balboa Avenue	San Diego City

* included in Regional Arterial System contingent upon being designated as a 4-lane arterial by the County of San Diego.

	Arterial	Limits	Jurisdiction
186	Scripps Poway Parkway	Interstate 15 to Springbrook Drive	San Diego City
187	Sea World Drive	W Mission Bay Drive to Morena Boulevard	San Diego City
188	Siempre Viva Road	Heritage Road to State Route 905	San Diego City
189	Sorrento Valley Boulevard	Sorrento Valley Road to Camino Santa Fe Avenue	San Diego City
190	Sports Arena Boulevard	Interstate 8 to Rosecrans Street	San Diego City
191	Sunset Cliffs Boulevard	Interstate 8 to West Mission Bay Drive	San Diego City
192	Ted Williams Parkway	Interstate 15 to Pomerado Road	San Diego City
193	University Avenue	54th Street to 69th Street	San Diego City
194	Valencia Parkway	Market Street to Imperial Avenue	San Diego City
195	Via de la Valle	Jimmy Durante Boulevard to El Camino Real	San Diego City
196	Vista Sorrento Parkway	Sorrento Valley Boulevard to Carmel Mountain Road	San Diego City
197	Wabash Boulevard	32nd Street to Interstate 5	San Diego City
198	Washington Street	Pacific Highway to Park Boulevard	San Diego City
199	Avocado Boulevard	Dewitt Court to State Route 94	San Diego County
200	Bear Valley Parkway	City of Escondido (north) to City of Escondido (south)	San Diego County
201	Bonita Road	Interstate 805 to San Miguel Road	San Diego County
202	Borrego Springs/Yaqui Pass Road (S-3)	Palm Canyon Drive (S-22) to State Route 78	San Diego County
203	Bradley Avenue	Wing Avenue to Winter Garden Boulevard	San Diego County
204	Buckman Springs/Sunrise Highway (S-1)	State Route 94 to State Route 79	San Diego County
205	Buena Creek Road	Blue Bird Canyon Trail to Twin Oaks Valley Road	San Diego County
206	Camino del Norte	Rancho Bernardo Road to City of San Diego	San Diego County
207	Citracado Parkway	Greenwood Place to Interstate 15	San Diego County
208	Deer Springs Road	Twin Oaks Valley Road to Interstate 15	San Diego County
209	Dehesa Road	Jamacha Road to Harbison Canyon Road	San Diego County
210	Dehesa Road*	Harbisonn Canyon Road to Sycuan Road	San Diego County
211	Del Dios Highway	Via Rancho Pkway to Paseo De Delicias	San Diego County
212	East Vista Way	State Route 76 to City of Vista	San Diego County
213	El Norte Parkway	Rees Road to Nordahl Road	San Diego County
214	Euclid Avenue	City of National City to City of National City	San Diego County
215	Gamble Lane	Eucalyptus Avenue to City of Escondido	San Diego County
216	Jamancha Road	City of El Cajon to State Route 94	San Diego County
217	Jamancha Road	State Route 125 to State Route 94	San Diego County
218	Lake Jennings Park Road	State Route 67 to Interstate 8	San Diego County
219	Lake Wohlford Road	Valley Center Road (north) to Valley Center Road (south)	San Diego County
220	Las Posas Road	City of San Marcos to Buena Creek Road	San Diego County
221	Mapleview Street	State Route 67 to Lake Jennings Road	San Diego County
222	Mar Vista Drive	City of Oceanside to City of Vsita	San Diego County
223	Melrose Drive	City of Oceanside to City of Vsita	San Diego County
224	Mission Road (S-13)	Interstate 15 to State Route 76	San Diego County
225	Montezuma Valley/Palm Caynon (S-22)	State Route 79 to Imperial County Line	San Diego County
226	Nordahl Road	El Norte to City of San Marcos	San Diego County
227	Old Highway 80	Buckman Springs Road to Interstate 8 (In-ko-pah)	San Diego County
228	Old Highway 80	State Route 79 to Sunrise Highway	San Diego County
229	Otay Lakes Road	Wueste Road to State Route 94	San Diego County
230	Paradise Valley Road	City of San Diego to Sweetwater Road	San Diego County
231	Proctor Valley Road	Mount Miguel Road to Rocking Horse Drive	San Diego County
232	Rancho Bernardo Road	City of San Diego (west) to City of San Diego (east)	San Diego County

* included in Regional Arterial System contingent upon being designated as a 4-lane arterial by the County of San Diego.

	Arterial	Limits	Jurisdiction
233	San Felipe Road/Overland Route (S-2)	County Route S-22 to Imperial County Line	San Diego County
234	Scripps Poway Parkway	Sycamore Canyon Road to State Route 67	San Diego County
235	South Santa Fe Avenue	City of Vista to City of San Marcos	San Diego County
236	Sunrise Highway	State Route 79 to Interstate 8	San Diego County
237	Sweetwater Road (Bonita)	Willow Street to City of National City	San Diego County
238	Sweetwater Road (Spring Valley)	Jamacha Boulevard to Broadway	San Diego County
239	Valley Center Road	State Route 76 to City of Escondido	San Diego County
240	Valley Center New Northern E to W Road	Cole Grade Road to Old Highway 395	San Diego County
241	Via de la Valle	City of San Diego to Paseo Delicias	San Diego County
242	Via Rancho Parkway	Del Dios Highway to City of Escondido	San Diego County
243	Wildcat Canyon Road*	Mapleview Street to San Vicente Road	San Diego County
244	Willow Glen Drive	Jamacha Road to Dehesa Road	San Diego County
245	Willows Road	Interstate 8 to Viejas Casino	San Diego County
246	Winter Gardens Boulevard	State Route 67 to 2nd Street	San Diego County
247	Barham Drive	Twin Oaks Valley Road to Los Amigos	San Marcos
248	Borden Road	Las Posas Road to Woodland Parkway	San Marcos
249	Buena Creek Road	Twin Oaks Valley Road to Sunny Vista Lane	San Marcos
250	Discovery Street	San Marcos Boulevard to Twin Oaks Valley Road	San Marcos
251	Las Posas Road	West San Marcos Boulevard to North City Limits	San Marcos
252	Mission Road	Pacific Street to Barham Drive	San Marcos
253	San Elijo Road	Twin Oaks Valley Road to Rancho Santa Fe Road	San Marcos
254	Rancho Santa Fe Road	Mission Road to Melrose Drive	San Marcos
255	San Marcos Boulevard	Business Park Drive to Mission Road	San Marcos
256	South Santa Fe Avenue	Smilax Road to Pacific Street	San Marcos
257	Twin Oaks Valley Road	Deer Springs Road to Questhaven Road	San Marcos
258	Woodland Parkway	Barham Drive to El Norte Parkway	San Marcos
259	Cuyamaca Street	Mission Gorge Road to City of El Cajon	Santee
260	Mission Gorge Road	City of San Diego to Magonia Avenue	Santee
261	Woodside Avenue	Magnolia Avenue to State Route 67	Santee
262	Coast Highway	City of Encinitas to City of Del Mar	Solana Beach
263	Lomas Santa Fe Avenue	Interstate 5 to Coast Highway	Solana Beach
264	Bobier Drive	Melrose Drive to East Vista Way	Vista
265	Broadway	West Vista Way to South Santa Fe Avenue	Vista
266	Cannon Road	South Melrose Drive to State Route 78	Vista
267	East Vista Way	Vista Village Drive to Barsby Street	Vista
268	Mar Vista Drive	Buena Vista Drive to State Route 78	Vista
269	South Santa Fe Avenue	Broadway to Montgomery Drive	Vista
270	Sycamore Avenue	South Santa Fe Avenue to South Melrose Drive	Vista
271	West Vista Way	Thunder Drive to Vista Village Drive	Vista

* included in Regional Arterial System contingent upon being designated as a 4-lane arterial by the County of San Diego.

401 B Street, Suite 800
San Diego, CA 92101-4231
(619) 699-1900
Fax (619) 699-1905
www.sandag.org

May 24, 2007 3000400

TO: Interested Agencies and Individuals

FROM: SANDAG Staff

SUBJECT: Notice of Preparation of an Environmental Impact Report for the 2007 Regional Transportation Plan (RTP)

SANDAG, as lead agency, will prepare an Environmental Impact Report (EIR) for the above-referenced project. SANDAG needs to know your views, or the views of your agency, as to the scope and content of the environmental information that will be addressed in the EIR. The project description is contained in the attached material.

Public scoping meetings will be held during the Cities/County Advisory Committee meeting scheduled for Thursday, June 7, 2007, at 9:45 a.m. and the Regional Planning Technical Working Group meeting scheduled for Thursday, June 14, 2007, at 1:15 p.m. Both meetings will be held at SANDAG and copies of the agendas can be found one week prior to the meetings on the SANDAG Web site at www.sandag.org.

Public input will be taken at these meetings. In addition, public input can be provided in writing at the meeting or can be sent via email to stu@sandag.org.

Due to the time limits mandated by state law, your response must be sent at the earliest possible date, but no later than 30 days after receipt of this notice.

Please send your response to Shelby Tucker, Associate Regional Planner, at the address shown above. Please include the name of a contact person in your agency, if appropriate.

ST/cd

Attachments:
1. Project Description
2. 2030 Highway Network
3. 2030 Transit Network

MEMBER AGENCIES
Cities of
Carlsbad
Chula Vista
Coronado
Del Mar
El Cajon
Encinitas
Escondido
Imperial Beach
La Mesa
Lemon Grove
National City
Oceanside
Poway
San Diego
San Marcos
Santee
Solana Beach
Vista
and
County of San Diego

ADVISORY MEMBERS
Imperial County
California Department of Transportation
Metropolitan Transit System
North County Transit District
United States Department of Defense
San Diego Unified Port District
San Diego County Water Authority
Southern California Tribal Chairmen's Association
Mexico

Environmental Impact Report
2007 Regional Transportation Plan
Project Description

May 24, 2007

Background and Overview

The San Diego Association of Governments (SANDAG) is currently preparing a Regional Transportation Plan (RTP) for the San Diego Region and an Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA). The RTP addresses all forms, or modes, of transportation including automobiles, transit, bicycles, pedestrians, and intercity railroads. The RTP contains public policies, strategies, projects, and programs aimed at meeting the diverse mobility needs of the growing San Diego region through the year 2030.

In accordance with state and federal guidelines, the RTP is updated approximately every four years. The last comprehensive EIR on the RTP was conducted in 2003 for the 2030 RTP (MOBILITY 2030). A new EIR for the 2007 RTP is necessary to adequately evaluate potentially significant environmental effects of the plan and to indicate the manner in which such significant effects can be avoided or mitigated. This Notice of Preparation (NOP) is intended to alert regulatory and trustee agencies, interested agencies, and individuals of the preparation of the 2007 RTP EIR. Comments regarding the scope of the EIR received during the 30-day NOP review period will be incorporated, as appropriate, in the environmental document.

Similar to MOBILITY 2030, the 2007 RTP will focus on regional mobility as opposed to addressing each mode of transportation individually. It will address four major components of improving mobility:

1. Land use changes;
2. Systems development;
3. Systems management; and
4. Demand management.

Strategies, projects, and programs in each of these areas will be identified. The 2007 RTP also will identify a Reasonably Expected Revenue Scenario, which will include facilities that can reasonably be implemented through 2030. The Reasonably Expected plan will consist of major highways, regional transit services, and selected regional arterials. This transportation network will serve as the core of the 2007 RTP and will be the highest priority for regional transportation funding. The 2007 RTP also will include actions needed to implement the plan as well as regular monitoring of the plan's improvements. The baseline land use assumption used for the RTP will rely on existing land use plans adopted (or under consideration) by the local jurisdictions in the San Diego region.

Issues Addressed in the EIR

The EIR will analyze the project's impacts on the physical environment. The EIR will address how the project impacts the following issue areas:

1. Land Use
2. Social Environment
3. Visual Resources
4. Transportation
5. Air Quality (including Greenhouse Gas Emissions)
6. Noise
7. Energy
8. Geology/Paleontology
9. Hydrology/Water Resources
10. Biological Resources
11. Cultural Resources

Alternatives Analyzed in the EIR

SANDAG will evaluate several alternatives in the EIR. Each alternative will be compared to the proposed project for its potential to achieve the goals of the 2007 RTP while reducing potentially adverse regional environmental impacts. In addition to the project, which will assume a transportation network that is developed from the Reasonably Expected Revenue Scenario, the EIR is proposed to evaluate four alternatives as described below.

1. No Project Alternative – The No Project Alternative is required by CEQA. For this EIR, the No Project Alternative is defined as a transportation network that includes those projects that have already received funding, are scheduled for funding, and/or have received environmental clearance.

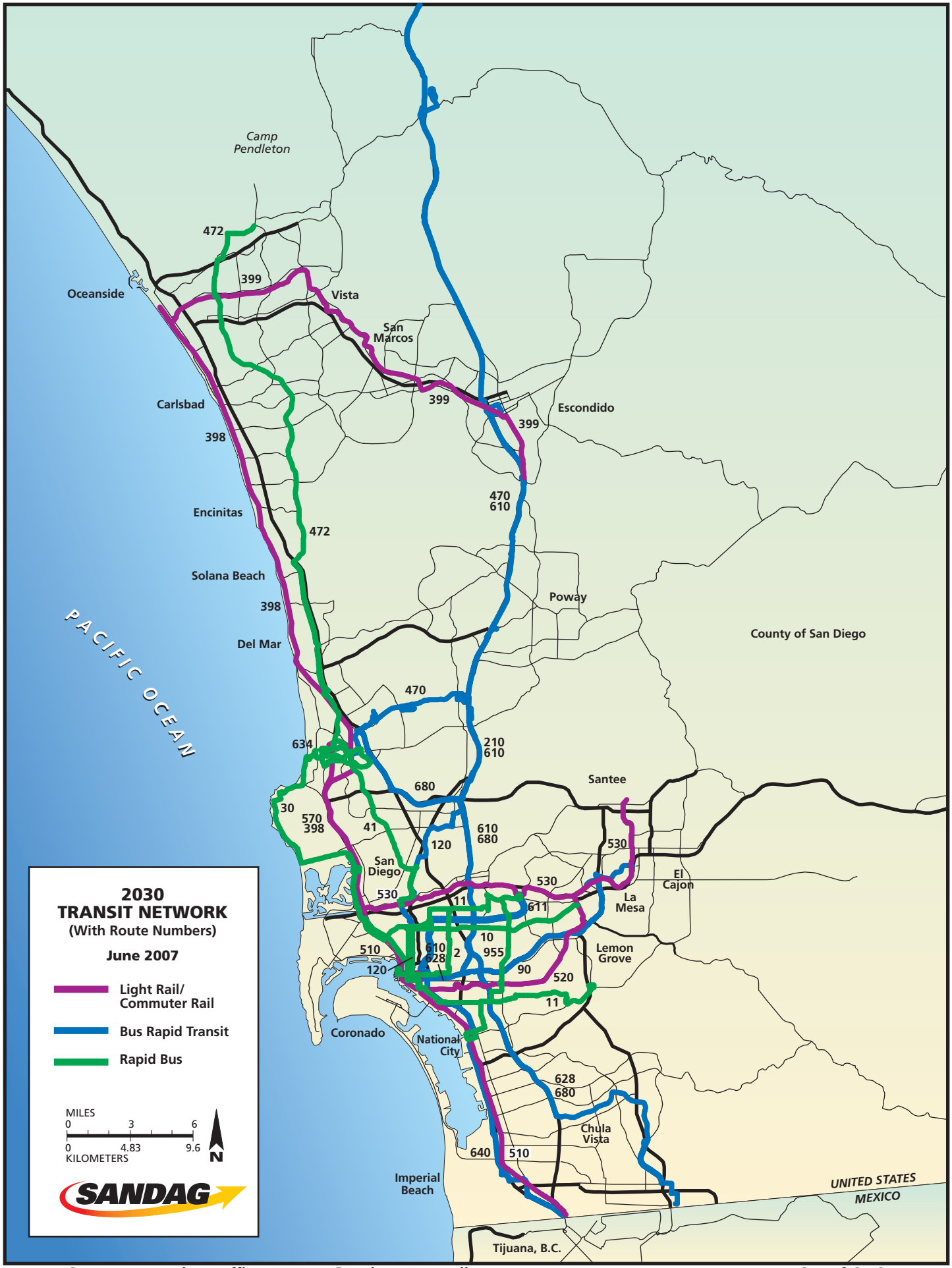
2. Revenue Constrained Alternative – The Revenue Constrained Alternative includes a transportation network that relies on guaranteed revenue sources and does not augment funding assumptions based on more aggressive efforts to bring increased funding levels to the region.

3. Transit Emphasis Alternative – The Transit Emphasis Alternative will assume a transit network where transit facilities would be improved and constructed with less emphasis on highways.

4. Transit Emphasis (Urban Core Focus) Alternative – This alternative is similar to the Transit Emphasis Alternative; however, the focus is on maximizing transit service in the downtown urban core area (within the orange and green line trolley service areas and extending south to National City).

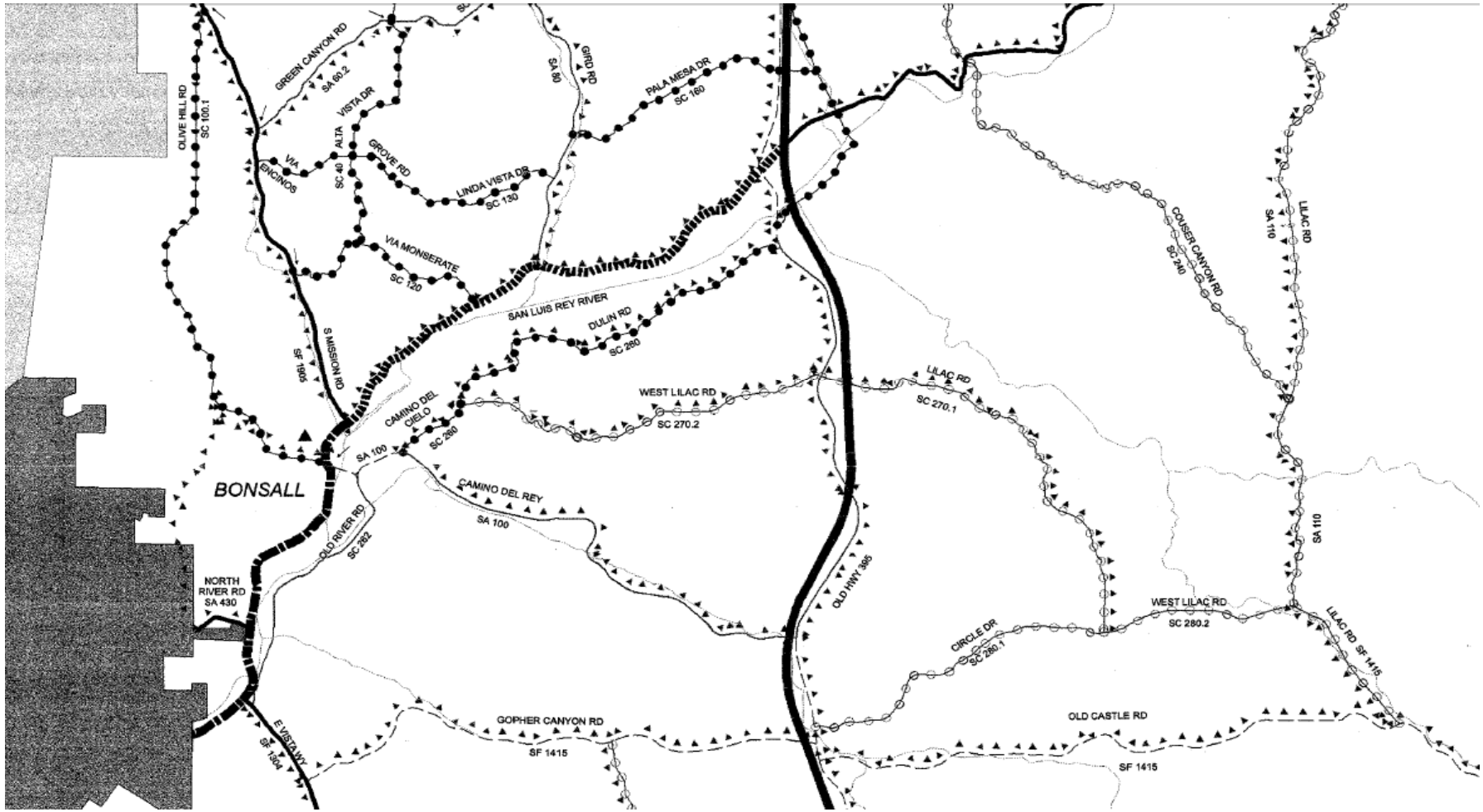
Although these alternatives have been identified, SANDAG is seeking input on the alternatives in the NOP process which could result in modifications to the number of alternatives analyzed in the EIR, or modifications to the alternatives identified above.

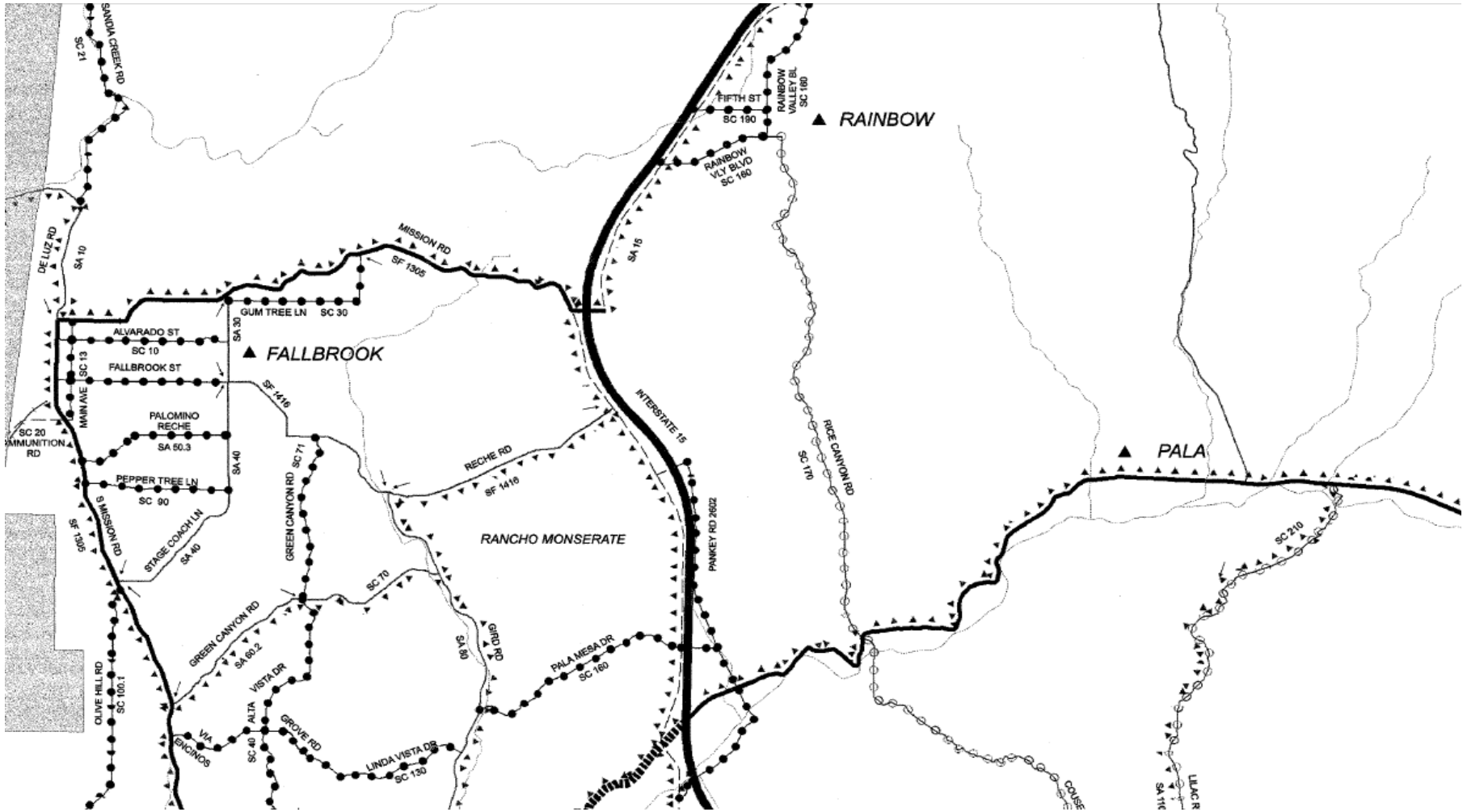

2030
HIGHWAY NETWORK
June 2007
Managed/HOV Lanes
General Purpose/Toll Lanes
Freeway Connectors
HOV/BRT Connectors
C = Conventional Highway
E = Expressway
F = Freeway
HOV = High Occupancy Vehicle
MB = Movable Barrier
ML = Managed Lanes
T = Toll Road
MILES
0 3 6
0 4.83 9.6
KILOMETERS
N
SANDAG
San Diego Region
MAP AREA
Riverside County
Orange County
San Diego County
Northern Extent
4T/6T
MILES
Camp Pendleton
PACIFIC OCEAN
Oceanside
Vista
San Marcos
Carlsbad
Escondido
Encinitas
Solana Beach
Poway
Del Mar
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Tijuana, B.C.
UNITED STATES
MEXICO
8F+4T
4C
2C
4E
6F+2HOV
8F+4ML
10F+4ML/MB
4F
14F+4ML
6F+2ML (Reversible)
6F
8F + 2HOV
8F +4ML
8F+2HOV
10F
8T
4T
8F

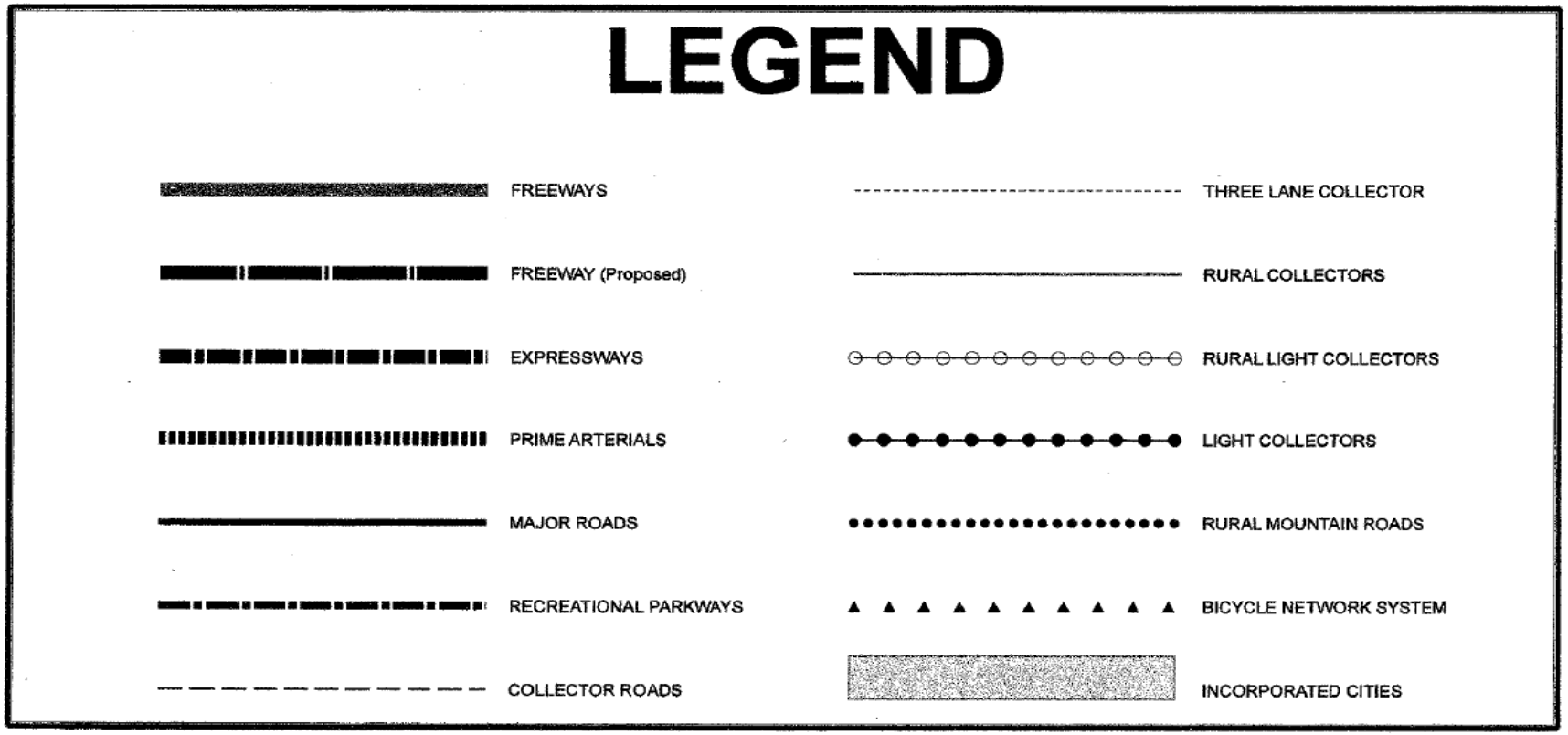

Camp Pendleton
Oceanside
Vista
San Marcos
Carlsbad
Escondido
Encinitas
Solana Beach
Poway
Del Mar
PACIFIC OCEAN
County of San Diego
Santee
San Diego
El Cajon
La Mesa
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
UNITED STATES
MEXICO
Tijuana, B.C.
472
399
398
470
610
634
210
680
30
570
41
120
530
11
611
10
510
628
2
955
90
520
640
2030
TRANSIT NETWORK
(With Route Numbers)
June 2007
Light Rail/
Commuter Rail
Bus Rapid Transit
Rapid Bus
MILES
0 3 6
0 4.83 9.6
KILOMETERS
N
SANDAG

Appendix B

County of San Diego Circulation Element Classification


GREEN CANYON RD
SA 60.2
OLIVE HILL RD
SC 100.1
VISTA DR
ALTA
SC 40
VIA ENCINOS
GROVE RD
LINDA VISTA DR
SC 130
SA 60
GIRD RD
PALA MESA DR
SC 160
VIA MONSERATE
SC 120
SAN LUIS REY RIVER
DULIN RD
SC 280
S MISSION RD
SF 1905
CAMINO DEL CIELO
SC 280
WEST LILAC RD
SC 270.2
LILAC RD
SC 270.1
COUSER CANYON RD
SC 240
LILAC RD
SA 110
SA 100
BONSALL
CAMINO DEL REY
SA 100
OLD RIVER RD
SC 282
NORTH RIVER RD
SA 430
OLD HWY 395
SA 110
WEST LILAC RD
SC 280.2
CIRCLE DR
SC 280.1
LILAC RD SF 1415
E VISTA WY
SF 1904
GOPHER CANYON RD
SF 1415
OLD CASTLE RD
SF 1415


SANDIA CREEK RD
SC 21
DE LUZ RD
SA 10
MISSION RD
SF 1305
GUM TREE LN
SC 30
SA 30
ALVARADO ST
SC 10
FALLBROOK
FALLBROOK ST
SC 13
MAIN AVE
SF 1416
PALOMINO RECHE
SA 50.3
SC 20
AMMUNITION RD
PEPPER TREE LN
SC 90
SA 40
S MISSION RD
SF 1305
STAGE COACH LN
SA 40
GREEN CANYON RD
SC 71
RECHE RD
SF 1416
RANCHO MONSERATE
SC 70
GREEN CANYON RD
SA 60.2
VISTA DR
ALTA
SC 40
VIA ENCINOS
GROVE RD
LINDA VISTA DR
SC 130
SA 60
GIRD RD
PALA MESA DR
SC 160
OLIVE HILL RD
SC 1001
INTERSTATE 15
PANKEY RD 2602
SA 15
FIFTH ST
SC 190
RAINBOW VALLEY BL
SC 160
RAINBOW
RAINBOW VLY BLVD
SC 160
RICE CANYON RD
SC 170
PALA
SC 210
COUSE
LILAC R
SA 11


LEGEND
FREEWAYS
FREEWAY (Proposed)
EXPRESSWAYS
PRIME ARTERIALS
MAJOR ROADS
RECREATIONAL PARKWAYS
COLLECTOR ROADS
THREE LANE COLLECTOR
RURAL COLLECTORS
RURAL LIGHT COLLECTORS
LIGHT COLLECTORS
RURAL MOUNTAIN ROADS
BICYCLE NETWORK SYSTEM
INCORPORATED CITIES

CIRCULATION ELEMENT ROAD SEGMENTS AND CLASSIFICATIONS (ALPHABETICAL)

5/11/01

C = Collector

ID	#	ROAD NAME	STUDIES	CLASS	LIMITS OF CLASSIFICATION FROM	TO	BEGIN T.B.	T.B. 2001
SF	1412	SOUTH SANTA FE AV	RL OC	M	CITY OF VISTA	CITY OF SAN MARCOS	15-E2	1108-B2
SA	210	SPLIT MOUNTAIN RD		C	SR 78	IMPERIAL COUNTY	406-F1	410-F10
SR	11	SR 11		F	HARVEST RD	MEXICAN BORDER		
SR	125	SR 125		F	CITY OF CHULA VISTA	CITY OF SAN DIEGO	70N-B4	1311-F5
SR	125	SR 125		F	CITY OF LEMON GROVE	SR 54	62-D4	1270-J7
SR	125	SR 125		PA	SWEETWATER RD	CITY OF CHULA VISTA	67-D4	1291-A6
SR	54	SR 54		E	CITY OF EL CAJON	SR 125	56-E6	1252-A7
SR	67	SR 67		C	RAMONA ST	DYE RD	33P-D1	1152-F7
SR	67	SR 67		F	WILLOW RD	CITY OF SANTEE	48-E1	1232-A1
SR	67	SR 67		M	DYE RD	WILLOW RD	33P-A3	1172-B4
SR	78	SR 78		M	G.S.O.S.R. OF 1849	IMPERIAL COUNTY	406-A2	410-A11
SR	79	SR 79		C	OLD HWY 80	I-8	51T-C3	1236-D3
SR	79	SR 79		M	RIVERSIDE COUNTY	SR 78	401-A1	409-G5
SR	79	SR 79		RM	MAIN ST (JULIAN)	OLD HWY 80	23T-D2	1136-B7
SR	94	SR 94		F	AVOCADO BL	SC 2118	63-B4	1271-F5
SR	94	SR 94		RLC	I-8	OLDE HWY 80	409-D4	1300-D5
SA	30	STAGE COACH LN	RL OC	RC	MISSION RD	FALLBROOK ST	5-E3	1027-J1
SA	40	STAGE COACH LN	RL OC	RC	FALLBROOK ST	MISSION RD	5-E4	1027-J3
SC	2050	STEELE CANYON RD	RL OC	C	WILLOW GLEN DR	SR 94	63-F4	1272-C5
SC	260.2	STEWART CYN RD	RL	C	OLD 395	PANKEY RD	5K-D5	1028-G4
SC	1110	SUMMIT DR/MARY LN	RL	LC	SR 78	PALMA VISTA CT	23-B4	1130-D4
SF	1404	SUNRISE HWY	use LC	RM	SR 79	I-8	405-E3	1176-G2
SC	1190	SUNSET DR	RL	C	CITY OF OCEANSIDE	CITY OF VISTA	14-F1	1107-D2
SC	1200	SUNSET DR/EMERALD DR		C	CITY OF OCEANSIDE	CITY OF OCEANSIDE	14-F1	1107-D2
SC	890	SUTHERLAND DAM RD	RL	C	BLACK CANYON RD	SUTHERLAND DR	405-B1	409-H11
SA	1170	SWEETWATER RD		C	PROSPECT ST	CITY OF NAT. CITY	69-D1	1310-B3
SC	2210	SWEETWATER RD		C	BONITA RD BRIDGE	WILLOW ST	67-D5	1310-J1
SF	1269	SWEETWATER RD	OC	C	CITY OF LEMON GROVE	SR 54	62-D4	1270-J7
SA	1170	SWEETWATER RD/WILLOW ST		M	CITY OF NAT. CITY	BONITA RD	69-F1	1310-E3
SA	970	SWEETWATER SPRINGS BL	OC	M	SR 94	JAMACHA BL	63-B4	1271-E5
SA	490	SYCAMORE AV/BUENA CREEK RD	OC SP	M	CITY OF VISTA	ORA AVO DR	15-F3	1108-C3
SA	380	TAVERN RD	RL	C	ARNOLD WAY	SOUTH GRADE RD	50-F5	1234-A6
SA	380	TAVERN RD	RL	M	I-8	ARNOLD WAY	50-F5	1233-J5
SA	380	TAVERN RD	RL	RM	SOUTH GRADE RD	DEHESA RD	58-F2	1254-A2
SC	1985	TAVERN RD/VICTORIA PARK TERR	RL	C	I-8	W VICTORIA DR	50-F5	1233-J5
SC	1160	TAYLOR ST/DOUGLAS DR		C	SANTA FE AV	ELEVADO RD	11-C2	1087-H2
SR	188	TECATE RD		M	SR 94	MEXICAN BORDER	406-D5	429-K10
SA	1140	TELEGRAPH CANYON RD		PA	CITY OF CHULA VISTA	OTAY LAKES RD	70-D5	1331-A1
SA	10	TENAJA/MARGARITA/CHRISTIANITOS RD		M	T8S-R5W-SEC13	I-5	403-D3	1409-A4
SC	960	THIRD ST (RAMONA)	RL OC	C	MAIN ST	KEYES RD	28P-F5	1152-H5
SC	610	TIERRA DEL SOL RD		RLC	OLDE HWY 80	SC 590	409-C5	1300-A6
SC	440	TILTING 'T' DR		C	BORREGO SPRINGS RD	BORREGO VALLEY RD	78-C3	1078-J6
SA	950.2	TROY ST/BANCROFT DR	RL OC	C	SWEETWATER RD	CITY OF LA MESA	62-D5	1270-J6
SC	990.2	TURNER HTS DR/MIRAR DEL VALLE	RL	C	MOUNTAIN MDWS RD	VALLEY CENTER RD	12L-B4	1089-E4
SC	1170	TWIN OAKS VALLEY RD	OC	C	SA 1414	DEER SPRINGS RD	12-D6	1088-H7
SA	1414	TWIN OAKS VALLEY RD	RL OC	M	ORA AVO DR	DEER SPRINGS RD	12-B6	1108-E1
SC	1170	TWIN OAKS VALLEY RD	RL OC	RC	S BDRY BONSALL C.P.	SA 1414	12-C3	1088-F2

Campus Park Traffic Impact Study Appendix Page 30 of 940

Pictures of SR-76 currently being widened from 2 to 4 lanes. Pictures taken Dec 2008 and Jan 2009.

Intersection of SR-76 at Pankey Road. Pankey Road closed south of SR-76 due to SR-76 widening.



Looking west along SR-76 in the vicinity of Granite driveway



Looking west along SR-76 prior to Pankey Rd where new alignment deviates from existing alignment



Looking west along SR-76 just before I-15 interchange



State Route 76 Middle

Melrose Drive to South Mission Road

FACT SHEET

GOALS

Relieve existing and future traffic congestion; improve motorist safety; and minimize environmental impacts.

FUNDING

The estimated cost for the preferred alternative is $244 million. Funding for the project includes the TransNet Sales Tax Measure approved by San Diego County voters in November 2004, gas tax revenues from the State Transportation Improvement Program (STIP), and federal and local funds. Construction is anticipated to begin in 2010.

CONTACT

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Fax: (619) 688-3695
www.dot.ca.gov/dist11

THE PROJECT

The current proposal is to develop a four-lane conventional highway that can accommodate widening to six lanes, from Melrose Drive in Oceanside to South Mission Road in Bonsall. SR-76 is known as Mission Avenue within the city of Oceanside and Mission Road within the unincorporated communities of Bonsall and Fallbrook. Caltrans identified the existing alternative as the preferred alternative in the October 2007 Draft Environmental Document (see map on back).

ENVIRONMENTAL CONCERNS

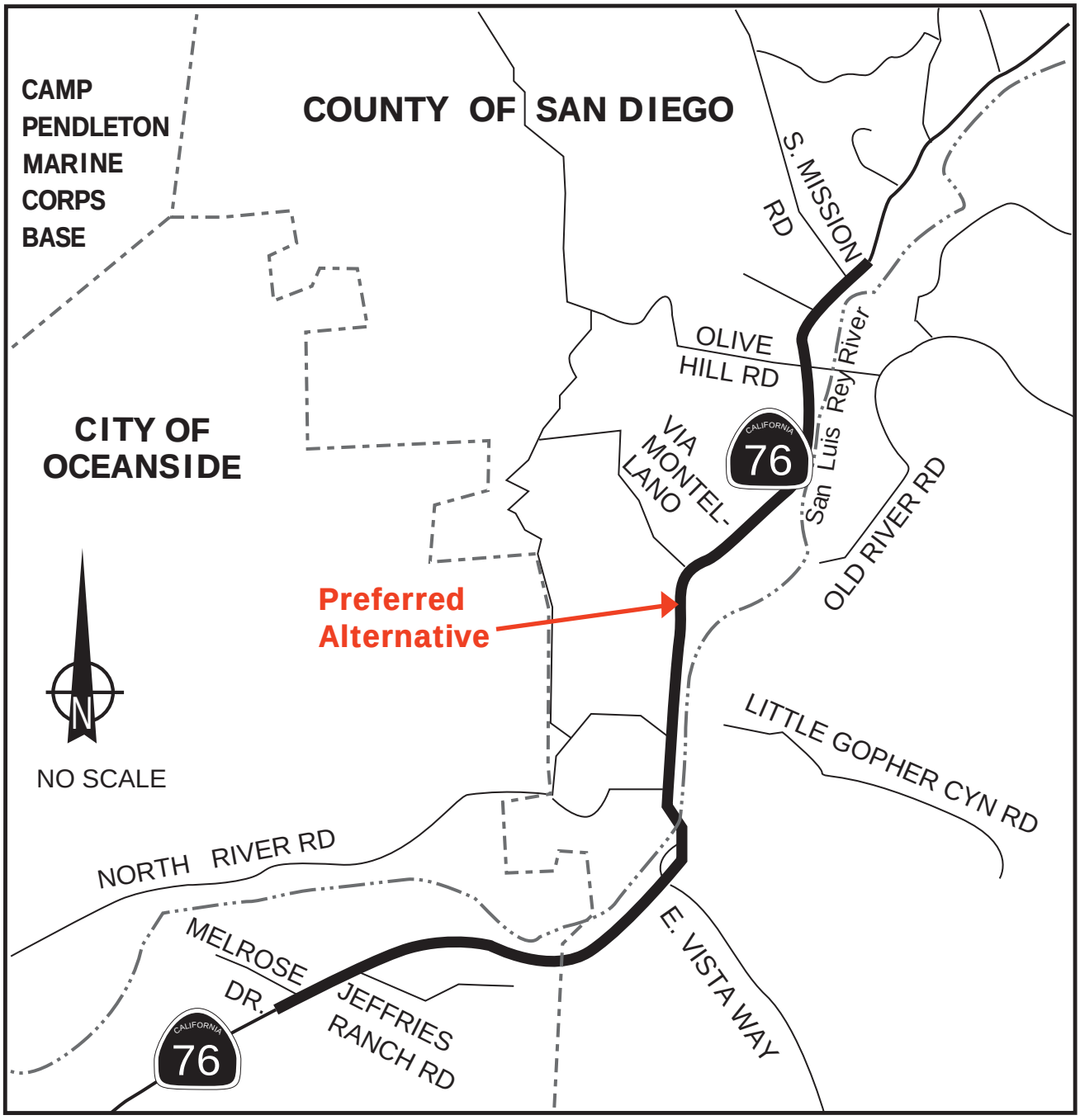
The widening and realigning of SR-76 will present numerous environmental concerns. Potential concerns include: impacts to existing and planned residential areas that would be subject to increased noise, neighborhood disruption and change of community character; potential business displacements; loss of biological resources including riparian habitat, wetlands, and endangered species; impacts to archaeological sites; floodplain encroachment; the taking of agricultural land; the use of Section 4(f) resources (public parks, recreation areas, wildlife and waterfowl refuges and historic sites eligible for the National Register of Historic Places); potential growth impacts; and visual impacts due to cuts, fills, and structures. Studies to determine the extent and severity of the impacts to these environmental resources began in Spring 2002.

TRAFFIC

The current traffic volume on SR-76 between Oceanside and South Mission Road is approximately 30,000 average daily trips. Planned growth will increase the traffic volume to more than 60,000 average daily trips by the year 2030. Within the study limits, a transportation project will need to be implemented to safely and efficiently handle the traffic increase. Rail transit is not planned for the corridor. The accident rate on SR-76 between Melrose Drive and Olive Hill Road meets or exceeds the statewide average compared to similar two-lane routes. The proposed build alternatives would reduce the potential for accidents in the future.



STATE ROUTE 76: STUDY AREA



State Route 76 East

South Mission Road to Interstate 15

FACT SHEET

GOALS

Relieve existing and future traffic congestion; improve motorist safety; and minimize environmental impacts.

FUNDING

The current project estimate is $240 million. Anticipated funding for the project includes the TransNet Sales Tax Measure approved by San Diego County voters in November 2004, gas tax revenues from the State Transportation Improvements Program (STIP), and federal and local funds.

CONTACT

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Ph: (619) 688-6670
Fax: (619) 688-3695
www.dot.ca.gov/dist11

THE PROJECT

The current proposal is to develop a four-lane conventional highway from South Mission Road to just east of Interstate 15 (I-15) as well as widen and improve the SR-76/I-15 interchange. Project alternatives currently being developed include a range of alternatives both north and south of the San Luis Rey River.

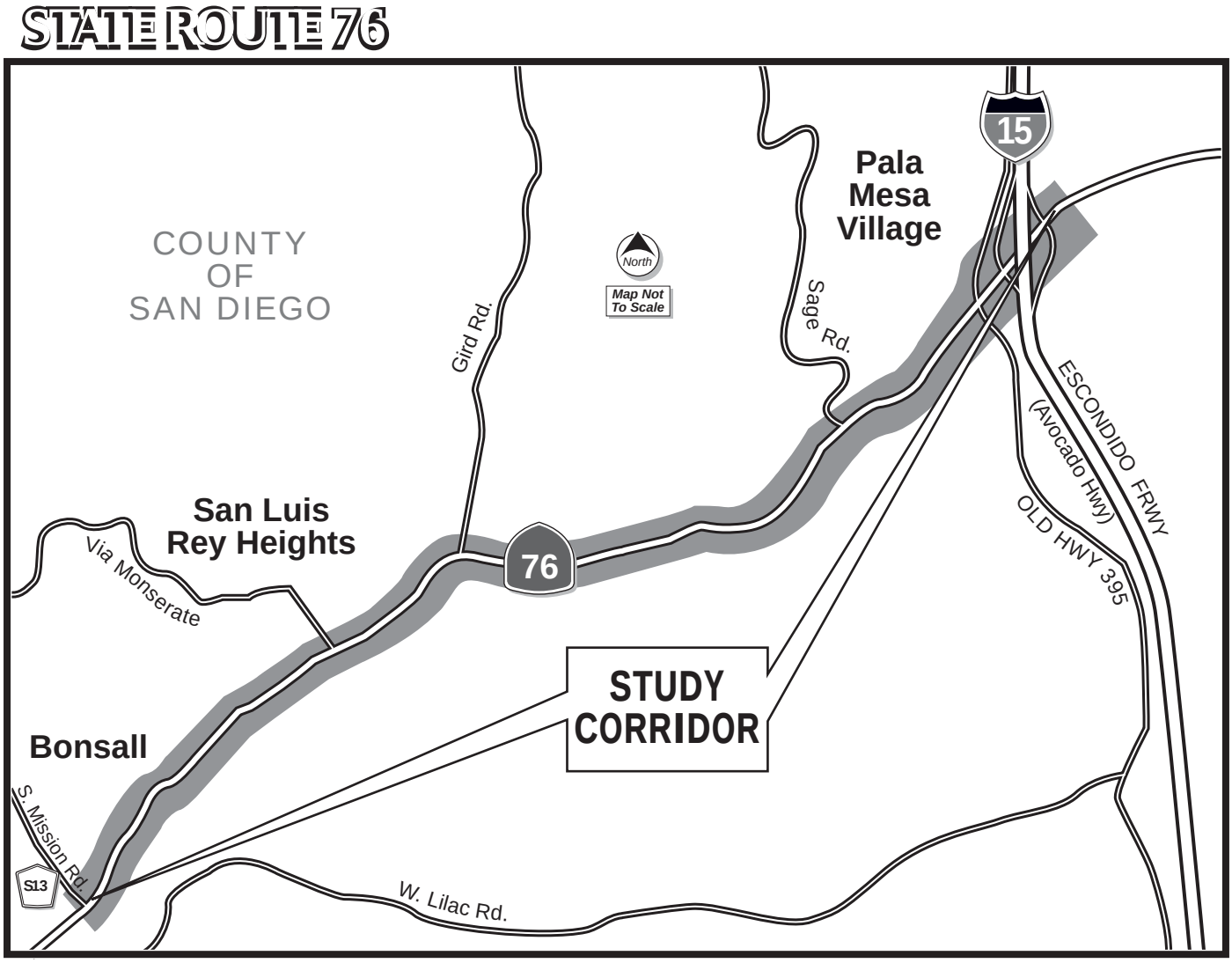
ENVIRONMENTAL CONCERNS

The widening and realigning of SR-76 will present numerous environmental concerns. Potential concerns include: impacts to existing and planned residential areas that would be subject to increased noise, neighborhood disruption and change of community character; potential business displacements; loss of biological resources including riparian habitat, wetlands, and endangered species; impacts to archaeological sites; floodplain encroachment; the taking of agricultural land; the use of Section 4(f) resources (public parks, recreation areas, wildlife and waterfowl refuges and historic sites eligible for the National Register of Historic Places); and visual impacts due to cuts, fills, and structures. Studies to determine the extent and severity of the impacts to these environmental resources began in Spring 2007. Construction is scheduled for completion in 2015.

TRAFFIC

The current traffic volume on SR-76 between South Mission Road and I-15 is approximately 25,000 average daily trips. Planned growth will increase the traffic volume to approximately 50,000 average daily trips by the year 2030. Within the study limits, a transportation project will need to be implemented to safely and efficiently handle the traffic increase. Rail transit is not planned for the corridor. The accident rate on this portion of SR-76, for fatal and injury accidents, is comparable to similar two-lane facilities in the state.




STATE ROUTE 76
COUNTY
OF
SAN DIEGO
North
Map Not
To Scale
Gird Rd.
Sage Rd.
Pala
Mesa
Village
15
ESCONDIDO FRWY
(Avocado Hwy)
OLD HWY 395
San Luis
Rey Heights
Via Monserate
76
STUDY
CORRIDOR
Bonsall
S. Mission Rd.
S13
W. Lilac Rd.

Appendix C

85th Percentile Speed Data

Speed Report

Date: 11/18/08 Site: [93216] SR-76 between Vista Way & Melrose Drive

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	29	10	7	1	5	8	64	199	186	58	5	3	0	0	575
01:00		21	9	6	4	0	8	85	210	242	91	9	0	0	0	685
02:00		38	8	3	1	1	16	52	155	257	81	11	4	0	0	627
03:00		38	7	11	7	0	4	82	268	228	63	15	1	0	0	724
04:00		27	9	9	4	16	41	149	246	228	70	13	1	1	0	814
05:00		46	40	74	72	85	95	149	225	194	46	3	0	0	0	1029
06:00		98	96	176	221	159	84	94	111	61	7	0	0	0	0	1107
07:00		99	189	264	242	193	73	51	23	5	0	0	0	0	0	1139
08:00		46	93	206	178	114	138	137	86	26	5	0	0	0	0	1029
09:00		11	3	3	7	26	78	219	265	137	21	1	1	0	0	772
10:00		6	0	0	0	0	15	86	168	182	48	9	2	0	0	516
11:00		2	3	0	3	2	19	73	125	110	49	9	2	0	0	397
12:00	PM	6	0	1	0	7	31	77	111	81	19	6	1	0	0	340
13:00		2	0	0	0	0	9	27	70	86	43	7	0	0	0	244
14:00		0	0	0	1	0	1	3	11	31	20	4	0	0	1	72
15:00		1	0	0	0	0	0	5	19	27	16	3	2	0	0	73
16:00		0	0	0	0	0	0	5	17	20	13	6	2	0	0	63
17:00		1	0	0	0	0	0	3	8	17	8	3	1	0	0	41
18:00		0	0	0	0	0	2	3	10	21	14	7	1	0	0	58
19:00		2	4	0	4	0	2	2	22	55	48	13	3	0	0	155
20:00		29	19	8	6	0	5	17	80	128	60	9	1	1	0	363
21:00		55	31	12	5	5	4	92	185	179	79	14	1	0	0	662
22:00		51	16	17	3	2	12	84	250	159	42	4	0	0	0	640
23:00		41	20	6	4	7	8	67	181	171	69	6	0	0	0	580
Totals		**649**	**557**	**803**	**763**	**622**	**653**	**1626**	**3045**	**2831**	**970**	**157**	**26**	**2**	**1**	**12705**
% of Totals		5%	4%	6%	6%	5%	5%	13%	24%	22%	8%	1%	0%	0%	0%	100%
% AM		4%	4%	6%	6%	5%	5%	10%	16%	15%	4%	1%	0%	0%		74%
AM Peak Hour			07:00	07:00	07:00	07:00	08:00	09:00	03:00	02:00	01:00	03:00	02:00	04:00		07:00
Volume			189	264	242	193	138	219	268	257	91	15	4	1		1139
% PM		1%	1%	0%	0%	0%	1%	3%	8%	8%	3%	1%	0%	0%	0%	26%
PM Peak Hour			21:00	22:00	20:00	12:00	12:00	21:00	22:00	21:00	21:00	21:00	19:00	20:00	14:00	21:00
Volume			31	17	6	7	31	92	250	179	79	14	3	1	1	662

Average Speed	50th Percentile	85th Percentile
36.6	41	49

Report Generated by "Turning Point Traffic Service" all rights reserved

Speed Report

Date: 11/18/08 Site: [93216] SR-76 between Vista Way & Melrose Drive

WESTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	24	8	4	2	0	5	19	61	126	211	174	54	14	4	706
01:00		14	9	6	4	10	11	20	56	109	154	137	71	19	4	624
02:00		30	15	7	1	1	0	1	35	113	173	155	61	8	4	604
03:00		33	12	5	4	0	9	11	32	90	166	120	54	19	3	558
04:00		21	13	1	2	0	1	12	59	131	172	152	61	17	1	643
05:00		61	12	4	3	0	1	10	56	105	130	105	33	14	2	536
06:00		118	10	5	2	0	8	21	46	104	129	83	21	5	0	552
07:00		141	17	1	0	0	7	44	57	108	101	57	12	3	2	550
08:00		76	18	4	0	1	3	25	63	74	128	69	28	5	0	494
09:00		13	16	4	1	1	0	3	17	94	127	102	33	8	2	421
10:00		4	4	2	1	0	0	3	8	48	89	90	47	7	4	307
11:00		2	1	2	0	0	0	0	7	57	98	88	34	13	1	303
12:00	PM	3	3	3	0	0	0	1	10	35	77	50	22	8	2	214
13:00		0	0	0	0	0	0	2	6	22	54	50	28	11	1	174
14:00		1	1	0	0	0	0	0	1	8	15	20	9	2	0	57
15:00		0	0	0	0	0	0	0	0	6	16	17	17	6	0	62
16:00		0	1	0	0	0	0	0	0	3	9	7	12	11	0	43
17:00		0	0	0	0	0	0	0	1	7	13	27	18	5	0	71
18:00		0	0	0	0	0	0	0	3	17	39	48	47	17	0	171
19:00		3	1	0	1	0	0	3	13	47	117	185	90	33	0	493
20:00		20	15	4	1	0	4	29	90	227	266	242	89	19	0	1006
21:00		62	7	13	25	31	40	78	125	248	284	141	26	7	0	1087
22:00		47	15	5	7	9	15	59	165	253	250	161	52	12	0	1050
23:00		48	7	9	2	1	15	40	118	171	212	167	66	12	0	868
Totals		**721**	**185**	**79**	**56**	**54**	**119**	**381**	**1029**	**2203**	**3030**	**2447**	**985**	**275**	**30**	**11594**
% of Totals		6%	2%	1%	0%	0%	1%	3%	9%	19%	26%	21%	8%	2%	0%	100%
% AM		5%	1%	0%	0%	0%	0%	1%	4%	10%	14%	11%	4%	1%	0%	54%
AM Peak Hour			08:00	02:00	01:00	01:00	01:00	07:00	08:00	04:00			01:00	01:00		
Volume			18	7	4	10	11	44	63	131	211	174	71	19	4	706
% PM		2%	0%	0%	0%	0%	1%	2%	5%	9%	12%	10%	4%	1%	0%	46%
PM Peak Hour			20:00	21:00	21:00	21:00	21:00	21:00	22:00	22:00	21:00	20:00	19:00	19:00	12:00	21:00
Volume			15	13	25	31	40	78	165	253	284	242	90	33	2	1087

Average Speed	50th Percentile	85th Percentile
48.1	52	59

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Speed Report

Date: 11/12/08 Site: [93215] SR-76 between North River Road & East Vista Way

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	2	9	33	37	24	7	3	0	115
01:00		1	0	0	0	0	0	0	3	18	27	13	5	0	0	67
02:00		1	0	0	0	0	0	0	5	16	22	12	3	3	0	62
03:00		0	1	0	0	0	0	1	6	11	15	3	3	1	0	41
04:00		2	2	3	0	1	0	2	15	32	34	20	4	0	0	115
05:00		20	20	3	3	0	3	9	62	83	76	36	8	0	0	323
06:00		50	25	8	2	3	20	80	143	153	73	15	0	0	0	572
07:00		59	35	29	31	28	63	82	127	148	52	16	0	0	0	670
08:00		63	45	18	7	17	19	97	180	106	56	10	0	0	0	618
09:00		42	17	12	5	3	26	71	167	172	61	16	3	0	0	595
10:00		39	15	6	4	8	15	51	140	204	98	22	3	3	1	609
11:00		50	18	17	25	28	35	84	184	157	62	13	0	1	1	675
12:00	PM	34	6	11	9	21	67	145	212	211	55	9	1	0	0	781
13:00		26	13	16	13	22	68	158	203	189	60	13	1	0	0	782
14:00		52	47	69	81	52	69	139	218	168	39	9	0	2	0	945
15:00		95	107	170	124	123	99	142	128	95	30	2	2	0	0	1117
16:00		170	297	408	171	48	28	16	11	5	3	0	0	0	0	1157
17:00		205	248	317	136	70	48	40	14	3	0	0	0	0	0	1081
18:00		158	228	365	206	74	25	29	21	18	3	2	0	0	0	1129
19:00		13	9	8	7	12	42	111	187	207	87	21	1	0	0	705
20:00		7	10	1	0	0	13	48	130	171	91	22	2	1	1	497
21:00		4	4	1	1	1	3	28	114	218	115	21	5	1	0	516
22:00		2	0	1	0	0	1	9	49	114	91	30	9	0	0	306
23:00		0	2	0	0	0	2	0	15	52	55	24	2	0	0	152
Totals		**1093**	**1149**	**1463**	**825**	**511**	**646**	**1344**	**2343**	**2584**	**1242**	**353**	**59**	**15**	**3**	**13630**
% of Totals		8%	8%	11%	6%	4%	5%	10%	17%	19%	9%	3%	0%	0%	0%	100%
% AM		2%	1%	1%	1%	1%	1%	4%	8%	8%	4%	1%	0%	0%	0%	33%
AM Peak Hour			08:00	07:00	07:00	07:00	07:00	08:00	11:00	10:00	10:00	05:00	05:00		10:00	11:00
Volume			45	29	31	28	63	97	184	204	98	36	8	3	1	675
% PM		6%	7%	10%	5%	3%	3%	6%	10%	11%	5%	1%	0%	0%	0%	67%
PM Peak Hour			16:00	16:00	18:00	15:00	15:00	13:00	14:00	21:00	21:00	22:00	22:00	14:00	20:00	16:00
Volume			297	408	206	123	99	158	218	218	115	30	9	2	1	1157

Average Speed	50th Percentile	85th Percentile
33.7	39	49

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Speed Report

Date: 11/12/08 Site: [93215] SR-76 between North River Road & East Vista Way

WESTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	1	0	0	0	0	2	3	9	33	29	15	5	2	1	100
01:00		0	0	0	0	0	0	0	4	20	22	20	4	3	0	73
02:00		0	0	0	0	0	0	1	1	7	18	12	7	5	0	51
03:00		0	0	0	0	0	1	2	15	31	41	24	11	2	1	128
04:00		2	1	0	0	0	0	13	46	77	83	68	29	2	1	322
05:00		6	8	12	3	9	34	82	207	253	146	24	6	1	0	791
06:00		21	11	28	24	43	93	158	275	314	66	6	3	0	0	1042
07:00		36	12	34	16	16	53	190	336	252	49	2	0	0	0	996
08:00		56	29	41	42	25	70	157	348	241	43	2	1	0	0	1055
09:00		32	15	5	4	9	15	58	224	363	128	24	4	1	0	882
10:00		25	13	3	2	8	39	109	234	258	107	22	7	0	0	827
11:00		46	9	4	6	8	43	71	206	227	96	15	1	0	0	732
12:00	PM	37	7	7	4	2	23	34	156	225	117	31	3	2	0	648
13:00		25	11	3	4	1	13	66	147	232	115	38	2	0	1	658
14:00		61	18	6	5	3	13	48	130	189	89	12	3	1	0	578
15:00		135	12	15	2	0	2	71	150	170	69	15	0	1	0	642
16:00		208	7	2	0	0	19	74	128	116	18	2	1	0	0	575
17:00		159	15	13	16	13	34	145	107	41	13	1	1	0	1	559
18:00		65	4	0	1	1	20	50	85	41	14	6	0	0	0	287
19:00		3	2	7	8	0	2	35	89	85	41	5	1	0	0	278
20:00		1	2	2	6	1	2	21	61	120	63	22	3	0	0	304
21:00		0	2	1	1	0	0	27	57	97	45	15	7	1	2	255
22:00		0	0	1	0	1	0	6	25	62	48	29	3	1	0	176
23:00		1	0	0	0	0	1	11	25	50	46	26	8	0	0	168
Totals		**920**	**178**	**184**	**144**	**140**	**479**	**1432**	**3065**	**3504**	**1506**	**436**	**110**	**22**	**7**	**12127**
% of Totals		8%	1%	2%	1%	1%	4%	12%	25%	29%	12%	4%	1%	0%	0%	100%
% AM		2%	1%	1%	1%	1%	3%	7%	16%	17%	7%	2%	1%	0%	0%	58%
AM Peak Hour			08:00	08:00	08:00	06:00	06:00	07:00	08:00	09:00	05:00	04:00	04:00	02:00		08:00
Volume			29	41	42	43	93	190	348	363	146	68	29	5	1	1055
% PM		6%	1%	0%	0%	0%	1%	5%	10%	12%	6%	2%	0%	0%	0%	42%
PM Peak Hour			14:00	15:00	17:00	17:00	17:00	17:00	12:00	13:00	12:00	13:00	23:00	12:00	21:00	13:00
Volume			18	15	16	13	34	145	156	232	117	38	8	2	2	658

Average Speed	50th Percentile	85th Percentile
40.9	44	51

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Speed Report

Date: 11/12/08 Site: [93214] SR-76 between Olive Hill Road & North River Road

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	1	0	0	0	0	2	6	29	36	24	7	5	1	111
01:00		0	0	0	0	0	0	1	4	19	27	14	6	1	0	72
02:00		1	0	1	0	0	0	0	2	12	26	15	7	2	1	67
03:00		0	0	0	0	0	0	1	7	6	11	13	4	1	0	43
04:00		3	1	0	1	0	0	4	7	26	36	22	7	2	0	109
05:00		8	5	3	2	0	2	10	47	122	69	53	12	0	0	333
06:00		114	11	3	0	0	0	22	79	115	109	19	2	1	0	475
07:00		157	14	1	0	0	5	31	128	162	84	15	1	0	0	598
08:00		101	17	7	1	0	8	46	151	146	52	20	1	0	0	550
09:00		38	10	4	4	1	0	16	162	270	107	26	0	1	0	639
10:00		29	12	8	7	1	6	34	119	183	144	37	4	1	1	586
11:00		30	13	6	1	0	5	24	175	257	117	32	3	1	0	664
12:00	PM	41	19	14	18	1	4	39	194	318	156	26	3	0	0	833
13:00		35	19	25	14	2	5	57	199	314	144	35	3	2	0	854
14:00		50	26	22	17	1	0	41	238	375	205	38	2	1	0	1016
15:00		54	21	32	41	37	34	116	361	333	90	12	3	0	0	1134
16:00		43	15	18	13	6	23	184	415	348	108	12	0	0	0	1185
17:00		55	14	18	20	23	72	378	398	156	34	12	0	0	0	1180
18:00		37	8	7	2	6	20	107	369	357	104	14	2	0	0	1033
19:00		7	4	1	2	0	6	37	160	281	193	26	5	0	0	722
20:00		8	6	1	2	1	0	19	72	216	160	39	3	2	2	531
21:00		1	3	0	1	2	6	34	77	162	146	51	15	1	0	499
22:00		2	2	0	0	0	0	0	23	90	116	40	9	3	0	285
23:00		0	0	0	0	0	0	1	17	59	63	31	4	1	1	177
Totals		**814**	**221**	**171**	**146**	**81**	**196**	**1204**	**3410**	**4356**	**2337**	**626**	**103**	**25**	**6**	**13696**
% of Totals		6%	2%	1%	1%	1%	1%	9%	25%	32%	17%	5%	1%	0%	0%	100%
% AM		4%	1%	0%	0%	0%	0%	1%	6%	10%	6%	2%	0%	0%	0%	31%
AM Peak Hour			08:00	10:00	10:00	09:00	08:00	08:00	11:00	09:00	10:00	05:00	05:00			11:00
Volume			17	8	7	1	8	46	175	270	144	53	12	5	1	664
% PM		2%	1%	1%	1%	1%	1%	7%	18%	22%	11%	2%	0%	0%	0%	69%
PM Peak Hour			14:00	15:00	15:00	15:00	17:00	17:00	16:00	14:00	14:00	21:00	21:00	22:00	20:00	16:00
Volume			26	32	41	37	72	378	415	375	205	51	15	3	2	1185

Average Speed	50th Percentile	85th Percentile
42.7	46	52

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Speed Report

Date: 11/12/08 Site: [93214] SR-76 between Olive Hill Road & North River Road

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	1	0	0	0	0	5	26	29	35	7	2	0	0	105
01:00		0	0	0	0	0	0	1	21	27	20	6	3	0	0	78
02:00		0	0	0	0	0	0	2	13	18	14	6	0	1	0	54
03:00		0	0	0	0	0	0	10	13	67	30	12	2	0	0	134
04:00		4	2	2	0	0	8	18	33	109	129	26	4	0	0	335
05:00		10	3	3	2	1	10	62	317	325	86	15	5	0	0	839
06:00		213	262	256	64	37	41	62	99	39	5	0	0	0	0	1078
07:00		228	341	256	139	78	19	0	0	0	1	0	0	0	0	1062
08:00		127	146	199	180	137	37	52	117	50	7	0	0	0	0	1052
09:00		30	12	7	1	1	17	138	362	264	57	3	0	0	0	892
10:00		31	12	10	6	0	14	115	314	282	59	8	0	0	0	851
11:00		27	7	3	5	0	9	91	382	253	35	5	0	0	0	817
12:00	PM	30	8	6	3	0	20	38	152	246	102	27	0	0	0	632
13:00		25	11	3	3	3	20	69	152	233	114	34	0	0	0	667
14:00		50	26	10	8	6	19	62	137	179	88	14	0	0	0	599
15:00		61	21	8	2	2	2	93	310	213	35	2	0	0	0	749
16:00		56	33	12	8	3	19	118	298	242	40	1	0	0	1	831
17:00		87	32	18	11	4	10	138	330	116	15	1	0	0	0	762
18:00		17	6	5	4	0	29	97	219	154	16	3	1	0	0	551
19:00		5	2	0	0	1	11	48	183	149	33	5	0	0	0	437
20:00		9	1	1	2	0	2	24	140	129	44	8	1	0	0	361
21:00		0	2	0	2	0	1	20	136	133	52	7	0	0	0	353
22:00		0	2	1	1	0	6	29	60	101	35	11	0	0	0	246
23:00		0	1	0	0	0	0	6	41	74	43	10	1	0	0	176
Totals		**1010**	**931**	**800**	**441**	**273**	**294**	**1298**	**3855**	**3432**	**1095**	**211**	**19**	**1**	**1**	**13661**
% of Totals		7%	7%	6%	3%	2%	2%	10%	28%	25%	8%	2%	0%	0%	0%	100%
% AM		5%	6%	5%	3%	2%	1%	4%	12%	11%	3%	1%	0%	0%		53%
AM Peak Hour			07:00	06:00	08:00	08:00	06:00	09:00	11:00	05:00	04:00	04:00	05:00	02:00		06:00
Volume			341	256	180	137	41	138	382	325	129	26	5	1		1078
% PM		2%	1%	0%	0%	0%	1%	5%	16%	14%	5%	1%	0%		0%	47%
PM Peak Hour			16:00	17:00	17:00	14:00	18:00	17:00	17:00	12:00	13:00	13:00	18:00		16:00	16:00
Volume			33	18	11	6	29	138	330	246	114	34	1		1	831

Average Speed	50th Percentile	85th Percentile
36.7	42	49

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Speed Report

Date: 11/12/08 Site: [93213] SR-76 between South Mission Road & Olive Hill Road

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	1	0	0	0	0	6	8	35	38	17	6	1	0	0	112
01:00		0	1	0	0	0	0	6	20	31	12	5	1	1	0	77
02:00		0	1	0	0	0	5	13	12	16	14	4	1	1	0	67
03:00		1	0	0	1	3	4	12	37	46	24	7	1	0	0	136
04:00		3	4	1	1	2	7	40	99	110	52	19	5	1	0	344
05:00		24	5	11	19	49	119	208	258	173	43	6	3	0	0	918
06:00		61	68	205	330	193	171	167	118	55	12	2	0	0	0	1382
07:00		126	140	316	263	149	122	114	80	27	3	1	0	0	0	1341
08:00		68	57	100	124	106	156	201	162	57	16	3	0	0	0	1050
09:00		55	25	22	46	79	128	274	219	87	27	2	0	0	0	964
10:00		60	16	17	34	71	117	225	224	87	11	5	0	0	0	867
11:00		72	43	43	32	85	140	214	196	68	10	1	0	0	0	904
12:00	PM	55	32	45	31	55	137	191	184	60	21	2	0	0	0	813
13:00		70	26	24	42	88	153	228	147	44	7	0	0	0	0	829
14:00		99	41	40	79	94	151	191	141	41	10	1	0	0	0	888
15:00		129	49	63	57	88	122	164	108	35	2	0	0	0	0	817
16:00		130	85	60	76	75	106	138	96	41	8	2	0	0	0	817
17:00		152	71	31	81	89	135	140	106	25	5	0	0	0	0	835
18:00		109	54	15	17	34	62	132	97	34	6	1	0	1	0	562
19:00		18	6	7	2	18	36	119	158	66	22	3	1	0	0	456
20:00		10	6	5	2	7	31	121	135	61	19	9	0	1	0	407
21:00		7	4	2	1	2	22	87	125	64	19	4	1	1	0	339
22:00		0	0	0	1	4	6	39	77	52	21	3	0	0	0	203
23:00		2	0	0	0	1	11	34	69	45	22	3	1	1	0	189
Totals		**1252**	**734**	**1007**	**1239**	**1292**	**1947**	**3066**	**2903**	**1363**	**403**	**89**	**15**	**7**	**0**	**15317**
% of Totals		8%	5%	7%	8%	8%	13%	20%	19%	9%	3%	1%	0%	0%		100%
% AM		3%	2%	5%	6%	5%	6%	10%	10%	5%	2%	0%	0%	0%		53%
AM Peak Hour			07:00	07:00	06:00	06:00	06:00	09:00	05:00	05:00	04:00	04:00	04:00	01:00		06:00
Volume			140	316	330	193	171	274	258	173	52	19	5	1		1382
% PM		5%	2%	2%	3%	4%	6%	10%	9%	4%	1%	0%	0%	0%		47%
PM Peak Hour			16:00	15:00	17:00	14:00	13:00	13:00	12:00	19:00	19:00	20:00	19:00	18:00		14:00
Volume			85	63	81	94	153	228	184	66	22	9	1	1		888

Average Speed	50th Percentile	85th Percentile
31.9	35	44

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Speed Report

Date: 11/12/08 Site: [93213] SR-76 between South Mission Road & Olive Hill Road

WESTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	1	0	0	0	4	11	40	44	15	0	1	0	0	116
01:00		0	0	0	2	0	0	9	15	24	15	1	0	0	0	66
02:00		0	0	0	0	1	1	6	20	21	18	1	1	0	0	69
03:00		0	0	1	0	0	1	6	7	15	11	0	0	0	0	41
04:00		0	1	2	1	0	2	14	26	33	19	3	2	0	0	103
05:00		3	9	4	1	0	2	25	43	42	30	4	1	0	1	165
06:00		48	5	3	1	9	17	33	31	19	6	0	0	0	0	172
07:00		142	22	8	5	7	50	103	80	27	3	0	0	0	0	447
08:00		75	19	13	2	11	50	198	173	46	11	2	1	0	0	601
09:00		55	19	6	1	23	79	192	169	49	7	1	0	0	0	601
10:00		53	15	9	2	6	86	210	150	59	9	1	0	0	0	600
11:00		59	21	9	1	22	64	239	181	60	6	0	0	0	0	662
12:00	PM	76	23	15	7	17	116	243	179	64	12	0	0	0	0	752
13:00		56	30	10	1	23	112	267	202	75	10	1	0	0	0	787
14:00		101	29	12	4	44	165	334	220	62	11	0	0	0	0	982
15:00		120	41	17	24	97	291	347	188	39	4	0	0	0	0	1168
16:00		140	46	41	52	141	306	297	146	33	5	0	0	1	0	1208
17:00		138	40	31	101	333	353	183	53	11	2	0	0	0	0	1245
18:00		72	33	25	94	335	424	233	99	26	6	1	0	0	0	1348
19:00		21	2	4	5	35	109	218	261	88	17	1	0	0	0	761
20:00		9	12	4	0	8	37	123	205	91	9	0	1	0	0	499
21:00		9	9	3	0	0	16	178	198	84	13	2	1	0	0	513
22:00		1	1	2	0	1	5	47	141	88	30	7	0	0	0	323
23:00		0	0	0	0	0	5	21	59	49	21	1	0	0	0	156
Totals		**1178**	**378**	**219**	**304**	**1113**	**2295**	**3537**	**2886**	**1149**	**290**	**26**	**8**	**1**	**1**	**13385**
% of Totals		9%	3%	2%	2%	8%	17%	26%	22%	9%	2%	0%	0%	0%	0%	100%
% AM		3%	1%	0%	0%	1%	3%	8%	7%	3%	1%	0%	0%		0%	27%
AM Peak Hour			07:00	08:00	07:00	09:00	10:00	11:00	11:00	11:00	05:00	05:00	04:00		05:00	11:00
Volume			22	13	5	23	86	239	181	60	30	4	2		1	662
% PM		6%	2%	1%	2%	8%	14%	19%	15%	5%	1%	0%	0%	0%		73%
PM Peak Hour			16:00	16:00	17:00	18:00	18:00	15:00	19:00	20:00	22:00	22:00	20:00	16:00		18:00
Volume			46	41	101	335	424	347	261	91	30	7	1	1		1348

Average Speed	50th Percentile	85th Percentile
33.8	37	44

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Speed Report

Date: 11/18/08 Site: [93212] SR-76 between Via Monserate & South Mission Road

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	27	9	6	8	6	19	80	185	121	24	3	1	0	0	489
01:00		7	8	6	2	2	8	103	227	115	15	2	0	0	0	495
02:00		15	8	5	1	4	20	108	194	129	29	1	0	0	0	514
03:00		15	11	10	4	6	12	106	238	160	22	2	0	0	0	586
04:00		15	7	6	2	1	32	91	227	157	45	6	0	0	0	589
05:00		16	9	8	6	0	9	89	269	244	66	7	0	0	0	723
06:00		35	11	4	9	2	18	142	345	261	56	3	0	0	0	886
07:00		27	7	4	3	3	43	193	356	187	22	0	0	0	0	845
08:00		20	9	5	3	9	61	247	336	95	13	1	0	1	0	800
09:00		3	4	1	1	4	35	152	225	107	27	5	0	0	0	564
10:00		3	2	3	0	0	3	68	139	134	14	3	0	0	0	369
11:00		1	1	0	0	1	3	42	121	92	25	4	0	1	0	291
12:00	PM	0	0	0	1	0	2	33	96	74	20	4	1	0	0	231
13:00		1	0	0	0	2	8	22	43	48	20	7	1	0	0	152
14:00		0	1	0	0	0	2	1	17	25	7	3	0	0	0	56
15:00		0	0	0	0	0	2	6	18	19	11	4	1	0	0	61
16:00		0	0	0	0	0	0	5	21	13	7	4	0	0	0	50
17:00		0	0	0	0	0	0	0	8	19	8	1	0	0	0	36
18:00		0	0	0	0	0	1	6	13	18	9	1	0	1	0	49
19:00		5	1	1	0	0	0	21	45	40	27	8	0	0	0	148
20:00		7	12	4	7	0	2	37	98	114	53	4	1	0	0	339
21:00		9	10	8	4	4	6	39	135	210	60	6	2	1	0	494
22:00		34	17	5	3	1	4	55	212	179	42	5	0	0	0	557
23:00		28	9	4	3	3	13	80	148	126	33	4	0	0	0	451
Totals		**268**	**136**	**80**	**57**	**48**	**303**	**1726**	**3716**	**2687**	**655**	**88**	**7**	**4**	**0**	**9775**
% of Totals		3%	1%	1%	1%	0%	3%	18%	38%	27%	7%	1%	0%	0%		100%
% AM		2%	1%	1%	0%	0%	3%	15%	29%	18%	4%	0%	0%	0%		73%
AM Peak Hour			03:00	03:00	06:00	08:00	08:00	08:00	07:00	06:00	05:00	05:00		08:00		06:00
Volume			11	10	9	9	61	247	356	261	66	7	1	1		886
% PM		1%	1%	0%	0%	0%	0%	3%	9%	9%	3%	1%	0%	0%		27%
PM Peak Hour			22:00	21:00	20:00	21:00	23:00	23:00	22:00	21:00	21:00	19:00	21:00	18:00		22:00
Volume			17	8	7	4	13	80	212	210	60	8	2	1		557

Average Speed	50th Percentile	85th Percentile
41.6	43	49

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Speed Report

Date: 11/18/08 Site: [93212] SR-76 between Via Monserate & South Mission Road

WESTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	11	4	1	10	18	32	91	184	106	19	2	0	0	0	478
01:00		14	5	2	8	15	49	123	145	79	10	3	0	0	0	453
02:00		10	1	3	5	11	62	115	156	81	11	0	0	0	0	455
03:00		14	7	8	3	6	30	121	152	84	12	1	0	0	0	438
04:00		27	7	5	2	0	7	71	236	166	27	1	0	0	0	549
05:00		26	8	2	2	11	17	65	179	142	48	8	0	0	0	508
06:00		26	11	5	4	0	4	66	209	144	33	2	0	0	0	504
07:00		25	7	4	2	2	16	100	294	137	33	5	1	0	0	626
08:00		19	5	4	1	0	32	144	172	87	16	1	0	0	0	481
09:00		9	2	1	0	1	21	55	127	79	19	8	1	0	0	323
10:00		1	2	1	2	0	6	49	77	69	36	5	1	0	0	249
11:00		1	0	0	0	1	1	30	61	74	20	8	0	0	0	196
12:00	PM	0	0	0	0	0	0	30	58	56	20	5	0	0	0	169
13:00		0	1	0	0	0	3	13	38	54	21	9	1	0	0	140
14:00		0	0	0	0	0	0	5	15	25	11	5	1	0	0	62
15:00		0	0	0	0	0	6	5	20	16	19	1	1	0	0	68
16:00		0	0	0	0	0	0	6	9	15	12	3	1	0	0	46
17:00		0	0	0	0	0	0	5	15	21	20	6	2	0	0	69
18:00		0	0	0	0	0	0	7	20	47	43	21	3	0	0	141
19:00		3	2	0	0	2	13	34	76	143	73	19	2	0	0	367
20:00		15	4	2	2	6	19	94	224	290	91	13	2	0	0	762
21:00		26	8	3	2	2	4	42	229	318	81	17	0	0	0	732
22:00		18	8	2	1	3	15	93	299	238	40	3	0	0	0	720
23:00		18	9	5	2	0	8	75	198	184	45	8	0	0	0	552
Totals		**263**	**91**	**48**	**46**	**78**	**345**	**1439**	**3193**	**2655**	**760**	**154**	**16**	**0**	**0**	**9088**
% of Totals		3%	1%	1%	1%	1%	4%	16%	35%	29%	8%	2%	0%			100%
% AM		2%	1%	0%	0%	1%	3%	11%	22%	14%	3%	0%	0%			58%
AM Peak Hour			06:00	03:00			02:00	08:00	07:00	04:00	05:00	05:00	07:00			07:00
Volume			11	8	10	18	62	144	294	166	48	8	1			626
% PM		1%	0%	0%	0%	0%	1%	5%	13%	15%	5%	1%	0%			42%
PM Peak Hour			23:00	23:00	20:00	20:00	20:00	20:00	22:00	21:00	20:00	18:00	18:00			20:00
Volume			9	5	2	6	19	94	299	318	91	21	3			762

Average Speed	50th Percentile	85th Percentile
42.1	43	49

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Speed Report

Date: 11/23/07 Site: [808.22] SR-76 btwn Via Monserate & Gird Rd

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	1	3	3	8	43	73	48	11	1	0	0	191
01:00		0	0	1	1	1	16	34	47	16	7	1	0	0	124
02:00		2	0	0	1	0	5	23	37	33	4	1	1	0	107
03:00		0	0	0	1	0	5	29	36	23	9	2	0	1	106
04:00		2	3	1	0	0	6	26	50	52	19	1	0	0	160
05:00		2	3	2	2	0	1	39	73	69	28	4	0	0	223
06:00		9	1	13	4	4	6	51	115	103	25	3	0	0	334
07:00		14	11	18	14	3	8	59	125	96	15	1	0	0	364
08:00		15	19	38	19	6	19	104	176	76	9	2	0	0	483
09:00		13	15	58	24	6	24	113	164	63	17	0	1	0	498
10:00		30	17	60	29	15	30	110	241	81	13	0	0	0	626
11:00		28	22	64	34	11	59	139	212	69	14	0	0	1	653
12:00	PM	26	26	70	41	13	82	220	211	59	4	1	0	0	753
13:00		25	22	57	30	9	69	191	223	47	6	0	0	0	679
14:00		32	22	79	35	15	82	260	218	39	4	0	0	0	786
15:00		25	20	66	27	19	67	268	183	49	5	0	0	0	729
16:00		12	16	80	14	33	139	306	169	38	7	1	0	0	815
17:00		12	24	93	27	19	87	199	175	70	10	0	0	0	716
18:00		5	11	54	13	5	54	162	202	76	12	0	0	0	594
19:00		5	7	46	15	11	26	137	159	54	10	3	1	0	474
20:00		2	7	21	13	4	31	112	143	45	7	2	0	0	387
21:00		5	3	22	8	1	25	84	125	57	15	1	0	0	346
22:00		0	5	16	6	8	27	64	129	65	8	2	0	0	330
23:00		1	0	6	2	9	17	61	97	48	16	1	0	1	259
Totals		**265**	**254**	**866**	**363**	**195**	**893**	**2834**	**3383**	**1376**	**275**	**27**	**3**	**3**	**10737**
% of Totals		2%	2%	8%	3%	2%	8%	26%	32%	13%	3%	0%	0%	0%	100%
% AM		1%	1%	2%	1%	0%	2%	7%	13%	7%	2%	0%	0%	0%	36%
AM Peak Hour		10:00	11:00	11:00	11:00	10:00	11:00	11:00	10:00	06:00	05:00	05:00	02:00	03:00	11:00
Volume		30	22	64	34	15	59	139	241	103	28	4	1	1	653
% PM		1%	2%	6%	2%	1%	7%	19%	19%	6%	1%	0%	0%	0%	64%
PM Peak Hour		14:00	12:00	17:00	12:00	16:00	16:00	16:00	13:00	18:00	23:00	19:00	19:00	23:00	16:00
Volume		32	26	93	41	33	139	306	223	76	16	3	1	1	815

Average Speed	50th Percentile	85th Percentile
41.7	44	50

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Speed Report

Date: 11/6/07 Site: [808.22] SR-76 btwn Via Monserate & Gird Rd

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	1	1	0	2	0	4	2	33	38	11	2	0	0	94
01:00		1	0	0	0	0	2	5	23	19	5	3	2	0	60
02:00		0	1	1	0	0	1	7	6	17	13	3	0	0	49
03:00		1	0	0	1	2	2	5	22	37	23	7	3	0	103
04:00		3	1	0	4	0	2	29	38	79	43	19	3	0	221
05:00		8	19	15	12	1	8	73	175	204	61	6	1	0	583
06:00		20	23	42	17	13	34	139	260	220	53	6	2	0	829
07:00		34	32	56	52	9	15	124	242	155	32	2	0	0	753
08:00		28	31	56	37	6	42	105	188	154	31	1	0	0	679
09:00		19	16	30	26	2	5	97	187	169	39	1	0	1	592
10:00		25	18	41	21	2	11	60	167	118	26	2	0	0	491
11:00		35	19	36	25	4	26	76	180	110	19	3	0	0	533
12:00	PM	33	17	43	28	6	13	77	141	97	23	2	1	0	481
13:00		37	20	45	28	2	28	105	147	122	20	4	0	0	558
14:00		28	20	61	36	5	45	99	193	116	15	1	0	0	619
15:00		36	47	71	49	0	25	119	239	127	18	0	0	0	731
16:00		54	28	52	55	1	29	151	273	95	15	0	0	0	753
17:00		38	38	106	46	7	50	175	211	82	14	1	1	0	769
18:00		11	33	65	36	5	10	96	152	96	23	2	0	0	529
19:00		9	11	24	24	0	8	52	129	96	22	3	0	0	378
20:00		2	3	14	13	1	12	32	102	84	24	5	1	0	293
21:00		1	2	15	9	1	0	64	136	85	14	2	0	0	329
22:00		2	0	6	6	3	27	62	85	49	21	5	0	0	266
23:00		2	2	2	3	0	1	41	58	53	21	2	0	0	185
Totals		**428**	**382**	**781**	**530**	**70**	**400**	**1795**	**3387**	**2422**	**586**	**82**	**14**	**1**	**10878**
% of Totals		4%	4%	7%	5%	1%	4%	17%	31%	22%	5%	1%	0%	0%	100%
% AM		2%	1%	3%	2%	0%	1%	7%	14%	12%	3%	1%	0%	0%	46%
AM Peak Hour		11:00	07:00	07:00	07:00	06:00	08:00	06:00	06:00	06:00	05:00	04:00	03:00	09:00	06:00
Volume		35	32	56	52	13	42	139	260	220	61	19	3	1	829
% PM		2%	2%	5%	3%	0%	2%	10%	17%	10%	2%	0%	0%		54%
PM Peak Hour		16:00	15:00	17:00	16:00	17:00	17:00	17:00	16:00	15:00	20:00	20:00	12:00		17:00
Volume		54	47	106	55	7	50	175	273	127	24	5	1		769

Average Speed	50th Percentile	85th Percentile
42.7	47	53

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Speed Report

Date: 11/6/07 Site: [808.23] SR-76 btwn Gird Rd & Sage Rd

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	3	2	0	0	0	1	1	9	12	17	9	3	1	58
01:00		0	0	0	0	0	0	2	2	8	15	16	1	0	44
02:00		0	0	0	0	0	0	1	3	10	16	9	5	1	45
03:00		0	1	0	0	0	0	0	5	13	18	10	1	0	48
04:00		5	2	0	0	0	2	5	16	29	29	23	6	1	118
05:00		31	20	1	1	0	0	3	24	84	84	36	6	0	290
06:00		45	32	6	2	3	13	26	68	99	86	27	7	2	416
07:00		76	34	6	1	14	80	112	175	175	92	11	1	0	777
08:00		49	29	2	1	3	38	52	114	181	145	26	0	0	640
09:00		37	20	6	0	5	9	21	82	144	132	31	3	0	490
10:00		29	24	6	1	4	13	63	107	152	102	36	3	1	541
11:00		32	14	4	3	4	24	56	116	178	103	16	0	0	550
12:00	PM	21	12	6	0	1	13	44	142	177	102	21	2	0	541
13:00		30	20	9	3	2	8	36	112	185	143	25	2	1	576
14:00		46	17	7	2	1	12	50	124	242	139	24	0	0	664
15:00		92	35	8	3	16	23	88	152	210	131	20	2	0	780
16:00		88	35	15	1	18	25	65	129	206	168	20	2	0	772
17:00		92	38	10	0	6	13	103	175	264	84	14	1	0	800
18:00		38	22	4	1	8	35	71	221	232	92	7	0	0	731
19:00		19	9	3	0	2	17	45	112	146	78	25	1	0	457
20:00		4	9	1	0	0	1	22	68	120	121	14	6	0	366
21:00		11	14	2	2	0	1	8	47	76	68	37	2	0	268
22:00		5	6	0	0	1	0	0	18	51	72	26	4	2	185
23:00		3	0	0	0	0	0	7	7	30	47	24	5	1	124
Totals		**756**	**395**	**96**	**21**	**88**	**328**	**881**	**2028**	**3024**	**2084**	**507**	**63**	**10**	**10281**
% of Totals		7%	4%	1%	0%	1%	3%	9%	20%	29%	20%	5%	1%	0%	100%
% AM		3%	2%	0%	0%	0%	2%	3%	7%	11%	8%	2%	0%	0%	39%
AM Peak Hour		07:00	07:00	06:00	11:00	07:00	07:00	07:00	07:00	08:00	08:00	05:00	06:00	06:00	07:00
Volume		76	34	6	3	14	80	112	175	181	145	36	7	2	777
% PM		4%	2%	1%	0%	1%	1%	5%	13%	19%	12%	2%	0%	0%	61%
PM Peak Hour		15:00	17:00	16:00	13:00	16:00	18:00	17:00	18:00	17:00	16:00	21:00	20:00	22:00	17:00
Volume		92	38	15	3	18	35	103	221	264	168	37	6	2	800

Average Speed	50th Percentile	85th Percentile
46.8	51	58

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Speed Report

Date: 11/6/07 Site: [808.23] SR-76 btwn Gird Rd & Sage Rd

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	5	5	16	39	20	7	1	0	93
01:00		0	0	0	0	0	1	5	13	20	8	7	2	1	57
02:00		0	0	0	0	0	0	8	4	13	9	10	5	0	49
03:00		0	0	0	0	0	3	3	14	20	34	18	5	4	101
04:00		1	3	0	1	0	10	25	27	45	70	32	8	1	223
05:00		13	3	6	6	10	18	89	137	168	90	14	7	2	563
06:00		16	17	20	34	27	60	141	202	177	83	23	4	2	806
07:00		31	25	19	29	43	44	113	130	86	43	10	1	0	574
08:00		22	5	17	12	39	54	82	111	116	45	6	2	0	511
09:00		13	6	5	11	14	35	68	173	140	45	14	0	0	524
10:00		12	4	9	6	6	16	85	96	116	38	8	0	0	396
11:00		10	5	7	6	27	50	93	120	100	44	5	3	0	470
12:00	PM	9	4	5	5	5	20	60	112	146	47	12	0	0	425
13:00		16	7	4	11	12	53	82	147	107	53	9	3	0	504
14:00		15	2	7	8	18	51	88	135	142	45	4	0	0	515
15:00		51	15	11	14	27	53	121	173	114	34	4	0	0	617
16:00		36	22	34	30	15	43	108	217	134	45	6	1	0	691
17:00		39	16	40	31	53	116	164	130	87	17	4	1	0	698
18:00		7	14	20	25	18	47	96	121	82	30	5	1	1	467
19:00		9	2	4	5	10	18	56	108	87	27	5	0	0	331
20:00		2	1	2	1	4	4	25	91	105	37	12	2	0	286
21:00		1	2	4	4	0	16	59	106	86	33	6	1	0	318
22:00		0	2	2	2	8	9	46	78	70	33	7	2	0	259
23:00		0	0	0	1	0	1	24	48	64	33	11	4	0	186
Totals		**303**	**155**	**216**	**242**	**336**	**727**	**1646**	**2509**	**2264**	**963**	**239**	**53**	**11**	**9664**
% of Totals		3%	2%	2%	3%	3%	8%	17%	26%	23%	10%	2%	1%	0%	100%
% AM		1%	1%	1%	1%	2%	3%	7%	11%	11%	5%	2%	0%	0%	45%
AM Peak Hour		07:00	07:00	06:00	06:00	07:00	06:00	06:00	06:00	06:00	05:00	04:00	04:00	03:00	06:00
Volume		31	25	20	34	43	60	141	202	177	90	32	8	4	806
% PM		2%	1%	1%	1%	2%	4%	10%	15%	13%	4%	1%	0%	0%	55%
PM Peak Hour		15:00	16:00	17:00	17:00	17:00	17:00	17:00	16:00	12:00	13:00	12:00	23:00	18:00	17:00
Volume		51	22	40	31	53	116	164	217	146	53	12	4	1	698

Average Speed	50th Percentile	85th Percentile
45.3	47	55

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Speed Report

Date: 11/6/07 Site: [808.24] SR-76 btwn Sage Rd & Old Hwy 395

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	3	0	0	0	0	2	5	13	18	10	4	0	0	55
01:00		0	0	0	0	0	0	3	4	18	14	4	2	0	45
02:00		0	0	0	0	0	0	3	10	20	7	4	2	0	46
03:00		0	0	0	0	0	0	5	5	25	9	1	1	0	46
04:00		2	1	0	0	0	5	14	21	42	25	5	0	0	115
05:00		11	5	6	0	1	7	30	88	86	51	4	1	0	290
06:00		33	10	4	3	3	3	14	106	142	59	10	0	0	387
07:00		52	17	11	19	25	58	107	258	174	49	3	0	0	773
08:00		30	7	8	2	3	41	165	208	159	21	1	0	0	645
09:00		27	6	5	1	1	10	92	159	154	36	5	0	0	496
10:00		21	10	2	3	4	26	123	188	119	17	1	0	0	514
11:00		23	11	10	9	41	42	92	193	96	13	1	0	0	531
12:00	PM	18	2	6	3	15	50	132	183	110	17	1	1	0	538
13:00		23	6	9	1	26	38	130	214	99	21	0	0	0	567
14:00		41	8	3	5	6	40	150	257	107	20	1	0	0	638
15:00		65	15	7	2	16	65	181	273	148	15	1	0	0	788
16:00		57	16	11	6	10	59	224	268	104	14	1	0	0	770
17:00		52	13	6	5	9	59	255	297	102	10	0	0	0	808
18:00		36	5	8	9	20	72	229	246	87	6	1	0	0	719
19:00		10	4	7	0	0	43	107	162	106	17	2	0	0	458
20:00		2	0	0	1	0	16	76	134	111	12	1	0	0	353
21:00		6	3	0	0	0	2	49	72	89	34	3	0	0	258
22:00		3	3	2	0	0	1	22	53	63	21	7	2	0	177
23:00		1	2	0	0	1	1	8	23	52	27	5	3	0	123
Totals		**516**	**144**	**105**	**69**	**181**	**640**	**2216**	**3435**	**2231**	**525**	**66**	**12**	**0**	**10140**
% of Totals		5%	1%	1%	1%	2%	6%	22%	34%	22%	5%	1%	0%		100%
% AM		2%	1%	0%	0%	1%	2%	6%	12%	10%	3%	0%	0%		39%
AM Peak Hour		07:00	07:00	07:00	07:00	11:00	07:00	08:00	07:00	07:00	06:00	06:00	01:00		07:00
Volume		52	17	11	19	41	58	165	258	174	59	10	2		773
% PM		3%	1%	1%	0%	1%	4%	15%	22%	12%	2%	0%	0%		61%
PM Peak Hour		15:00	16:00	16:00	18:00	13:00	18:00	17:00	17:00	15:00	21:00	22:00	23:00		17:00
Volume		65	16	11	9	26	72	255	297	148	34	7	3		808

Average Speed	50th Percentile	85th Percentile
44.5	47	53

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Speed Report

Date: 11/6/07 Site: [808.24] SR-76 btwn Sage Rd & Old Hwy 395

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	2	4	15	35	28	4	2	0	0	90
01:00		0	0	0	0	0	6	13	14	16	6	1	0	0	56
02:00		0	0	0	0	0	2	9	18	14	8	0	0	0	51
03:00		1	0	0	0	0	3	17	32	28	20	3	0	1	105
04:00		1	0	0	0	3	6	20	64	87	35	4	0	0	220
05:00		12	8	0	0	2	56	176	188	111	21	4	0	0	578
06:00		17	9	4	1	17	94	268	264	97	19	2	0	0	792
07:00		40	9	9	2	16	76	213	163	48	6	2	0	0	584
08:00		27	5	5	6	14	55	154	145	43	3	2	0	0	459
09:00		17	3	6	2	10	77	146	139	79	15	2	0	0	496
10:00		18	13	3	2	12	62	135	116	57	8	0	0	0	426
11:00		23	16	9	4	16	65	146	103	37	3	1	0	0	423
12:00	PM	17	6	2	0	9	48	117	163	50	2	1	0	0	415
13:00		20	7	1	2	8	45	157	176	59	10	4	0	0	489
14:00		33	3	10	3	12	60	191	141	58	9	0	0	0	520
15:00		37	14	20	6	11	87	221	151	42	7	2	0	0	598
16:00		38	15	13	3	14	128	266	154	39	9	0	0	0	679
17:00		39	13	8	4	55	169	203	128	35	5	1	0	0	660
18:00		16	9	15	2	11	74	151	133	34	4	2	0	1	452
19:00		6	4	2	1	4	19	105	132	48	4	1	0	0	326
20:00		2	0	1	0	0	6	65	118	72	11	3	0	0	278
21:00		6	0	0	0	2	18	103	108	66	19	0	0	0	322
22:00		3	0	1	0	3	23	72	98	38	8	4	0	0	250
23:00		1	0	1	0	1	7	55	53	40	15	5	0	0	178
Totals		**374**	**134**	**110**	**38**	**222**	**1190**	**3018**	**2836**	**1226**	**251**	**46**	**0**	**2**	**9447**
% of Totals		4%	1%	1%	0%	2%	13%	32%	30%	13%	3%	0%		0%	100%
% AM		2%	1%	0%	0%	1%	5%	14%	14%	7%	2%	0%		0%	45%
AM Peak Hour		07:00	11:00	07:00	08:00	06:00	06:00	06:00	06:00	05:00	04:00	04:00		03:00	06:00
Volume		40	16	9	6	17	94	268	264	111	35	4		1	792
% PM		2%	1%	1%	0%	1%	7%	18%	16%	6%	1%	0%		0%	55%
PM Peak Hour		17:00	16:00	15:00	15:00	17:00	17:00	16:00	13:00	20:00	21:00	23:00		18:00	16:00
Volume		39	15	20	6	55	169	266	176	72	19	5		1	679

Average Speed	50th Percentile	85th Percentile
43.0	44	50

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Speed Report

Date: 11/6/07 Site: [808.25] SR-76 btwn Old Hwy 395 & I-15 SB Ramps

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	2	11	14	9	6	11	6	0	1	1	61
01:00		1	0	2	5	7	9	5	12	18	9	0	0	0	68
02:00		0	0	4	2	4	5	12	12	9	5	1	0	0	54
03:00		0	1	5	5	9	7	11	14	7	8	0	0	0	67
04:00		0	2	5	8	29	32	30	18	19	8	1	0	1	153
05:00		1	15	21	41	95	118	72	21	15	11	0	0	0	410
06:00		9	19	22	58	180	162	88	27	17	1	0	0	0	583
07:00		25	31	52	118	237	260	136	29	9	1	1	0	0	899
08:00		32	33	93	169	202	171	91	25	6	2	0	0	0	824
09:00		23	22	55	104	195	137	69	21	4	2	0	0	0	632
10:00		21	47	41	126	178	131	78	35	2	3	0	0	0	662
11:00		10	28	62	143	202	136	63	11	6	1	0	0	0	662
12:00	PM	12	33	68	127	187	118	60	18	2	0	0	0	0	625
13:00		33	35	57	154	186	118	47	15	3	1	0	0	0	649
14:00		8	20	54	126	221	213	104	52	16	7	0	0	0	821
15:00		8	20	83	226	285	218	95	29	6	1	0	0	0	971
16:00		22	49	121	184	235	164	84	34	6	3	0	0	0	902
17:00		13	39	120	225	241	179	105	38	6	0	1	0	0	967
18:00		9	32	94	176	214	135	99	37	7	3	0	0	0	806
19:00		7	18	36	64	111	101	86	50	14	3	1	0	0	491
20:00		2	4	13	35	59	129	83	38	14	4	0	0	0	381
21:00		3	6	18	41	50	70	50	30	17	3	0	0	0	288
22:00		0	2	4	23	45	46	44	30	20	4	2	0	0	220
23:00		2	1	2	5	23	25	21	30	24	12	0	0	0	145
Totals		**241**	**457**	**1032**	**2167**	**3206**	**2698**	**1542**	**632**	**258**	**98**	**7**	**1**	**2**	**12341**
% of Totals		2%	4%	8%	18%	26%	22%	12%	5%	2%	1%	0%	0%	0%	100%
% AM		1%	2%	3%	6%	11%	10%	5%	2%	1%	0%	0%	0%	0%	41%
AM Peak Hour		08:00	10:00	08:00	08:00	07:00	07:00	07:00	10:00	04:00	05:00	02:00			07:00
Volume		32	47	93	169	237	260	136	35	19	11	1	1	1	899
% PM		1%	2%	5%	11%	15%	12%	7%	3%	1%	0%	0%			59%
PM Peak Hour		13:00	16:00	16:00	15:00	15:00	15:00	17:00	14:00	23:00	23:00	22:00			15:00
Volume		33	49	121	226	285	218	105	52	24	12	2			971

Average Speed	50th Percentile	85th Percentile
33.5	34	42

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Speed Report

Date: 11/6/07 Site: [808.25] SR-76 btwn Old Hwy 395 & I-15 SB Ramps

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	1	1	1	10	23	30	22	21	9	3	0	0	0	121
01:00		1	2	4	7	9	14	17	10	8	4	0	0	0	76
02:00		0	1	1	5	8	11	10	8	9	6	0	0	0	59
03:00		0	1	3	3	17	31	29	15	7	3	1	0	0	110
04:00		1	3	8	28	45	63	50	22	5	2	0	0	0	227
05:00		3	10	29	112	150	166	110	33	10	1	0	0	0	624
06:00		8	38	97	195	246	179	84	22	2	0	0	0	0	871
07:00		16	54	83	167	215	145	82	21	2	1	0	0	0	786
08:00		11	31	64	180	210	121	37	9	2	0	0	0	0	665
09:00		7	18	62	161	199	123	56	9	4	0	0	0	0	639
10:00		3	21	72	140	159	121	39	4	2	0	0	0	0	561
11:00		11	25	50	121	163	128	47	15	0	1	0	0	0	561
12:00	PM	0	15	49	88	203	138	60	17	4	2	0	0	0	576
13:00		1	15	46	122	209	145	59	13	8	0	0	0	0	618
14:00		10	30	64	135	215	157	79	33	10	0	0	0	0	733
15:00		12	39	121	226	226	148	88	23	5	0	0	0	0	888
16:00		20	71	123	250	228	161	97	27	12	0	0	0	0	989
17:00		16	46	106	254	266	137	83	29	7	1	0	0	0	945
18:00		6	14	34	153	218	136	65	23	13	1	0	0	0	663
19:00		0	6	10	54	124	160	78	35	8	2	0	0	0	477
20:00		0	4	11	56	114	120	72	20	4	1	0	0	0	402
21:00		2	4	6	47	99	129	76	36	13	2	0	0	0	414
22:00		1	7	6	26	88	88	75	28	9	3	0	0	0	331
23:00		0	3	6	15	30	63	62	37	6	5	1	0	0	228
Totals		**130**	**459**	**1056**	**2555**	**3464**	**2714**	**1477**	**510**	**159**	**38**	**2**	**0**	**0**	**12564**
% of Totals		1%	4%	8%	20%	28%	22%	12%	4%	1%	0%	0%			100%
% AM		0%	2%	4%	9%	11%	9%	5%	2%	0%	0%	0%			42%
AM Peak Hour		07:00	07:00	06:00	06:00	06:00	06:00	05:00	05:00	05:00	02:00	03:00			06:00
Volume		16	54	97	195	246	179	110	33	10	6	1			871
% PM		1%	2%	5%	11%	16%	13%	7%	3%	1%	0%	0%			58%
PM Peak Hour		16:00	16:00	16:00	17:00	17:00	16:00	16:00	23:00	18:00	23:00	23:00			16:00
Volume		20	71	123	254	266	161	97	37	13	5	1			989

Average Speed	50th Percentile	85th Percentile
33.1	33	41

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Speed Report

Date: 8/5/08 Site: [89501-1] SR-76 (Pala Road) between I-15 Northbound & Southbound Ramps

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	7	15	19	19	19	9	2	2	0	0	92
01:00		0	0	0	0	5	6	16	19	13	6	2	1	0	0	68
02:00		0	1	1	3	0	12	14	12	9	6	1	0	0	0	59
03:00		0	0	0	0	1	2	12	21	12	9	1	0	0	0	58
04:00		0	0	1	0	2	7	13	35	24	6	2	2	0	0	92
05:00		0	0	3	10	18	38	79	53	28	10	2	0	0	0	241
06:00		0	0	2	9	37	104	141	98	43	9	3	0	0	0	446
07:00		0	2	3	17	63	144	158	88	36	6	0	1	0	0	518
08:00		0	0	15	25	56	118	143	91	34	9	0	0	0	0	491
09:00		0	1	3	29	76	138	139	88	21	4	1	0	0	0	500
10:00		0	1	10	29	72	153	154	70	27	6	1	0	0	0	523
11:00		0	1	7	60	69	163	174	64	18	4	0	0	0	0	560
12:00	PM	0	1	9	46	146	211	121	37	9	4	0	0	0	0	584
13:00		0	0	10	26	112	240	167	62	11	4	2	0	0	0	634
14:00		0	0	7	37	107	204	186	91	21	3	0	0	0	0	656
15:00		6	13	20	73	179	294	179	66	13	2	1	0	0	0	846
16:00		2	22	47	84	157	337	202	74	19	5	1	0	0	0	950
17:00		10	34	44	101	213	276	165	69	21	5	0	0	0	0	938
18:00		0	1	8	60	183	285	237	94	36	8	0	0	0	0	912
19:00		0	1	4	10	71	180	232	112	35	3	0	0	0	0	648
20:00		0	0	2	10	58	160	156	60	25	2	1	0	0	0	474
21:00		0	0	1	7	48	125	110	62	16	3	0	0	0	0	372
22:00		0	0	0	10	54	109	88	39	13	1	0	0	0	0	314
23:00		0	1	0	0	6	31	63	68	29	3	0	1	0	0	202
Totals		**18**	**79**	**197**	**646**	**1740**	**3352**	**2968**	**1492**	**532**	**127**	**20**	**7**	**0**	**0**	**11178**
% of Totals		0%	1%	2%	6%	16%	30%	27%	13%	5%	1%	0%	0%			100%
% AM			0%	0%	2%	4%	8%	10%	6%	3%	1%	0%	0%			33%
AM Peak Hour			07:00	08:00	11:00	09:00	11:00	11:00	06:00	06:00	05:00	06:00				11:00
Volume			2	15	60	76	163	174	98	43	10	3	2			560
% PM		0%	1%	1%	4%	12%	22%	17%	7%	2%	0%	0%	0%			67%
PM Peak Hour			17:00	16:00	17:00	17:00	16:00	18:00	19:00	18:00	18:00	13:00	23:00			16:00
Volume			34	47	101	213	337	237	112	36	8	2	1			950

Average Speed	50th Percentile	85th Percentile
34.3	34	42

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Speed Report

Date: 8/5/08 Site: [89501-1] SR-76 (Pala Road) between I-15 Northbound & Southbound Ramps

WESTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	1	3	24	32	27	31	9	3	1	0	0	0	131
01:00		0	0	0	1	9	13	35	23	9	4	2	0	0	0	96
02:00		0	0	1	0	11	13	19	18	13	7	0	0	0	0	82
03:00		0	0	3	3	7	17	16	23	12	7	0	0	0	0	88
04:00		0	0	1	8	17	16	11	11	13	2	0	0	0	0	79
05:00		0	1	3	6	21	49	27	11	3	6	2	0	0	0	129
06:00		0	1	12	17	101	87	40	18	4	2	0	0	0	0	282
07:00		1	0	19	27	95	95	40	17	6	0	0	0	0	0	300
08:00		0	0	14	42	86	110	41	9	2	0	1	0	0	0	305
09:00		0	0	13	45	101	133	16	16	1	2	0	0	0	0	327
10:00		0	10	11	30	106	105	31	21	6	0	1	0	0	0	321
11:00		0	0	9	31	106	150	43	6	0	0	0	0	0	0	345
12:00	PM	0	2	14	62	131	140	52	10	0	0	0	0	0	0	411
13:00		0	3	28	56	164	137	27	7	0	0	0	0	0	0	422
14:00		0	3	23	56	183	166	30	14	4	0	0	0	0	0	479
15:00		0	0	12	72	258	197	35	3	1	0	0	0	0	0	578
16:00		0	0	10	78	283	169	44	12	0	0	0	0	0	0	596
17:00		0	0	9	51	288	200	43	6	2	0	0	0	0	0	599
18:00		0	1	9	23	215	182	45	8	2	1	0	0	0	0	486
19:00		0	0	0	22	111	163	43	13	3	0	0	0	0	0	355
20:00		0	0	1	17	135	133	32	6	0	0	0	0	0	0	324
21:00		0	1	2	14	87	118	41	7	2	1	0	0	0	0	273
22:00		0	3	28	52	266	187	50	4	2	0	0	0	0	0	592
23:00		0	0	2	9	49	96	73	37	7	0	0	0	0	0	273
Totals		**1**	**25**	**225**	**725**	**2854**	**2708**	**861**	**331**	**101**	**35**	**7**	**0**	**0**	**0**	**7873**
% of Totals		0%	0%	3%	9%	36%	34%	11%	4%	1%	0%	0%				100%
% AM		0%	0%	1%	3%	9%	10%	4%	3%	1%	0%	0%				32%
AM Peak Hour			10:00	07:00	09:00	10:00	11:00	11:00		02:00	02:00	01:00				11:00
Volume			10	19	45	106	150	43	31	13	7	2				345
% PM			0%	2%	7%	28%	24%	7%	2%	0%	0%					68%
PM Peak Hour			13:00	13:00	16:00	17:00	17:00	23:00	23:00	23:00	18:00					17:00
Volume			3	28	78	288	200	73	37	7	1					599

Average Speed	50th Percentile	85th Percentile
30.5	30	36

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Speed Report

Date: 11/6/07 Site: [808.26] SR-76 btwn I-15 NB Ramps & Pankey Rd

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	1	1	9	9	7	8	3	38
01:00		0	0	0	0	0	1	1	2	2	6	5	11	5	33
02:00		0	0	0	1	0	0	1	1	2	8	15	5	11	44
03:00		0	0	0	0	0	0	0	1	6	3	2	4	5	21
04:00		0	0	0	0	0	1	1	0	7	5	5	6	11	36
05:00		0	0	1	0	3	1	1	9	18	18	15	14	15	95
06:00		1	2	2	4	3	4	2	9	45	66	43	30	13	224
07:00		4	9	1	8	6	2	5	16	39	71	71	45	24	301
08:00		7	1	1	8	3	2	5	38	80	76	59	31	9	320
09:00		6	3	3	4	5	10	17	25	77	104	72	38	15	379
10:00		5	4	2	5	1	2	17	42	89	112	74	43	19	415
11:00		7	7	4	9	1	6	15	32	88	74	70	27	8	348
12:00	PM	9	2	4	11	4	0	8	38	110	83	51	33	9	362
13:00		10	4	5	16	7	3	11	35	74	99	70	27	11	372
14:00		12	11	6	12	2	6	15	26	82	88	60	42	18	380
15:00		36	12	5	7	0	3	15	45	119	86	69	27	3	427
16:00		41	17	11	9	2	1	18	22	75	94	82	25	12	409
17:00		34	12	5	6	1	0	5	40	66	123	84	42	9	427
18:00		9	14	3	15	2	0	5	27	96	135	87	34	6	433
19:00		2	5	2	9	3	1	4	6	46	72	49	17	6	222
20:00		3	1	2	4	0	3	1	18	36	43	39	32	8	190
21:00		2	3	5	4	0	1	3	3	18	37	31	25	8	140
22:00		0	2	2	4	1	1	0	9	27	18	31	13	13	121
23:00		0	2	1	1	1	0	0	4	8	12	19	9	13	70
Totals		**188**	**111**	**65**	**137**	**45**	**48**	**151**	**449**	**1219**	**1442**	**1110**	**588**	**254**	**5807**
% of Totals		3%	2%	1%	2%	1%	1%	3%	8%	21%	25%	19%	10%	4%	100%
% AM		1%	0%	0%	1%	0%	0%	1%	3%	8%	10%	8%	5%	2%	39%
AM Peak Hour		08:00	07:00	11:00	11:00	07:00	09:00	09:00	10:00	10:00	10:00	10:00	07:00	07:00	10:00
Volume		7	9	4	9	6	10	17	42	89	112	74	45	24	415
% PM		3%	1%	1%	2%	0%	0%	1%	5%	13%	15%	12%	6%	2%	61%
PM Peak Hour		16:00	16:00	16:00	13:00	13:00	14:00	16:00	15:00	15:00	18:00	18:00	14:00	14:00	18:00
Volume		41	17	11	16	7	6	18	45	119	135	87	42	18	433

Average Speed	50th Percentile	85th Percentile
54.0	57	65

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Speed Report

Date: 11/6/07 Site: [808.26] SR-76 btwn I-15 NB Ramps & Pankey Rd

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	1	0	0	0	1	6	15	24	23	24	11	7	112
01:00		0	0	0	0	0	0	2	5	16	24	16	16	1	80
02:00		0	1	0	0	0	0	2	3	13	18	15	13	7	72
03:00		1	0	0	0	0	2	5	9	13	7	13	16	5	71
04:00		0	0	0	0	0	0	0	9	5	12	10	10	11	57
05:00		1	5	1	0	0	0	4	25	33	32	21	12	8	142
06:00		3	12	0	0	0	0	10	25	40	59	30	14	4	197
07:00		8	15	4	2	9	16	33	34	61	33	17	7	0	239
08:00		7	19	6	3	4	6	13	27	34	44	22	6	2	193
09:00		6	25	3	2	1	6	6	33	46	54	15	6	0	203
10:00		5	32	3	8	3	6	13	46	57	41	23	1	0	238
11:00		9	17	7	3	17	26	33	25	46	39	19	6	1	248
12:00	PM	4	26	6	8	7	12	19	52	53	35	24	5	2	253
13:00		15	16	6	8	12	31	41	45	85	42	21	4	1	327
14:00		21	19	16	14	24	43	75	74	68	27	8	2	0	391
15:00		57	56	53	29	61	57	61	28	22	10	4	1	1	440
16:00		78	94	70	43	29	29	29	17	25	16	2	0	0	432
17:00		22	40	42	31	33	43	63	52	31	18	3	1	1	380
18:00		12	38	11	13	7	36	55	55	51	26	1	2	0	307
19:00		3	6	7	6	11	24	49	47	54	35	20	5	1	268
20:00		3	4	3	0	1	6	23	38	53	49	19	2	0	201
21:00		3	4	3	6	12	26	41	74	70	47	9	5	0	300
22:00		0	1	1	2	11	19	30	81	67	42	14	6	2	276
23:00		0	0	0	0	1	10	23	43	51	57	31	6	4	226
Totals		**258**	**431**	**242**	**178**	**243**	**399**	**636**	**862**	**1018**	**790**	**381**	**157**	**58**	**5653**
% of Totals		5%	8%	4%	3%	4%	7%	11%	15%	18%	14%	7%	3%	1%	100%
% AM		1%	2%	0%	0%	1%	1%	2%	5%	7%	7%	4%	2%	1%	33%
AM Peak Hour		11:00	10:00	11:00	10:00	11:00	11:00	07:00	10:00	07:00	06:00	06:00	01:00	04:00	11:00
Volume		9	32	7	8	17	26	33	46	61	59	30	16	11	248
% PM		4%	5%	4%	3%	4%	6%	9%	11%	11%	7%	3%	1%	0%	67%
PM Peak Hour		16:00	16:00	16:00	16:00	15:00	15:00	14:00	22:00	13:00	23:00	23:00	22:00	23:00	15:00
Volume		78	94	70	43	61	57	75	81	85	57	31	6	4	440

Average Speed	50th Percentile	85th Percentile
44.0	48	58

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Speed Report

Date: 11/6/07 Site: [808.27] SR-76 btwn Horse Ranch Creek Rd & Rice Cyn Rd

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	7	1	0	0	0	3	8	18	7	0	0	0	0	44
01:00		2	1	0	0	0	4	6	11	5	1	1	0	0	31
02:00		0	0	0	0	1	6	13	8	13	1	0	0	0	42
03:00		1	0	0	0	0	2	12	8	1	0	0	0	0	24
04:00		0	1	0	0	2	3	12	7	8	0	0	0	0	33
05:00		8	1	0	0	4	10	25	33	18	2	0	0	0	101
06:00		7	4	2	1	6	14	72	83	23	2	0	0	0	214
07:00		16	8	0	0	9	28	100	115	22	3	0	0	0	301
08:00		14	3	1	1	5	36	133	99	18	1	0	0	0	311
09:00		11	2	2	2	13	72	129	90	26	3	1	0	0	351
10:00		24	5	1	0	23	48	193	107	14	0	0	0	0	415
11:00		10	5	4	3	23	100	129	59	11	2	1	0	0	347
12:00	PM	11	1	3	2	29	90	167	59	8	1	0	0	0	371
13:00		24	5	2	17	20	63	148	66	10	0	0	0	0	355
14:00		35	9	0	5	15	80	165	61	12	1	0	0	0	383
15:00		51	19	3	5	21	69	168	69	5	0	0	0	0	410
16:00		31	29	5	1	9	69	156	80	15	2	0	0	0	397
17:00		32	20	3	1	17	97	182	83	3	0	1	0	1	440
18:00		30	11	0	1	24	77	162	88	11	0	1	0	0	405
19:00		13	8	0	2	5	38	94	36	5	3	0	0	0	204
20:00		17	4	0	0	5	20	63	49	13	1	0	0	0	172
21:00		20	6	2	0	3	14	48	33	16	1	0	0	0	143
22:00		16	4	0	1	3	8	49	32	11	1	0	0	0	125
23:00		8	2	1	0	2	9	17	28	6	1	0	0	0	74
Totals		**388**	**149**	**29**	**42**	**239**	**960**	**2251**	**1322**	**281**	**26**	**5**	**0**	**1**	**5693**
% of Totals		7%	3%	1%	1%	4%	17%	40%	23%	5%	0%	0%		0%	100%
% AM		2%	1%	0%	0%	2%	6%	15%	11%	3%	0%	0%			39%
AM Peak Hour		10:00	07:00	11:00	11:00	10:00	11:00	10:00	07:00	09:00	07:00	01:00			10:00
Volume		24	8	4	3	23	100	193	115	26	3	1			415
% PM		5%	2%	0%	1%	3%	11%	25%	12%	2%	0%	0%		0%	61%
PM Peak Hour		15:00	16:00	16:00	13:00	12:00	17:00	17:00	18:00	21:00	19:00	17:00		17:00	17:00
Volume		51	29	5	17	29	97	182	88	16	3	1		1	440

Average Speed	50th Percentile	85th Percentile
39.9	42	48

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Speed Report

Date: 11/6/07 Site: [808.27] SR-76 btwn Horse Ranch Creek Rd & Rice Cyn Rd

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	4	35	64	9	4	0	0	0	0	0	116
01:00		0	0	0	0	23	42	14	2	0	0	0	0	0	81
02:00		0	0	0	1	21	37	16	0	0	0	0	0	0	75
03:00		0	0	1	2	13	45	6	0	0	0	0	0	0	67
04:00		0	0	0	4	9	30	11	1	0	0	0	0	0	55
05:00		2	0	0	0	29	68	20	0	0	0	0	0	0	119
06:00		3	0	1	8	40	72	25	3	0	0	0	0	0	152
07:00		1	1	7	13	59	93	21	0	0	0	0	0	0	195
08:00		2	3	3	6	31	76	28	0	0	0	0	0	0	149
09:00		3	2	2	8	36	69	18	0	0	0	0	0	0	138
10:00		6	0	4	14	45	92	14	0	0	0	0	0	0	175
11:00		2	1	6	11	59	101	14	2	0	0	0	0	0	196
12:00	PM	0	4	1	13	56	120	19	0	0	0	0	0	0	213
13:00		10	3	2	15	90	128	17	0	0	0	0	0	0	265
14:00		8	11	11	33	133	143	6	0	0	0	0	0	0	345
15:00		20	1	17	32	204	184	12	0	0	0	0	0	0	470
16:00		16	5	10	5	148	206	20	0	0	0	0	0	0	410
17:00		14	6	16	15	124	139	12	0	0	0	0	0	0	326
18:00		9	9	12	17	96	95	5	0	1	0	0	0	0	244
19:00		3	0	6	4	92	117	12	1	0	0	0	0	0	235
20:00		1	3	3	7	65	102	13	1	0	0	0	0	0	195
21:00		1	3	2	15	120	150	11	0	0	0	0	0	0	302
22:00		2	0	2	13	141	122	6	2	0	0	0	0	0	288
23:00		1	1	1	2	95	109	10	0	0	1	0	0	0	220
Totals		**104**	**53**	**107**	**242**	**1764**	**2404**	**339**	**16**	**1**	**1**	**0**	**0**	**0**	**5031**
% of Totals		2%	1%	2%	5%	35%	48%	7%	0%	0%	0%				100%
% AM		0%	0%	0%	1%	8%	16%	4%	0%						30%
AM Peak Hour		10:00	08:00	07:00	10:00	07:00	11:00	08:00							11:00
Volume		6	3	7	14	59	101	28	4						196
% PM		2%	1%	2%	3%	27%	32%	3%	0%	0%	0%				70%
PM Peak Hour		15:00	14:00	15:00	14:00	15:00	16:00	16:00	22:00	18:00	23:00				15:00
Volume		20	11	17	33	204	206	20	2	1	1				470

Average Speed	50th Percentile	85th Percentile
34.5	36	39

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Speed Report

Date: 11/6/07 Site: [808.28] SR-76 (Pala Road) btwn Rice Cyn Rd & Couser Cyn Rd

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	4	4	0	0	7	12	13	2	0	0	0	0	42
01:00		0	0	2	0	0	3	17	8	1	1	0	0	0	32
02:00		0	1	1	0	1	6	17	14	3	1	0	0	0	44
03:00		0	2	2	0	0	7	7	6	0	0	0	0	0	24
04:00		0	0	0	0	1	10	9	4	4	1	0	0	0	29
05:00		1	3	0	0	5	22	36	26	5	0	0	0	0	98
06:00		3	3	3	0	15	44	106	32	3	0	0	0	0	209
07:00		9	4	5	2	13	82	133	47	8	0	0	0	0	303
08:00		13	4	1	3	22	119	116	32	2	0	0	0	0	312
09:00		8	5	6	7	35	130	124	39	1	2	0	0	0	357
10:00		7	6	4	6	49	163	168	26	1	0	0	0	0	430
11:00		10	9	2	2	40	133	140	20	0	1	0	0	0	357
12:00	PM	10	5	6	3	27	157	131	26	5	0	0	0	0	370
13:00		13	9	12	16	33	118	144	28	2	0	0	0	0	375
14:00		19	23	10	2	25	139	142	35	3	0	0	0	0	398
15:00		26	25	10	7	33	113	161	27	2	1	0	0	0	405
16:00		22	22	16	2	32	122	132	40	3	1	0	0	0	392
17:00		21	24	7	4	27	173	166	12	2	0	0	0	0	436
18:00		10	11	6	4	34	137	165	26	2	1	0	0	0	396
19:00		5	11	3	4	12	69	82	15	2	1	0	0	0	204
20:00		5	6	6	0	10	47	67	26	6	0	0	0	0	173
21:00		5	15	8	0	6	33	48	27	1	1	0	0	0	144
22:00		7	14	5	2	5	30	46	26	0	0	0	0	0	135
23:00		3	13	4	0	2	17	34	7	0	0	0	0	0	80
Totals		**197**	**219**	**123**	**64**	**427**	**1881**	**2203**	**562**	**58**	**11**	**0**	**0**	**0**	**5745**
% of Totals		3%	4%	2%	1%	7%	33%	38%	10%	1%	0%				100%
% AM		1%	1%	1%	0%	3%	13%	15%	5%	1%	0%				39%
AM Peak Hour		08:00	11:00	09:00	09:00	10:00	10:00	10:00	07:00	07:00	09:00				10:00
Volume		13	9	6	7	49	163	168	47	8	2				430
% PM		3%	3%	2%	1%	4%	20%	23%	5%	0%	0%				61%
PM Peak Hour		15:00	15:00	16:00	13:00	18:00	17:00	17:00	16:00	20:00	15:00				17:00
Volume		26	25	16	16	34	173	166	40	6	1				436

Average Speed	50th Percentile	85th Percentile
38.1	40	44

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Speed Report

Date: 11/6/07 Site: [808.28] SR-76 (Pala Road) btwn Rice Cyn Rd & Couser Cyn Rd

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	1	2	5	32	45	19	9	0	2	0	0	115
01:00		0	0	1	0	2	18	34	19	7	0	0	0	0	81
02:00		0	1	0	0	3	13	19	30	6	1	0	0	0	73
03:00		0	0	1	0	4	13	24	18	7	1	0	0	0	68
04:00		0	0	0	1	3	8	12	25	9	0	0	0	0	58
05:00		2	0	2	1	5	12	44	36	8	0	0	0	0	110
06:00		7	7	6	2	15	17	50	46	3	0	0	0	0	153
07:00		6	16	5	1	21	40	74	48	7	0	0	0	0	218
08:00		5	19	10	0	5	22	74	27	11	0	0	0	0	173
09:00		14	21	9	1	11	22	61	32	0	0	0	0	0	171
10:00		16	19	11	2	24	37	92	28	4	0	0	0	0	233
11:00		15	19	13	3	16	47	92	33	2	2	0	0	0	242
12:00	PM	6	15	9	7	18	49	93	51	5	1	0	0	0	254
13:00		19	15	9	5	15	63	137	38	1	0	0	0	0	302
14:00		13	25	14	12	55	79	187	37	3	0	0	0	0	425
15:00		16	25	16	9	27	160	212	34	9	0	0	0	0	508
16:00		17	19	23	1	15	97	228	41	2	0	0	0	0	443
17:00		13	30	25	4	36	137	127	24	0	0	0	0	0	396
18:00		11	22	22	0	24	105	100	21	1	0	0	0	0	306
19:00		4	8	6	1	16	65	120	30	1	0	0	0	0	251
20:00		2	11	1	3	13	60	77	34	3	1	0	0	0	205
21:00		3	3	5	1	18	105	161	26	1	0	0	0	0	323
22:00		2	1	6	3	21	88	125	34	2	0	1	0	0	283
23:00		2	0	4	0	14	67	100	32	1	0	0	0	0	220
Totals		**173**	**276**	**199**	**59**	**386**	**1356**	**2288**	**763**	**102**	**6**	**3**	**0**	**0**	**5611**
% of Totals		3%	5%	4%	1%	7%	24%	41%	14%	2%	0%	0%			100%
% AM		1%	2%	1%	0%	2%	5%	11%	6%	1%	0%	0%			30%
AM Peak Hour		10:00	09:00	11:00	11:00	10:00	11:00	10:00	07:00	08:00	11:00				11:00
Volume		16	21	13	3	24	47	92	48	11	2	2			242
% PM		2%	3%	2%	1%	5%	19%	30%	7%	1%	0%	0%			70%
PM Peak Hour		13:00	17:00	17:00	14:00	14:00	15:00	16:00	12:00	15:00	12:00	22:00			15:00
Volume		19	30	25	12	55	160	228	51	9	1	1			508

Average Speed	50th Percentile	85th Percentile
38.4	41	45

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Speed Report

Date: 11/12/08 Site: [93210] SR-76 between Couser Canyon Road & Pala Mission Road

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	1	16	34	39	18	3	0	0	0	111
01:00		0	0	0	0	0	3	14	13	18	20	5	2	0	0	75
02:00		0	0	0	0	0	2	8	20	28	9	4	1	0	0	72
03:00		0	0	0	0	1	5	4	21	25	11	3	0	0	0	70
04:00		0	0	0	1	0	0	3	6	9	18	4	2	0	0	43
05:00		0	2	2	0	1	1	6	15	25	10	8	1	1	0	72
06:00		1	1	0	1	0	0	12	32	37	30	5	1	0	1	121
07:00		5	3	1	1	0	0	10	39	57	39	14	2	1	0	172
08:00		3	0	0	1	0	1	11	36	61	34	3	4	0	0	154
09:00		1	0	0	0	0	2	15	45	48	29	4	2	0	0	146
10:00		4	2	0	1	0	2	9	43	66	19	9	2	0	0	157
11:00		1	1	0	1	0	0	17	65	60	44	6	1	1	0	197
12:00	PM	0	1	1	0	0	1	17	63	84	27	5	1	0	0	200
13:00		3	0	1	0	0	15	42	83	63	33	6	0	0	0	246
14:00		2	0	1	3	3	10	39	110	120	35	4	0	0	1	328
15:00		0	1	1	0	0	14	54	161	112	27	9	1	0	0	380
16:00		1	1	0	0	0	8	37	109	124	44	4	2	0	0	330
17:00		2	3	0	0	1	9	39	87	97	32	7	1	0	0	278
18:00		1	4	0	2	1	9	31	70	41	22	8	2	0	0	191
19:00		1	1	2	1	1	11	23	51	38	19	4	3	0	1	156
20:00		0	2	0	0	0	7	20	39	48	33	3	3	0	1	156
21:00		1	0	0	0	0	2	16	48	66	26	4	2	0	0	165
22:00		0	1	0	0	1	4	22	46	66	20	5	1	0	0	166
23:00		0	1	0	0	0	5	21	48	58	22	7	0	1	0	163
Totals		**26**	**24**	**9**	**12**	**9**	**112**	**486**	**1284**	**1390**	**621**	**134**	**34**	**4**	**4**	**4149**
% of Totals		1%	1%	0%	0%	0%	3%	12%	31%	34%	15%	3%	1%	0%	0%	100%
% AM		0%	0%	0%	0%	0%	0%	3%	9%	11%	7%	2%	0%	0%	0%	34%
AM Peak Hour			07:00	05:00	04:00	03:00	03:00	11:00	11:00	10:00	11:00	07:00	08:00	05:00	06:00	11:00
Volume			3	2	1	1	5	17	65	66	44	14	4	1	1	197
% PM		0%	0%	0%	0%	0%	2%	9%	22%	22%	8%	2%	0%	0%	0%	66%
PM Peak Hour			18:00	19:00	14:00	14:00	13:00	15:00	15:00	16:00	16:00	15:00	19:00	23:00	14:00	15:00
Volume			4	2	3	3	15	54	161	124	44	9	3	1	1	380

Average Speed	50th Percentile	85th Percentile
44.9	45	51

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Speed Report

Date: 11/12/08 Site: [93210] SR-76 between Couser Canyon Road & Pala Mission Road

WESTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	0	3	11	10	1	1	0	0	26
01:00		0	0	0	0	0	1	1	1	10	7	2	1	0	0	23
02:00		1	0	0	0	0	0	2	3	3	11	8	1	1	1	31
03:00		0	0	0	0	0	1	1	2	4	2	3	2	0	0	15
04:00		0	0	0	0	0	0	3	3	2	5	0	1	1	0	15
05:00		1	0	0	0	0	0	18	25	41	22	8	1	0	2	118
06:00		0	0	0	4	0	0	15	33	87	57	22	4	0	0	222
07:00		6	0	1	4	1	0	10	76	111	60	11	1	0	0	281
08:00		1	0	0	3	0	1	16	91	95	44	9	1	0	0	261
09:00		0	2	0	1	0	7	14	100	86	36	7	2	0	0	255
10:00		1	1	1	0	0	1	31	129	134	26	1	0	0	0	325
11:00		1	1	1	1	0	10	35	119	108	32	8	0	0	0	316
12:00	PM	2	0	0	0	0	3	32	103	121	31	4	0	0	0	296
13:00		3	0	2	1	0	1	21	91	103	57	9	0	0	0	288
14:00		1	2	1	0	0	3	21	86	97	44	3	2	0	1	261
15:00		4	2	3	1	1	3	29	71	129	50	7	3	0	0	303
16:00		3	0	2	3	1	1	34	94	118	39	2	0	0	1	298
17:00		1	1	1	0	0	1	14	91	111	27	3	0	1	0	251
18:00		1	0	3	1	0	1	22	69	71	32	5	1	0	0	206
19:00		0	0	0	3	1	0	10	54	67	39	5	0	1	0	180
20:00		0	0	1	0	0	2	12	51	38	22	2	0	1	0	129
21:00		0	0	0	1	0	0	9	30	54	27	7	0	0	1	129
22:00		0	1	0	0	0	1	7	35	40	24	6	1	0	0	115
23:00		0	0	0	0	0	0	1	11	26	20	2	1	4	0	65
Totals		**26**	**10**	**16**	**23**	**4**	**37**	**358**	**1371**	**1667**	**724**	**135**	**23**	**9**	**6**	**4409**
% of Totals		1%	0%	0%	1%	0%	1%	8%	31%	38%	16%	3%	1%	0%	0%	100%
% AM		0%	0%	0%	0%	0%	0%	3%	13%	16%	7%	2%	0%	0%	0%	43%
AM Peak Hour			09:00	07:00	06:00	07:00	11:00	11:00	10:00	10:00	07:00	06:00	06:00	02:00	05:00	10:00
Volume			2	1	4	1	10	35	129	134	60	22	4	1	2	325
% PM		0%	0%	0%	0%	0%	0%	5%	18%	22%	9%	1%	0%	0%	0%	57%
PM Peak Hour			14:00	15:00	16:00	15:00	12:00	16:00	12:00	15:00	13:00	13:00	15:00	23:00	14:00	15:00
Volume			2	3	3	1	3	34	103	129	57	9	3	4	1	303

Average Speed	50th Percentile	85th Percentile
45.7	46	52

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Speed Report

Date: 11/7/07 Site: [808.29] Dulin Rd btwn Old Hwy 395 & Pankey Rd

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	2	3	3	1	0	0	0	0	0	9
01:00		0	0	0	0	0	3	1	0	0	0	0	0	0	4
02:00		0	0	0	1	0	1	1	0	2	0	0	0	0	5
03:00		0	0	0	0	0	1	0	1	0	0	0	0	0	2
04:00		0	0	0	0	0	0	2	1	0	0	0	0	0	3
05:00		2	0	0	0	1	2	2	2	0	0	0	0	0	9
06:00		3	3	1	3	6	9	6	0	0	0	0	0	0	31
07:00		8	5	1	3	20	19	8	2	0	0	0	0	0	66
08:00		3	0	2	2	14	18	4	0	0	0	0	0	0	43
09:00		1	0	2	6	18	22	3	1	0	0	0	0	0	53
10:00		1	1	0	2	8	11	7	4	0	0	0	0	0	34
11:00		2	0	0	3	16	19	11	3	2	0	0	0	0	56
12:00	PM	2	1	0	5	10	20	16	2	3	0	0	0	0	59
13:00		1	1	0	9	17	13	15	4	0	1	0	0	0	61
14:00		3	2	2	8	22	35	14	6	0	0	0	0	0	92
15:00		1	0	1	15	30	38	23	8	0	0	0	0	0	116
16:00		5	1	3	13	48	56	17	1	0	0	0	0	0	144
17:00		1	1	4	27	60	49	21	0	0	0	0	0	0	163
18:00		4	0	3	19	42	50	15	5	1	0	0	0	0	139
19:00		0	0	3	10	28	35	20	4	1	0	0	0	0	101
20:00		0	0	1	5	25	22	10	3	1	0	0	0	0	67
21:00		0	0	0	4	19	19	16	1	0	0	0	0	0	59
22:00		0	0	0	2	8	9	7	1	0	0	0	0	0	27
23:00		0	0	0	2	5	7	1	2	1	0	0	0	0	18
Totals		**37**	**15**	**23**	**139**	**399**	**461**	**223**	**52**	**11**	**1**	**0**	**0**	**0**	**1361**
% of Totals		3%	1%	2%	10%	29%	34%	16%	4%	1%	0%				100%
% AM		1%	1%	0%	1%	6%	8%	4%	1%	0%					23%
AM Peak Hour		07:00	07:00	08:00	09:00	07:00	09:00	11:00	10:00	02:00					07:00
Volume		8	5	2	6	20	22	11	4	2					66
% PM		1%	0%	1%	9%	23%	26%	13%	3%	1%	0%				77%
PM Peak Hour		16:00	14:00	17:00	17:00	17:00	16:00	15:00	15:00	12:00	13:00				17:00
Volume		5	2	4	27	60	56	23	8	3	1				163

Average Speed	50th Percentile	85th Percentile
35.1	36	42

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Speed Report

Date: 11/7/07 Site: [808.29] Dulin Rd btwn Old Hwy 395 & Pankey Rd

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1
01:00		0	0	0	1	0	1	0	0	0	0	0	0	0	2
02:00		0	0	0	0	1	0	3	1	0	0	0	0	0	5
03:00		0	0	0	2	2	1	3	1	1	0	0	0	0	10
04:00		0	0	0	2	5	13	10	4	1	0	0	0	0	35
05:00		0	0	0	3	15	30	40	11	2	1	0	0	0	102
06:00		1	0	0	1	31	75	55	16	2	2	0	0	0	183
07:00		1	1	2	6	30	89	57	14	0	0	0	0	0	200
08:00		0	1	4	8	24	48	47	4	1	0	0	0	0	137
09:00		0	0	0	6	23	26	16	6	0	0	0	0	0	77
10:00		0	0	0	3	17	24	12	6	1	0	0	0	0	63
11:00		0	1	2	1	12	21	6	4	0	0	0	0	0	47
12:00	PM	1	0	1	5	11	18	12	2	0	0	0	0	0	50
13:00		0	0	3	3	16	21	12	2	1	0	0	0	0	58
14:00		1	2	3	6	19	28	15	3	0	1	0	0	0	78
15:00		1	1	2	3	14	20	19	5	1	1	0	0	0	67
16:00		0	1	2	7	28	24	14	3	2	0	0	0	0	81
17:00		2	0	1	4	20	24	14	2	1	0	0	0	0	68
18:00		1	2	0	5	17	21	11	4	1	0	0	0	0	62
19:00		0	1	1	2	6	13	5	2	0	0	0	0	0	30
20:00		1	0	0	0	5	7	6	2	1	0	0	0	0	22
21:00		0	0	1	1	3	6	0	4	0	0	0	0	0	15
22:00		0	0	1	3	4	1	2	2	0	0	0	0	0	13
23:00		0	0	0	0	0	2	1	0	0	0	0	0	0	3
Totals		**9**	**10**	**23**	**72**	**303**	**514**	**360**	**98**	**15**	**5**	**0**	**0**	**0**	**1409**
% of Totals		1%	1%	2%	5%	22%	36%	26%	7%	1%	0%				100%
% AM		0%	0%	1%	2%	11%	23%	18%	5%	1%	0%				61%
AM Peak Hour		06:00	07:00	08:00	08:00	06:00	07:00	07:00	06:00	05:00	06:00				07:00
Volume		1	1	4	8	31	89	57	16	2	2				200
% PM		0%	0%	1%	3%	10%	13%	8%	2%	0%	0%				39%
PM Peak Hour		17:00	14:00	13:00	16:00	16:00	14:00	15:00	15:00	16:00	14:00				16:00
Volume		2	2	3	7	28	28	19	5	2	1				81

Average Speed	50th Percentile	85th Percentile
37.6	38	44

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Speed Report

Date: 11/6/07 Site: [808.35] Old Hwy 395 btwn Reche Rd & East Mission Rd

NORTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	2	1	1	2	0	1	0	0	7
01:00		0	0	0	0	0	0	0	2	0	0	0	0	0	2
02:00		0	0	0	0	0	0	1	2	0	0	1	0	0	4
03:00		0	0	0	0	0	0	1	3	3	1	1	0	1	10
04:00		1	0	0	0	0	3	4	10	5	5	1	1	0	30
05:00		0	0	0	0	2	1	8	17	18	7	5	1	0	59
06:00		0	1	0	0	1	5	17	57	40	20	7	2	2	152
07:00		2	0	0	3	10	22	43	94	56	28	11	3	0	272
08:00		2	0	3	13	32	51	60	48	26	5	0	0	0	240
09:00		3	2	10	18	43	35	42	22	15	1	0	0	0	191
10:00		1	5	16	33	50	51	35	14	4	2	0	0	0	211
11:00		3	1	17	33	49	31	29	11	3	0	0	0	0	177
12:00	PM	4	3	3	5	1	12	23	62	47	12	2	1	0	175
13:00		3	1	1	2	6	10	36	41	36	21	5	1	0	163
14:00		0	0	1	0	2	18	51	74	57	24	3	1	1	232
15:00		1	0	1	0	5	15	42	68	62	24	6	0	0	224
16:00		1	1	0	0	1	8	40	81	76	23	4	0	1	236
17:00		1	0	0	1	0	7	38	80	45	14	4	0	1	191
18:00		1	1	0	1	1	3	20	52	32	18	1	1	0	131
19:00		0	0	0	0	4	5	18	12	19	12	4	1	0	75
20:00		0	0	0	0	0	1	10	29	20	10	1	0	0	71
21:00		0	0	0	0	0	0	22	25	15	14	1	0	0	77
22:00		0	0	0	0	0	1	5	1	10	6	3	0	1	27
23:00		0	0	0	0	0	2	2	3	2	2	2	0	0	13
Totals		**23**	**15**	**52**	**109**	**207**	**283**	**548**	**809**	**593**	**249**	**63**	**12**	**7**	**2970**
% of Totals		1%	1%	2%	4%	7%	10%	18%	27%	20%	8%	2%	0%	0%	100%
% AM		0%	0%	2%	3%	6%	7%	8%	9%	6%	2%	1%	0%	0%	46%
AM Peak Hour		09:00	10:00	11:00	10:00	10:00	08:00	08:00	07:00	07:00	07:00	07:00	07:00	06:00	07:00
Volume		3	5	17	33	50	51	60	94	56	28	11	3	2	272
% PM		0%	0%	0%	0%	1%	3%	10%	18%	14%	6%	1%	0%	0%	54%
PM Peak Hour		12:00	12:00	12:00	12:00	13:00	14:00	14:00	16:00	16:00	14:00	15:00	12:00	14:00	16:00
Volume		4	3	3	5	6	18	51	81	76	24	6	1	1	236

Average Speed	50th Percentile	85th Percentile
45.3	47	54

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Speed Report

Date: 11/7/07 Site: [808.35] Old Hwy 395 btwn Reche Rd & East Mission Rd

SOUTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	1	1	3	1	1	0	0	7
01:00		0	0	0	0	0	0	0	1	0	2	0	0	1	4
02:00		0	0	0	0	0	0	0	0	3	2	0	0	0	5
03:00		0	0	0	0	0	0	0	2	1	3	1	0	0	7
04:00		0	0	0	0	0	0	0	2	4	4	3	1	0	14
05:00		0	0	0	0	1	0	1	4	24	26	13	5	0	74
06:00		2	3	0	0	0	0	2	14	63	39	14	8	0	145
07:00		1	2	1	0	0	1	7	54	97	38	7	1	0	209
08:00		3	4	1	2	17	33	43	42	23	3	2	0	0	173
09:00		5	1	0	3	29	48	55	9	2	0	0	0	0	152
10:00		1	1	0	8	23	65	36	11	2	0	0	0	0	147
11:00		1	2	2	10	33	53	52	8	0	0	0	0	0	161
12:00	PM	1	1	4	2	5	12	18	47	57	17	7	0	0	171
13:00		1	1	0	0	2	2	22	59	82	27	7	1	0	204
14:00		4	0	0	1	0	3	14	63	91	31	7	1	1	216
15:00		5	1	0	0	0	3	20	72	97	49	7	0	0	254
16:00		1	0	1	0	0	0	11	52	88	43	6	0	0	202
17:00		1	1	2	0	0	4	8	28	79	36	6	1	0	166
18:00		1	1	0	0	2	1	7	40	65	44	12	0	0	173
19:00		0	0	0	0	1	2	8	24	46	26	10	0	0	117
20:00		0	0	0	0	0	0	6	13	34	28	9	0	0	90
21:00		1	1	0	0	0	0	1	12	27	21	8	3	2	76
22:00		0	0	0	0	0	0	0	4	15	8	5	1	0	33
23:00		0	0	0	0	0	0	1	5	9	8	1	2	0	26
Totals		**28**	**19**	**11**	**26**	**113**	**227**	**313**	**567**	**912**	**456**	**126**	**24**	**4**	**2826**
% of Totals		1%	1%	0%	1%	4%	8%	11%	20%	32%	16%	4%	1%	0%	100%
% AM		0%	0%	0%	1%	4%	7%	7%	5%	8%	4%	1%	1%	0%	39%
AM Peak Hour		09:00	08:00	11:00	11:00	11:00	10:00	09:00	07:00	07:00	06:00	06:00	06:00	01:00	07:00
Volume		5	4	2	10	33	65	55	54	97	39	14	8	1	209
% PM		1%	0%	0%	0%	0%	1%	4%	15%	24%	12%	3%	0%	0%	61%
PM Peak Hour		15:00	12:00	12:00	12:00	12:00	12:00	13:00	15:00	15:00	15:00	18:00	21:00	21:00	15:00
Volume		5	1	4	2	5	12	22	72	97	49	12	3	2	254

Average Speed	50th Percentile	85th Percentile
48.8	51	57

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Speed Report

Date: 11/14/07 Site: [80834] Old Hwy 395 btwn Reche Rd & Canonita Dr/Steward Cyn Rd

NORTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	2	7	5	3	2	0	0	19
01:00		0	0	0	0	0	1	1	3	3	1	0	1	2	12
02:00		0	0	0	0	0	0	5	4	1	0	0	0	0	10
03:00		0	0	0	0	0	1	1	1	0	1	2	1	0	7
04:00		0	0	0	0	0	0	2	3	4	0	2	0	1	12
05:00		1	1	0	0	0	1	3	4	13	9	6	2	1	41
06:00		1	1	6	8	2	5	5	19	48	20	6	4	0	125
07:00		1	1	0	1	2	5	30	34	81	44	15	5	3	222
08:00		3	1	0	0	3	8	10	40	64	44	20	7	2	202
09:00		1	0	0	0	0	4	12	34	60	32	11	2	1	157
10:00		5	2	1	1	1	4	15	39	54	40	9	1	1	173
11:00		1	1	1	0	0	7	29	52	49	21	9	1	2	173
12:00	PM	2	3	1	1	0	5	20	61	65	41	15	0	1	215
13:00		2	0	0	0	6	18	48	68	55	25	10	2	0	234
14:00		2	2	0	0	0	1	26	69	91	52	7	1	2	253
15:00		2	0	1	1	5	10	33	99	93	37	9	2	2	294
16:00		3	2	0	0	11	37	64	118	95	44	11	1	1	387
17:00		2	1	1	0	5	23	71	98	79	20	9	1	0	310
18:00		3	0	0	2	2	16	35	58	60	30	7	3	0	216
19:00		0	0	2	0	1	6	15	43	45	20	3	2	0	137
20:00		0	0	0	0	0	2	7	17	31	15	2	0	1	75
21:00		0	0	0	0	0	1	17	39	28	16	5	0	1	107
22:00		0	0	0	0	2	3	6	11	22	16	11	0	1	72
23:00		0	0	0	0	0	0	5	9	19	6	5	4	1	49
Totals		**29**	**15**	**13**	**14**	**40**	**158**	**462**	**930**	**1065**	**537**	**176**	**40**	**23**	**3502**
% of Totals		1%	0%	0%	0%	1%	5%	13%	27%	30%	15%	5%	1%	1%	100%
% AM		0%	0%	0%	0%	0%	1%	3%	7%	11%	6%	2%	1%	0%	33%
AM Peak Hour		10:00	10:00	06:00	06:00	08:00	08:00	07:00	11:00	07:00	07:00	08:00	08:00	07:00	07:00
Volume		5	2	6	8	3	8	30	52	81	44	20	7	3	222
% PM		0%	0%	0%	0%	1%	3%	10%	20%	20%	9%	3%	0%	0%	67%
PM Peak Hour		16:00	12:00	19:00	18:00	16:00	16:00	17:00	16:00	16:00	14:00	12:00	23:00	14:00	16:00
Volume		3	3	2	2	11	37	71	118	95	52	15	4	2	387

Average Speed	50th Percentile	85th Percentile
49.8	50	57

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Speed Report

Date: 11/14/07 Site: [80834] Old Hwy 395 btwn Reche Rd & Canonita Dr/Steward Cyn Rd

SOUTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	1	2	1	1	1	0	0	6
01:00		0	0	0	0	0	0	1	0	1	1	1	0	0	4
02:00		0	0	0	0	0	1	0	5	2	0	2	0	0	10
03:00		0	0	0	0	0	1	2	9	4	2	2	0	1	21
04:00		0	0	0	0	0	0	5	17	10	4	2	0	0	38
05:00		0	0	1	0	0	4	31	67	36	16	5	0	2	162
06:00		2	2	2	1	2	4	38	120	75	30	7	2	1	286
07:00		0	1	1	0	1	7	48	116	67	20	3	1	0	265
08:00		3	2	1	0	1	10	41	86	62	32	7	1	0	246
09:00		0	2	0	1	1	15	48	73	51	12	1	0	0	204
10:00		2	1	1	0	3	12	56	77	49	13	4	1	0	219
11:00		0	1	0	2	2	15	52	72	37	16	5	0	0	202
12:00	PM	1	2	1	1	0	21	59	57	38	16	2	2	0	200
13:00		5	1	3	0	2	20	50	58	35	17	6	1	0	198
14:00		1	0	0	1	6	18	56	61	42	14	3	1	0	203
15:00		3	2	0	0	1	18	51	63	37	14	5	0	0	194
16:00		2	2	3	0	0	19	69	82	38	11	3	0	1	230
17:00		0	3	2	0	1	9	52	75	34	15	2	0	0	193
18:00		1	0	1	0	0	4	34	56	30	11	3	1	0	141
19:00		0	0	0	0	0	3	15	36	26	13	3	1	0	97
20:00		0	0	0	0	0	4	17	20	23	10	3	0	0	77
21:00		0	1	0	0	0	0	11	24	15	9	4	1	0	65
22:00		0	0	0	0	0	2	11	7	11	4	1	2	1	39
23:00		0	0	0	0	0	0	3	2	2	1	0	0	0	8
Totals		**20**	**20**	**16**	**6**	**20**	**187**	**751**	**1185**	**726**	**282**	**75**	**14**	**6**	**3308**
% of Totals		1%	1%	0%	0%	1%	6%	23%	36%	22%	9%	2%	0%	0%	100%
% AM		0%	0%	0%	0%	0%	2%	10%	19%	12%	4%	1%	0%	0%	50%
AM Peak Hour		08:00	06:00	06:00	11:00	10:00	09:00	10:00	06:00	06:00	08:00	06:00	06:00	05:00	06:00
Volume		3	2	2	2	3	15	56	120	75	32	7	2	2	286
% PM		0%	0%	0%	0%	0%	4%	13%	16%	10%	4%	1%	0%	0%	50%
PM Peak Hour		13:00	17:00	13:00	12:00	14:00	12:00	16:00	16:00	14:00	13:00	13:00	12:00	16:00	16:00
Volume		5	3	3	1	6	21	69	82	42	17	6	2	1	230

Average Speed	50th Percentile	85th Percentile
47.6	48	54

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Speed Report

Date: 11/7/07 Site: [808.33] Old Hwy 395 btwn Tecalote Ln & Stewart Cyn Rd

NORTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	1	0	4	6	10	4	2	3	30
01:00		0	0	0	0	0	0	1	1	3	2	2	1	0	10
02:00		0	0	0	0	0	0	0	2	3	3	3	4	0	15
03:00		0	0	0	0	0	0	0	0	1	0	1	0	0	2
04:00		0	0	0	0	0	0	0	1	2	9	2	0	1	15
05:00		2	0	0	0	0	0	1	0	9	6	9	5	1	33
06:00		2	0	1	3	4	3	10	20	30	26	10	5	3	117
07:00		1	1	0	9	10	48	60	52	26	9	0	1	1	218
08:00		1	2	0	6	36	57	57	36	23	2	0	0	0	220
09:00		3	3	0	11	40	28	55	28	11	2	1	0	0	182
10:00		5	0	0	3	35	46	59	23	17	1	0	0	0	189
11:00		2	1	2	3	17	33	52	32	23	5	0	0	0	170
12:00	PM	5	1	0	2	3	8	36	74	42	18	1	0	1	191
13:00		2	0	1	0	4	5	58	74	64	15	3	0	0	226
14:00		2	0	1	3	5	31	75	87	62	33	3	0	0	302
15:00		3	2	4	4	7	12	34	68	88	53	13	2	0	290
16:00		5	2	33	50	53	33	54	47	38	6	2	0	0	323
17:00		5	2	3	26	52	78	66	40	30	20	2	1	0	325
18:00		0	1	1	0	0	0	12	38	82	50	17	1	0	202
19:00		0	1	0	0	0	7	7	10	27	43	31	11	5	142
20:00		0	0	0	0	0	0	3	8	16	36	32	11	3	109
21:00		0	0	0	0	0	1	0	7	20	38	11	9	6	92
22:00		0	0	0	0	1	1	0	6	6	33	9	9	2	67
23:00		0	0	0	0	0	0	1	8	14	12	9	7	2	53
Totals		**38**	**16**	**46**	**120**	**267**	**392**	**641**	**666**	**643**	**432**	**165**	**69**	**28**	**3523**
% of Totals		1%	0%	1%	3%	8%	11%	18%	19%	18%	12%	5%	2%	1%	100%
% AM		0%	0%	0%	1%	4%	6%	8%	6%	4%	2%	1%	1%	0%	34%
AM Peak Hour		10:00	09:00	11:00	09:00	09:00	08:00	07:00	07:00	06:00	06:00	06:00	05:00		08:00
Volume		5	3	2	11	40	57	60	52	30	26	10	5	3	220
% PM		1%	0%	1%	2%	4%	5%	10%	13%	14%	10%	4%	1%	1%	66%
PM Peak Hour		12:00	15:00	16:00	16:00	16:00	17:00	14:00	14:00	15:00	15:00	20:00	19:00	21:00	17:00
Volume		5	2	33	50	53	78	75	87	88	53	32	11	6	325

Average Speed	50th Percentile	85th Percentile
46.2	47	57

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Speed Report

Date: 11/7/07 Site: [808.33] Old Hwy 395 btwn Tecalote Ln & Stewart Cyn Rd

SOUTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	1	1	3	1	0	3	1	10
01:00		0	0	0	0	0	0	0	0	0	1	1	0	1	3
02:00		0	0	0	0	0	0	0	0	1	2	1	1	1	6
03:00		0	0	0	0	0	0	0	2	2	5	2	3	5	19
04:00		0	0	0	0	0	0	0	0	4	8	9	13	6	40
05:00		0	0	0	0	0	0	1	2	10	49	44	26	22	154
06:00		12	5	1	1	2	6	18	22	56	55	65	24	6	273
07:00		6	0	0	1	23	38	65	99	49	13	4	1	1	300
08:00		5	0	0	0	14	38	86	81	28	7	4	0	1	264
09:00		1	1	1	3	16	35	61	43	23	4	0	1	0	189
10:00		3	0	0	2	16	47	65	42	23	3	1	0	0	202
11:00		2	1	3	0	11	38	58	49	27	7	1	0	0	197
12:00	PM	2	1	1	1	0	6	31	49	79	35	13	1	1	220
13:00		2	1	1	0	0	3	26	56	70	37	9	4	0	209
14:00		7	3	3	2	0	6	22	59	89	40	6	1	0	238
15:00		1	1	0	0	0	5	12	48	73	40	19	2	2	203
16:00		17	11	7	11	19	23	41	40	29	17	4	1	0	220
17:00		5	2	0	6	24	31	43	35	23	21	8	2	0	200
18:00		2	1	0	0	0	1	2	13	32	54	30	4	5	144
19:00		1	0	1	1	0	0	3	12	28	28	25	13	6	118
20:00		0	0	0	0	0	0	1	4	1	14	15	8	3	46
21:00		0	0	0	0	0	0	1	2	9	22	13	4	4	55
22:00		0	0	0	0	1	1	0	2	2	7	6	2	2	23
23:00		0	0	0	0	0	0	1	2	2	2	1	0	2	10
Totals		**66**	**27**	**18**	**28**	**126**	**278**	**538**	**663**	**663**	**472**	**281**	**114**	**69**	**3343**
% of Totals		2%	1%	1%	1%	4%	8%	16%	20%	20%	14%	8%	3%	2%	100%
% AM		1%	0%	0%	0%	2%	6%	11%	10%	7%	5%	4%	2%	1%	50%
AM Peak Hour		06:00	06:00	11:00	09:00	07:00	10:00	08:00	07:00	06:00	06:00	06:00	05:00	05:00	07:00
Volume		12	5	3	3	23	47	86	99	56	55	65	26	22	300
% PM		1%	1%	0%	1%	1%	2%	5%	10%	13%	9%	4%	1%	1%	50%
PM Peak Hour		16:00	16:00	16:00	16:00	17:00	17:00	17:00	14:00	14:00	18:00	18:00	19:00	19:00	14:00
Volume		17	11	7	11	24	31	43	59	89	54	30	13	6	238

Average Speed	50th Percentile	85th Percentile
48.8	49	60

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Speed Report

Date: 11/8/07 Site: [808.32] Old Hwy 395 btwn Pala Mesa Dr & Tecalote Ln

NORTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	1	3	10	6	6	1	1	28
01:00		0	0	0	0	0	0	2	0	3	1	2	2	0	10
02:00		0	0	0	0	0	0	0	4	5	3	5	0	1	18
03:00		0	0	0	0	0	0	0	0	1	1	0	0	0	2
04:00		0	0	0	0	0	0	1	1	4	8	2	0	1	17
05:00		0	0	0	0	1	0	2	4	10	13	6	1	1	38
06:00		0	1	0	0	1	4	9	23	36	29	13	6	4	126
07:00		4	0	0	1	0	10	40	68	82	52	16	0	2	275
08:00		1	1	0	0	0	1	29	81	66	40	13	2	0	234
09:00		0	3	0	2	2	8	23	44	61	40	10	1	1	195
10:00		2	1	0	0	3	15	21	63	60	29	9	5	0	208
11:00		1	3	0	0	5	4	8	35	69	44	18	5	1	193
12:00	PM	1	5	0	0	0	3	15	44	76	42	13	6	1	206
13:00		2	1	0	0	1	5	17	54	88	53	9	1	0	231
14:00		5	2	2	0	0	6	10	48	99	77	26	4	1	280
15:00		2	4	0	0	1	2	16	37	112	83	27	4	4	292
16:00		1	2	0	2	0	0	20	43	135	83	32	13	4	335
17:00		2	1	1	1	0	3	16	59	140	74	19	3	1	320
18:00		1	0	1	0	0	5	9	26	72	53	25	6	2	200
19:00		0	1	1	0	0	0	10	20	48	40	18	2	4	144
20:00		0	0	2	0	0	0	5	7	28	33	22	6	3	106
21:00		0	0	0	0	0	0	3	14	24	40	12	6	3	102
22:00		0	0	0	0	0	0	2	5	12	27	11	5	2	64
23:00		0	0	0	0	0	0	4	7	17	14	9	4	1	56
Totals		**22**	**25**	**7**	**6**	**14**	**66**	**263**	**690**	**1258**	**885**	**323**	**83**	**38**	**3680**
% of Totals		1%	1%	0%	0%	0%	2%	7%	19%	34%	24%	9%	2%	1%	100%
% AM		0%	0%		0%	0%	1%	4%	9%	11%	7%	3%	1%	0%	37%
AM Peak Hour		07:00	09:00		09:00	11:00	10:00	07:00	08:00	07:00	07:00	11:00	06:00	06:00	07:00
Volume		4	3		2	5	15	40	81	82	52	18	6	4	275
% PM		0%	0%	0%	0%	0%	1%	3%	10%	23%	17%	6%	2%	1%	63%
PM Peak Hour		14:00	12:00	14:00	16:00	13:00	14:00	16:00	17:00	17:00	15:00	16:00	16:00	15:00	16:00
Volume		5	5	2	2	1	6	20	59	140	83	32	13	4	335

Average Speed	50th Percentile	85th Percentile
52.5	53	59

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Speed Report

Date: 11/8/07 Site: [808.32] Old Hwy 395 btwn Pala Mesa Dr & Tecalote Ln

SOUTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	1	3	3	1	0	1	0	9
01:00		0	0	0	0	0	1	1	0	0	2	0	0	1	5
02:00		0	0	0	0	0	0	0	1	3	1	1	0	0	6
03:00		0	0	0	0	0	1	0	0	3	7	1	0	5	17
04:00		0	0	0	0	0	0	0	1	3	10	9	12	6	41
05:00		0	0	0	0	0	0	2	5	15	38	45	22	24	151
06:00		1	1	1	0	1	1	3	19	59	94	80	20	6	286
07:00		5	2	1	0	0	2	9	51	93	87	39	9	5	303
08:00		6	1	0	0	1	0	20	66	87	58	13	5	1	258
09:00		2	2	0	1	3	7	21	37	58	42	14	2	3	192
10:00		2	2	1	1	0	2	22	59	79	51	14	0	1	234
11:00		0	0	0	0	2	0	15	42	75	39	9	7	0	189
12:00	PM	2	3	0	0	1	5	21	53	80	41	16	4	0	226
13:00		3	2	0	0	2	8	16	63	72	36	16	3	0	221
14:00		2	0	0	0	0	4	26	65	90	47	18	3	1	256
15:00		0	1	0	1	0	3	15	37	62	76	19	5	4	223
16:00		3	0	2	1	1	2	16	43	77	55	28	8	1	237
17:00		2	0	0	1	1	10	19	51	47	55	23	5	2	216
18:00		0	1	0	0	0	2	10	20	52	46	19	6	1	157
19:00		1	0	0	0	0	1	7	19	24	39	17	11	4	123
20:00		0	0	0	1	1	3	0	2	13	13	13	4	2	52
21:00		0	0	0	0	0	1	2	5	13	20	11	1	4	57
22:00		0	0	0	0	0	0	2	2	1	7	10	2	0	24
23:00		0	0	0	0	0	0	2	1	2	3	1	1	2	12
Totals		**29**	**15**	**5**	**6**	**13**	**53**	**230**	**645**	**1011**	**868**	**416**	**131**	**73**	**3495**
% of Totals		1%	0%	0%	0%	0%	2%	7%	18%	29%	25%	12%	4%	2%	100%
% AM		0%	0%	0%	0%	0%	0%	3%	8%	14%	12%	6%	2%	1%	48%
AM Peak Hour		08:00	07:00	06:00	09:00	09:00	09:00	10:00	08:00	07:00	06:00	06:00	05:00	05:00	07:00
Volume		6	2	1	1	3	7	22	66	93	94	80	22	24	303
% PM		0%	0%	0%	0%	0%	1%	4%	10%	15%	13%	5%	2%	1%	52%
PM Peak Hour		13:00	12:00	16:00	15:00	13:00	17:00	14:00	14:00	14:00	15:00	16:00	19:00	15:00	14:00
Volume		3	3	2	1	2	10	26	65	90	76	28	11	4	256

Average Speed	50th Percentile	85th Percentile
53.4	54	61

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Speed Report

Date: 11/8/07 Site: [808.31] Old Hwy 395 btwn Pala Rd & Pala Mesa Dr

NORTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	4	5	10	5	0	1	0	25
01:00		0	0	0	0	0	0	1	2	6	1	0	1	0	11
02:00		0	0	0	0	0	0	2	8	3	6	0	0	0	19
03:00		0	0	0	0	0	1	1	0	1	0	0	0	0	3
04:00		0	0	0	0	0	0	1	2	7	3	0	1	0	14
05:00		0	0	0	0	0	0	4	12	14	7	1	0	0	38
06:00		2	0	2	1	0	12	32	52	28	11	3	2	0	145
07:00		1	1	1	0	7	25	82	73	56	17	4	0	0	267
08:00		1	0	0	2	9	24	56	77	49	15	1	0	0	234
09:00		2	1	0	0	1	12	39	74	52	9	2	0	0	192
10:00		1	0	0	0	1	12	56	86	45	8	1	1	0	211
11:00		3	1	0	0	2	10	48	83	49	22	2	0	0	220
12:00	PM	2	3	0	0	0	10	39	68	78	20	3	1	0	224
13:00		3	1	0	1	0	9	43	77	83	21	2	0	0	240
14:00		4	1	0	1	0	8	39	120	98	32	2	1	0	306
15:00		4	5	0	1	0	7	59	122	95	23	0	1	0	317
16:00		2	3	0	0	4	26	44	134	112	27	5	2	0	359
17:00		2	2	0	2	8	18	58	132	107	14	4	0	0	347
18:00		0	1	0	0	1	19	43	90	63	20	4	0	0	241
19:00		1	0	0	0	3	8	41	48	53	9	2	1	1	167
20:00		0	0	0	0	2	5	21	30	47	13	6	0	0	124
21:00		0	1	0	0	0	3	11	36	35	18	3	0	0	107
22:00		0	0	0	0	1	0	8	17	31	10	1	1	0	69
23:00		0	0	0	0	0	1	6	12	25	11	2	1	0	58
Totals		**28**	**20**	**3**	**8**	**39**	**210**	**738**	**1360**	**1147**	**322**	**48**	**14**	**1**	**3938**
% of Totals		1%	1%	0%	0%	1%	5%	19%	35%	29%	8%	1%	0%	0%	100%
% AM		0%	0%	0%	0%	1%	2%	8%	12%	8%	3%	0%	0%		35%
AM Peak Hour		11:00	07:00	06:00	08:00	08:00	07:00	07:00	10:00	07:00	11:00	07:00	06:00		07:00
Volume		3	1	2	2	9	25	82	86	56	22	4	2		267
% PM		0%	0%		0%	0%	3%	10%	22%	21%	6%	1%	0%	0%	65%
PM Peak Hour		14:00	15:00		17:00	17:00	16:00	15:00	16:00	16:00	14:00	20:00	16:00	19:00	16:00
Volume		4	5		2	8	26	59	134	112	32	6	2	1	359

Average Speed	50th Percentile	85th Percentile
47.9	48	54

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Speed Report

Date: 11/8/07 Site: [808.31] Old Hwy 395 btwn Pala Rd & Pala Mesa Dr

SOUTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	3	1	2	1	2	0	0	9
01:00		0	0	0	0	0	1	0	0	0	2	0	0	0	3
02:00		0	0	0	0	0	1	0	0	3	2	2	0	0	8
03:00		0	0	0	0	0	0	0	2	4	3	2	1	4	16
04:00		0	0	0	0	1	1	3	2	6	11	14	3	5	46
05:00		0	0	1	0	0	3	7	12	33	46	37	13	9	161
06:00		7	0	1	1	2	5	10	37	95	93	39	9	4	303
07:00		3	3	1	0	2	11	31	46	106	99	32	2	1	337
08:00		3	0	2	3	1	14	25	59	119	52	7	2	2	289
09:00		2	0	0	0	2	14	29	53	73	37	9	3	2	224
10:00		3	2	0	0	1	9	30	63	82	30	9	1	1	231
11:00		1	0	0	0	10	12	28	62	69	33	10	1	2	228
12:00	PM	1	2	0	0	1	12	40	65	69	34	6	1	0	231
13:00		1	3	1	0	5	10	29	62	77	33	11	2	0	234
14:00		0	1	1	1	8	13	28	81	90	37	6	2	2	270
15:00		3	0	0	0	4	19	37	44	95	38	8	1	1	250
16:00		1	0	0	1	2	10	26	48	106	36	19	4	0	253
17:00		1	0	0	1	4	14	39	59	68	32	13	3	1	235
18:00		0	0	0	0	2	10	22	25	52	31	6	2	0	150
19:00		0	0	0	0	0	1	10	31	35	32	12	2	2	125
20:00		0	1	0	0	4	1	1	7	13	13	6	4	0	50
21:00		0	0	0	0	1	3	3	6	24	15	5	2	1	60
22:00		0	0	0	0	0	0	2	3	6	8	6	0	0	25
23:00		0	0	0	0	0	0	1	2	1	2	0	2	1	9
Totals		**26**	**12**	**7**	**7**	**50**	**164**	**404**	**770**	**1228**	**720**	**261**	**60**	**38**	**3747**
% of Totals		1%	0%	0%	0%	1%	4%	11%	21%	33%	19%	7%	2%	1%	100%
% AM		1%	0%	0%	0%	1%	2%	4%	9%	16%	11%	4%	1%	1%	50%
AM Peak Hour		06:00	07:00	08:00	08:00	11:00	08:00	07:00	10:00	08:00	07:00	06:00	05:00	05:00	07:00
Volume		7	3	2	3	10	14	31	63	119	99	39	13	9	337
% PM		0%	0%	0%	0%	1%	2%	6%	12%	17%	8%	3%	1%	0%	50%
PM Peak Hour		15:00	13:00	13:00	14:00	14:00	15:00	12:00	14:00	16:00	15:00	16:00	16:00	14:00	14:00
Volume		3	3	1	1	8	19	40	81	106	38	19	4	2	270

Average Speed	50th Percentile	85th Percentile
51.0	52	59

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Speed Report

Date: 12/13/07 Site: [815.01] Old Highway 395 btwn SR-76 & Dulin Road

NORTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1
01:00		0	0	0	0	0	0	0	3	1	1	1	1	0	7
02:00		0	0	0	0	0	0	0	1	1	0	0	0	0	2
03:00		0	0	0	0	0	0	0	1	2	0	0	1	0	4
04:00		0	0	0	0	0	1	1	7	2	3	0	0	1	15
05:00		0	0	0	0	0	0	9	12	9	10	2	2	1	45
06:00		1	0	1	0	0	4	15	27	33	19	5	2	0	107
07:00		0	0	1	0	0	4	17	47	72	49	12	1	1	204
08:00		1	1	1	1	0	6	20	32	39	25	10	2	0	138
09:00		2	1	0	1	0	4	15	22	41	20	8	1	2	117
10:00		0	0	1	0	0	4	16	23	37	13	6	2	2	104
11:00		0	0	0	0	3	5	14	28	38	26	10	2	0	126
12:00	PM	0	0	1	1	1	2	7	20	35	26	12	5	2	112
13:00		0	0	0	0	4	5	16	33	34	28	12	4	2	138
14:00		0	1	1	1	2	7	19	39	36	33	14	3	0	156
15:00		0	1	0	2	2	7	16	36	63	53	18	4	2	204
16:00		0	1	2	0	0	5	14	26	65	60	22	4	1	200
17:00		2	2	0	0	0	7	19	50	59	31	9	0	0	179
18:00		0	0	1	1	0	9	11	34	32	24	2	2	0	116
19:00		0	0	0	0	1	4	4	21	12	11	3	1	0	57
20:00		0	0	0	0	0	5	12	22	12	5	0	0	0	56
21:00		0	0	0	0	0	0	11	11	23	15	3	1	1	65
22:00		0	0	0	0	0	1	3	10	14	5	2	0	0	35
23:00		0	0	0	0	0	0	1	4	5	2	0	0	0	12
Totals		**6**	**7**	**9**	**7**	**13**	**80**	**240**	**509**	**665**	**459**	**152**	**38**	**15**	**2200**
% of Totals		0%	0%	0%	0%	1%	4%	11%	23%	30%	21%	7%	2%	1%	100%
% AM		0%	0%	0%	0%	0%	1%	5%	9%	13%	8%	3%	1%	0%	40%
AM Peak Hour		09:00	08:00	06:00	08:00	11:00	08:00	08:00	07:00	07:00	07:00	07:00	05:00	09:00	07:00
Volume		2	1	1	1	3	6	20	47	72	49	12	2	2	204
% PM		0%	0%	0%	0%	0%	2%	6%	14%	18%	13%	4%	1%	0%	60%
PM Peak Hour		17:00	17:00	16:00	15:00	13:00	18:00	14:00	17:00	16:00	16:00	16:00	12:00	12:00	15:00
Volume		2	2	2	2	4	9	19	50	65	60	22	5	2	204

Average Speed	50th Percentile	85th Percentile
51.3	52	59

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Speed Report

Date: 12/13/07 Site: [815.01] Old Highway 395 btwn SR-76 & Dulin Road

SOUTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	0	1	3	5	0	0	0	9
01:00		0	0	0	0	0	0	0	1	2	1	0	0	0	4
02:00		0	0	0	0	0	0	0	0	1	1	1	0	0	3
03:00		0	0	0	0	0	0	0	0	0	3	0	0	0	3
04:00		0	0	0	0	0	0	1	0	0	6	0	0	0	7
05:00		0	0	0	0	0	0	1	6	12	12	8	2	0	41
06:00		1	2	0	0	2	11	8	31	55	56	11	1	1	179
07:00		2	1	1	0	0	5	33	35	65	34	20	3	0	199
08:00		3	3	0	0	0	5	15	21	41	25	14	4	0	131
09:00		2	0	0	1	0	2	21	28	30	22	5	3	0	114
10:00		2	1	0	2	0	4	18	25	36	19	3	2	0	112
11:00		0	0	0	0	0	6	11	19	48	25	11	3	1	124
12:00	PM	0	1	0	0	0	2	3	19	34	45	9	3	1	117
13:00		1	1	0	1	1	0	2	32	37	40	20	6	1	142
14:00		3	0	0	2	0	0	9	19	41	43	13	3	2	135
15:00		2	2	1	0	0	0	11	29	56	50	19	3	0	173
16:00		1	0	0	1	2	1	12	36	61	38	11	6	0	169
17:00		3	0	0	0	0	2	12	40	53	46	17	1	0	174
18:00		1	0	0	2	0	2	8	38	51	32	10	1	1	146
19:00		2	0	0	0	0	2	2	27	43	18	9	2	0	105
20:00		0	0	0	0	0	1	7	21	24	15	6	1	1	76
21:00		0	0	0	0	0	1	3	14	14	16	10	2	1	61
22:00		1	0	0	0	0	0	4	4	15	8	4	1	0	37
23:00		0	0	0	0	0	0	2	4	6	6	0	1	0	19
Totals		**24**	**11**	**2**	**9**	**5**	**44**	**183**	**450**	**728**	**566**	**201**	**48**	**9**	**2280**
% of Totals		1%	0%	0%	0%	0%	2%	8%	20%	32%	25%	9%	2%	0%	100%
% AM		0%	0%	0%	0%	0%	1%	5%	7%	13%	9%	3%	1%	0%	41%
AM Peak Hour		08:00	08:00	07:00	10:00	06:00	06:00	07:00	07:00	07:00	06:00	07:00	08:00	06:00	07:00
Volume		3	3	1	2	2	11	33	35	65	56	20	4	1	199
% PM		1%	0%	0%	0%	0%	0%	3%	12%	19%	16%	6%	1%	0%	59%
PM Peak Hour		14:00	15:00	15:00	14:00	16:00	12:00	16:00	17:00	16:00	15:00	13:00	13:00	14:00	17:00
Volume		3	2	1	2	2	2	12	40	61	50	20	6	2	174

Average Speed	50th Percentile	85th Percentile
52.1	53	59

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Speed Report

Date: 11/7/07 Site: [808.30] Old Hwy 395 south of Dulin Road

NORTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	1	0	0	2	0	1	0	4
01:00		0	0	0	0	0	0	1	2	1	1	0	0	0	5
02:00		0	0	0	0	0	0	0	1	1	1	1	0	1	5
03:00		0	0	0	0	0	0	0	0	0	3	0	1	0	4
04:00		0	1	0	0	0	0	0	0	0	0	0	1	3	5
05:00		1	0	0	0	0	0	6	3	5	2	4	0	0	21
06:00		1	9	1	1	0	0	6	6	9	13	19	7	3	75
07:00		2	9	1	0	0	1	5	16	33	33	25	8	3	136
08:00		0	3	0	0	0	3	2	6	8	10	9	4	0	45
09:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00		0	1	0	0	0	3	2	7	8	10	5	5	4	45
11:00		2	1	0	0	0	2	8	12	17	11	9	7	4	73
12:00	PM	0	1	0	0	0	0	3	12	21	28	13	5	6	89
13:00		1	1	0	0	0	1	9	14	18	31	25	7	4	111
14:00		4	1	2	0	1	5	11	25	39	34	23	13	1	159
15:00		2	1	2	0	0	4	13	21	38	56	31	3	2	173
16:00		0	5	0	0	0	4	16	28	53	43	33	15	6	203
17:00		0	5	1	0	3	4	26	37	39	36	9	19	3	182
18:00		0	0	0	0	1	5	20	29	37	28	14	5	2	141
19:00		0	0	0	0	0	1	6	12	10	15	8	2	0	54
20:00		0	0	0	0	0	1	6	12	12	2	8	1	0	42
21:00		0	0	0	0	0	0	6	9	10	4	4	1	2	36
22:00		0	0	0	0	0	0	0	2	8	7	4	1	0	22
23:00		0	0	0	0	0	1	2	0	3	1	1	0	0	8
Totals		**13**	**38**	**7**	**1**	**5**	**35**	**149**	**254**	**370**	**371**	**245**	**106**	**44**	**1638**
% of Totals		1%	2%	0%	0%	0%	2%	9%	16%	23%	23%	15%	6%	3%	100%
% AM		0%	1%	0%	0%		1%	2%	3%	5%	5%	4%	2%	1%	26%
AM Peak Hour		07:00	06:00	06:00	06:00		08:00	11:00	07:00	07:00	07:00	07:00	07:00	10:00	07:00
Volume		2	9	1	1		3	8	16	33	33	25	8	4	136
% PM		0%	1%	0%		0%	2%	7%	12%	18%	17%	11%	4%	2%	74%
PM Peak Hour		14:00	16:00	14:00		17:00	14:00	17:00	17:00	16:00	15:00	16:00	17:00	12:00	16:00
Volume		4	5	2		3	5	26	37	53	56	33	19	6	203

Average Speed	50th Percentile	85th Percentile
53.2	54	63

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Speed Report

Date: 11/7/07 Site: [808.30] Old Hwy 395 south of Dulin Road

SOUTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	1	0	0	0	1	1	1	0	4
01:00		0	0	0	0	1	0	0	1	2	0	1	0	0	5
02:00		0	0	0	0	0	3	0	1	0	0	1	1	0	6
03:00		0	0	0	0	0	4	0	2	0	0	2	0	0	8
04:00		0	0	0	0	1	6	10	3	3	2	0	0	0	25
05:00		2	0	1	0	4	20	30	17	12	9	5	4	0	104
06:00		1	0	0	1	3	28	69	48	66	40	13	1	0	270
07:00		2	0	0	3	3	17	78	63	67	42	13	2	1	291
08:00		0	1	1	2	4	19	47	29	28	17	7	0	1	156
09:00		1	1	2	0	5	7	29	25	20	9	7	2	0	108
10:00		0	0	3	0	3	11	26	19	25	17	9	0	1	114
11:00		0	1	2	2	5	7	20	20	22	7	7	1	0	94
12:00	PM	0	0	1	2	4	10	15	26	26	17	3	1	1	106
13:00		0	0	1	0	1	10	22	31	30	14	3	0	0	112
14:00		0	1	4	4	8	14	32	28	31	16	3	0	0	141
15:00		0	3	2	1	2	10	18	55	32	15	6	2	0	146
16:00		0	1	3	2	7	14	24	38	30	12	2	0	0	133
17:00		0	2	4	3	4	5	31	29	12	9	4	0	0	103
18:00		0	0	2	1	2	8	15	19	16	6	3	0	0	72
19:00		0	2	2	1	0	5	6	6	10	7	2	0	0	41
20:00		0	0	2	1	0	4	6	11	4	0	0	1	0	29
21:00		0	1	1	2	0	2	4	5	2	2	1	2	0	22
22:00		0	0	0	2	0	3	3	5	3	3	1	1	1	22
23:00		0	0	0	1	0	0	0	1	2	3	1	0	0	8
Totals		**6**	**13**	**31**	**28**	**57**	**208**	**485**	**482**	**443**	**248**	**95**	**19**	**5**	**2120**
% of Totals		0%	1%	1%	1%	3%	10%	23%	23%	21%	12%	4%	1%	0%	100%
% AM		0%	0%	0%	0%	1%	6%	15%	11%	12%	7%	3%	1%	0%	56%
AM Peak Hour		05:00	08:00	10:00	07:00	09:00	06:00	07:00	07:00	07:00	07:00	06:00	05:00	07:00	07:00
Volume		2	1	3	3	5	28	78	63	67	42	13	4	1	291
% PM			0%	1%	1%	1%	4%	8%	12%	9%	5%	1%	0%	0%	44%
PM Peak Hour			15:00	14:00	14:00	14:00	14:00	14:00	15:00	15:00	12:00	15:00	15:00	12:00	15:00
Volume			3	4	4	8	14	32	55	32	17	6	2	1	146

Average Speed	50th Percentile	85th Percentile
47.2	47	56

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Speed Report

Date: 11/12/08 Site: [93217] Reche Road between Live Oak Park & Green Canyon Road

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	3	8	2	1	1	0	0	0	0	15
01:00		0	0	0	0	0	1	0	0	3	0	0	0	0	0	4
02:00		0	0	0	0	0	1	2	1	1	0	1	0	0	0	6
03:00		0	0	0	0	1	0	2	4	7	0	1	0	0	0	15
04:00		0	0	0	0	1	1	9	16	14	3	1	0	0	0	45
05:00		1	0	0	0	2	4	22	45	50	12	2	0	0	0	138
06:00		2	0	1	4	11	38	102	115	72	5	1	0	0	0	351
07:00		13	3	2	2	12	74	133	131	45	2	0	0	0	0	417
08:00		1	0	2	2	15	49	108	129	19	2	1	0	0	0	328
09:00		1	1	0	0	6	49	107	84	31	1	0	0	0	0	280
10:00		7	5	2	3	16	34	108	90	17	1	0	0	0	0	283
11:00		5	0	1	0	14	48	123	75	21	2	0	0	0	0	289
12:00	PM	2	2	0	0	2	49	121	87	17	3	0	0	0	0	283
13:00		11	1	0	0	9	55	151	95	18	0	0	0	0	0	340
14:00		6	0	3	0	16	55	152	109	21	2	0	0	0	0	364
15:00		8	5	1	3	22	71	146	117	27	1	0	0	0	0	401
16:00		12	2	2	7	16	29	151	153	31	0	0	0	0	0	403
17:00		6	5	1	2	26	59	131	101	12	0	0	1	0	0	344
18:00		1	2	0	5	11	32	71	86	20	2	1	0	0	0	231
19:00		0	1	0	0	4	25	61	72	18	2	0	0	0	0	183
20:00		0	1	0	0	6	21	41	52	20	1	0	0	0	0	142
21:00		0	0	0	0	3	12	44	37	10	1	0	0	0	0	107
22:00		0	0	0	0	1	6	7	15	5	3	0	0	0	0	37
23:00		0	0	0	0	1	0	4	4	2	1	0	1	0	0	13
Totals		**76**	**28**	**15**	**28**	**195**	**716**	**1804**	**1620**	**482**	**45**	**8**	**2**	**0**	**0**	**5019**
% of Totals		2%	1%	0%	1%	4%	14%	36%	32%	10%	1%	0%	0%			100%
% AM		1%	0%	0%	0%	2%	6%	14%	14%	6%	1%	0%				43%
AM Peak Hour			10:00	07:00	06:00	10:00	07:00	07:00	07:00	06:00	05:00	05:00				07:00
Volume			5	2	4	16	74	133	131	72	12	2				417
% PM		1%	0%	0%	0%	2%	8%	22%	18%	4%	0%	0%	0%			57%
PM Peak Hour			15:00	14:00	16:00	17:00	15:00	14:00	16:00	16:00	12:00	18:00	17:00			16:00
Volume			5	3	7	26	71	152	153	31	3	1	1			403

Average Speed	50th Percentile	85th Percentile
38.4	39	44

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Speed Report

Date: 11/12/08 Site: [93217] Reche Road between Live Oak Park & Green Canyon Road

WESTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	3	1	9	9	2	0	1	0	0	0	25
01:00		0	0	0	1	1	3	6	3	2	0	0	0	0	0	16
02:00		0	0	0	0	0	0	2	2	2	1	0	0	0	0	7
03:00		0	0	0	0	0	0	1	3	1	0	0	0	0	0	5
04:00		0	0	0	2	1	1	3	3	2	1	0	0	0	0	13
05:00		0	0	0	1	2	8	15	13	4	3	0	0	0	0	46
06:00		6	1	2	6	8	21	65	75	13	1	0	0	0	0	198
07:00		8	5	2	46	86	68	149	110	14	1	0	0	0	0	489
08:00		4	1	1	8	16	42	142	85	20	1	0	0	0	0	320
09:00		2	1	2	8	15	35	117	72	14	2	0	0	0	0	268
10:00		0	0	2	5	17	71	114	68	15	1	0	0	0	0	293
11:00		1	2	4	5	22	42	111	73	9	1	0	0	0	0	270
12:00	PM	3	5	2	5	20	35	87	102	17	3	0	0	0	0	279
13:00		6	1	0	13	46	60	130	72	13	1	0	0	0	0	342
14:00		6	0	0	6	29	53	124	107	17	0	0	0	0	0	342
15:00		7	4	6	13	39	69	138	120	24	3	0	0	0	0	423
16:00		8	3	4	16	42	78	199	126	17	0	0	0	0	0	493
17:00		4	2	5	16	31	85	154	106	20	2	0	0	0	0	425
18:00		1	0	3	15	25	48	134	92	8	1	0	0	0	0	327
19:00		1	0	0	3	6	23	64	63	16	1	1	0	0	0	178
20:00		0	0	0	3	10	16	79	41	12	6	0	0	0	0	167
21:00		0	0	0	2	3	22	39	38	11	2	0	0	0	0	117
22:00		0	0	0	3	2	4	25	23	9	3	0	0	0	0	69
23:00		0	0	0	1	3	2	9	10	6	0	0	0	0	0	31
Totals		**57**	**25**	**33**	**178**	**427**	**787**	**1916**	**1416**	**268**	**34**	**2**	**0**	**0**	**0**	**5143**
% of Totals		1%	0%	1%	3%	8%	15%	37%	28%	5%	1%	0%				100%
% AM		0%	0%	0%	2%	3%	6%	14%	10%	2%	0%	0%				38%
AM Peak Hour			07:00	11:00	07:00	07:00	10:00	07:00	07:00	08:00	05:00					07:00
Volume			5	4	46	86	71	149	110	20	3	1				489
% PM		1%	0%	0%	2%	5%	10%	23%	17%	3%	0%	0%				62%
PM Peak Hour			12:00	15:00	16:00	13:00	17:00	16:00	16:00	15:00	20:00	19:00				16:00
Volume			5	6	16	46	85	199	126	24	6	1				493

Average Speed	50th Percentile	85th Percentile
36.8	38	43

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Speed Report

Date: 11/6/07 Site: [808.38] Reche Rd west of Gird Rd

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	3	3	3	2	2	0	0	0	0	0	13
01:00		0	0	0	0	2	2	2	1	1	0	0	0	0	8
02:00		0	0	0	0	1	4	5	1	0	0	0	0	0	11
03:00		0	0	0	2	3	8	5	3	0	0	0	0	0	21
04:00		0	0	1	0	9	19	22	3	0	0	0	0	0	54
05:00		0	0	1	6	34	83	51	6	0	0	0	0	0	181
06:00		7	7	16	29	126	135	45	4	0	0	0	0	0	369
07:00		25	22	20	73	141	106	10	1	0	0	0	0	0	398
08:00		19	26	35	58	166	95	17	3	0	0	0	0	0	419
09:00		10	14	15	60	147	73	9	1	0	0	0	0	0	329
10:00		19	6	16	63	158	79	19	1	0	0	0	0	0	361
11:00		9	13	23	75	163	87	16	1	1	0	0	0	1	389
12:00	PM	9	15	17	59	145	67	4	0	0	0	0	0	0	316
13:00		17	21	28	79	150	48	5	0	0	0	0	0	0	348
14:00		26	28	25	88	136	78	10	0	0	0	0	0	0	391
15:00		63	47	45	83	172	86	11	2	0	0	0	0	0	509
16:00		65	49	46	88	146	82	15	0	1	0	0	0	0	492
17:00		38	43	37	78	133	86	11	0	0	0	0	0	0	426
18:00		14	17	6	34	85	64	23	2	0	0	0	0	0	245
19:00		6	9	6	17	65	52	10	2	0	0	0	0	0	167
20:00		3	3	2	12	57	72	10	3	0	0	0	0	0	162
21:00		0	2	2	7	53	43	15	1	0	0	0	0	0	123
22:00		0	0	0	2	10	17	10	4	1	0	0	0	0	44
23:00		0	0	0	1	2	9	7	2	0	0	0	0	0	21
Totals		**330**	**322**	**341**	**917**	**2107**	**1398**	**334**	**43**	**4**	**0**	**0**	**0**	**1**	**5797**
% of Totals		6%	6%	6%	16%	36%	24%	6%	1%	0%				0%	100%
% AM		2%	2%	2%	6%	16%	12%	4%	0%	0%				0%	44%
AM Peak Hour		07:00	08:00	08:00	11:00	08:00	06:00	05:00	05:00	01:00				11:00	08:00
Volume		25	26	35	75	166	135	51	6	1				1	419
% PM		4%	4%	4%	9%	20%	12%	2%	0%	0%					56%
PM Peak Hour		16:00	16:00	16:00	14:00	15:00	15:00	18:00	22:00	16:00					15:00
Volume		65	49	46	88	172	86	23	4	1					509

Average Speed	50th Percentile	85th Percentile
30.9	32	38

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Speed Report

Date: 11/6/07 Site: [808.38] Reche Rd west of Gird Rd

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	1	0	0	0	4	10	8	3	1	0	0	0	0	27
01:00		1	0	0	1	0	2	6	3	0	0	0	0	0	13
02:00		0	0	0	0	1	3	3	3	0	1	0	0	0	11
03:00		1	0	1	0	0	2	3	2	1	0	0	0	0	10
04:00		0	0	0	1	4	3	4	2	1	1	0	0	0	16
05:00		7	0	0	0	5	16	16	8	1	0	0	0	0	53
06:00		29	10	1	6	44	52	55	27	2	0	0	0	0	226
07:00		43	8	4	41	190	132	63	12	0	0	0	0	0	493
08:00		36	10	1	30	107	105	45	5	0	0	0	0	0	339
09:00		20	4	5	31	104	112	26	3	0	0	0	0	0	305
10:00		23	4	2	31	120	97	31	4	0	0	0	0	0	312
11:00		24	3	5	48	122	113	23	7	1	1	0	0	0	347
12:00	PM	28	2	0	34	123	104	39	5	1	0	0	0	0	336
13:00		30	5	9	46	131	97	42	4	0	0	0	0	0	364
14:00		34	5	6	31	150	160	50	10	0	0	0	0	0	446
15:00		43	10	5	41	166	182	88	22	0	0	0	0	0	557
16:00		43	12	7	43	175	201	94	18	0	0	0	0	0	593
17:00		35	12	1	15	109	170	77	14	0	1	0	0	0	434
18:00		26	4	3	5	62	113	89	15	1	0	0	0	0	318
19:00		5	5	5	3	33	86	44	14	1	1	0	0	0	197
20:00		2	2	1	9	32	38	31	2	0	0	0	0	0	117
21:00		4	3	0	1	7	32	26	14	0	0	0	0	0	87
22:00		1	0	0	1	7	25	27	6	1	0	0	0	0	68
23:00		1	0	0	2	8	13	23	13	2	0	0	0	0	62
Totals		**437**	**99**	**56**	**420**	**1704**	**1868**	**913**	**216**	**13**	**5**	**0**	**0**	**0**	**5731**
	% of Totals	8%	2%	1%	7%	30%	33%	16%	4%	0%	0%				100%
	% AM	3%	1%	0%	3%	12%	11%	5%	1%	0%	0%				38%
	AM Peak Hour	07:00	06:00	09:00	11:00	07:00	07:00	07:00	06:00	06:00	02:00				07:00
	Volume	43	10	5	48	190	132	63	27	2	1				493
	% PM	4%	1%	1%	4%	18%	21%	11%	2%	0%	0%				62%
	PM Peak Hour	15:00	16:00	13:00	13:00	16:00	16:00	16:00	15:00	23:00	17:00				16:00
	Volume	43	12	9	46	175	201	94	22	2	1				593

Average Speed	50th Percentile	85th Percentile
33.9	35	42

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Speed Report

Date: 11/14/07 Site: [808.37] Reche Rd btwn Wilt Rd & Gird Rd

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	1	2	3	1	1	0	0	0	8
01:00		0	0	0	0	0	1	3	2	0	0	0	0	0	6
02:00		0	0	0	0	0	3	5	4	0	0	0	0	0	12
03:00		1	0	0	0	1	3	9	8	1	0	0	0	0	23
04:00		0	0	0	0	1	11	15	16	6	1	1	0	0	51
05:00		2	0	2	2	7	32	94	38	10	0	0	0	0	187
06:00		4	3	7	3	16	104	144	62	6	1	0	0	0	350
07:00		12	5	12	8	39	148	121	34	2	0	0	0	0	381
08:00		5	4	4	22	41	160	69	13	4	1	1	0	0	324
09:00		5	3	7	10	55	116	80	11	0	0	0	0	1	288
10:00		12	2	4	7	93	112	60	6	0	0	0	1	0	297
11:00		7	5	3	20	66	109	60	8	0	1	0	0	0	279
12:00	PM	8	2	7	18	63	107	57	6	0	0	0	0	0	268
13:00		9	0	13	10	70	86	39	5	2	0	0	0	0	234
14:00		5	4	16	4	58	98	68	14	5	0	0	0	0	272
15:00		9	3	6	15	73	118	62	19	1	0	0	0	0	306
16:00		9	8	7	8	63	120	90	17	3	1	0	0	0	326
17:00		12	5	10	12	55	135	66	12	4	1	0	0	0	312
18:00		0	0	7	6	27	56	68	19	4	0	0	0	0	187
19:00		3	1	1	2	12	46	43	19	3	2	0	0	0	132
20:00		0	1	2	0	11	39	29	12	1	1	1	1	0	98
21:00		0	1	0	1	10	29	22	16	4	1	0	0	0	84
22:00		0	0	0	1	2	10	18	6	3	0	2	0	0	42
23:00		0	0	0	1	2	3	7	3	0	0	0	0	0	16
Totals		**103**	**47**	**108**	**150**	**765**	**1647**	**1231**	**353**	**60**	**11**	**5**	**2**	**1**	**4483**
% of Totals		2%	1%	2%	3%	17%	37%	27%	8%	1%	0%	0%	0%	0%	100%
% AM		1%	0%	1%	2%	7%	18%	15%	5%	1%	0%	0%	0%	0%	49%
AM Peak Hour		07:00	07:00	07:00	08:00	10:00	08:00	06:00	06:00	05:00		04:00	10:00	09:00	07:00
Volume		12	5	12	22	93	160	144	62	10	1	1	1	1	381
% PM		1%	1%	2%	2%	10%	19%	13%	3%	1%	0%	0%	0%		51%
PM Peak Hour		17:00	16:00	14:00	12:00	15:00	17:00	16:00	15:00	14:00	19:00	22:00	20:00		16:00
Volume		12	8	16	18	73	135	90	19	5	2	2	1		326

Average Speed	50th Percentile	85th Percentile
37.6	38	44

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Speed Report

Date: 11/14/07 Site: [808.37] Reche Rd btwn Wilt Rd & Gird Rd

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	2	2	9	8	0	0	0	0	21
01:00		0	0	0	0	0	0	6	4	1	1	1	0	1	14
02:00		1	0	0	0	0	1	10	2	2	0	0	0	0	16
03:00		0	0	0	0	0	0	2	4	4	2	0	0	0	12
04:00		1	0	0	0	0	1	4	3	7	1	1	0	0	18
05:00		4	1	0	0	0	2	16	14	14	2	1	1	0	55
06:00		9	7	1	0	10	14	59	58	12	6	1	0	0	177
07:00		21	7	0	5	15	49	108	84	13	1	1	0	0	304
08:00		12	6	4	0	13	62	96	24	3	0	0	0	0	220
09:00		6	3	1	4	15	84	46	9	1	0	0	0	0	169
10:00		16	2	2	6	61	104	45	8	0	0	0	0	0	244
11:00		10	6	1	7	36	81	69	12	6	0	0	0	0	228
12:00	PM	5	2	2	1	43	132	65	19	0	0	0	0	1	270
13:00		8	2	0	20	29	120	115	19	4	0	0	0	0	317
14:00		9	4	2	5	14	45	117	94	18	0	0	0	0	308
15:00		16	43	13	6	41	82	122	20	6	0	0	0	0	349
16:00		22	4	3	6	25	130	155	37	1	0	0	0	0	383
17:00		17	9	11	38	27	102	124	58	5	0	0	0	0	391
18:00		9	1	0	0	0	30	108	99	24	2	0	0	0	273
19:00		7	0	1	2	4	23	77	65	19	5	0	0	0	203
20:00		1	1	0	0	3	20	56	50	15	4	0	0	0	150
21:00		1	1	0	0	1	18	46	55	8	3	0	0	0	133
22:00		0	0	0	0	0	8	20	27	18	8	0	0	0	81
23:00		0	0	0	0	0	4	13	16	8	4	0	0	1	46
Totals		**175**	**99**	**41**	**100**	**337**	**1114**	**1481**	**790**	**197**	**39**	**5**	**1**	**3**	**4382**
% of Totals		4%	2%	1%	2%	8%	25%	34%	18%	4%	1%	0%	0%	0%	100%
% AM		2%	1%	0%	1%	3%	9%	11%	5%	2%	0%	0%	0%	0%	34%
AM Peak Hour		07:00	06:00	08:00	11:00	10:00	10:00	07:00	07:00	05:00	06:00	01:00	05:00	01:00	07:00
Volume		21	7	4	7	61	104	108	84	14	6	1	1	1	304
% PM		2%	2%	1%	2%	4%	16%	23%	13%	3%	1%			0%	66%
PM Peak Hour		16:00	15:00	15:00	17:00	12:00	12:00	16:00	18:00	18:00	22:00			12:00	17:00
Volume		22	43	13	38	43	132	155	99	24	8			1	391

Average Speed	50th Percentile	85th Percentile
39.6	41	47

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Speed Report

Date: 11/14/07 Site: [808.36] Reche Rd btwn Tecalote Rd & Wilt Rd

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	0	2	2	2	0	0	1	7
01:00		0	0	0	0	0	1	0	1	2	1	0	0	0	5
02:00		0	0	0	0	0	0	1	4	1	2	2	0	0	10
03:00		0	0	0	1	0	1	1	7	10	3	0	1	0	24
04:00		0	0	0	1	0	0	0	9	22	6	8	2	0	48
05:00		1	1	0	1	1	2	25	41	80	22	4	1	0	179
06:00		3	4	6	4	4	8	46	108	130	25	1	0	0	339
07:00		11	21	8	19	13	25	104	114	48	4	1	0	0	368
08:00		9	7	6	38	69	76	71	20	5	1	0	0	0	302
09:00		11	3	6	6	54	115	60	5	0	0	0	0	0	260
10:00		11	5	9	10	43	122	55	18	0	0	0	0	0	273
11:00		11	2	10	19	28	76	77	19	3	1	0	0	0	246
12:00	PM	8	2	9	10	37	70	65	27	3	0	0	0	0	231
13:00		12	6	20	33	59	47	40	7	2	0	0	0	0	226
14:00		17	11	12	13	13	57	67	47	13	2	0	0	0	252
15:00		13	4	8	15	34	66	76	29	8	1	0	0	0	254
16:00		4	0	16	81	189	58	5	0	0	0	0	0	0	353
17:00		19	6	12	37	31	45	91	52	15	3	0	0	0	311
18:00		1	1	5	2	2	4	45	84	33	2	0	0	0	179
19:00		1	0	6	2	0	2	21	49	25	6	0	1	0	113
20:00		0	0	0	4	1	4	17	51	16	3	1	1	0	98
21:00		0	0	2	1	0	0	14	34	17	4	1	0	0	73
22:00		0	0	0	1	0	1	7	10	13	5	0	0	0	37
23:00		0	0	0	0	0	0	2	6	6	0	1	0	0	15
Totals		**132**	**73**	**135**	**298**	**578**	**780**	**890**	**744**	**454**	**93**	**19**	**6**	**1**	**4203**
% of Totals		3%	2%	3%	7%	14%	19%	21%	18%	11%	2%	0%	0%	0%	100%
% AM		1%	1%	1%	2%	5%	10%	10%	8%	7%	2%	0%	0%	0%	49%
AM Peak Hour		07:00	07:00	11:00	08:00	08:00	10:00	07:00	07:00	06:00	06:00	04:00	04:00		07:00
Volume		11	21	10	38	69	122	104	114	130	25	8	2	1	368
% PM		2%	1%	2%	5%	9%	8%	11%	9%	4%	1%	0%	0%		51%
PM Peak Hour		17:00	14:00	13:00	16:00	16:00	12:00	17:00	18:00	18:00	19:00	20:00	19:00		16:00
Volume		19	11	20	81	189	70	91	84	33	6	1	1		353

Average Speed	50th Percentile	85th Percentile
39.5	41	50

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Speed Report

Date: 11/14/07 Site: [808.36] Reche Rd btwn Tecalote Rd & Wilt Rd

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	8	6	6	0	0	0	0	20
01:00		0	0	0	0	0	1	4	3	4	1	0	2	0	15
02:00		0	0	0	1	0	4	4	5	2	0	0	0	0	16
03:00		1	0	0	0	1	1	3	1	1	2	2	0	0	12
04:00		0	0	0	0	0	3	5	2	6	1	0	0	0	17
05:00		1	9	1	0	0	4	15	12	8	5	0	0	0	55
06:00		7	13	6	0	7	24	40	54	20	7	1	1	0	180
07:00		19	25	8	13	31	35	84	70	21	1	1	1	0	309
08:00		29	20	16	25	27	51	47	7	5	0	0	0	0	227
09:00		17	8	2	6	23	41	44	18	7	0	0	0	0	166
10:00		22	17	6	11	27	48	51	24	6	1	0	0	0	213
11:00		19	9	4	16	36	45	58	19	5	1	0	0	0	212
12:00	PM	17	9	8	13	47	77	62	22	6	0	0	0	0	261
13:00		39	15	19	24	48	80	43	27	4	0	0	0	0	299
14:00		15	10	7	11	28	43	83	84	25	3	1	0	0	310
15:00		21	25	12	22	38	73	85	56	10	4	0	0	0	346
16:00		145	140	71	7	0	0	0	0	0	0	0	0	0	363
17:00		32	62	36	15	9	27	85	60	34	7	0	0	0	367
18:00		4	9	4	0	7	12	62	107	50	11	2	1	0	269
19:00		4	4	0	0	5	12	38	70	60	9	3	0	0	205
20:00		1	1	1	2	1	7	33	51	44	5	2	1	0	149
21:00		1	2	1	0	1	3	28	58	31	7	2	0	0	134
22:00		0	0	1	0	2	6	16	25	19	6	0	1	0	76
23:00		0	0	0	0	0	5	7	11	18	3	2	0	1	47
Totals		**394**	**378**	**203**	**166**	**338**	**602**	**905**	**792**	**392**	**74**	**16**	**7**	**1**	**4268**
% of Totals		9%	9%	5%	4%	8%	14%	21%	19%	9%	2%	0%	0%	0%	100%
% AM		3%	2%	1%	2%	4%	6%	9%	5%	2%	0%	0%	0%		34%
AM Peak Hour		08:00	07:00	08:00	08:00	11:00	08:00	07:00	07:00	07:00	06:00	03:00	01:00		07:00
Volume		29	25	16	25	36	51	84	70	21	7	2	2		309
% PM		7%	6%	4%	2%	4%	8%	13%	13%	7%	1%	0%	0%	0%	66%
PM Peak Hour		16:00	16:00	16:00	13:00	13:00	13:00	15:00	18:00	19:00	18:00	19:00	18:00	23:00	17:00
Volume		145	140	71	24	48	80	85	107	60	11	3	1	1	367

Average Speed	50th Percentile	85th Percentile
36.5	40	49

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Speed Report

Date: 12/13/07 Site: [815.02] Reche Road btwn Tecalote Dr & Old Hwy 395

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	1	0	1	2	7	3	2	0	0	0	16
01:00		0	0	0	0	1	0	1	3	3	0	0	0	0	8
02:00		0	0	0	0	0	2	2	2	4	2	1	0	0	13
03:00		0	0	0	1	1	1	4	2	1	2	0	0	0	12
04:00		0	0	0	0	0	4	10	8	5	5	0	0	0	32
05:00		0	0	0	0	7	16	44	56	25	4	0	0	0	152
06:00		5	5	1	1	16	65	121	59	13	2	0	0	0	288
07:00		4	5	4	4	28	91	126	64	9	0	0	0	0	335
08:00		8	5	4	11	52	84	101	32	4	1	0	0	0	302
09:00		3	1	4	4	33	105	84	32	4	2	0	0	0	272
10:00		4	0	2	9	37	87	85	25	3	0	0	0	0	252
11:00		2	2	8	6	23	93	77	24	1	0	0	0	0	236
12:00	PM	3	2	0	5	39	80	60	26	3	1	0	0	0	219
13:00		1	2	9	10	26	77	65	28	3	0	0	0	0	221
14:00		8	2	4	2	16	66	87	33	3	1	0	0	0	222
15:00		8	7	4	17	46	97	93	36	10	1	0	0	0	319
16:00		11	6	9	10	53	95	90	21	1	0	0	0	0	296
17:00		5	1	6	4	34	89	100	22	6	1	0	0	0	268
18:00		0	2	3	2	31	43	64	31	8	1	0	0	0	185
19:00		1	1	4	1	3	24	36	12	5	1	0	0	0	88
20:00		0	1	1	1	2	18	38	18	5	0	0	0	0	84
21:00		2	1	1	0	5	22	29	15	5	1	0	0	0	81
22:00		0	0	0	0	1	6	19	9	3	0	1	0	0	39
23:00		0	0	0	1	3	5	8	4	1	0	0	0	0	22
Totals		**65**	**43**	**64**	**90**	**457**	**1171**	**1346**	**569**	**128**	**27**	**2**	**0**	**0**	**3962**
% of Totals		2%	1%	2%	2%	12%	30%	34%	14%	3%	1%	0%			100%
% AM		1%	0%	1%	1%	5%	14%	17%	8%	2%	1%	0%			48%
AM Peak Hour		08:00	06:00	11:00	08:00	08:00	09:00	07:00	07:00	05:00	04:00	02:00			07:00
Volume		8	5	8	11	52	105	126	64	25	5	1			335
% PM		1%	1%	1%	1%	7%	16%	17%	6%	1%	0%	0%			52%
PM Peak Hour		16:00	15:00	13:00	15:00	16:00	15:00	17:00	15:00	15:00	12:00	22:00			15:00
Volume		11	7	9	17	53	97	100	36	10	1	1			319

Average Speed	50th Percentile	85th Percentile
39.6	40	46

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Speed Report

Date: 12/13/07 Site: [815.02] Reche Road btwn Tecalote Dr & Old Hwy 395

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	2	5	11	4	0	0	0	0	0	22
01:00		0	0	0	1	1	4	5	1	0	0	0	0	0	12
02:00		0	0	0	1	1	2	0	2	0	1	1	0	0	8
03:00		0	0	0	0	0	4	4	2	0	0	0	0	0	10
04:00		0	1	0	0	2	3	2	0	0	0	0	0	0	8
05:00		3	4	0	1	2	11	6	1	3	0	0	0	0	31
06:00		6	8	0	10	27	48	46	16	3	0	0	0	0	164
07:00		20	4	7	14	22	91	97	26	4	1	0	0	0	286
08:00		20	5	3	7	35	73	58	15	2	1	0	0	0	219
09:00		12	3	3	3	24	57	43	11	1	0	0	0	0	157
10:00		12	3	4	4	30	60	43	13	0	1	0	0	0	170
11:00		12	6	0	5	27	72	48	15	3	0	0	0	0	188
12:00	PM	10	3	6	10	24	83	55	13	1	1	0	0	0	206
13:00		15	1	5	9	38	87	86	16	2	2	0	0	0	261
14:00		23	4	8	21	61	117	91	28	2	1	0	0	0	356
15:00		16	8	3	15	47	104	107	31	2	0	0	0	0	333
16:00		23	15	13	17	50	112	96	31	2	0	0	0	0	359
17:00		19	7	8	4	43	143	115	21	1	1	0	0	0	362
18:00		7	2	0	1	24	84	101	45	6	0	0	0	0	270
19:00		0	2	0	1	14	79	80	21	4	3	1	0	0	205
20:00		2	1	0	1	14	63	74	23	5	2	0	0	0	185
21:00		1	2	1	2	18	52	48	18	4	0	0	0	0	146
22:00		0	0	0	3	12	34	34	15	1	0	0	0	0	99
23:00		1	0	0	0	6	26	20	7	2	1	1	0	0	64
Totals		**202**	**79**	**61**	**130**	**524**	**1414**	**1270**	**375**	**48**	**15**	**3**	**0**	**0**	**4121**
	% of Totals	5%	2%	1%	3%	13%	34%	31%	9%	1%	0%	0%			100%
	% AM	2%	1%	0%	1%	4%	10%	9%	3%	0%	0%	0%			31%
	AM Peak Hour	07:00	06:00	07:00	07:00	08:00	07:00	07:00	07:00	07:00	02:00	02:00			07:00
	Volume	20	8	7	14	35	91	97	26	4	1	1			286
	% PM	3%	1%	1%	2%	9%	24%	22%	7%	1%	0%	0%			69%
	PM Peak Hour	14:00	16:00	16:00	14:00	14:00	17:00	17:00	18:00	18:00	19:00	19:00			17:00
	Volume	23	15	13	21	61	143	115	45	6	3	1			362

Average Speed	50th Percentile	85th Percentile
37.3	39	44

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Speed Report

Date: 11/15/07 Site: [808.40] Steward Cyn Rd west of Old Hwy 395

EASTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1
01:00		0	0	0	0	0	1	0	0	0	0	0	0	0	1
02:00		0	0	0	0	0	1	0	0	0	0	0	0	0	1
03:00		0	0	0	0	0	1	0	0	0	0	0	0	0	1
04:00		0	0	0	0	1	1	1	0	0	0	0	0	0	3
05:00		0	0	0	1	3	6	3	0	0	0	0	0	0	13
06:00		0	0	0	1	4	9	6	0	0	0	0	0	0	20
07:00		1	0	0	1	6	7	0	1	1	0	0	0	0	17
08:00		0	1	0	1	2	8	3	1	1	0	0	0	0	17
09:00		0	0	2	1	4	9	3	2	0	0	1	0	0	22
10:00		1	3	2	3	7	4	3	0	0	0	0	0	0	23
11:00		0	0	4	4	8	7	2	0	0	0	0	0	0	25
12:00	PM	1	0	0	4	1	6	2	3	0	0	0	0	0	17
13:00		0	1	2	5	7	8	4	0	1	0	0	0	0	28
14:00		0	1	2	4	3	7	4	1	0	1	0	0	0	23
15:00		0	0	0	0	6	9	6	0	0	0	0	0	0	21
16:00		0	2	0	1	5	9	9	1	0	0	0	0	0	27
17:00		1	0	0	0	3	2	11	4	0	0	0	0	0	21
18:00		0	0	1	2	4	9	5	1	1	0	0	0	0	23
19:00		0	0	0	0	2	4	2	0	0	0	0	0	0	8
20:00		0	0	0	1	3	6	3	0	0	0	0	0	0	13
21:00		0	0	0	1	2	4	2	0	0	0	0	0	0	9
22:00		0	0	0	1	4	3	3	0	0	0	0	0	0	11
23:00		0	0	0	0	1	2	1	0	0	0	0	0	0	4
Totals		**4**	**8**	**13**	**31**	**76**	**124**	**73**	**14**	**4**	**1**	**1**	**0**	**0**	**349**
% of Totals		1%	2%	4%	9%	22%	36%	21%	4%	1%	0%	0%			100%
% AM		1%	1%	2%	3%	10%	16%	6%	1%	1%		0%			41%
AM Peak Hour		07:00	10:00	11:00	11:00	11:00	06:00	06:00	09:00	07:00		09:00			11:00
Volume		1	3	4	4	8	9	6	2	1		1			25
% PM		1%	1%	1%	5%	12%	20%	15%	3%	1%	0%				59%
PM Peak Hour		12:00	16:00	13:00	13:00	13:00	15:00	17:00	17:00	13:00	14:00				13:00
Volume		1	2	2	5	7	9	11	4	1	1				28

Average Speed	50th Percentile	85th Percentile
35.9	37	43

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Speed Report

Date: 11/15/07 Site: [808.40] Steward Cyn Rd west of Old Hwy 395

WESTBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	1	2	0	0	0	0	0	0	0	3
01:00		0	0	0	0	1	0	0	0	0	0	0	0	0	1
02:00		0	0	0	0	1	1	0	0	0	0	0	0	0	2
03:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00		0	0	0	0	2	3	0	0	0	0	0	0	0	5
05:00		0	0	0	1	2	1	1	0	0	0	0	0	0	5
06:00		0	1	1	3	2	4	1	0	0	0	0	0	0	12
07:00		0	0	0	1	7	5	5	2	1	0	0	0	0	21
08:00		0	0	2	3	5	2	4	2	0	0	0	0	0	18
09:00		1	0	0	1	7	8	4	1	0	0	0	0	0	22
10:00		1	0	1	4	7	5	1	0	1	0	0	0	0	20
11:00		1	0	3	1	8	5	2	0	0	0	0	0	0	20
12:00	PM	0	1	2	3	4	5	2	0	0	0	0	0	0	17
13:00		1	0	1	1	7	7	2	1	0	0	0	0	0	20
14:00		2	0	1	3	2	14	4	1	0	0	0	0	0	27
15:00		0	0	1	4	7	10	4	0	0	0	0	0	0	26
16:00		0	1	1	5	14	8	6	0	0	0	0	0	0	35
17:00		0	1	2	7	7	8	3	2	0	0	0	0	0	30
18:00		0	0	2	3	9	7	4	0	0	0	0	0	0	25
19:00		0	0	1	4	6	5	4	0	0	0	0	0	0	20
20:00		0	0	1	3	5	5	2	0	0	0	0	0	0	16
21:00		0	0	0	0	2	2	0	0	0	0	0	0	0	4
22:00		0	0	0	0	1	0	0	0	0	0	0	0	0	1
23:00		0	0	0	0	1	3	0	0	0	0	0	0	0	4
Totals		**6**	**4**	**19**	**47**	**108**	**110**	**49**	**9**	**2**	**0**	**0**	**0**	**0**	**354**
% of Totals		2%	1%	5%	13%	31%	31%	14%	3%	1%					100%
% AM		1%	0%	2%	4%	12%	10%	5%	1%	1%					36%
AM Peak Hour		09:00	06:00	11:00	10:00	11:00	09:00	07:00	07:00	07:00					09:00
Volume		1	1	3	4	8	8	5	2	1					22
% PM		1%	1%	3%	9%	18%	21%	9%	1%						64%
PM Peak Hour		14:00	12:00	12:00	17:00	16:00	14:00	16:00	17:00						16:00
Volume		2	1	2	7	14	14	6	2						35

Average Speed	50th Percentile	85th Percentile
34.2	35	41

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Speed Report

Date: 12/11/08 Site: [94023] Pankey Road south of Stewart Canyon Road

NORTHBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00		0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
06:00		0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
07:00		0	0	0	0	0	1	0	0	0	1	0	0	0	0	2
08:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00		0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
11:00		0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
12:00	PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
13:00		0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
14:00		0	0	1	0	0	1	0	0	1	0	0	0	0	0	3
15:00		1	1	0	0	1	0	0	0	0	0	0	0	0	0	3
16:00		0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
17:00		1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
18:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:00		0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
22:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals		**2**	**1**	**2**	**3**	**5**	**2**	**2**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**20**
% of Totals		10%	5%	10%	15%	25%	10%	10%	5%	5%	5%					100%

% AM					10%	5%	5%	5%	5%		5%					35%
AM Peak Hour					06:00	11:00	07:00	10:00	05:00		07:00					07:00
Volume					1	1	1	1	1		1					2
% PM	10%	5%	10%	5%	20%	5%	5%		5%							65%
PM Peak Hour		15:00	12:00	16:00	13:00	14:00	13:00		14:00							14:00
Volume		1	1	1	1	1	1		1							3

Average Speed	50th Percentile	85th Percentile
27.1	27	40

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Speed Report

Date: 12/11/08 Site: [94023] Pankey Road south of Stewart Canyon Road

SOUTHBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00		0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
06:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00		0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
08:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00		0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
11:00		0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
12:00	PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00		0	0	0	0	0	1	1	0	1	0	0	0	0	0	3
14:00		0	0	1	0	0	1	0	0	0	0	0	0	0	0	2
15:00		0	0	2	0	1	0	0	0	0	0	0	0	0	0	3
16:00		0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
17:00		1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
18:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20:00		0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
21:00		0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
22:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals		**1**	**0**	**3**	**2**	**5**	**3**	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**20**
% of Totals		5%		15%	10%	25%	15%	25%		5%						100%
% AM					10%	10%		10%								30%
AM Peak Hour					11:00	05:00		07:00								10:00
Volume					2	1		1								2
% PM		5%		15%		15%	15%	15%		5%						70%
PM Peak Hour				15:00		15:00	13:00	13:00		13:00						13:00
Volume				2		1	1	1		1						3

Average Speed	50th Percentile	85th Percentile
28.6	29	38

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Speed Report

Date: 11/6/07 Site: [808.39] Pankey Rd btwn Pala Rd & Dulin Rd

NORTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	2	0	0	0	0	0	0	0	0	0	2
01:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00		0	0	0	0	1	0	0	0	0	0	0	0	0	1
03:00		0	0	0	1	0	0	0	0	0	0	0	0	0	1
04:00		0	0	2	2	1	0	0	0	0	0	0	0	0	5
05:00		0	1	3	15	0	0	0	0	0	0	0	0	0	19
06:00		0	1	10	17	5	0	0	0	0	0	0	0	0	33
07:00		1	2	12	18	5	0	0	0	0	0	0	0	0	38
08:00		0	4	13	13	4	0	0	0	0	0	0	0	0	34
09:00		0	0	10	10	5	0	0	0	0	0	0	0	0	25
10:00		0	0	8	13	2	0	0	0	0	0	0	0	0	23
11:00		0	0	4	16	3	0	0	0	0	0	0	0	0	23
12:00	PM	0	1	6	15	3	0	0	0	0	0	0	0	0	25
13:00		0	0	9	14	1	0	0	0	0	0	0	0	0	24
14:00		0	2	6	20	2	0	0	0	0	0	0	0	0	30
15:00		1	1	8	13	4	1	0	0	0	0	0	0	0	28
16:00		0	2	4	13	3	0	0	0	0	0	0	0	0	22
17:00		0	0	5	14	4	1	0	0	0	0	0	0	0	24
18:00		0	0	1	8	3	1	0	0	0	0	0	0	0	13
19:00		0	0	4	10	4	0	1	0	0	0	0	0	0	19
20:00		0	0	1	6	4	0	0	0	0	0	0	0	0	11
21:00		0	0	1	3	3	0	0	0	0	0	0	0	0	7
22:00		0	1	0	4	1	0	0	0	0	0	0	0	0	6
23:00		0	0	1	3	0	0	0	0	0	0	0	0	0	4
Totals		**2**	**15**	**108**	**230**	**58**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**417**
% of Totals		0%	4%	26%	55%	14%	1%	0%							100%
% AM		0%	2%	15%	26%	6%									49%
AM Peak Hour		07:00	08:00	08:00	07:00	06:00									07:00
Volume		1	4	13	18	5									38
% PM		0%	2%	11%	29%	8%	1%	0%							51%
PM Peak Hour		15:00	14:00	13:00	14:00	15:00	15:00	19:00							14:00
Volume		1	2	9	20	4	1	1							30

Average Speed	50th Percentile	85th Percentile
26.6	27	30

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Speed Report

Date: 11/6/07 Site: [808.39] Pankey Rd btwn Pala Rd & Dulin Rd

SOUTHBOUND

		5	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	1	0	5	1	0	0	0	0	0	0	0	0	7
01:00		0	0	1	1	0	1	0	0	0	0	0	0	0	3
02:00		0	0	0	2	2	0	0	0	0	0	0	0	0	4
03:00		0	0	0	1	0	0	0	0	0	0	0	0	0	1
04:00		0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:00		0	0	0	3	0	0	0	0	0	0	0	0	0	3
06:00		0	3	3	9	2	0	0	0	0	0	0	0	0	17
07:00		0	3	6	14	3	1	0	0	0	0	0	0	0	27
08:00		1	0	2	11	3	0	0	0	0	0	0	0	0	17
09:00		0	0	2	5	1	0	0	0	0	0	0	0	0	8
10:00		0	0	5	12	1	0	0	0	0	0	0	0	0	18
11:00		0	0	4	10	1	0	0	0	0	0	0	0	0	15
12:00	PM	0	0	4	14	6	0	0	0	0	0	0	0	0	24
13:00		0	1	3	13	0	0	0	0	0	0	0	0	0	17
14:00		0	0	9	11	3	1	0	0	0	0	0	0	0	24
15:00		0	0	13	19	5	2	0	0	0	0	0	0	0	39
16:00		0	4	14	25	13	0	0	0	0	0	0	0	0	56
17:00		0	0	8	25	7	0	0	0	0	0	0	0	0	40
18:00		0	0	17	30	3	0	0	0	0	0	0	0	0	50
19:00		0	0	11	25	5	0	0	0	0	0	0	0	0	41
20:00		0	0	6	21	5	0	0	0	0	0	0	0	0	32
21:00		0	2	4	19	4	0	0	0	0	0	0	0	0	29
22:00		0	1	5	7	2	0	0	0	0	0	0	0	0	15
23:00		0	0	1	2	3	1	0	0	0	0	0	0	0	7
Totals		**1**	**15**	**119**	**284**	**70**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**495**
% of Totals		0%	3%	24%	57%	14%	1%								100%
% AM		0%	1%	5%	15%	3%	0%								24%
AM Peak Hour		08:00	06:00	07:00	07:00	07:00	01:00								07:00
Volume		1	3	6	14	3	1								27
% PM			2%	19%	43%	11%	1%								76%
PM Peak Hour			16:00	18:00	18:00	16:00	15:00								16:00
Volume			4	17	30	13	2								56

Average Speed	50th Percentile	85th Percentile
26.8	27	30

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Speed Report

Date: 8/28/08 Site: [90101-1] Pala Mesa Dr btwn Old Hwy 395 & Wilt Rd/Sumac Rd

EASTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00		0	0	0	1	2	0	0	0	0	0	0	0	0	0	3
04:00		0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
05:00		1	0	0	3	5	4	0	0	0	0	0	0	0	0	13
06:00		0	2	0	2	12	5	0	0	0	0	0	0	0	0	21
07:00		0	1	0	4	9	7	2	0	0	0	0	0	0	0	23
08:00		0	0	2	6	12	4	2	0	0	0	0	0	0	0	26
09:00		0	0	2	6	7	5	0	0	0	0	0	0	0	0	20
10:00		0	1	3	5	6	0	1	0	0	0	0	0	0	0	16
11:00		0	0	3	6	5	4	0	0	0	0	0	0	0	0	18
12:00	PM	0	1	3	11	4	3	1	0	0	0	0	0	0	0	23
13:00		0	0	1	10	6	5	0	2	0	0	0	0	0	0	24
14:00		0	1	3	8	5	1	0	0	0	0	0	0	0	0	18
15:00		0	0	7	7	8	2	0	0	0	0	0	0	0	0	24
16:00		1	0	1	3	10	5	1	0	0	0	0	0	0	0	21
17:00		0	0	4	5	5	6	0	0	0	0	0	0	0	0	20
18:00		0	0	0	4	3	1	0	0	0	0	0	0	0	0	8
19:00		0	0	3	5	3	2	0	0	0	0	0	0	0	0	13
20:00		1	0	2	1	0	1	1	0	0	0	0	0	0	0	6
21:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00		0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
23:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals		**3**	**6**	**34**	**87**	**104**	**57**	**8**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**301**
% of Totals		1%	2%	11%	29%	35%	19%	3%	1%							100%
% AM		0%	1%	3%	11%	20%	10%	2%								47%
AM Peak Hour			06:00	10:00	08:00	06:00	07:00	07:00								08:00
Volume			2	3	6	12	7	2								26
% PM		1%	1%	8%	18%	15%	9%	1%	1%							53%
PM Peak Hour			12:00	15:00	12:00	16:00	17:00	12:00	13:00							13:00
Volume			1	7	11	10	6	1	2							24

Average Speed	50th Percentile	85th Percentile
25.7	26	32

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Speed Report

Date: 8/28/08 Site: [90101-2] Pala Mesa Dr btwn Old Hwy 395 & Wilt Rd/Sumac Rd

WESTBOUND

		5	10	15	20	25	30	35	40	45	50	55	60	65	70	
Time		**9**	**14**	**19**	**24**	**29**	**34**	**39**	**44**	**49**	**54**	**59**	**64**	**69**	**74+**	**Total**
00:00	AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
01:00		0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
02:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00		0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
05:00		0	0	0	1	0	1	0	0	0	0	0	0	0	0	2
06:00		0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
07:00		0	1	3	7	7	1	0	0	0	0	0	0	0	0	19
08:00		0	0	5	4	4	5	2	0	0	0	0	0	0	0	20
09:00		2	0	0	5	4	0	3	0	0	0	0	0	0	0	14
10:00		0	1	3	2	1	3	1	0	0	0	0	0	0	0	11
11:00		0	0	2	2	4	3	2	1	0	0	0	0	0	0	14
12:00	PM	0	1	1	6	8	7	3	0	0	0	0	0	0	0	26
13:00		0	1	2	5	7	9	1	0	0	0	0	0	0	0	25
14:00		1	1	4	3	10	7	2	1	0	0	0	0	0	0	29
15:00		1	0	2	2	8	4	5	1	1	0	0	0	0	0	24
16:00		0	2	2	5	9	3	2	0	0	0	0	0	0	0	23
17:00		0	0	2	5	7	7	3	1	0	0	0	0	0	0	25
18:00		0	0	0	3	6	4	1	1	0	0	0	0	0	0	15
19:00		0	0	0	2	2	2	5	2	0	0	0	0	0	0	13
20:00		0	1	1	2	5	4	1	0	0	0	0	0	0	0	14
21:00		0	0	3	4	4	2	0	0	0	0	0	0	0	0	13
22:00		0	0	0	3	0	1	0	0	0	0	0	0	0	0	4
23:00		0	0	0	0	0	0	1	0	0	1	0	0	0	1	3
Totals		**4**	**8**	**30**	**65**	**87**	**63**	**34**	**7**	**2**	**2**	**0**	**0**	**0**	**1**	**303**
% of Totals		1%	3%	10%	21%	29%	21%	11%	2%	1%	1%				0%	100%
% AM		1%	1%	4%	8%	7%	4%	3%	0%	0%	0%					29%
AM Peak Hour			07:00	08:00	07:00	07:00	08:00	09:00	11:00	01:00						08:00
Volume			1	5	7	7	5	3	1	1	1					20
% PM		1%	2%	6%	13%	22%	17%	8%	2%	0%	0%				0%	71%
PM Peak Hour			16:00	14:00	12:00	14:00	13:00	15:00	19:00	15:00	23:00				23:00	14:00
Volume			2	4	6	10	9	5	2	1	1				1	29

Average Speed	50th Percentile	85th Percentile
27.6	28	35

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Appendix D

Count Data, Caltrans' Factors, and pictures of current SR-76 widening

LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #04
Location: Via Monserate & Pala Road (SR-76)

Start Date: 12/18/2008
File Name: 941-01-1

	Northbound				Via Monserate Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	22	0	5	0	0	94	0	0	0	248	6	0	375
7:15	0	0	0	0	17	0	10	0	1	134	0	0	0	210	5	0	377
7:30	0	0	0	0	16	0	3	0	2	136	0	0	0	269	9	0	435
7:45	0	0	0	0	15	0	7	0	1	177	0	0	0	252	2	0	454
Total	0	0	0	0	70	0	25	0	4	541	0	0	0	979	22	0	1641
8:00	0	0	0	0	6	0	1	0	5	173	0	0	0	177	7	0	369
8:15	0	0	0	0	14	0	10	0	3	142	0	0	0	171	4	0	344
8:30	0	0	0	0	8	0	1	0	1	129	0	0	0	173	6	0	318
8:45	0	0	0	0	4	0	4	0	3	52	0	0	0	88	2	0	153
Total	0	0	0	0	32	0	16	0	12	496	0	0	0	609	19	0	1184
Grand Total	0	0	0	0	102	0	41	0	16	1037	0	0	0	1588	41	0	2825
Approach%	-	-	-	-	71.3	-	28.7	-	1.5	98.5	-	-	-	97.5	2.5	-	
Total%	-	-	-	-	3.6	-	1.5	-	0.6	36.7	-	-	-	56.2	1.5	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	-	-	-	-	70	-	25	-	4	541	-	-	-	979	22	-	1,641
Approach%	-	-	-	-	73.7	-	26.3	-	0.7	99.3	-	-	-	97.8	2.2	-	
Total%	-	-	-	-	4.3	-	1.5	-	0.2	33.0	-	-	-	59.7	1.3	-	
PHF				######				0.88				0.77				0.90	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #04
Location: Via Monserate & Pala Road (SR-76)

Start Date: 12/18/2008
File Name: 941-01-2

	Northbound				Via Monserate Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	13	0	7	0	6	212	0	0	0	213	18	0	469
16:15	0	0	0	0	14	0	3	0	7	213	0	0	0	192	10	0	439
16:30	0	0	0	0	6	0	2	0	4	242	0	0	0	186	15	0	455
16:45	0	0	0	0	8	0	3	0	5	260	0	0	0	206	10	0	492
Total	0	0	0	0	41	0	15	0	22	927	0	0	0	797	53	0	1855
17:00	0	0	0	0	19	0	2	0	2	220	0	0	0	202	15	0	460
17:15	0	0	0	0	13	0	0	0	2	246	0	0	0	173	13	0	447
17:30	0	0	0	0	12	0	2	0	4	234	0	0	0	188	7	0	447
17:45	0	0	0	0	4	0	3	0	4	188	0	0	0	151	10	0	360
Total	0	0	0	0	48	0	7	0	12	888	0	0	0	714	45	0	1714
Grand Total	0	0	0	0	89	0	22	0	34	1815	0	0	0	1511	98	0	3569
Approach%	-	-	-	-	80.2	-	19.8	-	1.8	98.2	-	-	-	93.9	6.1	-	
Total%	-	-	-	-	2.5	-	0.6	-	1.0	50.9	-	-	-	42.3	2.7	-	

Peak hour analysis for the period 16:00 to 16:45

Volume	-	-	-	-	41	-	15	-	22	927	-	-	-	797	53	-	1,855
Approach%	-	-	-	-	73.2	-	26.8	-	2.3	97.7	-	-	-	93.8	6.2	-	
Total%	-	-	-	-	2.2	-	0.8	-	1.2	50.0	-	-	-	43.0	2.9	-	
PHF				######				0.70				0.90				0.92	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #12
Location: Gird Road & Pala Road (SR-76)

Start Date: 12/18/2008
File Name: 941-02-1

	Northbound				Gird Road Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	13	0	18	0	25	94	0	0	0	194	6	0	350
7:15	0	0	0	0	14	0	28	0	22	141	0	0	0	185	10	0	400
7:30	0	0	0	0	14	0	34	0	22	134	0	0	0	243	4	0	451
7:45	0	0	0	0	14	0	25	0	18	165	0	0	0	184	10	0	416
Total	0	0	0	0	55	0	105	0	87	534	0	0	0	806	30	0	1617
8:00	0	0	0	0	17	0	16	0	13	149	0	0	0	169	5	0	369
8:15	0	0	0	0	11	0	20	0	21	136	0	0	0	157	9	0	354
8:30	0	0	0	0	12	0	17	0	15	148	0	0	0	167	5	0	364
8:45	0	0	0	0	13	0	15	0	9	115	0	0	0	136	13	0	301
Total	0	0	0	0	53	0	68	0	58	548	0	0	0	629	32	0	1388
Grand Total	0	0	0	0	108	0	173	0	145	1082	0	0	0	1435	62	0	3005
Approach%	-	-	-	-	38.4	-	61.6	-	11.8	88.2	-	-	-	95.9	4.1	-	
Total%	-	-	-	-	3.6	-	5.8	-	4.8	36.0	-	-	-	47.8	2.1	-	

Peak hour analysis for the period 07:15 to 08:00

Volume	-	-	-	-	59	-	103	-	75	589	-	-	-	781	29	-	1,636
Approach%	-	-	-	-	36.4	-	63.6	-	11.3	88.7	-	-	-	96.4	3.6	-	
Total%	-	-	-	-	3.6	-	6.3	-	4.6	36.0	-	-	-	47.7	1.8	-	
PHF				######				0.84				0.91				0.82	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #05
Location: Gird Road & Pala Road (SR-76)

Start Date: 12/18/2008
File Name: 941-02-2

	Northbound				Gird Road Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	7	0	17	0	14	195	0	0	0	202	20	0	455
16:15	0	0	0	0	12	0	15	0	24	202	0	0	0	216	24	0	493
16:30	0	0	0	0	15	0	12	0	17	216	0	0	0	200	13	0	473
16:45	0	0	0	0	6	0	13	0	31	223	0	0	0	201	16	0	490
Total	0	0	0	0	40	0	57	0	86	836	0	0	0	819	73	0	1911
17:00	0	0	0	0	9	0	16	0	24	219	0	0	0	197	15	0	480
17:15	0	0	0	0	15	0	10	0	28	221	0	0	0	179	20	0	473
17:30	0	0	0	0	14	0	17	1	28	211	0	0	0	207	17	0	494
17:45	0	0	0	0	13	0	17	0	21	171	0	0	0	184	16	0	422
Total	0	0	0	0	51	0	60	1	101	822	0	0	0	767	68	0	1869
Grand Total	0	0	0	0	91	0	117	1	187	1658	0	0	0	1586	141	0	3780
Approach%	-	-	-	-	43.5	-	56.0	0.5	10.1	89.9	-	-	-	91.8	8.2	-	
Total%	-	-	-	-	2.4	-	3.1	0.0	4.9	43.9	-	-	-	42.0	3.7	-	

Peak hour analysis for the period 16:45 to 17:30

Volume	-	-	-	-	44	-	56	1	111	874	-	-	-	784	68	-	1,937
Approach%	-	-	-	-	43.6	-	55.4	1.0	11.3	88.7	-	-	-	92.0	8.0	-	
Total%	-	-	-	-	2.3	-	2.9	0.1	5.7	45.1	-	-	-	40.5	3.5	-	
PHF				######				0.79				0.97				0.95	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #14
Location: Sage Road & Pala Road (SR-76)

Start Date: 12/18/2008
File Name: 941-03-1

	Northbound				Sage Road Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	1	0	3	0	0	120	0	0	0	214	0	0	338
7:15	0	0	0	0	1	0	1	0	0	151	0	0	0	203	0	0	356
7:30	0	0	0	0	1	0	5	0	0	164	0	0	0	235	0	0	405
7:45	0	0	0	0	2	0	1	0	1	168	0	0	0	193	1	0	366
Total	0	0	0	0	5	0	10	0	1	603	0	0	0	845	1	0	1465
8:00	0	0	0	0	0	0	1	0	1	166	0	0	0	160	1	0	329
8:15	0	0	0	0	0	0	2	0	2	149	0	0	0	171	3	0	327
8:30	0	0	0	0	4	0	1	0	1	160	0	0	0	172	2	0	340
8:45	0	0	0	0	3	0	2	0	3	116	0	0	0	142	1	0	267
Total	0	0	0	0	7	0	6	0	7	591	0	0	0	645	7	0	1263
Grand Total	0	0	0	0	12	0	16	0	8	1194	0	0	0	1490	8	0	2728
Approach%	-	-	-	-	42.9	-	57.1	-	0.7	99.3	-	-	-	99.5	0.5	-	
Total%	-	-	-	-	0.4	-	0.6	-	0.3	43.8	-	-	-	54.6	0.3	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	-	-	-	-	5	-	10	-	1	603	-	-	-	845	1	-	1,465
Approach%	-	-	-	-	33.3	-	66.7	-	0.2	99.8	-	-	-	99.9	0.1	-	
Total%	-	-	-	-	0.3	-	0.7	-	0.1	41.2	-	-	-	57.7	0.1	-	
PHF				######				0.63				0.89				0.90	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #14
Location: Sage Road & Pala Road (SR-76)

Start Date: 12/18/2008
File Name: 941-03-2

	Northbound				Sage Road Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	2	0	1	0	1	207	0	0	0	217	0	0	428
16:15	0	0	0	0	3	0	2	0	1	216	0	0	0	229	0	0	451
16:30	0	0	0	0	2	0	0	0	2	233	0	0	0	210	1	0	448
16:45	0	0	0	0	0	0	0	0	4	229	0	0	0	215	1	0	449
Total	0	0	0	0	7	0	3	0	8	885	0	0	0	871	2	0	1776
17:00	0	0	0	0	1	0	7	0	1	234	0	0	0	200	2	0	445
17:15	0	0	0	0	2	0	1	0	3	224	0	0	0	195	3	0	428
17:30	0	0	0	0	1	0	1	0	0	234	0	0	0	216	1	0	453
17:45	0	0	0	0	1	0	0	0	0	191	0	0	0	197	2	0	391
Total	0	0	0	0	5	0	9	0	4	883	0	0	0	808	8	0	1717
Grand Total	0	0	0	0	12	0	12	0	12	1768	0	0	0	1679	10	0	3493
Approach%	-	-	-	-	50.0	-	50.0	-	0.7	99.3	-	-	-	99.4	0.6	-	
Total%	-	-	-	-	0.3	-	0.3	-	0.3	50.6	-	-	-	48.1	0.3	-	

Peak hour analysis for the period 16:15 to 17:00

Volume	-	-	-	-	6	-	9	-	8	912	-	-	-	854	4	-	1,793
Approach%	-	-	-	-	40.0	-	60.0	-	0.9	99.1	-	-	-	99.5	0.5	-	
Total%	-	-	-	-	0.3	-	0.5	-	0.4	50.9	-	-	-	47.6	0.2	-	
PHF				######				0.47				0.98				0.94	

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LOS Engineering, Inc.

5114 Sea Mist Court, San Diego, CA 92121

Counted By: Emp. #01
Location: Old Highway 395 & Pala Road (SR-76)

Start Date: 01/06/2009
File Name: 941-04-1

	Old Highway 395 Northbound				Old Highway 395 Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	29	20	10	0	49	15	12	0	11	95	6	0	14	171	25	0	457
7:15	32	15	13	1	62	14	11	0	14	140	12	0	10	131	26	1	480
7:30	22	19	10	0	61	18	13	0	10	142	16	0	14	145	18	0	488
7:45	25	16	24	0	76	27	7	0	12	126	28	0	15	131	20	0	507
Total	108	70	57	1	248	74	43	0	47	503	62	0	53	578	89	1	1932
8:00	17	20	18	0	56	17	11	0	14	125	21	0	12	137	12	0	460
8:15	11	24	15	0	49	11	13	0	7	124	14	0	7	126	10	0	411
8:30	13	13	16	0	56	12	7	0	6	105	9	0	15	112	21	1	385
8:45	12	16	16	0	39	16	7	0	14	96	7	0	12	103	19	0	357
Total	53	73	65	0	200	56	38	0	41	450	51	0	46	478	62	1	1613
Grand Total	161	143	122	1	448	130	81	0	88	953	113	0	99	1056	151	2	3545
Approach%	37.7	33.5	28.6	0.2	68.0	19.7	12.3	-	7.6	82.6	9.8	-	7.6	80.7	11.5	0.2	
Total%	4.5	4.0	3.4	0.0	12.6	3.7	2.3	-	2.5	26.9	3.2	-	2.8	29.8	4.3	0.1	

Peak hour analysis for the period 07:15 to 08:00

Volume	96	70	65	1	255	76	42	-	50	533	77	-	51	544	76	1	1,935
Approach%	41.4	30.2	28.0	0.4	68.4	20.4	11.3	-	7.6	80.8	11.7	-	7.6	81.0	11.3	0.1	
Total%	5.0	3.6	3.4	0.1	13.2	3.9	2.2	-	2.6	27.5	4.0	-	2.6	28.1	3.9	0.1	
PHF				0.89				0.85				0.98				0.95	

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LOS Engineering, Inc.

5114 Sea Mist Court, San Diego, CA 92121

Counted By: Emp. #01
Location: Old Highway 395 & Pala Road (SR-76)

Start Date: 01/06/2009
File Name: 941-04-2

	Old Highway 395 Northbound				Old Highway 395 Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	21	27	18	0	45	19	16	0	16	197	16	0	19	159	56	3	609
16:15	25	22	19	0	47	21	17	0	15	201	16	0	18	147	42	4	590
16:30	14	23	12	0	49	12	10	0	15	209	21	0	9	167	62	3	603
16:45	13	27	11	1	40	17	12	0	25	173	22	0	14	126	76	1	556
Total	73	99	60	1	181	69	55	0	71	780	75	0	60	599	236	11	2358
17:00	12	32	21	0	41	14	13	0	16	181	20	0	16	180	55	0	601
17:15	16	17	9	0	59	19	14	0	41	158	13	0	26	141	52	2	565
17:30	14	20	9	0	49	23	11	0	15	180	17	0	14	168	52	0	572
17:45	9	19	16	0	41	25	7	0	9	167	19	0	18	141	46	0	517
Total	51	88	55	0	190	81	45	0	81	686	69	0	74	630	205	2	2255
Grand Total	124	187	115	1	371	150	100	0	152	1466	144	0	134	1229	441	13	4613
Approach%	29.0	43.8	26.9	0.2	59.7	24.2	16.1	-	8.6	83.2	8.2	-	7.4	67.6	24.3	0.7	
Total%	2.7	4.1	2.5	0.0	8.0	3.3	2.2	-	3.3	31.8	3.1	-	2.9	26.6	9.6	0.3	

Peak hour analysis for the period 16:00 to 16:45

Volume	73	99	60	1	181	69	55	-	71	780	75	-	60	599	236	11	2,358
Approach%	31.3	42.5	25.8	0.4	59.3	22.6	18.0	-	7.7	84.2	8.1	-	6.6	66.1	26.0	1.2	
Total%	3.1	4.2	2.5	0.0	7.7	2.9	2.3	-	3.0	33.1	3.2	-	2.5	25.4	10.0	0.5	
PHF				0.88				0.90				0.94				0.94	

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Transportation Studies, Inc.
1350 Reynolds Avenue
Suite 115
Irvine, CA. 92614

City: FALLBROOK
N-S Direction: OLD HIGHWAY 395
E-W Direction: DULIN ROAD

File Name : H0711119
Site Code : 00000000
Start Date : 12/5/2007
Page No : 1

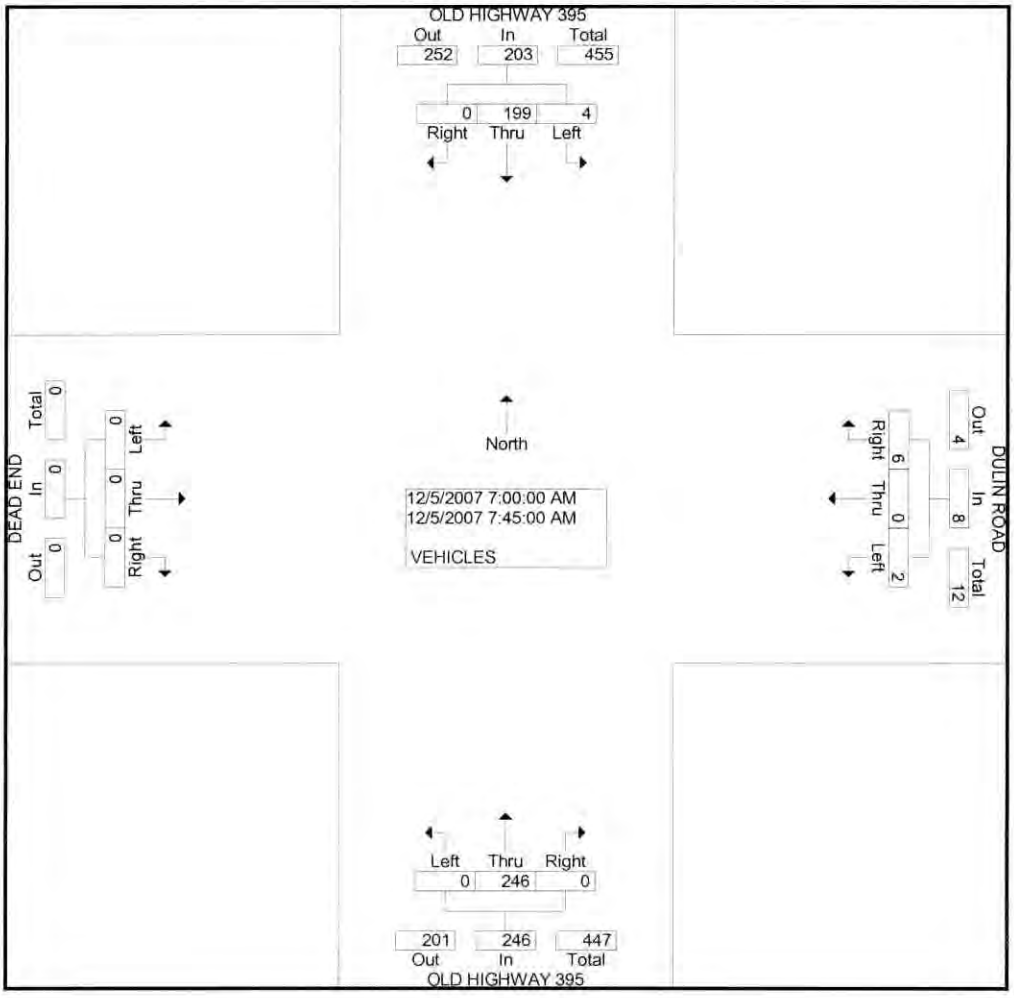
Groups Printed- VEHICLES

	OLD HIGHWAY 395 Southbound			DULIN ROAD Westbound			OLD HIGHWAY 395 Northbound			DEAD END Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	0	49	0	0	0	0	0	59	0	0	0	0	108
07:15 AM	0	51	4	1	0	0	0	61	0	0	0	0	117
07:30 AM	0	51	0	4	0	0	0	60	0	0	0	0	115
07:45 AM	0	48	0	1	0	2	0	66	0	0	0	0	117
Total	0	199	4	6	0	2	0	246	0	0	0	0	457
08:00 AM	0	46	0	0	0	0	1	59	0	0	0	0	106
08:15 AM	0	52	0	1	0	0	0	41	0	0	0	0	94
08:30 AM	0	44	0	0	0	0	0	53	0	0	0	0	97
08:45 AM	0	49	0	1	0	0	0	43	0	0	0	0	93
Total	0	191	0	2	0	0	1	196	0	0	0	0	390
*** BREAK ***													
04:00 PM	0	54	1	1	0	0	0	64	0	0	0	0	120
04:15 PM	0	52	0	0	0	0	0	76	0	0	0	0	128
04:30 PM	0	75	0	0	0	0	0	76	0	0	0	0	151
04:45 PM	0	60	0	0	0	0	0	78	0	0	0	0	138
Total	0	241	1	1	0	0	0	294	0	0	0	0	537
05:00 PM	0	59	0	0	0	0	0	60	0	0	0	0	119
05:15 PM	0	51	0	0	0	0	0	64	0	0	0	0	115
05:30 PM	0	51	1	1	0	0	0	61	0	0	0	0	114
05:45 PM	0	68	0	0	0	0	0	60	0	0	0	0	128
Total	0	229	1	1	0	0	0	245	0	0	0	0	476
Grand Total	0	860	6	10	0	2	1	981	0	0	0	0	1860
Apprch %	0.0	99.3	0.7	83.3	0.0	16.7	0.1	99.9	0.0	0.0	0.0	0.0	
Total %	0.0	46.2	0.3	0.5	0.0	0.1	0.1	52.7	0.0	0.0	0.0	0.0	

Transportation Studies, Inc.
1350 Reynolds Avenue
Suite 115
Irvine, CA. 92614

File Name : H0711119
Site Code : 00000000
Start Date : 12/5/2007
Page No : 2

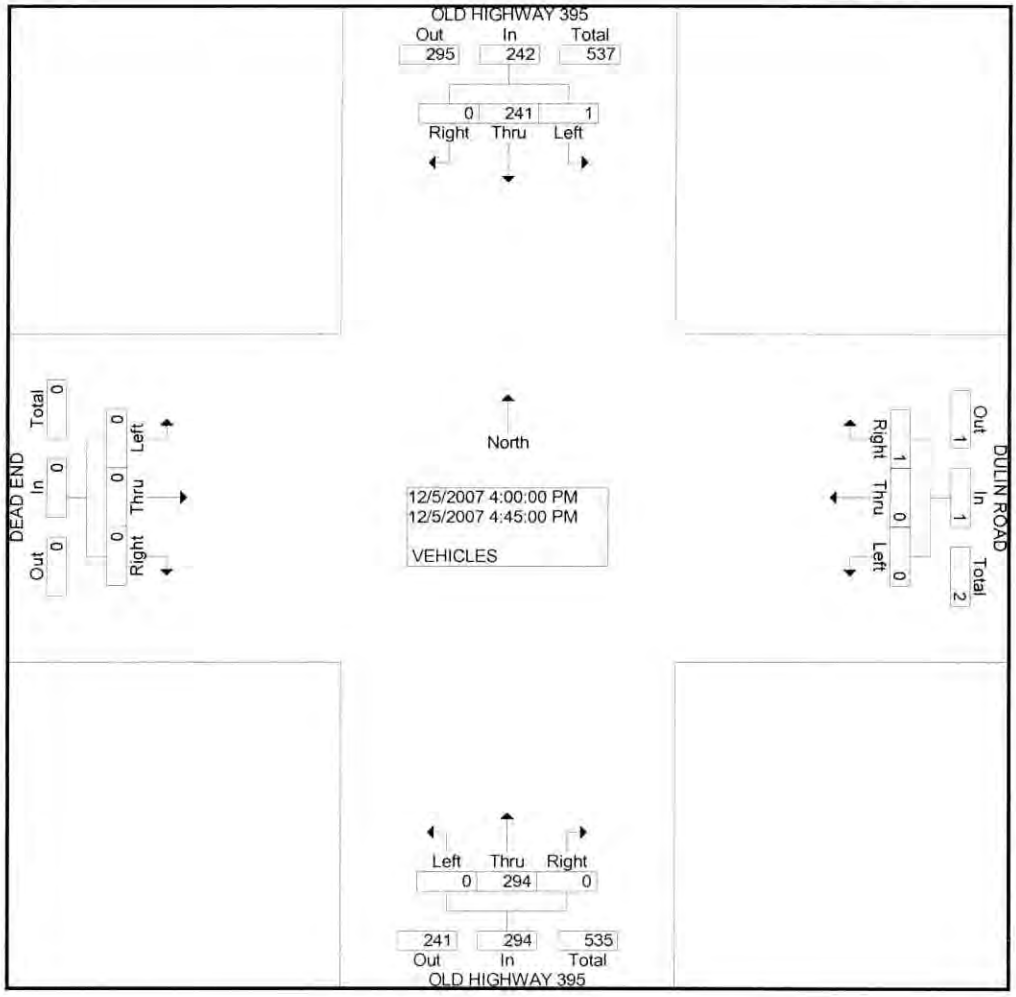
	OLD HIGHWAY 395 Southbound				DULIN ROAD Westbound				OLD HIGHWAY 395 Northbound				DEAD END Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Intersection 07:00 AM																	
Volume	0	199	4	203	6	0	2	8	0	246	0	246	0	0	0	0	457
Percent	0.0	98.0	2.0		75.0	0.0	25.0		0.0	100.0	0.0		0.0	0.0	0.0		
07:45 Volume	0	48	0	48	1	0	2	3	0	66	0	66	0	0	0	0	117
Peak Factor																	0.976
High Int.	07:15 AM				07:30 AM				07:45 AM				6:45:00 AM				
Volume	0	51	4	55	4	0	0	4	0	66	0	66					
Peak Factor				0.923				0.500				0.932					



Transportation Studies, Inc.
1350 Reynolds Avenue
Suite 115
Irvine, CA. 92614

File Name : H0711119
Site Code : 00000000
Start Date : 12/5/2007
Page No : 3

	OLD HIGHWAY 395 Southbound				DULIN ROAD Westbound				OLD HIGHWAY 395 Northbound				DEAD END Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection 04:00 PM																	
Volume	0	241	1	242	1	0	0	1	0	294	0	294	0	0	0	0	537
Percent	0.0	99.6	0.4		100.0	0.0	0.0		0.0	100.0	0.0		0.0	0.0	0.0		
04:30 Volume	0	75	0	75	0	0	0	0	0	76	0	76	0	0	0	0	151
Peak Factor																	0.889
High Int.	04:30 PM				04:00 PM				04:45 PM								
Volume	0	75	0	75	1	0	0	1	0	78	0	78					
Peak Factor				0.807				0.250				0.942					



LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06 Start Date: 12/18/2008

Location: I-15 Southbound Ramps & Pala Road (SR-76) File Name: 941-06-1

	I-15 Southbound On Ramp Northbound				I-15 Southbound Off Ramp Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	11	0	153	0	0	103	75	0	11	63	0	0	416
7:15	0	0	0	1	14	1	131	0	0	113	91	0	9	60	0	0	419
7:30	0	0	0	0	18	0	161	0	0	127	73	0	19	64	0	0	462
7:45	0	0	0	0	5	0	106	0	0	135	58	0	15	55	0	0	374
Total	0	0	0	1	48	1	551	0	0	478	297	0	54	242	0	0	1671
8:00	0	0	0	0	13	0	96	1	0	128	48	0	13	48	0	0	346
8:15	0	0	0	0	16	0	110	0	0	115	64	1	16	48	0	0	369
8:30	0	0	0	0	18	2	105	0	0	136	62	0	12	65	0	0	400
8:45	0	0	0	0	22	1	99	0	0	100	62	0	17	49	0	0	350
Total	0	0	0	0	69	3	410	1	0	479	236	1	58	210	0	0	1465
Grand Total	0	0	0	1	117	4	961	1	0	957	533	1	112	452	0	0	3136
Approach%	-	-	-	100.0	10.8	0.4	88.7	0.1	-	64.2	35.7	0.1	19.9	80.1	-	-	
Total%	-	-	-	0.0	3.7	0.1	30.6	0.0	-	30.5	17.0	0.0	3.6	14.4	-	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	-	-	-	1	48	1	551	-	-	478	297	-	54	242	-	-	1,671
Approach%	-	-	-	100.0	8.0	0.2	91.8	-	-	61.7	38.3	-	18.2	81.8	-	-	
Total%	-	-	-	0.1	2.9	0.1	33.0	-	-	28.6	17.8	-	3.2	14.5	-	-	
PHF				0.25				0.84				0.95				0.89	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06 Start Date: 12/18/2008

Location: I-15 Southbound Ramps & Pala Road (SR-76) File Name: 941-06-2

	I-15 Southbound On Ramp Northbound				I-15 Southbound Off Ramp Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	12	1	99	0	0	157	50	0	33	118	0	0	470
16:15	0	0	0	0	11	0	126	0	0	161	37	0	33	98	0	0	466
16:30	0	0	0	0	14	2	113	0	0	169	75	0	39	118	0	0	530
16:45	0	0	0	0	14	0	109	0	3	183	57	0	30	157	0	0	553
Total	0	0	0	0	51	3	447	0	3	670	219	0	135	491	0	0	2019
17:00	0	0	0	0	24	1	94	0	5	178	69	0	24	137	0	0	532
17:15	0	0	0	0	19	2	117	0	0	187	72	0	32	144	0	0	573
17:30	0	0	0	0	22	0	107	0	0	163	79	0	27	119	0	0	517
17:45	0	0	0	0	10	0	86	0	0	164	47	0	13	110	0	0	430
Total	0	0	0	0	75	3	404	0	5	692	267	0	96	510	0	0	2052
Grand Total	0	0	0	0	126	6	851	0	8	1362	486	0	231	1001	0	0	4071
Approach%	-	-	-	-	12.8	0.6	86.6	-	0.4	73.4	26.2	-	18.8	81.3	-	-	
Total%	-	-	-	-	3.1	0.1	20.9	-	0.2	33.5	11.9	-	5.7	24.6	-	-	

Peak hour analysis for the period 16:30 to 17:15

Volume	-	-	-	-	71	5	433	-	8	717	273	-	125	556	-	-	2,188
Approach%	-	-	-	-	13.9	1.0	85.1	-	0.8	71.8	27.4	-	18.4	81.6	-	-	
Total%	-	-	-	-	3.2	0.2	19.8	-	0.4	32.8	12.5	-	5.7	25.4	-	-	
PHF				######				0.92				0.96				0.91	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03 Start Date: 12/18/2008

Location: I-15 Northbound Ramps & Pala Road (SR-76) File Name: 941-07-1

	I-15 Northbound Off Ramp Northbound				I-15 Northbound On Ramp Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	41	0	21	0	0	0	0	0	92	25	0	0	0	32	2	0	213
7:15	31	0	27	0	0	0	0	0	96	40	0	0	0	39	13	0	246
7:30	29	0	32	0	0	0	0	0	100	55	0	0	0	63	13	1	292
7:45	38	0	29	0	0	0	0	0	102	47	0	0	0	36	16	0	268
Total	139	0	109	0	0	0	0	0	390	167	0	0	0	170	44	1	1019
8:00	37	0	26	0	0	0	0	0	108	43	0	0	0	30	4	0	248
8:15	30	0	29	0	0	0	0	0	95	49	0	0	0	38	8	1	249
8:30	45	2	25	0	0	0	0	0	90	46	0	0	0	39	10	0	257
8:45	34	0	42	0	0	0	0	0	83	47	0	0	0	34	11	0	251
Total	146	2	122	0	0	0	0	0	376	185	0	0	0	141	33	1	1005
Grand Total	285	2	231	0	0	0	0	0	766	352	0	0	0	311	77	2	2024
Approach%	55.0	0.4	44.6	-	-	-	-	-	68.5	31.5	-	-	-	79.7	19.7	0.5	
Total%	14.1	0.1	11.4	-	-	-	-	-	37.8	17.4	-	-	-	15.4	3.8	0.1	

Peak hour analysis for the period 07:30 to 08:15

Volume	134	-	116	-	-	-	-	-	405	194	-	-	-	167	41	2	1,057
Approach%	53.6	-	46.4	-	-	-	-	-	67.6	32.4	-	-	-	79.5	19.5	1.0	
Total%	12.7	-	11.0	-	-	-	-	-	38.3	18.4	-	-	-	15.8	3.9	0.2	
PHF				0.93				######				0.97				0.68	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03 Start Date: 12/18/2008

Location: I-15 Northbound Ramps & Pala Road (SR-76) File Name: 941-07-2

	I-15 Northbound Off Ramp Northbound				I-15 Northbound On Ramp Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	59	0	17	0	0	0	0	0	135	43	0	0	0	64	17	0	335
16:15	71	1	26	0	0	0	0	0	130	48	0	0	0	63	13	0	352
16:30	92	0	31	0	0	0	0	0	134	56	0	0	0	77	16	0	406
16:45	106	2	30	0	0	0	0	0	140	52	0	0	0	95	15	0	440
Total	328	3	104	0	0	0	0	0	539	199	0	0	0	299	61	0	1533
17:00	84	1	29	0	0	0	0	0	158	51	0	0	0	85	13	0	421
17:15	98	0	29	0	0	0	0	0	157	57	0	0	0	84	11	0	436
17:30	92	1	33	0	0	0	0	0	139	53	0	0	0	87	11	0	416
17:45	94	0	42	0	0	0	0	0	142	44	0	0	0	49	13	0	384
Total	368	2	133	0	0	0	0	0	596	205	0	0	0	305	48	0	1657
Grand Total	696	5	237	0	0	0	0	0	1135	404	0	0	0	604	109	0	3190
Approach%	74.2	0.5	25.3	-	-	-	-	-	73.7	26.3	-	-	-	84.7	15.3	-	
Total%	21.8	0.2	7.4	-	-	-	-	-	35.6	12.7	-	-	-	18.9	3.4	-	

Peak hour analysis for the period 16:45 to 17:30

Volume	380	4	121	-	-	-	-	-	594	213	-	-	-	351	50	-	1,713
Approach%	75.2	0.8	24.0	-	-	-	-	-	73.6	26.4	-	-	-	87.5	12.5	-	
Total%	22.2	0.2	7.1	-	-	-	-	-	34.7	12.4	-	-	-	20.5	2.9	-	
PHF				0.91				######				0.94				0.91	

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Transportation Studies, Inc.
1350 Reynolds Avenue
Suite 115
Irvine, CA. 92614

City: FALLBROOK
N-S Direction: PANKEY ROAD
E-W Direction: PALA ROAD

File Name : H0711122
Site Code : 00000000
Start Date : 12/4/2007
Page No : 1

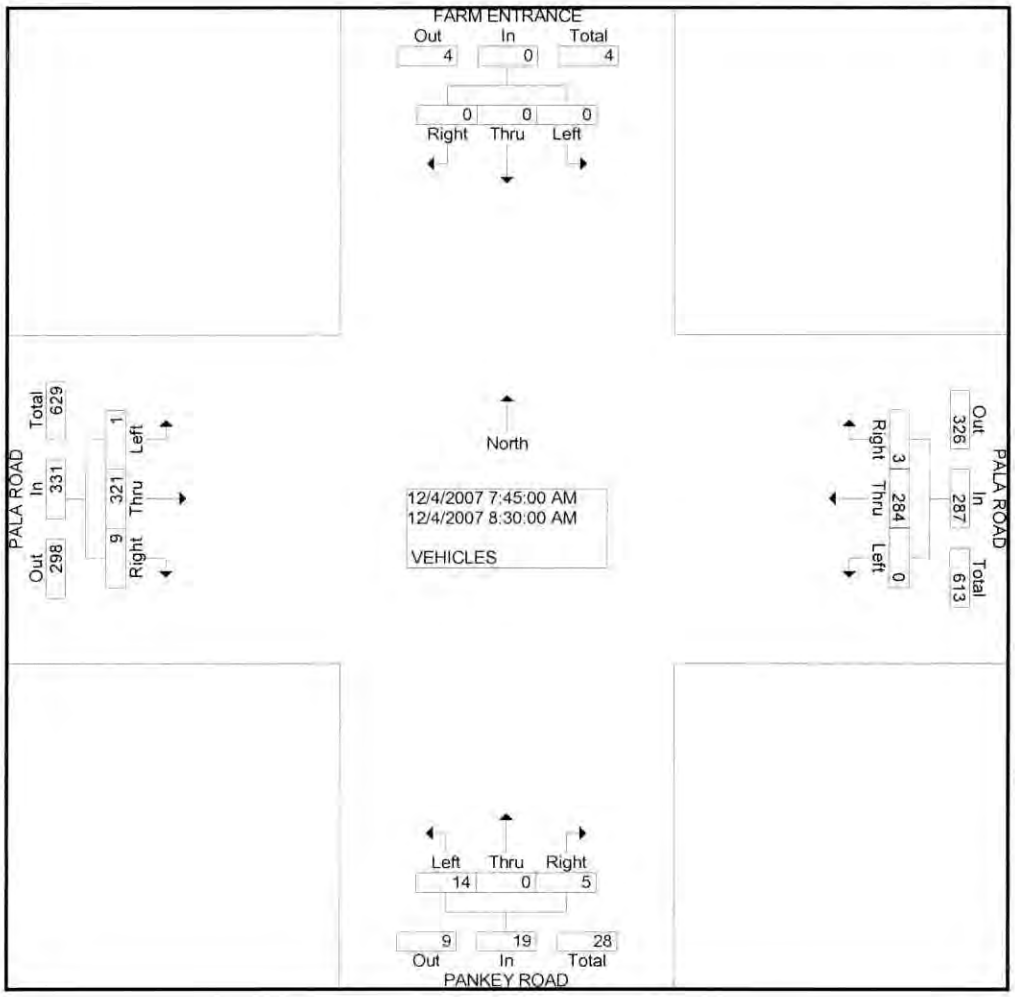
Groups Printed- VEHICLES

	FARM ENTRANCE Southbound			PALA ROAD Westbound			PANKEY ROAD Northbound			PALA ROAD Eastbound			
Start Time	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	0	0	0	0	38	1	2	0	2	2	66	0	111
07:15 AM	0	0	0	0	42	0	0	0	0	2	57	0	101
07:30 AM	0	0	0	0	61	0	2	0	2	0	51	1	117
07:45 AM	0	0	0	2	87	0	0	0	2	2	79	1	173
Total	0	0	0	2	228	1	4	0	6	6	253	2	502
08:00 AM	0	0	0	0	97	0	1	0	6	2	64	0	170
08:15 AM	0	0	0	0	53	0	1	0	3	2	96	0	155
08:30 AM	0	0	0	1	47	0	3	0	3	3	82	0	139
08:45 AM	0	0	0	0	58	1	1	0	3	7	89	0	159
Total	0	0	0	1	255	1	6	0	15	14	331	0	623
*** BREAK ***													
04:00 PM	0	0	0	0	92	1	3	0	5	6	64	0	171
04:15 PM	0	0	0	0	80	1	1	0	5	8	84	0	179
04:30 PM	0	0	0	0	80	0	3	0	6	2	63	0	154
04:45 PM	0	0	0	0	120	2	1	0	1	4	63	0	191
Total	0	0	0	0	372	4	8	0	17	20	274	0	695
05:00 PM	0	0	0	0	115	1	1	0	5	9	83	0	214
05:15 PM	0	0	0	0	118	0	0	0	3	9	83	0	213
05:30 PM	0	0	0	0	104	0	0	0	4	3	93	0	204
05:45 PM	0	0	0	7	97	0	0	0	2	6	90	0	202
Total	0	0	0	7	434	1	1	0	14	27	349	0	833
Grand Total	0	0	0	10	1289	7	19	0	52	67	1207	2	2653
Apprch %	0.0	0.0	0.0	0.8	98.7	0.5	26.8	0.0	73.2	5.3	94.6	0.2	
Total %	0.0	0.0	0.0	0.4	48.6	0.3	0.7	0.0	2.0	2.5	45.5	0.1	

Transportation Studies, Inc.
1350 Reynolds Avenue
Suite 115
Irvine, CA. 92614

File Name : H0711122
Site Code : 00000000
Start Date : 12/4/2007
Page No : 2

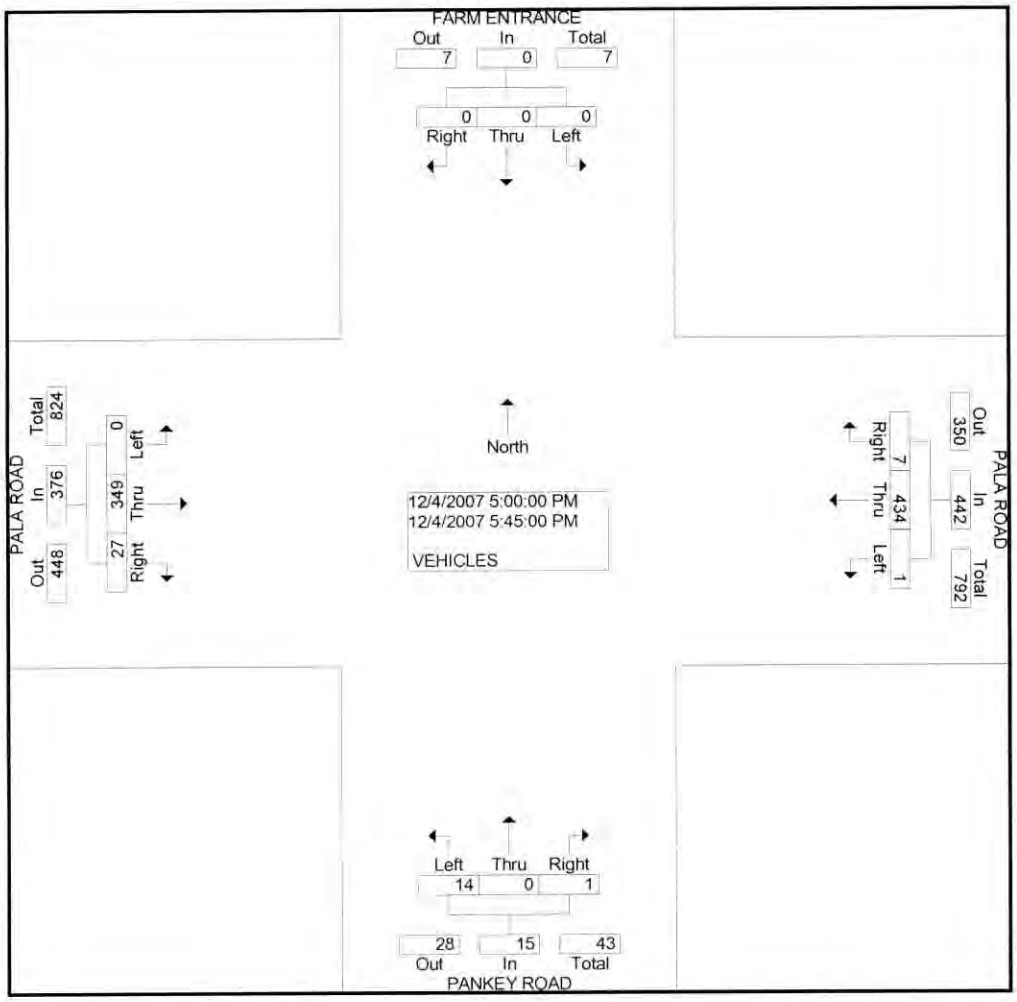
	FARM ENTRANCE Southbound				PALA ROAD Westbound				PANKEY ROAD Northbound				PALA ROAD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Intersection	07:45 AM																
Volume	0	0	0	0	3	284	0	287	5	0	14	19	9	321	1	331	637
Percent	0.0	0.0	0.0		1.0	99.0	0.0		26.3	0.0	73.7		2.7	97.0	0.3		
07:45 Volume	0	0	0	0	2	87	0	89	0	0	2	2	2	79	1	82	173
Peak Factor																	0.921
High Int.	6:45:00 AM				08:00 AM				08:00 AM				08:15 AM				
Volume	0	0	0	0	0	97	0	97	1	0	6	7	2	96	0	98	
Peak Factor								0.740				0.679				0.844	



Transportation Studies, Inc.
1350 Reynolds Avenue
Suite 115
Irvine, CA. 92614

File Name : H0711122
Site Code : 00000000
Start Date : 12/4/2007
Page No : 3

	FARM ENTRANCE Southbound				PALA ROAD Westbound				PANKEY ROAD Northbound				PALA ROAD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	05:00 PM																
Volume	0	0	0	0	7	434	1	442	1	0	14	15	27	349	0	376	833
Percent	0.0	0.0	0.0		1.6	98.2	0.2		6.7	0.0	93.3		7.2	92.8	0.0		
05:00 Volume	0	0	0	0	0	115	1	116	1	0	5	6	9	83	0	92	214
Peak Factor																	0.973
High Int.					05:15 PM				05:00 PM				05:30 PM				
Volume	0	0	0	0	0	118	0	118	1	0	5	6	3	93	0	96	
Peak Factor								0.936				0.625				0.979	



LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06 Start Date: 01/06/2009

Location: Rice Canyon Road & Pala Road (SR-76) File Name: 941-09-1

	Northbound				Rice Canyon Road Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	0	0	7	0	1	40	0	0	0	45	0	0	93
7:15	0	0	0	0	3	0	5	0	1	58	0	0	0	48	2	0	117
7:30	0	0	0	0	4	0	10	0	4	88	0	0	0	52	3	0	161
7:45	0	0	0	0	2	0	4	0	1	65	0	0	0	44	6	0	122
Total	0	0	0	0	9	0	26	0	7	251	0	0	0	189	11	0	493
8:00	0	0	0	0	4	0	2	0	4	68	0	0	0	25	1	0	104
8:15	0	0	0	0	2	0	5	0	0	79	0	0	0	44	0	0	130
8:30	0	0	0	0	1	0	2	0	1	56	0	0	0	53	1	0	114
8:45	0	0	0	0	1	0	2	0	1	56	0	0	0	38	1	0	99
Total	0	0	0	0	8	0	11	0	6	259	0	0	0	160	3	0	447
Grand Total	0	0	0	0	17	0	37	0	13	510	0	0	0	349	14	0	940
Approach%	-	-	-	-	31.5	-	68.5	-	2.5	97.5	-	-	-	96.1	3.9	-	
Total%	-	-	-	-	1.8	-	3.9	-	1.4	54.3	-	-	-	37.1	1.5	-	

Peak hour analysis for the period 07:30 to 08:15

Volume	-	-	-	-	12	-	21	-	9	300	-	-	-	165	10	-	517
Approach%	-	-	-	-	36.4	-	63.6	-	2.9	97.1	-	-	-	94.3	5.7	-	
Total%	-	-	-	-	2.3	-	4.1	-	1.7	58.0	-	-	-	31.9	1.9	-	
PHF				######				0.59				0.84				0.80	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06
Location: Rice Canyon Road & Pala Road (SR-76)

Start Date: 01/06/2009
File Name: 941-09-2

	Northbound				Rice Canyon Road Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	4	0	1	0	3	71	0	0	0	80	2	0	161
16:15	0	0	0	0	1	0	5	0	3	74	0	0	0	98	1	0	182
16:30	0	0	0	0	3	0	2	0	4	75	0	0	0	85	5	0	174
16:45	0	0	0	0	0	0	2	0	3	60	0	0	0	102	0	0	167
Total	0	0	0	0	8	0	10	0	13	280	0	0	0	365	8	0	684
17:00	0	0	0	0	1	0	1	0	9	54	0	0	0	85	3	0	153
17:15	0	0	0	0	0	0	7	0	5	67	0	0	0	83	0	0	162
17:30	0	0	0	0	1	0	6	0	2	84	0	0	0	87	1	0	181
17:45	0	0	0	0	1	0	3	0	6	58	0	0	0	63	1	0	132
Total	0	0	0	0	3	0	17	0	22	263	0	0	0	318	5	0	628
Grand Total	0	0	0	0	11	0	27	0	35	543	0	0	0	683	13	0	1312
Approach%	-	-	-	-	28.9	-	71.1	-	6.1	93.9	-	-	-	98.1	1.9	-	
Total%	-	-	-	-	0.8	-	2.1	-	2.7	41.4	-	-	-	52.1	1.0	-	

Peak hour analysis for the period 16:00 to 16:45

Volume	-	-	-	-	8	-	10	-	13	280	-	-	-	365	8	-	684
Approach%	-	-	-	-	44.4	-	55.6	-	4.4	95.6	-	-	-	97.9	2.1	-	
Total%	-	-	-	-	1.2	-	1.5	-	1.9	40.9	-	-	-	53.4	1.2	-	
PHF				######				0.75				0.93				0.91	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03 Start Date: 01/06/2009

Location: Couser Canyon Road & Pala Road (SR-76) File Name: 941.10-1

	Couser Canyon Road Northbound				Driveway Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	2	0	6	0	0	0	0	0	0	39	1	0	1	41	0	0	90
7:15	4	0	0	0	0	0	0	0	0	59	1	0	1	48	0	0	113
7:30	8	0	5	0	0	0	0	0	0	86	4	0	0	50	0	0	153
7:45	1	0	0	0	0	0	0	0	0	68	1	0	1	49	0	0	120
Total	15	0	11	0	0	0	0	0	0	252	7	0	3	188	0	0	476
8:00	1	0	0	0	0	0	0	0	0	73	0	0	0	24	0	0	98
8:15	1	0	0	0	0	0	0	0	0	75	6	0	1	43	0	0	126
8:30	2	0	2	0	0	0	0	0	0	52	4	0	1	53	0	0	114
8:45	6	0	0	0	0	0	0	0	0	56	3	0	0	33	1	0	99
Total	10	0	2	0	0	0	0	0	0	256	13	0	2	153	1	0	437
Grand Total	25	0	13	0	0	0	0	0	0	508	20	0	5	341	1	0	913
Approach%	65.8	-	34.2	-	-	-	-	-	-	96.2	3.8	-	1.4	98.3	0.3	-	
Total%	2.7	-	1.4	-	-	-	-	-	-	55.6	2.2	-	0.5	37.3	0.1	-	

Peak hour analysis for the period 07:30 to 08:15

Volume	11	-	5	-	-	-	-	-	-	302	11	-	2	166	-	-	497
Approach%	68.8	-	31.3	-	-	-	-	-	-	96.5	3.5	-	1.2	98.8	-	-	
Total%	2.2	-	1.0	-	-	-	-	-	-	60.8	2.2	-	0.4	33.4	-	-	
PHF				0.31				######				0.87				0.84	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03
Location: Couser Canyon Road & Pala Road (SR-76)

Start Date: 01/06/2009
File Name: 941.10-2

	Couser Canyon Road Northbound				Driveway Southbound				Pala Road (SR-76) Eastbound				Pala Road (SR-76) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	5	0	2	0	0	0	1	0	0	72	2	0	3	79	0	0	164
16:15	4	0	0	0	0	0	0	0	0	70	6	0	2	95	0	0	177
16:30	1	0	0	0	0	0	0	0	0	70	6	0	2	92	0	0	171
16:45	1	0	0	0	0	0	0	0	0	53	6	0	1	102	0	0	163
Total	11	0	2	0	0	0	1	0	0	265	20	0	8	368	0	0	675
17:00	3	0	0	0	0	0	0	0	0	50	3	0	1	87	0	0	144
17:15	0	0	1	0	0	0	0	0	0	64	2	0	0	79	0	0	146
17:30	2	0	0	0	0	0	0	0	0	83	2	0	2	89	0	0	178
17:45	1	0	0	0	0	0	0	0	0	53	4	0	1	62	0	0	121
Total	6	0	1	0	0	0	0	0	0	250	11	0	4	317	0	0	589
Grand Total	17	0	3	0	0	0	1	0	0	515	31	0	12	685	0	0	1264
Approach%	85.0	-	15.0	-	-	-	100.0	-	-	94.3	5.7	-	1.7	98.3	-	-	
Total%	1.3	-	0.2	-	-	-	0.1	-	-	40.7	2.5	-	0.9	54.2	-	-	

Peak hour analysis for the period 16:00 to 16:45

Volume	11	-	2	-	-	-	1	-	-	265	20	-	8	368	-	-	675
Approach%	84.6	-	15.4	-	-	-	100.0	-	-	93.0	7.0	-	2.1	97.9	-	-	
Total%	1.6	-	0.3	-	-	-	0.1	-	-	39.3	3.0	-	1.2	54.5	-	-	
PHF				0.46				0.25				0.94				0.91	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #14
Location: Old Highway 395 & Pala Mesa Drive

Start Date: 01/06/2009
File Name: 941-11-1

	Old Highway 395 Northbound				Old Highway 395 Southbound				Pala Mesa Drive Eastbound				Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	8	44	0	0	0	55	4	0	6	0	10	1	0	0	0	0	127
7:15	3	33	0	0	0	59	3	0	6	0	14	0	0	0	0	0	118
7:30	3	36	0	0	0	75	0	0	9	0	4	0	0	0	0	0	127
7:45	7	36	0	0	0	55	1	0	4	0	9	0	0	0	0	0	112
Total	21	149	0	0	0	244	8	0	25	0	37	1	0	0	0	0	484
8:00	5	32	0	0	0	63	2	0	5	0	9	0	0	0	0	0	116
8:15	3	32	0	0	0	53	6	0	3	0	7	0	0	0	0	0	104
8:30	4	36	0	0	0	43	1	0	3	0	8	1	0	0	0	0	95
8:45	3	40	0	0	0	44	4	0	4	0	4	0	0	0	0	0	99
Total	15	140	0	0	0	203	13	0	15	0	28	1	0	0	0	0	414
Grand Total	36	289	0	0	0	447	21	0	40	0	65	2	0	0	0	0	898
Approach%	11.1	88.9	-	-	-	95.5	4.5	-	37.4	-	60.7	1.9	-	-	-	-	
Total%	4.0	32.2	-	-	-	49.8	2.3	-	4.5	-	7.2	0.2	-	-	-	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	21	149	-	-	-	244	8	-	25	-	37	1	-	-	-	-	484
Approach%	12.4	87.6	-	-	-	96.8	3.2	-	39.7	-	58.7	1.6	-	-	-	-	
Total%	4.3	30.8	-	-	-	50.4	1.7	-	5.2	-	7.6	0.2	-	-	-	-	
PHF				0.82				0.84				0.79				######	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. # 14
Location: Old Highway 395 & Pala Mesa Drive

Start Date: 01/06/2009
File Name: 941-11-2

	Old Highway 395 Northbound				Old Highway 395 Southbound				Pala Mesa Drive Eastbound				Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	9	82	0	0	0	52	13	0	6	0	6	0	0	0	0	0	168
16:15	7	64	0	0	0	47	5	0	4	0	6	0	0	0	0	0	133
16:30	11	80	0	0	0	40	10	0	1	0	4	0	0	0	0	0	146
16:45	9	87	0	0	0	32	6	0	2	0	5	0	0	0	0	0	141
Total	36	313	0	0	0	171	34	0	13	0	21	0	0	0	0	0	588
17:00	19	98	0	0	0	46	6	0	6	0	9	0	0	0	0	0	184
17:15	3	56	0	0	0	52	4	0	2	0	4	0	0	0	0	0	121
17:30	4	60	0	0	0	53	5	0	2	0	6	0	0	0	0	0	130
17:45	14	52	0	0	0	43	2	0	2	0	3	0	0	0	0	0	116
Total	40	266	0	0	0	194	17	0	12	0	22	0	0	0	0	0	551
Grand Total	76	579	0	0	0	365	51	0	25	0	43	0	0	0	0	0	1139
Approach%	11.6	88.4	-	-	-	87.7	12.3	-	36.8	-	63.2	-	-	-	-	-	
Total%	6.7	50.8	-	-	-	32.0	4.5	-	2.2	-	3.8	-	-	-	-	-	

Peak hour analysis for the period 16:15 to 17:00

Volume	46	329	-	-	-	165	27	-	13	-	24	-	-	-	-	-	604
Approach%	12.3	87.7	-	-	-	85.9	14.1	-	35.1	-	64.9	-	-	-	-	-	
Total%	7.6	54.5	-	-	-	27.3	4.5	-	2.2	-	4.0	-	-	-	-	-	
PHF				0.80				0.92				0.62				######	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #04
Location: Wilt Road/ Sage Road & Pala Mesa Drive

Start Date: 01/06/2009
File Name: 941-12-1

	Sage Road Northbound				Wilt Road Southbound				Pala Mesa Drive Eastbound				Pala Mesa Drive Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	1	1	0	3	0	0	0	1	0	0	0	1	2	7	0	16
7:15	0	1	4	0	1	0	0	0	0	3	0	0	0	0	2	0	11
7:30	0	1	1	0	4	0	0	0	0	0	0	0	2	0	0	0	8
7:45	0	0	4	0	2	2	0	0	1	2	0	0	2	1	1	0	15
Total	0	3	10	0	10	2	0	0	2	5	0	0	5	3	10	0	50
8:00	0	0	2	0	3	4	0	0	0	0	0	0	2	1	1	0	13
8:15	0	4	3	0	6	0	0	0	0	0	0	0	2	0	2	0	17
8:30	0	0	0	0	5	2	0	0	0	1	0	0	1	0	2	0	11
8:45	0	1	3	1	1	0	0	0	0	0	0	0	1	0	3	0	9
Total	0	5	8	1	15	6	0	0	0	1	0	0	6	1	8	0	50
Grand Total	0	8	18	1	25	8	0	0	2	6	0	0	11	4	18	0	100
Approach%	-	29.6	66.7	3.7	75.8	24.2	-	-	25.0	75.0	-	-	33.3	12.1	54.5	-	
Total%	-	8.0	18.0	1.0	25.0	8.0	-	-	2.0	6.0	-	-	11.0	4.0	18.0	-	

Peak hour analysis for the period 07:45 to 08:30

Volume	-	4	9	-	16	8	-	-	1	3	-	-	7	2	6	-	56
Approach%	-	30.8	69.2	-	66.7	33.3	-	-	25.0	75.0	-	-	46.7	13.3	40.0	-	
Total%	-	7.1	16.1	-	28.6	14.3	-	-	1.8	5.4	-	-	12.5	3.6	10.7	-	
PHF				0.46				0.86				0.33				0.94	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #04
Location: Wilt Road/ Sage Road & Pala Mesa Drive

Start Date: 01/06/2009
File Name: 941-12-2

	Sage Road Northbound				Wilt Road Southbound				Pala Mesa Drive Eastbound				Pala Mesa Drive Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	1	2	0	8	3	1	0	1	0	0	0	1	0	6	0	23
16:15	0	1	2	0	4	3	0	0	1	0	0	0	2	1	4	0	18
16:30	0	1	0	0	2	2	0	0	0	1	0	0	4	1	4	0	15
16:45	0	0	2	0	4	2	0	0	0	0	0	0	1	0	2	0	11
Total	0	3	6	0	18	10	1	0	2	1	0	0	8	2	16	0	67
17:00	0	1	4	0	1	0	1	0	0	2	0	0	3	4	6	0	22
17:15	0	0	0	0	0	1	2	0	0	0	0	0	0	0	4	0	7
17:30	0	1	2	0	2	1	0	0	0	0	0	0	1	0	3	0	10
17:45	0	3	2	0	0	1	2	0	0	0	0	0	3	0	2	0	13
Total	0	5	8	0	3	3	5	0	0	2	0	0	7	4	15	0	52
Grand Total	0	8	14	0	21	13	6	0	2	3	0	0	15	6	31	0	119
Approach%	-	36.4	63.6	-	52.5	32.5	15.0	-	40.0	60.0	-	-	28.8	11.5	59.6	-	
Total%	-	6.7	11.8	-	17.6	10.9	5.0	-	1.7	2.5	-	-	12.6	5.0	26.1	-	

Peak hour analysis for the period 16:00 to 16:45

Volume	-	3	6	-	18	10	1	-	2	1	-	-	8	2	16	-	67
Approach%	-	33.3	66.7	-	62.1	34.5	3.4	-	66.7	33.3	-	-	30.8	7.7	61.5	-	
Total%	-	4.5	9.0	-	26.9	14.9	1.5	-	3.0	1.5	-	-	11.9	3.0	23.9	-	
PHF				0.75				0.60				0.75				0.72	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #12 Start Date: 12/11/2008

Location: Old Highway 395 & Canonita Drive/ Stewart Canyon Road File Name: 941-13-1

	Old Highway 395 Northbound				Old Highway 395 Southbound				Canonita Drive Eastbound				Stewart Canyon Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	1	33	6	0	4	56	1	0	2	1	7	0	3	0	3	0	117
7:15	0	39	1	0	3	71	1	0	1	0	2	0	3	0	1	0	122
7:30	1	38	1	0	2	54	2	0	9	0	10	0	1	0	1	0	119
7:45	1	37	3	0	3	62	3	0	2	0	4	0	3	0	8	0	126
Total	3	147	11	0	12	243	7	0	14	1	23	0	10	0	13	0	484
8:00	1	32	2	0	3	55	0	0	3	0	6	0	2	0	2	0	106
8:15	2	34	7	0	1	55	1	0	2	0	1	0	2	0	4	0	109
8:30	3	26	5	0	3	46	2	0	3	0	2	0	3	0	1	0	94
8:45	1	33	2	0	1	60	0	0	0	0	6	0	2	1	0	0	106
Total	7	125	16	0	8	216	3	0	8	0	15	0	9	1	7	0	415
Grand Total	10	272	27	0	20	459	10	0	22	1	38	0	19	1	20	0	899
Approach%	3.2	88.0	8.7	-	4.1	93.9	2.0	-	36.1	1.6	62.3	-	47.5	2.5	50.0	-	
Total%	1.1	30.3	3.0	-	2.2	51.1	1.1	-	2.4	0.1	4.2	-	2.1	0.1	2.2	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	3	147	11	-	12	243	7	-	14	1	23	-	10	-	13	-	484
Approach%	1.9	91.3	6.8	-	4.6	92.7	2.7	-	36.8	2.6	60.5	-	43.5	-	56.5	-	
Total%	0.6	30.4	2.3	-	2.5	50.2	1.4	-	2.9	0.2	4.8	-	2.1	-	2.7	-	
PHF				0.98				0.87				0.50				0.52	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06 Start Date: 12/11/2008

Location: Old Highway 395 & Canonita Drive/ Stewart Canyon Road File Name: 941-13-2

	Old Highway 395 Northbound				Old Highway 395 Southbound				Canonita Drive Eastbound				Stewart Canyon Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	3	86	5	0	2	45	5	0	3	0	5	0	3	0	11	0	168
16:15	4	59	2	0	2	28	2	0	1	1	5	0	4	0	2	0	110
16:30	7	57	3	0	4	47	5	0	3	1	2	0	3	1	4	0	137
16:45	7	57	2	0	4	48	7	0	1	1	6	0	9	0	11	0	153
Total	21	259	12	0	12	168	19	0	8	3	18	0	19	1	28	0	568
17:00	6	61	1	0	6	41	3	0	0	1	1	0	7	0	4	0	131
17:15	5	64	1	0	1	51	3	0	0	1	4	0	2	1	3	0	136
17:30	5	70	3	0	3	58	1	0	2	0	2	0	0	0	1	0	145
17:45	6	62	3	0	2	41	1	0	2	0	1	0	0	0	4	0	122
Total	22	257	8	0	12	191	8	0	4	2	8	0	9	1	12	0	534
Grand Total	43	516	20	0	24	359	27	0	12	5	26	0	28	2	40	0	1102
Approach%	7.4	89.1	3.5	-	5.9	87.6	6.6	-	27.9	11.6	60.5	-	40.0	2.9	57.1	-	
Total%	3.9	46.8	1.8	-	2.2	32.6	2.5	-	1.1	0.5	2.4	-	2.5	0.2	3.6	-	

Peak hour analysis for the period 16:00 to 16:45

Volume	21	259	12	-	12	168	19	-	8	3	18	-	19	1	28	-	568
Approach%	7.2	88.7	4.1	-	6.0	84.4	9.5	-	27.6	10.3	62.1	-	39.6	2.1	58.3	-	
Total%	3.7	45.6	2.1	-	2.1	29.6	3.3	-	1.4	0.5	3.2	-	3.3	0.2	4.9	-	
PHF				0.78				0.84				0.91				0.60	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #01
Location: Old Highway 395 & Reche Road

Start Date: 12/11/2008
File Name: 941-14-1

	Old Highway 395 Northbound				Old Highway 395 Southbound				Reche Road Eastbound				Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	25	11	0	0	0	17	56	0	29	0	41	0	0	0	0	0	179
7:15	33	12	0	0	0	14	28	0	33	0	55	0	0	0	0	0	175
7:30	29	19	0	0	0	16	34	0	57	0	51	0	0	0	0	0	206
7:45	33	18	0	0	0	19	29	0	42	0	47	0	0	0	0	0	188
Total	120	60	0	0	0	66	147	0	161	0	194	0	0	0	0	0	748
8:00	20	19	0	0	0	17	28	0	57	0	43	0	0	0	0	0	184
8:15	21	26	0	0	0	21	19	0	31	0	38	0	0	0	0	0	156
8:30	20	16	0	0	0	13	22	0	25	0	38	0	0	0	0	0	134
8:45	23	9	0	0	0	17	17	0	30	0	39	0	0	0	0	0	135
Total	84	70	0	0	0	68	86	0	143	0	158	0	0	0	0	0	609
Grand Total	204	130	0	0	0	134	233	0	304	0	352	0	0	0	0	0	1357
Approach%	61.1	38.9	-	-	-	36.5	63.5	-	46.3	-	53.7	-	-	-	-	-	
Total%	15.0	9.6	-	-	-	9.9	17.2	-	22.4	-	25.9	-	-	-	-	-	

Peak hour analysis for the period 07:15 to 08:00

Volume	115	68	-	-	-	66	119	-	189	-	196	-	-	-	-	-	753
Approach%	62.8	37.2	-	-	-	35.7	64.3	-	49.1	-	50.9	-	-	-	-	-	
Total%	15.3	9.0	-	-	-	8.8	15.8	-	25.1	-	26.0	-	-	-	-	-	
PHF				0.90				0.93				0.89				######	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #01
Location: Old Highway 395 & Reche Road

Start Date: 12/11/2008
File Name: 941-14-2

	Old Highway 395 Northbound				Old Highway 395 Southbound				Reche Road Eastbound				Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	76	25	0	0	0	22	33	0	33	0	33	0	0	0	0	0	222
16:15	57	23	0	0	0	17	31	0	37	0	33	0	0	0	0	0	198
16:30	52	26	0	0	0	19	23	0	40	0	47	0	0	0	0	0	207
16:45	54	19	0	0	0	15	33	0	53	0	45	0	0	0	0	0	219
Total	239	93	0	0	0	73	120	0	163	0	158	0	0	0	0	0	846
17:00	47	23	0	0	0	14	40	0	51	0	40	0	0	0	0	0	215
17:15	49	18	0	0	0	12	39	0	36	0	43	0	0	0	0	0	197
17:30	60	19	0	0	0	12	40	5	65	0	48	0	0	0	0	0	244
17:45	41	23	0	0	0	10	38	0	31	0	47	0	0	0	0	0	190
Total	197	83	0	0	0	48	157	5	183	0	178	0	0	0	0	0	846
Grand Total	436	176	0	0	0	121	277	5	346	0	336	0	0	0	0	0	1692
Approach%	71.2	28.8	-	-	-	30.0	68.7	1.2	50.7	-	49.3	-	-	-	-	-	
Total%	25.8	10.4	-	-	-	7.2	16.4	0.3	20.4	-	19.9	-	-	-	-	-	

Peak hour analysis for the period 16:45 to 17:30

Volume	210	79	-	-	-	53	152	5	205	-	176	-	-	-	-	-	875
Approach%	72.7	27.3	-	-	-	25.2	72.4	2.4	53.8	-	46.2	-	-	-	-	-	
Total%	24.0	9.0	-	-	-	6.1	17.4	0.6	23.4	-	20.1	-	-	-	-	-	
PHF				0.91				0.92				0.84				######	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #14
Location: Tecalote Drive & Reche Road

Start Date: 12/11/2008
File Name:941-15-1

	Tecalote Drive Northbound				Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	1	0	3	0	0	0	0	0	0	70	2	0	1	87	0	0	164
7:15	4	0	0	0	0	0	0	0	0	102	3	0	0	74	0	0	183
7:30	3	0	1	0	0	0	0	0	0	94	3	0	1	61	0	0	163
7:45	2	0	0	0	0	0	0	0	0	93	6	0	0	70	0	0	171
Total	10	0	4	0	0	0	0	0	0	359	14	0	2	292	0	0	681
8:00	1	0	1	0	0	0	0	0	0	90	3	0	0	50	0	0	145
8:15	7	0	1	0	0	0	0	0	0	68	2	0	0	45	0	0	123
8:30	5	0	1	0	0	0	0	0	0	64	2	0	0	43	0	0	115
8:45	7	0	0	0	0	0	0	0	0	65	4	0	0	47	0	0	123
Total	20	0	3	0	0	0	0	0	0	287	11	0	0	185	0	0	506
Grand Total	30	0	7	0	0	0	0	0	0	646	25	0	2	477	0	0	1187
Approach%	81.1	-	18.9	-	-	-	-	-	-	96.3	3.7	-	0.4	99.6	-	-	
Total%	2.5	-	0.6	-	-	-	-	-	-	54.4	2.1	-	0.2	40.2	-	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	10	-	4	-	-	-	-	-	-	359	14	-	2	292	-	-	681
Approach%	71.4	-	28.6	-	-	-	-	-	-	96.2	3.8	-	0.7	99.3	-	-	
Total%	1.5	-	0.6	-	-	-	-	-	-	52.7	2.1	-	0.3	42.9	-	-	
PHF				0.88				######				0.89				0.84	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #14
Location: Tecalote Drive & Reche Road

Start Date: 12/11/2008
File Name:941-15-2

	Tecalote Drive Northbound				Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	5	0	0	0	0	0	0	0	0	65	8	0	0	112	0	1	190
16:15	3	0	1	0	0	0	0	0	0	67	7	0	0	87	0	0	165
16:30	5	0	0	0	0	0	0	0	0	80	5	0	1	78	0	0	169
16:45	3	0	1	0	0	0	0	0	0	103	9	0	0	85	0	0	201
Total	16	0	2	0	0	0	0	0	0	315	29	0	1	362	0	1	725
17:00	4	0	0	0	0	0	0	0	0	100	6	0	0	92	0	0	202
17:15	8	0	2	0	0	0	0	0	0	80	5	0	0	86	0	0	181
17:30	2	0	0	0	0	0	0	0	0	98	1	0	0	106	0	0	207
17:45	2	0	0	0	0	0	0	0	0	83	5	0	1	79	0	0	170
Total	16	0	2	0	0	0	0	0	0	361	17	0	1	363	0	0	760
Grand Total	32	0	4	0	0	0	0	0	0	676	46	0	2	725	0	1	1485
Approach%	88.9	-	11.1	-	-	-	-	-	-	93.6	6.4	-	0.3	99.6	-	0.1	
Total%	2.2	-	0.3	-	-	-	-	-	-	45.5	3.1	-	0.1	48.8	-	0.1	

Peak hour analysis for the period 16:45 to 17:30

Volume	17	-	3	-	-	-	-	-	-	381	21	-	-	369	-	-	791
Approach%	85.0	-	15.0	-	-	-	-	-	-	94.8	5.2	-	-	100.0	-	-	
Total%	2.1	-	0.4	-	-	-	-	-	-	48.2	2.7	-	-	46.6	-	-	
PHF				0.50				######				0.90				0.87	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03
Location: Wilt Road & Reche Road

Start Date: 12/11/2008
File Name: 941-16-1

	Wilt Road Northbound				Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	11	0	1	0	0	0	0	0	0	74	4	0	6	78	0	0	174
7:15	9	0	5	0	0	0	0	0	0	97	2	0	1	76	0	0	190
7:30	11	0	2	0	0	0	0	0	0	98	5	0	3	58	0	0	177
7:45	13	0	3	0	0	0	0	0	0	91	6	0	4	73	0	0	190
Total	44	0	11	0	0	0	0	0	0	360	17	0	14	285	0	0	731
8:00	6	0	2	0	0	0	0	0	0	98	9	0	4	48	0	0	167
8:15	3	0	9	0	0	0	0	0	0	67	5	0	2	52	0	0	138
8:30	7	0	4	0	0	0	0	0	0	63	4	0	4	46	0	0	128
8:45	5	0	1	0	0	0	0	0	0	74	6	0	0	59	0	0	145
Total	21	0	16	0	0	0	0	0	0	302	24	0	10	205	0	0	578
Grand Total	65	0	27	0	0	0	0	0	0	662	41	0	24	490	0	0	1309
Approach%	70.7	-	29.3	-	-	-	-	-	-	94.2	5.8	-	4.7	95.3	-	-	
Total%	5.0	-	2.1	-	-	-	-	-	-	50.6	3.1	-	1.8	37.4	-	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	44	-	11	-	-	-	-	-	-	360	17	-	14	285	-	-	731
Approach%	80.0	-	20.0	-	-	-	-	-	-	95.5	4.5	-	4.7	95.3	-	-	
Total%	6.0	-	1.5	-	-	-	-	-	-	49.2	2.3	-	1.9	39.0	-	-	
PHF				0.86				######				0.92				0.89	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03
Location: Wilt Road & Reche Road

Start Date: 12/11/2008
File Name: 941-16-2

	Wilt Road Northbound				Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	6	0	2	0	0	0	0	0	0	76	6	0	3	117	0	0	210
16:15	5	0	7	0	0	0	0	0	0	70	7	0	1	91	0	0	181
16:30	10	0	2	0	0	0	0	0	0	86	7	0	2	78	0	0	185
16:45	8	0	2	0	0	0	0	0	0	111	6	0	1	95	0	0	223
Total	29	0	13	0	0	0	0	0	0	343	26	0	7	381	0	0	799
17:00	9	0	1	0	0	0	0	0	0	116	7	0	2	88	0	0	223
17:15	4	0	1	0	0	0	0	0	0	102	8	0	3	90	0	0	208
17:30	7	0	0	0	0	0	0	0	0	95	6	0	8	110	0	0	226
17:45	3	0	1	0	0	0	0	0	0	92	9	0	1	72	0	0	178
Total	23	0	3	0	0	0	0	0	0	405	30	0	14	360	0	0	835
Grand Total	52	0	16	0	0	0	0	0	0	748	56	0	21	741	0	0	1634
Approach%	76.5	-	23.5	-	-	-	-	-	-	93.0	7.0	-	2.8	97.2	-	-	
Total%	3.2	-	1.0	-	-	-	-	-	-	45.8	3.4	-	1.3	45.3	-	-	

Peak hour analysis for the period 16:45 to 17:30

Volume	28	-	4	-	-	-	-	-	-	424	27	-	14	383	-	-	880
Approach%	87.5	-	12.5	-	-	-	-	-	-	94.0	6.0	-	3.5	96.5	-	-	
Total%	3.2	-	0.5	-	-	-	-	-	-	48.2	3.1	-	1.6	43.5	-	-	
PHF				0.80				######				0.92				0.84	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #04 Start Date: 12/11/2008

Location: Gird Road/ Live Oak Park Driveway & Reche Road File Name: 941-17-1

	Gird Road Northbound				Live Oak Park Driveway Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	23	0	8	0	0	0	0	0	5	50	9	0	4	60	1	0	160
7:15	47	1	12	0	0	0	0	0	0	100	32	0	4	81	4	0	281
7:30	53	0	18	0	0	0	0	0	0	123	29	0	3	76	0	0	302
7:45	32	3	4	0	0	0	0	0	4	74	20	0	10	52	3	0	202
Total	155	4	42	0	0	0	0	0	9	347	90	0	21	269	8	0	945
8:00	15	0	13	0	0	0	0	0	0	93	23	0	15	43	0	0	202
8:15	21	0	10	0	0	1	0	0	1	76	14	0	7	59	0	0	189
8:30	29	0	7	0	0	0	1	0	0	76	31	0	10	63	6	0	223
8:45	37	0	6	0	1	0	0	0	1	93	18	0	5	67	0	0	228
Total	102	0	36	0	1	1	1	0	2	338	86	0	37	232	6	0	842
Grand Total	257	4	78	0	1	1	1	0	11	685	176	0	58	501	14	0	1787
Approach%	75.8	1.2	23.0	-	33.3	33.3	33.3	-	1.3	78.6	20.2	-	10.1	87.4	2.4	-	
Total%	14.4	0.2	4.4	-	0.1	0.1	0.1	-	0.6	38.3	9.8	-	3.2	28.0	0.8	-	

Peak hour analysis for the period 07:15 to 08:00

Volume	147	4	47	-	-	-	-	-	4	390	104	-	32	252	7	-	987
Approach%	74.2	2.0	23.7	-	-	-	-	-	0.8	78.3	20.9	-	11.0	86.6	2.4	-	
Total%	14.9	0.4	4.8	-	-	-	-	-	0.4	39.5	10.5	-	3.2	25.5	0.7	-	
PHF				0.70				######				0.82				0.82	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #04 Start Date: 12/11/2008

Location: Gird Road/ Live Oak Park Driveway & Reche Road File Name: 941-17-2

	Gird Road Northbound				Live Oak Park Driveway Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	45	0	9	0	0	0	0	0	1	79	30	0	17	104	0	0	285
16:15	43	2	6	0	1	0	1	0	0	85	33	0	8	79	1	0	259
16:30	32	0	5	0	1	1	0	0	1	98	27	0	5	84	2	0	256
16:45	26	0	11	0	0	1	0	0	0	114	20	0	11	99	0	0	282
Total	146	2	31	0	2	2	1	0	2	376	110	0	41	366	3	0	1082
17:00	31	0	7	0	0	0	0	0	0	118	23	0	9	92	0	0	280
17:15	16	0	10	0	0	0	0	0	4	113	24	0	17	84	3	0	271
17:30	20	0	9	0	0	1	0	0	2	100	10	0	8	99	0	0	249
17:45	46	3	10	0	0	0	0	0	0	97	48	2	6	68	15	0	293
Total	113	3	36	0	0	1	0	0	6	428	105	2	40	343	18	0	1093
Grand Total	259	5	67	0	2	3	1	0	8	804	215	2	81	709	21	0	2175
Approach%	78.2	1.5	20.2	-	33.3	50.0	16.7	-	0.8	78.1	20.9	0.2	10.0	87.4	2.6	-	
Total%	11.9	0.2	3.1	-	0.1	0.1	0.0	-	0.4	37.0	9.9	0.1	3.7	32.6	1.0	-	

Peak hour analysis for the period 17:00 to 17:45

Volume	113	3	36	-	-	1	-	-	6	428	105	2	40	343	18	-	1,093
Approach%	74.3	2.0	23.7	-	-	100.0	-	-	1.1	79.1	19.4	0.4	10.0	85.5	4.5	-	
Total%	10.3	0.3	3.3	-	-	0.1	-	-	0.5	39.2	9.6	0.2	3.7	31.4	1.6	-	
PHF				0.64				0.25				0.92				0.94	

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LOS Engineering, Inc.

5114 Sea Mist Court, San Diego, CA 92121

Counted By: Emp. #08
Location: Old Highway 395 & East Mission Road

Start Date: 12/18/2008
File Name: 941-18-1

	Old Highway 395 Northbound				East Mission Road Southbound				Eastbound				East Mission Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	3	37	0	152	9	0	0	0	0	0	0	30	0	209	0	440
7:15	0	3	33	0	136	6	0	0	0	0	0	0	26	0	206	0	410
7:30	0	5	43	0	129	10	0	0	0	0	0	0	29	0	241	0	457
7:45	0	10	40	0	132	14	0	0	0	0	0	0	22	0	222	1	440
Total	0	21	153	0	549	39	0	0	0	0	0	0	107	0	878	1	1747
8:00	0	3	37	0	139	18	0	0	0	0	0	0	22	0	154	0	373
8:15	0	5	30	0	126	5	0	0	0	0	0	0	24	0	150	0	340
8:30	0	9	42	1	120	12	0	0	0	0	0	0	23	0	124	0	330
8:45	0	9	37	0	112	10	0	0	0	0	0	0	21	0	140	0	329
Total	0	26	146	1	497	45	0	0	0	0	0	0	90	0	568	0	1372
Grand Total	0	47	299	1	1046	84	0	0	0	0	0	0	197	0	1446	1	3119
Approach%	-	13.5	86.2	0.3	92.6	7.4	-	-	-	-	-	-	12.0	-	88.0	0.1	
Total%	-	1.5	9.6	0.0	33.5	2.7	-	-	-	-	-	-	6.3	-	46.4	0.0	

Peak hour analysis for the period 07:00 to 07:45

Volume	-	21	153	-	549	39	-	-	-	-	-	-	107	-	878	1	1,747
Approach%	-	12.1	87.9	-	93.4	6.6	-	-	-	-	-	-	10.9	-	89.0	0.1	
Total%	-	1.2	8.8	-	31.4	2.2	-	-	-	-	-	-	6.1	-	50.3	0.1	
PHF				0.87				0.91				######				0.91	

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LOS Engineering, Inc.

5114 Sea Mist Court, San Diego, CA 92121

Counted By: Emp. #08
Location: Old Highway 395 & East Mission Road

Start Date: 12/18/2008
File Name: 941-18-2

	Old Highway 395 Northbound				East Mission Road Southbound				Eastbound				East Mission Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	6	55	0	233	7	0	0	0	0	0	0	48	0	175	1	524
16:15	0	6	49	0	251	5	0	0	0	0	0	0	30	0	183	0	524
16:30	0	11	53	0	244	6	0	0	0	0	0	0	66	0	151	1	531
16:45	0	9	60	0	242	2	0	0	0	0	0	0	37	0	179	1	529
Total	0	32	217	0	970	20	0	0	0	0	0	0	181	0	688	3	2108
17:00	0	12	59	0	243	5	0	0	0	0	0	0	43	0	159	0	521
17:15	0	7	58	0	239	5	0	0	0	0	0	0	55	0	150	0	514
17:30	0	4	71	0	227	8	0	0	0	0	0	0	43	0	163	0	516
17:45	0	8	76	0	223	4	0	0	0	0	0	0	63	0	153	0	527
Total	0	31	264	0	932	22	0	0	0	0	0	0	204	0	625	0	2078
Grand Total	0	63	481	0	1902	42	0	0	0	0	0	0	385	0	1313	3	4186
Approach%	-	11.6	88.4	-	97.8	2.2	-	-	-	-	-	-	22.6	-	77.2	0.2	
Total%	-	1.5	11.5	-	45.4	1.0	-	-	-	-	-	-	9.2	-	31.4	0.1	

Peak hour analysis for the period 16:00 to 16:45

Volume	-	32	217	-	970	20	-	-	-	-	-	-	181	-	688	3	2,108
Approach%	-	12.9	87.1	-	98.0	2.0	-	-	-	-	-	-	20.8	-	78.9	0.3	
Total%	-	1.5	10.3	-	46.0	0.9	-	-	-	-	-	-	8.6	-	32.6	0.1	
PHF				0.90				0.97				######				0.97	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #01 Start Date: 12/18/2008

Location: I-15 Southbound Ramps & East Mission Road File Name: 941-19-1

	I-15 Southbound On Ramp Northbound				I-15 Southbound Off Ramp Southbound				East Mission Road Eastbound				East Mission Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	2	0	190	0	0	129	52	0	17	59	0	0	449
7:15	0	0	0	0	4	6	190	0	0	126	48	0	15	50	0	0	439
7:30	0	0	0	0	1	1	216	0	0	134	47	0	15	61	0	0	475
7:45	0	0	0	0	1	0	179	0	0	140	46	0	14	72	0	0	452
Total	0	0	0	0	8	7	775	0	0	529	193	0	61	242	0	0	1815
8:00	0	0	0	0	2	0	128	0	0	135	47	0	11	43	0	0	366
8:15	0	0	0	0	1	1	125	0	0	118	42	0	11	57	0	0	355
8:30	0	0	0	0	1	2	102	0	0	122	48	0	10	42	0	0	327
8:45	0	0	0	0	1	0	124	0	0	114	44	0	7	43	0	0	333
Total	0	0	0	0	5	3	479	0	0	489	181	0	39	185	0	0	1381
Grand Total	0	0	0	0	13	10	1254	0	0	1018	374	0	100	427	0	0	3196
Approach%	-	-	-	-	1.0	0.8	98.2	-	-	73.1	26.9	-	19.0	81.0	-	-	
Total%	-	-	-	-	0.4	0.3	39.2	-	-	31.9	11.7	-	3.1	13.4	-	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	-	-	-	-	8	7	775	-	-	529	193	-	61	242	-	-	1,815
Approach%	-	-	-	-	1.0	0.9	98.1	-	-	73.3	26.7	-	20.1	79.9	-	-	
Total%	-	-	-	-	0.4	0.4	42.7	-	-	29.1	10.6	-	3.4	13.3	-	-	
PHF				######				0.91				0.97				0.88	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #01 Start Date: 12/18/2008

Location: I-15 Southbound Ramps & East Mission Road File Name: 941-19-2

	I-15 Southbound On Ramp Northbound				I-15 Southbound Off Ramp Southbound				East Mission Road Eastbound				East Mission Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	4	1	134	0	0	241	32	0	12	97	0	0	521
16:15	0	0	0	0	3	0	131	0	0	264	26	0	14	91	0	0	529
16:30	0	0	0	0	2	1	146	0	0	271	23	0	8	74	0	0	525
16:45	0	0	0	0	1	1	143	0	0	270	18	0	14	81	0	0	528
Total	0	0	0	0	10	3	554	0	0	1046	99	0	48	343	0	0	2103
17:00	0	0	0	0	2	0	137	0	0	291	18	0	8	68	0	0	524
17:15	0	0	0	0	2	0	149	0	0	265	20	0	10	61	0	0	507
17:30	0	0	0	0	2	0	137	0	0	270	13	0	15	78	0	0	515
17:45	0	0	0	0	1	1	163	0	0	270	19	0	3	58	0	0	515
Total	0	0	0	0	7	1	586	0	0	1096	70	0	36	265	0	0	2061
Grand Total	0	0	0	0	17	4	1140	0	0	2142	169	0	84	608	0	0	4164
Approach%	-	-	-	-	1.5	0.3	98.2	-	-	92.7	7.3	-	12.1	87.9	-	-	
Total%	-	-	-	-	0.4	0.1	27.4	-	-	51.4	4.1	-	2.0	14.6	-	-	

Peak hour analysis for the period 16:15 to 17:00

Volume	-	-	-	-	8	2	557	-	-	1,096	85	-	44	314	-	-	2,106
Approach%	-	-	-	-	1.4	0.4	98.2	-	-	92.8	7.2	-	12.3	87.7	-	-	
Total%	-	-	-	-	0.4	0.1	26.4	-	-	52.0	4.0	-	2.1	14.9	-	-	
PHF				######				0.95				0.96				0.85	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #02 Start Date: 12/18/2008

Location: I-15 Northbound Ramps & East Mission Road/ Old Highway 395 File Name: 941-20-1

	I-15 Northbound Off Ramp Northbound				I-15 Northbound On Ramp Southbound				East Mission Road Eastbound				Old Highway 395 Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	21	0	7	0	0	0	0	0	109	19	0	0	0	55	1	0	212
7:15	13	0	8	0	0	0	0	0	109	23	0	0	0	52	2	0	207
7:30	34	0	8	1	0	0	0	0	109	17	0	0	0	39	0	0	207
7:45	39	1	11	0	0	0	0	0	99	31	0	0	0	40	1	0	222
Total	107	1	34	1	0	0	0	0	426	90	0	0	0	186	4	0	848
8:00	29	1	10	0	0	0	0	0	125	22	0	0	0	30	1	0	218
8:15	31	0	6	0	0	0	0	0	101	16	0	0	0	31	1	0	186
8:30	19	0	4	0	0	0	0	0	107	19	0	0	0	28	1	0	178
8:45	24	1	6	0	0	0	0	0	74	19	0	0	0	18	1	0	143
Total	103	2	26	0	0	0	0	0	407	76	0	0	0	107	4	0	725
Grand Total	210	3	60	1	0	0	0	0	833	166	0	0	0	293	8	0	1573
Approach%	76.6	1.1	21.9	0.4	-	-	-	-	83.4	16.6	-	-	-	97.3	2.7	-	
Total%	13.4	0.2	3.8	0.1	-	-	-	-	53.0	10.6	-	-	-	18.6	0.5	-	

Peak hour analysis for the period 07:15 to 08:00

Volume	115	2	37	1	-	-	-	-	442	93	-	-	-	161	4	-	854
Approach%	74.2	1.3	23.9	0.6	-	-	-	-	82.6	17.4	-	-	-	97.6	2.4	-	
Total%	13.5	0.2	4.3	0.1	-	-	-	-	51.8	10.9	-	-	-	18.9	0.5	-	
PHF				0.76				######				0.91				0.76	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #02 Start Date: 12/18/2008

Location: I-15 Northbound Ramps & East Mission Road/ Old Highway 395 File Name: 941-20-2

	I-15 Northbound Off Ramp Northbound				I-15 Northbound On Ramp Southbound				East Mission Road Eastbound				Old Highway 395 Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	53	1	12	0	0	0	0	0	203	33	0	0	0	51	0	0	353
16:15	46	1	15	0	0	0	0	0	217	46	0	0	0	55	2	0	382
16:30	37	1	28	0	0	0	0	0	216	48	0	0	0	47	0	0	377
16:45	43	0	24	0	0	0	0	0	229	45	0	0	0	39	1	0	381
Total	179	3	79	0	0	0	0	0	865	172	0	0	0	192	3	0	1493
17:00	40	0	10	0	0	0	0	0	239	48	0	0	0	23	0	0	360
17:15	52	1	13	0	0	0	0	0	207	47	0	0	0	27	1	0	348
17:30	56	1	27	0	0	0	0	0	215	52	0	0	0	28	1	0	380
17:45	39	1	17	0	0	0	0	0	219	43	0	0	0	13	1	0	333
Total	187	3	67	0	0	0	0	0	880	190	0	0	0	91	3	0	1421
Grand Total	366	6	146	0	0	0	0	0	1745	362	0	0	0	283	6	0	2914
Approach%	70.7	1.2	28.2	-	-	-	-	-	82.8	17.2	-	-	-	97.9	2.1	-	
Total%	12.6	0.2	5.0	-	-	-	-	-	59.9	12.4	-	-	-	9.7	0.2	-	

Peak hour analysis for the period 16:15 to 17:00

Volume	166	2	77	-	-	-	-	-	901	187	-	-	-	164	3	-	1,500
Approach%	67.8	0.8	31.4	-	-	-	-	-	82.8	17.2	-	-	-	98.2	1.8	-	
Total%	11.1	0.1	5.1	-	-	-	-	-	60.1	12.5	-	-	-	10.9	0.2	-	
PHF				0.91				######				0.95				0.73	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06
Location: Pankey Road & Stewart Canyon Road

Start Date: 12/11/2008
File Name: 941-21-1

	Pankey Road Northbound				Pankey Road Southbound				Stewart Canyon Road Eastbound				Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	2	0	0	0	0	0	4	0	11	0	0	0	0	0	0	0	17
7:15	1	0	0	0	0	0	3	0	1	0	1	0	0	0	0	0	6
7:30	0	0	0	0	0	0	2	0	0	0	3	0	0	0	0	0	5
7:45	1	0	0	0	0	0	11	0	6	0	0	0	0	0	0	0	18
Total	4	0	0	0	0	0	20	0	18	0	4	0	0	0	0	0	46
8:00	0	0	0	0	0	0	4	0	5	0	1	0	0	0	0	0	10
8:15	0	0	0	0	0	0	5	0	8	0	0	2	0	0	0	0	13
8:30	1	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	5
8:45	0	0	0	0	0	0	3	0	4	0	0	0	0	0	0	0	7
Total	1	0	0	0	0	0	14	0	19	0	1	2	0	0	0	0	35
Grand Total	5	0	0	0	0	0	34	0	37	0	5	2	0	0	0	0	81
Approach%	100.0	-	-	-	-	-	100.0	-	84.1	-	11.4	4.5	-	-	-	-	
Total%	6.2	-	-	-	-	-	42.0	-	45.7	-	6.2	2.5	-	-	-	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	4	-	-	-	-	-	20	-	18	-	4	-	-	-	-	-	46
Approach%	100.0	-	-	-	-	-	100.0	-	81.8	-	18.2	-	-	-	-	-	
Total%	8.7	-	-	-	-	-	43.5	-	39.1	-	8.7	-	-	-	-	-	
PHF				0.50				0.45				0.50				######	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #07
Location: Pankey Road & Stewart Canyon Road

Start Date: 12/11/2008
File Name: 941-21-2

	Pankey Road Northbound				Pankey Road Southbound				Stewart Canyon Road Eastbound				Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	1	0	0	0	0	0	7	0	4	0	0	0	0	0	0	0	12
16:15	1	0	0	0	0	0	4	0	2	0	1	0	0	0	0	0	8
16:30	1	0	0	0	0	0	7	0	5	0	0	0	0	0	0	0	13
16:45	1	0	0	0	0	0	16	0	4	0	1	0	0	0	0	0	22
Total	4	0	0	0	0	0	34	0	15	0	2	0	0	0	0	0	55
17:00	1	0	0	0	0	0	8	0	5	0	2	0	0	0	0	0	16
17:15	1	0	0	0	0	0	5	0	3	0	0	0	0	0	0	0	9
17:30	0	1	0	0	0	0	1	0	6	0	0	0	0	0	0	0	8
17:45	0	0	0	0	0	0	3	0	5	0	0	0	0	0	0	0	8
Total	2	1	0	0	0	0	17	0	19	0	2	0	0	0	0	0	41
Grand Total	6	1	0	0	0	0	51	0	34	0	4	0	0	0	0	0	96
Approach%	85.7	14.3	-	-	-	-	100.0	-	89.5	-	10.5	-	-	-	-	-	
Total%	6.3	1.0	-	-	-	-	53.1	-	35.4	-	4.2	-	-	-	-	-	

Peak hour analysis for the period 16:30 to 17:15

Volume	4	-	-	-	-	-	36	-	17	-	3	-	-	-	-	-	60
Approach%	100.0	-	-	-	-	-	100.0	-	85.0	-	15.0	-	-	-	-	-	
Total%	6.7	-	-	-	-	-	60.0	-	28.3	-	5.0	-	-	-	-	-	
PHF				1.00				0.56				0.71				######	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06
Location: Melrose Drive & SR-76 (Mission Road)

Start Date: 11/13/2008
File Name: 932-07-1

	Melrose Drive Northbound				Melrose Drive Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Mission Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	93	0	30	0	1	0	0	0	0	154	28	0	11	336	2	0	655
7:15	84	0	13	0	0	0	0	0	0	179	54	0	13	257	0	0	600
7:30	98	1	17	0	0	0	1	0	0	161	83	1	13	285	2	0	661
7:45	97	0	14	0	0	1	1	0	16	196	53	0	17	313	2	0	710
Total	372	1	74	0	1	1	2	0	16	690	218	1	54	1191	6	0	2626
8:00	86	0	21	0	2	0	0	0	1	174	28	0	11	281	3	0	607
8:15	83	0	18	0	1	0	1	0	3	154	37	0	18	257	3	0	575
8:30	83	0	24	0	1	1	0	0	1	159	40	0	21	256	0	0	586
8:45	65	0	13	0	1	0	0	3	1	143	33	3	10	220	2	0	488
Total	317	0	76	0	5	1	1	3	6	630	138	3	60	1014	8	0	2256
Grand Total	689	1	150	0	6	2	3	3	22	1320	356	4	114	2205	14	0	4882
Approach%	82.0	0.1	17.9	-	42.9	14.3	21.4	21.4	1.3	77.6	20.9	0.2	4.9	94.5	0.6	-	
Total%	14.1	0.0	3.1	-	0.1	0.0	0.1	0.1	0.5	27.0	7.3	0.1	2.3	45.2	0.3	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	372	1	74	-	1	1	2	-	16	690	218	1	54	1,191	6	-	2,626
Approach%	83.2	0.2	16.6	-	25.0	25.0	50.0	-	1.7	74.6	23.6	0.1	4.3	95.2	0.5	-	
Total%	14.2	0.0	2.8	-	0.0	0.0	0.1	-	0.6	26.3	8.3	0.0	2.1	45.4	0.2	-	
PHF				0.91				0.50				0.87				0.90	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06
Location: Melrose Drive & SR-76 (Mission Road)

Start Date: 11/13/2008
File Name: 932-07-2

	Melrose Drive Northbound				Melrose Drive Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Mission Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	66	0	16	0	0	0	1	0	0	344	76	1	10	211	1	0	725
16:15	68	1	10	0	0	0	0	2	0	324	68	3	9	204	13	0	697
16:30	80	0	10	0	0	0	0	0	0	318	64	0	12	205	0	0	689
16:45	63	0	10	0	2	0	0	0	0	292	80	0	12	199	2	0	660
Total	277	1	46	0	2	0	1	2	0	1278	288	4	43	819	16	0	2771
17:00	69	0	10	0	0	0	0	0	1	382	87	0	14	230	0	0	793
17:15	51	0	8	0	0	0	0	0	0	373	101	0	8	220	0	0	761
17:30	70	0	14	0	0	0	0	0	0	356	77	0	14	206	1	1	738
17:45	56	0	13	0	0	0	0	0	3	353	95	0	8	178	0	0	706
Total	246	0	45	0	0	0	0	0	4	1464	360	0	44	834	1	1	2998
Grand Total	523	1	91	0	2	0	1	2	4	2742	648	4	87	1653	17	1	5769
Approach%	85.0	0.2	14.8	-	40.0	-	20.0	40.0	0.1	80.7	19.1	0.1	4.9	94.0	1.0	0.1	
Total%	9.1	0.0	1.6	-	0.0	-	0.0	0.0	0.1	47.5	11.2	0.1	1.5	28.7	0.3	0.0	

Peak hour analysis for the period 17:00 to 17:45

Volume	246	-	45	-	-	-	-	-	4	1,464	360	-	44	834	1	1	2,998
Approach%	84.5	-	15.5	-	-	-	-	-	0.2	80.1	19.7	-	5.0	94.8	0.1	0.1	
Total%	8.2	-	1.5	-	-	-	-	-	0.1	48.8	12.0	-	1.5	27.8	0.0	0.0	
PHF				0.87				######				0.96				0.90	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03 Start Date: 11/13/2008

Location: Old River Road/ East Vista Way & SR-76 (Mission Road) File Name: 932-06-1

	East Vista Way Northbound				Old River Road Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Mission Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	66	7	73	0	0	45	68	0	7	124	59	0	63	187	0	0	699
7:15	49	11	67	0	2	44	53	0	7	111	70	0	64	183	1	0	662
7:30	60	10	66	0	0	40	25	0	8	143	53	3	80	206	4	0	695
7:45	74	18	72	0	3	38	55	1	8	142	56	0	61	223	1	0	751
Total	249	46	278	0	5	167	201	1	30	520	238	3	268	799	6	0	2807
8:00	44	7	57	0	1	41	48	0	6	121	46	0	68	225	0	0	664
8:15	35	5	50	0	0	27	29	0	9	153	31	1	74	234	1	0	648
8:30	42	3	49	0	1	16	19	0	6	104	32	0	84	190	4	0	550
8:45	40	15	53	0	1	14	18	0	1	118	39	0	62	185	0	0	546
Total	161	30	209	0	3	98	114	0	22	496	148	1	288	834	5	0	2408
Grand Total	410	76	487	0	8	265	315	1	52	1016	386	4	556	1633	11	0	5215
Approach%	42.1	7.8	50.1	-	1.4	45.0	53.5	0.2	3.6	69.7	26.5	0.3	25.3	74.2	0.5	-	
Total%	7.9	1.5	9.3	-	0.2	5.1	6.0	0.0	1.0	19.5	7.4	0.1	10.7	31.3	0.2	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	249	46	278	-	5	167	201	1	30	520	238	3	268	799	6	-	2,807
Approach%	43.5	8.0	48.5	-	1.3	44.7	53.7	0.3	3.8	65.7	30.1	0.4	25.0	74.5	0.6	-	
Total%	8.9	1.6	9.9	-	0.2	5.9	7.2	0.0	1.1	18.5	8.5	0.1	9.5	28.5	0.2	-	
PHF				0.87				0.83				0.96				0.93	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03 Start Date: 11/13/2008

Location: Old River Road/ East Vista Way & SR-76 (Mission Road) File Name: 932-06-2

	East Vista Way Northbound				Old River Road Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Mission Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	50	6	95	0	1	14	14	0	11	244	52	0	91	169	3	0	750
16:15	54	13	85	0	2	22	13	0	18	253	59	0	100	174	2	0	795
16:30	37	20	94	0	0	15	17	0	21	251	49	0	89	175	6	0	774
16:45	41	23	74	0	0	17	14	0	20	233	39	0	95	175	4	0	735
Total	182	62	348	0	3	68	58	0	70	981	199	0	375	693	15	0	3054
17:00	45	25	79	0	0	12	16	0	15	206	52	0	95	182	4	0	731
17:15	49	15	88	0	0	28	19	0	25	213	40	0	102	164	5	0	748
17:30	40	20	93	0	2	16	9	0	27	218	52	0	97	174	2	0	750
17:45	50	16	95	0	2	11	7	0	13	215	45	0	92	150	3	0	699
Total	184	76	355	0	4	67	51	0	80	852	189	0	386	670	14	0	2928
Grand Total	366	138	703	0	7	135	109	0	150	1833	388	0	761	1363	29	0	5982
Approach%	30.3	11.4	58.2	-	2.8	53.8	43.4	-	6.3	77.3	16.4	-	35.3	63.3	1.3	-	
Total%	6.1	2.3	11.8	-	0.1	2.3	1.8	-	2.5	30.6	6.5	-	12.7	22.8	0.5	-	

Peak hour analysis for the period 16:00 to 16:45

Volume	182	62	348	-	3	68	58	-	70	981	199	-	375	693	15	-	3,054
Approach%	30.7	10.5	58.8	-	2.3	52.7	45.0	-	5.6	78.5	15.9	-	34.6	64.0	1.4	-	
Total%	6.0	2.0	11.4	-	0.1	2.2	1.9	-	2.3	32.1	6.5	-	12.3	22.7	0.5	-	
PHF				0.97				0.87				0.95				0.98	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #12
Location: North River Road & SR-76 (Mission Road)

Start Date: 11/13/2008
File Name: 932-05-1

	Northbound				North River Road Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Mission Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	18	0	15	0	34	163	0	0	0	250	53	0	533
7:15	0	0	0	0	32	0	21	0	26	174	0	0	0	265	36	0	554
7:30	0	0	0	0	27	0	13	0	20	180	0	0	0	274	36	0	550
7:45	0	0	0	0	14	0	17	0	13	215	0	0	0	287	35	0	581
Total	0	0	0	0	91	0	66	0	93	732	0	0	0	1076	160	0	2218
8:00	0	0	0	0	23	0	11	0	16	162	0	0	0	267	29	0	508
8:15	0	0	0	0	20	0	13	0	15	158	0	0	0	288	18	0	512
8:30	0	0	0	0	10	0	17	0	3	172	0	0	0	265	24	0	491
8:45	0	0	0	0	12	0	12	0	14	156	0	0	0	260	17	0	471
Total	0	0	0	0	65	0	53	0	48	648	0	0	0	1080	88	0	1982
Grand Total	0	0	0	0	156	0	119	0	141	1380	0	0	0	2156	248	0	4200
Approach%	-	-	-	-	56.7	-	43.3	-	9.3	90.7	-	-	-	89.7	10.3	-	
Total%	-	-	-	-	3.7	-	2.8	-	3.4	32.9	-	-	-	51.3	5.9	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	-	-	-	-	91	-	66	-	93	732	-	-	-	1,076	160	-	2,218
Approach%	-	-	-	-	58.0	-	42.0	-	11.3	88.7	-	-	-	87.1	12.9	-	
Total%	-	-	-	-	4.1	-	3.0	-	4.2	33.0	-	-	-	48.5	7.2	-	
PHF				######				0.74				0.90				0.96	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #01
Location: North River Road & SR-76 (Mission Road)

Start Date: 11/13/2008
File Name: 932-05-2

	Northbound				North River Road Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Mission Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	48	0	46	0	12	311	0	0	0	224	24	1	665
16:15	0	0	0	0	45	0	36	0	7	330	0	0	0	237	21	0	676
16:30	0	0	0	0	44	0	31	0	9	315	0	0	0	229	22	0	650
16:45	0	0	0	0	50	0	49	0	9	312	0	0	0	241	41	0	702
Total	0	0	0	0	187	0	162	0	37	1268	0	0	0	931	108	1	2693
17:00	0	0	0	0	54	0	30	2	8	303	0	0	0	244	23	2	662
17:15	0	0	0	0	56	0	18	0	14	307	0	0	0	245	24	0	664
17:30	0	0	0	0	60	0	28	0	15	301	0	0	0	234	22	0	660
17:45	0	0	0	0	57	0	24	0	5	301	0	0	0	223	28	0	638
Total	0	0	0	0	227	0	100	2	42	1212	0	0	0	946	97	2	2624
Grand Total	0	0	0	0	414	0	262	2	79	2480	0	0	0	1877	205	3	5317
Approach%	-	-	-	-	61.1	-	38.6	0.3	3.1	96.9	-	-	-	90.0	9.8	0.1	
Total%	-	-	-	-	7.8	-	4.9	0.0	1.5	46.6	-	-	-	35.3	3.9	0.1	

Peak hour analysis for the period 16:00 to 16:45

Volume	-	-	-	-	187	-	162	-	37	1,268	-	-	-	931	108	1	2,693
Approach%	-	-	-	-	53.6	-	46.4	-	2.8	97.2	-	-	-	89.5	10.4	0.1	
Total%	-	-	-	-	6.9	-	6.0	-	1.4	47.1	-	-	-	34.6	4.0	0.0	
PHF				######				0.88				0.97				0.92	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #14 Start Date: 11/13/2008

Location: Olive Hill Road/ Camino Del Rey & SR-76 (Mission Road) File Name: 932-04-1

	Camino Del Rey Northbound				Olive Hill Road Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Mission Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	9	9	56	0	23	60	8	0	13	171	6	0	86	283	13	1	737
7:15	12	9	58	0	18	35	18	0	21	162	15	0	139	275	11	1	773
7:30	12	18	56	1	14	59	18	0	14	195	26	0	113	256	18	2	799
7:45	11	25	62	0	26	60	15	0	12	164	35	0	121	274	14	0	819
Total	44	61	232	1	81	214	59	0	60	692	82	0	459	1088	56	4	3128
8:00	15	29	68	0	30	37	12	0	9	155	10	0	51	250	8	0	674
8:15	17	13	48	0	18	23	18	0	18	171	8	0	53	246	13	0	646
8:30	9	8	35	0	20	16	32	0	11	172	14	0	43	232	6	0	598
8:45	10	9	29	0	19	11	22	0	6	176	13	0	34	238	3	0	570
Total	51	59	180	0	87	87	84	0	44	674	45	0	181	966	30	0	2488
Grand Total	95	120	412	1	168	301	143	0	104	1366	127	0	640	2054	86	4	5616
Approach%	15.1	19.1	65.6	0.2	27.5	49.2	23.4	-	6.5	85.5	8.0	-	23.0	73.8	3.1	0.1	
Total%	1.7	2.1	7.3	0.0	3.0	5.4	2.5	-	1.9	24.3	2.3	-	11.4	36.6	1.5	0.1	

Peak hour analysis for the period 07:00 to 07:45

Volume	44	61	232	1	81	214	59	-	60	692	82	-	459	1,088	56	4	3,128
Approach%	13.0	18.0	68.6	0.3	22.9	60.5	16.7	-	7.2	83.0	9.8	-	28.6	67.7	3.5	0.2	
Total%	1.4	2.0	7.4	0.0	2.6	6.8	1.9	-	1.9	22.1	2.6	-	14.7	34.8	1.8	0.1	
PHF				0.86				0.88				0.89				0.94	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #14 Start Date: 11/13/2008

Location: Olive Hill Road/ Camino Del Rey & SR-76 (Mission Road) File Name: 932-04-2

	Camino Del Rey Northbound				Olive Hill Road Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Mission Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	13	18	49	0	26	13	16	0	15	319	18	0	48	186	23	0	744
16:15	18	19	86	0	33	25	9	0	25	331	12	0	43	229	17	0	847
16:30	20	25	74	0	21	16	21	0	19	342	10	0	59	219	12	0	838
16:45	18	11	82	0	27	11	19	0	26	311	13	0	55	253	22	2	848
Total	69	73	291	0	107	65	65	0	85	1303	53	0	205	887	74	2	3277
17:00	15	26	76	0	39	8	18	0	20	313	10	0	58	204	23	0	810
17:15	11	16	68	0	27	17	17	0	20	320	15	0	51	242	11	0	815
17:30	10	27	72	0	30	8	15	0	22	312	11	0	54	219	12	0	792
17:45	3	15	47	0	32	19	15	0	29	314	10	0	41	220	16	0	761
Total	39	84	263	0	128	52	65	0	91	1259	46	0	204	885	62	0	3178
Grand Total	108	157	554	0	235	117	130	0	176	2562	99	0	409	1772	136	2	6455
Approach%	13.2	19.2	67.6	-	48.8	24.3	27.0	-	6.2	90.3	3.5	-	17.6	76.4	5.9	0.1	
Total%	1.7	2.4	8.6	-	3.6	1.8	2.0	-	2.7	39.7	1.5	-	6.3	27.5	2.1	0.0	

Peak hour analysis for the period 16:15 to 17:00

Volume	71	81	318	-	120	60	67	-	90	1,297	45	-	215	905	74	2	3,343
Approach%	15.1	17.2	67.7	-	48.6	24.3	27.1	-	6.3	90.6	3.1	-	18.0	75.7	6.2	0.2	
Total%	2.1	2.4	9.5	-	3.6	1.8	2.0	-	2.7	38.8	1.3	-	6.4	27.1	2.2	0.1	
PHF				0.96				0.92				0.96				0.90	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #04 Start Date: 11/13/2008

Location: South Mission Road & SR-76 (Pala Road)/ SR-76 (Mission Road) File Name: 932-03-1

	Northbound				South Mission Road Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Pala Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	23	0	236	0	170	70	0	0	0	197	20	0	716
7:15	0	0	0	0	28	1	184	0	143	124	1	0	0	218	26	0	725
7:30	0	0	0	0	30	0	181	0	104	109	1	0	0	194	20	0	639
7:45	0	0	0	0	22	1	180	0	108	139	0	0	0	219	23	0	692
Total	0	0	0	0	103	2	781	0	525	442	2	0	0	828	89	0	2772
8:00	0	0	0	0	28	2	170	0	151	152	1	0	0	139	12	0	655
8:15	0	0	0	0	16	4	137	0	101	121	0	0	0	155	17	1	551
8:30	0	0	0	0	21	1	139	0	89	100	2	0	0	159	14	0	525
8:45	0	0	0	0	20	4	100	0	112	99	2	0	0	148	12	0	497
Total	0	0	0	0	85	11	546	0	453	472	5	0	0	601	55	1	2228
Grand Total	0	0	0	0	188	13	1327	0	978	914	7	0	0	1429	144	1	5000
Approach%	-	-	-	-	12.3	0.9	86.8	-	51.5	48.1	0.4	-	-	90.8	9.1	0.1	
Total%	-	-	-	-	3.8	0.3	26.5	-	19.6	18.3	0.1	-	-	28.6	2.9	0.0	

Peak hour analysis for the period 07:00 to 07:45

Volume	-	-	-	-	103	2	781	-	525	442	2	-	-	828	89	-	2,772
Approach%	-	-	-	-	11.6	0.2	88.1	-	54.2	45.6	0.2	-	-	90.3	9.7	-	
Total%	-	-	-	-	3.7	0.1	28.2	-	18.9	15.9	0.1	-	-	29.9	3.2	-	
PHF				######				0.86				0.90				0.94	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #04 Start Date: 11/13/2008

Location: South Mission Road & SR-76 (Pala Road)/ SR-76 (Mission Road) File Name: 932-03-2

	Northbound				South Mission Road Southbound				SR-76 (Mission Road) Eastbound				SR-76 (Pala Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	27	0	103	0	199	190	0	0	0	170	22	0	711
16:15	0	0	0	0	25	0	121	0	247	202	0	0	0	188	15	0	798
16:30	0	0	0	0	24	0	110	0	182	185	0	0	0	155	30	0	686
16:45	0	0	0	0	23	0	77	0	218	165	0	0	0	212	28	0	723
Total	0	0	0	0	99	0	411	0	846	742	0	0	0	725	95	0	2918
17:00	0	0	0	0	41	0	124	0	220	247	0	0	0	219	33	1	884
17:15	0	0	0	0	38	0	112	0	190	184	0	0	0	165	23	0	712
17:30	0	0	0	0	24	0	81	0	224	217	0	0	0	182	29	0	757
17:45	0	0	0	0	16	0	106	1	176	213	0	0	0	181	17	0	709
Total	0	0	0	0	119	0	423	1	810	861	0	0	0	747	102	1	3062
Grand Total	0	0	0	0	218	0	834	1	1656	1603	0	0	0	1472	197	1	5980
Approach%	-	-	-	-	20.7	-	79.2	0.1	50.8	49.2	-	-	-	88.1	11.8	0.1	
Total%	-	-	-	-	3.6	-	13.9	0.0	27.7	26.8	-	-	-	24.6	3.3	0.0	

Peak hour analysis for the period 16:15 to 17:00

Volume	-	-	-	-	113	-	432	-	867	799	-	-	-	774	106	1	3,091
Approach%	-	-	-	-	20.7	-	79.3	-	52.0	48.0	-	-	-	87.9	12.0	0.1	
Total%	-	-	-	-	3.7	-	14.0	-	28.0	25.8	-	-	-	25.0	3.4	0.0	
PHF				######				0.83				0.89				0.87	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03 Start Date: 11/18/2008

Location: South Live Oak Park Road & Reche Road File Name: 932-08-1

	Northbound				South Live Oak Park Road Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	13	0	26	0	5	95	0	0	0	106	8	0	253
7:15	0	0	0	0	22	0	37	0	9	100	0	0	0	103	6	0	277
7:30	0	0	0	0	16	0	38	0	18	92	0	0	0	87	16	0	267
7:45	0	0	0	0	28	0	46	0	26	78	0	0	0	87	26	0	291
Total	0	0	0	0	79	0	147	0	58	365	0	0	0	383	56	0	1088
8:00	0	0	0	0	20	0	12	0	16	93	0	0	0	54	18	0	213
8:15	0	0	0	0	11	0	9	0	8	84	0	0	0	54	8	0	174
8:30	0	0	0	0	11	0	10	0	13	81	0	0	0	78	9	0	202
8:45	0	0	0	0	5	0	12	0	6	70	0	0	0	74	7	0	174
Total	0	0	0	0	47	0	43	0	43	328	0	0	0	260	42	0	763
Grand Total	0	0	0	0	126	0	190	0	101	693	0	0	0	643	98	0	1851
Approach%	-	-	-	-	39.9	-	60.1	-	12.7	87.3	-	-	-	86.8	13.2	-	
Total%	-	-	-	-	6.8	-	10.3	-	5.5	37.4	-	-	-	34.7	5.3	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	-	-	-	-	79	-	147	-	58	365	-	-	-	383	56	-	1,088
Approach%	-	-	-	-	35.0	-	65.0	-	13.7	86.3	-	-	-	87.2	12.8	-	
Total%	-	-	-	-	7.3	-	13.5	-	5.3	33.5	-	-	-	35.2	5.1	-	
PHF				######				0.76				0.96				0.96	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #03
Location: South Live Oak Park Road & Reche Road

Start Date: 11/18/2008
File Name: 932-08-2

	Northbound				South Live Oak Park Road Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	13	0	17	0	13	68	0	0	0	134	9	0	254
16:15	0	0	0	0	8	0	7	0	10	89	0	0	0	117	19	0	250
16:30	0	0	0	0	12	0	10	0	11	93	0	0	0	99	13	0	238
16:45	0	0	0	0	6	0	5	0	8	86	0	0	0	116	6	0	227
Total	0	0	0	0	39	0	39	0	42	336	0	0	0	466	47	0	969
17:00	0	0	0	0	11	0	16	0	14	90	0	0	0	122	10	0	263
17:15	0	0	0	0	13	0	14	0	4	102	0	0	0	126	14	0	273
17:30	0	0	0	0	2	0	10	0	6	84	0	0	0	115	10	0	227
17:45	0	0	0	0	3	0	6	0	7	61	0	0	0	106	5	0	188
Total	0	0	0	0	29	0	46	0	31	337	0	0	0	469	39	0	951
Grand Total	0	0	0	0	68	0	85	0	73	673	0	0	0	935	86	0	1920
Approach%	-	-	-	-	44.4	-	55.6	-	9.8	90.2	-	-	-	91.6	8.4	-	
Total%	-	-	-	-	3.5	-	4.4	-	3.8	35.1	-	-	-	48.7	4.5	-	

Peak hour analysis for the period 16:30 to 17:15

Volume	-	-	-	-	42	-	45	-	37	371	-	-	-	463	43	-	1,001
Approach%	-	-	-	-	48.3	-	51.7	-	9.1	90.9	-	-	-	91.5	8.5	-	
Total%	-	-	-	-	4.2	-	4.5	-	3.7	37.1	-	-	-	46.3	4.3	-	
PHF				######				0.81				0.96				0.90	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06 Start Date: 11/18/2008

Location: Via Green Canyon Norte/ Green Canyon Road & Reche Road File Name: 932-09-1

	Green Canyon Road Northbound				Via Green Canyon Norte Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	14	1	21	1	1	1	2	0	5	80	7	0	14	102	2	0	250
7:15	41	1	28	0	5	1	2	0	1	71	11	0	21	121	1	0	304
7:30	56	0	41	1	1	0	0	0	1	87	8	0	15	117	0	0	326
7:45	39	0	20	0	1	1	0	0	2	93	11	0	10	109	0	1	286
Total	150	2	110	2	8	3	4	0	9	331	37	0	60	449	3	1	1166
8:00	18	1	21	0	1	1	0	0	0	102	18	0	9	71	0	1	242
8:15	5	0	19	0	0	0	1	0	2	72	8	0	5	53	4	0	169
8:30	10	1	27	0	4	0	2	0	1	74	6	0	9	77	0	0	211
8:45	10	0	21	0	0	1	1	0	0	65	4	0	12	74	1	0	189
Total	43	2	88	0	5	2	4	0	3	313	36	0	35	275	5	1	811
Grand Total	193	4	198	2	13	5	8	0	12	644	73	0	95	724	8	2	1977
Approach%	48.6	1.0	49.9	0.5	50.0	19.2	30.8	-	1.6	88.3	10.0	-	11.5	87.3	1.0	0.2	
Total%	9.8	0.2	10.0	0.1	0.7	0.3	0.4	-	0.6	32.6	3.7	-	4.8	36.6	0.4	0.1	

Peak hour analysis for the period 07:00 to 07:45

Volume	150	2	110	2	8	3	4	-	9	331	37	-	60	449	3	1	1,166
Approach%	56.8	0.8	41.7	0.8	53.3	20.0	26.7	-	2.4	87.8	9.8	-	11.7	87.5	0.6	0.2	
Total%	12.9	0.2	9.4	0.2	0.7	0.3	0.3	-	0.8	28.4	3.2	-	5.1	38.5	0.3	0.1	
PHF				0.67				0.47				0.89				0.90	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06 Start Date: 11/18/2008

Location: Via Green Canyon Norte/ Green Canyon Road & Reche Road File Name: 932-09-2

	Green Canyon Road Northbound				Via Green Canyon Norte Southbound				Reche Road Eastbound				Reche Road Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	12	0	9	0	0	0	0	0	1	74	21	1	20	109	1	0	247
16:15	18	0	11	0	0	0	2	0	0	97	13	1	22	94	2	0	259
16:30	27	0	10	2	0	0	0	0	0	116	13	0	12	100	1	0	279
16:45	17	1	11	0	3	0	3	0	1	95	6	0	17	99	3	0	256
Total	74	1	41	2	3	0	5	0	2	382	53	2	71	402	7	0	1041
17:00	7	1	10	0	0	0	2	0	0	93	12	0	19	112	1	0	257
17:15	10	0	14	0	1	0	1	0	0	106	12	0	20	118	1	0	283
17:30	18	0	14	0	0	0	3	0	2	72	9	0	21	83	0	0	222
17:45	12	0	6	0	0	0	0	0	0	73	9	0	18	90	1	0	209
Total	47	1	44	0	1	0	6	0	2	344	42	0	78	403	3	0	971
Grand Total	121	2	85	2	4	0	11	0	4	726	95	2	149	805	10	0	2012
Approach%	57.6	1.0	40.5	1.0	26.7	-	73.3	-	0.5	87.8	11.5	0.2	15.5	83.5	1.0	-	
Total%	6.0	0.1	4.2	0.1	0.2	-	0.5	-	0.2	36.1	4.7	0.1	7.4	40.0	0.5	-	

Peak hour analysis for the period 16:30 to 17:15

Volume	61	2	45	2	4	-	6	-	1	410	43	-	68	429	6	-	1,075
Approach%	55.5	1.8	40.9	1.8	40.0	-	60.0	-	0.2	90.3	9.5	-	13.5	85.3	1.2	-	
Total%	5.7	0.2	4.2	0.2	0.4	-	0.6	-	0.1	38.1	4.0	-	6.3	39.9	0.6	-	
PHF				0.71				0.42				0.88				0.90	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06 Start Date: 11/19/2008

Location: Pala Mission Road/ Pala Casino Driveway & SR-76 (Pala Road) File Name: 932-01-1

	Pala Casino Driveway Northbound				Pala Mission Road Southbound				SR-76 (Pala Road) Eastbound				SR-76 (Pala Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	2	1	0	0	2	1	22	0	27	29	0	0	0	25	0	0	109
7:15	1	3	1	0	1	2	29	0	11	31	2	0	0	16	1	0	98
7:30	5	0	0	0	3	1	33	0	30	50	2	1	1	15	0	0	140
7:45	3	0	0	0	4	1	34	0	23	38	6	0	1	24	2	0	136
Total	11	4	1	0	10	5	118	0	91	148	10	1	2	80	3	0	483
8:00	1	0	0	0	10	3	28	0	15	26	3	0	1	24	3	0	114
8:15	0	0	0	0	4	3	24	0	13	34	2	0	2	20	4	1	106
8:30	3	2	0	0	4	2	30	1	14	39	0	2	1	21	4	0	120
8:45	4	4	0	1	3	1	21	0	23	22	0	1	0	19	5	0	102
Total	8	6	0	1	21	9	103	1	65	121	5	3	4	84	16	1	442
Grand Total	19	10	1	1	31	14	221	1	156	269	15	4	6	164	19	1	925
Approach%	61.3	32.3	3.2	3.2	11.6	5.2	82.8	0.4	35.1	60.6	3.4	0.9	3.2	86.3	10.0	0.5	
Total%	2.1	1.1	0.1	0.1	3.4	1.5	23.9	0.1	16.9	29.1	1.6	0.4	0.6	17.7	2.1	0.1	

Peak hour analysis for the period 07:30 to 08:15

Volume	9	-	-	-	21	8	119	-	81	148	13	1	5	83	9	1	496
Approach%	100.0	-	-	-	14.2	5.4	80.4	-	33.3	60.9	5.3	0.4	5.1	84.7	9.2	1.0	
Total%	1.8	-	-	-	4.2	1.6	24.0	-	16.3	29.8	2.6	0.2	1.0	16.7	1.8	0.2	
PHF				0.45				0.90				0.73				0.88	

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LOS Engineering, Inc.

5629 Willowmere Lane, San Diego, CA 92130

Counted By: Emp. #06 Start Date: 11/19/2008

Location: Pala Mission Road/ Pala Casino Driveway & SR-76 (Pala Road) File Name: 932-01-2

	Pala Casino Driveway Northbound				Pala Mission Road Southbound				SR-76 (Pala Road) Eastbound				SR-76 (Pala Road) Westbound				Vehicle
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	6	5	3	0	2	4	28	0	43	40	2	0	2	61	2	0	198
16:15	0	0	2	0	1	2	28	0	37	53	5	0	6	47	3	0	184
16:30	1	8	2	0	9	9	51	1	53	45	3	0	2	51	2	0	236
16:45	4	6	2	0	5	4	29	0	32	41	7	0	5	54	2	1	191
Total	11	19	9	0	17	19	136	1	165	179	17	0	15	213	9	1	809
17:00	7	4	0	0	1	7	21	0	43	49	7	0	0	39	2	0	180
17:15	9	2	0	0	0	8	18	0	47	34	5	0	3	54	4	0	184
17:30	3	2	0	0	2	3	33	0	34	46	4	3	3	31	0	0	161
17:45	3	4	0	0	2	5	13	1	20	20	6	1	2	35	3	0	113
Total	22	12	0	0	5	23	85	1	144	149	22	4	8	159	9	0	638
Grand Total	33	31	9	0	22	42	221	2	309	328	39	4	23	372	18	1	1447
Approach%	45.2	42.5	12.3	-	7.7	14.6	77.0	0.7	45.4	48.2	5.7	0.6	5.6	89.9	4.3	0.2	
Total%	2.3	2.1	0.6	-	1.5	2.9	15.3	0.1	21.4	22.7	2.7	0.3	1.6	25.7	1.2	0.1	

Peak hour analysis for the period 16:00 to 16:45

Volume	11	19	9	-	17	19	136	1	165	179	17	-	15	213	9	1	809
Approach%	28.2	48.7	23.1	-	9.8	11.0	78.6	0.6	45.7	49.6	4.7	-	6.3	89.5	3.8	0.4	
Total%	1.4	2.3	1.1	-	2.1	2.3	16.8	0.1	20.4	22.1	2.1	-	1.9	26.3	1.1	0.1	
PHF				0.70				0.62				0.89				0.92	

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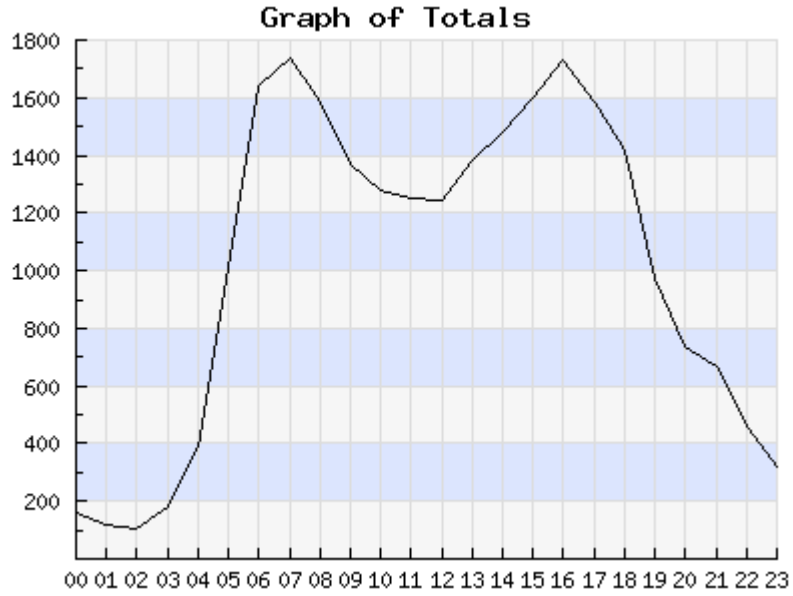
Daily Vehicle Volume Report

Location:
SR-76 btwn Vista Way & Melrose
File Number: 93216
Counter ID: 110
Report Duration:
Tuesday Nov 18, 2008 - 09:30 to
Wednesday Nov 19, 2008 - 09:29
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	80	79	159
01:00 - 01:59	70	51	121
02:00 - 02:59	47	55	102
03:00 - 03:59	46	133	179
04:00 - 04:59	91	295	386
05:00 - 05:59	246	762	1008
06:00 - 06:59	506	1136	1642
07:00 - 07:59	709	1025	1734
08:00 - 08:59	593	990	1583
09:00 - 09:59	604	764	1368
10:00 - 10:59	596	686	1282
11:00 - 11:59	638	616	1254
12:00 - 12:59	693	554	1247
13:00 - 13:59	760	624	1384
14:00 - 14:59	892	591	1483
15:00 - 15:59	1104	495	1599
16:00 - 16:59	1141	589	1730
17:00 - 17:59	1085	501	1586
18:00 - 18:59	919	502	1421
19:00 - 19:59	633	341	974
20:00 - 20:59	435	302	737
21:00 - 21:59	406	261	667
22:00 - 22:59	269	189	458
23:00 - 23:59	186	134	320
Total	**12749**	**11675**	**24424**
AM Peak	7:00	6:00	6:30
Hour	7:59	6:59	7:29
Volume	709	1136	1751
PM Peak	16:15	13:45	16:00
Hour	17:14	14:44	16:59
Volume	1151	652	1730

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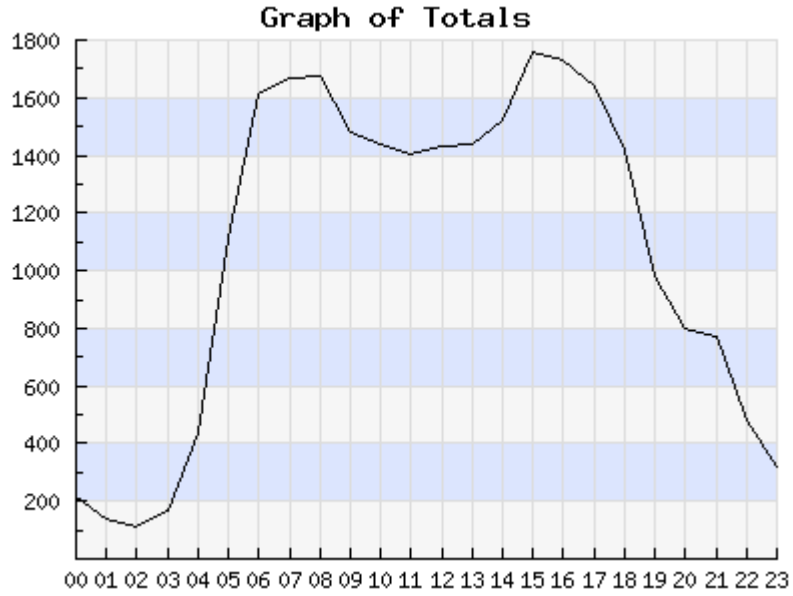
Daily Vehicle Volume Report

Location:
SR-76 btwn North River Rd & East Vista Way
File Number: 93315
Counter ID: 113
Report Duration:
Wednesday Nov 12, 2008 - 00:00 to
Wednesday Nov 12, 2008 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	115	100	215
01:00 - 01:59	67	73	140
02:00 - 02:59	62	51	113
03:00 - 03:59	41	128	169
04:00 - 04:59	115	322	437
05:00 - 05:59	323	791	1114
06:00 - 06:59	572	1042	1614
07:00 - 07:59	670	996	1666
08:00 - 08:59	618	1055	1673
09:00 - 09:59	595	882	1477
10:00 - 10:59	609	827	1436
11:00 - 11:59	675	732	1407
12:00 - 12:59	781	648	1429
13:00 - 13:59	782	658	1440
14:00 - 14:59	945	578	1523
15:00 - 15:59	1117	642	1759
16:00 - 16:59	1157	575	1732
17:00 - 17:59	1081	559	1640
18:00 - 18:59	1129	287	1416
19:00 - 19:59	705	278	983
20:00 - 20:59	497	304	801
21:00 - 21:59	516	255	771
22:00 - 22:59	306	176	482
23:00 - 23:59	152	168	320
Total	**13630**	**12127**	**25757**
AM Peak	6:30	8:00	6:30
Hour	7:29	8:59	7:29
Volume	707	1055	1696
PM Peak	16:15	12:15	15:15
Hour	17:14	13:14	16:14
Volume	1164	660	1775

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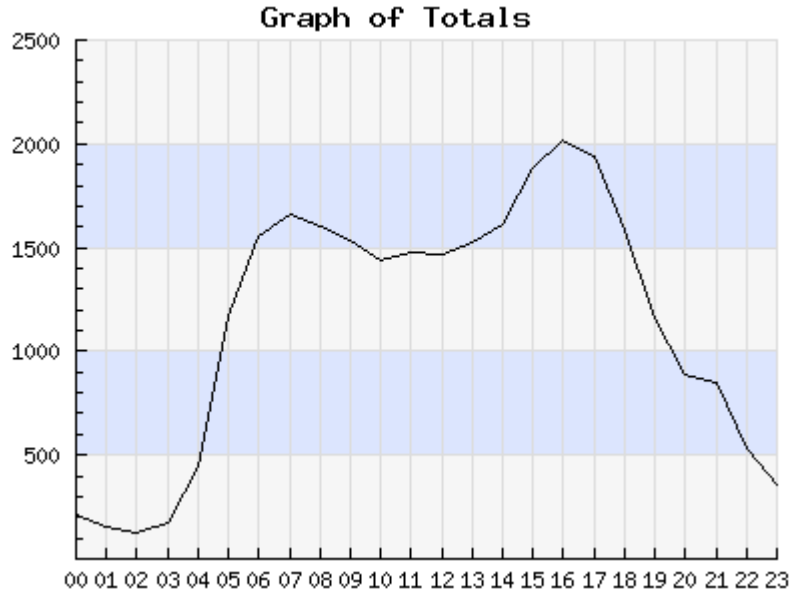
Daily Vehicle Volume Report

Location:
SR-76 btwn Olive Hill Rd & North River Rd
File Number: 93314
Counter ID: 106
Report Duration:
Tuesday Nov 11, 2008 - 15:00 to
Wednesday Nov 12, 2008 - 14:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	111	105	216
01:00 - 01:59	72	78	150
02:00 - 02:59	67	54	121
03:00 - 03:59	43	134	177
04:00 - 04:59	109	335	444
05:00 - 05:59	333	839	1172
06:00 - 06:59	475	1078	1553
07:00 - 07:59	598	1062	1660
08:00 - 08:59	550	1052	1602
09:00 - 09:59	639	892	1531
10:00 - 10:59	586	851	1437
11:00 - 11:59	664	817	1481
12:00 - 12:59	833	632	1465
13:00 - 13:59	854	667	1521
14:00 - 14:59	1016	599	1615
15:00 - 15:59	1134	749	1883
16:00 - 16:59	1185	831	2016
17:00 - 17:59	1180	762	1942
18:00 - 18:59	1033	551	1584
19:00 - 19:59	722	437	1159
20:00 - 20:59	531	361	892
21:00 - 21:59	499	353	852
22:00 - 22:59	285	246	531
23:00 - 23:59	177	176	353
Total	**13696**	**13661**	**27357**
AM Peak	11:00	5:45	7:00
Hour	11:59	6:44	7:59
Volume	664	1092	1660
PM Peak	17:15	16:15	16:00
Hour	18:14	17:14	16:59
Volume	1202	844	2016

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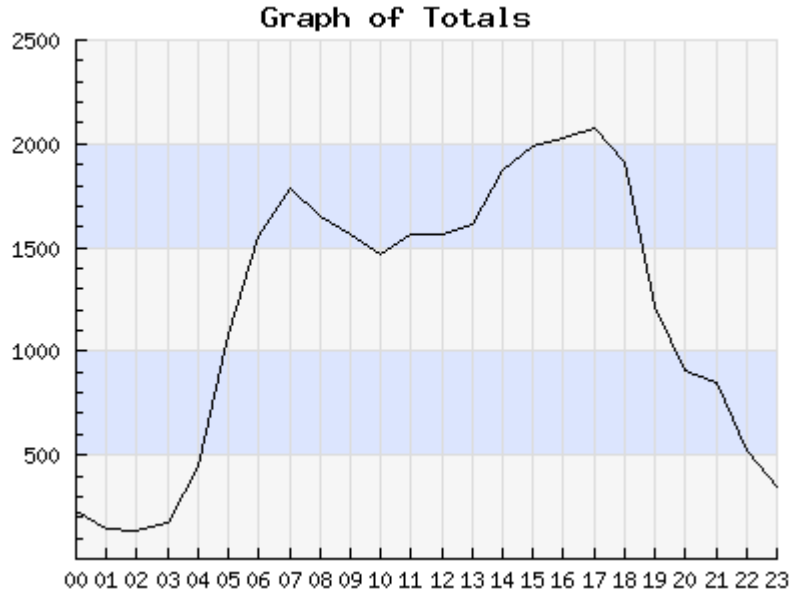
Daily Vehicle Volume Report

Location:
SR-76 btwn South Mission Rd & Olive Hill Rd
File Number: 93313
Counter ID: 104
Report Duration:
Wednesday Nov 12, 2008 - 00:00 to
Wednesday Nov 12, 2008 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	112	116	228
01:00 - 01:59	77	66	143
02:00 - 02:59	67	69	136
03:00 - 03:59	136	41	177
04:00 - 04:59	344	103	447
05:00 - 05:59	918	165	1083
06:00 - 06:59	1382	172	1554
07:00 - 07:59	1341	447	1788
08:00 - 08:59	1050	601	1651
09:00 - 09:59	964	601	1565
10:00 - 10:59	867	600	1467
11:00 - 11:59	904	662	1566
12:00 - 12:59	813	752	1565
13:00 - 13:59	829	787	1616
14:00 - 14:59	888	982	1870
15:00 - 15:59	817	1168	1985
16:00 - 16:59	817	1209	2026
17:00 - 17:59	835	1245	2080
18:00 - 18:59	562	1348	1910
19:00 - 19:59	456	761	1217
20:00 - 20:59	407	499	906
21:00 - 21:59	339	513	852
22:00 - 22:59	203	323	526
23:00 - 23:59	189	156	345
Total	**15317**	**13386**	**28703**
AM Peak	6:00	11:00	7:00
Hour	6:59	11:59	7:59
Volume	1382	662	1788
PM Peak	13:45	18:00	16:45
Hour	14:44	18:59	17:44
Volume	924	1348	2094

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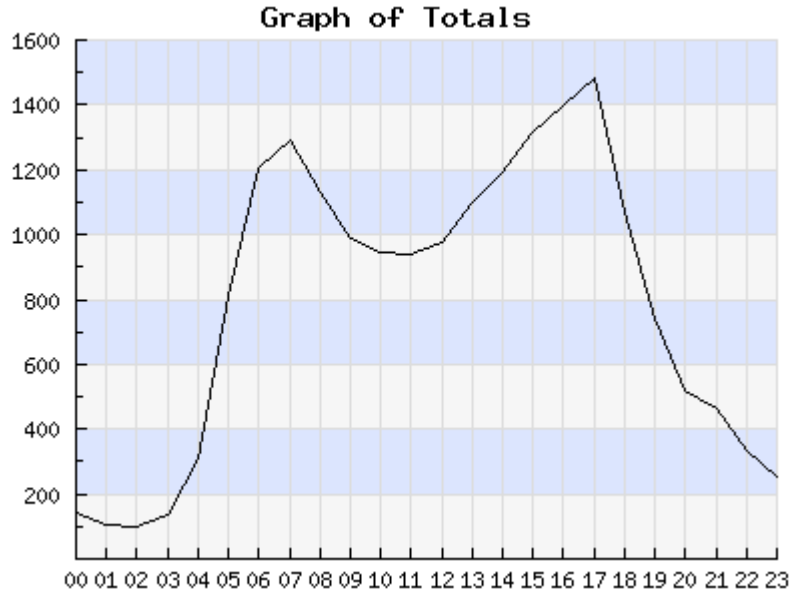
Daily Vehicle Volume Report

Location:
SR-76 btwn Via Monserate & South Mission Road
File Number: 93212
Counter ID: 111
Report Duration:
Tuesday Nov 18, 2008 - 09:30 to
Wednesday Nov 19, 2008 - 09:29
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	68	75	143
01:00 - 01:59	53	54	107
02:00 - 02:59	46	55	101
03:00 - 03:59	37	98	135
04:00 - 04:59	87	219	306
05:00 - 05:59	233	576	809
06:00 - 06:59	428	775	1203
07:00 - 07:59	534	756	1290
08:00 - 08:59	506	622	1128
09:00 - 09:59	480	507	987
10:00 - 10:59	491	455	946
11:00 - 11:59	465	472	937
12:00 - 12:59	560	419	979
13:00 - 13:59	623	477	1100
14:00 - 14:59	614	576	1190
15:00 - 15:59	827	487	1314
16:00 - 16:59	869	530	1399
17:00 - 17:59	849	632	1481
18:00 - 18:59	697	369	1066
19:00 - 19:59	455	288	743
20:00 - 20:59	308	214	522
21:00 - 21:59	277	185	462
22:00 - 22:59	179	153	332
23:00 - 23:59	124	127	251
Total	**9810**	**9121**	**18931**
AM Peak	7:15	5:45	7:15
Hour	8:14	6:44	8:14
Volume	582	775	1314
PM Peak	15:30	17:00	17:00
Hour	16:29	17:59	17:59
Volume	886	632	1481

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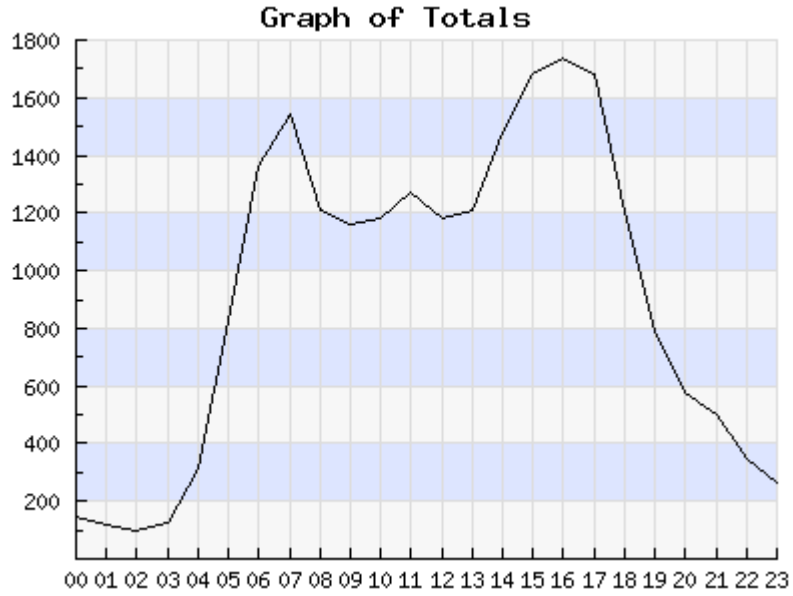
Daily Vehicle Volume Report

Location:
SR-76 (Pala Rd) btwn Via Monserate & Gird Road
File Number: 94001
Counter ID: 202/204
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	60	89	149
01:00 - 01:59	55	63	118
02:00 - 02:59	37	57	94
03:00 - 03:59	28	100	128
04:00 - 04:59	102	214	316
05:00 - 05:59	259	570	829
06:00 - 06:59	461	904	1365
07:00 - 07:59	651	889	1540
08:00 - 08:59	563	648	1211
09:00 - 09:59	579	583	1162
10:00 - 10:59	578	600	1178
11:00 - 11:59	599	673	1272
12:00 - 12:59	616	568	1184
13:00 - 13:59	645	567	1212
14:00 - 14:59	825	655	1480
15:00 - 15:59	913	769	1682
16:00 - 16:59	986	752	1738
17:00 - 17:59	936	747	1683
18:00 - 18:59	786	416	1202
19:00 - 19:59	469	326	795
20:00 - 20:59	332	248	580
21:00 - 21:59	257	240	497
22:00 - 22:59	186	160	346
23:00 - 23:59	130	134	264
Total	**11053**	**10972**	**22025**
AM Peak	7:15	6:45	7:00
Hour	8:14	7:44	7:59
Volume	676	931	1540
PM Peak	16:00	15:30	15:30
Hour	16:59	16:29	16:29
Volume	986	799	1762

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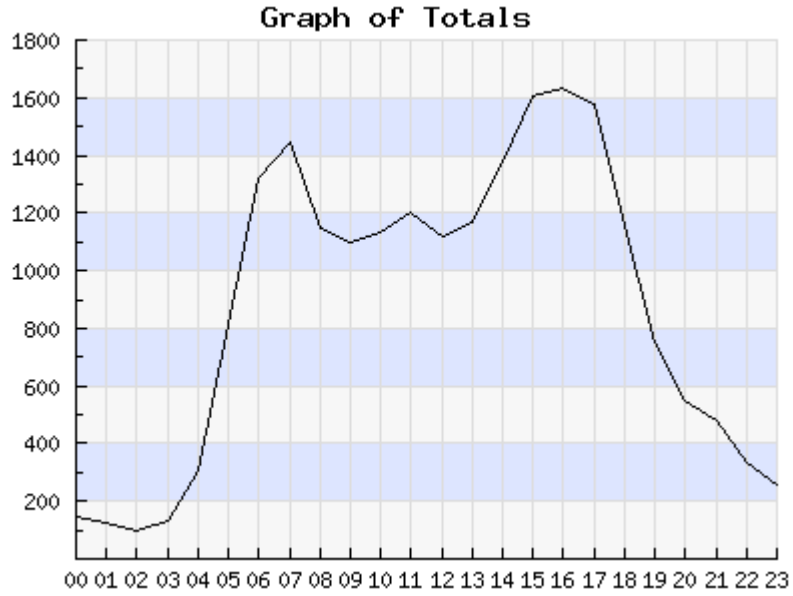
Daily Vehicle Volume Report

Location:
SR-76 (Pala Rd) between Gird Rd & Sage Rd
File Number: 94002
Counter ID: 104
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	59	90	149
01:00 - 01:59	57	65	122
02:00 - 02:59	34	62	96
03:00 - 03:59	32	99	131
04:00 - 04:59	101	208	309
05:00 - 05:59	262	548	810
06:00 - 06:59	464	854	1318
07:00 - 07:59	618	831	1449
08:00 - 08:59	549	595	1144
09:00 - 09:59	561	538	1099
10:00 - 10:59	561	569	1130
11:00 - 11:59	568	635	1203
12:00 - 12:59	573	546	1119
13:00 - 13:59	598	569	1167
14:00 - 14:59	764	612	1376
15:00 - 15:59	834	769	1603
16:00 - 16:59	893	741	1634
17:00 - 17:59	829	747	1576
18:00 - 18:59	709	442	1151
19:00 - 19:59	431	321	752
20:00 - 20:59	302	246	548
21:00 - 21:59	233	244	477
22:00 - 22:59	170	165	335
23:00 - 23:59	118	141	259
Total	**10320**	**10637**	**20957**
AM Peak	7:15	6:15	7:00
Hour	8:14	7:14	7:59
Volume	656	862	1449
PM Peak	16:00	15:15	15:30
Hour	16:59	16:14	16:29
Volume	893	815	1690

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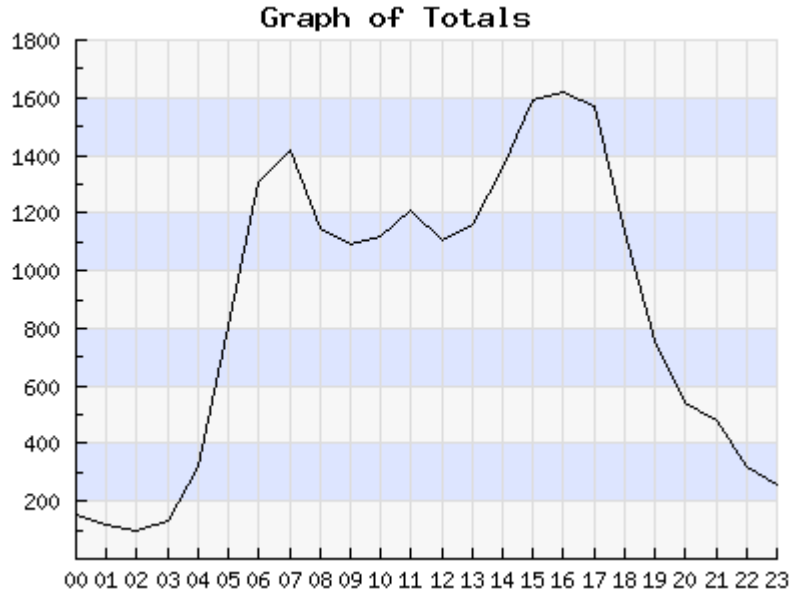
Daily Vehicle Volume Report

Location:
SR-76 (Pala Rd) between Sage Rd & Old Highway 395
File Number: 94003
Counter ID: 107
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	63	93	156
01:00 - 01:59	56	64	120
02:00 - 02:59	35	59	94
03:00 - 03:59	31	102	133
04:00 - 04:59	103	214	317
05:00 - 05:59	256	553	809
06:00 - 06:59	451	857	1308
07:00 - 07:59	615	802	1417
08:00 - 08:59	548	602	1150
09:00 - 09:59	556	536	1092
10:00 - 10:59	552	567	1119
11:00 - 11:59	577	630	1207
12:00 - 12:59	560	545	1105
13:00 - 13:59	586	573	1159
14:00 - 14:59	767	588	1355
15:00 - 15:59	818	776	1594
16:00 - 16:59	890	726	1616
17:00 - 17:59	828	743	1571
18:00 - 18:59	686	448	1134
19:00 - 19:59	439	318	757
20:00 - 20:59	299	245	544
21:00 - 21:59	232	247	479
22:00 - 22:59	163	160	323
23:00 - 23:59	120	138	258
Total	**10231**	**10586**	**20817**
AM Peak	7:15	6:00	7:00
Hour	8:14	6:59	7:59
Volume	660	857	1417
PM Peak	16:00	15:30	15:30
Hour	16:59	16:29	16:29
Volume	890	797	1658

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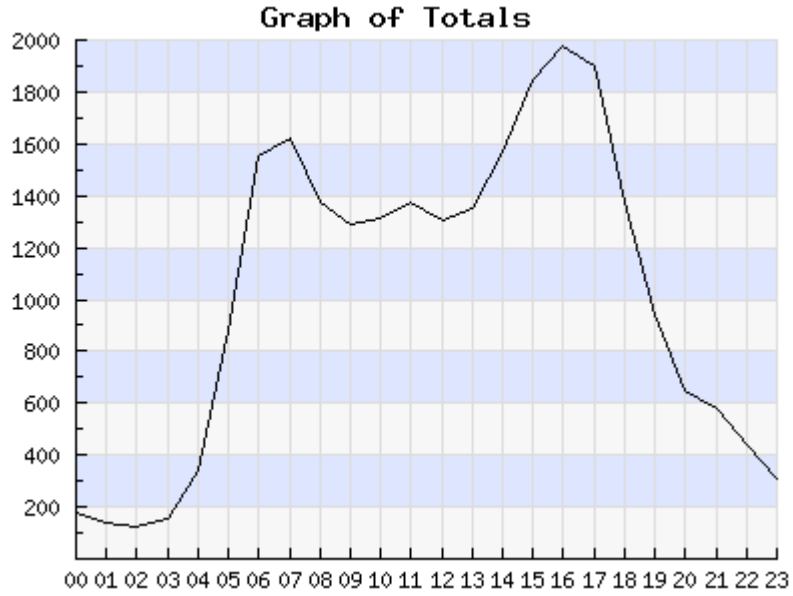
Daily Vehicle Volume Report

Location:
SR-76 (Pala Rd) btwn Old Hwy 395 & I-15 SB Ramps
File Number: 94004
Counter ID: 105/114
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	65	114	179
01:00 - 01:59	59	77	136
02:00 - 02:59	43	84	127
03:00 - 03:59	42	116	158
04:00 - 04:59	134	208	342
05:00 - 05:59	331	549	880
06:00 - 06:59	662	887	1549
07:00 - 07:59	829	796	1625
08:00 - 08:59	725	652	1377
09:00 - 09:59	699	591	1290
10:00 - 10:59	701	613	1314
11:00 - 11:59	710	662	1372
12:00 - 12:59	685	623	1308
13:00 - 13:59	691	664	1355
14:00 - 14:59	840	724	1564
15:00 - 15:59	973	875	1848
16:00 - 16:59	1034	940	1974
17:00 - 17:59	949	952	1901
18:00 - 18:59	763	610	1373
19:00 - 19:59	497	442	939
20:00 - 20:59	331	314	645
21:00 - 21:59	253	324	577
22:00 - 22:59	211	229	440
23:00 - 23:59	127	179	306
Total	**12354**	**12225**	**24579**
AM Peak	7:15	6:15	7:00
Hour	8:14	7:14	7:59
Volume	866	897	1625
PM Peak	16:00	16:30	16:15
Hour	16:59	17:29	17:14
Volume	1034	967	1981

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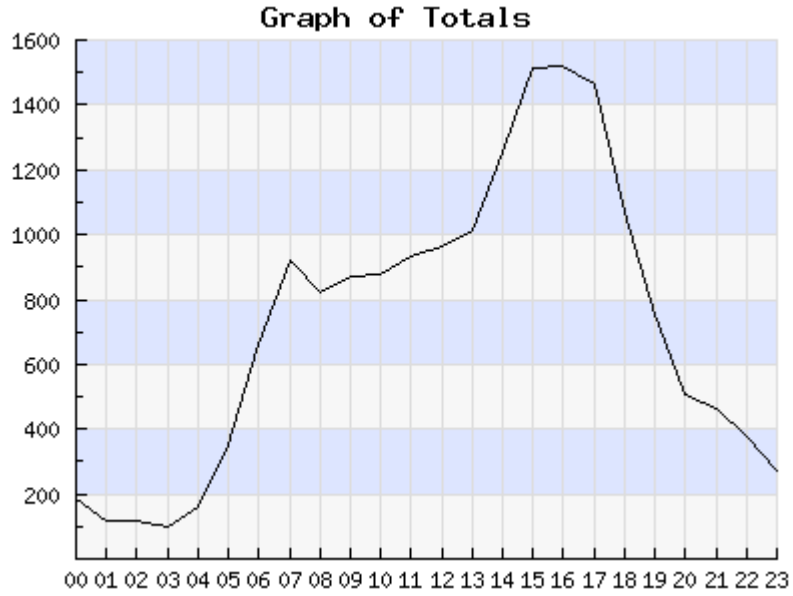
Daily Vehicle Volume Report

Location:
SR-76 (Pala Rd) between I-15 SB & I-15 NB Ramps
File Number: 94005
Counter ID: 113
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	73	111	184
01:00 - 01:59	56	60	116
02:00 - 02:59	50	68	118
03:00 - 03:59	35	61	96
04:00 - 04:59	99	62	161
05:00 - 05:59	245	108	353
06:00 - 06:59	448	214	662
07:00 - 07:59	586	335	921
08:00 - 08:59	529	293	822
09:00 - 09:59	561	308	869
10:00 - 10:59	574	306	880
11:00 - 11:59	588	345	933
12:00 - 12:59	588	376	964
13:00 - 13:59	602	409	1011
14:00 - 14:59	761	491	1252
15:00 - 15:59	857	656	1513
16:00 - 16:59	894	624	1518
17:00 - 17:59	847	615	1462
18:00 - 18:59	693	378	1071
19:00 - 19:59	469	285	754
20:00 - 20:59	305	199	504
21:00 - 21:59	255	211	466
22:00 - 22:59	199	175	374
23:00 - 23:59	131	139	270
Total	**10445**	**6829**	**17274**
AM Peak	10:45	10:45	10:45
Hour	11:44	11:44	11:44
Volume	604	346	950
PM Peak	15:45	16:30	16:30
Hour	16:44	17:29	17:29
Volume	903	670	1521

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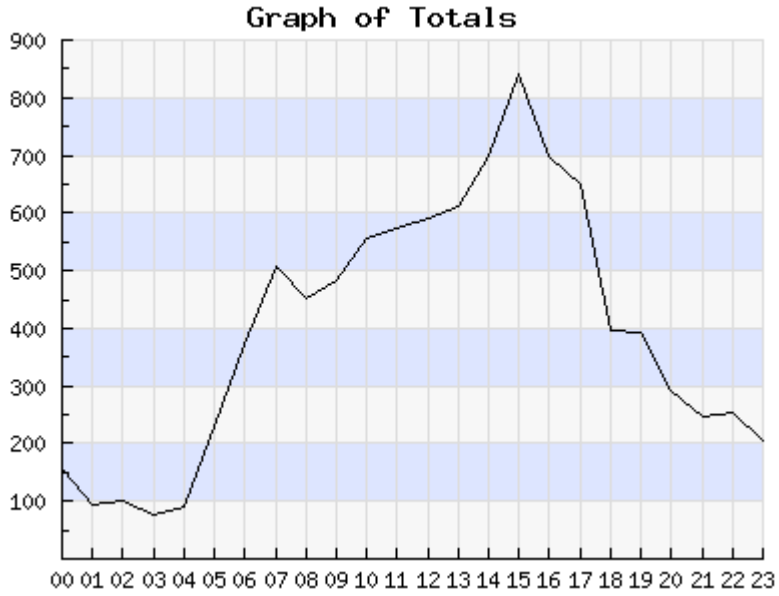
Daily Vehicle Volume Report

Location:
SR-76 (Pala Rd) between I-15 NB Ramps & Pankey Rd
File Number: 94006
Counter ID: 109
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	33	125	158
01:00 - 01:59	26	67	93
02:00 - 02:59	31	69	100
03:00 - 03:59	18	60	78
04:00 - 04:59	33	57	90
05:00 - 05:59	151	80	231
06:00 - 06:59	232	141	373
07:00 - 07:59	283	224	507
08:00 - 08:59	282	171	453
09:00 - 09:59	302	181	483
10:00 - 10:59	342	215	557
11:00 - 11:59	351	222	573
12:00 - 12:59	339	251	590
13:00 - 13:59	308	303	611
14:00 - 14:59	332	367	699
15:00 - 15:59	324	516	840
16:00 - 16:59	296	402	698
17:00 - 17:59	283	368	651
18:00 - 18:59	211	184	395
19:00 - 19:59	185	207	392
20:00 - 20:59	137	156	293
21:00 - 21:59	106	141	247
22:00 - 22:59	117	135	252
23:00 - 23:59	63	142	205
Total	**4785**	**4784**	**9569**
AM Peak	10:15	7:00	10:15
Hour	11:14	7:59	11:14
Volume	364	224	580
PM Peak	13:45	14:45	14:45
Hour	14:44	15:44	15:44
Volume	341	529	846

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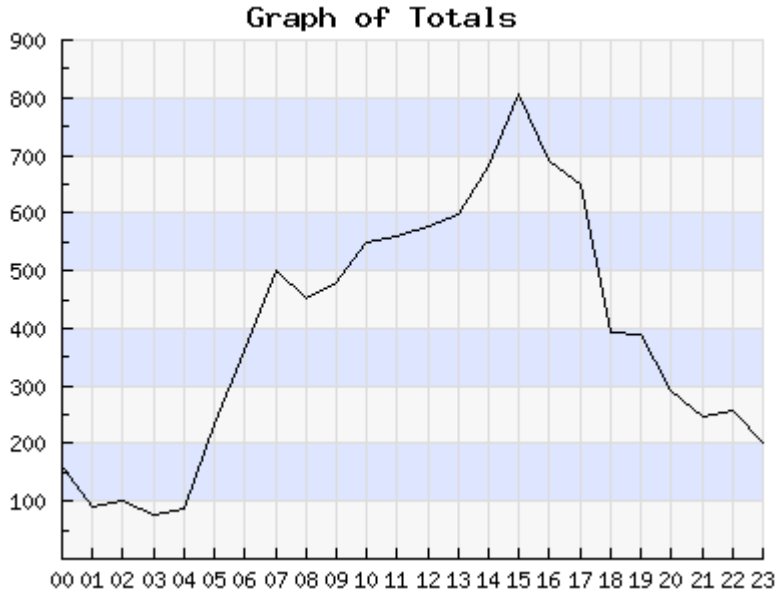
Daily Vehicle Volume Report

Location:
SR-76 (Pala Rd) between Pankey Rd & Rice Cyn Rd
File Number: 94007
Counter ID: 108
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	34	126	160
01:00 - 01:59	26	66	92
02:00 - 02:59	33	68	101
03:00 - 03:59	19	59	78
04:00 - 04:59	33	55	88
05:00 - 05:59	155	77	232
06:00 - 06:59	220	140	360
07:00 - 07:59	278	221	499
08:00 - 08:59	290	163	453
09:00 - 09:59	299	180	479
10:00 - 10:59	342	208	550
11:00 - 11:59	349	210	559
12:00 - 12:59	338	240	578
13:00 - 13:59	307	289	596
14:00 - 14:59	328	353	681
15:00 - 15:59	324	483	807
16:00 - 16:59	302	390	692
17:00 - 17:59	295	355	650
18:00 - 18:59	212	182	394
19:00 - 19:59	189	201	390
20:00 - 20:59	144	149	293
21:00 - 21:59	107	139	246
22:00 - 22:59	122	136	258
23:00 - 23:59	65	138	203
Total	**4811**	**4628**	**9439**
AM Peak	10:15	7:00	10:15
Hour	11:14	7:59	11:14
Volume	363	221	576
PM Peak	14:15	14:45	14:45
Hour	15:14	15:44	15:44
Volume	339	515	836

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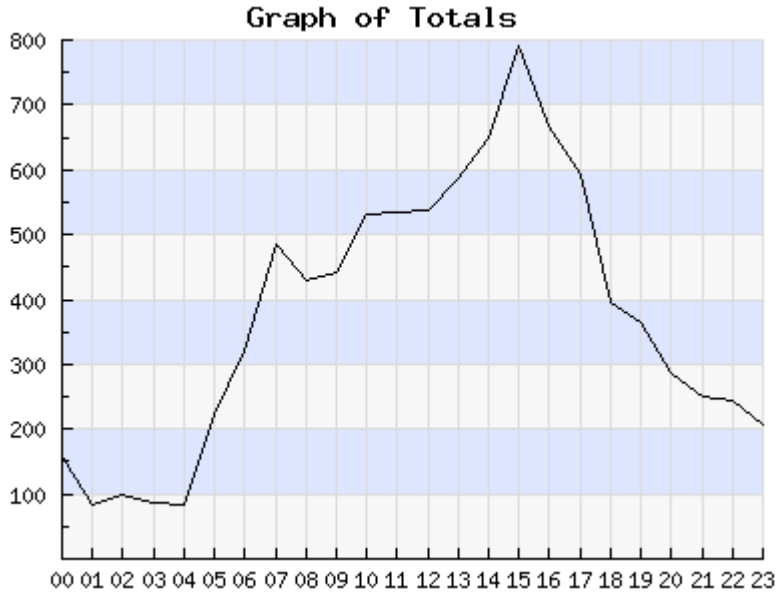
Daily Vehicle Volume Report

Location:
SR-76 (Pala Rd) between Rice Cyn Rd & Couser Cyn Rd
File Number: 94008
Counter ID: 110
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	32	125	157
01:00 - 01:59	19	63	82
02:00 - 02:59	33	65	98
03:00 - 03:59	21	64	85
04:00 - 04:59	30	53	83
05:00 - 05:59	146	76	222
06:00 - 06:59	197	124	321
07:00 - 07:59	269	216	485
08:00 - 08:59	272	158	430
09:00 - 09:59	286	156	442
10:00 - 10:59	328	203	531
11:00 - 11:59	336	197	533
12:00 - 12:59	317	220	537
13:00 - 13:59	298	290	588
14:00 - 14:59	311	339	650
15:00 - 15:59	293	499	792
16:00 - 16:59	284	383	667
17:00 - 17:59	265	327	592
18:00 - 18:59	210	184	394
19:00 - 19:59	168	197	365
20:00 - 20:59	135	153	288
21:00 - 21:59	103	147	250
22:00 - 22:59	117	126	243
23:00 - 23:59	67	139	206
Total	**4537**	**4504**	**9041**
AM Peak	10:30	7:00	10:15
Hour	11:29	7:59	11:14
Volume	348	216	558
PM Peak	13:45	14:45	15:00
Hour	14:44	15:44	15:59
Volume	323	500	792

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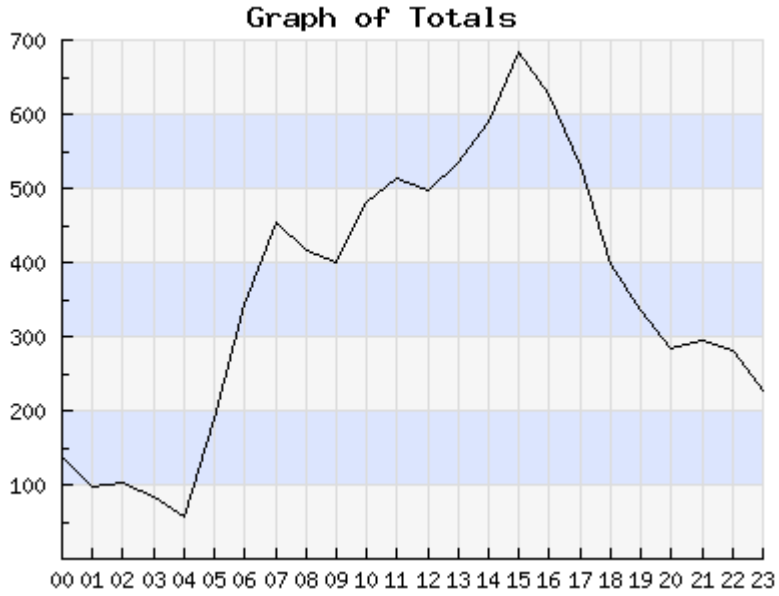
Daily Vehicle Volume Report

Location:
SR-76 btwn Couser Cyn Rd & Pala Mission Rd
File Number: 93310
Counter ID: 108
Report Duration:
Wednesday Nov 12, 2008 - 00:00 to
Wednesday Nov 12, 2008 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	111	26	137
01:00 - 01:59	75	23	98
02:00 - 02:59	72	31	103
03:00 - 03:59	70	15	85
04:00 - 04:59	43	15	58
05:00 - 05:59	72	118	190
06:00 - 06:59	121	222	343
07:00 - 07:59	172	281	453
08:00 - 08:59	154	261	415
09:00 - 09:59	146	255	401
10:00 - 10:59	157	325	482
11:00 - 11:59	197	316	513
12:00 - 12:59	200	296	496
13:00 - 13:59	246	288	534
14:00 - 14:59	328	261	589
15:00 - 15:59	380	303	683
16:00 - 16:59	330	298	628
17:00 - 17:59	278	251	529
18:00 - 18:59	191	206	397
19:00 - 19:59	156	180	336
20:00 - 20:59	156	129	285
21:00 - 21:59	165	129	294
22:00 - 22:59	166	115	281
23:00 - 23:59	163	65	228
Total	**4149**	**4409**	**8558**
AM Peak	11:00	10:00	11:00
Hour	11:59	10:59	11:59
Volume	197	325	513
PM Peak	14:30	15:30	15:00
Hour	15:29	16:29	15:59
Volume	392	340	683

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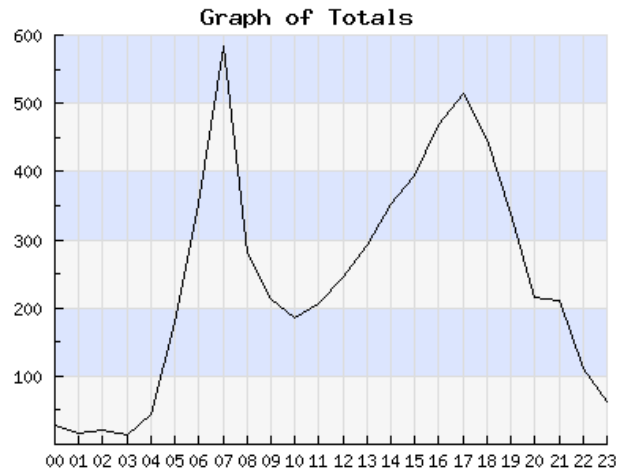
Daily Vehicle Volume Report

Location:
Dublin Road btwn Old Hwy 395 & Pankey Road
File Number: 94009
Counter ID: 209
Report Duration:
Thursday Dec 11, 2008 - 00:00 to
Thursday Dec 11, 2008 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	16	11	27
01:00 - 01:59	9	7	16
02:00 - 02:59	16	4	20
03:00 - 03:59	4	11	15
04:00 - 04:59	4	39	43
05:00 - 05:59	12	167	179
06:00 - 06:59	48	305	353
07:00 - 07:59	93	490	583
08:00 - 08:59	86	195	281
09:00 - 09:59	62	152	214
10:00 - 10:59	54	131	185
11:00 - 11:59	90	117	207
12:00 - 12:59	106	139	245
13:00 - 13:59	122	169	291
14:00 - 14:59	198	154	352
15:00 - 15:59	238	155	393
16:00 - 16:59	321	147	468
17:00 - 17:59	389	125	514
18:00 - 18:59	323	123	446
19:00 - 19:59	248	90	338
20:00 - 20:59	168	48	216
21:00 - 21:59	167	44	211
22:00 - 22:59	79	32	111
23:00 - 23:59	44	18	62
Total	**2897**	**2873**	**5770**
AM Peak	7:15	7:00	7:00
Hour	8:14	7:59	7:59
Volume	99	490	583
PM Peak	16:45	15:30	16:45
Hour	17:44	16:29	17:44
Volume	405	181	531

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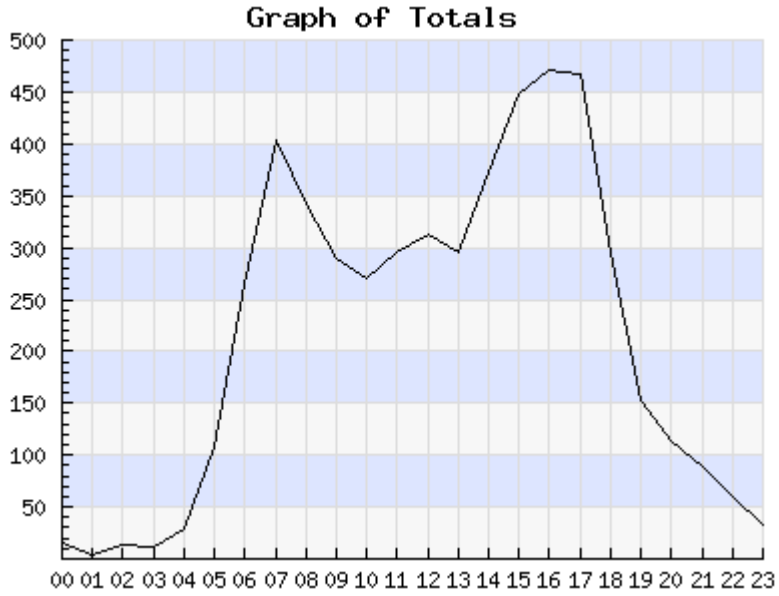
Daily Vehicle Volume Report

Location:
Old Highway 395 btwn East Misssion Rd & Reche Rd
File Number: 94010
Counter ID: 205
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	9	6	15
01:00 - 01:59	2	2	4
02:00 - 02:59	8	5	13
03:00 - 03:59	4	7	11
04:00 - 04:59	18	11	29
05:00 - 05:59	56	52	108
06:00 - 06:59	109	156	265
07:00 - 07:59	211	192	403
08:00 - 08:59	203	138	341
09:00 - 09:59	156	134	290
10:00 - 10:59	144	127	271
11:00 - 11:59	155	140	295
12:00 - 12:59	146	166	312
13:00 - 13:59	142	154	296
14:00 - 14:59	169	204	373
15:00 - 15:59	220	228	448
16:00 - 16:59	255	217	472
17:00 - 17:59	267	201	468
18:00 - 18:59	127	169	296
19:00 - 19:59	61	91	152
20:00 - 20:59	36	78	114
21:00 - 21:59	31	57	88
22:00 - 22:59	22	37	59
23:00 - 23:59	6	26	32
Total	**2557**	**2598**	**5155**
AM Peak	7:30	6:45	7:00
Hour	8:29	7:44	7:59
Volume	225	196	403
PM Peak	16:30	15:00	16:30
Hour	17:29	15:59	17:29
Volume	281	228	505

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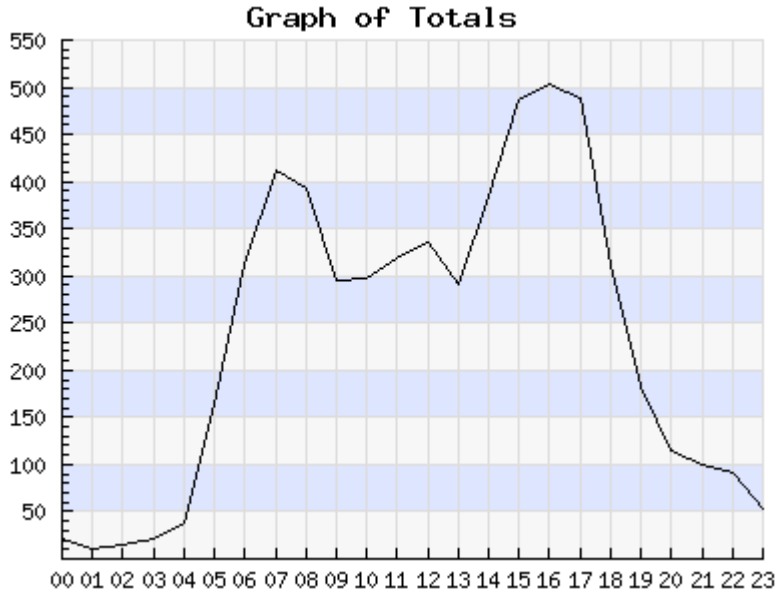
Daily Vehicle Volume Report

Location:
Old Highway 395 btwn Reche Rd & Stewart Cyn Rd
File Number: 94011
Counter ID: 208
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	19	3	22
01:00 - 01:59	5	5	10
02:00 - 02:59	9	6	15
03:00 - 03:59	10	12	22
04:00 - 04:59	9	29	38
05:00 - 05:59	45	119	164
06:00 - 06:59	94	219	313
07:00 - 07:59	196	217	413
08:00 - 08:59	174	218	392
09:00 - 09:59	149	146	295
10:00 - 10:59	140	158	298
11:00 - 11:59	148	171	319
12:00 - 12:59	158	177	335
13:00 - 13:59	158	133	291
14:00 - 14:59	207	178	385
15:00 - 15:59	286	201	487
16:00 - 16:59	329	174	503
17:00 - 17:59	302	187	489
18:00 - 18:59	190	123	313
19:00 - 19:59	115	67	182
20:00 - 20:59	70	44	114
21:00 - 21:59	71	29	100
22:00 - 22:59	57	35	92
23:00 - 23:59	31	23	54
Total	**2972**	**2674**	**5646**
AM Peak	7:00	7:15	7:15
Hour	7:59	8:14	8:14
Volume	196	244	426
PM Peak	16:15	15:15	16:15
Hour	17:14	16:14	17:14
Volume	367	211	537

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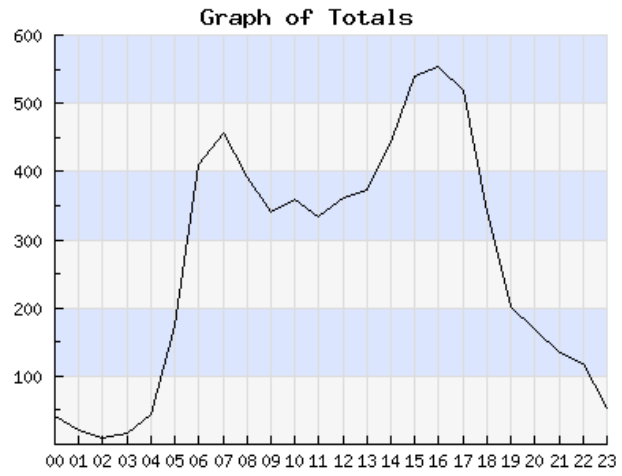
Daily Vehicle Volume Report

Location:
Old Hwy 395 btwn Stewart Cyn Rd & Tecalote Lane
File Number: 94012
Counter ID: 111
Report Duration:
Thursday Dec 11, 2008 - 00:00 to
Thursday Dec 11, 2008 - 23:59
Other Notes:
None at this time



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	30	12	42
01:00 - 01:59	17	5	22
02:00 - 02:59	4	5	9
03:00 - 03:59	5	12	17
04:00 - 04:59	11	33	44
05:00 - 05:59	31	143	174
06:00 - 06:59	122	287	409
07:00 - 07:59	175	282	457
08:00 - 08:59	149	243	392
09:00 - 09:59	150	191	341
10:00 - 10:59	150	209	359
11:00 - 11:59	147	187	334
12:00 - 12:59	187	174	361
13:00 - 13:59	215	157	372
14:00 - 14:59	261	181	442
15:00 - 15:59	285	255	540
16:00 - 16:59	329	224	553
17:00 - 17:59	301	219	520
18:00 - 18:59	226	115	341
19:00 - 19:59	132	70	202
20:00 - 20:59	110	58	168
21:00 - 21:59	82	53	135
22:00 - 22:59	75	42	117
23:00 - 23:59	40	14	54
Total	**3234**	**3171**	**6405**
AM Peak	7:00	6:45	7:00
Hour	7:59	7:44	7:59
Volume	175	289	457
PM Peak	15:45	15:00	15:45
Hour	16:44	15:59	16:44
Volume	357	255	576

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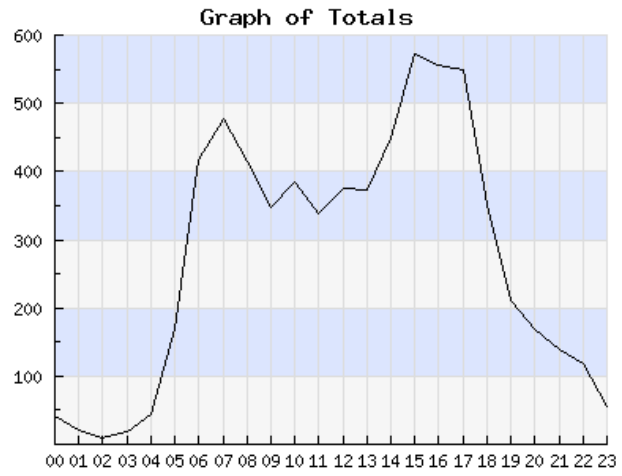
Daily Vehicle Volume Report

Location:
Old Hwy 395 btwn Tecalote Lane & Pala Mesa Dr
File Number: 94013
Counter ID: 113
Report Duration:
Thursday Dec 11, 2008 - 00:00 to
Thursday Dec 11, 2008 - 23:59
Other Notes:
None at this time



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	25	16	41
01:00 - 01:59	17	5	22
02:00 - 02:59	4	6	10
03:00 - 03:59	5	14	19
04:00 - 04:59	11	33	44
05:00 - 05:59	35	134	169
06:00 - 06:59	130	288	418
07:00 - 07:59	187	291	478
08:00 - 08:59	181	233	414
09:00 - 09:59	162	186	348
10:00 - 10:59	169	215	384
11:00 - 11:59	145	194	339
12:00 - 12:59	189	187	376
13:00 - 13:59	201	172	373
14:00 - 14:59	251	198	449
15:00 - 15:59	283	289	572
16:00 - 16:59	324	232	556
17:00 - 17:59	299	249	548
18:00 - 18:59	234	118	352
19:00 - 19:59	139	72	211
20:00 - 20:59	101	68	169
21:00 - 21:59	80	58	138
22:00 - 22:59	66	51	117
23:00 - 23:59	40	16	56
Total	**3278**	**3325**	**6603**
AM Peak	7:30	6:30	7:00
Hour	8:29	7:29	7:59
Volume	188	296	478
PM Peak	15:45	15:00	15:15
Hour	16:44	15:59	16:14
Volume	355	289	602

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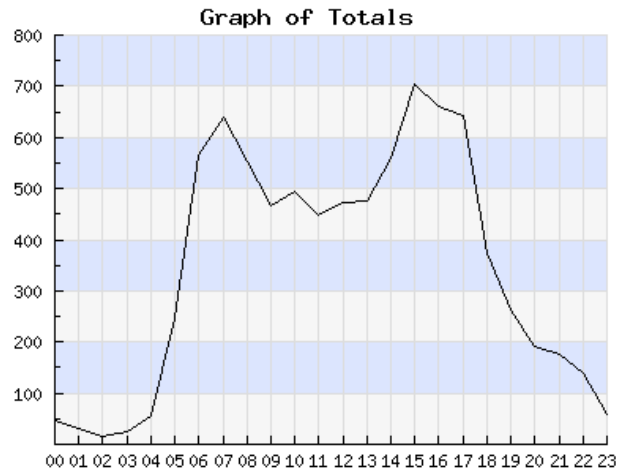
Daily Vehicle Volume Report

Location:
Old Hwy 395 btwn Pala Mesa Dr & SR-76 (Pala Rd)
File Number: 94014
Counter ID: 210
Report Duration:
Thursday Dec 11, 2008 - 00:00 to
Thursday Dec 11, 2008 - 23:59
Other Notes:
None at this time



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	30	17	47
01:00 - 01:59	21	9	30
02:00 - 02:59	4	11	15
03:00 - 03:59	5	20	25
04:00 - 04:59	11	46	57
05:00 - 05:59	38	208	246
06:00 - 06:59	148	416	564
07:00 - 07:59	246	394	640
08:00 - 08:59	230	323	553
09:00 - 09:59	200	267	467
10:00 - 10:59	207	286	493
11:00 - 11:59	192	257	449
12:00 - 12:59	251	223	474
13:00 - 13:59	273	202	475
14:00 - 14:59	325	235	560
15:00 - 15:59	375	328	703
16:00 - 16:59	433	229	662
17:00 - 17:59	375	266	641
18:00 - 18:59	310	65	375
19:00 - 19:59	193	69	262
20:00 - 20:59	130	62	192
21:00 - 21:59	119	57	176
22:00 - 22:59	85	53	138
23:00 - 23:59	51	7	58
Total	**4252**	**4050**	**8302**
AM Peak	7:00	6:00	7:00
Hour	7:59	6:59	7:59
Volume	246	416	640
PM Peak	15:45	15:00	15:30
Hour	16:44	15:59	16:29
Volume	472	328	720

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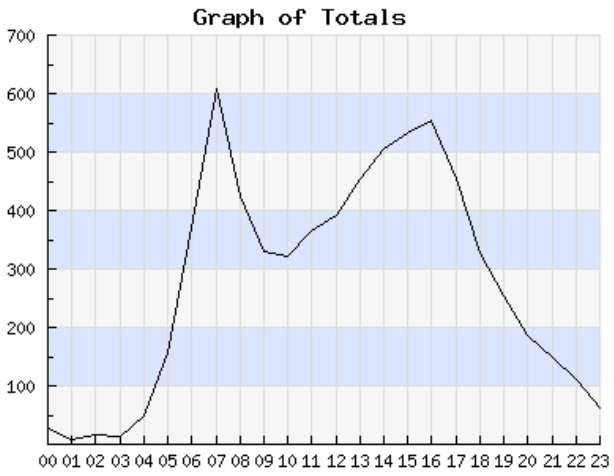
Daily Vehicle Volume Report

Location:
Old Hwy 395 btwn SR-76 (Pala Rd) & Dulin Rd
File Number: 94015
Counter ID: 207
Report Duration:
Thursday Dec 11, 2008 - 00:00 to
Thursday Dec 11, 2008 - 23:59
Other Notes:
None at this time



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	8	19	27
01:00 - 01:59	6	3	9
02:00 - 02:59	2	13	15
03:00 - 03:59	8	5	13
04:00 - 04:59	40	10	50
05:00 - 05:59	97	61	158
06:00 - 06:59	164	205	369
07:00 - 07:59	360	248	608
08:00 - 08:59	229	195	424
09:00 - 09:59	196	133	329
10:00 - 10:59	196	125	321
11:00 - 11:59	202	163	365
12:00 - 12:59	222	169	391
13:00 - 13:59	236	218	454
14:00 - 14:59	288	217	505
15:00 - 15:59	256	276	532
16:00 - 16:59	250	303	553
17:00 - 17:59	176	279	455
18:00 - 18:59	108	219	327
19:00 - 19:59	82	172	254
20:00 - 20:59	76	111	187
21:00 - 21:59	50	98	148
22:00 - 22:59	42	69	111
23:00 - 23:59	25	38	63
Total	**3319**	**3349**	**6668**
AM Peak	6:45	7:15	7:15
Hour	7:44	8:14	8:14
Volume	360	276	615
PM Peak	15:30	16:15	15:30
Hour	16:29	17:14	16:29
Volume	336	312	603

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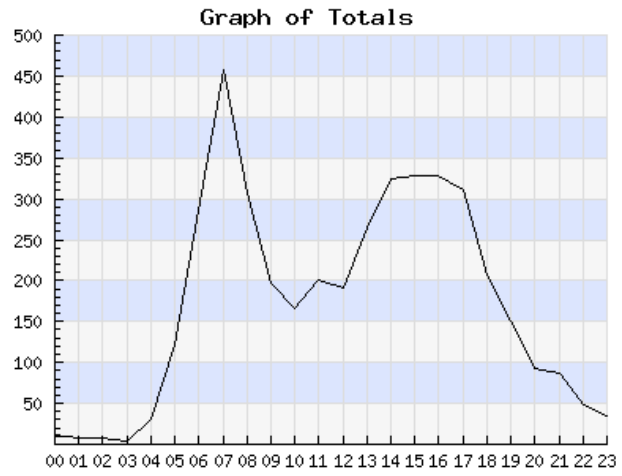
Daily Vehicle Volume Report

Location:
Old Hwy 395 btwn Dulin Rd & West Lilac Rd
File Number: 94016
Counter ID: 208
Report Duration:
Thursday Dec 11, 2008 - 00:00 to
Thursday Dec 11, 2008 - 23:59
Other Notes:
None at this time



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	5	7	12
01:00 - 01:59	6	2	8
02:00 - 02:59	3	4	7
03:00 - 03:59	1	3	4
04:00 - 04:59	10	21	31
05:00 - 05:59	18	103	121
06:00 - 06:59	55	230	285
07:00 - 07:59	145	313	458
08:00 - 08:59	143	164	307
09:00 - 09:59	71	126	197
10:00 - 10:59	68	98	166
11:00 - 11:59	82	119	201
12:00 - 12:59	91	100	191
13:00 - 13:59	139	125	264
14:00 - 14:59	205	120	325
15:00 - 15:59	195	133	328
16:00 - 16:59	207	122	329
17:00 - 17:59	205	105	310
18:00 - 18:59	140	67	207
19:00 - 19:59	106	45	151
20:00 - 20:59	62	30	92
21:00 - 21:59	63	24	87
22:00 - 22:59	32	16	48
23:00 - 23:59	20	14	34
Total	**2072**	**2091**	**4163**
AM Peak	7:15	7:15	7:15
Hour	8:14	8:14	8:14
Volume	200	330	530
PM Peak	16:45	13:30	15:30
Hour	17:44	14:29	16:29
Volume	226	148	355

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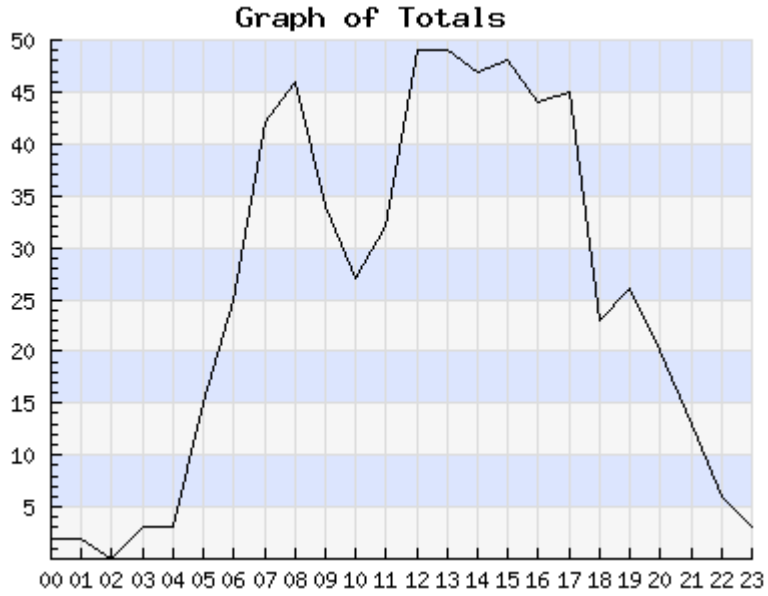
Daily Vehicle Volume Report

Location:
Pala Mesa Dr btwn Old Hwy 395 & Wilt Rd/Sumac Rd
File Number: 90101
Counter ID: 106
Report Duration:
Thursday Aug 28, 2008 - 00:00 to
Thursday Aug 28, 2008 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	0	2	2
01:00 - 01:59	0	2	2
02:00 - 02:59	0	0	0
03:00 - 03:59	3	0	3
04:00 - 04:59	2	1	3
05:00 - 05:59	13	2	15
06:00 - 06:59	21	4	25
07:00 - 07:59	23	19	42
08:00 - 08:59	26	20	46
09:00 - 09:59	20	14	34
10:00 - 10:59	16	11	27
11:00 - 11:59	18	14	32
12:00 - 12:59	23	26	49
13:00 - 13:59	24	25	49
14:00 - 14:59	18	29	47
15:00 - 15:59	24	24	48
16:00 - 16:59	21	23	44
17:00 - 17:59	20	25	45
18:00 - 18:59	8	15	23
19:00 - 19:59	13	13	26
20:00 - 20:59	6	14	20
21:00 - 21:59	0	13	13
22:00 - 22:59	2	4	6
23:00 - 23:59	0	3	3
Total	**301**	**303**	**604**
AM Peak	8:15	7:45	8:15
Hour	9:14	8:44	9:14
Volume	28	21	47
PM Peak	13:15	14:30	13:15
Hour	14:14	15:29	14:14
Volume	27	32	51

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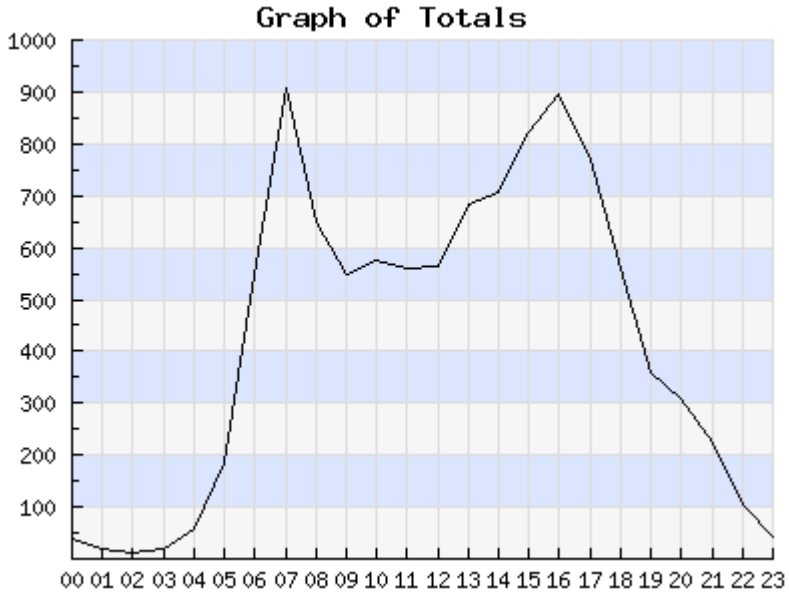
Daily Vehicle Volume Report

Location:
Reche Rd btwn Live Oak Park & Green Canyon Rd
File Number: 93317
Counter ID: 111
Report Duration:
Wednesday Nov 12, 2008 - 00:00 to
Wednesday Nov 12, 2008 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	15	25	40
01:00 - 01:59	4	16	20
02:00 - 02:59	6	7	13
03:00 - 03:59	15	5	20
04:00 - 04:59	45	13	58
05:00 - 05:59	138	46	184
06:00 - 06:59	351	198	549
07:00 - 07:59	417	489	906
08:00 - 08:59	328	320	648
09:00 - 09:59	280	268	548
10:00 - 10:59	283	293	576
11:00 - 11:59	289	270	559
12:00 - 12:59	283	279	562
13:00 - 13:59	340	342	682
14:00 - 14:59	364	342	706
15:00 - 15:59	401	423	824
16:00 - 16:59	403	493	896
17:00 - 17:59	344	425	769
18:00 - 18:59	231	327	558
19:00 - 19:59	183	178	361
20:00 - 20:59	142	167	309
21:00 - 21:59	107	117	224
22:00 - 22:59	37	69	106
23:00 - 23:59	13	31	44
Total	**5019**	**5143**	**10162**
AM Peak	6:45	7:00	7:00
Hour	7:44	7:59	7:59
Volume	420	489	906
PM Peak	16:30	15:30	16:00
Hour	17:29	16:29	16:59
Volume	407	493	896

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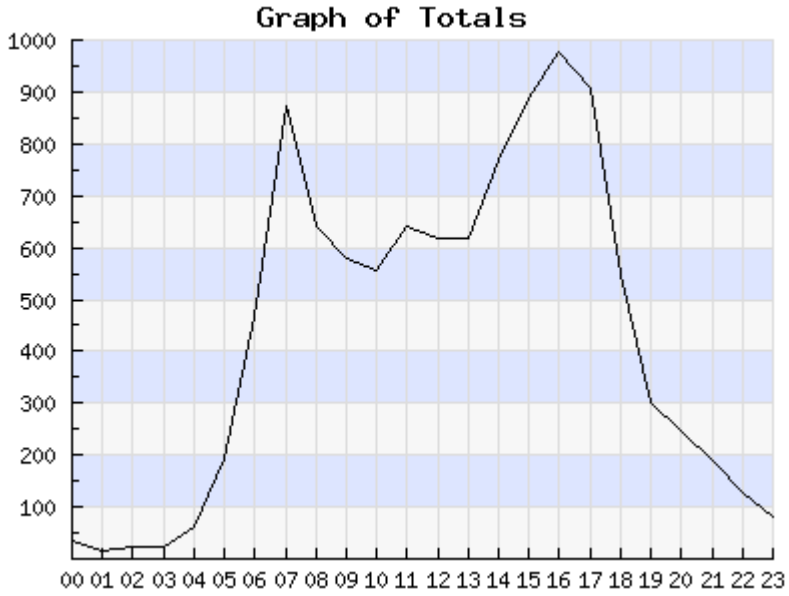
Daily Vehicle Volume Report

Location:
Reche Road between Live Oak Park Rd & Gird Rd
File Number: 94017
Counter ID: 106
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	12	23	35
01:00 - 01:59	8	7	15
02:00 - 02:59	14	9	23
03:00 - 03:59	18	7	25
04:00 - 04:59	44	16	60
05:00 - 05:59	149	45	194
06:00 - 06:59	282	185	467
07:00 - 07:59	452	420	872
08:00 - 08:59	378	262	640
09:00 - 09:59	308	270	578
10:00 - 10:59	277	278	555
11:00 - 11:59	341	301	642
12:00 - 12:59	340	279	619
13:00 - 13:59	285	334	619
14:00 - 14:59	385	383	768
15:00 - 15:59	446	443	889
16:00 - 16:59	454	523	977
17:00 - 17:59	508	399	907
18:00 - 18:59	258	291	549
19:00 - 19:59	142	159	301
20:00 - 20:59	134	115	249
21:00 - 21:59	90	98	188
22:00 - 22:59	57	70	127
23:00 - 23:59	33	48	81
Total	**5415**	**4965**	**10380**
AM Peak	7:15	7:00	7:00
Hour	8:14	7:59	7:59
Volume	472	420	872
PM Peak	16:45	16:00	16:30
Hour	17:44	16:59	17:29
Volume	530	523	990

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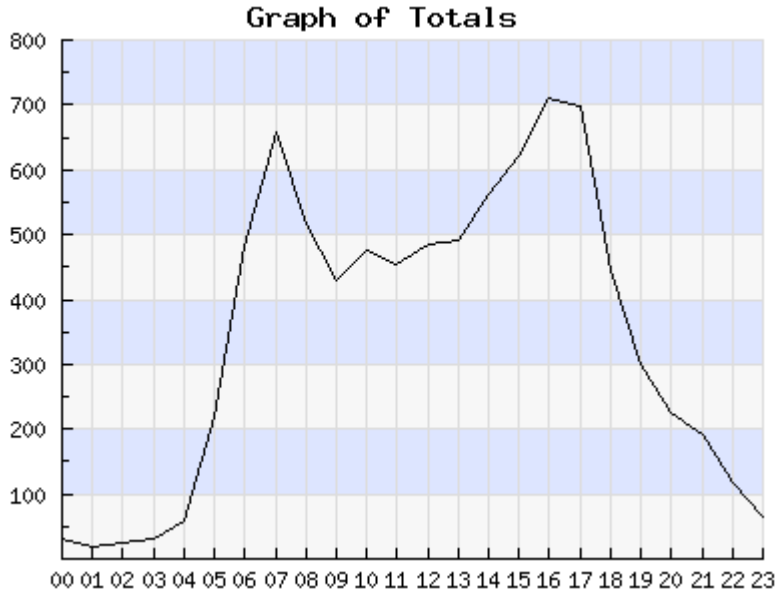
Daily Vehicle Volume Report

Location:
Reche Road between Gird Road & Wilt Road
File Number: 94018
Counter ID: 207
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	9	21	30
01:00 - 01:59	6	12	18
02:00 - 02:59	11	13	24
03:00 - 03:59	20	10	30
04:00 - 04:59	47	13	60
05:00 - 05:59	170	50	220
06:00 - 06:59	313	170	483
07:00 - 07:59	361	296	657
08:00 - 08:59	317	199	516
09:00 - 09:59	257	172	429
10:00 - 10:59	267	208	475
11:00 - 11:59	252	202	454
12:00 - 12:59	243	243	486
13:00 - 13:59	216	275	491
14:00 - 14:59	254	307	561
15:00 - 15:59	277	344	621
16:00 - 16:59	329	380	709
17:00 - 17:59	330	368	698
18:00 - 18:59	180	264	444
19:00 - 19:59	112	189	301
20:00 - 20:59	88	136	224
21:00 - 21:59	69	121	190
22:00 - 22:59	40	76	116
23:00 - 23:59	17	47	64
Total	**4185**	**4116**	**8301**
AM Peak	7:15	7:00	7:00
Hour	8:14	7:59	7:59
Volume	386	296	657
PM Peak	16:45	16:30	16:30
Hour	17:44	17:29	17:29
Volume	337	434	766

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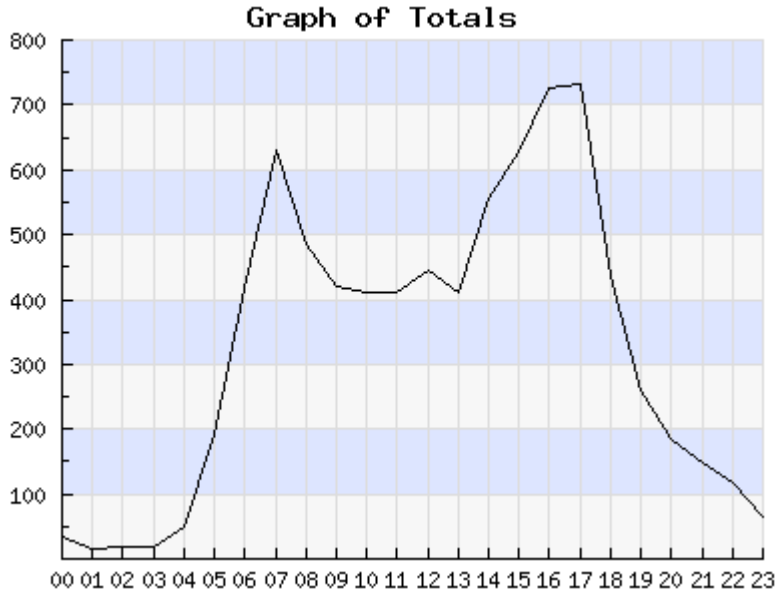
Daily Vehicle Volume Report

Location:
Reche Road between wilt Road & Tecalote Road
File Number: 94019
Counter ID: 209
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	11	23	34
01:00 - 01:59	8	8	16
02:00 - 02:59	10	7	17
03:00 - 03:59	13	7	20
04:00 - 04:59	44	5	49
05:00 - 05:59	150	41	191
06:00 - 06:59	261	156	417
07:00 - 07:59	344	287	631
08:00 - 08:59	332	152	484
09:00 - 09:59	234	187	421
10:00 - 10:59	240	171	411
11:00 - 11:59	239	172	411
12:00 - 12:59	238	206	444
13:00 - 13:59	197	215	412
14:00 - 14:59	245	312	557
15:00 - 15:59	279	349	628
16:00 - 16:59	319	407	726
17:00 - 17:59	378	355	733
18:00 - 18:59	177	259	436
19:00 - 19:59	96	165	261
20:00 - 20:59	72	113	185
21:00 - 21:59	50	98	148
22:00 - 22:59	44	73	117
23:00 - 23:59	20	45	65
Total	**4001**	**3813**	**7814**
AM Peak	7:15	7:00	7:00
Hour	8:14	7:59	7:59
Volume	395	287	631
PM Peak	17:00	16:30	16:30
Hour	17:59	17:29	17:29
Volume	378	436	765

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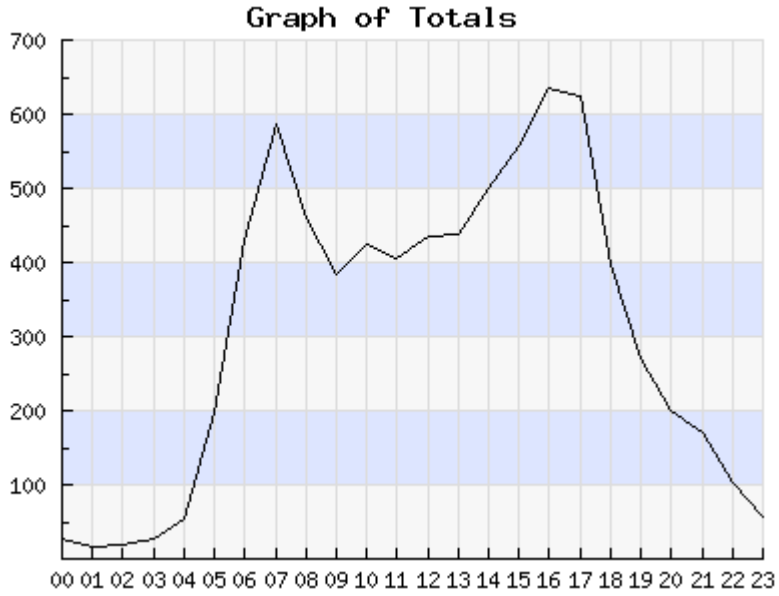
Daily Vehicle Volume Report

Location:
Reche Road between Tecalote Road & Old Highway 395
File Number: 94020
Counter ID: 210
Report Duration:
Tuesday Jan 06, 2009 - 00:00 to
Tuesday Jan 06, 2009 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	7	19	26
01:00 - 01:59	6	11	17
02:00 - 02:59	9	11	20
03:00 - 03:59	18	10	28
04:00 - 04:59	42	12	54
05:00 - 05:59	153	45	198
06:00 - 06:59	280	151	431
07:00 - 07:59	322	265	587
08:00 - 08:59	283	177	460
09:00 - 09:59	231	153	384
10:00 - 10:59	239	185	424
11:00 - 11:59	225	180	405
12:00 - 12:59	217	218	435
13:00 - 13:59	194	245	439
14:00 - 14:59	227	274	501
15:00 - 15:59	248	308	556
16:00 - 16:59	294	341	635
17:00 - 17:59	296	329	625
18:00 - 18:59	160	236	396
19:00 - 19:59	100	169	269
20:00 - 20:59	79	122	201
21:00 - 21:59	61	108	169
22:00 - 22:59	36	68	104
23:00 - 23:59	15	41	56
Total	**3742**	**3678**	**7420**
AM Peak	7:15	7:00	7:00
Hour	8:14	7:59	7:59
Volume	344	265	587
PM Peak	16:45	16:30	16:30
Hour	17:44	17:29	17:29
Volume	302	389	686

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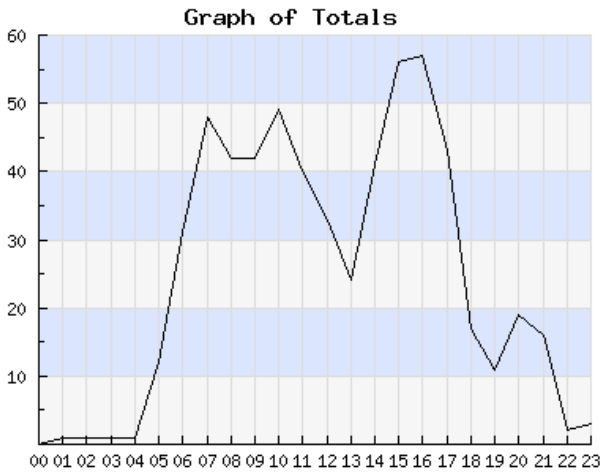
Daily Vehicle Volume Report

Location:
Stewart Cyn Rd btwn Old Hwy 395 & Pankey Rd
File Number: 94021
Counter ID: 106
Report Duration:
Thursday Dec 11, 2008 - 00:00 to
Thursday Dec 11, 2008 - 23:59
Other Notes:
None at this time



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	0	0	0
01:00 - 01:59	1	0	1
02:00 - 02:59	1	0	1
03:00 - 03:59	0	1	1
04:00 - 04:59	1	0	1
05:00 - 05:59	5	7	12
06:00 - 06:59	15	16	31
07:00 - 07:59	23	25	48
08:00 - 08:59	23	19	42
09:00 - 09:59	18	24	42
10:00 - 10:59	24	25	49
11:00 - 11:59	21	19	40
12:00 - 12:59	18	15	33
13:00 - 13:59	12	12	24
14:00 - 14:59	19	22	41
15:00 - 15:59	31	25	56
16:00 - 16:59	17	40	57
17:00 - 17:59	21	22	43
18:00 - 18:59	11	6	17
19:00 - 19:59	7	4	11
20:00 - 20:59	14	5	19
21:00 - 21:59	12	4	16
22:00 - 22:59	0	2	2
23:00 - 23:59	2	1	3
Total	**296**	**294**	**590**
AM Peak	7:45	10:15	10:15
Hour	8:44	11:14	11:14
Volume	27	27	54
PM Peak	15:15	16:15	16:15
Hour	16:14	17:14	17:14
Volume	32	41	62

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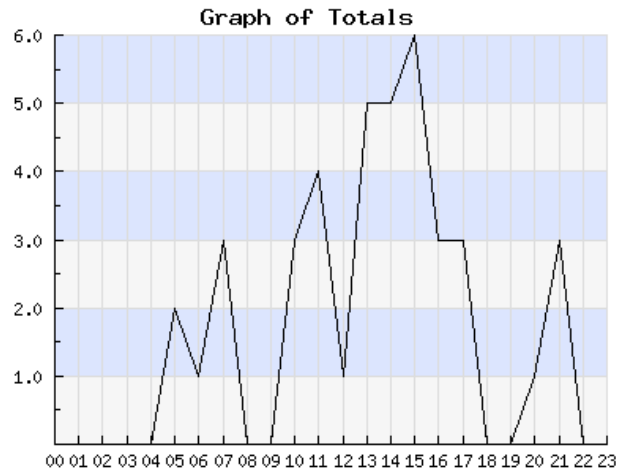
Daily Vehicle Volume Report

Location:
Pankey Road south of Stewart Canyon Road
File Number: 94023
Counter ID: 110
Report Duration:
Thursday Dec 11, 2008 - 00:00 to
Thursday Dec 11, 2008 - 23:59
Other Notes:
None at this time



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	0	0	0
01:00 - 01:59	0	0	0
02:00 - 02:59	0	0	0
03:00 - 03:59	0	0	0
04:00 - 04:59	0	0	0
05:00 - 05:59	1	1	2
06:00 - 06:59	1	0	1
07:00 - 07:59	2	1	3
08:00 - 08:59	0	0	0
09:00 - 09:59	0	0	0
10:00 - 10:59	1	2	3
11:00 - 11:59	2	2	4
12:00 - 12:59	1	0	1
13:00 - 13:59	2	3	5
14:00 - 14:59	3	2	5
15:00 - 15:59	3	3	6
16:00 - 16:59	1	2	3
17:00 - 17:59	2	1	3
18:00 - 18:59	0	0	0
19:00 - 19:59	0	0	0
20:00 - 20:59	0	1	1
21:00 - 21:59	1	2	3
22:00 - 22:59	0	0	0
23:00 - 23:59	0	0	0
Total	**20**	**20**	**40**
AM Peak	10:30	10:15	10:15
Hour	11:29	11:14	11:14
Volume	3	3	5
PM Peak	14:00	12:45	14:30
Hour	14:59	13:44	15:29
Volume	3	3	6

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Transportation Studies, Inc.
1350 Reynolds Avenue, Ste 115
Irvine, CA. 92614

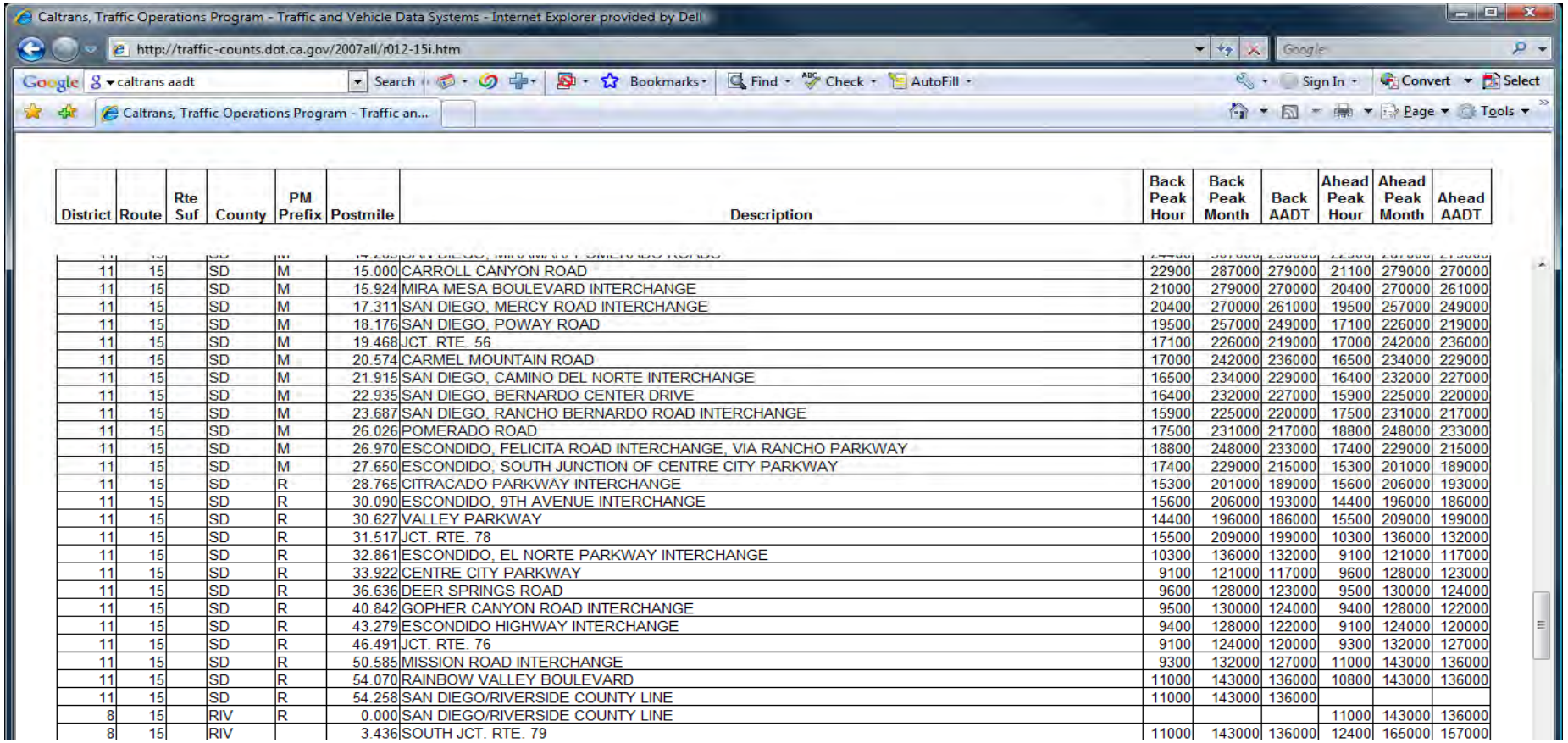
Location : PANKEY ROAD
Segment : PALA RD TO DULIN ROAD
Client : URBAN SYSTEMS

Site: FALLBROOK
Date: 12/13/07
Day: Thursday

Interval	NB				SB				Combined			
Begin	AM		PM		AM		PM		AM		PM	
12:00	0	4	6	23	4	11	9	31	4	15	15	54
12:15	1		3		3		7		4		10	
12:30	2		5		2		5		4		10	
12:45	1		9		2		10		3		19	
01:00	0	1	4	30	1	4	9	27	1	5	13	57
01:15	0		9		2		5		2		14	
01:30	1		13		1		7		2		20	
01:45	0		4		0		6		0		10	
02:00	0	3	5	24	0	5	7	25	0	8	12	49
02:15	1		2		1		4		2		6	
02:30	1		10		2		6		3		16	
02:45	1		7		2		8		3		15	
03:00	1	6	8	32	2	6	5	38	3	12	13	70
03:15	1		7		3		8		4		15	
03:30	1		11		0		13		1		24	
03:45	3		6		1		12		4		18	
04:00	0	4	10	34	0	3	14	54	0	7	24	88
04:15	2		7		1		10		3		17	
04:30	1		8		0		14		1		22	
04:45	1		9		2		16		3		25	
05:00	1	17	10	35	0	1	9	48	1	18	19	83
05:15	3		9		1		8		4		17	
05:30	7		6		0		17		7		23	
05:45	6		10		0		14		6		24	
06:00	6	26	8	19	1	12	8	36	7	38	16	55
06:15	8		4		4		13		12		17	
06:30	10		5		3		10		13		15	
06:45	2		2		4		5		6		7	
07:00	2	28	5	15	8	14	12	43	10	42	17	58
07:15	8		4		1		10		9		14	
07:30	7		4		1		10		8		14	
07:45	11		2		4		11		15		13	
08:00	4	35	1	14	3	11	5	29	7	46	6	43
08:15	11		6		4		8		15		14	
08:30	14		4		4		10		18		14	
08:45	6		3		0		6		6		9	
09:00	6	29	4	11	1	8	7	25	7	37	11	36
09:15	7		4		6		5		13		9	
09:30	9		1		0		4		9		5	
09:45	7		2		1		9		8		11	
10:00	7	30	3	6	6	15	3	14	13	45	6	20
10:15	5		3		3		2		8		5	
10:30	12		0		4		7		16		7	
10:45	6		0		2		2		8		2	
11:00	5	17	0	1	5	19	3	13	10	36	3	14
11:15	4		1		7		4		11		5	
11:30	4		0		3		3		7		3	
11:45	4		0		4		3		8		3	
Totals	200		244		109		383		309		627	
Split%	64.7		38.9		35.3		61.1					
Day Totals		444				492				936		
Day Splits		47.4				52.6						
Peak Hour	07:45		04:30		06:15		04:00		07:45		04:00	
Volume	40		36		19		54		55		88	
Factor	0.71		0.90		0.59		0.84		0.76		0.88	

Data File : D0711788

2007 Caltrans AADTs from Caltrans Website.



District	Route	Rte Suf	County	PM Prefix	Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
11	15		SD	M	15.000	CARROLL CANYON ROAD	22900	287000	279000	21100	279000	270000
11	15		SD	M	15.924	MIRA MESA BOULEVARD INTERCHANGE	21000	279000	270000	20400	270000	261000
11	15		SD	M	17.311	SAN DIEGO, MERCY ROAD INTERCHANGE	20400	270000	261000	19500	257000	249000
11	15		SD	M	18.176	SAN DIEGO, POWAY ROAD	19500	257000	249000	17100	226000	219000
11	15		SD	M	19.468	JCT. RTE. 56	17100	226000	219000	17000	242000	236000
11	15		SD	M	20.574	CARMEL MOUNTAIN ROAD	17000	242000	236000	16500	234000	229000
11	15		SD	M	21.915	SAN DIEGO, CAMINO DEL NORTE INTERCHANGE	16500	234000	229000	16400	232000	227000
11	15		SD	M	22.935	SAN DIEGO, BERNARDO CENTER DRIVE	16400	232000	227000	15900	225000	220000
11	15		SD	M	23.687	SAN DIEGO, RANCHO BERNARDO ROAD INTERCHANGE	15900	225000	220000	17500	231000	217000
11	15		SD	M	26.026	POMERADO ROAD	17500	231000	217000	18800	248000	233000
11	15		SD	M	26.970	ESCONDIDO, FELICITA ROAD INTERCHANGE, VIA RANCHO PARKWAY	18800	248000	233000	17400	229000	215000
11	15		SD	M	27.650	ESCONDIDO, SOUTH JUNCTION OF CENTRE CITY PARKWAY	17400	229000	215000	15300	201000	189000
11	15		SD	R	28.765	CITRACADO PARKWAY INTERCHANGE	15300	201000	189000	15600	206000	193000
11	15		SD	R	30.090	ESCONDIDO, 9TH AVENUE INTERCHANGE	15600	206000	193000	14400	196000	186000
11	15		SD	R	30.627	VALLEY PARKWAY	14400	196000	186000	15500	209000	199000
11	15		SD	R	31.517	JCT. RTE. 78	15500	209000	199000	10300	136000	132000
11	15		SD	R	32.861	ESCONDIDO, EL NORTE PARKWAY INTERCHANGE	10300	136000	132000	9100	121000	117000
11	15		SD	R	33.922	CENTRE CITY PARKWAY	9100	121000	117000	9600	128000	123000
11	15		SD	R	36.636	DEER SPRINGS ROAD	9600	128000	123000	9500	130000	124000
11	15		SD	R	40.842	GOPHER CANYON ROAD INTERCHANGE	9500	130000	124000	9400	128000	122000
11	15		SD	R	43.279	ESCONDIDO HIGHWAY INTERCHANGE	9400	128000	122000	9100	124000	120000
11	15		SD	R	46.491	JCT. RTE. 76	9100	124000	120000	9300	132000	127000
11	15		SD	R	50.585	MISSION ROAD INTERCHANGE	9300	132000	127000	11000	143000	136000
11	15		SD	R	54.070	RAINBOW VALLEY BOULEVARD	11000	143000	136000	10800	143000	136000
11	15		SD	R	54.258	SAN DIEGO/RIVERSIDE COUNTY LINE	11000	143000	136000			
8	15		RIV	R	0.000	SAN DIEGO/RIVERSIDE COUNTY LINE				11000	143000	136000
8	15		RIV		3.436	SOUTH JCT. RTE. 79	11000	143000	136000	12400	165000	157000

2005

Annual Average Daily Truck Traffic on the California State Highway System

Compiled by
Traffic and Vehicle Data Systems

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

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

NOVEMBER 2006

PREFACE

The annual average daily truck traffic is shown for selected locations on the State Highway System. Truck traffic is classified by number of axles. The two-axle class includes 11/2-ton trucks with dual rear tires and excludes pickups and vans with only four tires. Total vehicle AADT for the same year is taken from the Traffic Volumes on California State Highways booklet also published by the California Department of Transportation.

Annual average daily truck traffic is the total truck traffic volume divided by 365 days. Truck counting is done throughout the state in a program of continuous truck count sampling. The sampling includes a partial day, 24-hour, 7-day and continuous vehicle classification counts. The partial day and 24-hour counts are usually made on high volume, urban highways. The 7-day counts are made on low volume, rural highways. The counts are usually taken only once in the year. About one-sixth of the locations are counted annually. The resulting counts are adjusted to an estimate of annual average daily truck traffic by compensating for seasonal influence, weekly variation, and other variables that may be present. Annual average daily truck traffic is necessary for presenting a statewide picture of truck flow, evaluating truck trends, planning and designing highways and for other purposes.

The column entitled "Year Ver/Est" means Verified/Estimated and the codes are V and E. It represents the year the truck percentages were verified (counted continuously or quarterly) or estimated. Selected points on a route will be counted and the ones in between will be estimated. Our basic policy is to count a route every six years. At some locations, truck volumes are static and no new counts are made until there is a change in traffic on the route.

California State Highways are listed in legislative route number order. The legislative route number is the same as the signed route number in most cases.

Each count location is identified by the post mile value corresponding to that point on the highway. The post mile values increase from the beginning of a route within a county to the next county line. The post mile values start over again at each county line. Post mile values increase usually from south to north or west to east depending on the general direction the route follows within the state.

The post mile at a given location will remain the same year after year except in a few cases when the route was relocated/redesignated. When a section of road is relocated, new post miles (usually noted by an alphabetical prefix such as "R" or "M") are established for it. If relocation results in a change in length, "post mile equations" are introduced so that post miles on the remainder of the route within the county will remain unchanged. Post mile equations are not shown on this listing.

A leg is given for each count location and is denoted by an A, B or O. For traffic volumes purposes, a highway intersection or interchange has two legs. According to ascending post miles (route direction) and a post mile reference at the center of the intersection or interchange, B = back leg, A = ahead leg, and O = traffic volume is equal for the back and ahead legs.

Truck AADT's are shown as two-way traffic, but the equivalent axle loading (EAL) are calculated to represent one-way travel.

Data compiled by:

Traffic Operations Program, Office of Traffic Data
(916) 654-3072

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT TOTAL By Axle 2	3	4	5+	% TRUCK AADT By Axle 2	3	4	5+	EAL 1-WAY (1000)	YEAR VER/ EST
015	11	SD	2.226	B	JCT. RTE. 94	119000	6069	5.1	3107	1032	303	1626	51.2	17	5	26.8	809	85V
015	11	SD	R3.367	B	JCT. RTE. 805	103000	5253	5.1	2690	893	263	1408	51.2	17	5	26.8	701	85E
015	11	SD	R3.367	A	JCT. RTE. 805	160000	3520	2.2	2541	359	109	510	72.2	10.2	3.1	14.5	314	85V
015	11	SD	R6.132	B	JCT. RTE. 8	165000	3630	2.2	2621	374	113	523	72.2	10.3	3.1	14.4	323	85E
015	11	SD	R6.132	A	JCT. RTE. 8	222000	11056	4.98	6903	791	260	3101	62.44	7.15	2.35	28.05	1422	05V
015	11	SD	M12.124	A	JCT. RTE. 163	295000	11004	3.73	6761	792	304	3147	61.44	7.2	2.76	28.6	1440	05E
015	11	SD	M14.285	B	SAN DIEGO, MIRAMAR/ POMERADO ROADS	291000	10942	3.76	6723	788	302	3129	61.44	7.2	2.76	28.6	1432	05E
015	11	SD	M14.285	A	SAN DIEGO, MIRAMAR/ POMERADO ROADS	278000	10842	3.9	6353	1138	423	2927	58.6	10.5	3.9	27	1399	85V
015	11	SD	M18.176	B	SAN DIEGO, POWAY ROAD	250000	17750	7.1	8662	2006	994	6088	48.8	11.3	5.6	34.3	2734	96E
015	11	SD	M18.176	A	SAN DIEGO, POWAY ROAD	223000	15833	7.1	7727	1789	887	5431	48.8	11.3	5.6	34.3	2439	96E
015	11	SD	M27.65	A	ESCONDIDO, SOUTH JUNCTION OF CENTRE CITY PARKWAY	184000	13064	7.1	6375	1476	732	4481	48.8	11.3	5.6	34.3	2012	96E
015	11	SD	R30.627	B	VALLEY PARKWAY	185000	13135	7.1	6410	1484	736	4505	48.8	11.3	5.6	34.3	2023	96E
015	11	SD	R31.517	B	JCT. RTE. 78	198000	14058	7.1	6860	1589	787	4822	48.8	11.3	5.6	34.3	2166	96E
015	11	SD	R31.517	A	JCT. RTE. 78	128000	12928	10.1	5714	1112	672	5430	44.2	8.6	5.2	42	2274	80V
015	11	SD	R36.636	A	DEER SPRINGS ROAD	136000	17952	13.2	6337	1454	754	9407	35.3	8.1	4.2	52.4	3712	86V
015	11	SD	R46.491	B	JCT. RTE. 76	128000	13094	10.23	4167	1041	447	7440	31.82	7.95	3.41	56.82	2874	00E
015	11	SD	R46.491	A	JCT. RTE. 76	121000	9849	8.14	3200	751	334	5565	32.49	7.63	3.39	56.5	2150	00E
015	08	RIV	R0	A	SAN DIEGO/RIVERSIDE COUNTY LINE	136000	9180	6.75	3428	654	278	4820	37.34	7.12	3.03	52.51	1884	04V
015	08	RIV	3.436	B	SOUTH JCT. RTE. 79	136000	9180	6.75	3428	654	278	4820	37.34	7.12	3.03	52.51	1884	04E
015	08	RIV	3.436	A	SOUTH JCT. RTE. 79	157000	11069	7.05	4133	788	335	5812	37.34	7.12	3.03	52.51	2272	04E
015	08	RIV	6.623	B	NORTH JCT RTE. 79	170000	11169	6.57	4171	795	338	5865	37.34	7.12	3.03	52.51	2292	04E
015	08	RIV	8.737	B	JCT. RTE. 215 NORTH	196000	10878	5.55	4062	775	330	5712	37.34	7.12	3.03	52.51	2233	04E
015	08	RIV	8.737	A	JCT. RTE. 215 NORTH	117000	9828	8.4	4846	691	317	3972	49.31	7.03	3.23	40.42	1650	04E

PEAK HOUR VOLUME DATA

Peak hour volume data consists of hourly volume relationships and data location. The hourly volumes are expressed as a percentage of the Annual Average Daily Traffic (AADT). The percentages are shown for both the AM and the PM peak periods.

The principle data described here are the K factor, the D factor and their product (KD). The K factor is the percentage of AADT during the peak hour for both directions of travel. The D factor is the percentage of the peak hour travel in the peak direction. KD multiplied with the AADT gives the one way peak period directional flow rate or the design hourly volume (DHV). The design hourly volume is used for either Operational Analysis or Design Analysis. Refer to the 2000 Highway Capacity Manual for more details.

Following is a glossary of terms used in this listing of peak hour volume data:

Dir	Indicates direction of travel for peak volume
AADT	Annual Average Daily Traffic in vehicles per day (vpd).
AM Peak	Represents the morning peak period for traffic analysis
CS	Control Station Number, Caltrans identification number for monitoring site.
CO	County abbreviation used by Caltrans
D	D factor. The percentage of traffic in the peak direction during the peak hour. Values in this book are derived by dividing the measured PHV by the sum of both directions of travel during the peak hour.
DAY	Day of week for the peak volume.
DDHV	The directional design hour volume, in vehicles per hour (vph) DDHV=AADTxKxD. See equation (8-1) on page 8-11 of the 2000 Highway Capacity Manual.
DI	Caltrans has twelve transportation districts statewide. This abbreviation identifies the district in which the count station is located.
HR	The ending time for the peak hour volume listed. The volume observed fro 1 to 2 would be recorded as 2.

K	The percentage of the AADT in both directions during the peak hour. Values in this table are derived by dividing the measured 2-way PHV by the AADT.
KD	The product of K and D. The percentage of AADT in the peak direction during the peak hour. Values in this table are derived by dividing the measured 1-way PHV by the AADT.
LEG	For traffic counting purposes, a highway intersection or interchange is assigned two legs according to increasing postmiles (route direction) and with a postmile reference at the center of the intersection or interchange. The volume of traffic on each leg is denoted by an A, B or O. A = ahead leg, B = back leg, and O – traffic volume being same for both back and ahead legs.
MNTH	The month that the peak volume occurred.
PHV	Peak Hour Volume in the peak direction. A one way volume in vehicles per hour (vph) as used here. The PHV is analogous to the DDHV as used for design purposes.
PM	The Post Mile is the mileage measured from the county line, or from the beginning of a route. Each postmile along a route in a county is a unique location on the state highway system.
PM Peak	Represents the afternoon peak period for traffic analysis.
PRE	The postmile may have a prefix like R, T, L, M, etc. When a length of highway is changed due to construction or realigment, new postmile values are assigned. To distinguish the new values from the old, an alpha code is prefixed to the new postmile.
RTE	The state highway route number
YR	The year when the count was made. Traffic counting is on a 3-year cycle.

SANDAG Hwycov Year 2007 (peak hour volumes and capacities along SR-76)

Hwycov_id	Nm	Fxnm	Txnm	Lanes Iftlno	AM Vol Iftvla	dir	AM Cap Iftcpa	v/c ratio	AM LOS	AM Vol Itfvla	dir	AM Cap Itfcpa	v/c ratio	AM LOS	PM Vol Iftvlp	dir	PM Cap Iftcpp	v/c ratio	PM LOS	PM Vol Itfvlp	dir	PM Cap Itfcpp	v/c ratio	PM LOS
12033	MISSION	JEFFRIES RANCH	MELROSE	1	1536	WB	2406	0.64	C	980	EB	1300	0.75	D	1012	WB	2406	0.42	B	1456	EB	1300	1.12	F
2670	MISSION	CRANBERRY	JEFFRIES RANCH	1	1469	WB	1300	1.13	F	999	EB	1300	0.77	D	1001	WB	1300	0.77	D	1413	EB	1300	1.09	F
12731	MISSION	EAST VISTA	CRANBERRY	1	1469	WB	1300	1.13	F	999	EB	1654	0.60	C	1001	WB	1300	0.77	D	1413	EB	1654	0.85	D
12735	MISSION	HOLLY	EAST VISTA	1	1052	WB	1202	0.88	E	718	EB	950	0.76	D	653	WB	1202	0.54	C	1107	EB	950	1.17	F
12736	MISSION	NORTH RIVER	HOLLY	1	1040	WB	950	1.09	F	718	EB	1420	0.51	B	652	WB	950	0.69	C	1091	EB	1420	0.77	D
31079	MISSION	UNKNOWN	NORTH RIVER	1	1200	WB	1420	0.85	D	852	EB	950	0.90	E	781	WB	1420	0.55	C	1176	EB	950	1.24	F
7210	MISSION	VIA GRENADA	UNKNOWN	1	1200	WB	950	1.26	F	852	EB	950	0.90	E	781	WB	950	0.82	D	1176	EB	950	1.24	F
7209	MISSION	VALLEY RANCH	VIA GRENADA	1	1200	WB	950	1.26	F	852	EB	950	0.90	E	781	WB	950	0.82	D	1176	EB	950	1.24	F
11625	MISSION	OLIVEHILL/CM DEL REY	VALLEY RANCH	1	1198	WB	950	1.26	F	854	EB	1202	0.71	D	783	WB	950	0.82	D	1175	EB	1202	0.98	E
11626	MISSION	THOROUGHBRED	OLIVEHILL/CM DEL REY	1	1074	WB	1202	0.89	E	1031	EB	950	1.09	F	965	WB	1202	0.80	D	1457	EB	950	1.53	F
15943	PALA	THOROUGHBRED	MISSION	1	998	EB	2122	0.47	B	1245	WB	950	1.31	F	1467	EB	2122	0.69	C	1069	WB	950	1.13	F
19215	PALA	MISSION	ZONE CONNECTOR	1	745	EB	950	0.78	D	942	WB	2122	0.44	B	1064	EB	950	1.12	F	1101	WB	2122	0.52	C
19216	PALA	ZONE CONNECTOR	RAMONA	1	636	EB	950	0.67	C	900	WB	950	0.95	E	1062	EB	950	1.12	F	614	WB	950	0.65	C
30386	PALA	RAMONA	CALLE DE LA VUELTA	1	644	EB	950	0.68	C	901	WB	950	0.95	E	1064	EB	950	1.12	F	618	WB	950	0.65	C
17167	PALA	CALLE DE LA VUELTA	VIA MONSERATE	1	649	EB	950	0.68	C	881	WB	950	0.93	E	1037	EB	950	1.09	F	620	WB	950	0.65	C
3279	PALA	VIA MONSERATE	UNKNOWN	1	808	EB	950	0.85	D	895	WB	950	0.94	E	1077	EB	950	1.13	F	786	WB	950	0.83	D
1799	PALA	UNKNOWN	LIMBER PINE	1	808	EB	950	0.85	D	895	WB	950	0.94	E	1077	EB	950	1.13	F	786	WB	950	0.83	D
1800	PALA	LIMBER PINE	GIRD	1	808	EB	950	0.85	D	895	WB	950	0.94	E	1077	EB	950	1.13	F	786	WB	950	0.83	D
3278	PALA	GIRD	UNKNOWN	1	718	EB	950	0.76	D	540	WB	950	0.57	C	640	EB	950	0.67	C	715	WB	950	0.75	D
17822	PALA	UNKNOWN	ZONE CONNECTOR	1	740	EB	950	0.78	D	542	WB	950	0.57	C	645	EB	950	0.68	C	742	WB	950	0.78	D
17823	PALA	ZONE CONNECTOR	OLD 395	1	760	EB	950	0.80	D	534	WB	950	0.56	C	638	EB	950	0.67	C	768	WB	950	0.81	D
8586	PALA	OLD 395	RAMP I-15 SB	1	1507	EB	2050	0.74	D	665	WB	2028	0.33	B	816	EB	2050	0.40	B	1258	WB	2028	0.62	C
1801	PALA	RAMP I-15 SB	RAMP I-15 NB	1	844	EB	950	0.89	E	539	WB	950	0.57	C	718	EB	950	0.76	D	1153	WB	950	1.21	F
11460	PALA	RAMP I-15 NB	PANKEY	1	559	EB	950	0.59	C	606	WB	950	0.64	C	696	EB	950	0.73	D	820	WB	950	0.86	E
1804	PALA	PANKEY	PANKEY NEW	1	589	EB	950	0.62	C	540	WB	950	0.57	C	631	EB	950	0.66	C	897	WB	950	0.94	E
11457	PALA-NEW	PANKEY NEW	PALA	1	588	EB	950	0.62	C	539	WB	950	0.57	C	630	EB	950	0.66	C	896	WB	950	0.94	E
11456	PALA	PALA-NEW	RICE CANYON	1	589	EB	950	0.62	C	540	WB	950	0.57	C	631	EB	950	0.66	C	897	WB	950	0.94	E
11453	PALA	RICE CANYON	COUSER CANYON	1	617	EB	950	0.65	C	450	WB	950	0.47	B	526	EB	950	0.55	C	930	WB	950	0.98	E
7771	PALA	COUSER CANYON	ZONE CONNECTOR	1	630	EB	950	0.66	C	357	WB	950	0.38	B	434	EB	950	0.46	B	945	WB	950	0.99	E
11454	PALA	ZONE CONNECTOR	UNKNOWN	1	632	EB	950	0.67	C	356	WB	950	0.37	B	432	EB	950	0.45	B	947	WB	950	1.00	E
11451	PALA	UNKNOWN	PALA MISSION	1	634	EB	950	0.67	C	351	WB	950	0.37	B	427	EB	950	0.45	B	950	WB	950	1.00	F

Notes: Shaded cells represent the worst v/c ratio for the study area segments by peak hour and direction

SAN DIEGO COUNTY SERIES 10 TRAFFIC MODEL (Year 2030) Showing SR-76 Capacity at 4 lanes (Shaded Cells)

Hwycov_id	Nm	Fxnm	Txnm	Lanes Iftlno	dir	AM Cap Iftcpa	dir	AM Cap Itfcpa		dir	PM Cap Iftcpp	dir	PM Cap Itfcpp
11460	PALA	RAMP I-15 NB	PANKEY	2	EB	3100	WB	3030		EB	3100	WB	3030
1804	PALA	PANKEY	PANKEY NEW	2	EB	1806	WB	2028		EB	1806	WB	2028

Notes: Shaded cells represent capacity used in year 2007 analysis because SR-76 is currently being widened to 2 lanes each direction

Pictures of SR-76 currently being widened from 2 to 4 lanes. Pictures taken Dec 2008 and Jan 2009.

Intersection of SR-76 at Pankey Road. Pankey Road closed south of SR-76 due to SR-76 widening.



Looking west along SR-76 in the vicinity of Granite driveway



Looking west along SR-76 prior to Pankey Rd where new alignment deviates from existing alignment



Looking west along SR-76 just before I-15 interchange



Appendix E

Existing Level of Service Calculations

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	4	541	979	22	70	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	569	1031	23	74	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1054				1620	1042
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1054				1620	1042
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				35	91
cM capacity (veh/h)	661				113	279

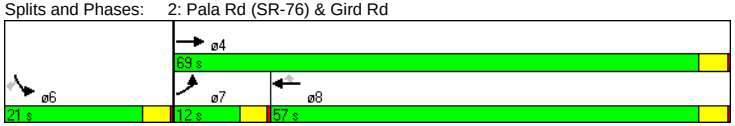
Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	4	569	1054	100
Volume Left	4	0	0	74
Volume Right	0	0	23	26
cSH	661	1700	1700	134
Volume to Capacity	0.01	0.33	0.62	0.75
Queue Length 95th (ft)	0	0	0	109
Control Delay (s)	10.5	0.0	0.0	86.1
Lane LOS	B			F
Approach Delay (s)	0.1		0.0	86.1
Approach LOS				F

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	75	589	781	29	59	103
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	69.0	57.0	57.0	21.0	21.0
Total Split (%)	13.3%	76.7%	63.3%	63.3%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	7.6	34.5	29.0	29.0	8.8	8.8
Actuated g/C Ratio	0.13	0.65	0.54	0.54	0.16	0.16
v/c Ratio	0.37	0.52	0.81	0.04	0.24	0.33
Control Delay	35.5	5.5	17.7	5.6	30.1	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	5.5	17.7	5.6	30.1	10.5
LOS	D	A	B	A	C	B
Approach Delay		8.9	17.3		17.7	
Approach LOS		A	B		B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 53.4			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 13.9		Intersection LOS: B	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



AM Existing
2: Pala Rd (SR-76) & Gird Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	79	620	822	31	62	108
v/c Ratio	0.37	0.52	0.81	0.04	0.24	0.33
Control Delay	35.5	5.5	17.7	5.6	30.1	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	5.5	17.7	5.6	30.1	10.5
Queue Length 50th (ft)	26	63	222	4	20	0
Queue Length 95th (ft)	#93	137	406	14	66	44
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	240	1495	1309	998	490	513
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.41	0.63	0.03	0.13	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing
2: Pala Rd (SR-76) & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Volume (vph)	75	589	781	29	59	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	620	822	31	62	108
RTOR Reduction (vph)	0	0	0	3	0	90
Lane Group Flow (vph)	79	620	822	28	62	18
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	3.7	36.7	29.0	29.0	8.9	8.9
Effective Green, g (s)	3.7	36.7	29.0	29.0	8.9	8.9
Actuated g/C Ratio	0.07	0.68	0.54	0.54	0.17	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	109	1276	1008	767	263	235
v/s Ratio Prot	c0.05	0.33	c0.44		c0.04	
v/s Ratio Perm				0.02		0.01
v/c Ratio	0.72	0.49	0.82	0.04	0.24	0.08
Uniform Delay, d1	24.5	4.0	10.1	5.8	19.4	18.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.1	0.3	5.2	0.0	0.5	0.1
Delay (s)	45.6	4.3	15.3	5.8	19.9	19.0
Level of Service	D	A	B	A	B	B
Approach Delay (s)		8.9	14.9		19.3	
Approach LOS		A	B		B	

Intersection Summary

HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	53.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

AM Existing
3: Pala Rd (SR-76) & Sage Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	1	603	845	1	5	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	635	889	1	5	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	891				1527	890
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	891				1527	890
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	97
cM capacity (veh/h)	761				129	342

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	636	891	16
Volume Left	1	0	5
Volume Right	0	1	11
cSH	761	1700	221
Volume to Capacity	0.00	0.52	0.07
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.0	22.6
Lane LOS	A		C
Approach Delay (s)	0.0	0.0	22.6
Approach LOS			C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

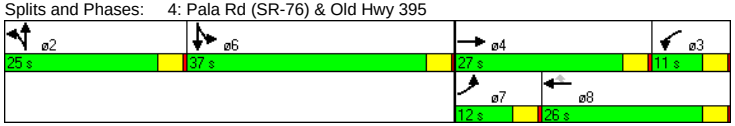
AM Existing
4: Pala Rd (SR-76) & Old Hwy 395

Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Configurations							
Volume (vph)	50	533	51	544	76	70	76
Turn Type	Prot		Prot		Perm		
Protected Phases	7	4	3	8		2	6
Permitted Phases					8		
Detector Phases	7	4	3	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	27.0	11.0	26.0	26.0	25.0	37.0
Total Split (%)	12.0%	27.0%	11.0%	26.0%	26.0%	25.0%	37.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	Min
Act Effct Green (s)	7.4	17.7	6.9	17.3	17.3	14.2	20.4
Actuated g/C Ratio	0.10	0.25	0.09	0.24	0.24	0.20	0.28
v/c Ratio	0.34	0.74	0.37	0.67	0.20	0.67	0.77
Control Delay	46.2	33.4	48.4	32.7	9.2	38.8	36.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	33.4	48.4	32.7	9.2	38.8	36.6
LOS	D	C	D	C	A	D	D
Approach Delay		34.4		31.2		38.8	36.6
Approach LOS		C		C		D	D

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 71.8			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 34.2		Intersection LOS: C	
Intersection Capacity Utilization 64.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



AM Existing
4: Pala Rd (SR-76) & Old Hwy 395 — Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	53	642	54	573	80	243	392
v/c Ratio	0.34	0.74	0.37	0.67	0.20	0.67	0.77
Control Delay	46.2	33.4	48.4	32.7	9.2	38.8	36.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	33.4	48.4	32.7	9.2	38.8	36.6
Queue Length 50th (ft)	26	156	27	142	0	110	185
Queue Length 95th (ft)	73	265	#78	241	37	215	314
Internal Link Dist (ft)		572		382		819	4384
Turn Bay Length (ft)	330		150		150		
Base Capacity (vph)	180	1130	159	1103	497	523	738
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.57	0.34	0.52	0.16	0.46	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing
4: Pala Rd (SR-76) & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.96			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (prot)	1583	3472		1583	3539	1417		1756			1774	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (perm)	1583	3472		1583	3539	1417		1756			1774	
Volume (vph)	50	533	77	51	544	76	96	70	65	255	76	42
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	561	81	54	573	80	101	74	68	268	80	44
RTOR Reduction (vph)	0	11	0	0	0	61	0	14	0	0	5	0
Lane Group Flow (vph)	53	631	0	54	573	19	0	229	0	0	387	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	3.7	17.7		3.3	17.3	17.3		14.2			20.4	
Effective Green, g (s)	3.7	17.7		3.3	17.3	17.3		14.2			20.4	
Actuated g/C Ratio	0.05	0.25		0.05	0.24	0.24		0.20			0.28	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	82	858		73	855	342		348			505	
v/s Ratio Prot	0.03	c0.18		0.03	c0.16			c0.13			c0.22	
v/s Ratio Perm						0.01						
v/c Ratio	0.65	0.74		0.74	0.67	0.06		0.66			0.77	
Uniform Delay, d1	33.3	24.8		33.7	24.6	20.9		26.5			23.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	16.2	3.3		32.0	2.1	0.1		4.4			6.8	
Delay (s)	49.5	28.1		65.8	26.6	20.9		30.9			30.3	
Level of Service	D	C		E	C	C		C			C	
Approach Delay (s)		29.7			29.0			30.9			30.3	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	29.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	71.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing
5: Dulin Rd & Old Hwy 395 HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	10	6	260	7	4	214
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	6	274	7	4	225
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		13				
Median type	None					
Median storage veh)						
Upstream signal (ft)						899
pX, platoon unblocked						
vC, conflicting volume	511	277			281	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	511	277			281	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	521	761			1281	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	17	281	229
Volume Left	11	0	4
Volume Right	6	7	0
cSH	833	1700	1281
Volume to Capacity	0.02	0.17	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	11.2	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	11.2	0.0	0.2
Approach LOS	B		

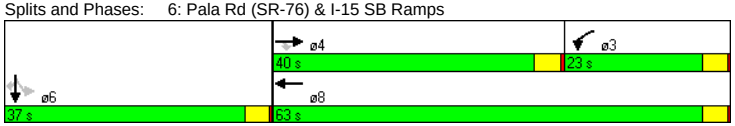
Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		24.5%	ICU Level of Service A
Analysis Period (min)		15	

AM Existing
6: Pala Rd (SR-76) & I-15 SB Ramps Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Volume (vph)	478	297	54	242	1	551
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6	
Permitted Phases		4				6
Detector Phases	4	4	3	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	40.0	40.0	23.0	63.0	37.0	37.0
Total Split (%)	40.0%	40.0%	23.0%	63.0%	37.0%	37.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	32.0	32.0	8.3	42.4	49.6	49.6
Actuated g/C Ratio	0.32	0.32	0.08	0.42	0.50	0.50
v/c Ratio	0.84	0.47	0.44	0.32	0.06	0.58
Control Delay	44.5	4.8	48.9	20.8	18.3	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	4.8	48.9	20.8	18.3	4.7
LOS	D	A	D	C	B	A
Approach Delay	29.3			25.9	5.8	
Approach LOS	C			C	A	

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 40 (40%), Referenced to phase 2: and 6:SBTL, Start of Green		
Natural Cycle: 55		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.84		
Intersection Signal Delay: 20.3	Intersection LOS: C	
Intersection Capacity Utilization 57.5%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



AM Existing
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	503	313	57	255	52	580
v/c Ratio	0.84	0.47	0.44	0.32	0.06	0.58
Control Delay	44.5	4.8	48.9	20.8	18.3	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.5	4.8	48.9	20.8	18.3	4.7
Queue Length 50th (ft)	296	0	38	99	17	0
Queue Length 95th (ft)	369	51	m54	0	49	85
Internal Link Dist (ft)	574			1191	1129	
Turn Bay Length (ft)			500			900
Base Capacity (vph)	694	724	301	1099	881	995
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.43	0.19	0.23	0.06	0.58

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

AM Existing
6: Pala Rd (SR-76) & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1776	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1776	1417
Volume (vph)	0	478	297	54	242	0	0	0	0	48	1	551
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	503	313	57	255	0	0	0	0	51	1	580
RTOR Reduction (vph)	0	0	213	0	0	0	0	0	0	0	0	297
Lane Group Flow (vph)	0	503	100	57	255	0	0	0	0	0	52	283
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		32.0	32.0	7.2	43.2						48.8	48.8
Effective Green, g (s)		32.0	32.0	7.2	43.2						48.8	48.8
Actuated g/C Ratio		0.32	0.32	0.07	0.43						0.49	0.49
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		596	453	114	805						867	691
v/s Ratio Prot		c0.27		c0.04	0.14							
v/s Ratio Perm			0.07								0.03	c0.20
v/c Ratio		0.84	0.22	0.50	0.32						0.06	0.41
Uniform Delay, d1		31.7	24.9	44.7	18.7						13.5	16.4
Progression Factor		1.00	1.00	0.92	1.14						1.00	1.00
Incremental Delay, d2		10.6	0.2	3.1	0.2						0.1	1.8
Delay (s)		42.2	25.1	44.3	21.5						13.6	18.2
Level of Service		D	C	D	C						B	B
Approach Delay (s)		35.7			25.7			0.0			17.8	
Approach LOS		D			C			A			B	

Intersection Summary

HCM Average Control Delay	27.5	HCM Level of Service		C		
HCM Volume to Capacity ratio	0.57					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0		
Intersection Capacity Utilization	57.5%	ICU Level of Service		B		
Analysis Period (min)	15					

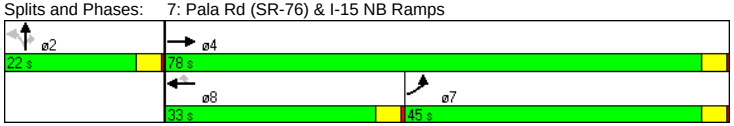
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Volume (vph)	405	194	167	41	0	116
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		2	
Permitted Phases				8		2
Detector Phases	7	4	8	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	45.0	78.0	33.0	33.0	22.0	22.0
Total Split (%)	45.0%	78.0%	33.0%	33.0%	22.0%	22.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	31.8	49.8	14.0	14.0	42.2	42.2
Actuated g/C Ratio	0.32	0.50	0.14	0.14	0.42	0.42
v/c Ratio	0.85	0.22	0.67	0.19	0.19	0.18
Control Delay	24.4	3.7	53.2	15.7	22.8	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	3.7	53.2	15.7	22.8	5.8
LOS	C	A	D	B	C	A
Approach Delay		17.7	45.8		14.9	
Approach LOS		B	D		B	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 56 (56%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 22.6 Intersection LOS: C
Intersection Capacity Utilization 57.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	426	204	176	43	141	122
v/c Ratio	0.85	0.22	0.67	0.19	0.19	0.18
Control Delay	24.4	3.7	53.2	15.7	22.8	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	3.7	53.2	15.7	22.8	5.8
Queue Length 50th (ft)	284	18	108	3	55	0
Queue Length 95th (ft)	m54	m18	168	33	124	43
Internal Link Dist (ft)		1191	2152		911	
Turn Bay Length (ft)	450			50		800
Base Capacity (vph)	651	1379	540	437	747	668
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.15	0.33	0.10	0.19	0.18

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

AM Existing
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1770	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1770	1417			
Volume (vph)	405	194	0	0	167	41	134	0	116	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	204	0	0	176	43	141	0	122	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	32	0	0	71	0	0	0
Lane Group Flow (vph)	426	204	0	0	176	11	0	141	51	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	31.8	49.8			14.0	14.0		42.2	42.2			
Effective Green, g (s)	31.8	49.8			14.0	14.0		42.2	42.2			
Actuated g/C Ratio	0.32	0.50			0.14	0.14		0.42	0.42			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	503	928			261	198		747	598			
v/s Ratio Prot	c0.27	0.11			c0.09							
v/s Ratio Perm						0.01		0.08	0.04			
v/c Ratio	0.85	0.22			0.67	0.06		0.19	0.09			
Uniform Delay, d1	31.8	14.1			40.8	37.3		18.1	17.3			
Progression Factor	0.40	0.26			1.00	1.00		1.00	1.00			
Incremental Delay, d2	9.4	0.1			6.7	0.1		0.6	0.3			
Delay (s)	22.0	3.8			47.6	37.4		18.7	17.6			
Level of Service	C	A			D	D		B	B			
Approach Delay (s)		16.1			45.6			18.2			0.0	
Approach LOS		B			D			B			A	

Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing
8: Pala Rd (SR-76) & Pankey Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	321	9	0	284	3	14	0	5	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	338	9	0	299	3	15	0	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	302			347			494	647	174	477	650	151
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	302			347			494	647	174	477	650	151
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	100	100	100
cM capacity (veh/h)	1256			1208			458	388	840	468	386	868

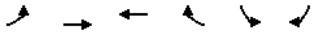
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1	225	122	0	199	103	20	0
Volume Left	1	0	0	0	0	0	15	0
Volume Right	0	0	9	0	0	3	5	0
cSH	1256	1700	1700	1700	1700	1700	520	1700
Volume to Capacity	0.00	0.13	0.07	0.00	0.12	0.06	0.04	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	3	0
Control Delay (s)	7.9	0.0	0.0	0.0	0.0	0.0	12.2	0.0
Lane LOS	A						B	A
Approach Delay (s)	0.0			0.0			12.2	0.0
Approach LOS							B	A

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	19.2%	ICU Level of Service		A
Analysis Period (min)	15			

LOS Engineering

AM Existing
10: Pala Rd (SR-76) & Rice Canyon Rd

HCM Unsignalized Intersection Capacity Analysis



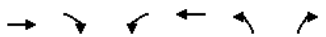
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	9	300	165	10	12	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	316	174	11	13	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	184				514	179
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	184				514	179
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	97
cM capacity (veh/h)	1391				517	864

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	325	184	35
Volume Left	9	0	13
Volume Right	0	11	22
cSH	1391	1700	695
Volume to Capacity	0.01	0.11	0.05
Queue Length 95th (ft)	1	0	4
Control Delay (s)	0.3	0.0	10.5
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

AM Existing
11: Pala Rd (SR-76) & Couser Canyon Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	302	11	2	166	11	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	318	12	2	175	12	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			329		503	324
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			329		503	324
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	99
cM capacity (veh/h)			1230		528	717

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	329	177	17
Volume Left	0	2	12
Volume Right	12	0	5
cSH	1700	1230	575
Volume to Capacity	0.19	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.1	11.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	11.4
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		

AM Existing
12: Pala Mesa Dr & Old Hwy 395 HCM Unsignalized Intersection Capacity Analysis



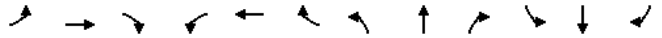
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	25	37	21	149	244	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	39	22	157	257	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	462	261	265			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	462	261	265			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	95	98			
cM capacity (veh/h)	548	778	1299			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	65	22	157	265
Volume Left	26	22	0	0
Volume Right	39	0	0	8
cSH	665	1299	1700	1700
Volume to Capacity	0.10	0.02	0.09	0.16
Queue Length 95th (ft)	8	1	0	0
Control Delay (s)	11.0	7.8	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.0	1.0		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing
13: Pala Mesa Dr & Wilt Rd HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	3	0	7	2	6	0	4	9	16	8	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	3	0	7	2	6	0	4	9	17	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	8			3			29	28	3	37	25	5
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	8			3			29	28	3	37	25	5
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	98	99	100
cM capacity (veh/h)	1612			1619			968	860	1081	953	864	1078

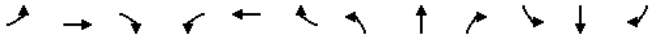
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	16	14	25
Volume Left	1	7	0	17
Volume Right	0	6	9	0
cSH	1612	1619	1002	921
Volume to Capacity	0.00	0.00	0.01	0.03
Queue Length 95th (ft)	0	0	1	2
Control Delay (s)	1.8	3.4	8.6	9.0
Lane LOS	A	A	A	A
Approach Delay (s)	1.8	3.4	8.6	9.0
Approach LOS			A	A

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	18.0%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing

14: Stewart Canyon Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	14	1	23	10	0	13	3	147	11	12	243	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	1	24	11	0	14	3	155	12	13	256	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	459	457	259	473	455	161	263			166		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	459	457	259	473	455	161	263			166		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	97	98	100	98	100			99		
cM capacity (veh/h)	500	494	779	481	495	885	1301			1412		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	40	24	3	166	13	263
Volume Left	15	11	3	0	13	0
Volume Right	24	14	0	12	0	7
cSH	638	648	1301	1700	1412	1700
Volume to Capacity	0.06	0.04	0.00	0.10	0.01	0.15
Queue Length 95th (ft)	5	3	0	0	1	0
Control Delay (s)	11.0	10.8	7.8	0.0	7.6	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	11.0	10.8	0.1		0.3	
Approach LOS	B	B				

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	23.2%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

AM Existing

15: Reche Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	189	196	115	68	66	119
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	199	206	121	72	69	125
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	446	132	195			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	446	132	195			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	62	78	91			
cM capacity (veh/h)	520	917	1378			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	405	121	72	195
Volume Left	199	121	0	0
Volume Right	206	0	0	125
cSH	667	1378	1700	1700
Volume to Capacity	0.61	0.09	0.04	0.11
Queue Length 95th (ft)	103	7	0	0
Control Delay (s)	18.4	7.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	18.4	4.9		0.0
Approach LOS	C			

Intersection Summary				
Average Delay	10.6			
Intersection Capacity Utilization	53.0%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

AM Existing
16: Reche Rd & Tecalote Dr

HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	359	14	2	292	10	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	378	15	2	307	11	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			393		697	385
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			393		697	385
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1166		406	662

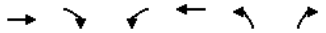
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	393	309	15
Volume Left	0	2	11
Volume Right	15	0	4
cSH	1700	1166	457
Volume to Capacity	0.23	0.00	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.1	13.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	13.1
Approach LOS			B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		29.7%	ICU Level of Service A
Analysis Period (min)		15	

LOS Engineering

AM Existing
17: Reche Rd & Wilt Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	360	17	14	285	44	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	379	18	15	300	46	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			397		717	388
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			397		717	388
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		88	98
cM capacity (veh/h)			1162		391	660

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	397	315	58
Volume Left	0	15	46
Volume Right	18	0	12
cSH	1700	1162	426
Volume to Capacity	0.23	0.01	0.14
Queue Length 95th (ft)	0	1	12
Control Delay (s)	0.0	0.5	14.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	14.8
Approach LOS			B

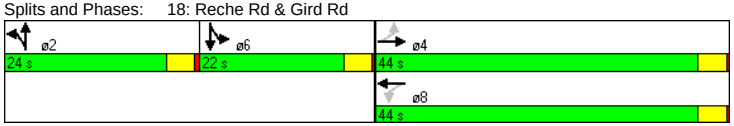
Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		36.5%	ICU Level of Service A
Analysis Period (min)		15	

LOS Engineering

Lane Group	EBL	EBT	WBL	WBT	NBT	ø6
Lane Configurations						
Volume (vph)	4	390	32	252	4	
Turn Type	Perm		Perm			
Protected Phases		4		8	2	6
Permitted Phases	4		8			
Detector Phases	4	4	8	8	2	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	44.0	44.0	44.0	44.0	24.0	22.0
Total Split (%)	48.9%	48.9%	48.9%	48.9%	26.7%	24%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	18.1	18.1	18.1	18.1	10.6	
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.22	
v/c Ratio	0.01	0.74	0.19	0.38	0.52	
Control Delay	9.2	19.2	12.8	12.1	21.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.2	19.2	12.8	12.1	21.5	
LOS	A	B	B	B	C	
Approach Delay		19.1		12.2	21.5	
Approach LOS		B		B	C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 47.3		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.74		
Intersection Signal Delay: 17.5	Intersection LOS: B	
Intersection Capacity Utilization 47.6%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 18: Reche Rd & Gird Rd



Lane Group	EBL	EBT	WBL	WBT	NBT
Lane Group Flow (vph)	4	520	34	272	208
v/c Ratio	0.01	0.74	0.19	0.38	0.52
Control Delay	9.2	19.2	12.8	12.1	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	19.2	12.8	12.1	21.5
Queue Length 50th (ft)	1	105	6	48	43
Queue Length 95th (ft)	5	233	24	111	122
Internal Link Dist (ft)		6878		6771	1594
Turn Bay Length (ft)	50		50		
Base Capacity (vph)	507	1067	273	1089	638
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.49	0.12	0.25	0.33

Intersection Summary

AM Existing
18: Reche Rd & Gird Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0				
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00				
Frt	1.00	0.97		1.00	1.00			0.97				
Flt Protected	0.95	1.00		0.95	1.00			0.96				
Satd. Flow (prot)	1583	1804		1583	1856			1739				
Flt Permitted	0.56	1.00		0.27	1.00			0.96				
Satd. Flow (perm)	928	1804		457	1856			1739				
Volume (vph)	4	390	104	32	252	7	147	4	47	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	411	109	34	265	7	155	4	49	0	0	0
RTOR Reduction (vph)	0	12	0	0	1	0	0	12	0	0	0	0
Lane Group Flow (vph)	4	508	0	34	271	0	0	196	0	0	0	0
Turn Type	Perm			Perm			Split			Split		
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8								
Actuated Green, G (s)	18.1	18.1		18.1	18.1			10.6				
Effective Green, g (s)	18.1	18.1		18.1	18.1			10.6				
Actuated g/C Ratio	0.39	0.39		0.39	0.39			0.23				
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0				
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0				
Lane Grp Cap (vph)	360	701		178	721			396				
v/s Ratio Prot		c0.28			0.15			c0.11				
v/s Ratio Perm	0.00			0.07								
v/c Ratio	0.01	0.73		0.19	0.38			0.49				
Uniform Delay, d1	8.8	12.1		9.4	10.2			15.7				
Progression Factor	1.00	1.00		1.00	1.00			1.00				
Incremental Delay, d2	0.0	3.7		0.5	0.3			1.0				
Delay (s)	8.8	15.9		9.9	10.5			16.6				
Level of Service	A	B		A	B			B				
Approach Delay (s)		15.8			10.5			16.6			0.0	
Approach LOS		B			B			B			A	

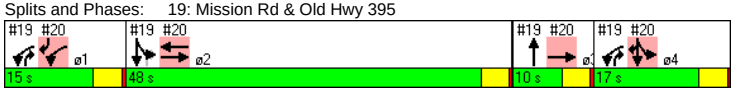
Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	46.6	Sum of lost time (s)	17.9
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing
19: Mission Rd & Old Hwy 395 — Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	107	878	21	153	549	39		
Turn Type		Free		custom	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		2				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	8.0
Total Split (s)	32.0	0.0	10.0	32.0	48.0	48.0	15.0	17.0
Total Split (%)	35.6%	0.0%	11.1%	35.6%	53.3%	53.3%	17%	19%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes					Yes
Recall Mode			None		None	None	None	None
Act Effct Green (s)	28.3	82.4	6.1	68.2	35.9	35.9		
Actuated g/C Ratio	0.34	1.00	0.07	0.83	0.44	0.44		
v/c Ratio	0.21	0.65	0.16	0.14	0.84	0.05		
Control Delay	25.0	2.1	42.0	1.6	32.4	12.6		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	25.0	2.1	42.0	1.6	32.4	12.6		
LOS	C	A	D	A	C	B		
Approach Delay	4.6		6.4			31.1		
Approach LOS	A		A			C		

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 82.4		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.91		
Intersection Signal Delay: 13.7	Intersection LOS: B	
Intersection Capacity Utilization 54.0%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 19: Mission Rd & Old Hwy 395



Queues

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	113	924	22	161	578	41
v/c Ratio	0.21	0.65	0.16	0.14	0.84	0.05
Control Delay	25.0	2.1	42.0	1.6	32.4	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	2.1	42.0	1.6	32.4	12.6
Queue Length 50th (ft)	44	14	11	10	253	12
Queue Length 95th (ft)	m62	m20	36	18	391	28
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	544	1417	137	1174	855	1007
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.65	0.16	0.14	0.68	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Volume (vph)	107	878	21	153	549	39
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	113	924	22	161	578	41
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	113	924	22	161	578	41
Turn Type		Free		custom	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		2		
Actuated Green, G (s)	28.3	82.3	6.1	64.2	35.9	35.9
Effective Green, g (s)	28.3	82.3	6.1	64.2	35.9	35.9
Actuated g/C Ratio	0.34	1.00	0.07	0.78	0.44	0.44
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	544	1417	138	1174	691	813
v/s Ratio Prot	0.07		0.01	0.05	c0.37	0.02
v/s Ratio Perm		c0.65		0.07		
v/c Ratio	0.21	0.65	0.16	0.14	0.84	0.05
Uniform Delay, d1	19.1	0.0	35.7	2.2	20.6	13.4
Progression Factor	1.10	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.5	0.5	0.1	8.7	0.0
Delay (s)	21.1	1.5	36.2	2.3	29.3	13.4
Level of Service	C	A	D	A	C	B
Approach Delay (s)	3.6		6.4			28.2
Approach LOS	A		A			C

Intersection Summary

HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	82.3	Sum of lost time (s)	4.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

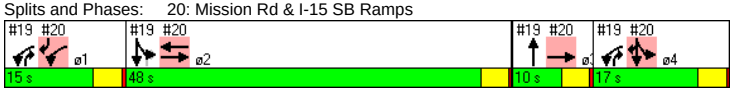
AM Existing
20: Mission Rd & I-15 SB Ramps

Timings

Lane Group	EBT	WBL	WBT	SBT	SBR	ø3
Lane Configurations						
Volume (vph)	529	61	242	7	775	
Turn Type		Prot			custom	
Protected Phases	2 3	1	2	4	4 1	3
Permitted Phases					4	
Detector Phases	2 3	1	2	4	4 1	
Minimum Initial (s)		4.0	4.0	4.0		4.0
Minimum Split (s)		8.0	20.0	8.0		20.0
Total Split (s)	58.0	15.0	48.0	17.0	32.0	10.0
Total Split (%)	64.4%	16.7%	53.3%	18.9%	35.6%	11%
Yellow Time (s)		3.5	3.5	3.5		3.5
All-Red Time (s)		0.5	0.5	0.5		0.5
Lead/Lag		Lead	Lag	Lag		Lead
Lead-Lag Optimize?				Yes		Yes
Recall Mode		None	None	None		None
Act Effct Green (s)	46.0	11.1	35.9	13.2	28.3	
Actuated g/C Ratio	0.56	0.13	0.44	0.16	0.34	
v/c Ratio	0.75	0.30	0.31	0.05	0.91	
Control Delay	5.2	39.4	15.7	33.6	23.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	5.2	39.4	15.7	33.6	23.6	
LOS	A	D	B	C	C	
Approach Delay	5.2		20.5	23.8		
Approach LOS	A		C	C		

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 82.4		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.91		
Intersection Signal Delay: 15.8	Intersection LOS: B	
Intersection Capacity Utilization 73.0%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



AM Existing
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	760	64	255	15	816
v/c Ratio	0.75	0.30	0.31	0.05	0.91
Control Delay	5.2	39.4	15.7	33.6	23.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	39.4	15.7	33.6	23.6
Queue Length 50th (ft)	34	32	82	7	105
Queue Length 95th (ft)	m44	73	132	25	#413
Internal Link Dist (ft)	354		664	817	
Turn Bay Length (ft)		285			200
Base Capacity (vph)	1090	214	1007	290	896
Starvation Cap Reductn	3	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.70	0.30	0.25	0.05	0.91

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

AM Existing
20: Mission Rd & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.96		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.97	1.00
Satd. Flow (prot)		1796		1583	1863						1814	1417
Flt Permitted		1.00		0.95	1.00						0.97	1.00
Satd. Flow (perm)		1796		1583	1863						1814	1417
Volume (vph)	0	529	193	61	242	0	0	0	0	8	7	775
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	557	203	64	255	0	0	0	0	8	7	816
RTOR Reduction (vph)	0	16	0	0	0	0	0	0	0	0	0	409
Lane Group Flow (vph)	0	744	0	64	255	0	0	0	0	0	15	407
Turn Type				Prot						Split		custom
Protected Phases		2 3		1	2					4	4	4 1
Permitted Phases												4
Actuated Green, G (s)		46.0		11.1	35.9						13.2	28.3
Effective Green, g (s)		46.0		11.1	35.9						13.2	28.3
Actuated g/C Ratio		0.56		0.13	0.44						0.16	0.34
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1004		214	813						291	487
v/s Ratio Prot		c0.41		0.04	0.14						0.01	c0.29
v/s Ratio Perm												
v/c Ratio		0.74		0.30	0.31						0.05	0.84
Uniform Delay, d1		13.7		32.1	15.2						29.3	24.9
Progression Factor		0.11		1.00	1.00						1.00	1.00
Incremental Delay, d2		2.2		0.8	0.2						0.1	11.8
Delay (s)		3.7		32.9	15.4						29.3	36.7
Level of Service		A		C	B						C	D
Approach Delay (s)		3.7			18.9			0.0			36.6	
Approach LOS		A			B			A			D	

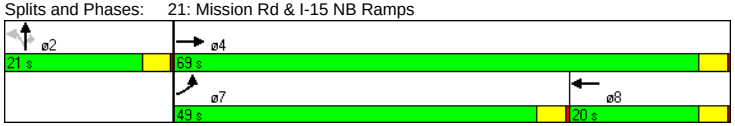
Intersection Summary				
HCM Average Control Delay	20.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	82.3	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	73.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing
21: Mission Rd & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	442	93	161	2	37
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	49.0	69.0	20.0	21.0	21.0
Total Split (%)	54.4%	76.7%	22.2%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	20.3	31.5	10.2	10.8	10.8
Actuated g/C Ratio	0.39	0.61	0.19	0.21	0.21
v/c Ratio	0.75	0.09	0.49	0.33	0.12
Control Delay	22.6	3.4	27.7	26.3	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	3.4	27.7	26.3	10.7
LOS	C	A	C	C	B
Approach Delay		19.2	27.7	22.6	
Approach LOS		B	C	C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 51.7		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.75		
Intersection Signal Delay: 21.5	Intersection LOS: C	
Intersection Capacity Utilization 73.0%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



AM Existing
21: Mission Rd & I-15 NB Ramps

Queues

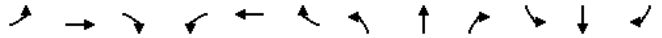


Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	465	98	173	123	39
v/c Ratio	0.75	0.09	0.49	0.33	0.12
Control Delay	22.6	3.4	27.7	26.3	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	3.4	27.7	26.3	10.7
Queue Length 50th (ft)	113	8	45	32	0
Queue Length 95th (ft)	271	24	139	106	25
Internal Link Dist (ft)		664	1191	1002	
Turn Bay Length (ft)	300				200
Base Capacity (vph)	959	1461	526	566	478
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.07	0.33	0.22	0.08

Intersection Summary

AM Existing
21: Mission Rd & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			1.00			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1583	1863			1857			1775	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1583	1863			1857			1775	1417			
Volume (vph)	442	93	0	0	161	4	115	2	37	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	465	98	0	0	169	4	121	2	39	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	31	0	0	0
Lane Group Flow (vph)	465	98	0	0	172	0	0	123	8	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	20.3	32.4			8.1			10.8	10.8			
Effective Green, g (s)	20.3	32.4			8.1			10.8	10.8			
Actuated g/C Ratio	0.40	0.63			0.16			0.21	0.21			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	628	1179			294			374	299			
v/s Ratio Prot	c0.29	0.05			c0.09							
v/s Ratio Perm								0.07	0.01			
v/c Ratio	0.74	0.08			0.59			0.33	0.03			
Uniform Delay, d1	13.2	3.6			20.0			17.1	16.0			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	4.7	0.0			3.0			0.5	0.0			
Delay (s)	17.9	3.7			23.0			17.6	16.1			
Level of Service	B	A			C			B	B			
Approach Delay (s)		15.4			23.0			17.3			0.0	
Approach LOS		B			C			B			A	

Intersection Summary				
HCM Average Control Delay	17.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	51.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	73.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing
22: Stewart Canyon Rd & Horse Ranch Creek Rd HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	18	4	4	0	0	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	19	4	4	0	0	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	19	11	21			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19	11	21			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	996	1071	1595			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	4	21
Volume Left	19	4	0
Volume Right	4	0	21
cSH	1009	1595	1700
Volume to Capacity	0.02	0.00	0.01
Queue Length 95th (ft)	2	0	0
Control Delay (s)	8.7	7.3	0.0
Lane LOS	A	A	
Approach Delay (s)	8.7	7.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

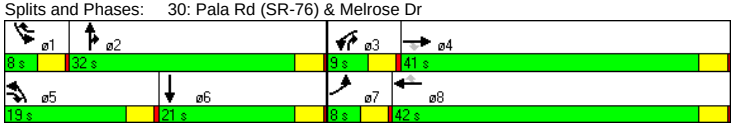
LOS Engineering

AM Existing
30: Pala Rd (SR-76) & Melrose Dr Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	16	690	218	54	1191	6	372	1	74	1	1
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6
Permitted Phases			4			8					
Detector Phases	7	4	5	3	8	1	5	2	2 3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0		8.0	20.0
Total Split (s)	8.0	41.0	19.0	9.0	42.0	8.0	19.0	32.0	41.0	8.0	21.0
Total Split (%)	8.9%	45.6%	21.1%	10.0%	46.7%	8.9%	21.1%	35.6%	45.6%	8.9%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	4.0	28.3	45.8	5.1	32.4	37.1	13.5	33.6	42.4	4.1	17.4
Actuated g/C Ratio	0.05	0.36	0.58	0.06	0.41	0.44	0.17	0.43	0.53	0.05	0.22
v/c Ratio	0.22	0.57	0.25	0.29	0.86	0.01	0.74	0.00	0.10	0.01	0.01
Control Delay	48.3	22.3	1.7	43.1	28.3	6.7	42.1	19.0	4.3	43.0	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	22.3	1.7	43.1	28.3	6.7	42.1	19.0	4.3	43.0	23.7
LOS	D	C	A	D	C	A	D	B	A	D	C
Approach Delay		17.9			28.9			35.7			28.5
Approach LOS		B			C			D			C

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 78.3		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 26.2	Intersection LOS: C	
Intersection Capacity Utilization 58.1%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 30: Pala Rd (SR-76) & Melrose Dr



LOS Engineering

AM Existing
30: Pala Rd (SR-76) & Melrose Dr

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	17	726	229	57	1254	6	392	1	78	1	3
v/c Ratio	0.22	0.57	0.25	0.29	0.86	0.01	0.74	0.00	0.10	0.01	0.01
Control Delay	48.3	22.3	1.7	43.1	28.3	6.7	42.1	19.0	4.3	43.0	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	22.3	1.7	43.1	28.3	6.7	42.1	19.0	4.3	43.0	23.7
Queue Length 50th (ft)	8	156	0	14	270	0	93	0	0	1	0
Queue Length 95th (ft)	31	209	25	36	417	6	#173	4	26	6	8
Internal Link Dist (ft)		1250			566			954			653
Turn Bay Length (ft)	500		500	500		500	400		400	200	
Base Capacity (vph)	77	1518	908	194	1614	625	586	799	787	76	374
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.48	0.25	0.29	0.78	0.01	0.67	0.00	0.10	0.01	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing
30: Pala Rd (SR-76) & Melrose Dr

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	
Volume (vph)	16	690	218	54	1191	6	372	1	74	1	1	2
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	726	229	57	1254	6	392	1	78	1	1	2
RTOR Reduction (vph)	0	0	110	0	0	4	0	0	40	0	2	0
Lane Group Flow (vph)	17	726	119	57	1254	2	392	1	38	1	1	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.4	30.0	43.5	3.8	32.4	33.1	13.5	33.5	41.3	0.7	20.7	
Effective Green, g (s)	1.4	30.0	43.5	3.8	32.4	33.1	13.5	33.5	41.3	0.7	20.7	
Actuated g/C Ratio	0.02	0.36	0.52	0.05	0.39	0.39	0.16	0.40	0.49	0.01	0.25	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	26	1264	801	139	1365	626	494	743	697	13	413	
v/s Ratio Prot	0.01	0.21	0.02	c0.02	c0.35	0.00	c0.13	0.00	c0.03	0.00	0.00	
v/s Ratio Perm			0.06			0.00						
v/c Ratio	0.65	0.57	0.15	0.41	0.92	0.00	0.79	0.00	0.06	0.08	0.00	
Uniform Delay, d1	41.1	21.8	10.6	39.0	24.5	15.4	33.9	15.2	11.2	41.3	23.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	46.4	0.6	0.1	2.0	10.0	0.0	8.5	0.0	0.0	2.5	0.0	
Delay (s)	87.4	22.5	10.7	41.0	34.6	15.4	42.5	15.2	11.2	43.9	23.9	
Level of Service	F	C	B	D	C	B	D	B	B	D	C	
Approach Delay (s)		20.8			34.7			37.2			28.9	
Approach LOS		C			C			D			C	

Intersection Summary

HCM Average Control Delay	30.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	58.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

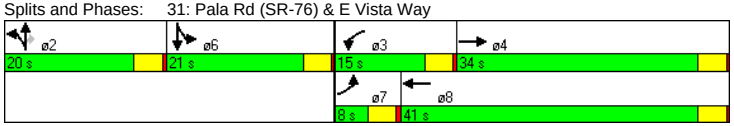
AM Existing
31: Pala Rd (SR-76) & E Vista Way

Timings

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Volume (vph)	30	520	268	799	46	278	167
Turn Type	Prot		Prot			Perm	
Protected Phases	7	4	3	8	2		6
Permitted Phases						2	
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	34.0	15.0	41.0	20.0	20.0	21.0
Total Split (%)	8.9%	37.8%	16.7%	45.6%	22.2%	22.2%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	Max
Act Effct Green (s)	4.0	27.0	10.7	37.1	16.0	16.0	17.0
Actuated g/C Ratio	0.04	0.31	0.12	0.43	0.18	0.18	0.20
v/c Ratio	0.46	0.72	0.75	1.07	0.94	0.58	1.02
Control Delay	63.3	27.5	50.9	77.9	74.2	9.5	83.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	27.5	50.9	77.9	74.2	9.5	83.4
LOS	E	C	D	E	E	A	F
Approach Delay		28.9		71.1	42.8		83.4
Approach LOS		C		E	D		F

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 86.8			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.07			
Intersection Signal Delay: 55.1		Intersection LOS: E	
Intersection Capacity Utilization 96.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 31: Pala Rd (SR-76) & E Vista Way



AM Existing
31: Pala Rd (SR-76) & E Vista Way

Queues

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	32	798	282	847	310	293	393
v/c Ratio	0.46	0.72	0.75	1.07	0.94	0.58	1.02
Control Delay	63.3	27.5	50.9	77.9	74.2	9.5	83.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	27.5	50.9	77.9	74.2	9.5	83.4
Queue Length 50th (ft)	18	181	80	~555	177	0	~218
Queue Length 95th (ft)	#56	246	#137	#780	#341	71	#397
Internal Link Dist (ft)		630		446	717		472
Turn Bay Length (ft)	300		450			200	
Base Capacity (vph)	70	1188	388	795	330	501	385
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.67	0.73	1.07	0.94	0.58	1.02

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing
31: Pala Rd (SR-76) & E Vista Way

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		0.97	1.00			1.00	1.00		1.00	
Frt	1.00	0.95		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (prot)	1583	3372		3072	1861			1787	1417		1726	
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (perm)	1583	3372		3072	1861			1787	1417		1726	
Volume (vph)	30	520	238	268	799	6	249	46	278	5	167	201
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	547	251	282	841	6	262	48	293	5	176	212
RTOR Reduction (vph)	0	60	0	0	0	0	0	0	240	0	47	0
Lane Group Flow (vph)	32	738	0	282	847	0	0	310	53	0	346	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)	2.3	28.7		10.7	37.1			16.0	16.0		17.0	
Effective Green, g (s)	2.3	28.7		10.7	37.1			16.0	16.0		17.0	
Actuated g/C Ratio	0.03	0.32		0.12	0.42			0.18	0.18		0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	41	1095		372	781			323	256		332	
v/s Ratio Prot	0.02	0.22		c0.09	c0.46			c0.17			c0.20	
v/s Ratio Perm									0.04			
v/c Ratio	0.78	0.67		0.76	1.08			0.96	0.21		1.04	
Uniform Delay, d1	42.8	25.8		37.6	25.7			35.9	30.8		35.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	62.4	1.7		8.6	57.6			40.8	1.8		60.9	
Delay (s)	105.2	27.5		46.2	83.2			76.7	32.6		96.6	
Level of Service	F	C		D	F			E	C		F	
Approach Delay (s)		30.5			74.0			55.3			96.6	
Approach LOS		C			E			E			F	

Intersection Summary			
HCM Average Control Delay	60.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

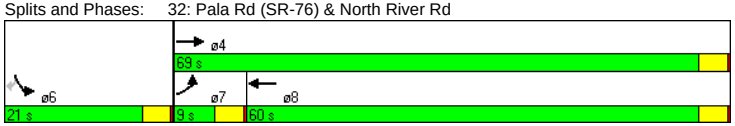
AM Existing
32: Pala Rd (SR-76) & North River Rd

Timings

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	93	732	1076	91	66
Turn Type	Prot				Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phases	7	4	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	69.0	60.0	21.0	21.0
Total Split (%)	10.0%	76.7%	66.7%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	5.0	65.0	56.0	17.0	17.0
Actuated g/C Ratio	0.06	0.72	0.62	0.19	0.19
v/c Ratio	1.11	0.57	1.14	0.32	0.21
Control Delay	172.6	8.0	92.1	35.0	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	172.6	8.0	92.1	35.0	10.0
LOS	F	A	F	D	A
Approach Delay		26.6	92.1	24.6	
Approach LOS		C	F	C	

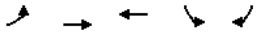
Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Natural Cycle: 120		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.14		
Intersection Signal Delay: 62.9	Intersection LOS: E	
Intersection Capacity Utilization 87.7%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 32: Pala Rd (SR-76) & North River Rd



AM Existing
32: Pala Rd (SR-76) & North River Rd

Queues



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	98	771	1301	96	69
v/c Ratio	1.11	0.57	1.14	0.32	0.21
Control Delay	172.6	8.0	92.1	35.0	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	172.6	8.0	92.1	35.0	10.0
Queue Length 50th (ft)	~65	174	~871	48	0
Queue Length 95th (ft)	#164	259	#1124	93	35
Internal Link Dist (ft)		1276	1320	1206	
Turn Bay Length (ft)	150			50	
Base Capacity (vph)	88	1346	1145	299	324
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.11	0.57	1.14	0.32	0.21

Intersection Summary

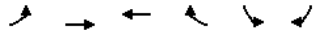
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing
32: Pala Rd (SR-76) & North River Rd

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1863	1830		1583	1417
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1863	1830		1583	1417
Volume (vph)	93	732	1076	160	91	66
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	771	1133	168	96	69
RTOR Reduction (vph)	0	0	6	0	0	56
Lane Group Flow (vph)	98	771	1295	0	96	13
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	5.0	65.0	56.0		17.0	17.0
Effective Green, g (s)	5.0	65.0	56.0		17.0	17.0
Actuated g/C Ratio	0.06	0.72	0.62		0.19	0.19
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	88	1346	1139		299	268
v/s Ratio Prot	c0.06	0.41	c0.71		c0.06	
v/s Ratio Perm						0.01
v/c Ratio	1.11	0.57	1.14		0.32	0.05
Uniform Delay, d1	42.5	5.9	17.0		31.5	29.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	130.0	0.6	72.7		2.8	0.3
Delay (s)	172.5	6.5	89.7		34.3	30.2
Level of Service	F	A	F		C	C
Approach Delay (s)		25.2	89.7		32.6	
Approach LOS		C	F		C	

Intersection Summary

HCM Average Control Delay	61.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

AM Existing
33: Pala Rd (SR-76) & Olive Hill Rd

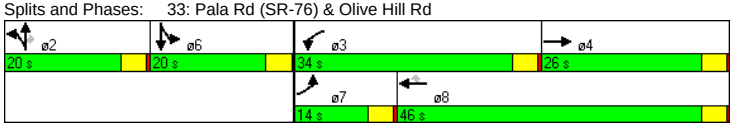
Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	60	692	459	1088	56	61	232	81	214
Turn Type	Prot		Prot		Perm		Perm	Split	
Protected Phases	7	4	3	8		2		6	6
Permitted Phases					8		2		
Detector Phases	7	4	3	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	14.0	26.0	34.0	46.0	46.0	20.0	20.0	20.0	20.0
Total Split (%)	14.0%	26.0%	34.0%	46.0%	46.0%	20.0%	20.0%	20.0%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)	8.6	22.0	30.0	45.4	45.4	16.0	16.0	16.0	16.0
Actuated g/C Ratio	0.08	0.22	0.30	0.45	0.45	0.16	0.16	0.16	0.16
v/c Ratio	0.47	1.05	1.02	0.71	0.09	0.38	0.56	0.34	0.96
Control Delay	55.0	84.2	81.8	26.1	5.9	41.9	10.6	41.5	84.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	84.2	81.8	26.1	5.9	41.9	10.6	41.5	84.3
LOS	E	F	F	C	A	D	B	D	F
Approach Delay		82.1		41.3		20.3			74.5
Approach LOS		F		D		C			E

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 53.7 Intersection LOS: D
Intersection Capacity Utilization 84.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 33: Pala Rd (SR-76) & Olive Hill Rd



LOS Engineering

AM Existing
33: Pala Rd (SR-76) & Olive Hill Rd

Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	63	814	483	1145	59	110	244	85	287
v/c Ratio	0.47	1.05	1.02	0.71	0.09	0.38	0.56	0.34	0.96
Control Delay	55.0	84.2	81.8	26.1	5.9	41.9	10.6	41.5	84.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	84.2	81.8	26.1	5.9	41.9	10.6	41.5	84.3
Queue Length 50th (ft)	39	~296	~317	317	1	63	0	49	177
Queue Length 95th (ft)	81	#419	#524	405	25	117	69	95	#343
Internal Link Dist (ft)		505		583		881			1106
Turn Bay Length (ft)	250		250		200		150	150	
Base Capacity (vph)	153	776	475	1607	673	292	432	253	299
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	1.05	1.02	0.71	0.09	0.38	0.56	0.34	0.96

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing
33: Pala Rd (SR-76) & Olive Hill Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3483		1583	3539	1417		1825	1417	1583	1802	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3483		1583	3539	1417		1825	1417	1583	1802	
Volume (vph)	60	692	82	459	1088	56	44	61	232	81	214	59
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	728	86	483	1145	59	46	64	244	85	225	62
RTOR Reduction (vph)	0	9	0	0	0	30	0	0	205	0	10	0
Lane Group Flow (vph)	63	805	0	483	1145	29	0	110	39	85	277	0
Turn Type	Prot			Prot		Perm	Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	7.4	22.8		30.0	45.4	45.4		16.0	16.0	16.0	16.0	
Effective Green, g (s)	7.4	22.8		30.0	45.4	45.4		16.0	16.0	16.0	16.0	
Actuated g/C Ratio	0.07	0.23		0.30	0.45	0.45		0.16	0.16	0.16	0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	116	788		471	1594	638		290	225	251	286	
v/s Ratio Prot	0.04	c0.23		c0.31	0.32			c0.06		0.05	c0.15	
v/s Ratio Perm						0.02			0.03			
v/c Ratio	0.54	1.02		1.03	0.72	0.05		0.38	0.17	0.34	0.97	
Uniform Delay, d1	45.1	39.0		35.4	22.5	15.5		38.0	36.7	37.7	42.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.1	37.5		48.1	1.6	0.0		3.7	1.7	3.6	45.7	
Delay (s)	50.2	76.5		83.5	24.1	15.6		41.7	38.3	41.3	87.8	
Level of Service	D	E		F	C	B		D	D	D	F	
Approach Delay (s)		74.6			40.8			39.4			77.2	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM Average Control Delay	53.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

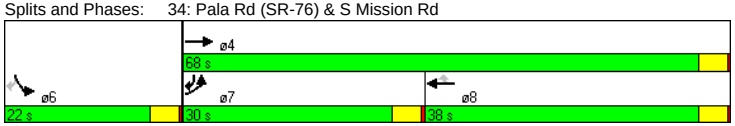
AM Existing
34: Pala Rd (SR-76) & S Mission Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	525	442	828	89	103	781
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	30.0	68.0	38.0	38.0	22.0	30.0
Total Split (%)	33.3%	75.6%	42.2%	42.2%	24.4%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	20.9	49.5	24.4	24.4	18.5	43.5
Actuated g/C Ratio	0.27	0.65	0.32	0.32	0.24	0.57
v/c Ratio	0.66	0.38	0.77	0.18	0.14	0.58
Control Delay	29.3	6.8	28.5	5.4	27.5	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	6.8	28.5	5.4	27.5	13.6
LOS	C	A	C	A	C	B
Approach Delay		19.0	26.2		15.2	
Approach LOS		B	C		B	

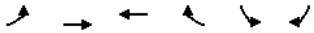
Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 76.2		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.77		
Intersection Signal Delay: 20.2	Intersection LOS: C	
Intersection Capacity Utilization 60.1%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



AM Existing
34: Pala Rd (SR-76) & S Mission Rd

Queues

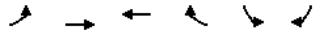


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	553	465	872	94	108	822
v/c Ratio	0.66	0.38	0.77	0.18	0.14	0.58
Control Delay	29.3	6.8	28.5	5.4	27.5	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	6.8	28.5	5.4	27.5	13.6
Queue Length 50th (ft)	120	86	200	0	22	134
Queue Length 95th (ft)	194	129	276	30	48	240
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	994	1325	1417	624	747	1490
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.35	0.62	0.15	0.14	0.55

Intersection Summary

AM Existing
34: Pala Rd (SR-76) & S Mission Rd

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Volume (vph)	525	442	828	89	103	781
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	553	465	872	94	108	822
RTOR Reduction (vph)	0	0	0	64	0	0
Lane Group Flow (vph)	553	465	872	30	108	822
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	20.9	49.4	24.5	24.5	18.5	39.4
Effective Green, g (s)	20.9	49.4	24.5	24.5	18.5	39.4
Actuated g/C Ratio	0.28	0.65	0.32	0.32	0.24	0.52
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	846	1213	1142	457	749	1426
v/s Ratio Prot	c0.18	0.25	c0.25		0.04	c0.16
v/s Ratio Perm				0.02		0.17
v/c Ratio	0.65	0.38	0.76	0.07	0.14	0.58
Uniform Delay, d1	24.3	6.2	23.1	17.8	22.5	12.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.2	3.1	0.1	0.4	0.6
Delay (s)	26.1	6.4	26.2	17.8	22.9	13.1
Level of Service	C	A	C	B	C	B
Approach Delay (s)		17.1	25.4		14.2	
Approach LOS		B	C		B	

Intersection Summary				
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing
35: Reche Rd & Live Oak Park Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	58	365	383	56	79	147
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	61	384	403	59	83	155
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	462				939	433
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	462				939	433
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				70	75
cM capacity (veh/h)	1099				277	623

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	61	384	462	238
Volume Left	61	0	0	83
Volume Right	0	0	59	155
cSH	1099	1700	1700	433
Volume to Capacity	0.06	0.23	0.27	0.55
Queue Length 95th (ft)	4	0	0	81
Control Delay (s)	8.5	0.0	0.0	23.0
Lane LOS	A			C
Approach Delay (s)	1.2		0.0	23.0
Approach LOS				C

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

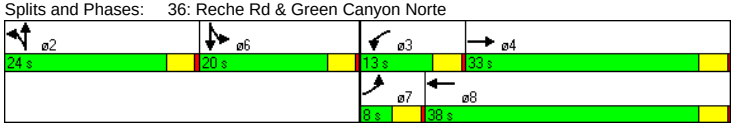
AM Existing
36: Reche Rd & Green Canyon Norte

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	9	331	60	449	150	2	3
Turn Type	Prot		Prot		Split		
Protected Phases	7	4	3	8	2	2	6
Permitted Phases							
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	33.0	13.0	38.0	24.0	24.0	20.0
Total Split (%)	8.9%	36.7%	14.4%	42.2%	26.7%	26.7%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	None
Act Effct Green (s)	4.2	17.1	7.4	22.5	21.6	21.6	6.2
Actuated g/C Ratio	0.07	0.31	0.12	0.41	0.39	0.39	0.10
v/c Ratio	0.08	0.68	0.32	0.63	0.26	0.17	0.09
Control Delay	35.7	24.2	31.9	17.4	19.1	6.0	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	24.2	31.9	17.4	19.1	6.0	28.9
LOS	D	C	C	B	B	A	C
Approach Delay		24.5		19.1		13.5	28.9
Approach LOS		C		B		B	C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 55.4			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 19.7		Intersection LOS: B	
Intersection Capacity Utilization 52.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 36: Reche Rd & Green Canyon Norte



Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	9	387	63	476	158	118	15
v/c Ratio	0.08	0.68	0.32	0.63	0.26	0.17	0.09
Control Delay	35.7	24.2	31.9	17.4	19.1	6.0	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	24.2	31.9	17.4	19.1	6.0	28.9
Queue Length 50th (ft)	3	112	19	98	37	0	3
Queue Length 95th (ft)	19	244	68	283	123	40	23
Internal Link Dist (ft)		893		4812		1421	1287
Turn Bay Length (ft)	150		150		150		
Base Capacity (vph)	107	815	241	972	618	691	397
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.47	0.26	0.49	0.26	0.17	0.04

Intersection Summary

HCM Signalized Intersection Capacity Analysis

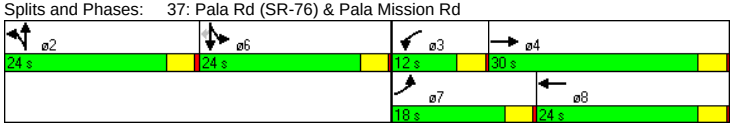
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1583	1835		1583	1861		1583	1588			1749	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.97	
Satd. Flow (perm)	1583	1835		1583	1861		1583	1588			1749	
Volume (vph)	9	331	37	60	449	3	150	2	110	8	3	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	348	39	63	473	3	158	2	116	8	3	4
RTOR Reduction (vph)	0	5	0	0	0	0	0	75	0	0	4	0
Lane Group Flow (vph)	9	382	0	63	476	0	158	43	0	0	11	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	0.5	18.6		4.3	22.4		21.6	21.6			1.0	
Effective Green, g (s)	0.5	18.6		4.3	22.4		21.6	21.6			1.0	
Actuated g/C Ratio	0.01	0.30		0.07	0.36		0.35	0.35			0.02	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	13	555		111	678		556	558			28	
v/s Ratio Prot	0.01	0.21		c0.04	c0.26		c0.10	0.03			c0.01	
v/s Ratio Perm												
v/c Ratio	0.69	0.69		0.57	0.70		0.28	0.08			0.40	
Uniform Delay, d1	30.4	18.9		27.7	16.7		14.4	13.3			30.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	96.3	3.6		6.5	3.3		1.3	0.3			8.9	
Delay (s)	126.7	22.4		34.2	20.0		15.7	13.6			38.9	
Level of Service	F	C		C	B		B	B			D	
Approach Delay (s)		24.8			21.7			14.8			38.9	
Approach LOS		C			C			B			D	

Intersection Summary				
HCM Average Control Delay	21.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	61.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	52.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	SBT	SBR
Lane Configurations							
Volume (vph)	81	148	5	83	9	8	119
Turn Type	Prot		Prot		Split		Perm
Protected Phases	7	4	3	8	2	6	
Permitted Phases							6
Detector Phases	7	4	3	8	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	18.0	30.0	12.0	24.0	24.0	24.0	24.0
Total Split (%)	20.0%	33.3%	13.3%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	None	None
Act Effct Green (s)	9.7	17.3	6.3	9.6	34.2	8.0	8.0
Actuated g/C Ratio	0.13	0.24	0.08	0.13	0.48	0.11	0.11
v/c Ratio	0.42	0.20	0.04	0.39	0.01	0.15	0.47
Control Delay	30.4	15.9	31.0	27.3	17.0	27.4	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	15.9	31.0	27.3	17.0	27.4	12.1
LOS	C	B	C	C	B	C	B
Approach Delay		20.7		27.5		15.0	
Approach LOS		C		C		B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 71.7		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.47		
Intersection Signal Delay: 20.3	Intersection LOS: C	
Intersection Capacity Utilization 26.6%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 37: Pala Rd (SR-76) & Pala Mission Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	SBT	SBR
Lane Group Flow (vph)	85	170	5	96	9	30	125
v/c Ratio	0.42	0.20	0.04	0.39	0.01	0.15	0.47
Control Delay	30.4	15.9	31.0	27.3	17.0	27.4	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	15.9	31.0	27.3	17.0	27.4	12.1
Queue Length 50th (ft)	28	20	2	30	2	10	0
Queue Length 95th (ft)	72	52	12	76	13	34	43
Internal Link Dist (ft)		861		996		1485	
Turn Bay Length (ft)	250		250		200		50
Base Capacity (vph)	299	1203	168	478	756	455	452
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.14	0.03	0.20	0.01	0.07	0.28

Intersection Summary

AM Existing

37: Pala Rd (SR-76) & Pala Mission Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0				4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00				1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00				1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95				0.96	1.00
Satd. Flow (prot)	1583	3495		1583	1837		1583				1797	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95				0.96	1.00
Satd. Flow (perm)	1583	3495		1583	1837		1583				1797	1417
Volume (vph)	81	148	13	5	83	9	9	0	0	21	8	119
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	85	156	14	5	87	9	9	0	0	22	8	125
RTOR Reduction (vph)	0	8	0	0	4	0	0	0	0	0	0	113
Lane Group Flow (vph)	85	162	0	5	92	0	9	0	0	0	30	12
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												6
Actuated Green, G (s)	6.9	16.2		1.3	10.6		33.7				7.2	7.2
Effective Green, g (s)	6.9	16.2		1.3	10.6		33.7				7.2	7.2
Actuated g/C Ratio	0.09	0.22		0.02	0.14		0.45				0.10	0.10
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0				4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0				3.0	3.0
Lane Grp Cap (vph)	147	761		28	262		717				174	137
v/s Ratio Prot	c0.05	0.05		0.00	c0.05		c0.01				c0.02	
v/s Ratio Perm												0.01
v/c Ratio	0.58	0.21		0.18	0.35		0.01				0.17	0.09
Uniform Delay, d1	32.4	23.9		36.0	28.8		11.2				30.9	30.6
Progression Factor	1.00	1.00		1.00	1.00		1.00				1.00	1.00
Incremental Delay, d2	5.4	0.1		3.0	0.8		0.0				0.5	0.3
Delay (s)	37.8	24.0		39.1	29.6		11.2				31.3	30.9
Level of Service	D	C		D	C		B				C	C
Approach Delay (s)		28.6			30.1			11.2			31.0	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	29.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	74.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	26.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing
1: Pala Rd (SR-76) & Via Monserate HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	22	927	797	53	41	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	976	839	56	43	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	895				1889	867
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	895				1889	867
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				42	96
cM capacity (veh/h)	758				75	352

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	23	976	895	59
Volume Left	23	0	0	43
Volume Right	0	0	56	16
cSH	758	1700	1700	95
Volume to Capacity	0.03	0.57	0.53	0.62
Queue Length 95th (ft)	2	0	0	74
Control Delay (s)	9.9	0.0	0.0	91.4
Lane LOS	A			F
Approach Delay (s)	0.2		0.0	91.4
Approach LOS				F

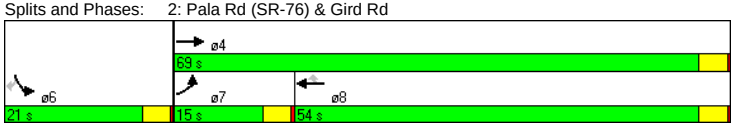
Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

PM Existing
2: Pala Rd (SR-76) & Gird Rd Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	111	874	784	68	44	56
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	69.0	54.0	54.0	21.0	21.0
Total Split (%)	16.7%	76.7%	60.0%	60.0%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	9.2	41.6	31.6	31.6	8.2	8.2
Actuated g/C Ratio	0.15	0.70	0.53	0.53	0.14	0.14
v/c Ratio	0.49	0.70	0.83	0.09	0.21	0.24
Control Delay	36.7	7.6	20.4	6.4	32.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	7.6	20.4	6.4	32.5	12.5
LOS	D	A	C	A	C	B
Approach Delay		10.9	19.3		21.2	
Approach LOS		B	B		C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 59.3			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 15.1		Intersection LOS: B	
Intersection Capacity Utilization 61.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



PM Existing
2: Pala Rd (SR-76) & Gird Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				14		59
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	111	874	784	68	44	56
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	117	920	825	72	46	59
Lane Group Flow (vph)	117	920	825	72	46	59
v/c Ratio	0.49	0.70	0.83	0.09	0.21	0.24
Control Delay	36.7	7.6	20.4	6.4	32.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	7.6	20.4	6.4	32.5	12.5
Queue Length 50th (ft)	41	117	240	10	16	0
Queue Length 95th (ft)	#115	250	436	29	53	34
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	295	1503	1225	937	432	430
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.61	0.67	0.08	0.11	0.14

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing
2: Pala Rd (SR-76) & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Volume (vph)	111	874	784	68	44	56
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	117	920	825	72	46	59
RTOR Reduction (vph)	0	0	0	6	0	51
Lane Group Flow (vph)	117	920	825	66	46	8
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	7.1	42.7	31.6	31.6	8.2	8.2
Effective Green, g (s)	7.1	42.7	31.6	31.6	8.2	8.2
Actuated g/C Ratio	0.12	0.72	0.54	0.54	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	191	1351	1000	760	220	197
v/s Ratio Prot	0.07	c0.49	c0.44		c0.03	
v/s Ratio Perm				0.05		0.01
v/c Ratio	0.61	0.68	0.82	0.09	0.21	0.04
Uniform Delay, d1	24.6	4.4	11.4	6.6	22.5	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	1.4	5.6	0.0	0.5	0.1
Delay (s)	30.3	5.8	17.0	6.7	23.0	22.0
Level of Service	C	A	B	A	C	C
Approach Delay (s)		8.6	16.2		22.4	
Approach LOS		A	B		C	

Intersection Summary				
HCM Average Control Delay	12.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing
3: Pala Rd (SR-76) & Sage Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	8	912	854	4	6	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	960	899	4	6	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	903				1878	901
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	903				1878	901
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				92	97
cM capacity (veh/h)	753				78	337

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	968	903	16
Volume Left	8	0	6
Volume Right	0	4	9
cSH	753	1700	144
Volume to Capacity	0.01	0.53	0.11
Queue Length 95th (ft)	1	0	9
Control Delay (s)	0.3	0.0	33.0
Lane LOS	A		D
Approach Delay (s)	0.3	0.0	33.0
Approach LOS			D

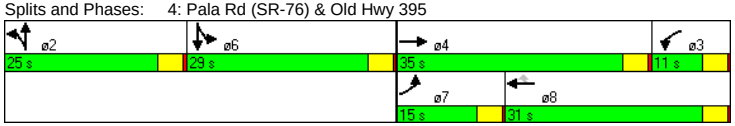
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		

PM Existing
4: Pala Rd (SR-76) & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Configurations							
Volume (vph)	71	780	60	599	236	99	69
Turn Type	Prot		Prot		Perm		
Protected Phases	7	4	3	8		2	6
Permitted Phases					8		
Detector Phases	7	4	3	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	35.0	11.0	31.0	31.0	25.0	29.0
Total Split (%)	15.0%	35.0%	11.0%	31.0%	31.0%	25.0%	29.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	Min
Act Effct Green (s)	9.0	24.8	7.2	23.0	23.0	15.1	18.4
Actuated g/C Ratio	0.11	0.31	0.09	0.29	0.29	0.19	0.23
v/c Ratio	0.43	0.83	0.46	0.62	0.42	0.71	0.78
Control Delay	48.1	34.8	54.3	30.6	6.5	43.8	44.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	34.8	54.3	30.6	6.5	43.8	44.8
LOS	D	C	D	C	A	D	D
Approach Delay		35.8		25.8		43.8	44.8
Approach LOS		D		C		D	D

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 80.1			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 34.0		Intersection LOS: C	
Intersection Capacity Utilization 68.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



PM Existing
4: Pala Rd (SR-76) & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987				0.850		0.965			0.976	
Flt Protected	0.950			0.950				0.984			0.971	
Satd. Flow (prot)	1583	3493	0	1583	3539	1417	0	1769	0	0	1765	0
Flt Permitted	0.950			0.950				0.984			0.971	
Satd. Flow (perm)	1583	3493	0	1583	3539	1417	0	1769	0	0	1765	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				248		16			11	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	71	780	75	60	599	236	73	99	60	181	69	55
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	821	79	63	631	248	77	104	63	191	73	58
Lane Group Flow (vph)	75	900	0	63	631	248	0	244	0	0	322	0
v/c Ratio	0.43	0.83		0.46	0.62	0.42		0.71			0.78	
Control Delay	48.1	34.8		54.3	30.6	6.5		43.8			44.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	48.1	34.8		54.3	30.6	6.5		43.8			44.8	
Queue Length 50th (ft)	41	242		36	163	0		125			168	
Queue Length 95th (ft)	91	354		#96	249	58		217			281	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	221	1322		146	1202	645		474			548	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	0.34	0.68		0.43	0.52	0.38		0.51			0.59	

Intersection Summary
Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing
4: Pala Rd (SR-76) & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.97			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (prot)	1583	3493		1583	3539	1417		1770			1765	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (perm)	1583	3493		1583	3539	1417		1770			1765	
Volume (vph)	71	780	75	60	599	236	73	99	60	181	69	55
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	821	79	63	631	248	77	104	63	191	73	58
RTOR Reduction (vph)	0	7	0	0	0	176	0	13	0	0	8	0
Lane Group Flow (vph)	75	893	0	63	631	72	0	231	0	0	314	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	6.9	24.8		5.1	23.0	23.0		15.1			18.4	
Effective Green, g (s)	6.9	24.8		5.1	23.0	23.0		15.1			18.4	
Actuated g/C Ratio	0.09	0.31		0.06	0.29	0.29		0.19			0.23	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	138	1091		102	1025	410		337			409	
v/s Ratio Prot	0.05	c0.26		0.04	c0.18			c0.13			c0.18	
v/s Ratio Perm						0.05						
v/c Ratio	0.54	0.82		0.62	0.62	0.18		0.69			0.77	
Uniform Delay, d1	34.7	25.2		36.2	24.4	21.1		29.9			28.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	4.3	4.9		10.6	1.1	0.2		5.7			8.4	
Delay (s)	39.1	30.1		46.8	25.5	21.3		35.6			36.9	
Level of Service	D	C		D	C	C		D			D	
Approach Delay (s)		30.8			25.8			35.6			36.9	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	30.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	79.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing
5: Dulin Rd & Old Hwy 395 HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	10	1	317	12	1	261
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1	334	13	1	275
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		13				
Median type	None					
Median storage veh)						
Upstream signal (ft)						899
pX, platoon unblocked						
vC, conflicting volume	617	340			346	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	617	340			346	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	100			100	
cM capacity (veh/h)	453	702			1213	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	12	346	276
Volume Left	11	0	1
Volume Right	1	13	0
cSH	498	1700	1213
Volume to Capacity	0.02	0.20	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	12.9	0.0	0.0
Lane LOS	B		A
Approach Delay (s)	12.9	0.0	0.0
Approach LOS	B		

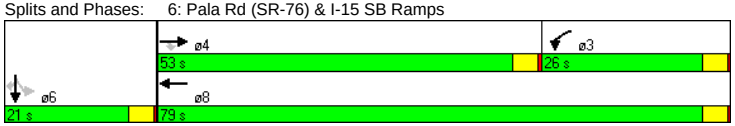
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

PM Existing
6: Pala Rd (SR-76) & I-15 SB Ramps Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Volume (vph)	717	273	125	556	5	433
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6	
Permitted Phases		4				6
Detector Phases	4	4	3	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	53.0	53.0	26.0	79.0	21.0	21.0
Total Split (%)	53.0%	53.0%	26.0%	79.0%	21.0%	21.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	43.8	43.8	14.5	60.0	32.0	32.0
Actuated g/C Ratio	0.44	0.44	0.14	0.60	0.32	0.32
v/c Ratio	0.93	0.37	0.58	0.52	0.14	0.63
Control Delay	44.2	3.2	28.8	14.5	32.3	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	3.2	28.8	14.5	32.3	11.3
LOS	D	A	C	B	C	B
Approach Delay	32.9			17.1	14.4	
Approach LOS	C			B	B	

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 40 (40%), Referenced to phase 2: and 6:SBTL, Start of Green		
Natural Cycle: 65		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.93		
Intersection Signal Delay: 23.7	Intersection LOS: C	
Intersection Capacity Utilization 86.5%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



PM Existing
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.955	
Satd. Flow (prot)	0	1863	1417	1583	1863	0	0	0	0	0	1779	1417
Flt Permitted				0.950							0.955	
Satd. Flow (perm)	0	1863	1417	1583	1863	0	0	0	0	0	1779	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			287									399
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	717	273	125	556	0	0	0	0	71	5	433
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	755	287	132	585	0	0	0	0	75	5	456
Lane Group Flow (vph)	0	755	287	132	585	0	0	0	0	0	80	456
v/c Ratio		0.93	0.37	0.58	0.52						0.14	0.63
Control Delay		44.2	3.2	28.8	14.5						32.3	11.3
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		44.2	3.2	28.8	14.5						32.3	11.3
Queue Length 50th (ft)		422	0	78	135						37	26
Queue Length 95th (ft)		#585	42	m60	m20						88	#190
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		913	841	348	1397						569	725
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.83	0.34	0.38	0.42						0.14	0.63

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Existing
6: Pala Rd (SR-76) & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.96	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1779	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.96	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1779	1417
Volume (vph)	0	717	273	125	556	0	0	0	0	71	5	433
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	755	287	132	585	0	0	0	0	75	5	456
RTOR Reduction (vph)	0	0	161	0	0	0	0	0	0	0	0	275
Lane Group Flow (vph)	0	755	126	132	585	0	0	0	0	0	80	181
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		43.8	43.8	13.0	60.8						31.2	31.2
Effective Green, g (s)		43.8	43.8	13.0	60.8						31.2	31.2
Actuated g/C Ratio		0.44	0.44	0.13	0.61						0.31	0.31
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		816	621	206	1133						555	442
v/s Ratio Prot		c0.41		c0.08	0.31							
v/s Ratio Perm			0.09								0.04	c0.13
v/c Ratio		0.93	0.20	0.64	0.52						0.14	0.41
Uniform Delay, d1		26.6	17.3	41.3	11.2						24.8	27.1
Progression Factor		1.00	1.00	0.66	1.28						1.00	1.00
Incremental Delay, d2		16.1	0.2	2.3	0.1						0.5	2.8
Delay (s)		42.7	17.5	29.5	14.4						25.3	30.0
Level of Service		D	B	C	B						C	C
Approach Delay (s)		35.7			17.2			0.0			29.3	
Approach LOS		D			B			A			C	

Intersection Summary

HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

PM Existing
7: Pala Rd (SR-76) & I-15 NB Ramps

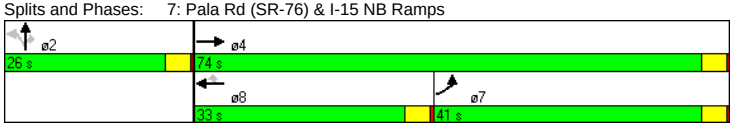
Timings

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Volume (vph)	594	213	351	50	4	121
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		2	
Permitted Phases				8		2
Detector Phases	7	4	8	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	41.0	74.0	33.0	33.0	26.0	26.0
Total Split (%)	41.0%	74.0%	33.0%	33.0%	26.0%	26.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	42.4	70.0	23.6	23.6	22.0	22.0
Actuated g/C Ratio	0.42	0.70	0.24	0.24	0.22	0.22
v/c Ratio	0.93	0.17	0.84	0.15	1.03	0.31
Control Delay	40.3	1.0	53.1	19.5	94.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	1.0	53.1	19.5	94.0	8.1
LOS	D	A	D	B	F	A
Approach Delay		29.9	48.9		73.5	
Approach LOS		C	D		E	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 56 (56%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 47.2 Intersection LOS: D
Intersection Capacity Utilization 86.5% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



LOS Engineering

PM Existing
7: Pala Rd (SR-76) & I-15 NB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1583	1863	0	0	1863	1417	0	1775	1417	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	1583	1863	0	0	1863	1417	0	1775	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						22			127			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	594	213	0	0	351	50	380	4	121	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	625	224	0	0	369	53	400	4	127	0	0	0
Lane Group Flow (vph)	625	224	0	0	369	53	0	404	127	0	0	0
v/c Ratio	0.93	0.17			0.84	0.15		1.03	0.31			
Control Delay	40.3	1.0			53.1	19.5		94.0	8.1			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	40.3	1.0			53.1	19.5		94.0	8.1			
Queue Length 50th (ft)	414	7			223	15		~279	0			
Queue Length 95th (ft)	m#547	m15			311	44		#463	46			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	671	1304			540	427		391	411			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	0.93	0.17			0.68	0.12		1.03	0.31			

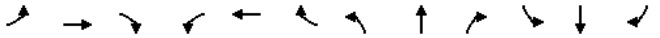
Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Existing
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis



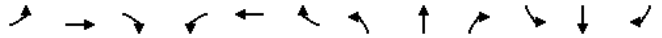
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1775	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1775	1417			
Volume (vph)	594	213	0	0	351	50	380	4	121	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	625	224	0	0	369	53	400	4	127	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	17	0	0	99	0	0	0
Lane Group Flow (vph)	625	224	0	0	369	36	0	404	28	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	42.4	70.0			23.6	23.6		22.0	22.0			
Effective Green, g (s)	42.4	70.0			23.6	23.6		22.0	22.0			
Actuated g/C Ratio	0.42	0.70			0.24	0.24		0.22	0.22			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	671	1304			440	334		391	312			
v/s Ratio Prot	c0.39	0.12			c0.20							
v/s Ratio Perm						0.03		0.23	0.02			
v/c Ratio	0.93	0.17			0.84	0.11		1.03	0.09			
Uniform Delay, d1	27.4	5.1			36.4	30.0		39.0	31.0			
Progression Factor	0.87	0.17			1.00	1.00		1.00	1.00			
Incremental Delay, d2	12.1	0.0			13.1	0.1		54.3	0.6			
Delay (s)	35.9	0.9			49.5	30.1		93.3	31.6			
Level of Service	D	A			D	C		F	C			
Approach Delay (s)		26.7			47.1			78.6			0.0	
Approach LOS		C			D			E			A	

Intersection Summary				
HCM Average Control Delay	46.7	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing
8: Pala Rd (SR-76) & Pankey Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	349	27	1	434	7	14	0	1	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	367	28	1	457	7	15	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	464			396			612	848	198	647	858	232
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	464			396			612	848	198	647	858	232
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	100	100	100	100
cM capacity (veh/h)	1093			1159			377	297	810	355	292	770

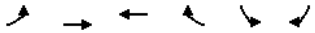
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	245	151	1	305	160	16	0
Volume Left	0	0	0	1	0	0	15	0
Volume Right	0	0	28	0	0	7	1	0
cSH	1700	1700	1700	1159	1700	1700	391	1700
Volume to Capacity	0.00	0.14	0.09	0.00	0.18	0.09	0.04	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	3	0
Control Delay (s)	0.0	0.0	0.0	8.1	0.0	0.0	14.6	0.0
Lane LOS				A			B	A
Approach Delay (s)	0.0			0.0			14.6	0.0
Approach LOS							B	A

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	22.2%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

PM Existing
10: Pala Rd (SR-76) & Rice Canyon Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	13	280	365	8	8	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	295	384	8	8	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	393				711	388
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	393				711	388
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	98
cM capacity (veh/h)	1166				395	660

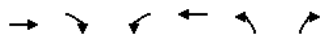
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	308	393	19
Volume Left	14	0	8
Volume Right	0	8	11
cSH	1166	1700	508
Volume to Capacity	0.01	0.23	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	0.5	0.0	12.4
Lane LOS	A		B
Approach Delay (s)	0.5	0.0	12.4
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing
11: Pala Rd (SR-76) & Couser Canyon Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	265	20	8	368	11	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	279	21	8	387	12	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			300		694	289
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			300		694	289
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	100
cM capacity (veh/h)			1261		406	750

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	300	396	14
Volume Left	0	8	12
Volume Right	21	0	2
cSH	1700	1261	437
Volume to Capacity	0.18	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	0.2	13.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	13.5
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing
12: Pala Mesa Dr & Old Hwy 395 HCM Unsignalized Intersection Capacity Analysis



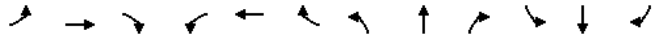
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	13	24	46	329	165	27
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	25	48	346	174	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	631	188	202			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	631	188	202			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	97	96			
cM capacity (veh/h)	429	854	1370			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	39	48	346	202
Volume Left	14	48	0	0
Volume Right	25	0	0	28
cSH	634	1370	1700	1700
Volume to Capacity	0.06	0.04	0.20	0.12
Queue Length 95th (ft)	5	3	0	0
Control Delay (s)	11.1	7.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.1	0.9		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing
13: Pala Mesa Dr & Wilt Rd HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	1	0	8	2	16	0	3	6	18	10	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	0	8	2	17	0	3	6	19	11	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	19			1			39	41	1	41	33	11
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	19			1			39	41	1	41	33	11
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	99	98	99	100
cM capacity (veh/h)	1598			1622			951	845	1084	950	854	1071

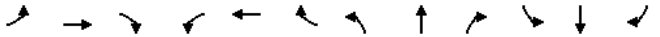
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	27	9	31
Volume Left	2	8	0	19
Volume Right	0	17	6	1
cSH	1598	1622	991	918
Volume to Capacity	0.00	0.01	0.01	0.03
Queue Length 95th (ft)	0	0	1	3
Control Delay (s)	4.8	2.3	8.7	9.1
Lane LOS	A	A	A	A
Approach Delay (s)	4.8	2.3	8.7	9.1
Approach LOS			A	A

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	18.3%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing

14: Stewart Canyon Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	8	3	18	19	1	28	21	259	12	12	168	19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	3	19	20	1	29	22	273	13	13	177	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	559	542	187	546	545	279	197			285		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	559	542	187	546	545	279	197			285		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	99	98	95	100	96	98			99		
cM capacity (veh/h)	414	436	855	428	434	760	1376			1277		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	31	51	22	285	13	197
Volume Left	8	20	22	0	13	0
Volume Right	19	29	0	13	0	20
cSH	613	574	1376	1700	1277	1700
Volume to Capacity	0.05	0.09	0.02	0.17	0.01	0.12
Queue Length 95th (ft)	4	7	1	0	1	0
Control Delay (s)	11.2	11.9	7.7	0.0	7.8	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	11.2	11.9	0.6		0.5	
Approach LOS	B	B				

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	30.5%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

PM Existing

15: Reche Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	205	176	210	79	53	152
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	216	185	221	83	56	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	661	136	216			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	661	136	216			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	40	80	84			
cM capacity (veh/h)	358	913	1354			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	401	221	83	216
Volume Left	216	221	0	0
Volume Right	185	0	0	160
cSH	497	1354	1700	1700
Volume to Capacity	0.81	0.16	0.05	0.13
Queue Length 95th (ft)	191	15	0	0
Control Delay (s)	35.9	8.2	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	35.9	5.9		0.0
Approach LOS	E			

Intersection Summary				
Average Delay	17.6			
Intersection Capacity Utilization	59.9%	ICU Level of Service	B	
Analysis Period (min)	15			

LOS Engineering

PM Existing

16: Reche Rd & Tecalote Dr — HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	381	21	0	369	17	3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	401	22	0	388	18	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			423		801	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			423		801	412
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	100
cM capacity (veh/h)			1136		354	640

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	423	388	21
Volume Left	0	0	18
Volume Right	22	0	3
cSH	1700	1136	379
Volume to Capacity	0.25	0.00	0.06
Queue Length 95th (ft)	0	0	4
Control Delay (s)	0.0	0.0	15.0
Lane LOS			C
Approach Delay (s)	0.0	0.0	15.0
Approach LOS			C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		31.3%	ICU Level of Service A
Analysis Period (min)		15	

LOS Engineering

PM Existing

17: Reche Rd & Wilt Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	424	27	14	383	28	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	446	28	15	403	29	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			475		893	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			475		893	461
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		90	99
cM capacity (veh/h)			1087		308	601

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	475	418	34
Volume Left	0	15	29
Volume Right	28	0	4
cSH	1700	1087	328
Volume to Capacity	0.28	0.01	0.10
Queue Length 95th (ft)	0	1	9
Control Delay (s)	0.0	0.4	17.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.4	17.2
Approach LOS			C

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		41.5%	ICU Level of Service A
Analysis Period (min)		15	

LOS Engineering

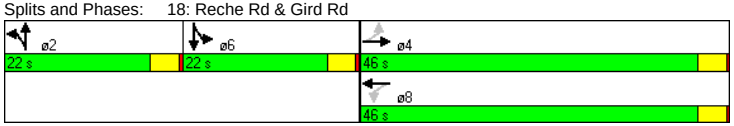
PM Existing
18: Reche Rd & Gird Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations						
Volume (vph)	6	428	40	343	3	1
Turn Type	Perm		Perm			
Protected Phases		4		8	2	6
Permitted Phases	4		8			
Detector Phases	4	4	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	46.0	46.0	46.0	46.0	22.0	22.0
Total Split (%)	51.1%	51.1%	51.1%	51.1%	24.4%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	19.1	19.1	19.1	19.1	9.4	5.9
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.20	0.13
v/c Ratio	0.02	0.76	0.24	0.51	0.45	0.00
Control Delay	8.5	18.8	13.0	12.7	21.3	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.5	18.8	13.0	12.7	21.3	25.0
LOS	A	B	B	B	C	C
Approach Delay		18.7		12.8	21.3	25.0
Approach LOS		B		B	C	C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 47.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 16.9		Intersection LOS: B	
Intersection Capacity Utilization 57.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 18: Reche Rd & Gird Rd



PM Existing
18: Reche Rd & Gird Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	50		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.970			0.992			0.968				
Flt Protected	0.950			0.950				0.964				
Satd. Flow (prot)	1583	1807	0	1583	1848	0	0	1738	0	0	1863	0
Flt Permitted	0.423			0.261				0.964				
Satd. Flow (perm)	705	1807	0	435	1848	0	0	1738	0	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			4			16				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		6958			6851			1674			1091	
Travel Time (s)		158.1			155.7			38.0			24.8	
Volume (vph)	6	428	105	40	343	18	113	3	36	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	6	451	111	42	361	19	119	3	38	0	1	0
Lane Group Flow (vph)	6	562	0	42	380	0	0	160	0	0	1	0
v/c Ratio	0.02	0.76		0.24	0.51			0.45			0.00	
Control Delay	8.5	18.8		13.0	12.7			21.3			25.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	8.5	18.8		13.0	12.7			21.3			25.0	
Queue Length 50th (ft)	1	111		7	67			32			0	
Queue Length 95th (ft)	6	242		27	148			99			5	
Internal Link Dist (ft)		6878			6771			1594			1011	
Turn Bay Length (ft)	50			50								
Base Capacity (vph)	429	1107		265	1126			587			585	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.51		0.16	0.34			0.27			0.00	

Intersection Summary	
Area Type:	Other

PM Existing
18: Reche Rd & Gird Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	0.99			0.97			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.96			1.00	
Satd. Flow (prot)	1583	1808		1583	1849			1738			1863	
Flt Permitted	0.44	1.00		0.25	1.00			0.96			1.00	
Satd. Flow (perm)	739	1808		424	1849			1738			1863	
Volume (vph)	6	428	105	40	343	18	113	3	36	0	1	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	6	451	111	42	361	19	119	3	38	0	1	0
RTOR Reduction (vph)	0	11	0	0	2	0	0	13	0	0	0	0
Lane Group Flow (vph)	6	551	0	42	378	0	0	147	0	0	1	0
Turn Type	Perm			Perm			Split			Split		
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8								
Actuated Green, G (s)	19.1	19.1		19.1	19.1			9.4			5.9	
Effective Green, g (s)	19.1	19.1		19.1	19.1			9.4			5.9	
Actuated g/C Ratio	0.41	0.41		0.41	0.41			0.20			0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	304	744		175	761			352			237	
v/s Ratio Prot		c0.31			0.20			c0.08			c0.00	
v/s Ratio Perm	0.01			0.10								
v/c Ratio	0.02	0.74		0.24	0.50			0.42			0.00	
Uniform Delay, d1	8.1	11.6		8.9	10.1			16.1			17.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	4.0		0.7	0.5			0.8			0.0	
Delay (s)	8.1	15.5		9.6	10.6			16.9			17.7	
Level of Service	A	B		A	B			B			B	
Approach Delay (s)		15.5			10.5			16.9			17.7	
Approach LOS		B			B			B			B	

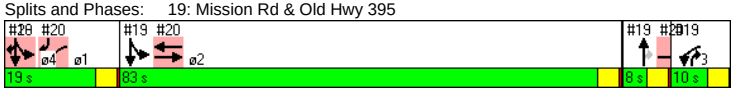
Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	46.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

PM Existing
19: Mission Rd & Old Hwy 395 — Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	181	688	32	217	970	20		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			8.0		20.0	20.0	8.0	8.0
Total Split (s)	29.0	0.0	8.0	29.0	83.0	83.0	19.0	10.0
Total Split (%)	24.2%	0.0%	6.7%	24.2%	69.2%	69.2%	16%	8%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes					Yes
Recall Mode			None		None	None	None	None
Act Effct Green (s)	22.3	116.0	4.0	30.3	77.7	77.7		
Actuated g/C Ratio	0.19	1.00	0.03	0.26	0.67	0.67		
v/c Ratio	0.63	0.51	0.53	0.61	0.96	0.02		
Control Delay	56.4	1.4	85.2	46.0	39.8	7.1		
Queue Delay	0.0	0.0	0.0	0.0	3.5	0.0		
Total Delay	56.4	1.4	85.2	46.0	43.4	7.1		
LOS	E	A	F	D	D	A		
Approach Delay	12.9		51.1			42.7		
Approach LOS	B		D			D		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 116			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 31.4		Intersection LOS: C	
Intersection Capacity Utilization 84.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 19: Mission Rd & Old Hwy 395



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	181	688	32	217	970	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	724	34	228	1021	21
Lane Group Flow (vph)	191	724	34	228	1021	21
v/c Ratio	0.63	0.51	0.53	0.61	0.96	0.02
Control Delay	56.4	1.4	85.2	46.0	39.8	7.1
Queue Delay	0.0	0.0	0.0	0.0	3.5	0.0
Total Delay	56.4	1.4	85.2	46.0	43.4	7.1
Queue Length 50th (ft)	144	16	26	153	700	5
Queue Length 95th (ft)	m184	19	#76	240	#1059	14
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	342	1417	64	405	1082	1273
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	33	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.51	0.53	0.56	0.97	0.02

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Volume (vph)	181	688	32	217	970	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	191	724	34	228	1021	21
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	191	724	34	228	1021	21
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	22.3	115.9	4.0	26.3	77.6	77.6
Effective Green, g (s)	22.3	115.9	4.0	26.3	77.6	77.6
Actuated g/C Ratio	0.19	1.00	0.03	0.23	0.67	0.67
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	305	1417	64	370	1060	1247
v/s Ratio Prot	c0.12		0.02	c0.12	c0.64	0.01
v/s Ratio Perm		c0.51		0.04		
v/c Ratio	0.63	0.51	0.53	0.62	0.96	0.02
Uniform Delay, d1	43.0	0.0	55.0	40.3	17.8	6.4
Progression Factor	1.11	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.2	1.1	8.2	3.0	19.2	0.0
Delay (s)	51.1	1.1	63.2	43.3	37.1	6.4
Level of Service	D	A	E	D	D	A
Approach Delay (s)	11.5		45.9			36.4
Approach LOS	B		D			D

Intersection Summary

HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	115.9	Sum of lost time (s)	4.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

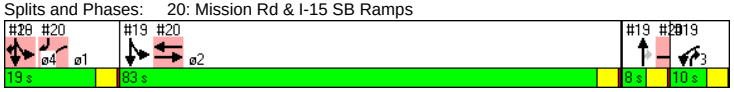
c Critical Lane Group

Lane Group	EBT	WBL	WBT	SBT	SBR	ø3
Lane Configurations						
Volume (vph)	1096	44	314	2	557	
Turn Type		Prot			custom	
Protected Phases	2 3	1	2	4	1 4	3
Permitted Phases					4	
Detector Phases	2 3	1	2	4	1 4	
Minimum Initial (s)		4.0	4.0	4.0		4.0
Minimum Split (s)		8.0	20.0	8.0		8.0
Total Split (s)	91.0	19.0	83.0	10.0	29.0	8.0
Total Split (%)	75.8%	15.8%	69.2%	8.3%	24.2%	7%
Yellow Time (s)		3.5	3.5	3.5		3.5
All-Red Time (s)		0.5	0.5	0.5		0.5
Lead/Lag		Lead	Lag	Lag		Lead
Lead-Lag Optimize?				Yes		Yes
Recall Mode		None	None	None		None
Act Effct Green (s)	85.7	12.3	77.7	6.0	22.3	
Actuated g/C Ratio	0.74	0.11	0.67	0.05	0.19	
v/c Ratio	0.91	0.28	0.27	0.11	0.79	
Control Delay	12.7	52.2	8.7	57.1	11.9	
Queue Delay	14.2	0.0	0.0	0.5	0.0	
Total Delay	26.8	52.2	8.7	57.6	11.9	
LOS	C	D	A	E	B	
Approach Delay	26.8		14.0	12.7		
Approach LOS	C		B	B		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 116
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 20.9 — Intersection LOS: C
Intersection Capacity Utilization 72.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		0	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50					50	50	50
Trailing Detector (ft)		0		0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990										0.850
Flt Protected				0.950							0.962	
Satd. Flow (prot)	0	1844	0	1583	1863	0	0	0	0	0	1792	1417
Flt Permitted				0.950							0.962	
Satd. Flow (perm)	0	1844	0	1583	1863	0	0	0	0	0	1792	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8										586
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	1096	85	44	314	0	0	0	0	8	2	557
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1154	89	46	331	0	0	0	0	8	2	586
Lane Group Flow (vph)	0	1243	0	46	331	0	0	0	0	0	10	586
v/c Ratio		0.91		0.28	0.27						0.11	0.79
Control Delay		12.7		52.2	8.7						57.1	11.9
Queue Delay		14.2		0.0	0.0						0.5	0.0
Total Delay		26.8		52.2	8.7						57.6	11.9
Queue Length 50th (ft)		201		33	98						8	0
Queue Length 95th (ft)		m335		70	143						26	125
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1364		205	1273						93	766
Starvation Cap Reductn		139		0	0						0	0
Spillback Cap Reductn		105		0	0						20	0
Storage Cap Reductn		0		0	0						0	0
Reduced v/c Ratio		1.01		0.22	0.26						0.14	0.77

Intersection Summary

Area Type: Other
m Volume for 95th percentile queue is metered by upstream signal.

PM Existing
20: Mission Rd & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.96	1.00
Satd. Flow (prot)		1845		1583	1863						1791	1417
Flt Permitted		1.00		0.95	1.00						0.96	1.00
Satd. Flow (perm)		1845		1583	1863						1791	1417
Volume (vph)	0	1096	85	44	314	0	0	0	0	8	2	557
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1154	89	46	331	0	0	0	0	8	2	586
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	473
Lane Group Flow (vph)	0	1241	0	46	331	0	0	0	0	0	10	113
Turn Type				Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases												4
Actuated Green, G (s)		85.6		12.3	77.6						6.0	22.3
Effective Green, g (s)		85.6		12.3	77.6						6.0	22.3
Actuated g/C Ratio		0.74		0.11	0.67						0.05	0.19
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1363		168	1247						93	273
v/s Ratio Prot		c0.67		0.03	0.18						0.01	c0.08
v/s Ratio Perm												
v/c Ratio		0.91		0.27	0.27						0.11	0.41
Uniform Delay, d1		12.1		47.7	7.7						52.4	41.1
Progression Factor		0.49		1.00	1.00						1.00	1.00
Incremental Delay, d2		4.3		0.9	0.1						0.5	1.0
Delay (s)		10.3		48.6	7.8						52.9	42.1
Level of Service		B		D	A						D	D
Approach Delay (s)		10.3			12.8			0.0			42.3	
Approach LOS		B			B			A			D	

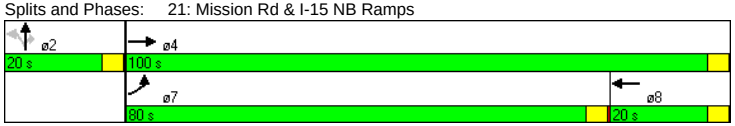
Intersection Summary				
HCM Average Control Delay	19.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	115.9	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	72.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

PM Existing
21: Mission Rd & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	901	187	164	2	77
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	80.0	100.0	20.0	20.0	20.0
Total Split (%)	66.7%	83.3%	16.7%	16.7%	16.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	66.2	84.1	13.6	13.9	13.9
Actuated g/C Ratio	0.62	0.79	0.13	0.13	0.13
v/c Ratio	0.96	0.13	0.74	0.76	0.32
Control Delay	41.4	2.9	66.7	69.7	14.1
Queue Delay	7.8	0.0	0.0	0.0	0.0
Total Delay	49.2	2.9	66.7	69.7	14.1
LOS	D	A	E	E	B
Approach Delay		41.3	66.7	52.3	
Approach LOS		D	E	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 106.5		
Natural Cycle: 100		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.96		
Intersection Signal Delay: 45.9	Intersection LOS: D	
Intersection Capacity Utilization 83.9%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998				0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1583	1863	0	0	1859	0	0	1775	1417	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	1583	1863	0	0	1859	0	0	1775	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1				81			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	901	187	0	0	164	3	166	2	77	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	948	197	0	0	173	3	175	2	81	0	0	0
Lane Group Flow (vph)	948	197	0	0	176	0	0	177	81	0	0	0
v/c Ratio	0.96	0.13			0.74			0.76	0.32			
Control Delay	41.4	2.9			66.7			69.7	14.1			
Queue Delay	7.8	0.0			0.0			0.0	0.0			
Total Delay	49.2	2.9			66.7			69.7	14.1			
Queue Length 50th (ft)	624	28			132			134	0			
Queue Length 95th (ft)	#970	43			#228			#240	46			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	1043	1517			285			273	286			
Starvation Cap Reductn	79	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.98	0.13			0.62			0.65	0.28			

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			1.00			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1583	1863			1858			1775	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1583	1863			1858			1775	1417			
Volume (vph)	901	187	0	0	164	3	166	2	77	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	948	197	0	0	173	3	175	2	81	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	70	0	0	0
Lane Group Flow (vph)	948	197	0	0	175	0	0	177	11	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	66.2	84.1			13.9			13.9	13.9			
Effective Green, g (s)	66.2	84.1			13.9			13.9	13.9			
Actuated g/C Ratio	0.62	0.79			0.13			0.13	0.13			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	989	1478			244			233	186			
v/s Ratio Prot	c0.60	0.11			c0.09							
v/s Ratio Perm								0.10	0.01			
v/c Ratio	0.96	0.13			0.72			0.76	0.06			
Uniform Delay, d1	18.6	2.5			44.2			44.4	40.3			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	19.1	0.0			9.7			13.3	0.1			
Delay (s)	37.7	2.6			53.8			57.7	40.4			
Level of Service	D	A			D			E	D			
Approach Delay (s)		31.7			53.8			52.3			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM Average Control Delay	37.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

PM Existing
22: Stewart Canyon Rd & Horse Ranch Creek Rd HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	17	3	4	0	0	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	18	3	4	0	0	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	27	19	38			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	27	19	38			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	985	1059	1572			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	21	4	38
Volume Left	18	4	0
Volume Right	3	0	38
cSH	995	1572	1700
Volume to Capacity	0.02	0.00	0.02
Queue Length 95th (ft)	2	0	0
Control Delay (s)	8.7	7.3	0.0
Lane LOS	A	A	
Approach Delay (s)	8.7	7.3	0.0
Approach LOS	A		

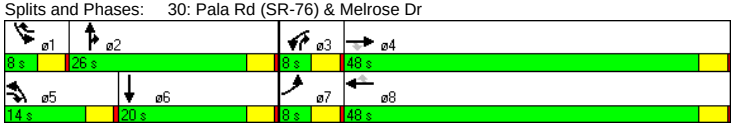
Intersection Summary			
Average Delay		3.4	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

PM Existing
30: Pala Rd (SR-76) & Melrose Dr Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	ø2	ø6
Lane Configurations										
Volume (vph)	4	1464	360	44	834	1	246	45		
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot	pt+ov		
Protected Phases	7	4	5	3	8	1	5	2 3	2	6
Permitted Phases			4			8				
Detector Phases	7	4	5	3	8	1	5	2 3		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0		20.0	20.0
Total Split (s)	8.0	48.0	14.0	8.0	48.0	8.0	14.0	34.0	26.0	20.0
Total Split (%)	8.9%	53.3%	15.6%	8.9%	53.3%	8.9%	15.6%	37.8%	29%	22%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	None		Max	Max
Act Effct Green (s)	4.1	40.7	54.4	4.0	45.3	50.1	9.6	36.2		
Actuated g/C Ratio	0.04	0.48	0.64	0.05	0.53	0.55	0.11	0.42		
v/c Ratio	0.06	0.91	0.36	0.32	0.47	0.00	0.74	0.07		
Control Delay	44.8	29.7	1.8	47.9	13.4	6.0	52.4	0.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	44.8	29.7	1.8	47.9	13.4	6.0	52.4	0.2		
LOS	D	C	A	D	B	A	D	A		
Approach Delay		24.3			15.1					
Approach LOS		C			B					

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 84.9
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 23.5 Intersection LOS: C
Intersection Capacity Utilization 55.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 30: Pala Rd (SR-76) & Melrose Dr



PM Existing
30: Pala Rd (SR-76) & Melrose Dr

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	500		500	500		500	400		400	200		0
Storage Lanes	1		1	2		1	2		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			
Flt Protected	0.950			0.950			0.950					
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1667	1863	0
Flt Permitted	0.950			0.950			0.950					
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1667	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			379			1			104			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1330			646			1034			733	
Travel Time (s)		30.2			14.7			23.5			16.7	
Volume (vph)	4	1464	360	44	834	1	246	0	45	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	1541	379	46	878	1	259	0	47	0	0	0
Lane Group Flow (vph)	4	1541	379	46	878	1	259	0	47	0	0	0
v/c Ratio	0.06	0.91	0.36	0.32	0.47	0.00	0.74		0.07			
Control Delay	44.8	29.7	1.8	47.9	13.4	6.0	52.4		0.2			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0			
Total Delay	44.8	29.7	1.8	47.9	13.4	6.0	52.4		0.2			
Queue Length 50th (ft)	2	398	0	13	136	0	74		0			
Queue Length 95th (ft)	13	#523	29	30	223	2	#130		1			
Internal Link Dist (ft)		1250			566			954			653	
Turn Bay Length (ft)	500		500	500		500	400		400			
Base Capacity (vph)	70	1774	1035	143	1963	778	365		654			
Starvation Cap Reductn	0	0	0	0	0	0	0		0			
Spillback Cap Reductn	0	0	0	0	0	0	0		0			
Storage Cap Reductn	0	0	0	0	0	0	0		0			
Reduced v/c Ratio	0.06	0.87	0.37	0.32	0.45	0.00	0.71		0.07			

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing
30: Pala Rd (SR-76) & Melrose Dr

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0			
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97		1.00			
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072		1417			
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072		1417			
Volume (vph)	4	1464	360	44	834	1	246	0	45	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	1541	379	46	878	1	259	0	47	0	0	0
RTOR Reduction (vph)	0	0	160	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	4	1541	219	46	878	1	259	0	18	0	0	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	0.8	43.1	52.7	3.0	45.3	46.1	9.6		35.5			
Effective Green, g (s)	0.8	43.1	52.7	3.0	45.3	46.1	9.6		35.5			
Actuated g/C Ratio	0.01	0.47	0.58	0.03	0.50	0.50	0.11		0.39			
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0					
Lane Grp Cap (vph)	14	1669	879	101	1754	777	323		550			
v/s Ratio Prot	0.00	c0.44	0.03	c0.01	0.25	0.00	c0.08		c0.01			
v/s Ratio Perm			0.13			0.00						
v/c Ratio	0.29	0.92	0.25	0.46	0.50	0.00	0.80		0.03			
Uniform Delay, d1	45.0	22.6	9.6	43.4	15.5	11.2	40.0		17.3			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00			
Incremental Delay, d2	10.9	9.0	0.1	3.2	0.2	0.0	13.3		0.0			
Delay (s)	56.0	31.6	9.7	46.6	15.7	11.2	53.3		17.3			
Level of Service	E	C	A	D	B	B	D		B			
Approach Delay (s)		27.3			17.2			47.8			0.0	
Approach LOS		C			B			D			A	

Intersection Summary				
HCM Average Control Delay	26.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	91.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	55.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

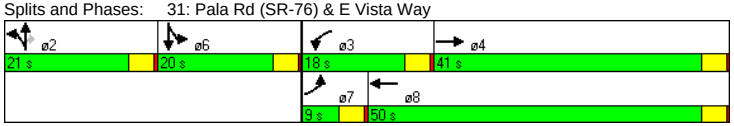
PM Existing
31: Pala Rd (SR-76) & E Vista Way — Timings

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Volume (vph)	70	981	375	693	62	348	68
Turn Type	Prot		Prot			Perm	
Protected Phases	7	4	3	8	2		6
Permitted Phases						2	
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	41.0	18.0	50.0	21.0	21.0	20.0
Total Split (%)	9.0%	41.0%	18.0%	50.0%	21.0%	21.0%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	Max
Act Effct Green (s)	5.0	37.0	14.0	46.0	17.0	17.0	16.0
Actuated g/C Ratio	0.05	0.37	0.14	0.46	0.17	0.17	0.16
v/c Ratio	0.94	0.96	0.92	0.87	0.84	0.67	0.44
Control Delay	134.9	48.1	70.6	37.3	65.1	10.9	33.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	134.9	48.1	70.6	37.3	65.1	10.9	33.0
LOS	F	D	E	D	E	B	C
Approach Delay		52.9		48.8	33.2		33.0
Approach LOS		D		D	C		C

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 46.8 — Intersection LOS: D
Intersection Capacity Utilization 79.4% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 31: Pala Rd (SR-76) & E Vista Way



PM Existing
31: Pala Rd (SR-76) & E Vista Way — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		150	450		0	0		200	0		0
Storage Lanes	1		0	2		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.997				0.850		0.939	
Flt Protected	0.950			0.950				0.964			0.999	
Satd. Flow (prot)	1583	3451	0	3072	1857	0	0	1796	1417	0	1747	0
Flt Permitted	0.950			0.950				0.964			0.999	
Satd. Flow (perm)	1583	3451	0	3072	1857	0	0	1796	1417	0	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			1				366		35	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		710			526			797			552	
Travel Time (s)		16.1			12.0			18.1			12.5	
Volume (vph)	70	981	199	375	693	15	182	62	348	3	68	58
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	1033	209	395	729	16	192	65	366	3	72	61
Lane Group Flow (vph)	74	1242	0	395	745	0	0	257	366	0	136	0
v/c Ratio	0.94	0.96		0.92	0.87			0.84	0.67		0.44	
Control Delay	134.9	48.1		70.6	37.3			65.1	10.9		33.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	134.9	48.1		70.6	37.3			65.1	10.9		33.0	
Queue Length 50th (ft)	48	394		129	414			160	0		58	
Queue Length 95th (ft)	#138	#546		#218	#649			#295	88		117	
Internal Link Dist (ft)		630			446			717			472	
Turn Bay Length (ft)	300			450					200			
Base Capacity (vph)	79	1294		430	855			305	545		309	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.94	0.96		0.92	0.87			0.84	0.67		0.44	

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Existing
31: Pala Rd (SR-76) & E Vista Way

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		0.97	1.00			1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (prot)	1583	3450		3072	1857			1796	1417		1748	
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (perm)	1583	3450		3072	1857			1796	1417		1748	
Volume (vph)	70	981	199	375	693	15	182	62	348	3	68	58
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	1033	209	395	729	16	192	65	366	3	72	61
RTOR Reduction (vph)	0	17	0	0	1	0	0	0	304	0	29	0
Lane Group Flow (vph)	74	1225	0	395	744	0	0	257	62	0	107	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)	5.0	37.0		14.0	46.0			17.0	17.0		16.0	
Effective Green, g (s)	5.0	37.0		14.0	46.0			17.0	17.0		16.0	
Actuated g/C Ratio	0.05	0.37		0.14	0.46			0.17	0.17		0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	79	1277		430	854			305	241		280	
v/s Ratio Prot	0.05	c0.36		c0.13	0.40			c0.14			c0.06	
v/s Ratio Perm									0.04			
v/c Ratio	0.94	0.96		0.92	0.87			0.84	0.26		0.38	
Uniform Delay, d1	47.3	30.8		42.4	24.3			40.2	36.0		37.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	79.2	16.2		24.3	9.7			23.7	2.6		3.9	
Delay (s)	126.5	47.0		66.7	34.1			63.9	38.6		41.5	
Level of Service	F	D		E	C			E	D		D	
Approach Delay (s)		51.4			45.4			49.0			41.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	48.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

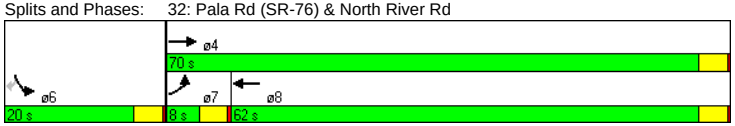
PM Existing
32: Pala Rd (SR-76) & North River Rd

Timings

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	37	1268	931	187	162
Turn Type	Prot				Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phases	7	4	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	70.0	62.0	20.0	20.0
Total Split (%)	8.9%	77.8%	68.9%	22.2%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	4.0	64.8	60.0	16.0	16.0
Actuated g/C Ratio	0.04	0.73	0.68	0.18	0.18
v/c Ratio	0.57	0.98	0.88	0.69	0.43
Control Delay	74.3	33.8	22.8	48.7	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	74.3	33.8	22.8	48.7	9.1
LOS	E	C	C	D	A
Approach Delay		35.0	22.8	30.3	
Approach LOS		C	C	C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 88.8		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.98		
Intersection Signal Delay: 29.7	Intersection LOS: C	
Intersection Capacity Utilization 85.0%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 32: Pala Rd (SR-76) & North River Rd



PM Existing
32: Pala Rd (SR-76) & North River Rd — Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	150			0	50	0
Storage Lanes	1			0	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.986			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1837	0	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1837	0	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			13			171
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		1356	1400		1286	
Travel Time (s)		30.8	31.8		29.2	
Volume (vph)	37	1268	931	108	187	162
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	39	1335	980	114	197	171
Lane Group Flow (vph)	39	1335	1094	0	197	171
v/c Ratio	0.57	0.98	0.88		0.69	0.43
Control Delay	74.3	33.8	22.8		48.7	9.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	74.3	33.8	22.8		48.7	9.1
Queue Length 50th (ft)	22	591	482		106	0
Queue Length 95th (ft)	#70	#1029	#836		#201	54
Internal Link Dist (ft)		1276	1320		1206	
Turn Bay Length (ft)	150				50	
Base Capacity (vph)	69	1366	1246		285	396
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.57	0.98	0.88		0.69	0.43

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Existing
32: Pala Rd (SR-76) & North River Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1863	1837		1583	1417
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1863	1837		1583	1417
Volume (vph)	37	1268	931	108	187	162
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	39	1335	980	114	197	171
RTOR Reduction (vph)	0	0	4	0	0	141
Lane Group Flow (vph)	39	1335	1090	0	197	30
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	2.4	66.4	60.0		16.0	16.0
Effective Green, g (s)	2.4	66.4	60.0		16.0	16.0
Actuated g/C Ratio	0.03	0.73	0.66		0.18	0.18
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	42	1368	1219		280	251
v/s Ratio Prot	0.02	c0.72	0.59		c0.12	
v/s Ratio Perm						0.02
v/c Ratio	0.93	0.98	0.89		0.70	0.12
Uniform Delay, d1	43.9	11.2	12.6		35.0	31.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	109.9	18.6	8.7		13.8	1.0
Delay (s)	153.8	29.9	21.2		48.8	32.3
Level of Service	F	C	C		D	C
Approach Delay (s)		33.4	21.2		41.1	
Approach LOS		C	C		D	

Intersection Summary

HCM Average Control Delay	29.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

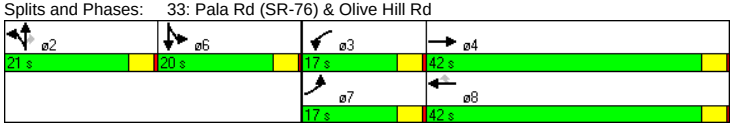
PM Existing
33: Pala Rd (SR-76) & Olive Hill Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	90	1297	215	905	74	81	318	120	60
Turn Type	Prot		Prot		Perm		Perm	Split	
Protected Phases	7	4	3	8		2		6	6
Permitted Phases					8		2		
Detector Phases	7	4	3	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	17.0	42.0	17.0	42.0	42.0	21.0	21.0	20.0	20.0
Total Split (%)	17.0%	42.0%	17.0%	42.0%	42.0%	21.0%	21.0%	20.0%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)	10.7	38.0	13.0	42.5	42.5	17.0	17.0	16.0	16.0
Actuated g/C Ratio	0.10	0.38	0.13	0.42	0.42	0.17	0.17	0.16	0.16
v/c Ratio	0.57	1.05	1.10	0.63	0.12	0.52	0.67	0.50	0.43
Control Delay	56.0	71.0	133.3	26.2	5.3	44.5	13.5	45.9	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	71.0	133.3	26.2	5.3	44.5	13.5	45.9	28.9
LOS	E	E	F	C	A	D	B	D	C
Approach Delay		70.1		44.1		23.5			37.1
Approach LOS		E		D		C			D

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 51.8	Intersection LOS: D
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 33: Pala Rd (SR-76) & Olive Hill Rd



LOS Engineering

PM Existing
33: Pala Rd (SR-76) & Olive Hill Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		200	0		150	150		0
Storage Lanes	1		0	1		1	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995				0.850			0.850		0.921	
Flt Protected	0.950			0.950				0.977		0.950		
Satd. Flow (prot)	1583	3522	0	1583	3539	1417	0	1820	1417	1583	1716	0
Flt Permitted	0.950			0.950				0.977		0.950		
Satd. Flow (perm)	1583	3522	0	1583	3539	1417	0	1820	1417	1583	1716	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4				78			310		48	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		585			663			961			1186	
Travel Time (s)		13.3			15.1			21.8			27.0	
Volume (vph)	90	1297	45	215	905	74	71	81	318	120	60	67
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	1365	47	226	953	78	75	85	335	126	63	71
Lane Group Flow (vph)	95	1412	0	226	953	78	0	160	335	126	134	0
v/c Ratio	0.57	1.05		1.10	0.63	0.12		0.52	0.67	0.50	0.43	
Control Delay	56.0	71.0		133.3	26.2	5.3		44.5	13.5	45.9	28.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	56.0	71.0		133.3	26.2	5.3		44.5	13.5	45.9	28.9	
Queue Length 50th (ft)	58	~521		~164	258	0		94	14	74	49	
Queue Length 95th (ft)	109	#658		#312	340	29		160	103	133	107	
Internal Link Dist (ft)		505			583			881			1106	
Turn Bay Length (ft)	250			250		200			150	150		
Base Capacity (vph)	198	1341		206	1505	647		309	498	253	315	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.48	1.05		1.10	0.63	0.12		0.52	0.67	0.50	0.43	

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

PM Existing
33: Pala Rd (SR-76) & Olive Hill Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3522		1583	3539	1417		1820	1417	1583	1715	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3522		1583	3539	1417		1820	1417	1583	1715	
Volume (vph)	90	1297	45	215	905	74	71	81	318	120	60	67
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	1365	47	226	953	78	75	85	335	126	63	71
RTOR Reduction (vph)	0	2	0	0	0	45	0	0	258	0	40	0
Lane Group Flow (vph)	95	1410	0	226	953	33	0	160	77	126	94	0
Turn Type	Prot			Prot		Perm	Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	9.3	38.8		13.0	42.5	42.5		17.0	17.0	16.0	16.0	
Effective Green, g (s)	9.3	38.8		13.0	42.5	42.5		17.0	17.0	16.0	16.0	
Actuated g/C Ratio	0.09	0.38		0.13	0.42	0.42		0.17	0.17	0.16	0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	146	1356		204	1492	597		307	239	251	272	
v/s Ratio Prot	0.06	c0.40		c0.14	c0.27			c0.09		c0.08	0.05	
v/s Ratio Perm						0.02			0.05			
v/c Ratio	0.65	1.04		1.11	0.64	0.06		0.52	0.32	0.50	0.34	
Uniform Delay, d1	44.2	31.0		43.9	23.1	17.3		38.2	36.8	38.8	37.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.9	35.3		94.9	0.9	0.0		6.2	3.6	7.0	3.4	
Delay (s)	54.1	66.3		138.8	24.0	17.3		44.4	40.4	45.8	41.2	
Level of Service	D	E		F	C	B		D	D	D	D	
Approach Delay (s)		65.6			44.2			41.7			43.4	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM Average Control Delay	52.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

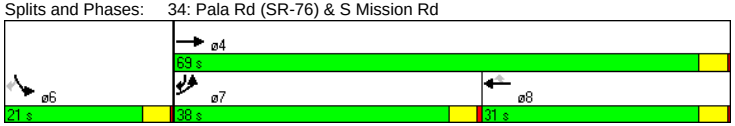
PM Existing
34: Pala Rd (SR-76) & S Mission Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	867	799	774	106	113	432
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	38.0	69.0	31.0	31.0	21.0	38.0
Total Split (%)	42.2%	76.7%	34.4%	34.4%	23.3%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	29.7	56.9	23.2	23.2	17.3	51.1
Actuated g/C Ratio	0.36	0.69	0.28	0.28	0.21	0.62
v/c Ratio	0.83	0.65	0.82	0.23	0.18	0.29
Control Delay	31.6	9.7	35.7	6.4	30.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	9.7	35.7	6.4	30.7	8.4
LOS	C	A	D	A	C	A
Approach Delay		21.1	32.1		13.0	
Approach LOS		C	C		B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 82.4		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.83		
Intersection Signal Delay: 22.8	Intersection LOS: C	
Intersection Capacity Utilization 62.6%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



PM Existing
34: Pala Rd (SR-76) & S Mission Rd — Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				112		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	867	799	774	106	113	432
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	913	841	815	112	119	455
Lane Group Flow (vph)	913	841	815	112	119	455
v/c Ratio	0.83	0.65	0.82	0.23	0.18	0.29
Control Delay	31.6	9.7	35.7	6.4	30.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	9.7	35.7	6.4	30.7	8.4
Queue Length 50th (ft)	232	203	220	0	29	63
Queue Length 95th (ft)	308	304	291	37	53	92
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	1212	1346	1117	524	646	1591
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.62	0.73	0.21	0.18	0.29

Intersection Summary
Area Type: Other

LOS Engineering

PM Existing
34: Pala Rd (SR-76) & S Mission Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Volume (vph)	867	799	774	106	113	432
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	913	841	815	112	119	455
RTOR Reduction (vph)	0	0	0	80	0	0
Lane Group Flow (vph)	913	841	815	32	119	455
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	29.7	56.9	23.2	23.2	17.3	47.0
Effective Green, g (s)	29.7	56.9	23.2	23.2	17.3	47.0
Actuated g/C Ratio	0.36	0.69	0.28	0.28	0.21	0.57
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1110	1290	999	400	647	1547
v/s Ratio Prot	c0.30	0.45	c0.23		0.04	c0.11
v/s Ratio Perm				0.02		0.08
v/c Ratio	0.82	0.65	0.82	0.08	0.18	0.29
Uniform Delay, d1	23.9	7.1	27.5	21.7	26.7	9.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	1.2	5.2	0.1	0.6	0.1
Delay (s)	28.9	8.3	32.7	21.7	27.3	9.2
Level of Service	C	A	C	C	C	A
Approach Delay (s)		19.0	31.4		12.9	
Approach LOS		B	C		B	

Intersection Summary				
HCM Average Control Delay	21.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	82.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing
35: Reche Rd & Live Oak Park Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	37	371	463	43	42	45
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	39	391	487	45	44	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	533				978	510
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	533				978	510
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				83	92
cM capacity (veh/h)	1035				267	563

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	39	391	533	92
Volume Left	39	0	0	44
Volume Right	0	0	45	47
cSH	1035	1700	1700	367
Volume to Capacity	0.04	0.23	0.31	0.25
Queue Length 95th (ft)	3	0	0	24
Control Delay (s)	8.6	0.0	0.0	18.0
Lane LOS	A			C
Approach Delay (s)	0.8		0.0	18.0
Approach LOS				C

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

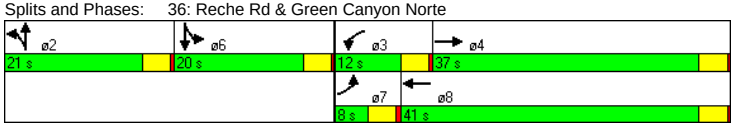
LOS Engineering

PM Existing
36: Reche Rd & Green Canyon Norte — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	1	410	68	429	61	2	0
Turn Type	Prot		Prot		Split		
Protected Phases	7	4	3	8	2	2	6
Permitted Phases							
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	37.0	12.0	41.0	21.0	21.0	20.0
Total Split (%)	8.9%	41.1%	13.3%	45.6%	23.3%	23.3%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	None
Act Effct Green (s)	4.3	18.4	7.2	23.4	18.8	18.8	6.1
Actuated g/C Ratio	0.07	0.34	0.13	0.44	0.35	0.35	0.10
v/c Ratio	0.01	0.75	0.36	0.56	0.12	0.08	0.06
Control Delay	34.0	24.2	32.9	14.1	20.1	8.8	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	24.2	32.9	14.1	20.1	8.8	24.5
LOS	C	C	C	B	C	A	C
Approach Delay		24.2		16.6		15.2	24.5
Approach LOS		C		B		B	C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 53.6			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 46.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 36: Reche Rd & Green Canyon Norte



LOS Engineering

PM Existing
36: Reche Rd & Green Canyon Norte — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	150		0	150		0	150		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.998			0.856			0.919	
Flt Protected	0.950			0.950			0.950				0.980	
Satd. Flow (prot)	1583	1837	0	1583	1859	0	1583	1595	0	0	1678	0
Flt Permitted	0.950			0.950			0.950				0.980	
Satd. Flow (perm)	1583	1837	0	1583	1859	0	1583	1595	0	0	1678	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			1			47			6	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			4892			1501			1367	
Travel Time (s)		22.1			111.2			34.1			31.1	
Volume (vph)	1	410	43	68	429	6	61	2	45	4	0	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	432	45	72	452	6	64	2	47	4	0	6
Lane Group Flow (vph)	1	477	0	72	458	0	64	49	0	0	10	0
v/c Ratio	0.01	0.75		0.36	0.56		0.12	0.08			0.06	
Control Delay	34.0	24.2		32.9	14.1		20.1	8.8			24.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	34.0	24.2		32.9	14.1		20.1	8.8			24.5	
Queue Length 50th (ft)	0	136		22	80		15	1			1	
Queue Length 95th (ft)	5	286		76	247		60	28			17	
Internal Link Dist (ft)		893			4812			1421			1287	
Turn Bay Length (ft)	150			150			150					
Base Capacity (vph)	112	918		226	1058		556	591			396	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.01	0.52		0.32	0.43		0.12	0.08			0.03	

Intersection Summary
Area Type: Other

LOS Engineering

PM Existing
36: Reche Rd & Green Canyon Norte — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86			0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1583	1836		1583	1859		1583	1595			1678	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (perm)	1583	1836		1583	1859		1583	1595			1678	
Volume (vph)	1	410	43	68	429	6	61	2	45	4	0	6
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	432	45	72	452	6	64	2	47	4	0	6
RTOR Reduction (vph)	0	5	0	0	1	0	0	32	0	0	6	0
Lane Group Flow (vph)	1	472	0	72	457	0	64	17	0	0	4	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	0.5	19.9		4.0	23.4		18.8	18.8			0.9	
Effective Green, g (s)	0.5	19.9		4.0	23.4		18.8	18.8			0.9	
Actuated g/C Ratio	0.01	0.33		0.07	0.39		0.32	0.32			0.02	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	13	613		106	730		499	503			25	
v/s Ratio Prot	0.00	c0.26		c0.05	c0.25		c0.04	0.01			c0.00	
v/s Ratio Perm												
v/c Ratio	0.08	0.77		0.68	0.63		0.13	0.03			0.16	
Uniform Delay, d1	29.3	17.8		27.2	14.6		14.6	14.1			29.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	2.5	5.9		15.9	1.7		0.5	0.1			3.1	
Delay (s)	31.8	23.8		43.1	16.3		15.1	14.2			32.1	
Level of Service	C	C		D	B		B	B			C	
Approach Delay (s)		23.8			19.9			14.7			32.1	
Approach LOS		C			B			B			C	

Intersection Summary				
HCM Average Control Delay	21.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	59.6	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing
37: Pala Rd (SR-76) & Pala Mission Rd

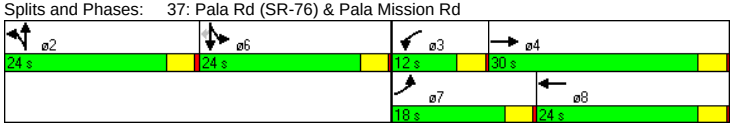
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Volume (vph)	165	179	15	213	11	19	19	136
Turn Type	Prot		Prot		Split			Perm
Protected Phases	7	4	3	8	2	2	6	
Permitted Phases								6
Detector Phases	7	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	18.0	30.0	12.0	24.0	24.0	24.0	24.0	24.0
Total Split (%)	20.0%	33.3%	13.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	None	None
Act Effct Green (s)	11.5	23.9	6.5	13.2	28.3	28.3	7.5	7.5
Actuated g/C Ratio	0.17	0.35	0.09	0.19	0.42	0.42	0.11	0.11
v/c Ratio	0.66	0.17	0.12	0.66	0.02	0.04	0.19	0.51
Control Delay	41.1	14.2	36.9	34.7	21.9	17.3	32.6	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	14.2	36.9	34.7	21.9	17.3	32.6	13.2
LOS	D	B	D	C	C	B	C	B
Approach Delay		26.5		34.9		18.7	17.3	
Approach LOS		C		C		B	B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66.9
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 26.6 Intersection LOS: C
Intersection Capacity Utilization 40.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 37: Pala Rd (SR-76) & Pala Mission Rd



LOS Engineering

PM Existing
37: Pala Rd (SR-76) & Pala Mission Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		0	200		0	0		50
Storage Lanes	1		0	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.994			0.953				0.850
Flt Protected	0.950			0.950			0.950				0.977	
Satd. Flow (prot)	1583	3493	0	1583	1852	0	1583	1775	0	0	1820	1417
Flt Permitted	0.950			0.950			0.950				0.977	
Satd. Flow (perm)	1583	3493	0	1583	1852	0	1583	1775	0	0	1820	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			2			9				143
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		941			1076			1007			1565	
Travel Time (s)		21.4			24.5			22.9			35.6	
Volume (vph)	165	179	17	15	213	9	11	19	9	17	19	136
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	174	188	18	16	224	9	12	20	9	18	20	143
Lane Group Flow (vph)	174	206	0	16	233	0	12	29	0	0	38	143
v/c Ratio	0.66	0.17		0.12	0.66		0.02	0.04			0.19	0.51
Control Delay	41.1	14.2		36.9	34.7		21.9	17.3			32.6	13.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	41.1	14.2		36.9	34.7		21.9	17.3			32.6	13.2
Queue Length 50th (ft)	69	24		7	92		4	6			15	0
Queue Length 95th (ft)	#163	63		26	172		18	28			45	49
Internal Link Dist (ft)		861			996			927			1485	
Turn Bay Length (ft)	250			250			200					50
Base Capacity (vph)	314	1393		170	495		669	755			453	460
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.55	0.15		0.09	0.47		0.02	0.04			0.08	0.31

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing

37: Pala Rd (SR-76) & Pala Mission Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1583	3493		1583	1852		1583	1776			1820	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (perm)	1583	3493		1583	1852		1583	1776			1820	1417
Volume (vph)	165	179	17	15	213	9	11	19	9	17	19	136
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	174	188	18	16	224	9	12	20	9	18	20	143
RTOR Reduction (vph)	0	8	0	0	2	0	0	6	0	0	0	131
Lane Group Flow (vph)	174	198	0	16	231	0	12	23	0	0	38	12
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												6
Actuated Green, G (s)	9.6	21.8		1.3	13.5		27.0	27.0			5.9	5.9
Effective Green, g (s)	9.6	21.8		1.3	13.5		27.0	27.0			5.9	5.9
Actuated g/C Ratio	0.13	0.30		0.02	0.19		0.38	0.38			0.08	0.08
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	211	1058		29	347		594	666			149	116
v/s Ratio Prot	c0.11	0.06		0.01	c0.12		0.01	c0.01			c0.02	
v/s Ratio Perm												0.01
v/c Ratio	0.82	0.19		0.55	0.67		0.02	0.04			0.26	0.10
Uniform Delay, d1	30.4	18.6		35.1	27.2		14.2	14.3			31.0	30.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	22.3	0.1		20.8	4.8		0.1	0.1			0.9	0.4
Delay (s)	52.7	18.6		55.8	31.9		14.2	14.3			31.9	31.0
Level of Service	D	B		E	C		B	B			C	C
Approach Delay (s)		34.2			33.5			14.3			31.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM Average Control Delay	32.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

Appendix F

SANDAG's State Route V/C Ratio Formulas

RE: County 2030 Cumulative run - Fallbook map question
From:**Calandra, Mike** (mca@sandag.org)
Sent: Tue 12/30/08 3:08 PM
To: 'Justin Rasas' (justin@losengineering.com)
Cc: 'Nick Ortiz' (francisco.ortiz@sdcounty.ca.gov); 'Bob Citrano' (robert.citrano@sdcounty.ca.gov); Yu, Limeng (lyu@sandag.org)

Justin, below is the V/C lookup table we use to define LOS in the transportation model:

LOS A	0.00 - 0.30
LOS B	0.31 - 0.50
LOS C	0.51 - 0.70
LOS D	0.71 - 0.85
LOS E	0.86 - 0.99
LOS F	1.00+

****
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* San Diego Association of Governments
* 401 B St Suite 800
* San Diego, CA 92101
* (619) 699-6929 - phone, (619) 699-1905 - fax
* mca@sandag.org
* www.sandag.org
****

RE: County 2030 Cumulative run - Fallbook map question

From:**Calandra, Mike** (mca@sandag.org)
Sent: Mon 12/29/08 3:42 PM
To: 'Justin Rasas' (justin@losengineering.com); Yu, Limeng (lyu@sandag.org); Bob Citrano (robert.citrano@sdcounty.ca.gov)
Cc: Nick Ortiz (francisco.ortiz@sdcounty.ca.gov)

Justin, let me try and clear some of this up for you:

1. The fields AMVOL and PMVOL are bi-directional 3 hour peak period volumes. If you apply the peak hour factors, the result is a bi-directional volume for one peak hour. This volume should probably be split into two, one for each direction. For each link, you should go through these 4 calculations and use the highest V/C value to define the LOS for State Routes ~
    a. IFTVLA / IFTCPA = V/C ratio for the AM in the FROM-TO direction
    b. ITFVLA / ITFCPA = V/C ratio for the AM in the TO-FROM direction
    c. IFTVLP / IFTCPP = V/C ratio for the PM in the FROM-TO direction
    d. IFTVLP / ITFCPP = V/C ratio for the PM in the TO-FROM direction

****
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Appendix G

SANDAG's *2006 Congestion Management Program* Update - Excerpts

2006
CONGESTION MANAGEMENT PROGRAM UPDATE

JULY 2006

This report was financed with federal funds from the U.S. Department of Transportation, Federal Highway Administration, and state funds from the California Department of Transportation



401 B Street, Suite 800 • San Diego, CA 92101-4231• (619) 699-1900

Exhibit D-1
Level of Service (LOS) Definitions
(Generally used by Caltrans)

The concept of Level of Service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers. A Level of Service[1] definition generally describes these conditions in terms of such factors as speed, travel time, freedom to maneuver, comfort and convenience, and safety. Levels of Service definitions can generally be categorized as follows:

LOS	D/C[2]	Congestion/Delay	Traffic Description
(Used for freeways, expressways and conventional highways[3])			
"A"	<0.41	None	Free flow.
"B"	0.42-0.62	None	Free to stable flow, light to moderate volumes.
"C"	0.63-0.79	None to minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted.
"D"	0.80-0.92	Minimal to substantial	Approaches unstable flow, heavy volumes, very limited freedom to maneuver.
"E"	0.93-1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor.
(Used for conventional highways)			
"F"	>1.00	Considerable	Forced or breakdown. Delay measured in average flow, travel speed (MPH). Signalized segments experience delays >60.0 seconds/vehicle.
(Used for freeways and expressways)			
"F0"	1.01-1.25	Considerable 0-1 hour delay	Forced flow, heavy congestion, long queues form behind breakdown points, stop and go.
"F1"	1.26-1.35	Severe 1-2 hour delay	Very heavy congestion, very long queues.
"F2"	1.36-1.45	Very severe 2-3 hour delay	Extremely heavy congestion, longer queues, more numerous breakdown points, longer stop periods.
"F3"	>1.46	Extremely severe 3+ hours of delay	Gridlock.

[1] Level of Service can generally be calculated using "Table 3.1. LOS Criteria for Basic Freeway Sections" from the latest Highway Capacity Manual. However, contact Caltrans for more specific information on determining existing "free-flow" freeway speeds.

[2] Demand/Capacity ratio used for forecasts (V/C ratio used for operational analysis, where V = volume)

[3] Arterial LOS is based upon average "free-flow" travel speeds, and should refer to definitions in Table 11.1 in the HCM.



GUIDE FOR THE PREPARATION

OF

TRAFFIC IMPACT STUDIES

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

December 2002

Transition between LOS "C" and LOS "D" Criteria

(Reference Highway Capacity Manual)

BASIC FREEWAY SEGMENTS @ 65 mi/hr

LOS	Maximum Density (pc/mi/ln)	Minimum Speed (mph)	Maximum v/c	Maximum Service Flow Rate (pc/hr/ln)
A	11	65.0	0.30	710
B	18	65.0	0.50	1170
C	26	64.6	0.71	1680
D	35	59.7	0.89	2090
E	45	52.2	1.00	2350

SIGNALIZED INTERSECTIONS and RAMP TERMINALS

LOS	Control Delay per Vehicle (sec/veh)
A	**≤ 10**
B	**> 10 - 20**
C	**> 20 - 35**
D	**> 35 - 55**
E	**> 55 - 80**
F	**> 80**

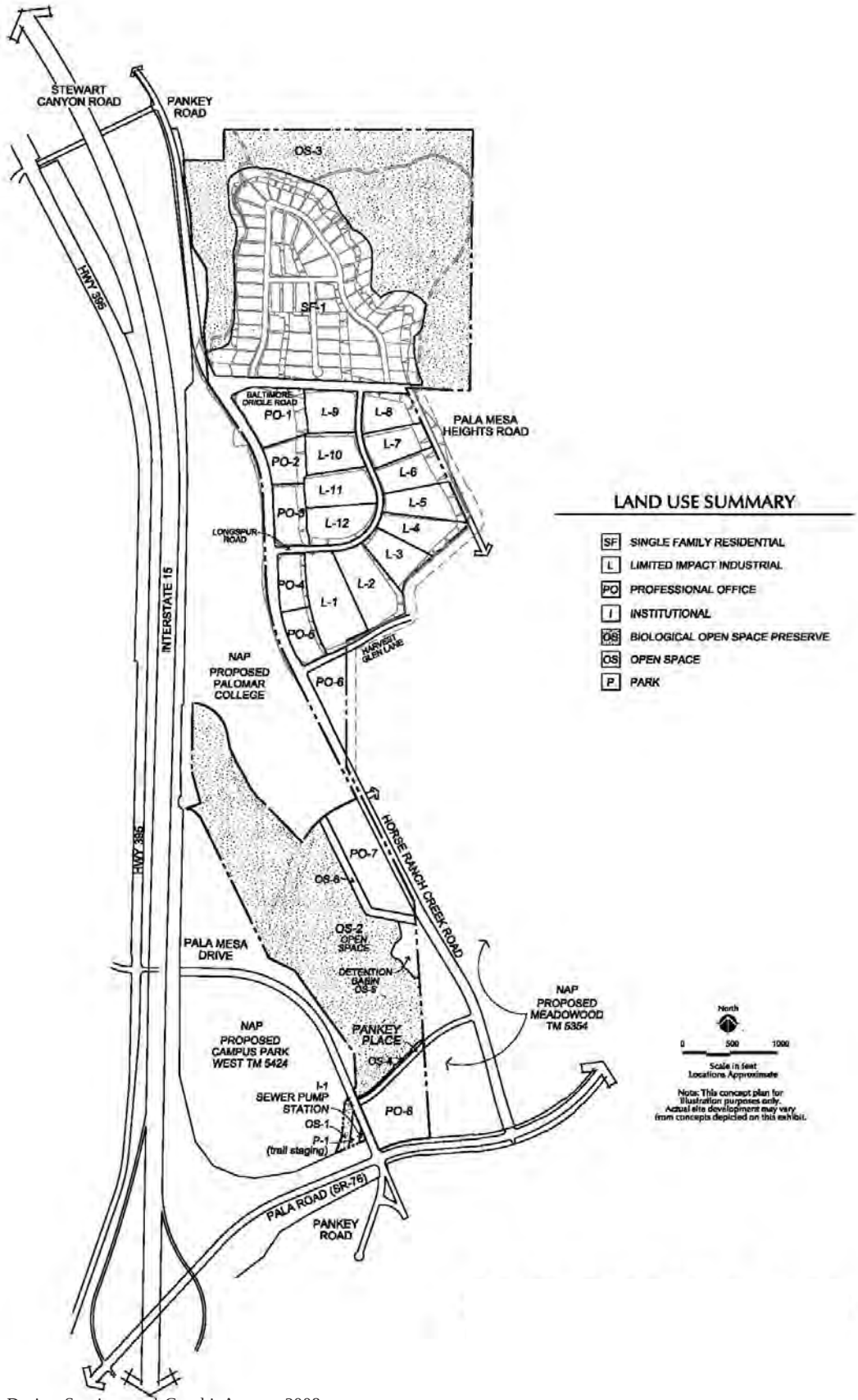
MULTI-LANE HIGHWAYS @ 55 mi/hr

LOS	Maximum Density (pc/mi/ln)	Minimum Speed (mph)	Maximum v/c	Maximum Service Flow Rate (pc/hr/ln)
A	11	55.0	0.29	600
B	18	55.0	0.47	990
C	26	54.9	0.68	1430
D	35	52.9	0.88	1850
E	41	51.2	1.00	2100

Dotted line represents the transition between LOS "C" and LOS "D"

Appendix H

Site Plans for the Alternatives



Source: Development Design Services and GraphicAccess, 2008

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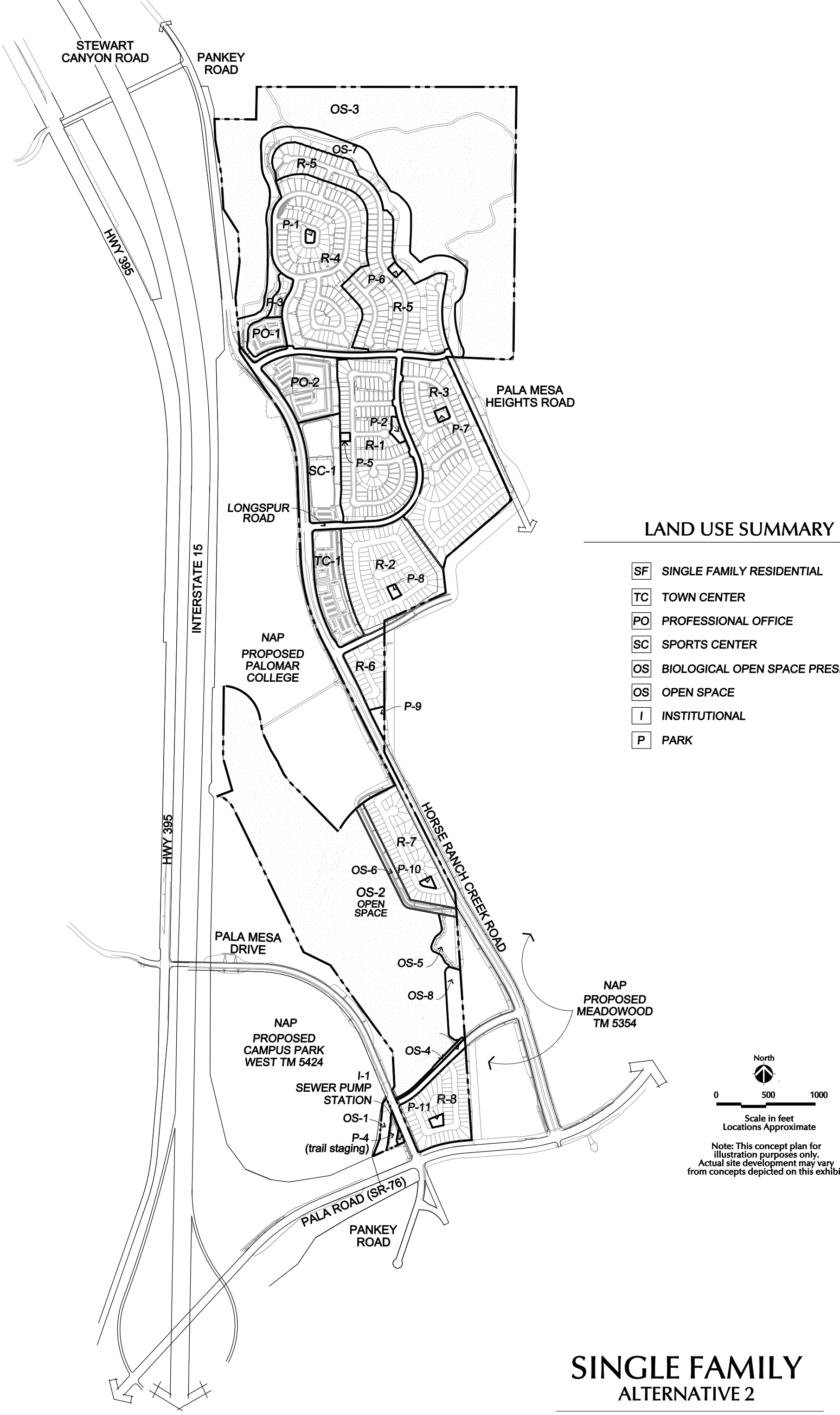
No Project/Existing Plan Alternative

CAMPUS PARK PROJECT

HELIX

Figure 5-1



Note: This concept plan for illustration purposes only. Actual site development may vary from concepts depicted on this exhibit.

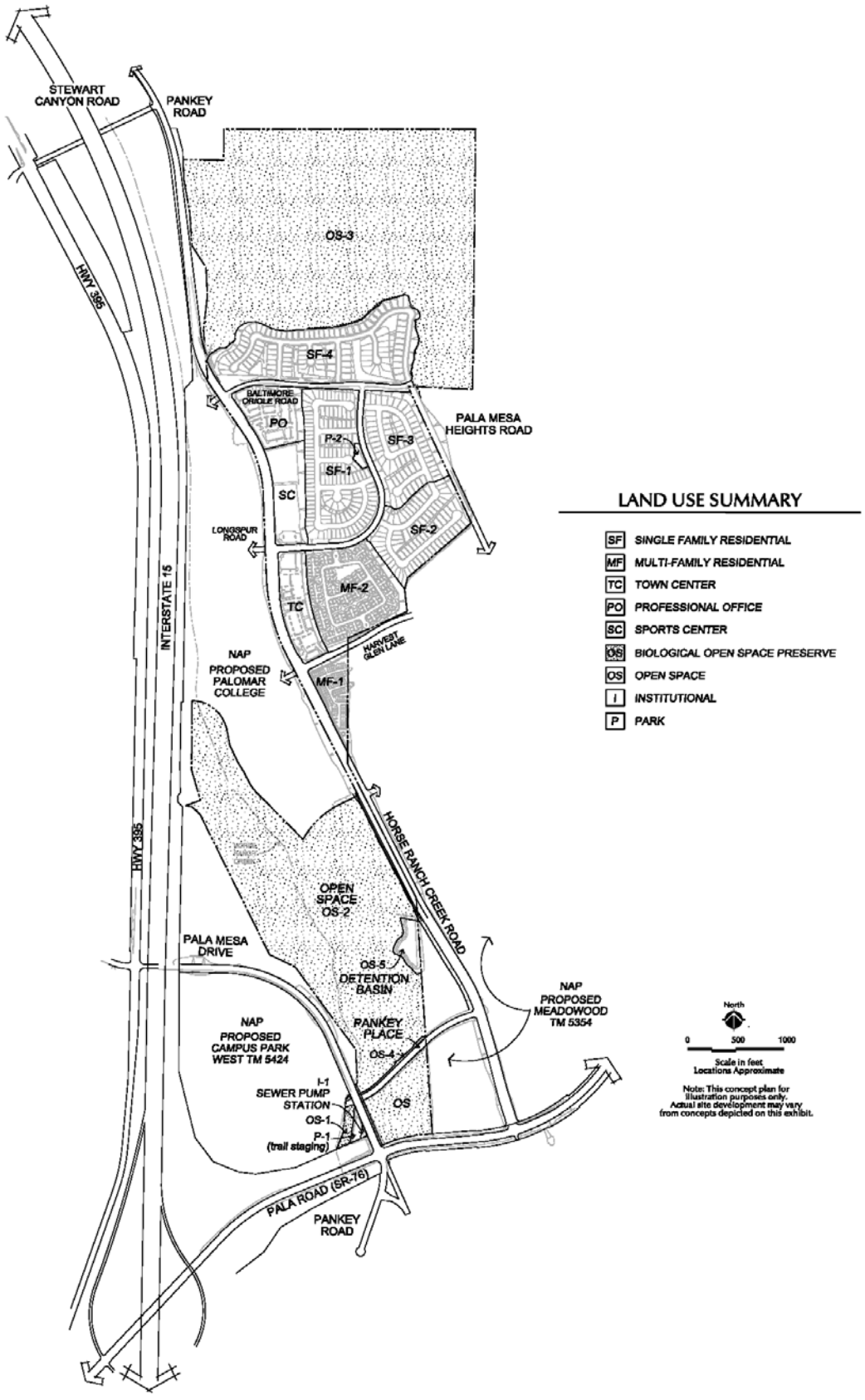
LAND USE SUMMARY

SF	SINGLE FAMILY RESIDENTIAL
TC	TOWN CENTER
PO	PROFESSIONAL OFFICE
SC	SPORTS CENTER
OS	BIOLOGICAL OPEN SPACE PRESERVE
OS	OPEN SPACE
I	INSTITUTIONAL
P	PARK

SINGLE FAMILY
ALTERNATIVE 2

CAMPUS PARK
FALLBROOK, CALIFORNIA

4/15/2009



Source: Development Design Services and GraphicAccess, 2008

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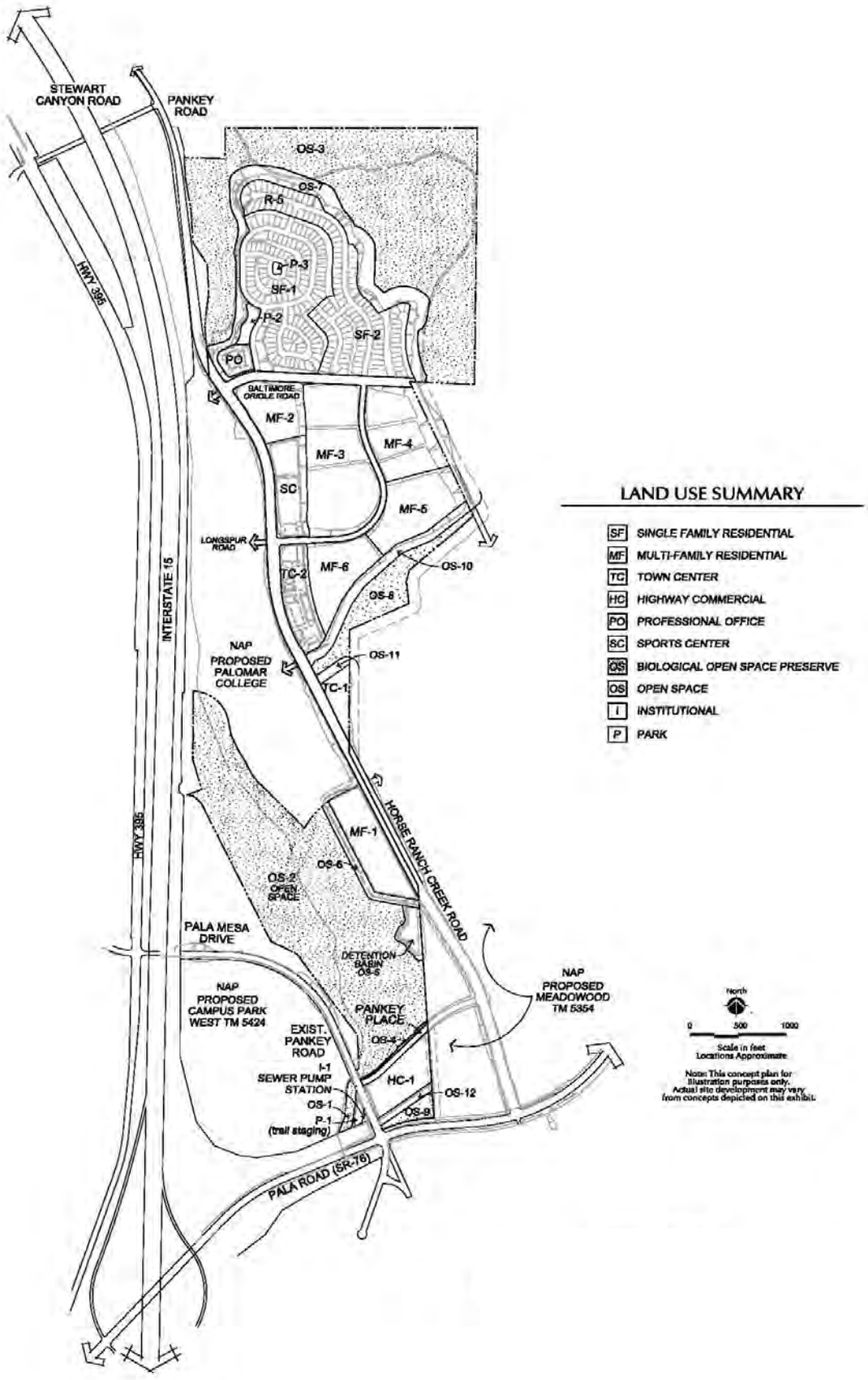
Biological Reduced Footprint Alternative

CAMPUS PARK PROJECT

HELIX

Figure 5-3



Source: Development Design Services and GraphicAccess, 2008

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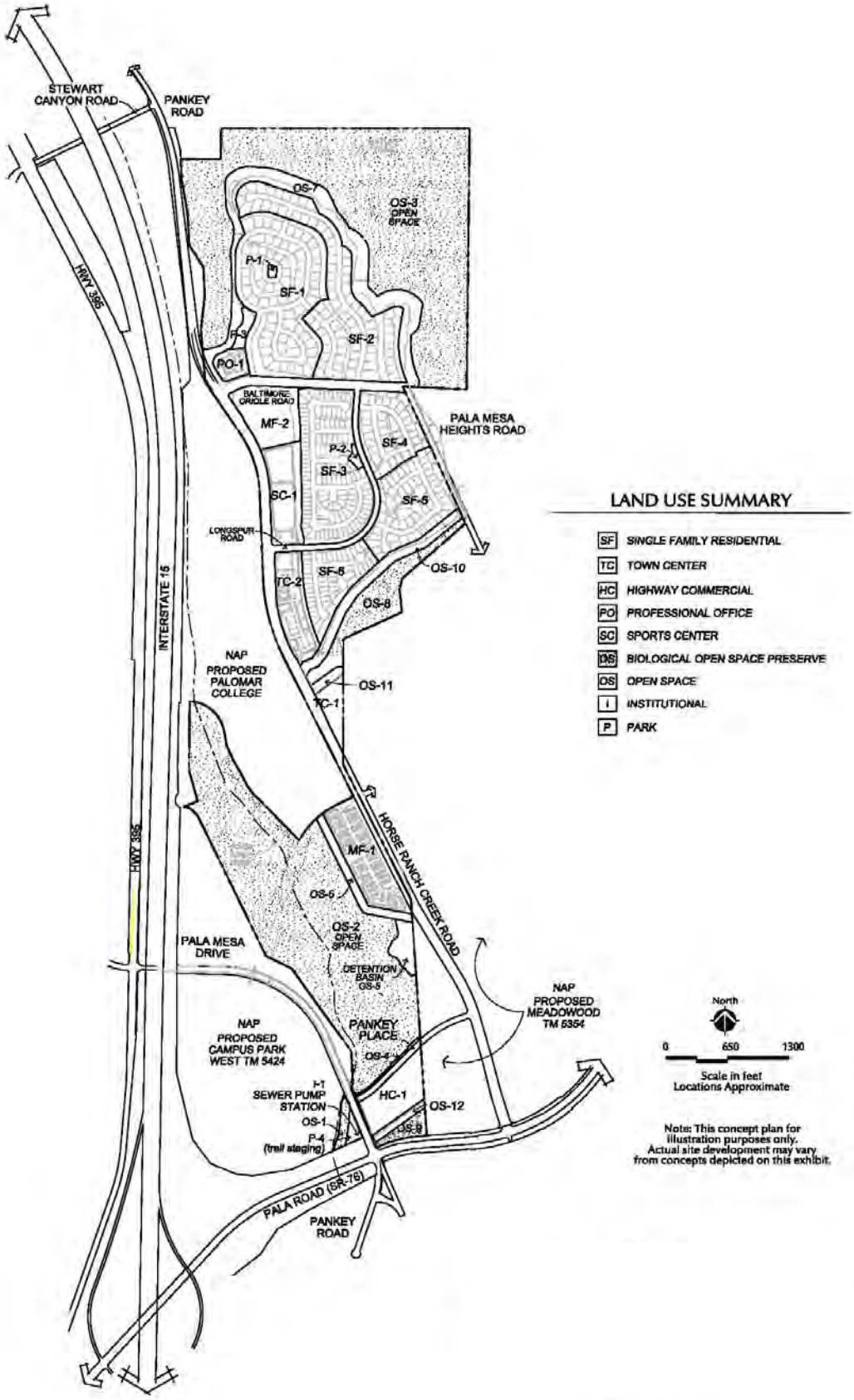
General Plan Update Draft Land Use Map Alternative

CAMPUS PARK PROJECT

HELIX

Figure 5-4



Source: Development Design Services and GraphicAccess, 2008

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General Plan Update Board Referrel Map Alternative

CAMPUS PARK PROJECT

HELIX

Figure 5-5

Appendix I

Internal Capture Rate Support Data & Trail Graphics

LOS Engineering, Inc.
Traffic and Transportation

5114 Sea Mist Ct, San Diego, CA 92121
Phone 619-890-1253, Fax 619-374-7247

December 11, 2007

Mr. Nick Ortiz
County of San Diego DPW
5469 Kearny Villa Road, Suite 305
San Diego, CA 92123-1159

SUBJECT: Series 11 Internal Capture Rate Findings for Campus Park (TM 5338) and Meadowood (TM 5354)

Dear Mr. Ortiz:

The purpose of this letter is to request approval of a 33% internal capture rate from a SANDAG Series 11 year 2030 traffic model for use in the traffic impact study for Campus Park and Meadowood.

The cordon defining the 33% internal capture rate and the Traffic Analysis Zone (TAZs) making up the internal capture rate area are shown in **Attachment A**. The internal capture rate difference from 100% will define the 67% that will leave the internal study roadways. The internal study roadways will have 100% project assignment.

A search of on-line and printed material was conducted to determine if the aforementioned internal capture rate is reasonable. The Institute of Transportation Engineers (ITE) has aggregated multiple papers documenting internal capture rates for isolated communities. An average internal capture rate of 37% was calculated from three papers that covered 10 communities. A summary is shown in **Table 1** with the ITE compilation of papers included in **Attachment B**.

Table 1: Other Documented Internal Capture Rates

Report and Details	Internal Capture Rate
FDOT Districtwide Trip Generation Study, March 1995	
Crocker Center	41%
Mizner Park	40%
Galleria Area	38%
Contry Isles	33%
Village Commons	28%
Boca Del Mar	33%
FDOT Characteristics Study, Dec 1993	
Average of three sites (range 28%-33%)	31%
JHK Brandermill PUD Traffic Generation Study, June 1984	
Brandermill Virginia	51%
Average Internal Capture Rate from ITE Sources	**37%**

The internal capture rate area includes four projects that create a small community with complementing land uses. The latest proposed land uses were obtained for the four projects as shown in **Table 1**.

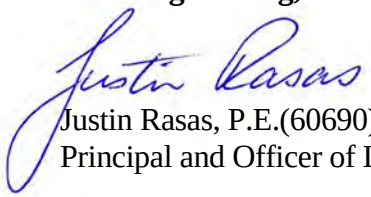
Table 1: Community Land Uses Making Up the Internal Capture Rate Area

Series 11 TAZ	Project & Land Use	Size	Units	Trip Rate	ADT
4606	Campus Park				
	Single Family	529	DU	10 ADT/DU	5,290
	Multi Family	187	DU	8 ADT/DU	1,496
4607	Campus Park				
	Mixed Commercial	72,000	SF	120 ADT/KSF	8,640
	Professional Office	157,000	SF	20 ADT/KSF	3,140
4609	Campus Park				
	Neighborhood Park	10.6	Acres	5 ADT/Ac	53
	Meadowood				
	Elementary School	12.7	Acres	90 ADT/Ac	1,143
	Neighborhood Park	10	Acres	5 ADT/Ac	50
4610	Meadowood				
	Single Family	355	DU	10 ADT/DU	3,550
	Multi Family	503	DU	8 ADT/DU	4,024
	Campus Park				
	Multi Family	280	DU	8 ADT/DU	2,240
	Campus Park West				
	Multi Family	395	DU	8 ADT/DU	3,160
4608	Palomar (Fallbrook College)				
	Community College (1)	120	Acres	Unknown	3,500
110	Campus Park West (2)				
	Mixed Commercial	230,000	SF	120 ADT/KSF	27,600
	Professional Office	300,000	SF	20 ADT/KSF	6,000
	Campus Park				
	Highway Commercial	140,000	SF	120 ADT/KSF	16,800
				Total ADTs	**86,686**

Notes: (1) College ADT from RBF - traffic consultant that prepared the traffic study for Fallbrook College.
(2) Additional Campus Park West land uses are also proposed south of SR-76. The aforementioned Campus Park West land uses are only proposed north of SR-76.

Your timely review and approval of the aforementioned internal capture rate would be greatly appreciated. Please call me at (619) 890-1253 if you have any questions.

Sincerely,
LOS Engineering, Inc.



Justin Rasas, P.E.(60690), PTOE
Principal and Officer of LOS Engineering, Inc.

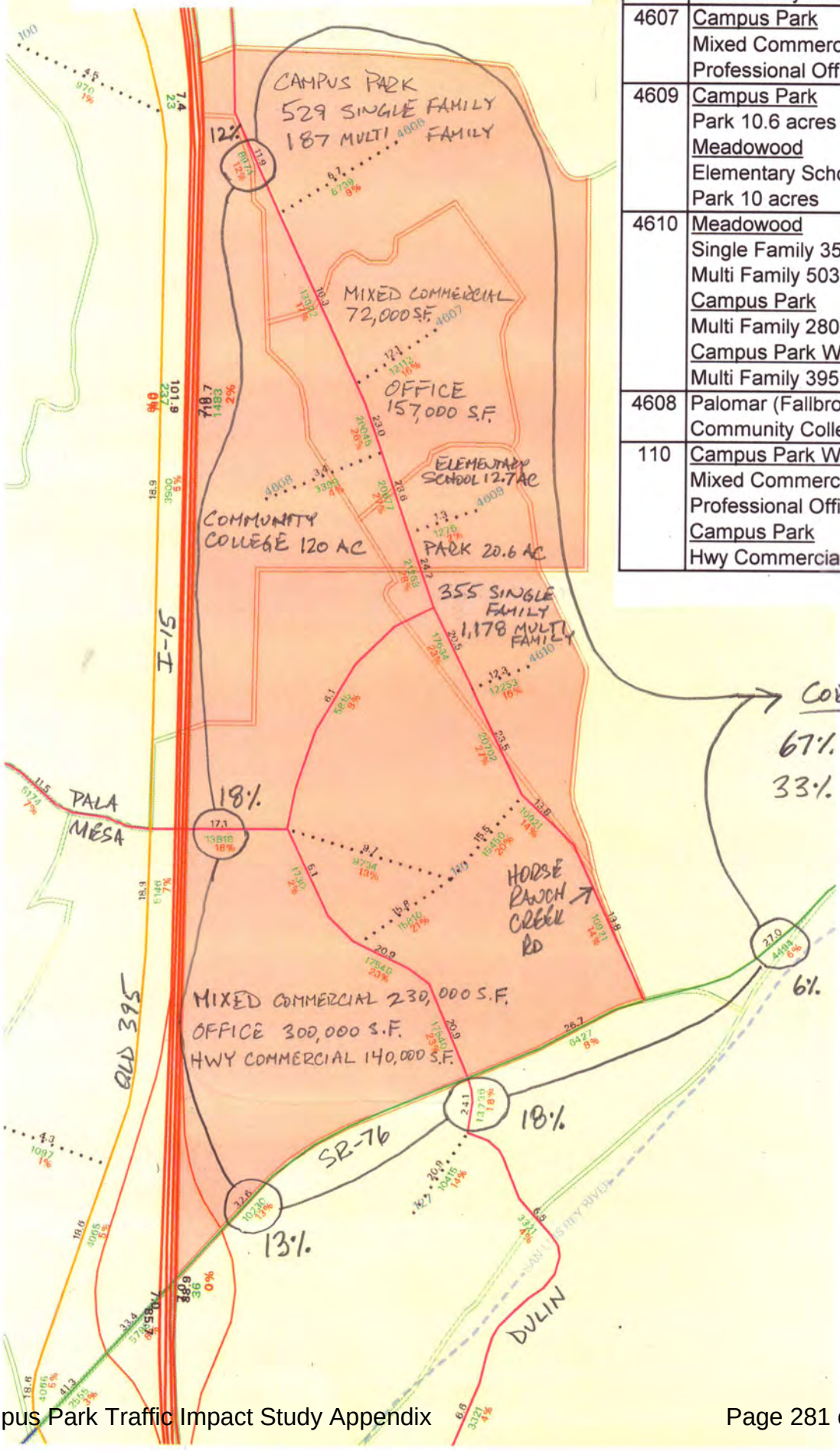
cc: Mr. Maurice Eaton (Caltrans)

ATTACHMENT A

SANDAG SERIES 11 YEAR 2030 TRAFFIC MODEL

SANDAG Series 11 (Year 2030)
Run date = 12/7/07

TOTAL PRODUCTIONS & ATTRACTIONS		
TAZ	**Project & Land Use**	**ADT**
4606	Campus Park	
	Single Family 529 Units	5,290
	Multi Family 187 Units	1,496
4607	Campus Park	
	Mixed Commercial 72 KSF	8,640
	Professional Office 157 KSF	3,140
4609	Campus Park	
	Park 10.6 acres	53
	Meadowood	
	Elementary School	1,143
	Park 10 acres	50
4610	Meadowood	
	Single Family 355 Units	3,550
	Multi Family 503 Units	4,024
	Campus Park	
	Multi Family 280 Units	2,240
	Campus Park West	
	Multi Family 395 Units	3,160
4608	Palomar (Fallbrook College)	
	Community College 120 ac	3,500
110	Campus Park West	
	Mixed Commercial 230 KSF	27,600
	Professional Office 300 KSF	6,000
	Campus Park	
	Hwy Commercial 140 KSF	16,800
	Total ADTs	**86,686**



ATTACHMENT B

ITE SUMMARY OF LITERATURE ON MULTI-USE DEVELOPMENTS

APPENDIX C

Summary of Literature on Multi-Use Developments

This appendix includes material that is strictly for informational purposes. It provides no recommended practices, procedures, or guidelines.

C.1 Background

Presented below are summaries of key quantitative and qualitative findings from known data bases on trip characteristics at multi-use sites. For each study, data are presented (as available) on the mix and sizes of land uses within the site, the level of internalization of trips within the site, overall trip generation characteristics for the site, and the level of pass-by trips for the site. In most cases, the analyses use ITE defined independent variables. In several cases, new variables are introduced.

1. Districtwide Trip Generation Study, Florida Department of Transportation, District IV, March 1995

The Florida Department of Transportation (FDOT) sponsored this study for two reasons: first, to develop a data base that could help identify internal capture rates for multi-use development sites; and second, to develop a data base from which pass-by capture rates could be established.

A summary of the characteristics of the six surveyed multi-use sites is presented in table C.1. The sites range in area from 26 to 253 acres (with four of the sites being 72 acres or less). The office/commercial square footage ranges between 250,000 and 1.3 million square feet (with three of the sites having less than 300,000 square feet).

Internal Trips

The proportion of daily trips generated within the surveyed multi-use sites that were internal to the sites are listed in table C.2. The internal capture rates ranged between 28 and 41 percent, with an average of 36 percent across the six sites.

Table C.1 Characteristics of Multi-Use Sites Surveyed by FDOT

MULTI-USE SITE	SITE SIZE (ACRES)	OFFICE (SQ. FOOTAGE)	COMMERCIAL (SQ. FOOTAGE)	HOTEL (ROOMS)	RESIDENTIAL (UNITS)
Crocker Center	26	209,000	87,000	256	0
Mizner Park	30	88,000	163,000	0	136
Galleria Area	165	137,000	1,150,000	229	722
Country Isles	61	59,000	193,000	0	368
Village Commons	72	293,000	231,000	0	317
Boca Del Mar	253	303,000	198,000	0	1,144

Table C.2 Daily Internal Capture Rates at FDOT Sites

Multi-Use Development Site	Internal Capture Rate (percentage)
Crocker Center	41
Mizner Park	40
Galleria Area	38
Country Isles	33
Village Commons	28
Boca Del Mar	33
Overall Average	**36**

Three of the multi-use sites were further evaluated to determine the internal capture rates for different types of trip makers. As listed in table C.3, the internal capture rates for trips made by site workers are typically higher than rates found for visitors to the site (i.e., users of the multi-use site services). The rates by trip maker are remarkably consistent across all three sites. On average, 37 percent of user trips are internal and 47 percent of worker trips are internal to the multi-use site.

Table C.3 Internal Trip Capture Rates (Percentages) by Type of Trip Maker at FDOT Sites

Trip-Maker	Crocker Center	Mizner Park	Galleria Area	Average
Users	37	38	36	37
Workers	46	49	46	47
Total	**41**	**40**	**38**	**40**

Finally, three of the multi-use sites were further evaluated to determine the internal capture rates of individual land uses. Table C.4 lists the reported internal capture rates by land use/trip purpose. In general, the higher internal capture rates were reported for trips to and from banks and sit-down restaurants.

Table C.4 Internal Trip Capture Rates (Percentages) by Land Use Type at FDOT Sites

LAND USE/TRIP PURPOSE	CROCKER CENTER	MIZNER PARK	GALLERIA AREA
Office (General)	11	11	7
Office (Medical)	-	15	12
Retail	36	30	42
Restaurant (Sit-Down)	54	52	-
Restaurant (Fast)	26	-	56
Hotel	30	-	29
Bank	-	48	62
Cinema	-	23	-
Multi-Family Housing	-	11	50
Retail Mall	-	-	39

Vehicle Trip Generation

The actual vehicle trip generation rates measured at the six study sites are compared to the estimated trip generation rates based on ITE *Trip Generation*, Fifth Edition, data in table C.5. A value of less than 1.0 indicates that the number of actual overall vehicle trips generated is less than that predicted using ITE rates.

As shown in the first column of the table, the actual number of vehicle-trips generated by a multi-use site on a daily basis is substantially less than a number predicted using ITE *Trip Generation* rates for each individual component of the site (i.e., disaggregated). In contrast, the actual trip generation on a daily basis roughly equals an estimate based on the "full-size" trip generation rates for the total square footage (or comparable independent variable) for all land uses by type within the site (i.e., aggregated). Even though a high percentage of internal trips was observed at all six sites (as documented earlier), there appears to be little effect on daily vehicle trip generation rates for the overall multi-use site.

In terms of a trip generation rate for the morning peak hour, an average of the measured rates equals the aggregated ITE *Trip Generation* rate (although the six sites demonstrated a much wider range of variability than was the case for daily trip generation). The evening peak hour trip generation rates are on average 20 percent less than the aggregate site estimate based on ITE rates. This reduction is consistent across the six study sites.

Table C.5 Comparison Between Actual FDOT Vehicle Trip Generation and an Estimate from ITE *Trip Generation*

	Ratio of Actual Vehicle Trip Generation to ITE Estimate			
MULTI-USE SITE	TOTAL DAILY (DISAGGREGATED)	TOTAL DAILY (AGGREGATE)	A.M. PEAK HOUR (AGGREGATE)	P.M. PEAK HOUR (AGGREGATE)
Crocker Center	0.82	0.99	1.27	0.82
Mizner Park	1.13	1.07	0.73	0.77
Galleria Area	0.71	0.99	1.09	0.84
Country Isles	0.72	1.04	1.10	0.85
Village Commons	0.69	1.06	0.92	0.80
Boca Del Mar	0.70	0.98	1.06	0.73
Overall Average	**0.77**	**1.02**	**1.00**	**0.80**

Pass-By Trips

The pass-by trip proportions, as determined through intercept surveys, are listed in table C.6 for the six study sites. It is perhaps most telling that four of the six sites are reported to have pass-by rates between 26 and 29 percent.

Table C.6 Daily Pass-By Rates at FDOT Sites

MULTI-USE DEVELOPMENT SITE	DAILY PASS-BY RATE (PERCENTAGE)
Crocker Center	26
Mizner Park	29
Galleria Area	40
Country Isles	28
Village Commons	14
Boca Del Mar	29
Overall Average	**28**

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2. FDOT Trip Characteristics Study of Multi-Use Developments, FDOT District IV, December 1993

This study was the predecessor of the March 1995 FDOT trip generation study. Much of the data that were collected and many of the relationships derived in this first study are included in the 1995 study results described above. However, the 1995 study did not report on two relationships presented in the 1993 report (summarized below).

Internal Trips

Relationships were developed for estimating internal trips as a function of the combination of two land use types in terms of residential units and office/retail square footage. Strong relationships were developed for two internal trip type categories: between residential and retail uses and between retail and retail uses. The office-retail relationship was less definitive.

The study presented a working hypothesis that the number of internal trips from one land use type (A) to another land use (B) within a multi-use site is directly proportional to the size of land use A and also proportional to the size of land use B. This suggests a functional relationship of the form:

Person Trips between A and B = Constant x Land Use A x Land Use B where:

Land Use A = total site land use of type A in residential units or per 1,000 square feet,

Land Use B = total site land use of type B in residential units or per 1,000 square feet, and

Constant = a value that is solely a function of the two land use types.

In the equation shown above, the constant can be derived from information collected on person trips between different land use types and on the sizes of these different land uses. The derived constants are listed in table C.7.

Table C.7 Internal Trip Coefficients for Paired Land Use Types

PAIRED LAND USES	MIDDAY PEAK PERIOD (12 NOON - 2 P.M.)	EVENING PEAK PERIOD (4 P.M. - 6 P.M.)	DAILY
Residential/Retail	0.00082	0.00103	0.00557
Office/Retail	0.00087	0.00024	0.00232
Retail/Retail	0.01219	0.00995	0.07407

For example, application of these coefficients for a particular multi-use site with 1,144 residential dwelling units, 198,000 square feet of retail, and 303,000 square feet of office space would yield the following results:

◆ number of daily internal trip ends between residential and retail uses is 1,262 [0.00557 x 1,144 (residential units) x 198 (1,000 retail square footage) = 1,262]

◆ number of daily internal trip ends between office and retail uses is 139 [0.00232 x 303 (1,000 office square footage) x 198 (1,000 retail square footage) = 139]

◆ number of daily internal trip ends between retail and retail uses is 2,904 [0.07407 x 198 (1,000 retail square footage) x 198 (1,000 retail square footage) = 2,904]

This study also collected information on internal capture rates by time of day. Total internal capture rates for the three surveyed multi-use sites are shown in table C.8. The estimated daily midday and evening peak period internal capture rates are quite similar. The daily internal capture rates range from 28 percent to 33 percent for the three survey sites (with an overall average of 31 percent). The midday and evening peak periods produced similar ranges for the three survey sites, 30 to 35 percent and 28 to 32 percent, respectively.

The mean values for the entire survey period shown in table C.8 have a high degree of statistical validity. Maximum two-tailed errors calculated using the binomial distribution, with 90 percent confidence level methodology, are all less than 5 percent.

Table C.8 Internal Person Trip Ends by Time of Day (Percentage)

TIME PERIOD	AVERAGE RECORDED AT THREE SITES	RANGE RECORDED AT THREE SITES
Daily	31	28 - 33
Midday Peak Period (12 noon - 2 P.M.)	32	30 - 35
Evening Peak Period (4 P.M. - 6 P.M.)	30	28 - 32

3. Trip Generation for Mixed-Use Developments, Technical Committee Report, Colorado-Wyoming Section, Institute of Transportation Engineers, January 1986.

This study was undertaken to determine how trip generation estimates using ITE rates compared to actual driveway counts at multi-use developments in Colorado and Wyoming. Also included were interviews to determine whether persons entering and leaving multi-use sites came there for multiple purposes. The size and mix of land uses at the eight sites with interviews are listed in table C.9.

NO GOOD BECAUSE RESIDENTIAL WAS NOT INCLUDED.

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Table C.9 Characteristics of Multi-Use Sites with Interviews

SITE	SIZE (SQUARE FEET)	LAND USES
1	240,917	Retail, General Office, Government Office, Restaurants, Health Club, Bank
2	731,846	Retail, Office, Restaurants, Hotel
3	500,000	Retail, Office, Restaurants, Motel, Theaters
4	115,000	Retail, Restaurants, Hardware Store, Supermarket
5	1,000,000	Regional Mall, Retail, Restaurants, Banks, Office, Theaters
6	110,000	Retail, Theaters, Restaurants, Banks
7	95,104	Retail, Restaurants, Supermarket, Medical Office, Savings & Loan
8	300,000	Retail, Hardware, Restaurants, Supermarkets, Post Office

Internal Trips

A key piece of information collected at the interview sites was the number of trip purposes that an interviewed person accomplished on the particular trip within the site. Overall, a majority (77 percent) of the interviewees indicated that their trip involved only a single stop within the multi-use site. However, this still left a significant proportion (23 percent) who indicated they were making two or more stops within the site. Based on these interview results, the study authors estimated that 25 percent of an otherwise total number of trips were eliminated with the linking of internal trips within the eight surveyed multi-use sites.

Table C.10 presents the "number of trip purposes" data, arrayed according to the primary destination. This data gives the reader a sense for which land uses tend to generate multi-stop trips within multi-use sites. Office buildings and a post office generated the greatest number of multi-stop trips. Theaters, restaurants, and banks tended to generate lower-than-average numbers of multi-stop trips within the site.

Table C.10 Percentages of Persons within Multi-Sites by Number of Purposes (Stops) and by Primary Destination

PRIMARY DESTINATION	NUMBER OF PURPOSES/STOPS STATED BY INTERVIEWEE		
	1 PURPOSE (%)	2 PURPOSES (%)	3+ PURPOSES (%)
Bank/Savings and Loan	83	8	9
Hardware Store	76	22	2
Supermarket	77	17	6
Theater	93	7	0
Office/Work Site	68	31	1
Small Retail Shop	73	14	13
Restaurant	85	12	3
Health Club	71	29	0
Post Office	63	24	13
Total (Average)	**77**	**16**	**7**

Trip Generation

Vehicle trip generation data were collected at nine sites, as described in table C.11. During both the morning and evening peak hours for the generators within the nine multi-use sites, the actual vehicle counts were less than the calculated volumes from ITE *Trip Generation* rates. On a daily basis, six of the nine actual counts were also less.

Several of the surveyed sites are predominantly shopping centers (with some peripheral office or hotel space within the site boundaries) for which trip reduction estimates are not truly valid. Table C.12 presents the comparisons between driveway counts and ITE *Trip Generation* estimates (for each disaggregated element of the site) for the three surveyed sites that best fit the traditional view of a multi-use site. The site numbers in the table correspond to site numbers used previously in table C.11.

The measured reduction in trips generated by the site (as an indirect and perhaps direct result of an internal capture rate) varies considerably. As shown in table C.12, during the morning peak hour, the measured reduction at the three sites with internal trips ranged from 30 to 37 percent, with an average of 33 percent. The average reduction was 29 percent during the evening peak hour (with observed values ranging between 15 and 45 percent). Finally, on a daily basis the average reduction in vehicle trips was 13 percent (with a range between 9 and 20 percent).

Table C.11 Characteristics of Trip Generation Data Collection Sites

SITE	SIZE (SQUARE FEET)	LAND USES
1	154,536	Retail, Office, Government Office, Restaurants, Health Club
2	86,381	Retail, Restaurants, Bank
3	731,846	Retail, Office, Restaurants, Hotel
4	500,000	Retail, Office, Restaurants, Motel, Theaters
5	61,198	Retail, Office
6	115,000	Retail, Restaurants, Hardware Store, Supermarket
7	1,773,500	Office, Restaurants, Bank, Hotel, Medical Office, Training Center
8	177,277	Retail, Office, Medical Office, Restaurants, Health Club, Bank, Theater, Hardware Store, Supermarket, Savings & Loan
9	95,104	Retail, Restaurants, Bank, Supermarket, Medical Office, Savings & Loan

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The measured driveway volumes show vehicle trip reductions that could be considered to approximate the 25 percent drop caused by internalization of trips. It was the researchers' conclusion that most of the secondary trip purposes indicated by interviewees occur because of the availability of multiple retail outlets in close proximity to major primary destinations, such as work locations, supermarkets, banks, restaurants, hotels, and theaters in multi-use developments. If the secondary destinations were not in close proximity to the primary destinations, trips to the secondary destinations would not occur or would occur at a much less frequent rate.

Table C.12 Comparison of ITE *Trip Generation* with Driveway Counts

SITE NO.	A.M. PEAK HOUR			P.M. PEAK HOUR			DAILY		
	ITE	COUNT	CHANGE	ITE	COUNT	CHANGE	ITE	COUNT	CHANGE
3	1,217	855	362 (30%)	1,491	821	670 (45%)	12,838	11,706	1,132 (9%)
4	922	640	282 (31%)	1,337	1,138	199 (15%)	15,119	13,718	1,401 (9%)
7	3,878	2,448	1,430 (37%)	4,019	2,891	1,128 (28%)	30,408	24,462	5,946 (20%)

4. Trip Generation at Special Sites, Virginia Transportation Research Council, Charlottesville, Virginia, VHTRC 84-R23, January 1984.

Driveway vehicle counts were taken at a multi-use site located in a densely developed area in the Northern Virginia suburbs of Washington, D.C. The multi-use site contains 606 rental units (555 of which are located in a high-rise, the remainder being multi-level townhouse units) and approximately 64,000 square feet of retail/office area (including a delicatessen, a commercial cleaning company office, two building contractor offices, a restaurant, a bank, a hospital consulting company, a direct-mail advertising firm, a real estate agency, a management consulting group, and a dentist). The site is served by transit.

Vehicle Trip Generation

Table C.13 presents a comparison between the measured trip rates at the site and the estimated trips calculated from the ITE *Trip Generation*, Fifth Edition rates. Counts were taken (and trip generation estimates developed) for the morning peak hour, the evening peak hour, and the weekday daily time periods. The field-counted trips were 27 percent less than the ITE-calculated rates during the evening peak hour and 17 percent less during a 24-hour period. As has been stated in previous assessments of multi-use sites in this chapter, the reasons for this reduction could be twofold: (1) internalization of trips and (2) simple randomness of the actual trip generation rates.

NOT APPLICABLE AS REPORT CONCLUDES ON NEXT PAGE THAT INTERNAL TRIP RATES ARE NOT POSSIBLE TO ESTIMATE FROM A COMPARISON OF COUNTED VS. ITE-CALCULATED TRIP RATES.

Table C.13 Comparison of Actual and Counted Trip Ends

	A.M. PEAK HOUR (7 - 9 A.M.)	P.M. PEAK HOUR (4 - 6 P.M.)	DAILY
ITE Calculated	337	764	8,222
Field Counted	440	559	6,803
Difference from Calculated	**103 Higher (31%)**	**205 Lower (27%)**	**1,419 Lower (17%)**

Internal Trips

Trip-making at the site was only measured at its boundary. No internal counts or interviews were conducted. It is not possible to estimate internal trip rates directly from a comparison between counted and ITE-calculated vehicle trip rates. Nevertheless, all other factors being equal, it appears that the evening peak hour internal capture rate is greater than that during the morning peak hour.

5. A Trip Rate Interaction Model for Mixed Land Use Developments, University of Maryland Department of Civil Engineering (Gang-Len Chang, Chao-Hua Chen, Everett C. Carter), and Maryland State Highway Administration, November 1992

The objective of this study was to develop a systematic procedure for estimating the traffic impact of multi-use developments. The recommended method from the research is based on the results of surveys at three multi-use sites. The general characteristics of the survey sites are presented in table C.14. For the purposes of this chapter, the Cross Keys development is the most representative of a multi-use site, although it is situated in an urban setting. Burke Center more closely resembles a small town or rural village, but its trip-making characteristics are nevertheless presented below. The Reston development stretches over 20 square miles and is not truly a multi-use development in the context of this handbook; its trip-making characteristics are not discussed further.

Internal Trips

The measured internal capture rates for individual land uses at the two applicable survey sites are listed in table C.15. Similar to findings in other studies, the internal capture rates are higher at office buildings for the evening peak than for the morning peak (because site workers are more likely to make secondary trips during the afternoon than in the morning). The high morning internal capture rate for the retail mall is not meaningful because it represents an inconsequential number of trips that would not typically be considered in a traffic impact analysis.

X

NOT APPLICABLE AS REPORT IS UNCLEAR IF COUNTS INCLUDED RESIDENTIAL AREAS.

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Table C.14 Characteristics of Survey Sites

	CROSS KEYS	BURKE CENTER	RESTON
Size	72 acres	1,700 acres	14,046 acres
Residences	942	19,643	56,188
Single-Purpose Office	104,841 sf (service-oriented)	17,254 sf (service-oriented)	294,000 (non-service)
Multi-Purpose Building	61,000 sf (bank, retail, office, medical)	—	847,950 sf (office, bank, retail, hotel, theater)
Retail	—	117,269 sf	—

Table C.15 Internal Trip Capture Rates at Individual Land Uses in Multi-Use Sites

	CROSS KEYS			BURKE CENTER		
	A.M. PEAK (7-9)	P.M. PEAK (4-5:30)	ALL DAY	A.M. PEAK (7-9)	P.M. PEAK (4-5:30)	ALL DAY
Single-Purpose Office (Service-Oriented)	4%	13%	8%	7%	17%	17%
Multi-Purpose Building	1%	27%	11%	—	—	—
Retail Mall	—	—	—	29%	17%	15%

The University of Maryland study reports vehicle trip generation at each survey site, but it is unclear whether or not the counts included the residential areas and whether or not some vehicle movements may have been double-counted. Therefore, the results are not presented here. The University of Maryland study did not attempt to quantify pass-by trips.

6) The Brandermill PUD Traffic Generation Study, Technical Report, JHK & Associates, Alexandria, Virginia, June 1984.

Brandermill is a large, planned multi-use development (and, in many respects, is a small town/village) located approximately 10 miles southwest of Richmond, Virginia. At the time of the study, there were approximately 2,300 occupied dwelling units, with 180 townhouse-style condominiums and 2,120 single-family detached units. Commercial development consisted of an 82,600-square foot shopping center, a 63,000-square foot business park, a 14,000-square foot medical center, and a 4,400-square foot restaurant. There were also recreational facilities, including a golf course, tennis courts, swimming facilities, and several lakeside recreation facilities. Finally, there was a day-care center, a church, an elementary school, and a middle school. The study had the overall goal of determining the on-site (internal) and off-site (external) traffic generation at Brandermill.

Internal Trips

The split between internal and external trips was estimated on the basis of various data. As shown in table C.16, 51 percent of the daily trips, 55 percent of the evening peak hour trips, and 45 percent of the morning peak hour trips were internal to (or captured within) the multi-use site. Additionally, 46 percent of the persons employed in Brandermill also reside there.

Table C.16 Split Between Internal and External Trip Ends at Brandermill

	A.M. PEAK HOUR	P.M. PEAK HOUR	DAILY
Total Generated	2,570	2,935	33,540
External Trips	1,420	1,325	16,280
Internal Trips	1,150 (45%)	1,610 (55%)	17,260 (51%)

Travel questionnaires were distributed to residences and used to measure the level of internal trip ends for home-based trips. As shown in table C.17, roughly 35 percent of the daily home-based trips from Brandermill residences are linked with trip ends within Brandermill. Over 39 percent of the daily trip ends *to* Brandermill residences start within Brandermill. For the shopping center trips within Brandermill, roughly two-thirds of the trips originate within Brandermill during the midday and evening peak hours.

Table C.17 Internal Trip Ends Linked with Brandermill Residences and Retail Centers

HOURS	HOME-BASED TRIPS WITH DESTINATIONS WITHIN BRANDERMILL	HOME-BASED TRIPS WITH ORIGINS WITHIN BRANDERMILL
7 A.M. to 9 A.M.	18%	51%
9 A.M. to 4 P.M.	44%	50%
4 P.M. to 6 P.M.	55%	34%
6 P.M. to 7 A.M.	41%	34%
Daily	35%	39%

HOURS	SHOPPING CENTER TRIPS WITH DESTINATIONS WITHIN BRANDERMILL	SHOPPING CENTER TRIPS WITH ORIGINS WITHIN BRANDERMILL
11 A.M. to 1 P.M.	66%	65%
4 P.M. to 6 P.M.	66%	52%

7. Travel Characteristics at Large-Scale Suburban Activity Centers, JHK & Associates, NCHRP Report 323, 1990.

The objective of the project was to develop a comprehensive data base on travel characteristics for various types of large-scale, multi-use suburban activity centers (SAC). The activity centers studied were very large and had a scale very different from typical multi-use development. Therefore, the findings of this study are applicable only in major activity centers.

Data were collected at the six suburban activity centers listed in table C.18. Following is a summary of findings pertinent to internal trips for each of the land uses listed. It is noted that "larger centers" refers to the three centers with at least 15 million square feet of office/retail space, whereas "smaller centers" refers to the remaining three, which have less than 8 million square feet. A summary of some relevant relationships that were reported in NCHRP 323 is presented in table C.19.

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Table C.18 Characteristics of NCHRP Report 323 Study Sites

SUBURBAN ACTIVITY CENTER	OFFICE SPACE		RETAIL SPACE		HOTEL ROOMS	RESIDENTIAL DWELLING UNITS
	GFA	EMPLOYEES	GLA	EMPLOYEES		
Bellevue (Washington)	4.7 million	12,880	3 million	6,150	1,000	N/A
South Coast Metro (Orange Co., California)	3.5 million	10,465	4 million	6,865	1,800	2,300
Tysons Corner (Fairfax Co., Virginia)	17.0 million	35,020	7 million	13,355	3,100	15,000
Parkway Center (Dallas, Texas)	13.0 million	39,000	2 million	3,430	1,800	206
Perimeter Center (Atlanta, Georgia)	13.0 million	32,500	3 million	5,150	910	2,000
Southdale (Minneapolis, Minnesota)	4.0 million	13,700	3 million	6,155	2,200	3,000

Table C.19 Internal Trip-Making Characteristics at NCHRP 323 Study Sites

	AVERAGE	RANGE
OFFICE EMPLOYEES		
% who make an intermediate stop		
• on the way to work	10%	7 - 15%
• on the way home from work	11%	6 - 16%
% who make midday trips internal to the activity center		
• SAC with high level of professional employment[1]	—	29 - 33%
• SAC with low level of professional employment	—	20 - 23%
OFFICE VISITORS — % from within activity center		
• A.M. Peak Period		
• all SAC	—	15 - 59%
• small SAC	30%	—
• large SAC	54%	—
• P.M. Peak Period		
• all SAC	—	15 - 68%
• small SAC	33%	—
• large SAC	58%	—
REGIONAL MALLS — % trips which are internal to SAC		
• Midday		
• all SAC	37%	7 - 68%
• small SAC	23%	—
• large SAC	47%	—
• P.M. Peak Period		
• all SAC	24%	7 - 57%
• small SAC	14%	—
• large SAC	31%	—
EMPLOYED RESIDENTS — % who work within SAC		
• all	—	13 - 50%
• small SAC	27%	—
• large SAC	33%	—
HOTEL TRIPS — % internal to SAC		
• A.M. Peak Period		
• all SAC	—	13 - 53%
• small SAC	19%	—
• large SAC	37%	—
• P.M. Peak Period		
• all SAC	—	15 - 46%
• small SAC	27%	—
• large SAC	36%	—

[1] Sites with at least 60 percent of the work force in professional, technical, managerial, or administrative positions.

Campus Park Traffic Impact Study Appendix Page 296 of 940

C.2 References

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Trip Generation for Mixed Use Developments, Technical Committee Report, Colorado-Wyoming Section, ITE, January 1986.

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The Brandermill PUD Traffic Generation Study, Technical Report, Alexandria, VA: JHK & Associates, June 1984.

Travel Characteristics at Large-Scale Suburban Activity Centers, Hooper, K., National Cooperative Highway Research Program Report 323, Washington, DC: Transportation Research Board, National Academy of Sciences, 1990.

LOS Engineering, Inc.
Traffic and Transportation

5114 Sea Mist Ct, San Diego, CA 92121
Phone 619-890-1253, Fax 619-374-7247

February 5, 2008

Mr. Nael Areigat
County of San Diego DPW
5201 Ruffin Road, Suite D
San Diego, CA 92123-4310

RE: Campus Park (TM 5338) and Meadowood (TM 5354) – Internal Capture Rate

Dear Mr. Areigat:

Please find additional information supporting the SANDAG based 33% internal capture rate.

Comment #1: The letter should discuss how the proposed Campus Park and Meadowood projects plus the other two proposed eastern Fallbrook development projects (Campus Park West, Palomar College) compare to the sites surveyed/studied in the ITE internal capture rate documentation. The letter should compare/contrast the Fallbrook development projects to the ITE study sites as it relates to location, size, proximity to major freeways/highways, and land use composition. The letter should demonstrate that the ITE internal capture rates are applicable to the Fallbrook development projects.

Response #1: A comparison is shown between the sites documented in ITE and the combined project in **Table 1**:

Table 1: Composition Comparison of ITE Multi-Use Site to Proposed Project

Multi-Use Site	Location	Proximity to Freeway	Site Size (Acres)	Office (sf)	Commercial (sf)	Hotel (rooms)	Residential (Units)	Internal Capture Rate
Crocker Center	Florida	Unknown	26	209,000	87,000	256	0	41%
Mizner park	Florida	Unknown	30	88,000	163,000	0	136	40%
Galleria Area	Florida	Unknown	165	137,000	1,150,000	229	722	38%
Country Isles	Florida	Adjacent	61	59,000	193,000	0	368	33%
Village Commons	Florida	Unknown	72	293,000	231,000	0	317	28%
Boca Del Mar	Florida	Unknown	253	303,000	198,000	0	1,144	33%
Brandermill	Virginia	Adjacent	Unknown	77,000	87,000	0	2,300	51%
Minimum			*26*	*59,000*	*87,000*	*0*	*0*	*28%*
Average								***38%***
Maximum			*253*	*303,000*	*1,150,000*	*256*	*2,300*	*51%*
Meadowood	California	Adjacent	390	0	0	0	900	
Campus Park	California	Adjacent	165	157,000	72,000	0	1,096	
Campus Park West	California	Adjacent	92	300,000	230,000	0	395	
Palomar College	California	Adjacent	85	0	0	0	0	
Combined Fallboork projects (4 above)			*732*	*457,000*	*302,000*	*0*	*2,391*	Est. 33%

Source: ITE Trip Generation Handbook, March 2001 for data from Florida and Virginia.

As shown in Table 1, the combined project (Meadowood, Campus Park, Campus Park West, and Palomar College) matches well with Galleria Area, Boca Del Mar, and

Brandermill projects, because each of these multi-use communities have a relatively higher number of residential units and a larger amount of office/commercial. These three sites have internal capture rates of 38%, 33%, and 51%, respectively. Overall, the Meadowood, Campus Park, Campus Park West, and Palomar College projects fit well within the type and mix of the ITE surveyed locations that have an average internal capture rate of 38%.

Comment #2: The letter should further elaborate on why the proposed 33% internal capture rate would be reasonable for the Fallbrook development projects. The ITE internal capture rate ranges from 28% to 51%.

Response #2: Simple internal capture rates were calculated for two San Diego area communities: Fallbrook and Tierrasanta. These two communities were chosen due to: 1) a limited number of ingress/egress roadways serving the community, 2) a mix of retail, commercial, schools, and parks to support internal trips, and 3) direct access to I-15. No other communities were found to have a similar proximity to a freeway and some level of isolation such as the proposed project. For Fallbrook, counts were collected on 7 roadways creating a cordon as shown in **Attachment A**. For Tierrasanta, cordon counts were collected on 4 roadways. The actual Average Daily Trips (ADT) leaving and entering the community was taken as the sum of the cordon counts. The number of occupied households for each community was obtained from SANDAG. The cordon volumes and SANDAG data are included in **Attachment B**. The SANDAG rate of 10 daily trips per household was used to calculate the theoretical number of household ADT per community. The difference between the cordon and theoretical ADT provides a number of ADT staying within the community. The ratio of ADT staying in the community to the theoretical ADT provided the calculated internal capture rate as shown in **Table 2**:

Table 2: San Diego Area Internal Capture Rates (Fallbrook and Tierrasanta)

Study Area and Cordon Streets	ADT based on Ground Counts (1)	SANDAG 2007 Occupied Households (2)	ADT based on 10 ADT per Household (A)	Number of ADT staying in area (B)	Simplified Internal Capture Rate (B divided by A)
Fallbrook					
Old 395/Mission - West of I-15	24,359				
Old 395 - North of SR-76	7,174				
Sage Rd - North of SR-76	258				
Gird Rd - North of SR-76	3,190				
Via Monserate - North of SR-76 (3)	1,600				
Mission Rd - North of SR-76	20,352				
Olive Hill Rd - South of La Tara Ln	4,049				
Fallbrook Cordon	*60,982*	*14,366*	*143,660*	*82,678*	58%
Tierrasanta					
Santo Road - South of SR-52	15,658				
Clairemont Blvd - East of I-15	18,555				
Tierrasanta Blvd - East of I-15	20,937				
Aero Dr - East of I-15	13,846				
Tierrasanta Cordon	*68,996*	*10,989*	*109,890*	*40,894*	*37%*
			Average Simplified Internal Capture Rate		**47.4%**

Notes: (1) 24 hours collected on Wed 1/23/08. (2) SANDAG data by zip code for Tierrasanta and by census tracks for Fallbrook. (3) Via Monserate count failed, thus count was estimated at about half of Gird Road volume.

As shown in Table 2, this calculated internal capture rate for Fallbrook is 58% and 37% for Tierrasanta with an average of 47.4%. The 47% average is within the ITE range from 28% to 51%. The SANDAG internal capture rate of 33% is conservative when compared to local internal capture rates for communities that are adjacent to I-15.

Comment #3: It appears that the 33% internal capture rate is proposed for buildout of the Fallbrook development projects for the Year 2030 scenario. The letter should provide suggested internal capture rates for the following two scenarios:

Existing plus Project

Existing plus Project plus proposed/pending projects (near-term cumulative)

It is very unlikely that the internal capture rates for the two above scenarios would not be as high as what would be projected for buildout of the Fallbrook development projects for the Year 2030 scenario.

Response #3: The 33% internal capture rate is proposed for use at buildout.

Under existing plus project conditions, an internal capture rate will only be used when there is a mix of residential and commercial uses (i.e. if only residential is constructed initially, then no internal capture rate would be applied). The existing plus project internal capture rate will be based on a ratio of near-term residential to commercial uses vs. build-out residential to commercial uses. That is to say, if a project phase only had half of the commercial and all of the residential, then that phase would only incorporate an internal capture rate of about half of the buildout 33% internal capture rate.

Under existing plus project plus proposed/pending projects (near-term cumulative), the interim internal capture rate will be based on the ratio of near-term cumulative residential to commercial uses vs. build-out residential to commercial uses as described above.

Comment #4: The traffic consultant should coordinate with SANDAG staff to determine if other local multi-use developments have assumed/exhibited internal capture rates within the range proposed for the Fallbrook projects. In addition to County and Caltrans staff, SANDAG staff should provide input on the internal capture rate because the Fallbrook developments are large-scale Congestion Management Program (CMP) projects.

Response #4: SANDAG staff member Mr. Mike Calandra stated “As far as I am aware, there are no other comparable mixed-use developments in the County of San Diego that meet both internal land uses and external proximity to anything else. While there probably are comparable mixed-use developments, your Fallbrook project(s) are unique in that they are isolated: it is almost 20 miles north/south to Temecula and Escondido, and almost 10 miles east/west to Fallbrook\Oceanside and Pala\Pauma. You should not compare your project to a similar one in an urban or suburban

environment because those developments will have good accessibility literally in all directions across the street."

SANDAG staff has provided information on the latest CMP requirements to be used in the traffic study.

Comment #5: The letter should discuss how the SANDAG traffic model determines the exchange of trips to/from the Riverside County cordon zone and the Fallbrook/North County area. The letter should discuss if the project site's close proximity to the Riverside County cordon zone is affecting the internal capture rate result.

Response #5: SANDAG staff member Mr. Mike Calandra stated "Limeng provided you with a graphic earlier that shows the model assigning 9% of all project traffic to/from the Riverside cordon zone. The model distributes and assigns trips based on existing data and observations, including surveys of county-line crossers. The proximity of this project to nothing means that trips will match up and be assigned to zone-pairs that exceed the average trip length, but keep in mind that the average trip length frequencies are a bell curve and thus in theory have no upper limit."

Comment #6: The letter should attempt to quantify trip reductions and the ability of trips to remain internal within large multiuse developments with information regarding non-motorized internal traffic. The letter could discuss the following:

a. Projected Percentage of Walk Trips in Development (GIS buffered ¼-1/2 mile from homes to shops/offices/retail)
b. Projected Percentage of Bike trips in development (GIS buffered ½-2 miles from homes to shops/offices/retail).
c. Sidewalk access from homes to destinations.
d. Completeness of sidewalk network, accessibility of network from homes to commercial offices.
e. Bicycle network, accessibility, destination parking and ability to use lower speed streets, avoid high speed roads.
f. Other internal connections/paths within developments that are not counted/documented in a traditional TAZ.

A figure is included in **Attachment C** that includes ¼, ½, and 1 mile buffers around the shops, office, and retail areas for both Campus Park and Meadowood. Based on the aforementioned buffer areas, the number of households and percentage of total households are summarized in **Table 3**.

Table 3: Households within ¼, ½, and 1 mile of shops/office/retail uses

Development	With 1/4 Mile		With 1/2 Mile		With 1 Mile	
	Units	Percentage	Units	Percentage	Units	Percentage
Campus Park (households)	728	66%	978	89%	1096	100%
Meadowood (households)	316	37%	662	77%	858	100%
Totals	**1044**	**53%**	**1640**	**84%**	**1954**	**100%**

Source: RECON GIS Analysis

As shown in Table 3, a total of about 50% and 80% of the total households are within a walking distance (¼ to ½ mile) of the shops, offices, and retail uses. Furthermore, about 100% of the households are within biking distance of 1 mile. Please note that due to the location and elongated shape of the shops, offices and retails areas, the buffering does not account for the longer distance from a household on the southern end to a commercial point on the northern end. Rather, the buffering provides an average for distances to the commercial areas. Furthermore, a large portion of the multi-family is immediately adjacent to the town center – a concentrated element within the buffering rings. Another element difficult to quantify is the exact route (sidewalks or pathways) a pedestrian may take. Therefore, the calculated percentages are used in approximate terms (i.e. 53% is better expressed as approximately 50%) with emphasis that the mass of the households are within a close distance to the shops, offices, and retail uses.

Response #6a: The percentage of walk trips in the development is a function of distance, topography, work purpose, leisure purpose, convenience, desire for exercise, and other factors. As shown in Table 3, more than half of the households will be within walking distance to the shops, office, and retail uses. Thus, walk trips will include work, school, and leisure trips.

A review of on-line resources uncovered a survey documenting the mode of transportation to work in Fallbrook that showed 3% walked to work while 1% used a bicycle (survey summary included in **Attachment D**). However, this survey is only one part of the potential walk trips. The survey does not document the percentage of school and leisure trips. Therefore, applying specific survey results may not accurately relay the true potential of walk trips because so many households are located ¼ to ½ mile of shops, offices, and retail uses. What is most important here is that this community is configured to allow household members to ability to reach multiple amenities by simply walking.

Response #6b: The percentage of bike trips could potentially be very high with all of the households located with 1 mile of the shops, offices, and retail uses.

Response #6c: Either sidewalks or pathway will be provided from the residential areas to the shops, office, and retail areas.

Response #6d: In addition to sidewalks and pathways, the community will have trails to further provide a network for accessibility from homes to the shops, office, and retail

areas. Meadowood is proposed with approximately 4.2 miles of trails. Exhibits showing the proposed trails for Campus Park and Meadowood are shown in **Attachment E**.

Response #6e: Bicycle accessibility is possible for a majority of the community through multiple routes to the shops, office, and retail areas. Bicycle parking will be provided at commercial areas as required by code.

Response #6f: It is correct that traditional TAZs do not include details such as internal connections or paths within developments. If a traffic model was constructed with smaller TAZs and more centroid connectors representing additional connections/paths, the internal capture rate could be higher as the gravity model would have the potential to assign more trips to near-by zones. Thus, the SANDAG Series 11 traffic model with fewer TAZs and fewer centroid connectors may have underestimated the internal capture rate.

In summary, the SANDAG Series 11 internal capture rate of 33% is very reasonable if not under estimated given that:

1) ITE sources with similar land uses documented internal capture rates from 28% to 51% with an average of 38%,
2) Local internal capture rates have been calculated for Fallbrook at 58% and 37% for Tierrasanta,
3) SANDAG staff have indicated no other similar projects have been modeled that are unique in being isolated with a complementary mix of land uses, and
4) A GIS analysis documented about 50% of the households are within a walking distance of ¼ mile to the commercial uses while approximately 80% of the households are with ½ mile of the commercial uses, and 100% of the households are within 1 mile of the commercial uses – making this a walkable project.

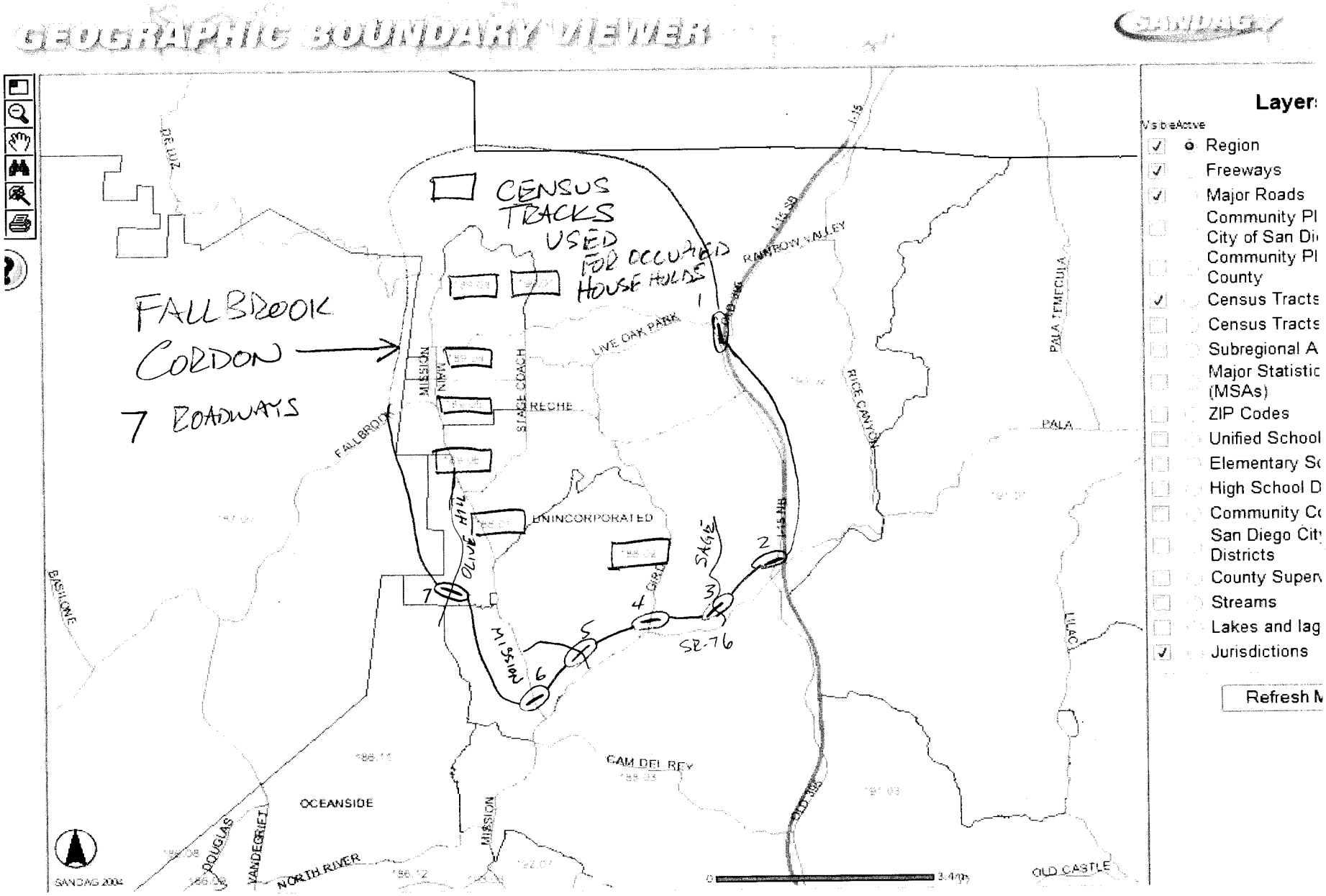
Please call me at (619) 890-1253 if you have any questions.

Sincerely,
LOS Engineering, Inc.

Justin Rasas, P.E.(60690), PTOE
Principal and Officer of LOS Engineering, Inc.

ATTACHMENT A

FALLBROOK CORDON MAP

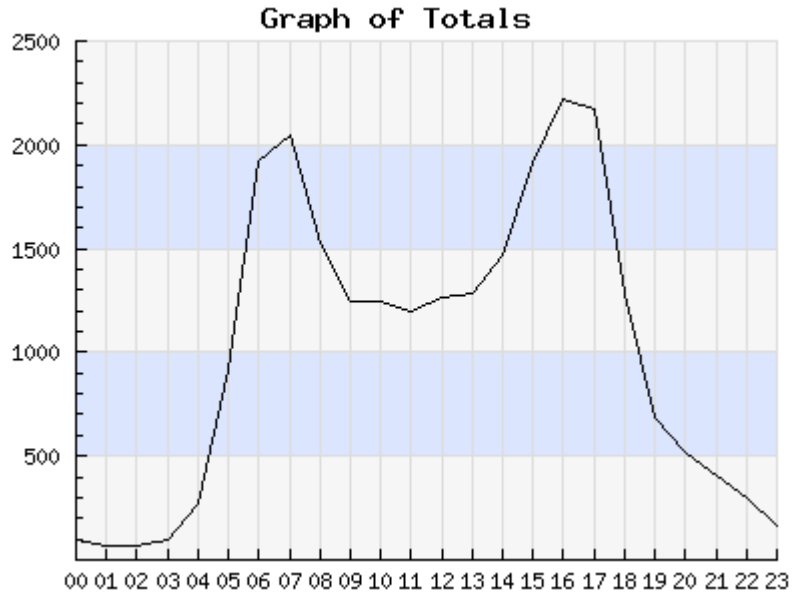

GEOGRAPHIC BOUNDARY VIEWER
SANDAG
CENSUS TRACKS USED FOR OCCUPIED HOUSEHOLDS
FALLBROOK CORDON
7 ROADWAYS
1
2
3
4
5
6
7
SAGE
SR-76
OLIVE HILL
MISSION
RAINBOW VALLEY
LIVE OAK PARK
RICE CANYON
PALA TEMECULA
PALA
LILAC
OLD CASTLE
CAM DEL REY
OCEANSIDE
NORTH RIVER
VANDEGRIFT
DOUGLAS
BASILONE
FALLBROOK
MISSION
MAIN
STAGE COACH
RECHE
UNINCORPORATED
GIRD
I-15
I-15 SB
I-15 NB
OLD 395
DE LUZ
Layers
Visible Active
Region
Freeways
Major Roads
Community Pl
City of San Di
Community Pl
County
Census Tracts
Census Tracts
Subregional A
Major Statistic
(MSAs)
ZIP Codes
Unified School
Elementary Sc
High School D
Community Co
San Diego City
Districts
County Superv
Streams
Lakes and lag
Jurisdictions
Refresh M
SANDAG 2004
0
3.4 mi

ATTACHMENT B

CORDON VOLUMES AND SANDAG OCCUPIED HOUSEHOLD DATA

Daily Vehicle Volume Report

Location:
Old 395 between Mission Road and I-15 SB Ramps
File Number: 82401
Counter ID: AB201/AB202
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	West Bound Volume	East Bound Volume	Total Volume
00:00 - 00:59	60	38	98
01:00 - 01:59	39	26	65
02:00 - 02:59	29	34	63
03:00 - 03:59	46	51	97
04:00 - 04:59	138	128	266
05:00 - 05:59	588	332	920
06:00 - 06:59	1215	705	1920
07:00 - 07:59	1177	866	2043
08:00 - 08:59	718	804	1522
09:00 - 09:59	555	694	1249
10:00 - 10:59	537	704	1241
11:00 - 11:59	522	678	1200
12:00 - 12:59	623	645	1268
13:00 - 13:59	657	626	1283
14:00 - 14:59	678	787	1465
15:00 - 15:59	882	1034	1916
16:00 - 16:59	910	1314	2224
17:00 - 17:59	770	1405	2175
18:00 - 18:59	568	715	1283
19:00 - 19:59	323	359	682
20:00 - 20:59	288	230	518
21:00 - 21:59	219	183	402
22:00 - 22:59	170	126	296
23:00 - 23:59	93	70	163
Total	**11805**	**12554**	**24359**
AM Peak	6:15	7:15	6:45
Hour	7:14	8:14	7:44
Volume	1265	934	2052
PM Peak	15:45	16:45	16:15
Hour	16:44	17:44	17:14
Volume	950	1435	2256

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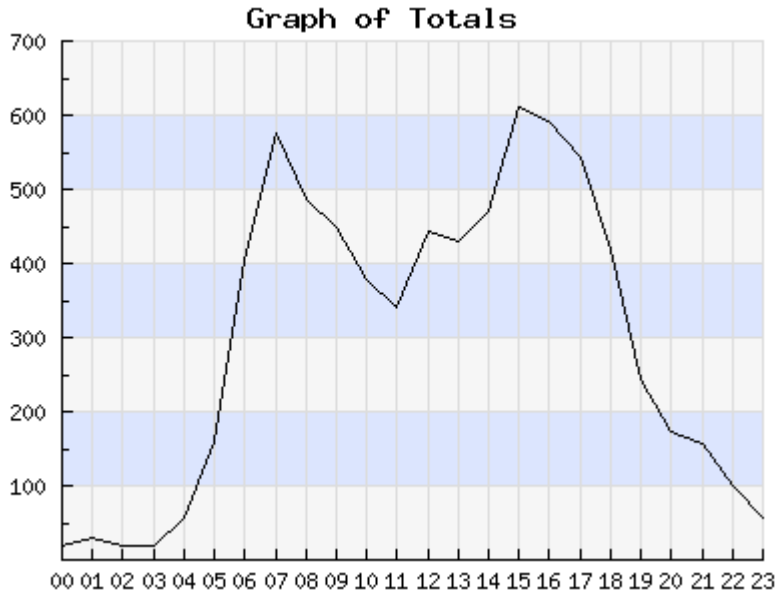
Daily Vehicle Volume Report

Location:
Old 395 just north of SR-76
File Number: 82402
Counter ID: AB208
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	15	3	18
01:00 - 01:59	16	13	29
02:00 - 02:59	8	11	19
03:00 - 03:59	2	16	18
04:00 - 04:59	15	41	56
05:00 - 05:59	25	135	160
06:00 - 06:59	110	294	404
07:00 - 07:59	203	374	577
08:00 - 08:59	185	301	486
09:00 - 09:59	184	265	449
10:00 - 10:59	150	229	379
11:00 - 11:59	154	187	341
12:00 - 12:59	210	233	443
13:00 - 13:59	233	197	430
14:00 - 14:59	250	221	471
15:00 - 15:59	338	273	611
16:00 - 16:59	381	211	592
17:00 - 17:59	350	193	543
18:00 - 18:59	277	142	419
19:00 - 19:59	150	92	242
20:00 - 20:59	124	49	173
21:00 - 21:59	86	72	158
22:00 - 22:59	65	35	100
23:00 - 23:59	38	18	56
Total	**3569**	**3605**	**7174**
AM Peak	8:45	7:00	7:00
Hour	9:44	7:59	7:59
Volume	204	374	577
PM Peak	15:45	15:00	15:45
Hour	16:44	15:59	16:44
Volume	406	273	644

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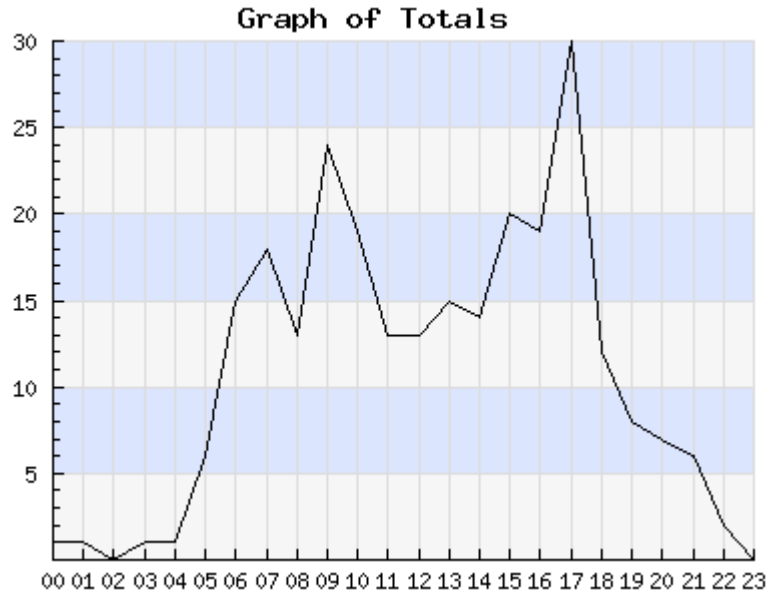
Daily Vehicle Volume Report

Location:
Sage Road just north of SR-76
File Number: 82403
Counter ID: SP101
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	South Bound Volume	North Bound Volume	Total Volume
00:00 - 00:59	0	1	1
01:00 - 01:59	0	1	1
02:00 - 02:59	0	0	0
03:00 - 03:59	0	1	1
04:00 - 04:59	1	0	1
05:00 - 05:59	3	3	6
06:00 - 06:59	6	9	15
07:00 - 07:59	12	6	18
08:00 - 08:59	7	6	13
09:00 - 09:59	11	13	24
10:00 - 10:59	11	8	19
11:00 - 11:59	9	4	13
12:00 - 12:59	8	5	13
13:00 - 13:59	8	7	15
14:00 - 14:59	6	8	14
15:00 - 15:59	10	10	20
16:00 - 16:59	4	15	19
17:00 - 17:59	14	16	30
18:00 - 18:59	8	4	12
19:00 - 19:59	2	6	8
20:00 - 20:59	2	5	7
21:00 - 21:59	1	5	6
22:00 - 22:59	1	1	2
23:00 - 23:59	0	0	0
Total	**124**	**134**	**258**
AM Peak	6:45	9:15	9:15
Hour	7:44	10:14	10:14
Volume	14	16	26
PM Peak	17:00	15:30	17:00
Hour	17:59	16:29	17:59
Volume	14	18	30

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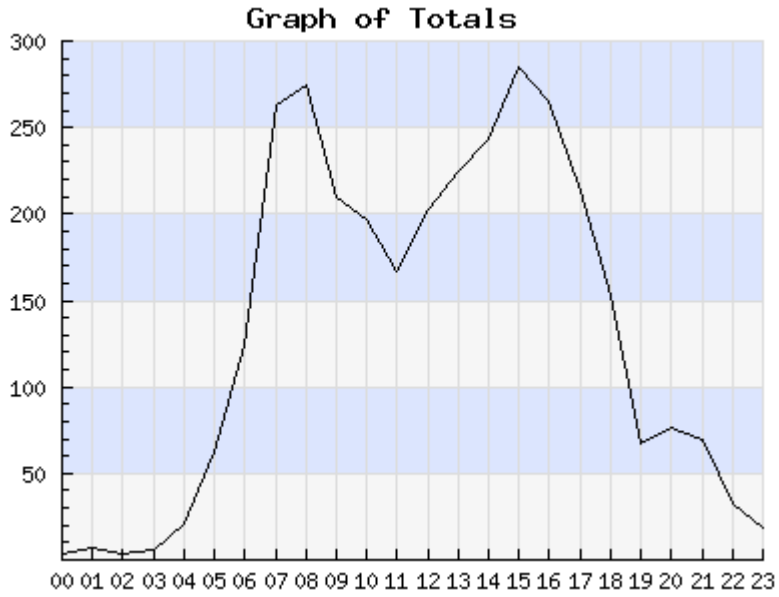
Daily Vehicle Volume Report

Location:
Gird Road just north of SR-76
File Number: 82404
Counter ID: AB209
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	South Bound Volume	North Bound Volume	Total Volume
00:00 - 00:59	1	2	3
01:00 - 01:59	3	4	7
02:00 - 02:59	3	1	4
03:00 - 03:59	4	2	6
04:00 - 04:59	18	3	21
05:00 - 05:59	54	8	62
06:00 - 06:59	93	31	124
07:00 - 07:59	140	123	263
08:00 - 08:59	160	115	275
09:00 - 09:59	124	86	210
10:00 - 10:59	103	94	197
11:00 - 11:59	88	79	167
12:00 - 12:59	85	118	203
13:00 - 13:59	93	132	225
14:00 - 14:59	108	135	243
15:00 - 15:59	124	161	285
16:00 - 16:59	89	176	265
17:00 - 17:59	65	148	213
18:00 - 18:59	26	127	153
19:00 - 19:59	8	59	67
20:00 - 20:59	23	54	77
21:00 - 21:59	10	59	69
22:00 - 22:59	1	31	32
23:00 - 23:59	2	17	19
Total	**1425**	**1765**	**3190**
AM Peak	8:00	7:15	7:30
Hour	8:59	8:14	8:29
Volume	160	141	298
PM Peak	14:30	15:30	15:00
Hour	15:29	16:29	15:59
Volume	132	177	285

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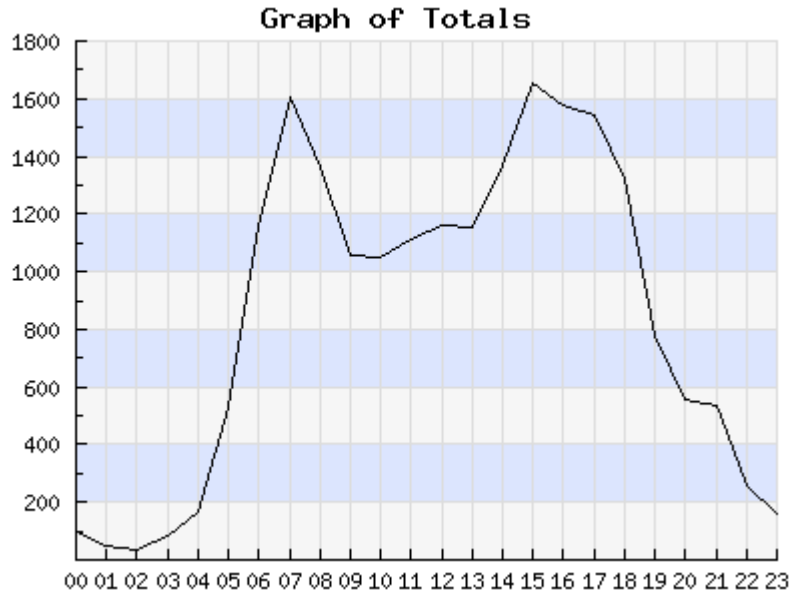
Daily Vehicle Volume Report

Location:
Mission Road just north of SR-76
File Number: 82405
Counter ID: AB210/AB211
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	79	15	94
01:00 - 01:59	33	18	51
02:00 - 02:59	24	10	34
03:00 - 03:59	33	48	81
04:00 - 04:59	30	140	170
05:00 - 05:59	94	433	527
06:00 - 06:59	381	773	1154
07:00 - 07:59	737	865	1602
08:00 - 08:59	601	761	1362
09:00 - 09:59	501	554	1055
10:00 - 10:59	528	518	1046
11:00 - 11:59	585	524	1109
12:00 - 12:59	624	535	1159
13:00 - 13:59	678	475	1153
14:00 - 14:59	835	537	1372
15:00 - 15:59	995	661	1656
16:00 - 16:59	1001	575	1576
17:00 - 17:59	1002	540	1542
18:00 - 18:59	944	375	1319
19:00 - 19:59	509	272	781
20:00 - 20:59	363	193	556
21:00 - 21:59	371	167	538
22:00 - 22:59	189	65	254
23:00 - 23:59	129	32	161
Total	**11266**	**9086**	**20352**
AM Peak	6:45	6:45	6:45
Hour	7:44	7:44	7:44
Volume	754	870	1624
PM Peak	16:15	14:45	15:00
Hour	17:14	15:44	15:59
Volume	1053	661	1656

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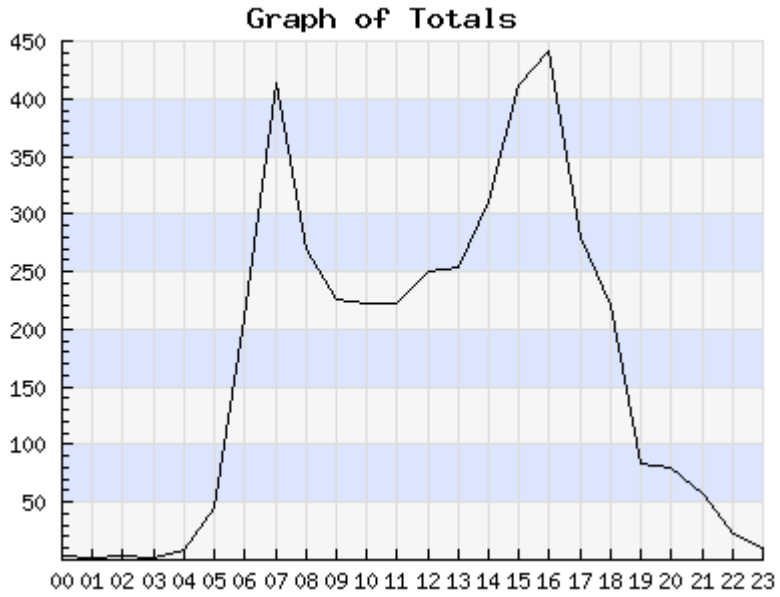
Daily Vehicle Volume Report

Location:
Olive Hill Rd just south of La Tara Lane
File Number: 82406
Counter ID: SP108
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	1	2	3
01:00 - 01:59	1	0	1
02:00 - 02:59	2	2	4
03:00 - 03:59	0	2	2
04:00 - 04:59	4	4	8
05:00 - 05:59	26	19	45
06:00 - 06:59	74	136	210
07:00 - 07:59	206	207	413
08:00 - 08:59	127	143	270
09:00 - 09:59	108	118	226
10:00 - 10:59	124	99	223
11:00 - 11:59	126	96	222
12:00 - 12:59	130	120	250
13:00 - 13:59	138	116	254
14:00 - 14:59	158	153	311
15:00 - 15:59	202	209	411
16:00 - 16:59	267	175	442
17:00 - 17:59	150	130	280
18:00 - 18:59	124	97	221
19:00 - 19:59	36	47	83
20:00 - 20:59	25	55	80
21:00 - 21:59	23	35	58
22:00 - 22:59	9	13	22
23:00 - 23:59	3	7	10
Total	**2064**	**1985**	**4049**
AM Peak	7:00	6:45	6:45
Hour	7:59	7:44	7:44
Volume	206	235	432
PM Peak	16:00	15:00	16:00
Hour	16:59	15:59	16:59
Volume	267	209	442

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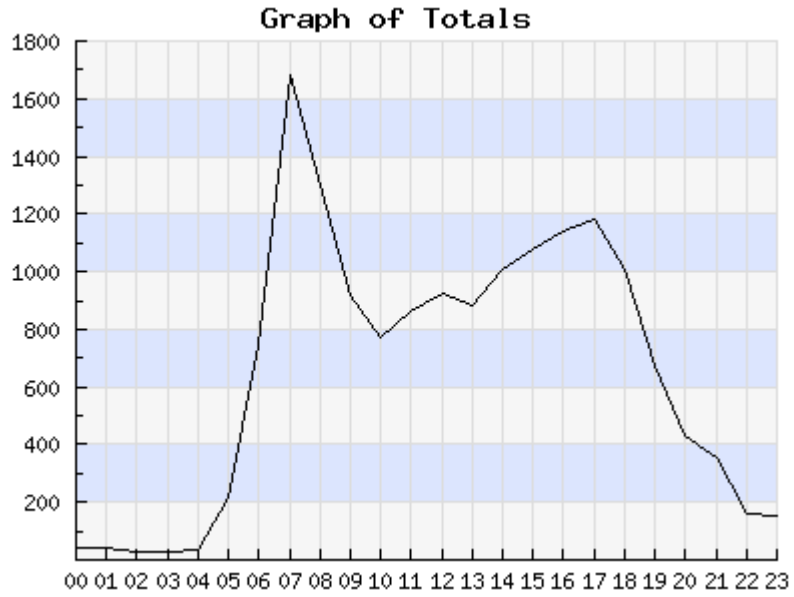
Daily Vehicle Volume Report

Location:
Santo Road between SR-52 and Portobelo Dr
File Number: 82501
Counter ID: SP106/SP107
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	North Bound Volume	South Bound Volume	Total Volume
00:00 - 00:59	15	28	43
01:00 - 01:59	14	28	42
02:00 - 02:59	8	20	28
03:00 - 03:59	12	13	25
04:00 - 04:59	28	10	38
05:00 - 05:59	172	40	212
06:00 - 06:59	548	198	746
07:00 - 07:59	1183	496	1679
08:00 - 08:59	839	463	1302
09:00 - 09:59	557	360	917
10:00 - 10:59	432	341	773
11:00 - 11:59	418	441	859
12:00 - 12:59	464	460	924
13:00 - 13:59	440	441	881
14:00 - 14:59	481	524	1005
15:00 - 15:59	508	572	1080
16:00 - 16:59	589	551	1140
17:00 - 17:59	674	507	1181
18:00 - 18:59	433	573	1006
19:00 - 19:59	270	404	674
20:00 - 20:59	172	261	433
21:00 - 21:59	148	209	357
22:00 - 22:59	59	103	162
23:00 - 23:59	54	97	151
Total	**8518**	**7140**	**15658**
AM Peak	7:00	7:15	7:15
Hour	7:59	8:14	8:14
Volume	1183	538	1707
PM Peak	16:45	17:45	16:45
Hour	17:44	18:44	17:44
Volume	688	583	1194

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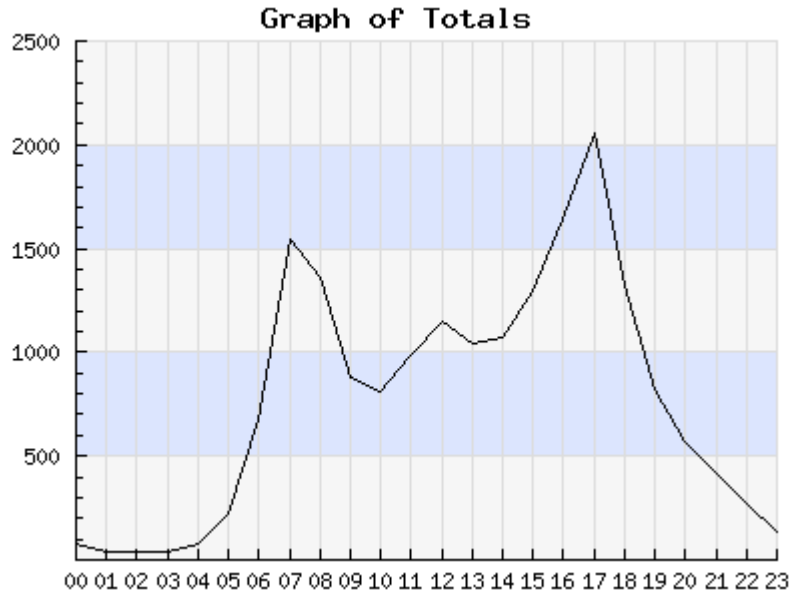
Daily Vehicle Volume Report

Location:
Clairemont Blvd just east of I-15
File Number: 82502
Counter ID: SP104
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	53	26	79
01:00 - 01:59	26	13	39
02:00 - 02:59	23	15	38
03:00 - 03:59	16	19	35
04:00 - 04:59	18	61	79
05:00 - 05:59	42	183	225
06:00 - 06:59	175	496	671
07:00 - 07:59	451	1093	1544
08:00 - 08:59	387	977	1364
09:00 - 09:59	341	542	883
10:00 - 10:59	354	460	814
11:00 - 11:59	461	519	980
12:00 - 12:59	579	573	1152
13:00 - 13:59	516	530	1046
14:00 - 14:59	563	511	1074
15:00 - 15:59	793	497	1290
16:00 - 16:59	1167	475	1642
17:00 - 17:59	1556	503	2059
18:00 - 18:59	884	435	1319
19:00 - 19:59	558	265	823
20:00 - 20:59	390	184	574
21:00 - 21:59	270	149	419
22:00 - 22:59	180	91	271
23:00 - 23:59	93	42	135
Total	**9896**	**8659**	**18555**
AM Peak	11:00	7:30	7:15
Hour	11:59	8:29	8:14
Volume	461	1152	1599
PM Peak	17:00	12:30	17:00
Hour	17:59	13:29	17:59
Volume	1556	612	2059

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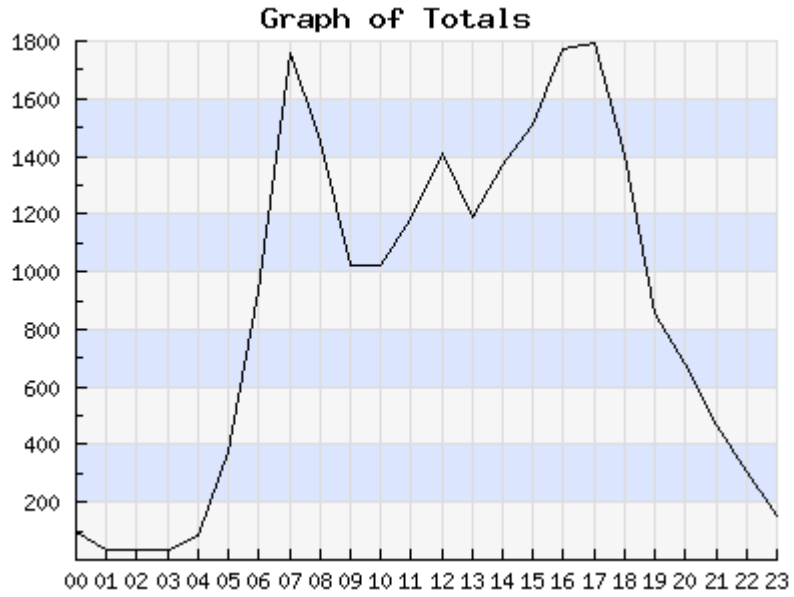
Daily Vehicle Volume Report

Location:
Tierrasanta Blvd just east of I-15
File Number: 82503
Counter ID: SP105
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	East Bound Volume	West Bound Volume	Total Volume
00:00 - 00:59	66	31	97
01:00 - 01:59	22	13	35
02:00 - 02:59	18	14	32
03:00 - 03:59	15	23	38
04:00 - 04:59	24	61	85
05:00 - 05:59	63	314	377
06:00 - 06:59	253	675	928
07:00 - 07:59	481	1274	1755
08:00 - 08:59	421	1032	1453
09:00 - 09:59	399	620	1019
10:00 - 10:59	485	537	1022
11:00 - 11:59	598	583	1181
12:00 - 12:59	726	686	1412
13:00 - 13:59	595	595	1190
14:00 - 14:59	748	624	1372
15:00 - 15:59	877	633	1510
16:00 - 16:59	1131	644	1775
17:00 - 17:59	1171	623	1794
18:00 - 18:59	836	567	1403
19:00 - 19:59	558	298	856
20:00 - 20:59	437	241	678
21:00 - 21:59	295	172	467
22:00 - 22:59	186	118	304
23:00 - 23:59	100	54	154
Total	**10505**	**10432**	**20937**
AM Peak	11:00	7:00	7:00
Hour	11:59	7:59	7:59
Volume	598	1274	1755
PM Peak	16:30	12:15	16:30
Hour	17:29	13:14	17:29
Volume	1227	717	1917

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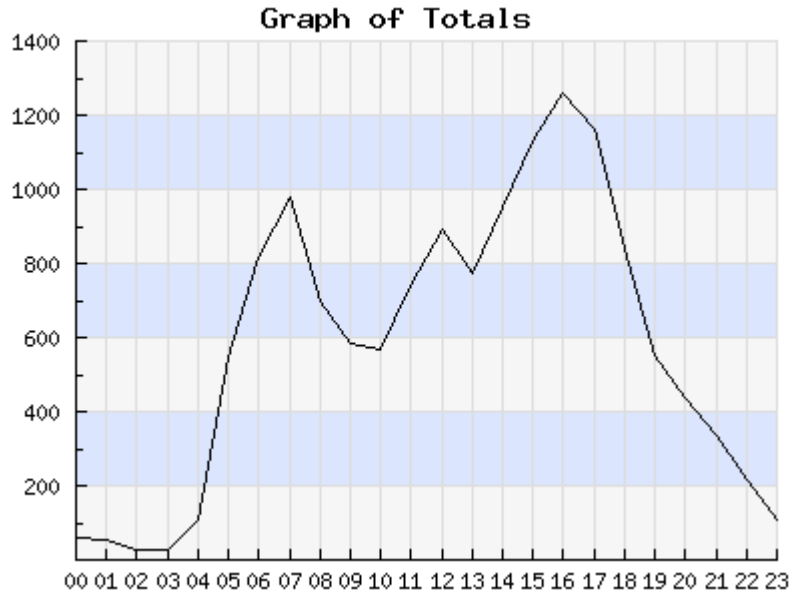
Daily Vehicle Volume Report

Location:
Aero Dr just east of I-15
File Number: 82504
Counter ID: SP111/SP112
Report Duration:
Wednesday Jan 23, 2008 - 00:00 to
Wednesday Jan 23, 2008 - 23:59
Other Notes:
None at this time.



Time	West Bound Volume	East Bound Volume	Total Volume
00:00 - 00:59	13	44	57
01:00 - 01:59	14	39	53
02:00 - 02:59	9	17	26
03:00 - 03:59	18	7	25
04:00 - 04:59	90	16	106
05:00 - 05:59	486	61	547
06:00 - 06:59	604	210	814
07:00 - 07:59	588	388	976
08:00 - 08:59	353	345	698
09:00 - 09:59	281	302	583
10:00 - 10:59	292	276	568
11:00 - 11:59	341	398	739
12:00 - 12:59	403	488	891
13:00 - 13:59	294	481	775
14:00 - 14:59	429	520	949
15:00 - 15:59	433	698	1131
16:00 - 16:59	472	785	1257
17:00 - 17:59	518	644	1162
18:00 - 18:59	339	501	840
19:00 - 19:59	199	352	551
20:00 - 20:59	168	270	438
21:00 - 21:59	107	226	333
22:00 - 22:59	91	126	217
23:00 - 23:59	39	71	110
Total	**6581**	**7265**	**13846**
AM Peak	6:15	11:00	7:00
Hour	7:14	11:59	7:59
Volume	617	398	976
PM Peak	16:45	15:30	15:45
Hour	17:44	16:29	16:44
Volume	518	801	1278

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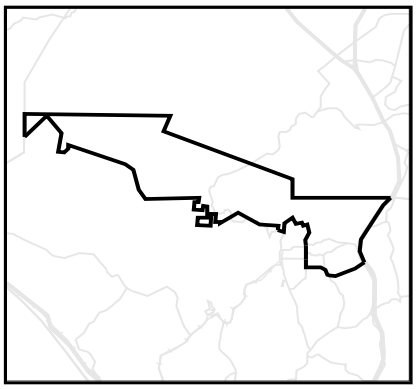
POPULATION AND HOUSING ESTIMATES
Census Tract 190.01





POPULATION AND HOUSING (2000 and 2007)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Total Population	**5,235**	**5,672**	**437**	**8.3%**
Household Population	5,215	5,642	427	8.2%
Group Quarters Population	20	30	10	50.0%
Total Housing Units	**2,060**	**2,257**	**197**	**9.6%**
Single Family - Detached	--	1,939	--	--
Single Family - Multiple-Unit	--	19	--	--
Multi-Family	--	194	--	--
Mobile Home and Other	--	105	--	--
Occupied Housing Units	**1,931**	**2,107**	**176**	**9.1%**
Single Family - Detached	--	1,856	--	--
Single Family - Multiple-Unit	--	16	--	--
Multi-Family	--	139	--	--
Mobile Home and Other	--	96	--	--
Vacancy Rate	**6.3%**	**6.6%**	**0.3%**	**4.8%**
Persons per Household	**2.70**	**2.68**	**-0.02**	**-0.7%**

NOTE: Starting in 2007, SANDAG will begin tracking housing structure type based on new definitions. Data for the new structure types are not comparable with information from the 2000 Census or SANDAG's Forecast. New definitions are described on page 3.

HOUSEHOLD INCOME (real 1999 dollars, adjusted for inflation)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Households by Income Category				
Less than $15,000	121	104	-17	-14.0%
$15,000-$29,999	261	243	-18	-6.9%
$30,000-$44,999	299	304	5	1.7%
$45,000-$59,999	305	303	-2	-0.7%
$60,000-$74,999	263	265	2	0.8%
$75,000-$99,999	228	333	105	46.1%
$100,000-$124,999	168	221	53	31.5%
$125,000-$149,999	115	136	21	18.3%
$150,000-$199,999	65	129	64	98.5%
$200,000 or more	106	69	-37	-34.9%
Total Households	**1,931**	**2,107**	**176**	**9.1%**
Median Household Income				
Adjusted for inflation (1999 $)	$58,992	$65,632	6,640	11.3%
Not adjusted for inflation (current $)	$58,992	$86,636	27,644	46.9%

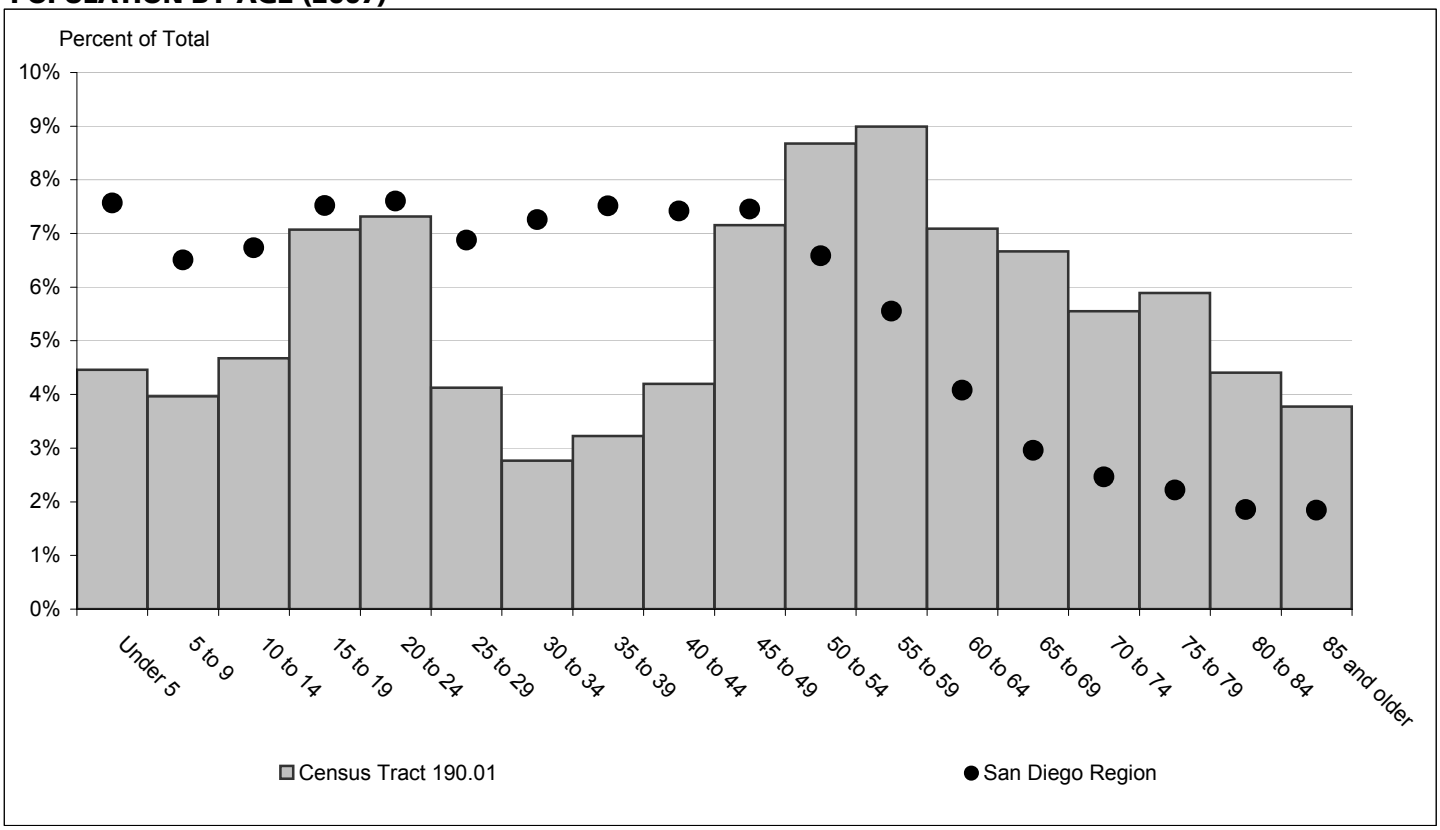
ADVISORY:

Caution should be taken when using data for small population groups, particularly at small levels of geography. Some 2000 Census data may not match information published by the U.S. Census Bureau for the following reasons: sample census data have been controlled to match 100 percent count (Summary File 1) data; and some minor adjustments were made (such as correcting the location of housing units that were erroneously allocated by the Census Bureau to roads and open space) to more accurately reflect the region's true population and housing distribution.

POPULATION BY GENDER AND AGE (2007)

	Total	Male	Female	Percent Female
Total Population	**5,672**	**2,834**	**2,838**	**50%**
Under 5	253	122	131	52%
5 to 9	225	103	122	54%
10 to 14	265	146	119	45%
15 to 17	246	128	118	48%
18 and 19	155	84	71	46%
20 to 24	415	208	207	50%
25 to 29	234	123	111	47%
30 to 34	157	80	77	49%
35 to 39	183	92	91	50%
40 to 44	238	111	127	53%
45 to 49	406	186	220	54%
50 to 54	492	257	235	48%
55 to 59	510	244	266	52%
60 and 61	159	67	92	58%
62 to 64	243	119	124	51%
65 to 69	378	185	193	51%
70 to 74	315	168	147	47%
75 to 79	334	175	159	48%
80 to 84	250	130	120	48%
85 and older	214	106	108	50%
Under 18	989	499	490	50%
65 and older	1,491	764	727	49%
Median age	50.6	50.7	50.5	-

POPULATION BY AGE (2007)



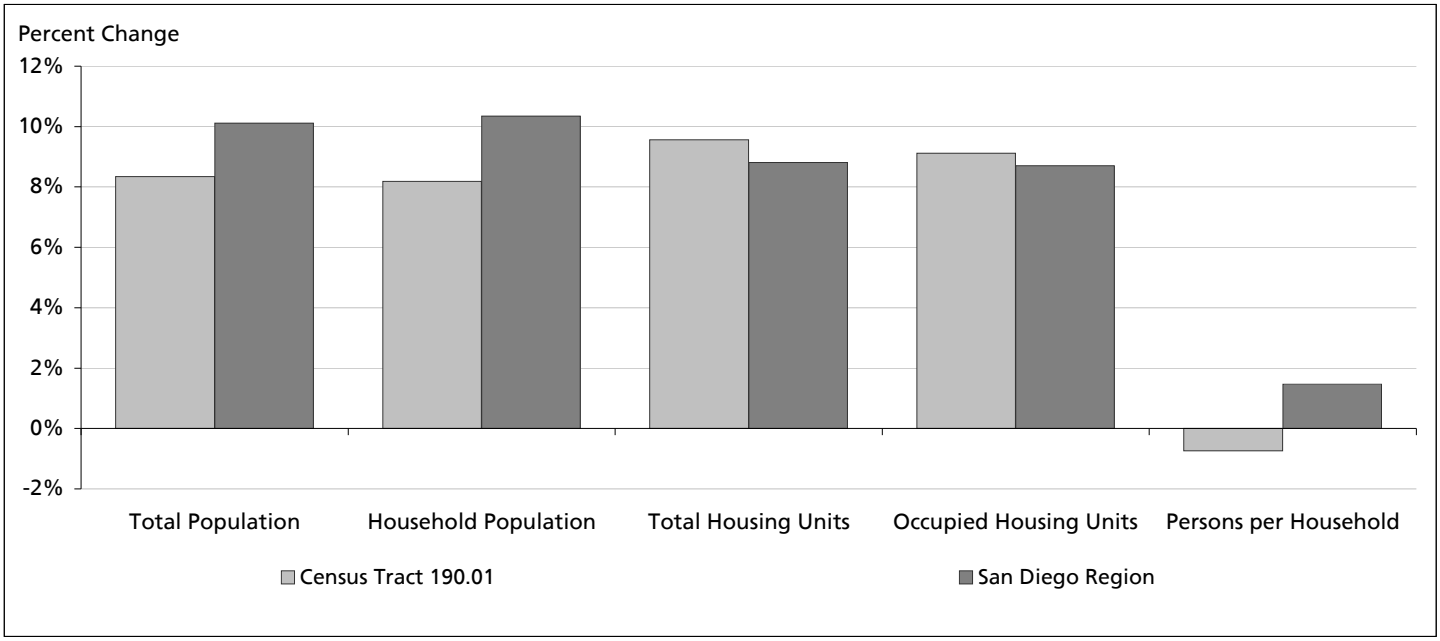
Source: SANDAG, Current Estimates (2007)
SANDAG
www.sandag.org

October 2007
Census Tract 190.01 Estimates
Page 2 of 3

POPULATION BY RACE, ETHNICITY AND AGE (2007)

		Non-Hispanic				
	Hispanic	White	Black	American Indian	Asian & Pacific Isl.	Other
Total Population	**1,141**	**4,279**	**7**	**14**	**101**	**130**
Under 5	102	140	0	1	4	6
5 to 9	60	158	0	0	2	5
10 to 14	97	157	0	0	6	5
15 to 17	62	179	1	0	1	3
18 and 19	34	116	0	0	2	3
20 to 24	99	305	2	0	3	6
25 to 29	77	147	0	0	3	7
30 to 34	62	84	0	1	2	8
35 to 39	80	97	0	1	1	4
40 to 44	60	173	1	0	1	3
45 to 49	75	307	1	0	13	10
50 to 54	90	385	0	0	5	12
55 to 59	72	417	0	0	14	7
60 and 61	23	128	0	1	3	4
62 to 64	35	191	0	1	8	8
65 to 69	27	334	0	2	8	7
70 to 74	10	291	0	1	5	8
75 to 79	29	289	1	2	8	5
80 to 84	17	218	0	4	5	6
85 and older	30	163	1	0	7	13
Under 18	321	634	1	1	13	19
65 and older	113	1,295	2	9	33	39
Median age	33.2	53.6	42.5	70.0	57.7	52.1

POPULATION AND HOUSING CHARACTERISTICS (CHANGE 2000 - 2007)



New Housing Structure Type Definitions in 2007:

Single Family - Detached: Traditional detached single family housing units.

Single Family - Multiple Unit: Includes single family attached housing units, duplexes, townhouses, and lower density condominium developments (generally less than 12 units per acre)

Multi-Family: Apartments and higher density condominium developments (generally more than 12 units per acre)

Mobile Home and Other: Mobile homes in mobile home parks, boats, and other housing not elsewhere classified.

Source: SANDAG, Current Estimates (2007)
SANDAG
www.sandag.org

October 2007
Census Tract 190.01 Estimates
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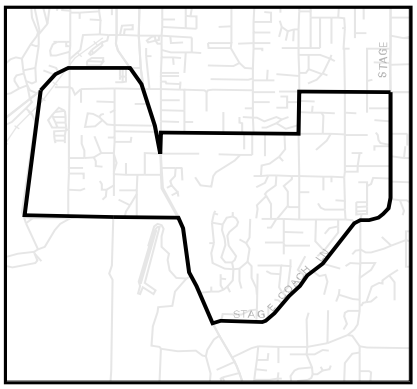
POPULATION AND HOUSING ESTIMATES
Census Tract 189.06





POPULATION AND HOUSING (2000 and 2007)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Total Population	**5,759**	**6,658**	**899**	**15.6%**
Household Population	5,728	6,617	889	15.5%
Group Quarters Population	31	41	10	32.3%
Total Housing Units	**1,839**	**2,151**	**312**	**17.0%**
Single Family - Detached	--	1,043	--	--
Single Family - Multiple-Unit	--	33	--	--
Multi-Family	--	802	--	--
Mobile Home and Other	--	273	--	--
Occupied Housing Units	**1,791**	**2,054**	**263**	**14.7%**
Single Family - Detached	--	1,011	--	--
Single Family - Multiple-Unit	--	30	--	--
Multi-Family	--	745	--	--
Mobile Home and Other	--	268	--	--
Vacancy Rate	**2.6%**	**4.5%**	**1.9%**	**73.1%**
Persons per Household	**3.20**	**3.22**	**0.02**	**0.6%**

NOTE: Starting in 2007, SANDAG will begin tracking housing structure type based on new definitions. Data for the new structure types are not comparable with information from the 2000 Census or SANDAG's Forecast. New definitions are described on page 3.

HOUSEHOLD INCOME (real 1999 dollars, adjusted for inflation)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Households by Income Category				
Less than $15,000	201	227	26	12.9%
$15,000-$29,999	512	472	-40	-7.8%
$30,000-$44,999	394	444	50	12.7%
$45,000-$59,999	232	328	96	41.4%
$60,000-$74,999	173	220	47	27.2%
$75,000-$99,999	125	200	75	60.0%
$100,000-$124,999	85	90	5	5.9%
$125,000-$149,999	36	40	4	11.1%
$150,000-$199,999	19	26	7	36.8%
$200,000 or more	14	7	-7	-50.0%
Total Households	**1,791**	**2,054**	**263**	**14.7%**
Median Household Income				
Adjusted for inflation (1999 $)	$36,948	$41,081	4,133	11.2%
Not adjusted for inflation (current $)	$36,948	$54,228	17,280	46.8%

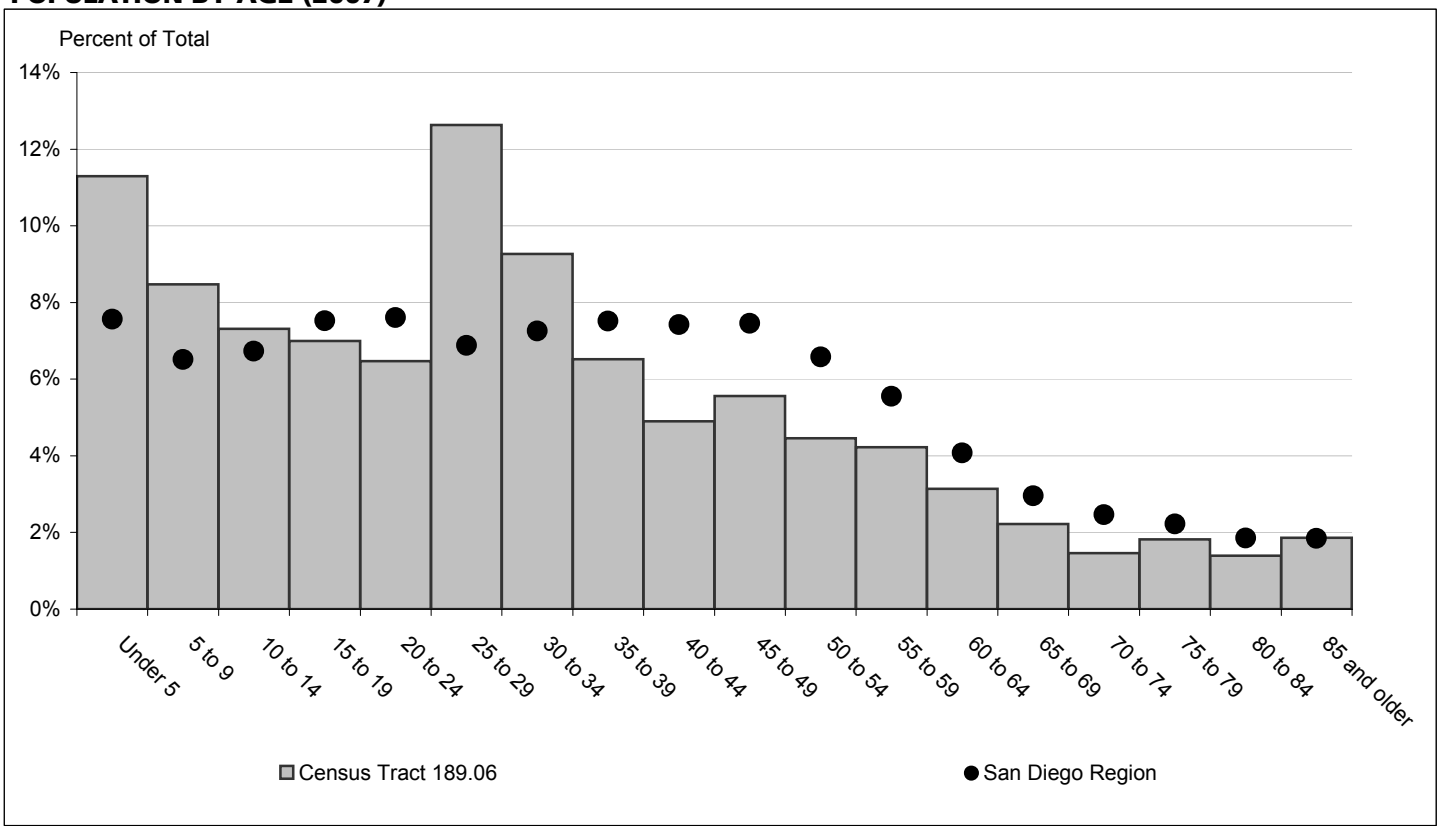
ADVISORY:

Caution should be taken when using data for small population groups, particularly at small levels of geography. Some 2000 Census data may not match information published by the U.S. Census Bureau for the following reasons: sample census data have been controlled to match 100 percent count (Summary File 1) data; and some minor adjustments were made (such as correcting the location of housing units that were erroneously allocated by the Census Bureau to roads and open space) to more accurately reflect the region's true population and housing distribution.

POPULATION BY GENDER AND AGE (2007)

	Total	Male	Female	Percent Female
Total Population	**6,658**	**3,458**	**3,200**	**48%**
Under 5	752	366	386	51%
5 to 9	564	294	270	48%
10 to 14	487	280	207	43%
15 to 17	292	142	150	51%
18 and 19	174	90	84	48%
20 to 24	431	228	203	47%
25 to 29	841	472	369	44%
30 to 34	617	345	272	44%
35 to 39	434	228	206	47%
40 to 44	326	194	132	40%
45 to 49	370	192	178	48%
50 to 54	297	132	165	56%
55 to 59	281	142	139	49%
60 and 61	93	40	53	57%
62 to 64	116	51	65	56%
65 to 69	148	71	77	52%
70 to 74	97	51	46	47%
75 to 79	121	60	61	50%
80 to 84	93	31	62	67%
85 and older	124	49	75	60%
Under 18	2,095	1,082	1,013	48%
65 and older	583	262	321	55%
Median age	28.7	28.5	29.1	-

POPULATION BY AGE (2007)



Source: SANDAG, Current Estimates (2007)
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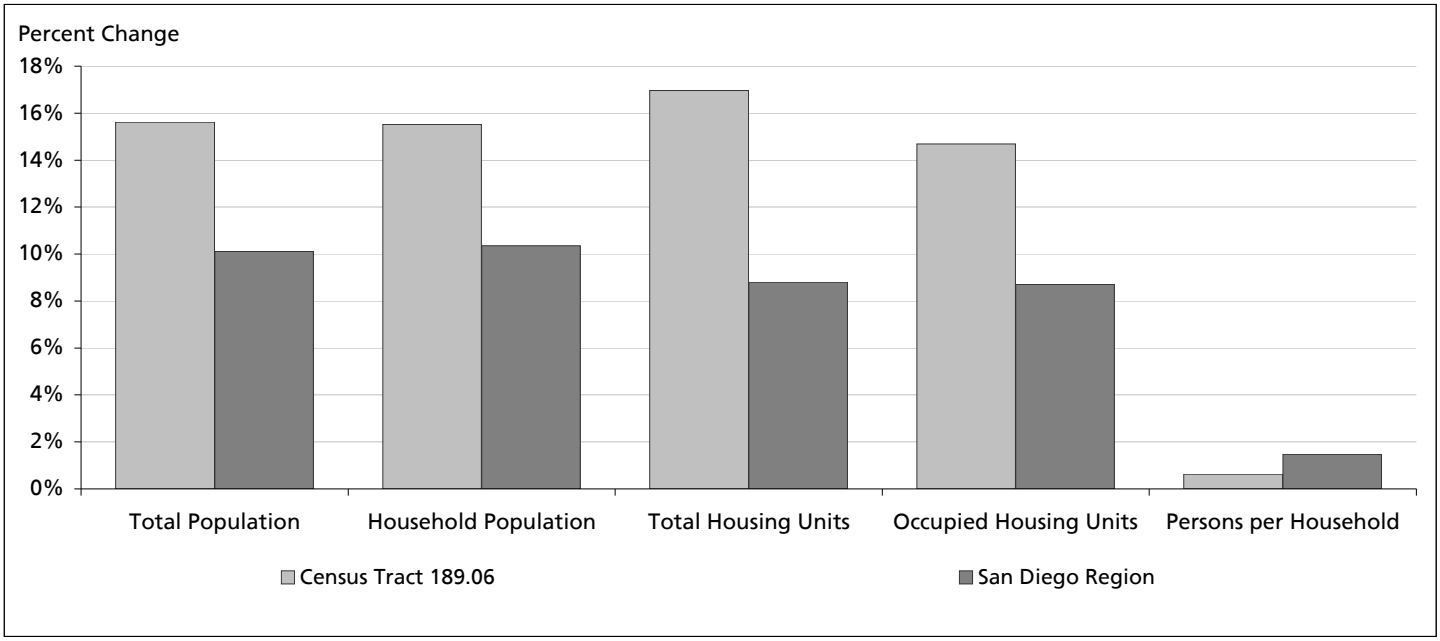
POPULATION BY RACE, ETHNICITY AND AGE (2007)

		Non-Hispanic				
	Hispanic	White	Black	American Indian	Asian & Pacific Isl.	Other
Total Population	**3,637**	**2,569**	**177**	**33**	**124**	**118**
Under 5	484	236	12	0	14	6
5 to 9	356	172	24	1	4	7
10 to 14	345	118	9	1	9	5
15 to 17	206	79	3	0	1	3
18 and 19	117	48	2	0	1	6
20 to 24	269	138	6	0	3	15
25 to 29	481	313	26	2	14	5
30 to 34	375	213	20	3	5	1
35 to 39	295	119	12	4	4	0
40 to 44	198	105	7	5	6	5
45 to 49	173	170	14	1	3	9
50 to 54	111	165	5	4	9	3
55 to 59	82	169	11	0	10	9
60 and 61	25	58	2	2	2	4
62 to 64	16	79	3	2	8	8
65 to 69	28	101	6	4	4	5
70 to 74	12	69	5	0	5	6
75 to 79	26	68	4	2	12	9
80 to 84	17	66	3	1	2	4
85 and older	21	83	3	1	8	8
Under 18	1,391	605	48	2	28	21
65 and older	104	387	21	8	31	32
Median age	25.4	34.2	31.6	47.5	46.7	48.3

POPULATION AND HOUSING CHARACTERISTICS (CHANGE 2000 - 2007)



New Housing Structure Type Definitions in 2007:

Single Family - Detached: Traditional detached single family housing units.

Single Family - Multiple Unit: Includes single family attached housing units, duplexes, townhouses, and lower density condominium developments (generally less than 12 units per acre)

Multi-Family: Apartments and higher density condominium developments (generally more than 12 units per acre)

Mobile Home and Other: Mobile homes in mobile home parks, boats, and other housing not elsewhere classified.

Source: SANDAG, Current Estimates (2007)
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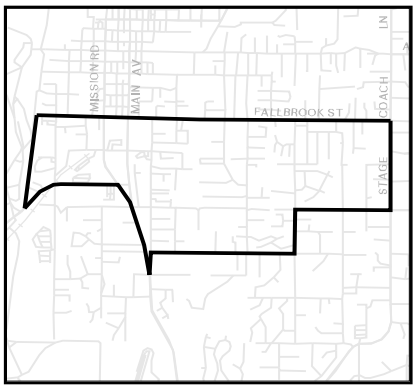
POPULATION AND HOUSING ESTIMATES
Census Tract 189.05





POPULATION AND HOUSING (2000 and 2007)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Total Population	**6,425**	**6,975**	**550**	**8.6%**
Household Population	6,414	6,919	505	7.9%
Group Quarters Population	11	56	45	409.1%
Total Housing Units	**1,895**	**2,064**	**169**	**8.9%**
Single Family - Detached	--	1,053	--	--
Single Family - Multiple-Unit	--	124	--	--
Multi-Family	--	810	--	--
Mobile Home and Other	--	77	--	--
Occupied Housing Units	**1,864**	**2,014**	**150**	**8.0%**
Single Family - Detached	--	1,046	--	--
Single Family - Multiple-Unit	--	124	--	--
Multi-Family	--	771	--	--
Mobile Home and Other	--	73	--	--
Vacancy Rate	**1.6%**	**2.4%**	**0.8%**	**50.0%**
Persons per Household	**3.44**	**3.44**	**0.00**	**0.0%**

NOTE: Starting in 2007, SANDAG will begin tracking housing structure type based on new definitions. Data for the new structure types are not comparable with information from the 2000 Census or SANDAG's Forecast. New definitions are described on page 3.

HOUSEHOLD INCOME (real 1999 dollars, adjusted for inflation)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Households by Income Category				
Less than $15,000	273	229	-44	-16.1%
$15,000-$29,999	462	451	-11	-2.4%
$30,000-$44,999	405	427	22	5.4%
$45,000-$59,999	288	321	33	11.5%
$60,000-$74,999	167	216	49	29.3%
$75,000-$99,999	140	203	63	45.0%
$100,000-$124,999	47	93	46	97.9%
$125,000-$149,999	32	41	9	28.1%
$150,000-$199,999	29	26	-3	-10.3%
$200,000 or more	21	7	-14	-66.7%
Total Households	**1,864**	**2,014**	**150**	**8.0%**
Median Household Income				
Adjusted for inflation (1999 $)	$37,296	$41,487	4,191	11.2%
Not adjusted for inflation (current $)	$37,296	$54,764	17,468	46.8%

ADVISORY:

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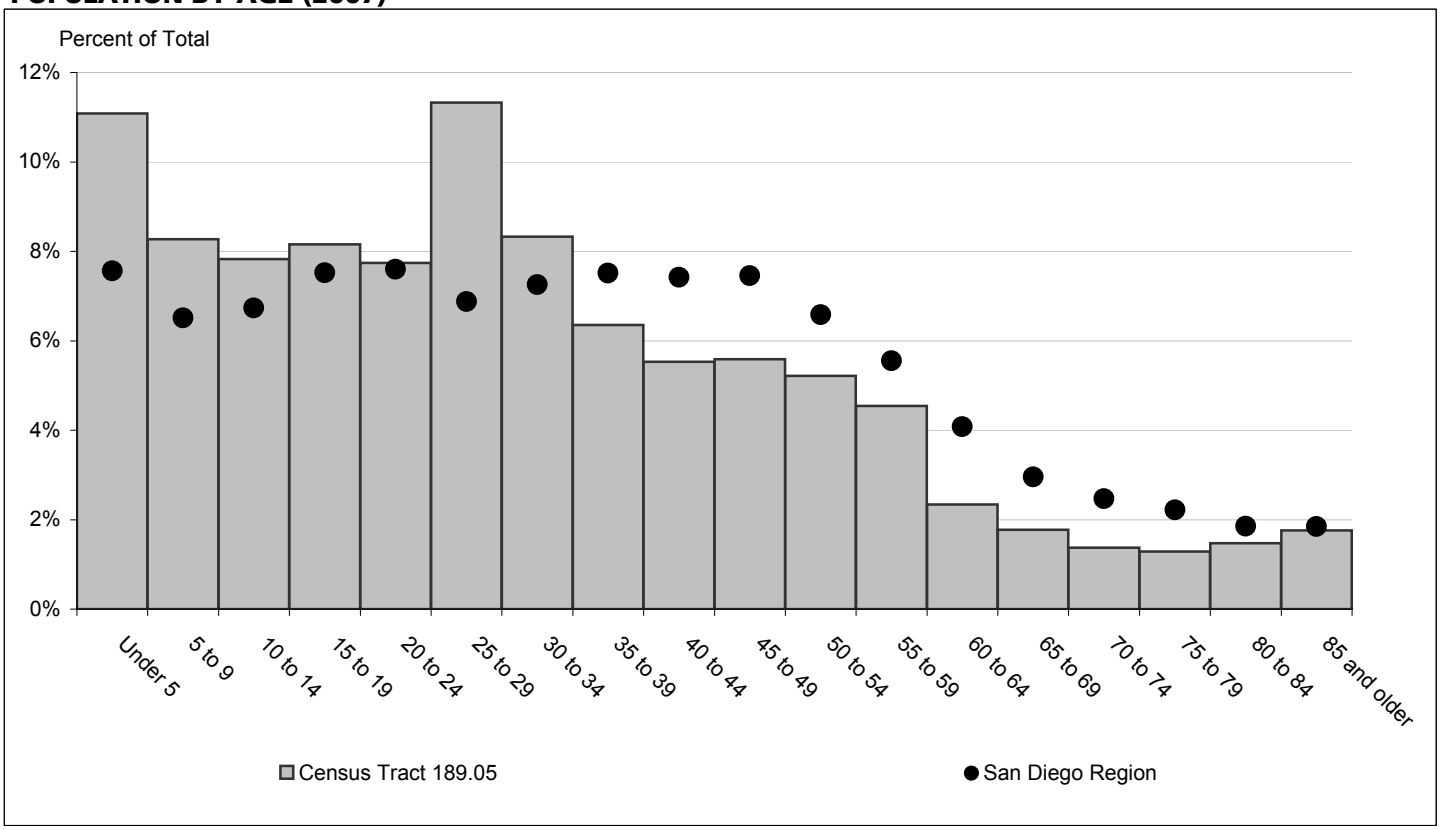
POPULATION BY GENDER AND AGE (2007)

	Total	Male	Female	Percent Female
Total Population	**6,975**	**3,566**	**3,409**	**49%**
Under 5	773	372	401	52%
5 to 9	577	289	288	50%
10 to 14	546	288	258	47%
15 to 17	339	161	178	53%
18 and 19	230	113	117	51%
20 to 24	540	284	256	47%
25 to 29	790	430	360	46%
30 to 34	581	329	252	43%
35 to 39	443	243	200	45%
40 to 44	386	224	162	42%
45 to 49	390	186	204	52%
50 to 54	364	171	193	53%
55 to 59	317	157	160	50%
60 and 61	76	45	31	41%
62 to 64	87	47	40	46%
65 to 69	124	66	58	47%
70 to 74	96	38	58	60%
75 to 79	90	33	57	63%
80 to 84	103	35	68	66%
85 and older	123	55	68	55%
Under 18	2,235	1,110	1,125	50%
65 and older	536	227	309	58%
Median age	28.1	28.2	27.9	-

POPULATION BY AGE (2007)



Source: SANDAG, Current Estimates (2007)
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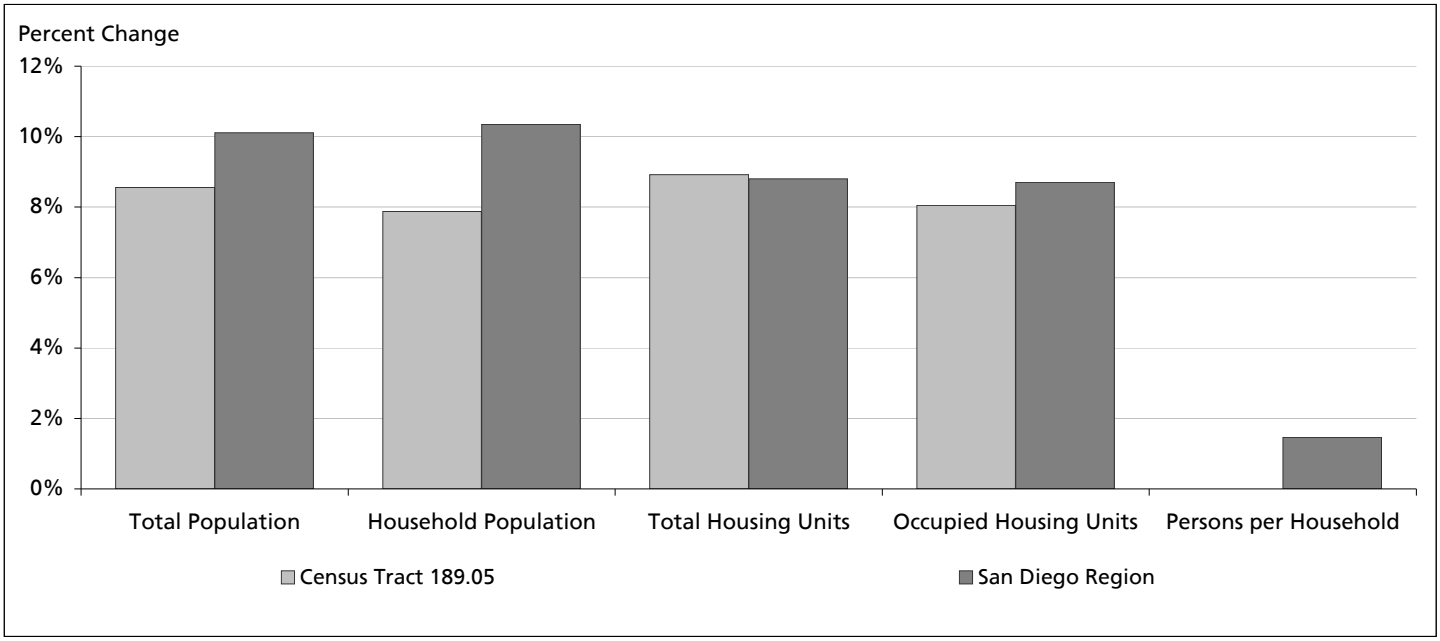
POPULATION BY RACE, ETHNICITY AND AGE (2007)

		Non-Hispanic				
	Hispanic	White	Black	American Indian	Asian & Pacific Isl.	Other
Total Population	**3,760**	**2,778**	**172**	**21**	**116**	**128**
Under 5	482	251	15	0	9	16
5 to 9	364	199	9	0	3	2
10 to 14	375	157	3	0	4	7
15 to 17	220	111	1	0	3	4
18 and 19	150	72	4	1	2	1
20 to 24	319	201	2	0	5	13
25 to 29	408	333	28	2	7	12
30 to 34	349	198	23	1	3	7
35 to 39	282	132	18	0	4	7
40 to 44	229	125	6	3	5	18
45 to 49	174	180	13	1	11	11
50 to 54	147	177	18	2	11	9
55 to 59	100	188	8	3	10	8
60 and 61	28	41	1	0	6	0
62 to 64	41	35	4	0	4	3
65 to 69	39	75	1	2	6	1
70 to 74	26	53	3	2	11	1
75 to 79	5	72	5	1	2	5
80 to 84	13	86	2	0	2	0
85 and older	9	92	8	3	8	3
Under 18	1,441	718	28	0	19	29
65 and older	92	378	19	8	29	10
Median age	24.5	31.6	35.3	55.8	50.9	36.4

POPULATION AND HOUSING CHARACTERISTICS (CHANGE 2000 - 2007)



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Single Family - Multiple Unit: Includes single family attached housing units, duplexes, townhouses, and lower density condominium developments (generally less than 12 units per acre)

Multi-Family: Apartments and higher density condominium developments (generally more than 12 units per acre)

Mobile Home and Other: Mobile homes in mobile home parks, boats, and other housing not elsewhere classified.

Source: SANDAG, Current Estimates (2007)
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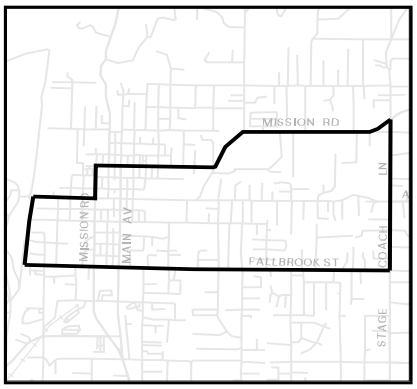
POPULATION AND HOUSING ESTIMATES
Census Tract 189.04





POPULATION AND HOUSING (2000 and 2007)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Total Population	**5,715**	**5,783**	**68**	**1.2%**
Household Population	5,525	5,553	28	0.5%
Group Quarters Population	190	230	40	21.1%
Total Housing Units	**1,863**	**1,883**	**20**	**1.1%**
Single Family - Detached	--	1,048	--	--
Single Family - Multiple-Unit	--	125	--	--
Multi-Family	--	710	--	--
Mobile Home and Other	--	0	--	--
Occupied Housing Units	**1,824**	**1,837**	**13**	**0.7%**
Single Family - Detached	--	1,041	--	--
Single Family - Multiple-Unit	--	125	--	--
Multi-Family	--	671	--	--
Mobile Home and Other	--	0	--	--
Vacancy Rate	**2.1%**	**2.4%**	**0.3%**	**14.3%**
Persons per Household	**3.03**	**3.02**	**-0.01**	**-0.3%**

NOTE: Starting in 2007, SANDAG will begin tracking housing structure type based on new definitions. Data for the new structure types are not comparable with information from the 2000 Census or SANDAG's Forecast. New definitions are described on page 3.

HOUSEHOLD INCOME (real 1999 dollars, adjusted for inflation)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Households by Income Category				
Less than $15,000	307	297	-10	-3.3%
$15,000-$29,999	434	483	49	11.3%
$30,000-$44,999	299	290	-9	-3.0%
$45,000-$59,999	302	294	-8	-2.6%
$60,000-$74,999	204	226	22	10.8%
$75,000-$99,999	185	148	-37	-20.0%
$100,000-$124,999	48	61	13	27.1%
$125,000-$149,999	13	6	-7	-53.8%
$150,000-$199,999	20	12	-8	-40.0%
$200,000 or more	12	20	8	66.7%
Total Households	**1,824**	**1,837**	**13**	**0.7%**
Median Household Income				
Adjusted for inflation (1999 $)	$38,579	$37,164	-1,415	-3.7%
Not adjusted for inflation (current $)	$38,579	$49,057	10,478	27.2%

ADVISORY:

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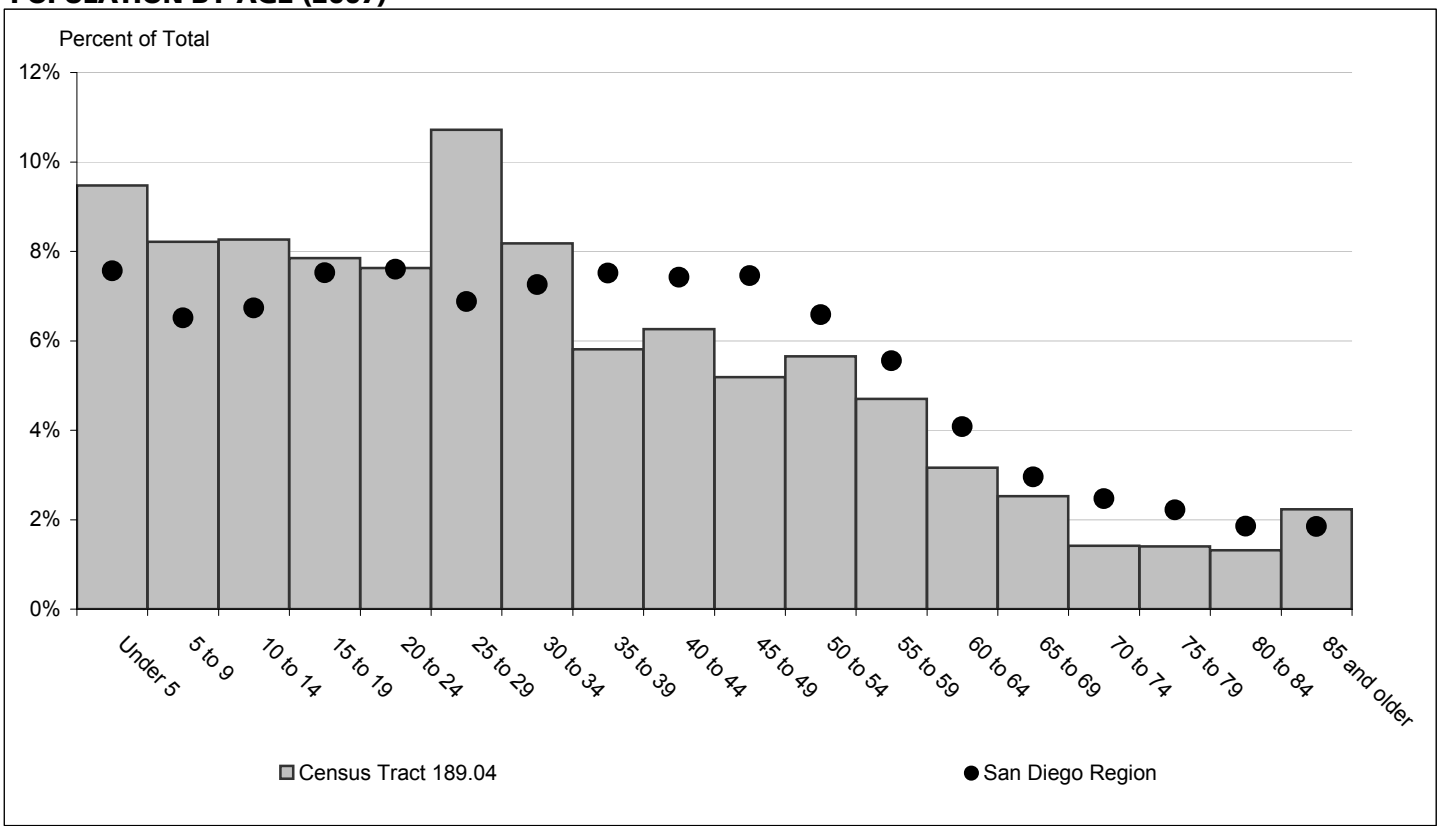
POPULATION BY GENDER AND AGE (2007)

	Total	Male	Female	Percent Female
Total Population	**5,783**	**2,881**	**2,902**	**50%**
Under 5	548	264	284	52%
5 to 9	475	242	233	49%
10 to 14	478	226	252	53%
15 to 17	252	126	126	50%
18 and 19	202	108	94	47%
20 to 24	441	239	202	46%
25 to 29	620	346	274	44%
30 to 34	473	276	197	42%
35 to 39	336	176	160	48%
40 to 44	362	172	190	52%
45 to 49	300	152	148	49%
50 to 54	327	136	191	58%
55 to 59	272	140	132	49%
60 and 61	71	29	42	59%
62 to 64	112	43	69	62%
65 to 69	146	69	77	53%
70 to 74	82	36	46	56%
75 to 79	81	36	45	56%
80 to 84	76	24	52	68%
85 and older	129	41	88	68%
Under 18	1,753	858	895	51%
65 and older	514	206	308	60%
Median age	29.0	28.4	29.7	-

POPULATION BY AGE (2007)



Source: SANDAG, Current Estimates (2007)
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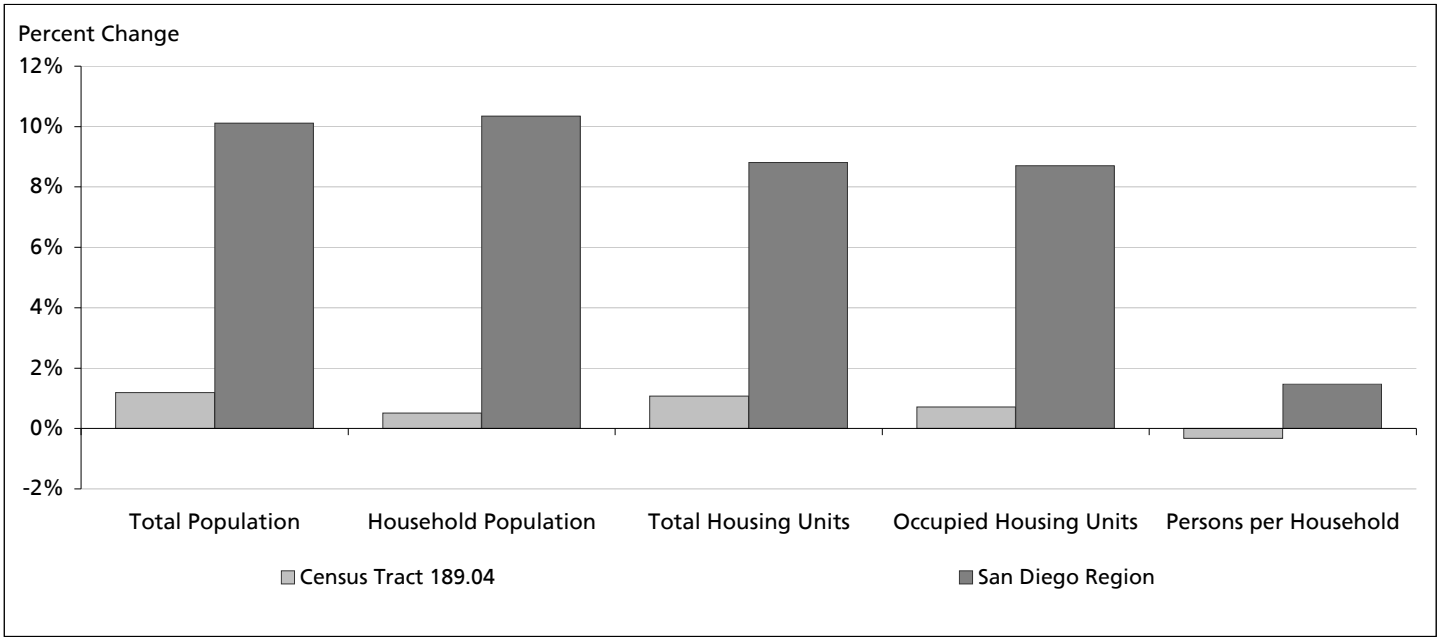
POPULATION BY RACE, ETHNICITY AND AGE (2007)

		Non-Hispanic				
	Hispanic	White	Black	American Indian	Asian & Pacific Isl.	Other
Total Population	**2,716**	**2,641**	**123**	**20**	**110**	**173**
Under 5	280	227	15	0	0	26
5 to 9	246	208	7	0	3	11
10 to 14	292	176	1	0	2	7
15 to 17	153	89	2	0	1	7
18 and 19	115	76	7	1	1	2
20 to 24	227	179	6	0	5	24
25 to 29	303	259	34	1	5	18
30 to 34	283	154	25	1	6	4
35 to 39	188	128	5	3	4	8
40 to 44	193	139	6	1	5	18
45 to 49	123	149	6	1	14	7
50 to 54	98	200	1	3	15	10
55 to 59	59	194	4	0	9	6
60 and 61	18	44	0	0	5	4
62 to 64	35	68	0	1	6	2
65 to 69	49	79	0	2	11	5
70 to 74	30	41	0	1	6	4
75 to 79	9	60	1	0	6	5
80 to 84	6	63	1	1	3	2
85 and older	9	108	2	4	3	3
Under 18	971	700	25	0	6	51
65 and older	103	351	4	8	29	19
Median age	25.7	33.5	28.5	53.3	53.0	27.6

POPULATION AND HOUSING CHARACTERISTICS (CHANGE 2000 - 2007)



New Housing Structure Type Definitions in 2007:

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Multi-Family: Apartments and higher density condominium developments (generally more than 12 units per acre)

Mobile Home and Other: Mobile homes in mobile home parks, boats, and other housing not elsewhere classified.

Source: SANDAG, Current Estimates (2007)
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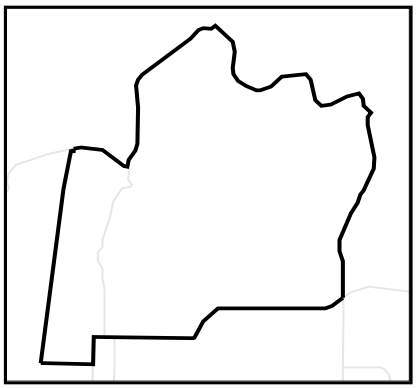
POPULATION AND HOUSING ESTIMATES
Census Tract 189.03





POPULATION AND HOUSING (2000 and 2007)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Total Population	**4,771**	**4,926**	**155**	**3.2%**
Household Population	4,729	4,829	100	2.1%
Group Quarters Population	42	97	55	131.0%
Total Housing Units	**1,668**	**1,704**	**36**	**2.2%**
Single Family - Detached	--	1,079	--	--
Single Family - Multiple-Unit	--	92	--	--
Multi-Family	--	404	--	--
Mobile Home and Other	--	129	--	--
Occupied Housing Units	**1,621**	**1,645**	**24**	**1.5%**
Single Family - Detached	--	1,066	--	--
Single Family - Multiple-Unit	--	87	--	--
Multi-Family	--	375	--	--
Mobile Home and Other	--	117	--	--
Vacancy Rate	**2.8%**	**3.5%**	**0.7%**	**25.0%**
Persons per Household	**2.92**	**2.94**	**0.02**	**0.7%**

NOTE: Starting in 2007, SANDAG will begin tracking housing structure type based on new definitions. Data for the new structure types are not comparable with information from the 2000 Census or SANDAG's Forecast. New definitions are described on page 3.

HOUSEHOLD INCOME (real 1999 dollars, adjusted for inflation)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Households by Income Category				
Less than $15,000	257	221	-36	-14.0%
$15,000-$29,999	327	303	-24	-7.3%
$30,000-$44,999	291	277	-14	-4.8%
$45,000-$59,999	230	222	-8	-3.5%
$60,000-$74,999	142	169	27	19.0%
$75,000-$99,999	138	186	48	34.8%
$100,000-$124,999	132	111	-21	-15.9%
$125,000-$149,999	71	64	-7	-9.9%
$150,000-$199,999	10	60	50	500.0%
$200,000 or more	23	32	9	39.1%
Total Households	**1,621**	**1,645**	**24**	**1.5%**
Median Household Income				
Adjusted for inflation (1999 $)	$41,675	$46,453	4,778	11.5%
Not adjusted for inflation (current $)	$41,675	$61,319	19,644	47.1%

ADVISORY:

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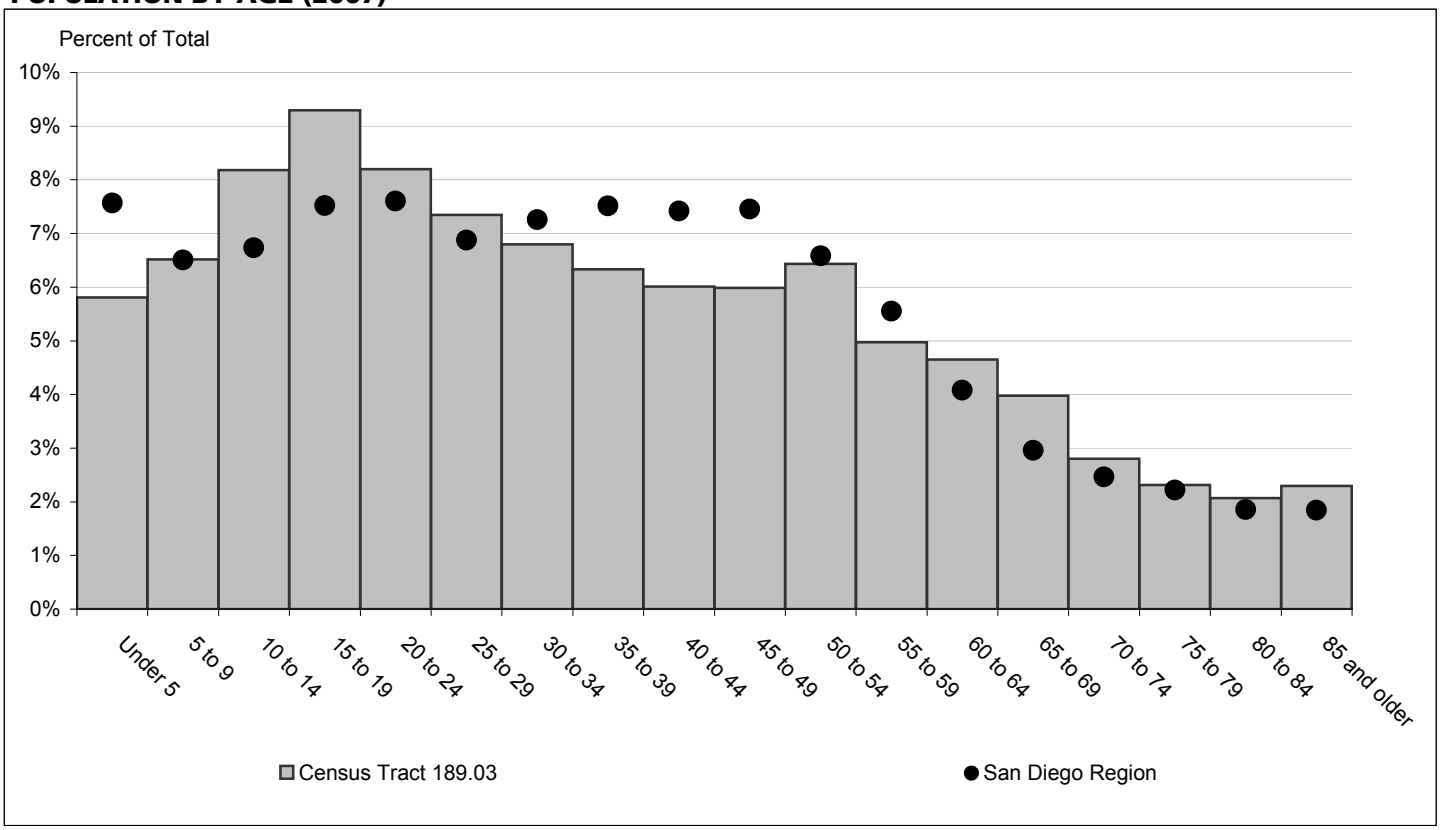
POPULATION BY GENDER AND AGE (2007)

	Total	Male	Female	Percent Female
Total Population	**4,926**	**2,418**	**2,508**	**51%**
Under 5	286	138	148	52%
5 to 9	321	159	162	50%
10 to 14	403	212	191	47%
15 to 17	288	154	134	47%
18 and 19	170	86	84	49%
20 to 24	404	195	209	52%
25 to 29	362	193	169	47%
30 to 34	335	179	156	47%
35 to 39	312	163	149	48%
40 to 44	296	141	155	52%
45 to 49	295	138	157	53%
50 to 54	317	163	154	49%
55 to 59	245	114	131	53%
60 and 61	82	48	34	41%
62 to 64	147	61	86	59%
65 to 69	196	90	106	54%
70 to 74	138	63	75	54%
75 to 79	114	50	64	56%
80 to 84	102	38	64	63%
85 and older	113	33	80	71%
Under 18	1,298	663	635	49%
65 and older	663	274	389	59%
Median age	33.4	32.0	35.0	-

POPULATION BY AGE (2007)



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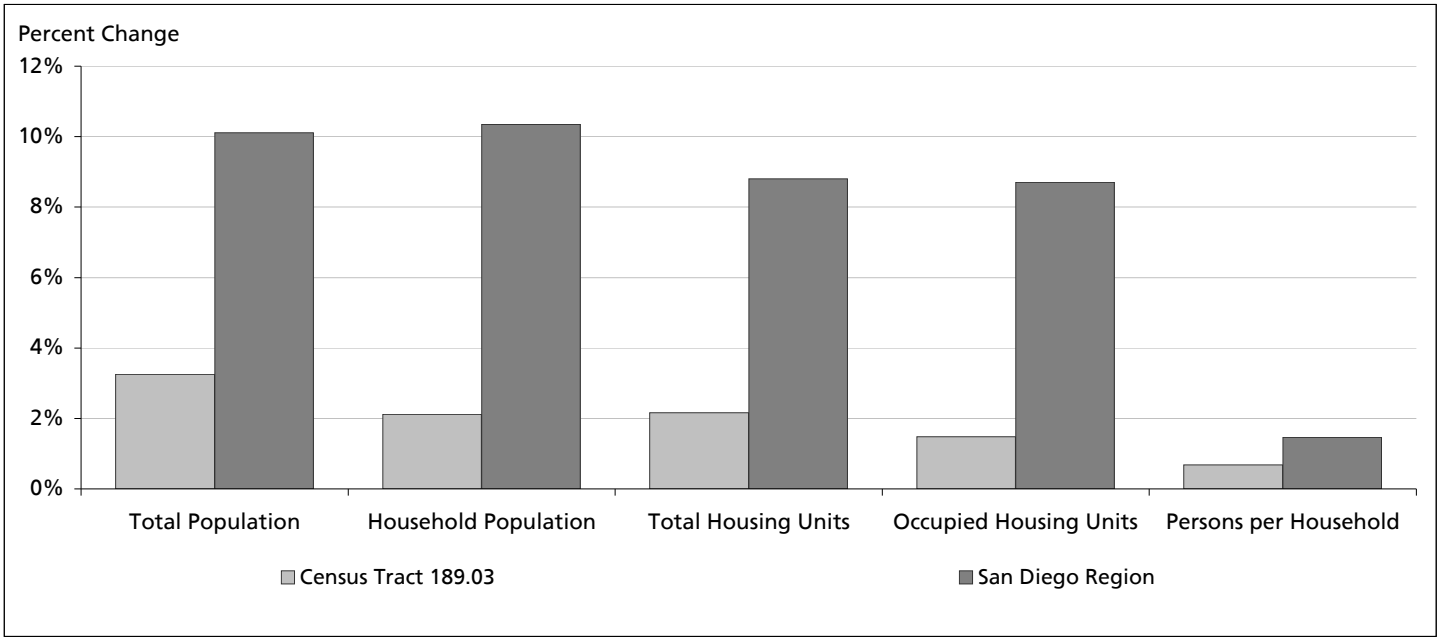
POPULATION BY RACE, ETHNICITY AND AGE (2007)

		Non-Hispanic				
	Hispanic	White	Black	American Indian	Asian & Pacific Isl.	Other
Total Population	**2,204**	**2,448**	**66**	**15**	**58**	**135**
Under 5	201	54	1	0	2	28
5 to 9	188	106	7	0	3	17
10 to 14	215	163	13	0	1	11
15 to 17	165	105	7	0	3	8
18 and 19	86	74	4	0	0	6
20 to 24	193	180	6	2	2	21
25 to 29	180	159	5	2	4	12
30 to 34	195	122	5	2	2	9
35 to 39	203	93	5	2	7	2
40 to 44	159	122	3	1	7	4
45 to 49	117	162	1	1	7	7
50 to 54	85	216	4	1	5	6
55 to 59	59	180	2	1	3	0
60 and 61	20	57	2	1	2	0
62 to 64	36	108	0	1	1	1
65 to 69	38	153	1	0	3	1
70 to 74	43	93	0	0	2	0
75 to 79	17	94	0	1	1	1
80 to 84	3	99	0	0	0	0
85 and older	1	108	0	0	3	1
Under 18	769	428	28	0	9	64
65 and older	102	547	1	1	9	3
Median age	26.5	46.4	20.8	38.8	43.6	19.1

POPULATION AND HOUSING CHARACTERISTICS (CHANGE 2000 - 2007)



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Single Family - Multiple Unit: Includes single family attached housing units, duplexes, townhouses, and lower density condominium developments (generally less than 12 units per acre)

Multi-Family: Apartments and higher density condominium developments (generally more than 12 units per acre)

Mobile Home and Other: Mobile homes in mobile home parks, boats, and other housing not elsewhere classified.

Source: SANDAG, Current Estimates (2007)
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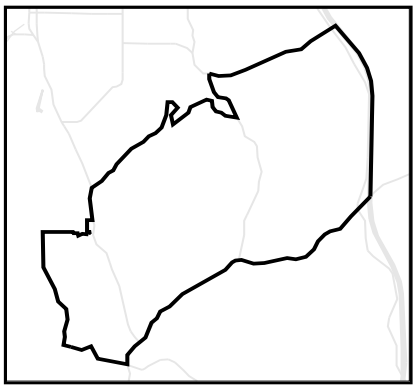
POPULATION AND HOUSING ESTIMATES
Census Tract 188.02





POPULATION AND HOUSING (2000 and 2007)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Total Population	**7,350**	**8,540**	**1,190**	**16.2%**
Household Population	7,334	8,514	1,180	16.1%
Group Quarters Population	16	26	10	62.5%
Total Housing Units	**3,077**	**3,601**	**524**	**17.0%**
Single Family - Detached	--	2,777	--	--
Single Family - Multiple-Unit	--	326	--	--
Multi-Family	--	284	--	--
Mobile Home and Other	--	214	--	--
Occupied Housing Units	**2,917**	**3,409**	**492**	**16.9%**
Single Family - Detached	--	2,683	--	--
Single Family - Multiple-Unit	--	317	--	--
Multi-Family	--	206	--	--
Mobile Home and Other	--	203	--	--
Vacancy Rate	**5.2%**	**5.3%**	**0.1%**	**1.9%**
Persons per Household	**2.51**	**2.50**	**-0.01**	**-0.4%**

NOTE: Starting in 2007, SANDAG will begin tracking housing structure type based on new definitions. Data for the new structure types are not comparable with information from the 2000 Census or SANDAG's Forecast. New definitions are described on page 3.

HOUSEHOLD INCOME (real 1999 dollars, adjusted for inflation)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Households by Income Category				
Less than $15,000	237	227	-10	-4.2%
$15,000-$29,999	308	313	5	1.6%
$30,000-$44,999	323	366	43	13.3%
$45,000-$59,999	318	371	53	16.7%
$60,000-$74,999	396	348	-48	-12.1%
$75,000-$99,999	425	493	68	16.0%
$100,000-$124,999	381	380	-1	-0.3%
$125,000-$149,999	158	278	120	75.9%
$150,000-$199,999	179	332	153	85.5%
$200,000 or more	192	301	109	56.8%
Total Households	**2,917**	**3,409**	**492**	**16.9%**
Median Household Income				
Adjusted for inflation (1999 $)	$70,322	$79,031	8,709	12.4%
Not adjusted for inflation (current $)	$70,322	$104,323	34,001	48.4%

ADVISORY:

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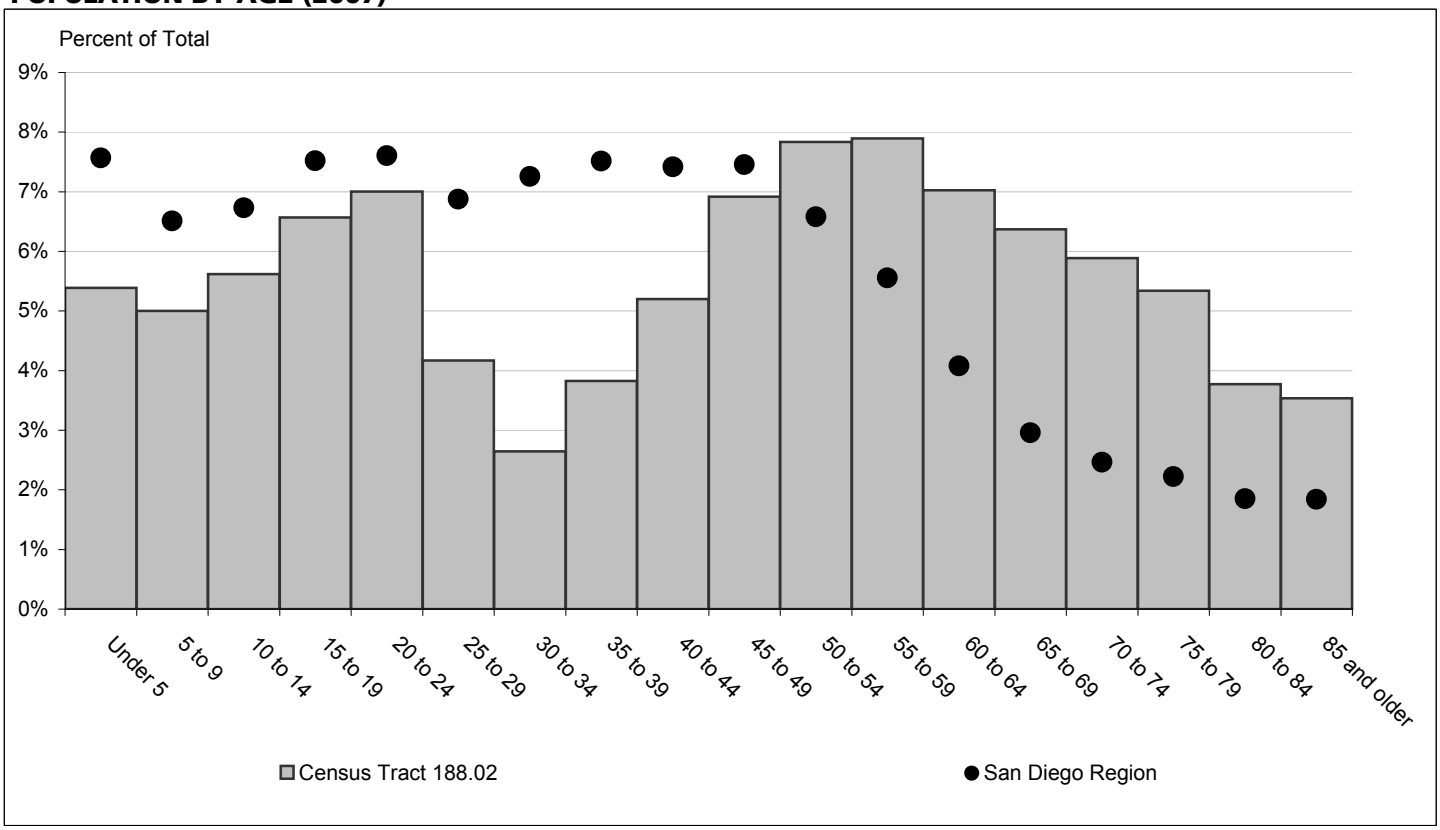
POPULATION BY GENDER AND AGE (2007)

	Total	Male	Female	Percent Female
Total Population	**8,540**	**4,122**	**4,418**	**52%**
Under 5	460	219	241	52%
5 to 9	427	212	215	50%
10 to 14	480	232	248	52%
15 to 17	349	172	177	51%
18 and 19	212	114	98	46%
20 to 24	598	317	281	47%
25 to 29	356	186	170	48%
30 to 34	226	122	104	46%
35 to 39	327	148	179	55%
40 to 44	444	212	232	52%
45 to 49	591	267	324	55%
50 to 54	669	311	358	54%
55 to 59	674	323	351	52%
60 and 61	276	119	157	57%
62 to 64	324	164	160	49%
65 to 69	544	260	284	52%
70 to 74	503	271	232	46%
75 to 79	456	215	241	53%
80 to 84	322	165	157	49%
85 and older	302	93	209	69%
Under 18	1,716	835	881	51%
65 and older	2,127	1,004	1,123	53%
Median age	48.3	47.4	49.1	-

POPULATION BY AGE (2007)



Source: SANDAG, Current Estimates (2007)
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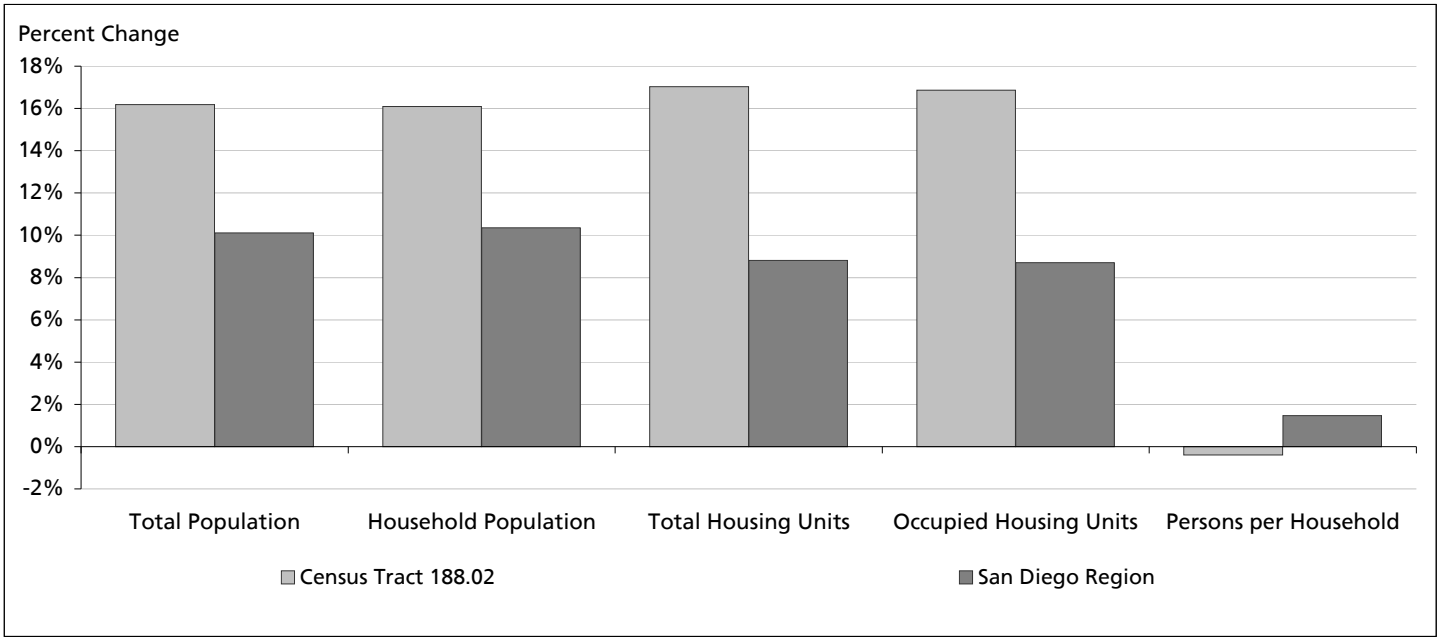
POPULATION BY RACE, ETHNICITY AND AGE (2007)

		Non-Hispanic				
	Hispanic	White	Black	American Indian	Asian & Pacific Isl.	Other
Total Population	**901**	**7,260**	**38**	**35**	**187**	**119**
Under 5	102	305	8	0	20	25
5 to 9	75	288	14	5	13	32
10 to 14	71	361	8	7	12	21
15 to 17	44	289	0	1	8	7
18 and 19	19	176	0	3	4	10
20 to 24	81	484	3	1	19	10
25 to 29	62	272	1	3	15	3
30 to 34	72	136	0	2	14	2
35 to 39	78	231	1	2	15	0
40 to 44	76	351	1	3	12	1
45 to 49	57	515	1	2	14	2
50 to 54	38	618	0	0	10	3
55 to 59	51	613	0	1	9	0
60 and 61	15	261	0	0	0	0
62 to 64	5	316	0	0	3	0
65 to 69	10	528	0	2	3	1
70 to 74	30	462	1	1	7	2
75 to 79	10	439	0	0	7	0
80 to 84	3	319	0	0	0	0
85 and older	2	296	0	2	2	0
Under 18	292	1,243	30	13	53	85
65 and older	55	2,044	1	5	19	3
Median age	29.7	51.8	8.9	25.8	30.9	10.6

POPULATION AND HOUSING CHARACTERISTICS (CHANGE 2000 - 2007)



New Housing Structure Type Definitions in 2007:

Single Family - Detached: Traditional detached single family housing units.

Single Family - Multiple Unit: Includes single family attached housing units, duplexes, townhouses, and lower density condominium developments (generally less than 12 units per acre)

Multi-Family: Apartments and higher density condominium developments (generally more than 12 units per acre)

Mobile Home and Other: Mobile homes in mobile home parks, boats, and other housing not elsewhere classified.

Source: SANDAG, Current Estimates (2007)
SANDAG
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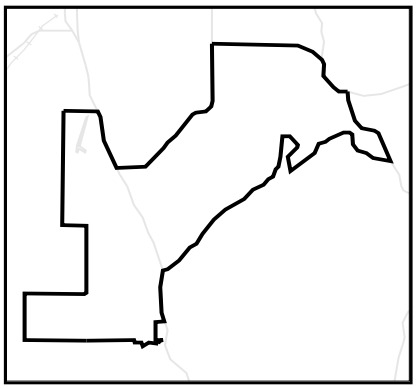
POPULATION AND HOUSING ESTIMATES
Census Tract 188.01





POPULATION AND HOUSING (2000 and 2007)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Total Population	**3,180**	**3,701**	**521**	**16.4%**
Household Population	3,175	3,687	512	16.1%
Group Quarters Population	5	14	9	180.0%
Total Housing Units	**1,154**	**1,343**	**189**	**16.4%**
Single Family - Detached	--	1,235	--	--
Single Family - Multiple-Unit	--	18	--	--
Multi-Family	--	90	--	--
Mobile Home and Other	--	0	--	--
Occupied Housing Units	**1,114**	**1,300**	**186**	**16.7%**
Single Family - Detached	--	1,212	--	--
Single Family - Multiple-Unit	--	14	--	--
Multi-Family	--	74	--	--
Mobile Home and Other	--	0	--	--
Vacancy Rate	**3.5%**	**3.2%**	**-0.3%**	**-8.6%**
Persons per Household	**2.85**	**2.84**	**-0.01**	**-0.4%**

NOTE: Starting in 2007, SANDAG will begin tracking housing structure type based on new definitions. Data for the new structure types are not comparable with information from the 2000 Census or SANDAG's Forecast. New definitions are described on page 3.

HOUSEHOLD INCOME (real 1999 dollars, adjusted for inflation)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Households by Income Category				
Less than $15,000	138	150	12	8.7%
$15,000-$29,999	66	78	12	18.2%
$30,000-$44,999	89	101	12	13.5%
$45,000-$59,999	124	143	19	15.3%
$60,000-$74,999	148	191	43	29.1%
$75,000-$99,999	242	229	-13	-5.4%
$100,000-$124,999	132	193	61	46.2%
$125,000-$149,999	59	77	18	30.5%
$150,000-$199,999	80	64	-16	-20.0%
$200,000 or more	36	74	38	105.6%
Total Households	**1,114**	**1,300**	**186**	**16.7%**
Median Household Income				
Adjusted for inflation (1999 $)	$74,189	$73,979	-210	-0.3%
Not adjusted for inflation (current $)	$74,189	$97,654	23,465	31.6%

ADVISORY:

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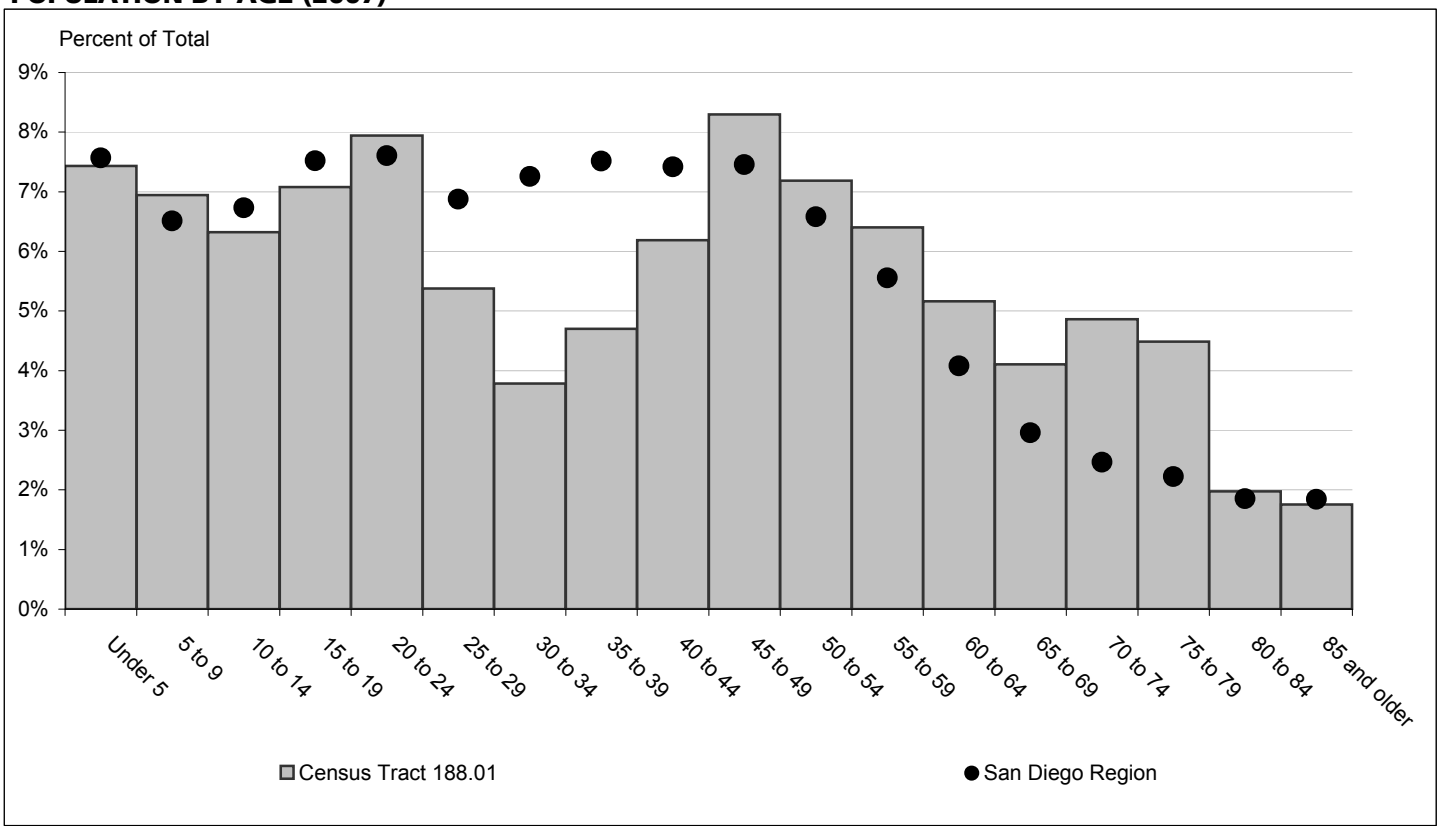
POPULATION BY GENDER AND AGE (2007)

	Total	Male	Female	Percent Female
Total Population	**3,701**	**1,868**	**1,833**	**50%**
Under 5	275	138	137	50%
5 to 9	257	129	128	50%
10 to 14	234	130	104	44%
15 to 17	150	72	78	52%
18 and 19	112	53	59	53%
20 to 24	294	157	137	47%
25 to 29	199	115	84	42%
30 to 34	140	79	61	44%
35 to 39	174	79	95	55%
40 to 44	229	104	125	55%
45 to 49	307	144	163	53%
50 to 54	266	127	139	52%
55 to 59	237	117	120	51%
60 and 61	76	31	45	59%
62 to 64	115	57	58	50%
65 to 69	152	74	78	51%
70 to 74	180	94	86	48%
75 to 79	166	92	74	45%
80 to 84	73	42	31	42%
85 and older	65	34	31	48%
Under 18	916	469	447	49%
65 and older	636	336	300	47%
Median age	40.3	38.9	41.3	-

POPULATION BY AGE (2007)



Source: SANDAG, Current Estimates (2007)
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www.sandag.org

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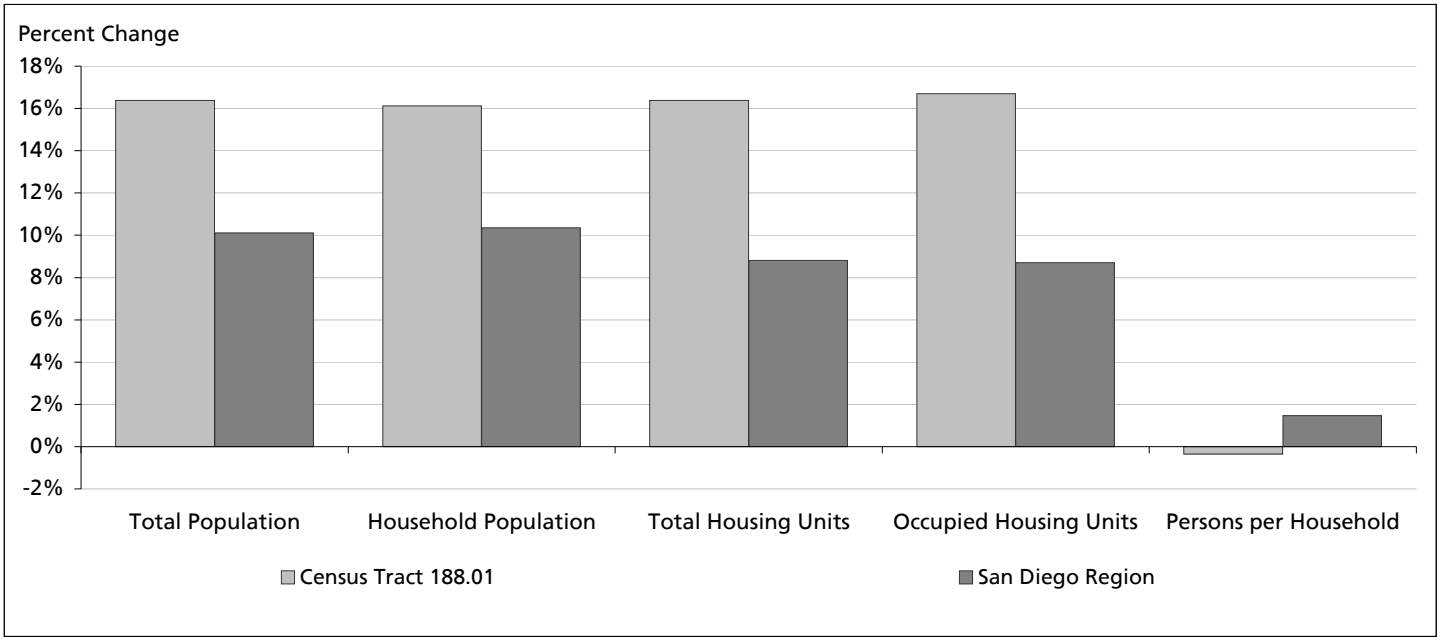
POPULATION BY RACE, ETHNICITY AND AGE (2007)

		Non-Hispanic				
	Hispanic	White	Black	American Indian	Asian & Pacific Isl.	Other
Total Population	**606**	**2,874**	**15**	**22**	**97**	**87**
Under 5	83	147	7	0	19	19
5 to 9	57	147	0	12	12	29
10 to 14	59	146	4	5	10	10
15 to 17	34	100	0	0	8	8
18 and 19	25	82	0	1	0	4
20 to 24	47	231	0	0	13	3
25 to 29	65	127	2	0	4	1
30 to 34	51	78	0	0	8	3
35 to 39	61	111	0	0	2	0
40 to 44	32	195	0	0	1	1
45 to 49	29	269	0	1	6	2
50 to 54	27	235	0	0	2	2
55 to 59	10	221	0	2	3	1
60 and 61	1	75	0	0	0	0
62 to 64	1	114	0	0	0	0
65 to 69	4	146	0	0	1	1
70 to 74	8	165	1	1	4	1
75 to 79	9	153	1	0	3	0
80 to 84	3	67	0	0	1	2
85 and older	0	65	0	0	0	0
Under 18	233	540	11	17	49	66
65 and older	24	596	2	1	9	4
Median age	24.8	46.4	10.6	9.6	19.7	9.2

POPULATION AND HOUSING CHARACTERISTICS (CHANGE 2000 - 2007)



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Multi-Family: Apartments and higher density condominium developments (generally more than 12 units per acre)

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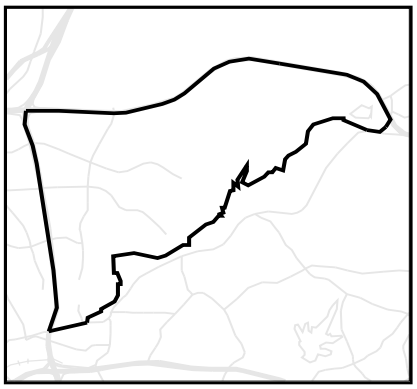
POPULATION AND HOUSING ESTIMATES

Tierrasanta Community Planning Area

City of San Diego





POPULATION AND HOUSING (2000 and 2007)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Total Population	**30,430**	**29,218**	**-1,212**	**-4.0%**
Household Population	30,416	29,196	-1,220	-4.0%
Group Quarters Population	14	22	8	57.1%
Total Housing Units	**11,069**	**11,432**	**363**	**3.3%**
Single Family - Detached	--	4,725	--	--
Single Family - Multiple-Unit	--	3,777	--	--
Multi-Family	--	2,930	--	--
Mobile Home and Other	--	0	--	--
Occupied Housing Units	**10,635**	**10,989**	**354**	**3.3%**
Single Family - Detached	--	4,661	--	--
Single Family - Multiple-Unit	--	3,651	--	--
Multi-Family	--	2,677	--	--
Mobile Home and Other	--	0	--	--
Vacancy Rate	**3.9%**	**3.9%**	**0.0%**	**0.0%**
Persons per Household	**2.86**	**2.66**	**-0.20**	**-7.0%**

NOTE: Starting in 2007, SANDAG will begin tracking housing structure type based on new definitions. Data for the new structure types are not comparable with information from the 2000 Census or SANDAG's Forecast. New definitions are described on page 3.

HOUSEHOLD INCOME (real 1999 dollars, adjusted for inflation)

	April 1 2000 Census	January 1 2007	2000 to 2007 Change Numeric	Percent
Households by Income Category				
Less than $15,000	556	533	-23	-4.1%
$15,000-$29,999	1,238	1,218	-20	-1.6%
$30,000-$44,999	1,945	1,979	34	1.7%
$45,000-$59,999	1,719	1,708	-11	-0.6%
$60,000-$74,999	1,489	1,757	268	18.0%
$75,000-$99,999	1,279	1,396	117	9.1%
$100,000-$124,999	1,081	1,013	-68	-6.3%
$125,000-$149,999	510	495	-15	-2.9%
$150,000-$199,999	538	558	20	3.7%
$200,000 or more	280	332	52	18.6%
Total Households	**10,635**	**10,989**	**354**	**3.3%**
Median Household Income				
Adjusted for inflation (1999 $)	$58,774	$60,482	1,708	2.9%
Not adjusted for inflation (current $)	$58,774	$79,838	21,064	35.8%

ADVISORY:

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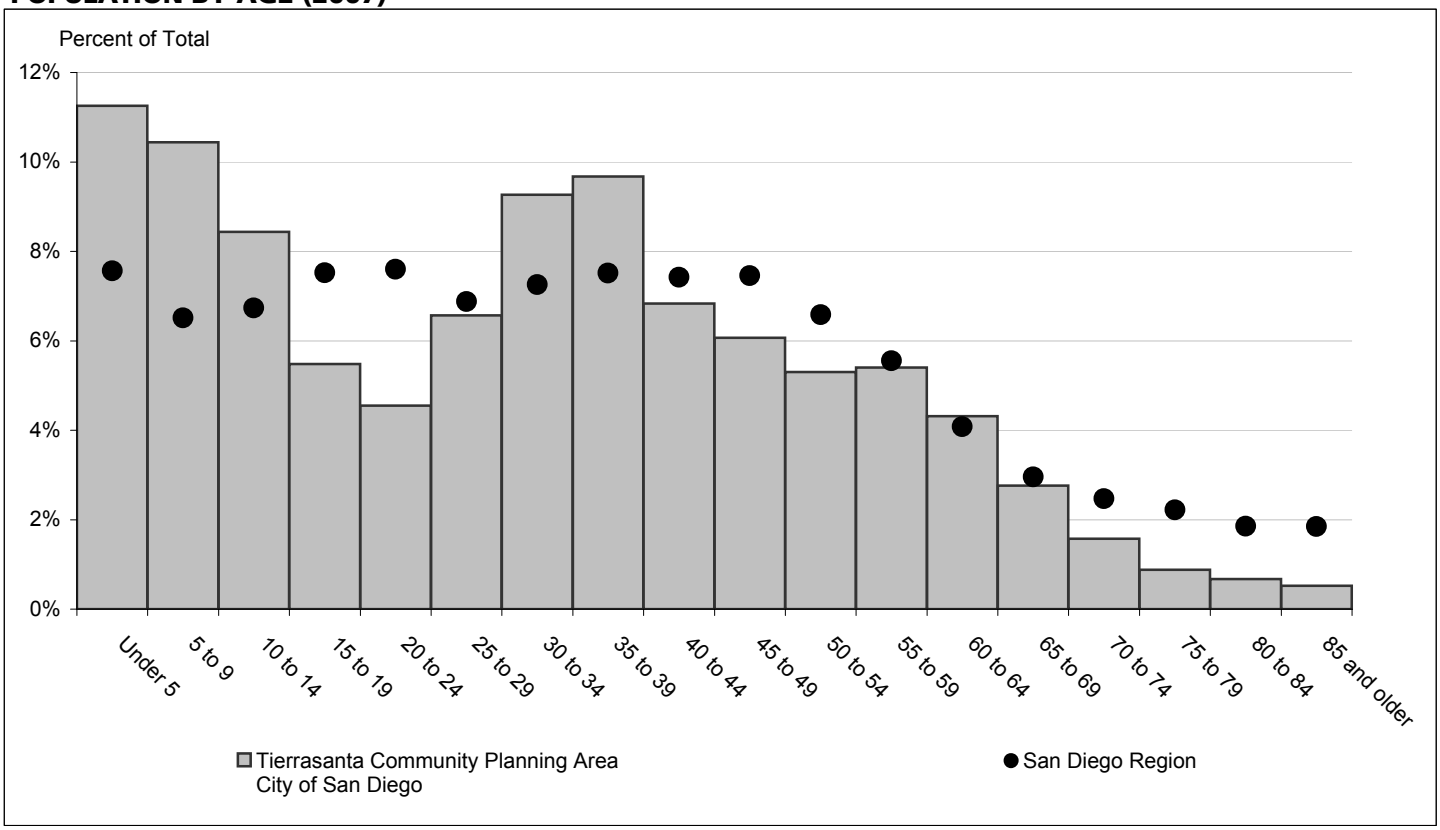
POPULATION BY GENDER AND AGE (2007)

	Total	Male	Female	Percent Female
Total Population	**29,218**	**14,388**	**14,830**	**51%**
Under 5	3,289	1,688	1,601	49%
5 to 9	3,051	1,539	1,512	50%
10 to 14	2,465	1,231	1,234	50%
15 to 17	1,073	501	572	53%
18 and 19	528	280	248	47%
20 to 24	1,329	677	652	49%
25 to 29	1,920	929	991	52%
30 to 34	2,707	1,377	1,330	49%
35 to 39	2,826	1,413	1,413	50%
40 to 44	1,996	1,008	988	49%
45 to 49	1,772	878	894	50%
50 to 54	1,550	698	852	55%
55 to 59	1,579	688	891	56%
60 and 61	554	258	296	53%
62 to 64	707	332	375	53%
65 to 69	806	387	419	52%
70 to 74	460	238	222	48%
75 to 79	258	134	124	48%
80 to 84	196	73	123	63%
85 and older	152	59	93	61%
Under 18	9,878	4,959	4,919	50%
65 and older	1,872	891	981	52%
Median age	31.8	31.3	32.3	-

POPULATION BY AGE (2007)



Source: SANDAG, Current Estimates (2007)
SANDAG
www.sandag.org

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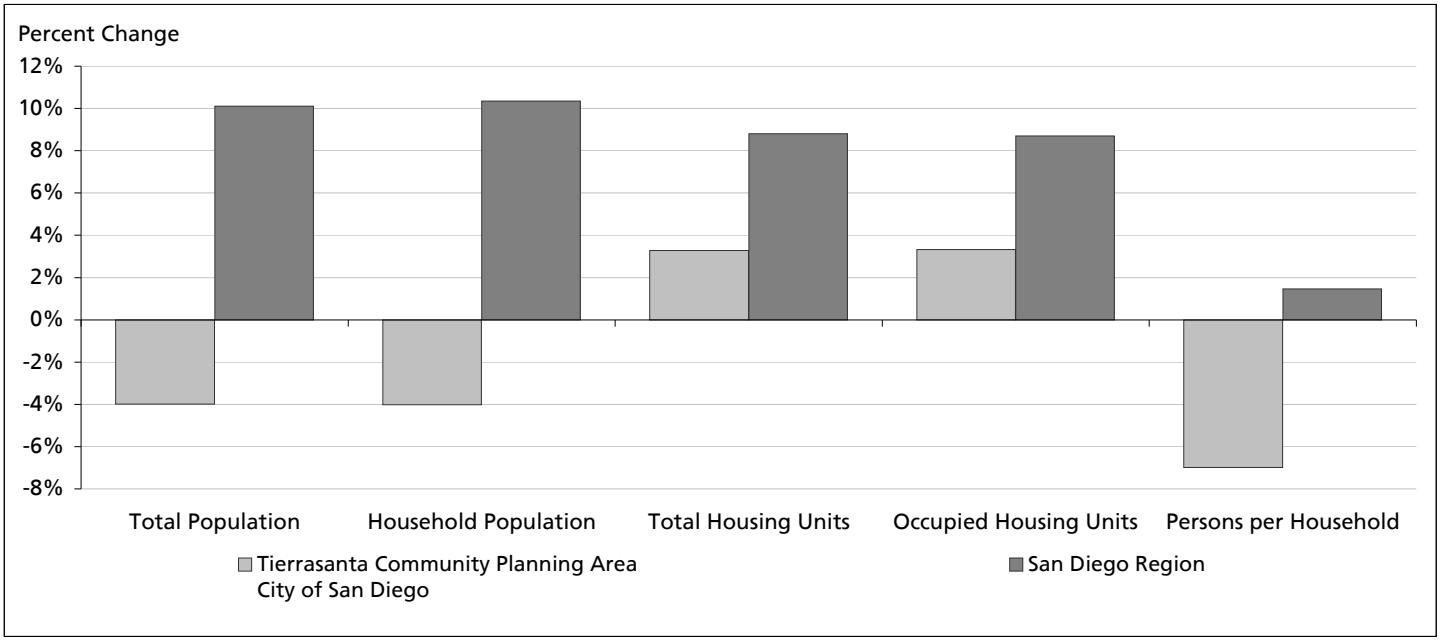
POPULATION BY RACE, ETHNICITY AND AGE (2007)

		Non-Hispanic				
	Hispanic	White	Black	American Indian	Asian & Pacific Isl.	Other
Total Population	**3,107**	**19,563**	**2,145**	**80**	**3,086**	**1,237**
Under 5	548	1,894	296	11	277	263
5 to 9	445	1,733	314	6	246	307
10 to 14	376	1,309	329	7	207	237
15 to 17	138	616	116	4	115	84
18 and 19	75	322	42	2	46	41
20 to 24	199	800	76	6	181	67
25 to 29	323	1,113	166	9	238	71
30 to 34	346	1,728	245	11	321	56
35 to 39	284	1,832	280	11	383	36
40 to 44	91	1,480	128	7	274	16
45 to 49	72	1,396	63	1	223	17
50 to 54	68	1,253	31	0	190	8
55 to 59	54	1,355	22	2	140	6
60 and 61	4	505	3	0	42	0
62 to 64	18	628	2	0	52	7
65 to 69	31	703	10	2	57	3
70 to 74	23	359	15	0	52	11
75 to 79	7	221	4	0	22	4
80 to 84	3	177	1	0	12	3
85 and older	2	139	2	1	8	0
Under 18	1,507	5,552	1,055	28	845	891
65 and older	66	1,599	32	3	151	21
Median age	19.2	35.7	18.8	27.2	33.6	11.0

POPULATION AND HOUSING CHARACTERISTICS (CHANGE 2000 - 2007)



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Multi-Family: Apartments and higher density condominium developments (generally more than 12 units per acre)

Mobile Home and Other: Mobile homes in mobile home parks, boats, and other housing not elsewhere classified.

Source: SANDAG, Current Estimates (2007)
SANDAG
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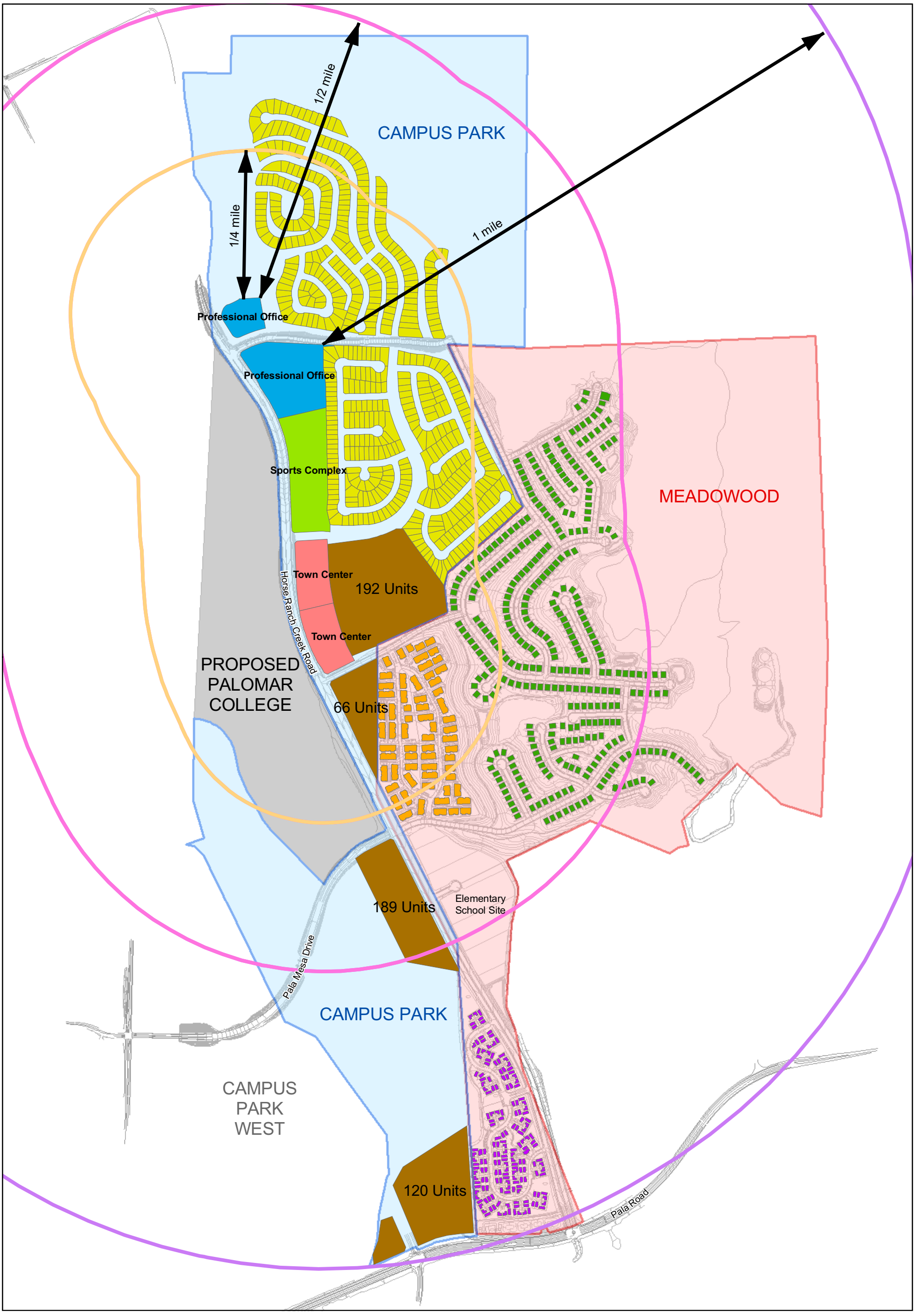
ATTACHMENT C

GIS MAP SHOWING ¼, ½, AND 1 MILE BUFFERS AROUND SHOPS, OFFICES, AND RETAIL USES



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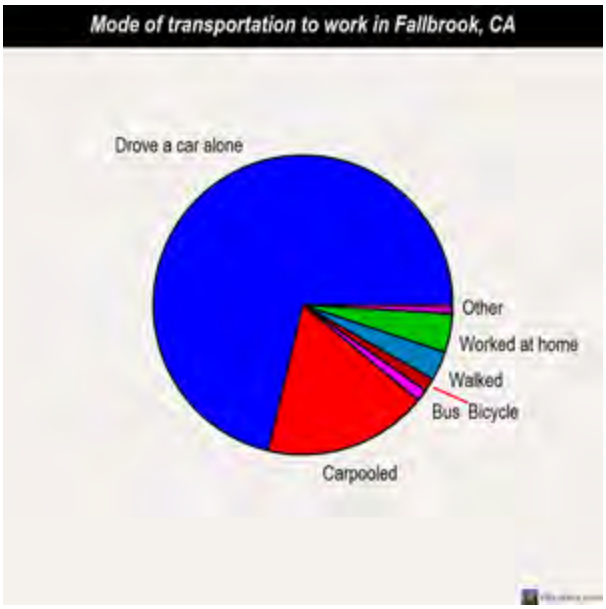
ATTACHMENT D

FALLBROOK SURVEY RESULTS



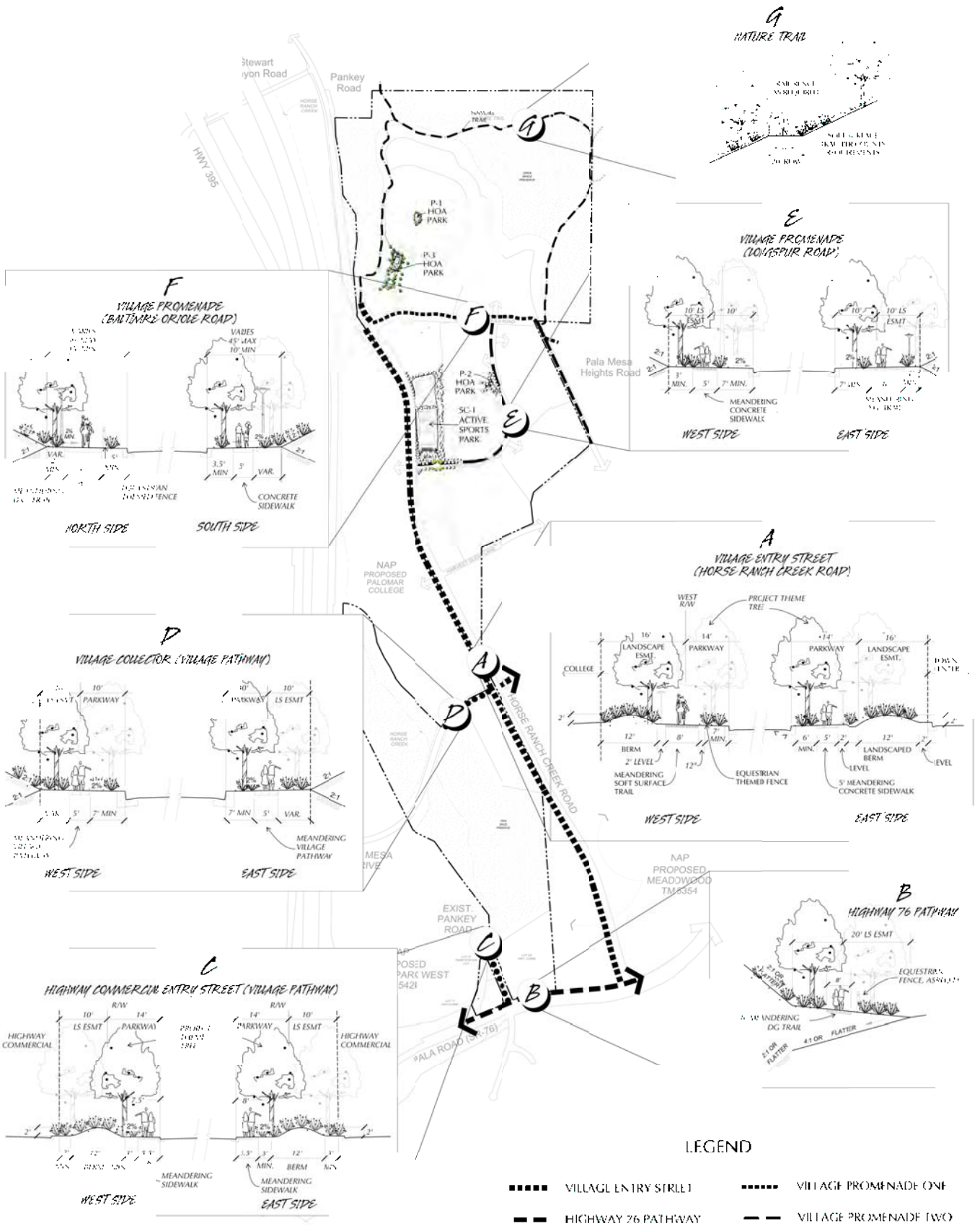
Means of transportation to work

- Drove a car alone: 8,583 (71%)
- Carpooled: 2,136 (18%)
- Bus or trolley bus: 156 (1%)
- Streetcar or trolley car: 12 (0%)
- Railroad: 7 (0%)
- Taxi: 8 (0%)
- Motorcycle: 31 (0%)
- Bicycle: 175 (1%)
- Walked: 377 (3%)
- Other means: 56 (0%)
- Worked at home: 503 (4%)

Source: http://www.city-data.com/housing/houses-Fallbrook-California.html

ATTACHMENT E

CAMPUS PARK AND MEADOWOOD TRAIL EXHIBITS



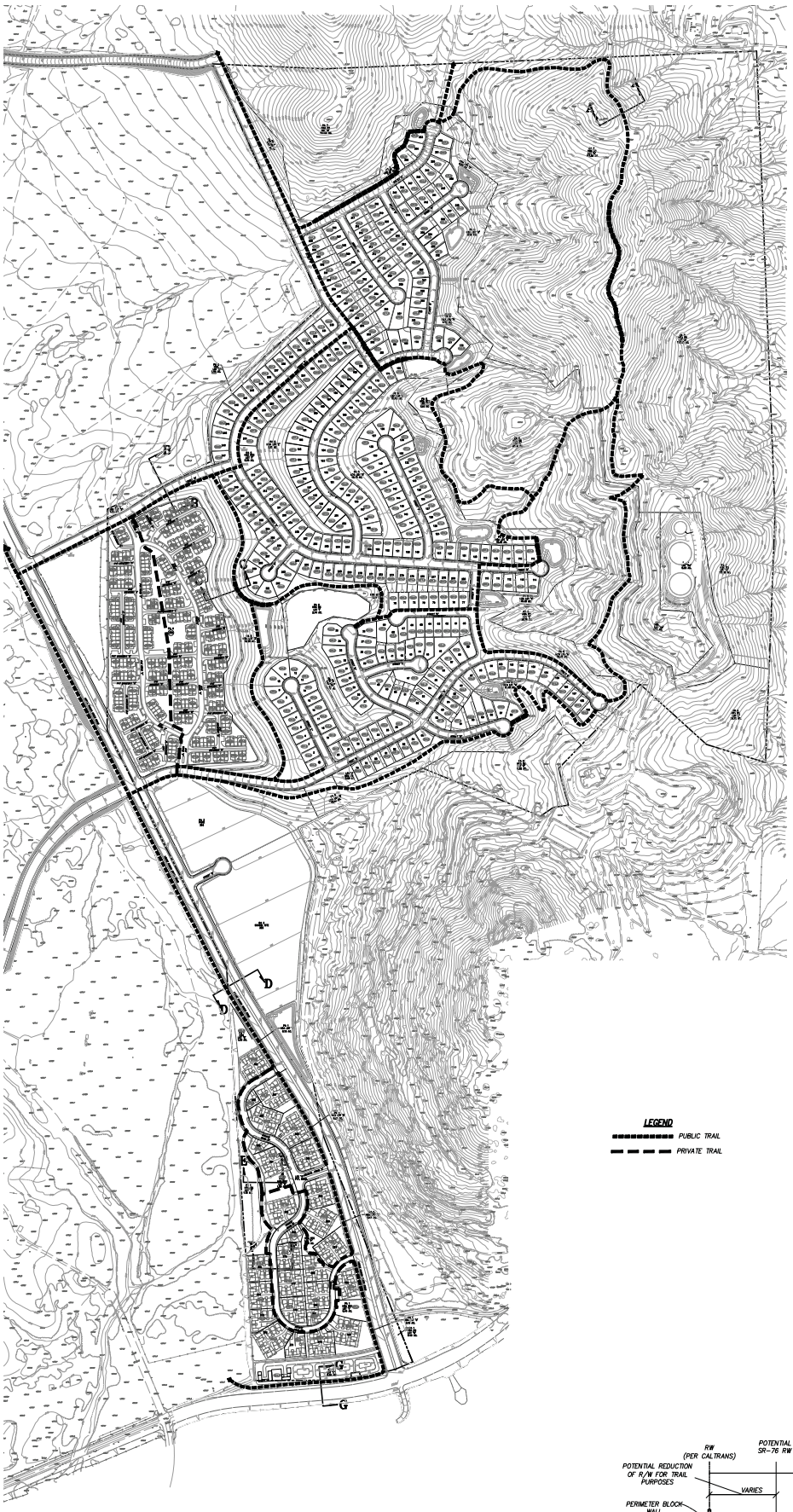
Note: This concept plan for illustration purposes only. Actual site development may vary from concepts depicted on this exhibit.

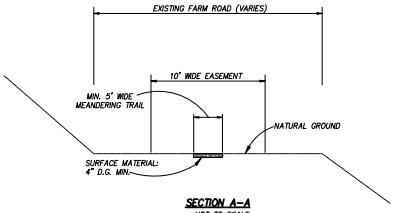
TRAILS, OPEN SPACE, AND PARKS CONCEPT

CAMPUS PARK - FALLBROOK CALIFORNIA

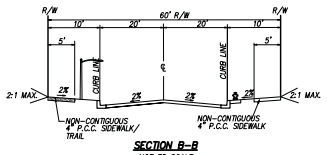
TRAIL EXHIBIT

MEADOWOOD

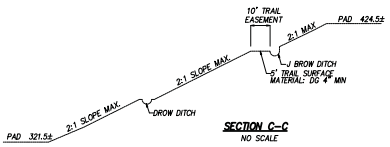




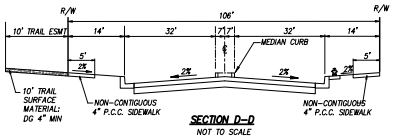
SECTION A–A
NOT TO SCALE
NOTE: ALL TRAILS MULTI–USE AND NON–MOTORIZED



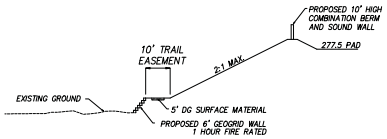
SECTION B–B
NOT TO SCALE



SECTION C–C
NO SCALE

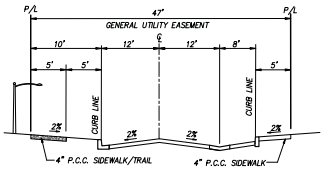


SECTION D–D
NOT TO SCALE



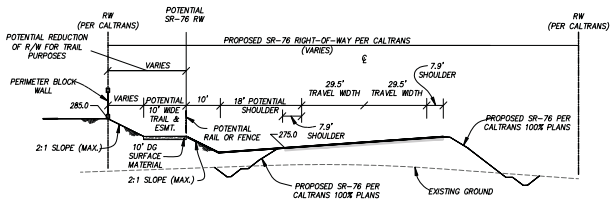
SECTION E–E
NOT TO SCALE

LEGEND
PUBLIC TRAIL
PRIVATE TRAIL



PARALLEL PARKING ONE SIDE (WHERE OCCURS)

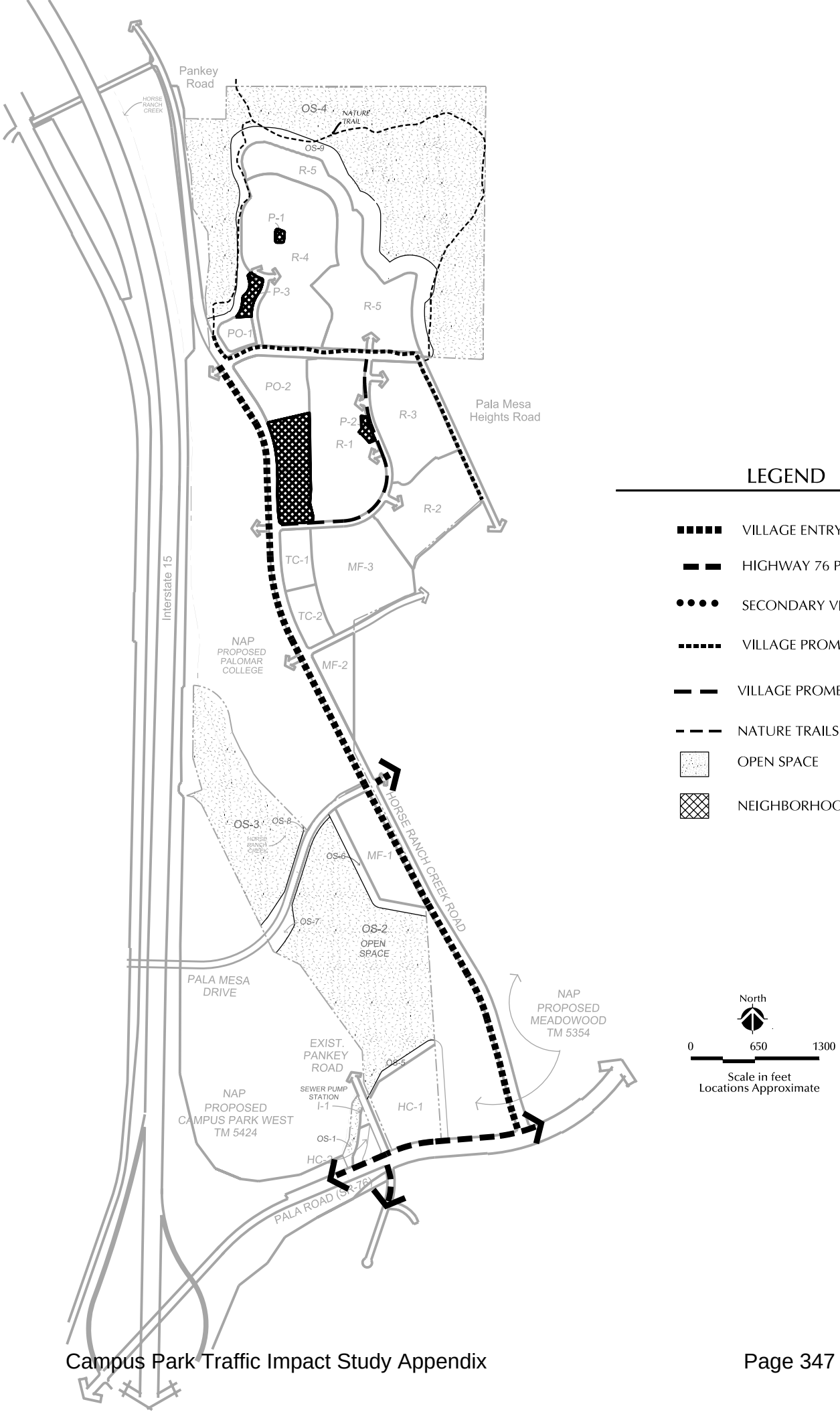
SECTION F–F
NOT TO SCALE



SECTION G–G
NOT TO SCALE

PREPARED BY:
Latitude 33
Planning and Engineering
4933 Paramount Drive, Suite C
San Diego, CA 92123
Tel 858–751–0633 Fax 858–751–0634

SCALE: 1" = 300'


Pankey Road
HORSE RANCH CREEK
OS-4
NATURE TRAIL
OS-9
R-5
P-1
R-4
P-3
R-5
PO-1
PO-2
P-2
R-3
R-1
Pala Mesa Heights Road
R-2
TC-1
MF-3
TC-2
Interstate 15
NAP PROPOSED PALOMAR COLLEGE
MF-2
OS-3
OS-8
HORSE RANCH CREEK
OS-6
MF-1
HORSE RANCH CREEK ROAD
OS-7
OS-2
OPEN SPACE
PALA MESA DRIVE
NAP PROPOSED MEADOWOOD TM 5354
EXIST. PANKEY ROAD
OS-5
SEWER PUMP STATION
I-1
HC-1
NAP PROPOSED CAMPUS PARK WEST TM 5424
OS-1
HC-2
PALA ROAD (SR-76)
LEGEND
VILLAGE ENTRY STREET
HIGHWAY 76 PATHWAY
SECONDARY VILLAGE ENTRY
VILLAGE PROMENADE ONE
VILLAGE PROMENADE TWO
NATURE TRAILS
OPEN SPACE
NEIGHBORHOOD PARK SITE
North
0
650
1300
Scale in feet
Locations Approximate

County of San Diego

DEPARTMENT OF PUBLIC WORKS

JOHN L. SNYDER
DIRECTOR

5201 RUFFIN ROAD, SUITE D
SAN DIEGO, CALIFORNIA 92123-4310
(858) 694-2055 FAX: (858) 694-8928
Web Site: sdcdpw.org

RICHARD E. CROMPTON
ASSISTANT DIRECTOR

March 7, 2008

LOS Engineering, Inc.
Traffic and Transportation
5114 Sea Mist Court
San Diego, CA 92121

Dear Project Engineer:

CAMPUS PARK (TM 5338) AND MEADOWOOD (TM 5354) – INTERNAL CAPTURE RATE

DPW staff has reviewed the response letter prepared by LOS Engineering dated February 5, 2008 regarding the proposed internal capture rate for the Campus Park and Meadowood projects. The letter provides responses to our division's previous comment letter dated January 17, 2008. The following are our comments:

- The proposed 33% internal capture rate appears to be within a potentially acceptable range for the buildout/Year 2030 scenario assumption. Caltrans staff should review and comment on the current submittal in order to determine a final internal capture rate percentage that is acceptable to all interested parties.

- The letter states that the capture rate percentage for the near-term scenarios such as Existing plus Project and near-term cumulative would be based on a ratio between residential and commercial uses. For example, if half the commercial and all residential uses are constructed; that particular phase would incorporate half of the 'buildout 33% internal capture rate' for the near-term scenario. The consultant should provide recommended capture rate percentages for the near-term scenarios based on the proposed ratio methodology. Overall, it should be assumed that the internal capture rate percentages would start off lower for the individual projects (Existing plus project) and gradually increase over time to the buildout/Year 2030 levels.

- Non-vehicular traffic counts or surveys should also be included to document the amount of walk and bicycle trips conducted within the one-mile buffer zone.

If we can answer any questions or provide further information, please contact Nick Ortiz at (858) 874-4204.

Very truly yours,

Nael Areigat, Project Manager
Department of Public Works

NA: SH

cc: Bob Goralka/Nick Ortiz (O334); Jacob Armstrong, Caltrans (O240); Maurice Eaton, Caltrans (O240); Christine Stevenson, DPLU (O650); TM 5338, 5354 File

Windows Live™

Re: Internal Capture Rate for Meadowood and Campus Park

From: **Maurice Eaton** (maurice_eaton@dot.ca.gov)
Sent: Mon 4/14/08 9:53 AM
To: Justin Rasas (justin@losengineering.com)
Cc: Alan Ziegaus (aziegaus@swspr.com); Bruce Tabb (btabb@envdev.com); Christine Stevenson (County) (christine.stevenson@sdcounty.ca.gov); Nick Ortiz (francisco.ortiz@sdcounty.ca.gov); Jacob Armstrong (jacob_armstrong@dot.ca.gov); Jimmy Ayala (Pardee) (jimmy.ayala@pardeehomes.com); Karen Kosup (Pardee) (karen.kosup@pardeehomes.com); Nael Areigat (nael.areigat@sdcounty.ca.gov); David Davis (Winwood) (winwood-davis@msn.com)

Justin:
We are in agreement with the 30% internal trip capture rate for use in the traffic studies for the Meadowood and Campus Park projects. In agreeing to the 30% internal capture rate, it should be noted that this is a special case specifically for these two projects, and should not be considered the de facto internal capture rate or as setting precedent for other projects with impacts to State transportation facilities.

Maurice

Maurice Eaton, Branch Chief
Travel Forecasting and Modeling
Caltrans District 11, MS 240
4050 Taylor Street
San Diego, CA 92110
Tel. 619-688-3137, Calnet 8-688-3137
maurice.eaton@dot.ca.gov

Justin Rasas <justin@losengineering.com>
04/14/2008 07:40 AM

To "Maurice Eaton (Caltrans)" <maurice_eaton@dot.ca.gov>
cc Alan Ziegaus <aziegaus@swspr.com>, Nick Ortiz <francisco.ortiz@sdcounty.ca.gov>, Nael Areigat <nael.areigat@sdcounty.ca.gov>, Bruce Tabb <btabb@envdev.com>, "Christine Stevenson (County)" <christine.stevenson@sdcounty.ca.gov>, "David Davis (Winwood)" <winwood-davis@msn.com>, Jacob Armstrong <jacob_armstrong@dot.ca.gov>, "Jimmy Ayala (Pardee)" <jimmy.ayala@pardeehomes.com>, "Karen Kosup (Pardee)" <karen.kosup@pardeehomes.com>

Appendix J

Horse Ranch Creek Rd: GP Update Boulevard, Caltrans Letter & North End Transition

Summary Table 1: Proposed CE Road Standards

CE Road Series	Travel Lanes	Design Speed	No.	Name for Road Classification	Road Components	Threshold Capacity (ADT)	Minimum ROW (feet)	Relationship to Public Road Standards
6.1 Expressway	6 lanes	65 mph	6.1	Expressway	Median / Grade-Separated Interchange	86,000	146’	Same as existing Expressway
6.2 Prime Arterial	6 lanes	65 mph	6.2	Prime Arterial	Median / At-Grade Interchange	50,000	122’	Same as existing Prime Arterial
4.1 Major Road Series	4 lanes	55 mph	4.1A	Major Road with Raised Median	Raised Median	33,400	98’	Same as existing Major Road
			4.1B	Major Road with Intermittent Turn Lanes	Intermittent Turn Lanes	30,800	84’ to 98’	Same as existing Collector Road
4.2 Boulevard Series	4 lanes	40 mph	4.2A	Boulevard with Raised Median	Raised Median	27,000	106’	New standard
			4.2B	Boulevard with Intermittent Turn Lane	Intermittent Turn Lanes	25,000	92’ to 106’	New standard
2.1 Community Collector Series	2 lanes	45 mph	2.1A	Community Collector with Raised Median	Raised Median	15,000	74’	Similar to existing Town Collector (except higher design speed)
			2.1B	Community Collector with Continuous Turn Lane	Continuous Turn Lane	13,500	74’	
			2.1C	Community Collector with Intermittent Turn Lane	Intermittent Turn Lanes	13,500	60’ to 74’	New standard
			2.1D	Community Collector with Improvement Options	Raised Median, Continuous Turn Lane, Intermittent Turn Lane	13,500 – 15,000	84’	Similar to existing Rural Collector
			2.1E	Community Collector	None	10,900	60’	Same as existing Light Collector

CE Road Series	Travel Lanes	Design Speed	No.	Name for Road Classification	Road Components	Threshold Capacity (ADT)	Minimum ROW (feet)	Relationship to Public Road Standards
2.2 Light Collector Series	2 lanes	40 mph	2.2A	Light Collector with Raised Median	Raised Median	13,500	78’	Similar to existing Town Collector (except wider parkway, ROW)
			2.2B	Light Collector with Continuous Turn Lane	Continuous Turn Lane	13,500	78’	
			2.2C	Light Collector with Intermittent Turn Lanes	Intermittent Turn Lanes	13,500	64’ to 78’	New Standard
			2.2D	Light Collector with Improvement Options	Raised Median, Continuous Turn Lane, Intermittent Turn Lane	13,500	88’	Similar to existing Rural Collector
			2.2E	Light Collector	None	10,900	64’	Similar to existing Rural Light Collector
			2.2F	Light Collector with Reduced Shoulder	Reduced Shoulder	8,700	52’	New Standard (Similar to previous Rural Minor Road)
2.3 Minor Collector Series	2 lanes	35 mph	2.3A	Minor Collector with Raised Median	Raised Median	8,000	82’	New Standard
			2.3B	Minor Collector with Intermittent Turn Lane	Intermittent Turn Lane	8,000	68’ to 82’	New Standard
			2.3C	Minor Collector	None	7,000	68’	New Standard

SUMMARY TABLE 2: LOCATION GUIDE

Summary Table 2 indicates where to locate different CE road classifications, and ***are listed in order of preference***. Road types with lower design speeds are recommended for Villages and for Semi-Rural or Rural Lands with physical constraints. This table should be used in conjunction with other mapping criteria prepared for GP2020. In order to develop a rational network, road mapping should consider the *predominant* topography or land use patterns, and a change in road classification should occur only at road intersections or another easily identifiable location in the network.

Lanes:	**Village / Village Core3**	**Semi-Rural**	**Rural Lands**
6 Lane	*Limited use only*: 6.1 Expressway or 6.2 Prime Arterial	6.1 Expressway or 6.2 Prime Arterial	6.1 Expressway or 6.2 Prime Arterial
4 Lane	*1st Choice*: 4.2 Boulevard *Limited use only*: 4.1 Major Road	*1st Choice*: 4.1 Major Road *Limited use only*: 4.2 Boulevard	*1st Choice*: 4.1 Major Road *Limited use only*: 4.2 Boulevard
2 Lane	*1st Choice*: 2.3 Minor Collector *2nd Choice*: 2.2 Light Collector *Limited use only*: 2.1 Community Collector	*1st Choice*: 2.2 Light Collector *2nd Choice*: 2.1 Community Collector *Limited use*: 2.3 Minor Collector	*1st Choice*: 2.1 Community Collector *Areas with Physical Constraints*: 2.2 Light Collector or 2.3 Minor Collector

NON-CIRCULATION ELEMENT ROADS

At the request of Steering Committee members, preliminary information for two non-CE roads was added to this handout. The information on Fire Access Roads is subject to further review and refinement based on input from DPW, the Fire Services Section of DPLU, and the respective fire protection districts.

Local Public Road: Local Public Roads may be shown on the regional CE Map when used to resolve road capacity problems within the CE network or when used to link CE roads together into a complete network. Local Public Roads may be shown on a community plan map when they form an important part of a community-wide or town center road network. Community plan maps can also include new local public road alignments that are being proposed to improve connectivity within a community. Standards for this road type are located in the County's "Public Road Standards".

3 Please note that passing lanes are not appropriate for a Village.

Fire Access Road: Fire/Emergency Access Roads provide a secondary egress route for the public in the event of a fire emergency. These roads can be built to local public road standards or to private road standards. Proposed criteria for designating a Fire/Emergency Access Road, as well as preliminary standards for these roads, is contained in Appendix D.

During the road network planning process, a number of fire access roads were identified by the community planning groups as candidates for Fire/Emergency access routes. Their primary objective was to identify evacuation routes in the event of a fire emergency. In several cases, proposed routes were already mapped as a CE road on the Existing General Plan but were not built to CE standards. Many of these mapped roads do not meet the preliminary road standard for a Fire/Emergency Access Road, and further discussions are needed to identify funding mechanisms to bring emergency access routes up to proposed standards.

	Type of Non-CE Road	**Travel Lanes**	**Minimum Design Speed**	**Threshold Capacity (ADT)**	**Minimum ROW (feet)**
Non-Circulation Element Roads	**Local Public Road**	2	30 mph	4,500	60’
	Fire Access Road	2	30 mph[4]	Not Applicable	40’

ROAD STANDARD DESCRIPTIONS

The pages that follow contain detailed descriptions for each road standard. Cross sections are included to illustrate the size and organization of all road components. See the Glossary of Terms for an explanation of terms used in the diagrams.

Please note that a wider Right-of-Way (ROW) will be required for bike lanes identified in the Bicycle Master Plan. Areas called Parkways contain landscaping, utilities, and trails or bicycle paths as required. Additional width may be required for trails (called “pathways” in the Trails Master Plan).

4 Private Road Standards were used to establish fire/emergency access roads’ design speed and ROW.

DEPARTMENT OF TRANSPORTATION
DISTRICT 11
4050 TAYLOR STREET, M.S. 240
SAN DIEGO, CA 92110
PHONE (619) 688-6003
FAX (619) 688-4299
TTY (619) 688-6670

Flex your power!
Be energy efficient!

January 11, 2007

11-SD-76
PM 17.86
SR-76 Access Spacing

Mr. Andy Schlaefli
Urban Systems Associates, Inc.
4540 Kearny Villa Road
Suite 106
San Diego , CA 92123

Dear Mr. Schlaefli

The California Department of Transportation (Caltrans) has reviewed Latitude 33's December 1, 2006 correspondence regarding their State Route 76 (SR-76)/Horse Ranch Creek Road alternative intersection analysis for access to the proposed Meadowood development. As you are aware, Caltrans requested that further studies be conducted to determine if the proposed Horse Ranch Creek Road could be moved farther to the east so as to allow additional spacing from existing Pankey Road. Therefore, based on the data and information presented in the Meadowood SR-76 Alternative Analysis, Caltrans agrees with the conclusion of this study and that relocating the Horse Ranch Creek Road intersection farther to the east would result in unacceptable impacts.

It should be noted that for specific access locations for the Meadowood, Campus Park and Campus Park West developments, please refer to the project study report and project report for the widening and realignment of SR-76 east of Interstate 15.

If you require further information or have any questions, please contact me.

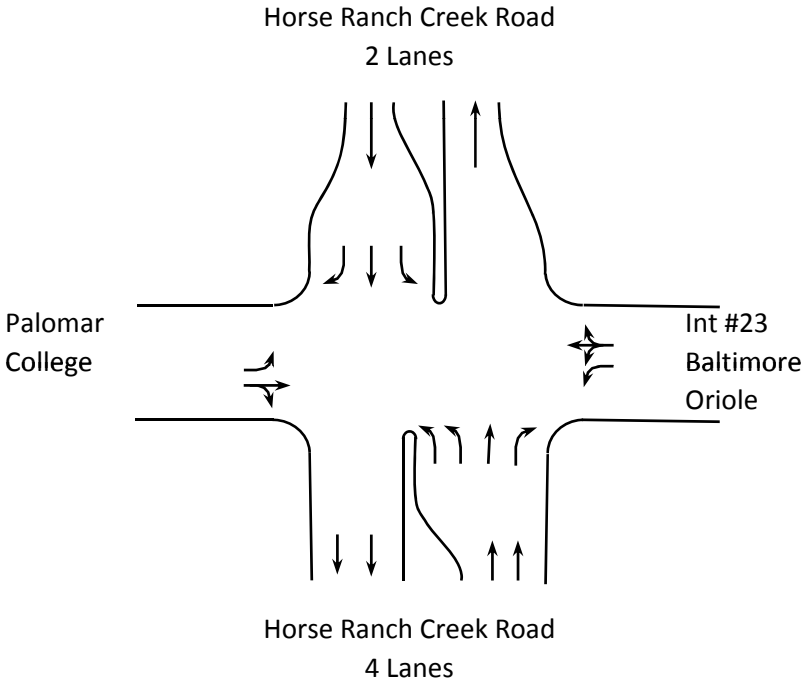
Sincerely,

Al Cox, Chief
Development Review Branch

Cc: Bill Figge	Caltrans
Joe Hull	Caltrans
Michael Powers	Caltrans
Bob Corbin	Caltrans
Sam Amen	Caltrans
Trent Clark	Caltrans
Nick Ortiz	County of San Diego, DPW
Jerry Moriarty	County of San Diego, DPW
John Eardensohn	Latitude 33
Karen Kosup	Pardee Homes

Caltrans improves mobility across California

Graphic of Transition from 2 Lanes to 4 Lanes along Horse Ranch Creek Road.



Appendix K

Existing + Project Intersection Level of Service Calculations

AM Existing + Project
1: Pala Rd (SR-76) & Via Monserate

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	4	590	1030	22	70	25
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	621	1084	23	74	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1107				1725	1096
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1107				1725	1096
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				24	90
cM capacity (veh/h)	631				97	260

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	4	621	1107	100
Volume Left	4	0	0	74
Volume Right	0	0	23	26
cSH	631	1700	1700	116
Volume to Capacity	0.01	0.37	0.65	0.86
Queue Length 95th (ft)	1	0	0	130
Control Delay (s)	10.7	0.0	0.0	118.7
Lane LOS	B			F
Approach Delay (s)	0.1		0.0	118.7
Approach LOS				F

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization		68.2%	ICU Level of Service C
Analysis Period (min)		15	

LOS Engineering

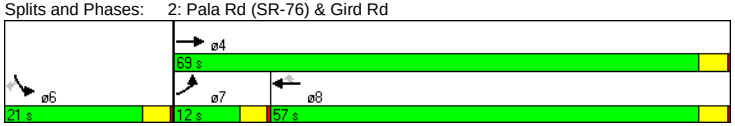
AM Existing + Project
2: Pala Rd (SR-76) & Gird Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	75	638	832	29	59	103
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	69.0	57.0	57.0	21.0	21.0
Total Split (%)	13.3%	76.7%	63.3%	63.3%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	7.6	36.9	31.4	31.4	8.9	8.9
Actuated g/C Ratio	0.13	0.66	0.56	0.56	0.16	0.16
v/c Ratio	0.39	0.55	0.84	0.04	0.25	0.34
Control Delay	37.5	5.7	18.8	5.6	31.5	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	5.7	18.8	5.6	31.5	10.9
LOS	D	A	B	A	C	B
Approach Delay		9.0	18.3		18.4	
Approach LOS		A	B		B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 55.9		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.84		
Intersection Signal Delay: 14.5	Intersection LOS: B	
Intersection Capacity Utilization 62.1%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



LOS Engineering

AM Existing + Project
2: Pala Rd (SR-76) & Gird Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	79	672	876	31	62	108
v/c Ratio	0.39	0.55	0.84	0.04	0.25	0.34
Control Delay	37.5	5.7	18.8	5.6	31.5	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	5.7	18.8	5.6	31.5	10.9
Queue Length 50th (ft)	28	72	250	4	22	0
Queue Length 95th (ft)	#93	155	461	15	66	44
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	230	1493	1308	997	473	499
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.45	0.67	0.03	0.13	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing + Project
2: Pala Rd (SR-76) & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Volume (vph)	75	638	832	29	59	103
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	672	876	31	62	108
RTOR Reduction (vph)	0	0	0	3	0	91
Lane Group Flow (vph)	79	672	876	28	62	17
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	3.7	39.1	31.4	31.4	8.9	8.9
Effective Green, g (s)	3.7	39.1	31.4	31.4	8.9	8.9
Actuated g/C Ratio	0.07	0.70	0.56	0.56	0.16	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	105	1301	1045	795	252	225
v/s Ratio Prot	c0.05	0.36	c0.47		c0.04	
v/s Ratio Perm				0.02		0.01
v/c Ratio	0.75	0.52	0.84	0.04	0.25	0.08
Uniform Delay, d1	25.7	4.0	10.2	5.5	20.6	20.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.8	0.3	6.0	0.0	0.5	0.1
Delay (s)	51.5	4.3	16.2	5.5	21.1	20.2
Level of Service	D	A	B	A	C	C
Approach Delay (s)		9.3	15.8		20.5	
Approach LOS		A	B		C	

Intersection Summary

HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

AM Existing + Project
3: Pala Rd (SR-76) & Sage Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	1	652	896	1	5	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	686	943	1	5	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	944				1632	944
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	944				1632	944
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	97
cM capacity (veh/h)	727				111	318

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	687	944	16
Volume Left	1	0	5
Volume Right	0	1	11
cSH	727	1700	196
Volume to Capacity	0.00	0.56	0.08
Queue Length 95th (ft)	0	0	6
Control Delay (s)	0.0	0.0	24.9
Lane LOS	A		C
Approach Delay (s)	0.0	0.0	24.9
Approach LOS			C

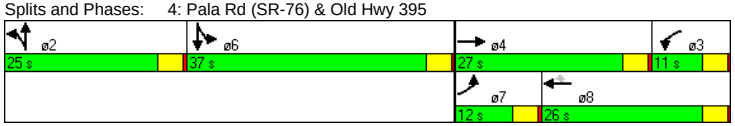
Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

AM Existing + Project
4: Pala Rd (SR-76) & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Configurations							
Volume (vph)	75	557	51	562	76	84	91
Turn Type	Prot		Prot		Perm		
Protected Phases	7	4	3	8		2	6
Permitted Phases					8		
Detector Phases	7	4	3	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	27.0	11.0	26.0	26.0	25.0	37.0
Total Split (%)	12.0%	27.0%	11.0%	26.0%	26.0%	25.0%	37.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	Min
Act Effct Green (s)	7.9	21.4	7.0	18.3	18.3	15.3	23.6
Actuated g/C Ratio	0.10	0.27	0.08	0.23	0.23	0.19	0.30
v/c Ratio	0.52	0.71	0.41	0.73	0.21	0.73	0.83
Control Delay	55.1	34.0	52.8	37.4	9.2	44.9	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	34.0	52.8	37.4	9.2	44.9	42.2
LOS	E	C	D	D	A	D	D
Approach Delay		36.2		35.5		44.9	42.2
Approach LOS		D		D		D	D

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 79.6			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 38.2		Intersection LOS: D	
Intersection Capacity Utilization 68.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



AM Existing + Project
4: Pala Rd (SR-76) & Old Hwy 395

Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Group Flow (vph)	79	667	54	592	80	257	443
v/c Ratio	0.52	0.71	0.41	0.73	0.21	0.73	0.83
Control Delay	55.1	34.0	52.8	37.4	9.2	44.9	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.1	34.0	52.8	37.4	9.2	44.9	42.2
Queue Length 50th (ft)	44	182	30	163	0	131	230
Queue Length 95th (ft)	#116	#294	#78	250	37	230	364
Internal Link Dist (ft)		572		382		819	4384
Turn Bay Length (ft)	330		150		150		
Base Capacity (vph)	166	1087	142	999	458	476	691
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.61	0.38	0.59	0.17	0.54	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing + Project
4: Pala Rd (SR-76) & Old Hwy 395

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.96			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (prot)	1583	3475		1583	3539	1417		1762			1765	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (perm)	1583	3475		1583	3539	1417		1762			1765	
Volume (vph)	75	557	77	51	562	76	96	84	65	255	91	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	586	81	54	592	80	101	88	68	268	96	79
RTOR Reduction (vph)	0	10	0	0	0	61	0	13	0	0	8	0
Lane Group Flow (vph)	79	657	0	54	592	19	0	244	0	0	435	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.7	21.4		3.5	19.2	19.2		15.3			23.6	
Effective Green, g (s)	5.7	21.4		3.5	19.2	19.2		15.3			23.6	
Actuated g/C Ratio	0.07	0.27		0.04	0.24	0.24		0.19			0.30	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	113	932		69	851	341		338			522	
v/s Ratio Prot	0.05	c0.19		0.03	c0.17			c0.14			c0.25	
v/s Ratio Perm						0.01						
v/c Ratio	0.70	0.70		0.78	0.70	0.06		0.72			0.83	
Uniform Delay, d1	36.2	26.3		37.8	27.6	23.3		30.3			26.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	17.2	2.4		42.6	2.5	0.1		7.4			10.9	
Delay (s)	53.4	28.8		80.4	30.1	23.4		37.7			37.2	
Level of Service	D	C		F	C	C		D			D	
Approach Delay (s)		31.4			33.1			37.7			37.2	
Approach LOS		C			C			D			D	

Intersection Summary

HCM Average Control Delay	33.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	79.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	68.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

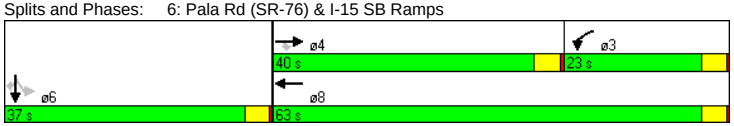
Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Volume (vph)	502	297	193	260	1	551
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6	
Permitted Phases		4				6
Detector Phases	4	4	3	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	40.0	40.0	23.0	63.0	37.0	37.0
Total Split (%)	40.0%	40.0%	23.0%	63.0%	37.0%	37.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	33.6	33.6	16.4	54.0	38.0	38.0
Actuated g/C Ratio	0.34	0.34	0.16	0.54	0.38	0.38
v/c Ratio	0.84	0.46	0.78	0.27	0.17	0.65
Control Delay	43.1	4.6	47.6	13.8	25.2	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	4.6	47.6	13.8	25.2	6.5
LOS	D	A	D	B	C	A
Approach Delay	28.8			28.1	9.6	
Approach LOS	C			C	A	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 40 (40%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 22.0 Intersection LOS: C
Intersection Capacity Utilization 59.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



AM Existing + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	528	313	203	274	114	580
v/c Ratio	0.84	0.46	0.78	0.27	0.17	0.65
Control Delay	43.1	4.6	47.6	13.8	25.2	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	4.6	47.6	13.8	25.2	6.5
Queue Length 50th (ft)	305	0	94	71	48	0
Queue Length 95th (ft)	395	51	m139	m0	102	99
Internal Link Dist (ft)	574			1191	1129	
Turn Bay Length (ft)			500			900
Base Capacity (vph)	703	729	309	1141	715	917
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.43	0.66	0.24	0.16	0.63

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

AM Existing + Project
6: Pala Rd (SR-76) & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1775	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1775	1417
Volume (vph)	0	502	297	193	260	0	0	0	0	107	1	551
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	528	313	203	274	0	0	0	0	113	1	580
RTOR Reduction (vph)	0	0	208	0	0	0	0	0	0	0	0	360
Lane Group Flow (vph)	0	528	105	203	274	0	0	0	0	0	114	220
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		33.6	33.6	16.4	54.0						38.0	38.0
Effective Green, g (s)		33.6	33.6	16.4	54.0						38.0	38.0
Actuated g/C Ratio		0.34	0.34	0.16	0.54						0.38	0.38
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		626	476	260	1006						675	538
v/s Ratio Prot		c0.28		c0.13	0.15							
v/s Ratio Perm			0.07								0.06	c0.16
v/c Ratio		0.84	0.22	0.78	0.27						0.17	0.41
Uniform Delay, d1		30.8	23.8	40.1	12.4						20.5	22.8
Progression Factor		1.00	1.00	0.78	1.17						1.00	1.00
Incremental Delay, d2		10.1	0.2	11.0	0.1						0.5	2.3
Delay (s)		40.8	24.0	42.3	14.7						21.1	25.1
Level of Service		D	C	D	B						C	C
Approach Delay (s)		34.6			26.4			0.0			24.4	
Approach LOS		C			C			A			C	

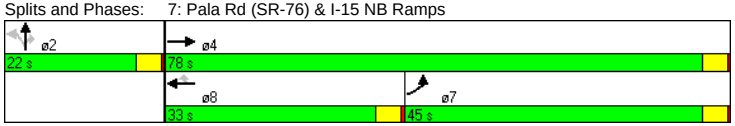
Intersection Summary				
HCM Average Control Delay	29.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing + Project
7: Pala Rd (SR-76) & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Volume (vph)	405	277	324	112	0	234
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		2	
Permitted Phases				8		2
Detector Phases	7	4	8	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	45.0	78.0	33.0	33.0	22.0	22.0
Total Split (%)	45.0%	78.0%	33.0%	33.0%	22.0%	22.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	31.5	57.9	22.4	22.4	34.1	34.1
Actuated g/C Ratio	0.32	0.58	0.22	0.22	0.34	0.34
v/c Ratio	0.85	0.27	0.82	0.33	0.23	0.38
Control Delay	34.3	4.1	52.5	19.8	29.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	4.1	52.5	19.8	29.7	6.5
LOS	C	A	D	B	C	A
Approach Delay		22.1	44.1		15.0	
Approach LOS		C	D		B	

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 56 (56%), Referenced to phase 2:NBTL and 6:, Start of Green		
Natural Cycle: 65		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.85		
Intersection Signal Delay: 26.8	Intersection LOS: C	
Intersection Capacity Utilization 59.6%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



AM Existing + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

Queues

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	426	292	341	118	141	246
v/c Ratio	0.85	0.27	0.82	0.33	0.23	0.38
Control Delay	34.3	4.1	52.5	19.8	29.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	4.1	52.5	19.8	29.7	6.5
Queue Length 50th (ft)	292	36	207	34	65	0
Queue Length 95th (ft)	m328	m24	285	76	141	68
Internal Link Dist (ft)		1191	2152		911	
Turn Bay Length (ft)	450			50		800
Base Capacity (vph)	649	1379	540	449	604	645
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.21	0.63	0.26	0.23	0.38

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

AM Existing + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1770	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1770	1417			
Volume (vph)	405	277	0	0	324	112	134	0	234	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	426	292	0	0	341	118	141	0	246	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	41	0	0	162	0	0	0
Lane Group Flow (vph)	426	292	0	0	341	77	0	141	84	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	31.5	57.9			22.4	22.4		34.1	34.1			
Effective Green, g (s)	31.5	57.9			22.4	22.4		34.1	34.1			
Actuated g/C Ratio	0.32	0.58			0.22	0.22		0.34	0.34			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	499	1079			417	317		604	483			
v/s Ratio Prot	c0.27	0.16			c0.18							
v/s Ratio Perm						0.05		0.08	0.06			
v/c Ratio	0.85	0.27			0.82	0.24		0.23	0.17			
Uniform Delay, d1	32.1	10.5			36.9	31.8		23.6	23.1			
Progression Factor	0.68	0.39			1.00	1.00		1.00	1.00			
Incremental Delay, d2	10.5	0.1			11.8	0.4		0.9	0.8			
Delay (s)	32.3	4.2			48.6	32.2		24.5	23.9			
Level of Service	C	A			D	C		C	C			
Approach Delay (s)		20.8			44.4			24.1			0.0	
Approach LOS		C			D			C			A	

Intersection Summary

HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

AM Existing + Project
8: Pala Rd (SR-76) & Pankey Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	9	514	9	14	489	3	14	2	32	0	6	23
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	541	9	15	515	3	15	2	34	0	6	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	518			551			879	1112	275	870	1115	259
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	518			551			879	1112	275	870	1115	259
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			93	99	95	100	97	97
cM capacity (veh/h)	1044			1015			224	203	722	228	202	740

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	9	361	190	15	343	175	51	31
Volume Left	9	0	0	15	0	0	15	0
Volume Right	0	0	9	0	0	3	34	24
cSH	1044	1700	1700	1015	1700	1700	412	477
Volume to Capacity	0.01	0.21	0.11	0.01	0.20	0.10	0.12	0.06
Queue Length 95th (ft)	1	0	0	1	0	0	10	5
Control Delay (s)	8.5	0.0	0.0	8.6	0.0	0.0	15.0	13.1
Lane LOS	A			A			B	B
Approach Delay (s)	0.1			0.2			15.0	13.1
Approach LOS							B	B

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	30.7%	ICU Level of Service	A	
Analysis Period (min)	15			

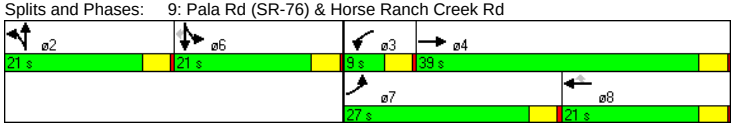
AM Existing + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	220	326	287	45	40	0	219		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	27.0	39.0	21.0	21.0	21.0	21.0	21.0	21.0	9.0
Total Split (%)	30.0%	43.3%	23.3%	23.3%	23.3%	23.3%	23.3%	23%	10%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	12.4	23.1	9.8	9.8	7.3	7.3	7.3		
Actuated g/C Ratio	0.24	0.47	0.20	0.20	0.15	0.15	0.15		
v/c Ratio	0.61	0.21	0.43	0.15	0.19	0.13	0.13		
Control Delay	25.0	7.0	21.4	8.6	24.6	0.3	0.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	25.0	7.0	21.4	8.6	24.6	0.3	0.3		
LOS	C	A	C	A	C	A	A		
Approach Delay		14.3	19.7			4.0			
Approach LOS		B	B			A			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 49.2			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 13.5		Intersection LOS: B	
Intersection Capacity Utilization 34.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



AM Existing + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	343	302	47	42	114	117
v/c Ratio	0.61	0.21	0.43	0.15	0.19	0.13	0.13
Control Delay	25.0	7.0	21.4	8.6	24.6	0.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	7.0	21.4	8.6	24.6	0.3	0.3
Queue Length 50th (ft)	60	25	42	0	11	0	0
Queue Length 95th (ft)	134	46	88	24	43	0	0
Internal Link Dist (ft)		2753	5080			1429	
Turn Bay Length (ft)	250			250	150		150
Base Capacity (vph)	595	2093	1102	473	450	980	951
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.16	0.27	0.10	0.09	0.12	0.12

Intersection Summary

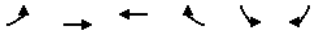
AM Existing + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.85	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1583	3539			3539	1417				1504	1441	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1583	3539			3539	1417				1504	1441	1346
Volume (vph)	220	326	0	0	287	45	0	0	0	40	0	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	343	0	0	302	47	0	0	0	42	0	231
RTOR Reduction (vph)	0	0	0	0	0	38	0	0	0	0	97	100
Lane Group Flow (vph)	232	343	0	0	302	9	0	0	0	42	17	17
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	10.3	24.1			9.8	9.8				7.3	7.3	7.3
Effective Green, g (s)	10.3	24.1			9.8	9.8				7.3	7.3	7.3
Actuated g/C Ratio	0.21	0.49			0.20	0.20				0.15	0.15	0.15
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	331	1730			703	282				223	213	199
v/s Ratio Prot	c0.15	0.10			c0.09					c0.03	0.01	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.70	0.20			0.43	0.03				0.19	0.08	0.09
Uniform Delay, d1	18.1	7.1			17.3	15.9				18.4	18.1	18.1
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	6.6	0.1			0.4	0.0				0.4	0.2	0.2
Delay (s)	24.6	7.2			17.7	16.0				18.8	18.3	18.3
Level of Service	C	A			B	B				B	B	B
Approach Delay (s)		14.2			17.5			0.0			18.4	
Approach LOS		B			B			A			B	

Intersection Summary				
HCM Average Control Delay	16.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	49.3	Sum of lost time (s)	21.9	
Intersection Capacity Utilization	34.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing + Project
10: Pala Rd (SR-76) & Rice Canyon Rd — HCM Unsignalized Intersection Capacity Analysis



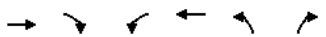
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	11	338	205	10	12	26
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	356	216	11	13	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	226				600	221
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	226				600	221
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	97
cM capacity (veh/h)	1342				460	819

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	367	226	40
Volume Left	12	0	13
Volume Right	0	11	27
cSH	1342	1700	657
Volume to Capacity	0.01	0.13	0.06
Queue Length 95th (ft)	1	0	5
Control Delay (s)	0.3	0.0	10.8
Lane LOS	A		B
Approach Delay (s)	0.3	0.0	10.8
Approach LOS			B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Project
11: Pala Rd (SR-76) & Couser Canyon Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	336	15	2	191	26	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	354	16	2	201	27	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			369		567	362
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			369		567	362
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1189		484	683

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	369	203	33
Volume Left	0	2	27
Volume Right	16	0	5
cSH	1700	1189	508
Volume to Capacity	0.22	0.00	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.1	12.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	12.6
Approach LOS			B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Project

12: Pala Mesa Dr & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	38	37	55	24	15	21	149	46	32	244	8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	40	39	58	25	16	22	157	48	34	257	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	558	578	261	608	558	181	265			205		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	558	578	261	608	558	181	265			205		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	90	95	83	94	98	98			98		
cM capacity (veh/h)	400	409	778	347	420	862	1299			1366		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	105	58	41	22	205	34	265
Volume Left	26	58	0	22	0	34	0
Volume Right	39	0	16	0	48	0	8
cSH	493	347	523	1299	1700	1366	1700
Volume to Capacity	0.21	0.17	0.08	0.02	0.12	0.02	0.16
Queue Length 95th (ft)	20	15	6	1	0	2	0
Control Delay (s)	14.3	17.4	12.5	7.8	0.0	7.7	0.0
Lane LOS	B	C	B	A		A	
Approach Delay (s)	14.3	15.4		0.8		0.9	
Approach LOS	B	C					

Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	39.0%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

AM Existing + Project

13: Pala Mesa Dr & Wilt Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	3	0	10	2	17	0	4	19	33	8	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	3	0	11	2	18	0	4	20	35	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	20			3			42	46	3	59	37	11
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	20			3			42	46	3	59	37	11
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	99	98	96	99	100
cM capacity (veh/h)	1596			1619			949	839	1081	911	849	1070

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	31	24	43
Volume Left	1	11	0	35
Volume Right	0	18	20	0
cSH	1596	1619	1029	898
Volume to Capacity	0.00	0.01	0.02	0.05
Queue Length 95th (ft)	0	0	2	4
Control Delay (s)	1.8	2.5	8.6	9.2
Lane LOS	A	A	A	A
Approach Delay (s)	1.8	2.5	8.6	9.2
Approach LOS			A	A

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	18.9%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

AM Existing + Project

14: Stewart Canyon Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	14	1	23	16	0	138	3	156	13	98	273	7
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	15	1	24	17	0	145	3	164	14	103	287	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	813	682	291	696	678	171	295			178		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	813	682	291	696	678	171	295			178		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	97	95	100	83	100			93		
cM capacity (veh/h)	233	344	748	324	345	873	1267			1398		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	40	162	3	178	103	295
Volume Left	15	17	3	0	103	0
Volume Right	24	145	0	14	0	7
cSH	406	742	1267	1700	1398	1700
Volume to Capacity	0.10	0.22	0.00	0.10	0.07	0.17
Queue Length 95th (ft)	8	21	0	0	6	0
Control Delay (s)	14.8	11.2	7.8	0.0	7.8	0.0
Lane LOS	B	B	A		A	
Approach Delay (s)	14.8	11.2	0.1		2.0	
Approach LOS	B	B				

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	38.0%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

AM Existing + Project

15: Reche Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	189	229	146	171	149	119
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	199	241	154	180	157	125
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	707	219	282			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	707	219	282			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	44	71	88			
cM capacity (veh/h)	354	820	1280			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	440	154	180	282
Volume Left	199	154	0	0
Volume Right	241	0	0	125
cSH	514	1280	1700	1700
Volume to Capacity	0.86	0.12	0.11	0.17
Queue Length 95th (ft)	226	10	0	0
Control Delay (s)	40.9	8.2	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	40.9	3.8		0.0
Approach LOS	E			

Intersection Summary				
Average Delay	18.2			
Intersection Capacity Utilization	61.6%	ICU Level of Service	B	
Analysis Period (min)	15			

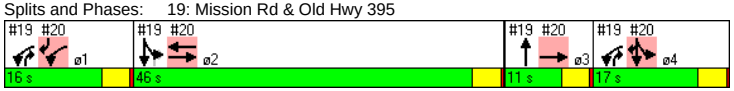
LOS Engineering

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	178	878	30	247	549	51		
Turn Type		Free		custom	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		2				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	8.0
Total Split (s)	33.0	0.0	11.0	33.0	46.0	46.0	16.0	17.0
Total Split (%)	36.7%	0.0%	12.2%	36.7%	51.1%	51.1%	18%	19%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes					Yes
Recall Mode			None		None	None	None	None
Act Effct Green (s)	29.1	86.0	7.0	70.9	37.8	37.8		
Actuated g/C Ratio	0.34	1.00	0.08	0.82	0.44	0.44		
v/c Ratio	0.35	0.65	0.21	0.22	0.83	0.07		
Control Delay	26.4	1.8	42.4	2.1	33.0	13.6		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	26.4	1.8	42.4	2.1	33.0	13.6		
LOS	C	A	D	A	C	B		
Approach Delay	5.9		6.5			31.4		
Approach LOS	A		A			C		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 86
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 13.9 Intersection LOS: B
Intersection Capacity Utilization 58.3% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 19: Mission Rd & Old Hwy 395



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	187	924	32	260	578	54
v/c Ratio	0.35	0.65	0.21	0.22	0.83	0.07
Control Delay	26.4	1.8	42.4	2.1	33.0	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	1.8	42.4	2.1	33.0	13.6
Queue Length 50th (ft)	80	14	17	20	266	16
Queue Length 95th (ft)	m92	m9	46	33	#418	36
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	536	1417	152	1169	777	914
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.65	0.21	0.22	0.74	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

AM Existing + Project
19: Mission Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Volume (vph)	178	878	30	247	549	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	187	924	32	260	578	54
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	187	924	32	260	578	54
Turn Type		Free		custom	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		2		
Actuated Green, G (s)	29.2	86.0	7.0	67.0	37.8	37.8
Effective Green, g (s)	29.2	86.0	7.0	67.0	37.8	37.8
Actuated g/C Ratio	0.34	1.00	0.08	0.78	0.44	0.44
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	537	1417	152	1170	696	819
v/s Ratio Prot	0.12		0.02	0.08	c0.37	0.03
v/s Ratio Perm		c0.65		0.11		
v/c Ratio	0.35	0.65	0.21	0.22	0.83	0.07
Uniform Delay, d1	21.3	0.0	36.9	2.5	21.3	13.9
Progression Factor	1.10	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	1.2	0.7	0.1	8.3	0.0
Delay (s)	23.6	1.2	37.6	2.6	29.6	13.9
Level of Service	C	A	D	A	C	B
Approach Delay (s)	5.0		6.5			28.3
Approach LOS	A		A			C

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

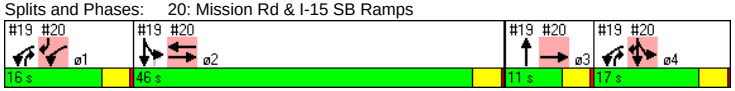
LOS Engineering

AM Existing + Project
20: Mission Rd & I-15 SB Ramps — Timings

Lane Group	EBT	WBL	WBT	SBT	SBR	ø3
Lane Configurations						
Volume (vph)	623	61	254	7	834	
Turn Type		Prot			custom	
Protected Phases	2 3	1	2	4	4 1	3
Permitted Phases					4	
Detector Phases	2 3	1	2	4	4 1	
Minimum Initial (s)		4.0	4.0	4.0		4.0
Minimum Split (s)		8.0	20.0	8.0		20.0
Total Split (s)	57.0	16.0	46.0	17.0	33.0	11.0
Total Split (%)	63.3%	17.8%	51.1%	18.9%	36.7%	12%
Yellow Time (s)		3.5	3.5	3.5		3.5
All-Red Time (s)		0.5	0.5	0.5		0.5
Lead/Lag		Lead	Lag	Lag		Lead
Lead-Lag Optimize?				Yes		Yes
Recall Mode		None	None	None		None
Act Effct Green (s)	48.8	12.1	37.8	13.1	29.1	
Actuated g/C Ratio	0.57	0.14	0.44	0.15	0.34	
v/c Ratio	0.83	0.29	0.33	0.05	1.00	
Control Delay	9.5	39.0	16.7	33.9	41.5	
Queue Delay	0.3	0.0	0.0	0.0	0.0	
Total Delay	9.8	39.0	16.7	33.9	41.5	
LOS	A	D	B	C	D	
Approach Delay	9.8		21.0	41.4		
Approach LOS	A		C	D		

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 86		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.00		
Intersection Signal Delay: 25.1	Intersection LOS: C	
Intersection Capacity Utilization 77.8%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



LOS Engineering

AM Existing + Project
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Group Flow (vph)	859	64	267	15	878
v/c Ratio	0.83	0.29	0.33	0.05	1.00
Control Delay	9.5	39.0	16.7	33.9	41.5
Queue Delay	0.3	0.0	0.0	0.0	0.0
Total Delay	9.8	39.0	16.7	33.9	41.5
Queue Length 50th (ft)	66	33	91	8	~229
Queue Length 95th (ft)	m84	72	145	25	#507
Internal Link Dist (ft)	354		664	817	
Turn Bay Length (ft)		285			200
Base Capacity (vph)	1058	222	914	276	880
Starvation Cap Reductn	22	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.83	0.29	0.29	0.05	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

AM Existing + Project
20: Mission Rd & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.97		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.97	1.00
Satd. Flow (prot)		1803		1583	1863						1814	1417
Flt Permitted		1.00		0.95	1.00						0.97	1.00
Satd. Flow (perm)		1803		1583	1863						1814	1417
Volume (vph)	0	623	193	61	254	0	0	0	0	8	7	834
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	656	203	64	267	0	0	0	0	8	7	878
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	399
Lane Group Flow (vph)	0	846	0	64	267	0	0	0	0	0	15	479
Turn Type				Prot						Split		custom
Protected Phases		2 3		1	2					4	4	4 1
Permitted Phases												4
Actuated Green, G (s)		48.8		12.1	37.8						13.1	29.2
Effective Green, g (s)		48.8		12.1	37.8						13.1	29.2
Actuated g/C Ratio		0.57		0.14	0.44						0.15	0.34
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1023		223	819						276	481
v/s Ratio Prot		c0.47		0.04	0.14						0.01	c0.34
v/s Ratio Perm												
v/c Ratio		0.83		0.29	0.33						0.05	1.00
Uniform Delay, d1		15.2		33.1	15.8						31.2	28.3
Progression Factor		0.21		1.00	1.00						1.00	1.00
Incremental Delay, d2		4.4		0.7	0.2						0.1	39.7
Delay (s)		7.6		33.8	16.0						31.2	68.1
Level of Service		A		C	B						C	E
Approach Delay (s)		7.6			19.4			0.0			67.5	
Approach LOS		A			B			A			E	

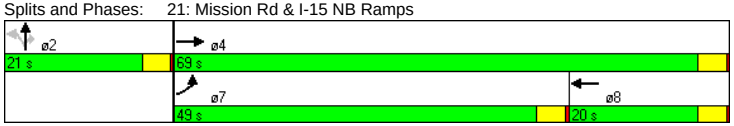
Intersection Summary

HCM Average Control Delay	35.2	HCM Level of Service		D	
HCM Volume to Capacity ratio	0.89				
Actuated Cycle Length (s)	86.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	77.8%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	527	102	173	2	37
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	49.0	69.0	20.0	21.0	21.0
Total Split (%)	54.4%	76.7%	22.2%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	24.9	36.5	11.0	10.4	10.4
Actuated g/C Ratio	0.44	0.64	0.19	0.18	0.18
v/c Ratio	0.80	0.09	0.54	0.38	0.13
Control Delay	24.6	3.3	32.2	30.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	3.3	32.2	30.7	11.8
LOS	C	A	C	C	B
Approach Delay		21.2	32.2	26.2	
Approach LOS		C	C	C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 56.9		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.80		
Intersection Signal Delay: 24.0	Intersection LOS: C	
Intersection Capacity Utilization 77.8%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Group Flow (vph)	555	107	186	123	39
v/c Ratio	0.80	0.09	0.54	0.38	0.13
Control Delay	24.6	3.3	32.2	30.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	3.3	32.2	30.7	11.8
Queue Length 50th (ft)	155	9	56	38	0
Queue Length 95th (ft)	349	27	163	114	27
Internal Link Dist (ft)		664	1191	1002	
Turn Bay Length (ft)	300				200
Base Capacity (vph)	957	1463	498	528	449
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.07	0.37	0.23	0.09

Intersection Summary

AM Existing + Project

21: Mission Rd & I-15 NB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			1.00			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1583	1863			1857			1775	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1583	1863			1857			1775	1417			
Volume (vph)	527	102	0	0	173	4	115	2	37	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	555	107	0	0	182	4	121	2	39	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	32	0	0	0
Lane Group Flow (vph)	555	107	0	0	185	0	0	123	7	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	24.9	37.5			8.6			10.4	10.4			
Effective Green, g (s)	24.9	37.5			8.6			10.4	10.4			
Actuated g/C Ratio	0.45	0.67			0.15			0.19	0.19			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	705	1250			286			330	264			
v/s Ratio Prot	c0.35	0.06			c0.10							
v/s Ratio Perm								0.07	0.01			
v/c Ratio	0.79	0.09			0.65			0.37	0.03			
Uniform Delay, d1	13.2	3.2			22.2			19.9	18.6			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	5.8	0.0			5.0			0.7	0.0			
Delay (s)	19.0	3.2			27.2			20.6	18.7			
Level of Service	B	A			C			C	B			
Approach Delay (s)		16.5			27.2			20.1			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM Average Control Delay	19.0	HCM Level of Service		B
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	55.9	Sum of lost time (s)		12.0
Intersection Capacity Utilization	77.8%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing + Project

22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	18	92	135	2	5	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	19	97	142	2	5	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	302	16	26			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	302	16	26			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	91	91			
cM capacity (veh/h)	628	1063	1588			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	116	144	26
Volume Left	19	142	0
Volume Right	97	0	21
cSH	955	1588	1700
Volume to Capacity	0.12	0.09	0.02
Queue Length 95th (ft)	10	7	0
Control Delay (s)	9.3	7.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	7.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Project

23: Baltimore Oriole & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	136	44	89	121	24	69
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	143	46	94	127	25	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	217	94			221	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	217	94			221	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	95			98	
cM capacity (veh/h)	757	963			1348	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	189	94	127	25	73
Volume Left	143	0	0	25	0
Volume Right	46	0	127	0	0
cSH	799	1700	1700	1348	1700
Volume to Capacity	0.24	0.06	0.07	0.02	0.04
Queue Length 95th (ft)	23	0	0	1	0
Control Delay (s)	10.9	0.0	0.0	7.7	0.0
Lane LOS	B			A	
Approach Delay (s)	10.9	0.0		2.0	
Approach LOS	B				

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Project

24: Longspur & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	109	35	175	161	30	175
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	115	37	184	169	32	184

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	152	184	169	32	184
Volume Left (vph)	115	0	0	32	0
Volume Right (vph)	37	0	169	0	0
Hadj (s)	0.04	0.03	-0.67	0.53	0.03
Departure Headway (s)	5.2	5.2	4.5	5.8	5.3
Degree Utilization, x	0.22	0.27	0.21	0.05	0.27
Capacity (veh/h)	642	672	774	592	653
Control Delay (s)	9.6	8.8	7.5	7.9	9.1
Approach Delay (s)	9.6	8.2		8.9	
Approach LOS	A	A		A	

Intersection Summary			
Delay	8.7		
HCM Level of Service	A		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Project

25: Harvest Glen Ln & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	83	29	307	146	42	242
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	87	31	323	154	44	255

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	87	31	323	154	44	255
Volume Left (vph)	87	0	0	0	44	0
Volume Right (vph)	0	31	0	154	0	0
Hadj (s)	0.53	-0.67	0.03	-0.67	0.53	0.03
Departure Headway (s)	6.8	5.6	5.2	4.5	5.9	5.4
Degree Utilization, x	0.16	0.05	0.47	0.19	0.07	0.38
Capacity (veh/h)	488	583	673	768	585	648
Control Delay (s)	9.9	7.6	11.6	7.4	8.1	10.5
Approach Delay (s)	9.3		10.2		10.1	
Approach LOS	A		B		B	

Intersection Summary			
Delay	10.1		
HCM Level of Service	B		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Project

26: Pardee South Loop & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	25	366	0	7	297
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	26	385	0	7	313
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	713	385			385	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	713	385			385	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			99	
cM capacity (veh/h)	396	662			1173	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	26	385	0	7	313
Volume Left	0	0	0	7	0
Volume Right	26	0	0	0	0
cSH	662	1700	1700	1173	1700
Volume to Capacity	0.04	0.23	0.00	0.01	0.18
Queue Length 95th (ft)	3	0	0	0	0
Control Delay (s)	10.7	0.0	0.0	8.1	0.0
Lane LOS	B			A	
Approach Delay (s)	10.7	0.0		0.2	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	29.3%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Project

27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	384	0	0	349
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	404	0	0	367
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	588	202			404	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	588	202			404	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	440	805			1151	

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	202	202	184	184
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.12	0.12	0.11	0.11
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	13.9%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Project

28: Connector Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	121	6	2	263	253	96
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	127	6	2	277	266	101

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	127	6	2	277	266	101
Volume Left (vph)	127	0	2	0	0	0
Volume Right (vph)	0	6	0	0	0	101
Hadj (s)	0.53	-0.67	0.53	0.03	0.03	-0.67
Departure Headway (s)	6.5	5.3	5.9	5.4	5.3	4.6
Degree Utilization, x	0.23	0.01	0.00	0.41	0.39	0.13
Capacity (veh/h)	508	610	589	652	662	756
Control Delay (s)	10.3	7.2	7.7	10.8	10.4	7.0
Approach Delay (s)	10.2		10.8		9.5	
Approach LOS	B		B		A	

Intersection Summary			
Delay	10.1		
HCM Level of Service	B		
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Project
29: Connector Rd & Pankey Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	29	94	0	10	116	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	99	0	11	122	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	249	5			11	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	249	5			11	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	91			92	
cM capacity (veh/h)	683	1078			1609	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	129	11	122
Volume Left	31	0	122
Volume Right	99	11	0
cSH	948	1700	1609
Volume to Capacity	0.14	0.01	0.08
Queue Length 95th (ft)	12	0	6
Control Delay (s)	9.4	0.0	7.4
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	7.4
Approach LOS	A		

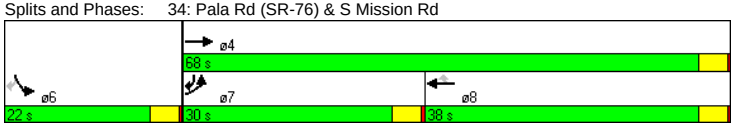
Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	28.8%	ICU Level of Service	A
Analysis Period (min)	15		

AM Existing + Project
34: Pala Rd (SR-76) & S Mission Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	525	469	868	95	123	781
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	30.0	68.0	38.0	38.0	22.0	30.0
Total Split (%)	33.3%	75.6%	42.2%	42.2%	24.4%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	21.3	51.4	25.9	25.9	18.4	43.9
Actuated g/C Ratio	0.27	0.66	0.33	0.33	0.24	0.56
v/c Ratio	0.66	0.40	0.78	0.19	0.18	0.59
Control Delay	29.9	6.9	28.7	5.2	28.1	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	6.9	28.7	5.2	28.1	14.2
LOS	C	A	C	A	C	B
Approach Delay		19.0	26.4		16.1	
Approach LOS		B	C		B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 78			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 20.6		Intersection LOS: C	
Intersection Capacity Utilization 61.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



AM Existing + Project
34: Pala Rd (SR-76) & S Mission Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	553	494	914	100	129	822
v/c Ratio	0.66	0.40	0.78	0.19	0.18	0.59
Control Delay	29.9	6.9	28.7	5.2	28.1	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	6.9	28.7	5.2	28.1	14.2
Queue Length 50th (ft)	123	94	214	0	27	140
Queue Length 95th (ft)	194	140	294	31	56	240
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	976	1325	1410	625	726	1463
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.37	0.65	0.16	0.18	0.56

Intersection Summary

LOS Engineering

AM Existing + Project
34: Pala Rd (SR-76) & S Mission Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Volume (vph)	525	469	868	95	123	781
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	553	494	914	100	129	822
RTOR Reduction (vph)	0	0	0	66	0	0
Lane Group Flow (vph)	553	494	914	34	129	822
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	21.3	51.4	26.1	26.1	18.4	39.7
Effective Green, g (s)	21.3	51.4	26.1	26.1	18.4	39.7
Actuated g/C Ratio	0.27	0.66	0.34	0.34	0.24	0.51
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	841	1231	1187	475	727	1400
v/s Ratio Prot	c0.18	0.27	c0.26		0.04	c0.16
v/s Ratio Perm				0.02		0.17
v/c Ratio	0.66	0.40	0.77	0.07	0.18	0.59
Uniform Delay, d1	25.0	6.1	23.2	17.6	23.7	13.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.2	3.1	0.1	0.5	0.6
Delay (s)	26.9	6.3	26.3	17.7	24.2	14.0
Level of Service	C	A	C	B	C	B
Approach Delay (s)		17.2	25.5		15.3	
Approach LOS		B	C		B	

Intersection Summary				
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Project
1: Pala Rd (SR-76) & Via Monserate

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	22	1006	864	53	41	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	23	1059	909	56	43	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	965				2043	937
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	965				2043	937
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				28	95
cM capacity (veh/h)	713				60	321

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	23	1059	965	59
Volume Left	23	0	0	43
Volume Right	0	0	56	16
cSH	713	1700	1700	77
Volume to Capacity	0.03	0.62	0.57	0.77
Queue Length 95th (ft)	3	0	0	93
Control Delay (s)	10.2	0.0	0.0	138.0
Lane LOS	B			F
Approach Delay (s)	0.2		0.0	138.0
Approach LOS				F

Intersection Summary			
Average Delay		4.0	
Intersection Capacity Utilization		63.2%	ICU Level of Service B
Analysis Period (min)		15	

LOS Engineering

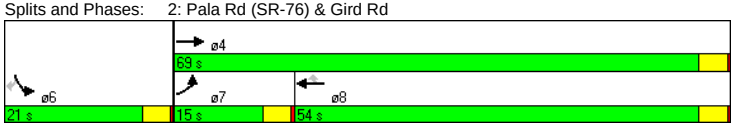
PM Existing + Project
2: Pala Rd (SR-76) & Gird Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	111	953	851	68	44	56
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	69.0	54.0	54.0	21.0	21.0
Total Split (%)	16.7%	76.7%	60.0%	60.0%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	9.3	46.1	36.0	36.0	8.3	8.3
Actuated g/C Ratio	0.14	0.72	0.56	0.56	0.13	0.13
v/c Ratio	0.52	0.75	0.85	0.09	0.22	0.25
Control Delay	40.1	8.4	21.5	6.2	34.7	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	8.4	21.5	6.2	34.7	12.9
LOS	D	A	C	A	C	B
Approach Delay		11.7	20.4		22.5	
Approach LOS		B	C		C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 63.8		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.85		
Intersection Signal Delay: 16.1	Intersection LOS: B	
Intersection Capacity Utilization 65.0%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



LOS Engineering

PM Existing + Project
2: Pala Rd (SR-76) & Gird Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				13		59
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	111	953	851	68	44	56
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	117	1003	896	72	46	59
Lane Group Flow (vph)	117	1003	896	72	46	59
v/c Ratio	0.52	0.75	0.85	0.09	0.22	0.25
Control Delay	40.1	8.4	21.5	6.2	34.7	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	8.4	21.5	6.2	34.7	12.9
Queue Length 50th (ft)	47	142	288	10	19	0
Queue Length 95th (ft)	#115	306	514	29	53	34
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	275	1502	1221	934	405	407
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.67	0.73	0.08	0.11	0.14

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Existing + Project
2: Pala Rd (SR-76) & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Volume (vph)	111	953	851	68	44	56
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	117	1003	896	72	46	59
RTOR Reduction (vph)	0	0	0	6	0	51
Lane Group Flow (vph)	117	1003	896	66	46	8
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	7.2	47.2	36.0	36.0	8.3	8.3
Effective Green, g (s)	7.2	47.2	36.0	36.0	8.3	8.3
Actuated g/C Ratio	0.11	0.74	0.57	0.57	0.13	0.13
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	179	1385	1056	803	207	185
v/s Ratio Prot	0.07	c0.54	c0.48		c0.03	
v/s Ratio Perm				0.05		0.01
v/c Ratio	0.65	0.72	0.85	0.08	0.22	0.04
Uniform Delay, d1	27.0	4.5	11.5	6.2	24.7	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.3	1.9	6.5	0.0	0.5	0.1
Delay (s)	35.2	6.4	18.0	6.3	25.3	24.2
Level of Service	D	A	B	A	C	C
Approach Delay (s)		9.4	17.1		24.7	
Approach LOS		A	B		C	

Intersection Summary				
HCM Average Control Delay	13.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

PM Existing + Project
3: Pala Rd (SR-76) & Sage Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	8	991	921	4	6	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	1043	969	4	6	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	974				2032	972
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	974				2032	972
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				90	97
cM capacity (veh/h)	708				62	306

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1052	974	16
Volume Left	8	0	6
Volume Right	0	4	9
cSH	708	1700	119
Volume to Capacity	0.01	0.57	0.13
Queue Length 95th (ft)	1	0	11
Control Delay (s)	0.4	0.0	39.8
Lane LOS	A		E
Approach Delay (s)	0.4	0.0	39.8
Approach LOS			E

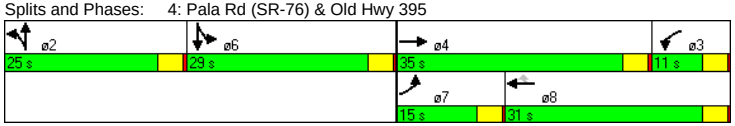
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

PM Existing + Project
4: Pala Rd (SR-76) & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Configurations							
Volume (vph)	118	812	60	632	236	122	89
Turn Type	Prot		Prot		Perm		
Protected Phases	7	4	3	8		2	6
Permitted Phases					8		
Detector Phases	7	4	3	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	35.0	11.0	31.0	31.0	25.0	29.0
Total Split (%)	15.0%	35.0%	11.0%	31.0%	31.0%	25.0%	29.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	Min
Act Effct Green (s)	10.0	26.4	7.1	23.6	23.6	16.3	21.0
Actuated g/C Ratio	0.11	0.31	0.08	0.28	0.28	0.19	0.25
v/c Ratio	0.69	0.86	0.49	0.68	0.44	0.76	0.85
Control Delay	62.2	38.2	58.1	33.8	6.9	48.7	51.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.2	38.2	58.1	33.8	6.9	48.7	51.1
LOS	E	D	E	C	A	D	D
Approach Delay		41.0		28.5		48.7	51.1
Approach LOS		D		C		D	D

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 85.1			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 38.7		Intersection LOS: D	
Intersection Capacity Utilization 73.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



PM Existing + Project
4: Pala Rd (SR-76) & Old Hwy 395 Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987				0.850		0.968			0.967	
Flt Protected	0.950			0.950				0.986			0.975	
Satd. Flow (prot)	1583	3493	0	1583	3539	1417	0	1778	0	0	1756	0
Flt Permitted	0.950			0.950				0.986			0.975	
Satd. Flow (perm)	1583	3493	0	1583	3539	1417	0	1778	0	0	1756	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				245		14			16	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	118	812	75	60	632	236	73	122	60	181	89	89
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	124	855	79	63	665	248	77	128	63	191	94	94
Lane Group Flow (vph)	124	934	0	63	665	248	0	268	0	0	379	0
v/c Ratio	0.69	0.86		0.49	0.68	0.44		0.76			0.85	
Control Delay	62.2	38.2		58.1	33.8	6.9		48.7			51.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	62.2	38.2		58.1	33.8	6.9		48.7			51.1	
Queue Length 50th (ft)	76	282		39	195	1		151			216	
Queue Length 95th (ft)	#165	#395		#96	264	60		#243			#378	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	207	1263		135	1133	620		451			530	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	0.60	0.74		0.47	0.59	0.40		0.59			0.72	

Intersection Summary	
Area Type:	Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Existing + Project
4: Pala Rd (SR-76) & Old Hwy 395 HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.98	
Satd. Flow (prot)	1583	3494		1583	3539	1417		1778			1756	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99			0.98	
Satd. Flow (perm)	1583	3494		1583	3539	1417		1778			1756	
Volume (vph)	118	812	75	60	632	236	73	122	60	181	89	89
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	124	855	79	63	665	248	77	128	63	191	94	94
RTOR Reduction (vph)	0	7	0	0	0	176	0	11	0	0	12	0
Lane Group Flow (vph)	124	927	0	63	665	72	0	257	0	0	367	0
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	7.7	26.4		5.0	23.7	23.7		16.3			21.0	
Effective Green, g (s)	7.7	26.4		5.0	23.7	23.7		16.3			21.0	
Actuated g/C Ratio	0.09	0.31		0.06	0.28	0.28		0.19			0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	144	1089		93	990	396		342			435	
v/s Ratio Prot	0.08	c0.27		0.04	c0.19			c0.14			c0.21	
v/s Ratio Perm						0.05						
v/c Ratio	0.86	0.85		0.68	0.67	0.18		0.75			0.84	
Uniform Delay, d1	38.0	27.3		39.1	27.0	23.1		32.3			30.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	37.6	6.6		17.8	1.8	0.2		8.9			13.9	
Delay (s)	75.5	33.9		56.9	28.9	23.4		41.2			44.2	
Level of Service	E	C		E	C	C		D			D	
Approach Delay (s)		38.7			29.3			41.2			44.2	
Approach LOS		D			C			D			D	

Intersection Summary					
HCM Average Control Delay	36.3	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	84.7	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	73.5%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

PM Existing + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

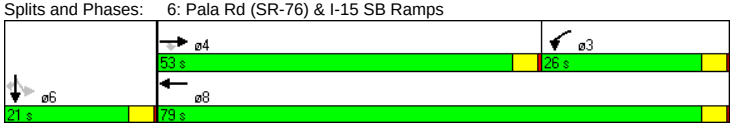
Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Volume (vph)	749	273	291	589	5	433
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6	
Permitted Phases		4				6
Detector Phases	4	4	3	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	53.0	53.0	26.0	79.0	21.0	21.0
Total Split (%)	53.0%	53.0%	26.0%	79.0%	21.0%	21.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	45.4	45.4	21.3	70.7	21.3	21.3
Actuated g/C Ratio	0.45	0.45	0.21	0.71	0.21	0.21
v/c Ratio	0.93	0.36	0.91	0.47	0.50	0.76
Control Delay	44.3	3.2	30.1	5.6	42.1	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	3.2	30.1	5.6	42.1	18.1
LOS	D	A	C	A	D	B
Approach Delay	33.3			13.7	25.1	
Approach LOS	C			B	C	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 40 (40%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 24.5 Intersection LOS: C
Intersection Capacity Utilization 97.0% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



LOS Engineering

PM Existing + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.954	
Satd. Flow (prot)	0	1863	1417	1583	1863	0	0	0	0	0	1777	1417
Flt Permitted				0.950							0.954	
Satd. Flow (perm)	0	1863	1417	1583	1863	0	0	0	0	0	1777	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			283									375
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	749	273	291	589	0	0	0	0	174	5	433
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	788	287	306	620	0	0	0	0	183	5	456
Lane Group Flow (vph)	0	788	287	306	620	0	0	0	0	0	188	456
v/c Ratio		0.93	0.36	0.91	0.47						0.50	0.76
Control Delay		44.3	3.2	30.1	5.6						42.1	18.1
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		44.3	3.2	30.1	5.6						42.1	18.1
Queue Length 50th (ft)		423	1	151	34						113	46
Queue Length 95th (ft)		#670	43	m138	m32						186	#217
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		914	840	351	1399						380	598
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.86	0.34	0.87	0.44						0.49	0.76

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Existing + Project
6: Pala Rd (SR-76) & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1776	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1776	1417
Volume (vph)	0	749	273	291	589	0	0	0	0	174	5	433
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	788	287	306	620	0	0	0	0	183	5	456
RTOR Reduction (vph)	0	0	155	0	0	0	0	0	0	0	0	295
Lane Group Flow (vph)	0	788	132	306	620	0	0	0	0	0	188	161
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		45.4	45.4	21.3	70.7						21.3	21.3
Effective Green, g (s)		45.4	45.4	21.3	70.7						21.3	21.3
Actuated g/C Ratio		0.45	0.45	0.21	0.71						0.21	0.21
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		846	643	337	1317						378	302
v/s Ratio Prot		c0.42		c0.19	0.33							
v/s Ratio Perm			0.09								0.11	c0.11
v/c Ratio		0.93	0.21	0.91	0.47						0.50	0.53
Uniform Delay, d1		25.8	16.4	38.4	6.4						34.6	34.9
Progression Factor		1.00	1.00	0.61	0.89						1.00	1.00
Incremental Delay, d2		16.7	0.2	3.7	0.0						4.6	6.6
Delay (s)		42.5	16.6	27.3	5.7						39.3	41.5
Level of Service		D	B	C	A						D	D
Approach Delay (s)		35.6			12.9			0.0			40.9	
Approach LOS		D			B			A			D	

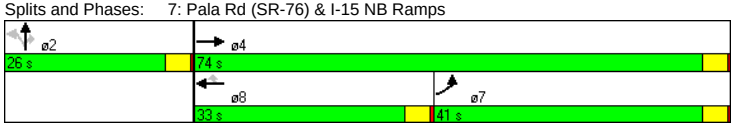
Intersection Summary				
HCM Average Control Delay	28.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	97.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

PM Existing + Project
7: Pala Rd (SR-76) & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Volume (vph)	594	348	550	133	4	329
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		2	
Permitted Phases				8		2
Detector Phases	7	4	8	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	41.0	74.0	33.0	33.0	26.0	26.0
Total Split (%)	41.0%	74.0%	33.0%	33.0%	26.0%	26.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	37.0	70.0	29.0	29.0	22.0	22.0
Actuated g/C Ratio	0.37	0.70	0.29	0.29	0.22	0.22
v/c Ratio	1.07	0.28	1.07	0.32	1.03	0.59
Control Delay	77.2	2.2	95.0	22.6	94.0	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.2	2.2	95.0	22.6	94.0	8.4
LOS	E	A	F	C	F	A
Approach Delay		49.5	80.9		54.5	
Approach LOS		D	F		D	

Intersection Summary		
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 56 (56%), Referenced to phase 2:NBTL and 6:, Start of Green		
Natural Cycle: 120		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.07		
Intersection Signal Delay: 60.2	Intersection LOS: E	
Intersection Capacity Utilization 97.0%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



PM Existing + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1583	1863	0	0	1863	1417	0	1775	1417	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	1583	1863	0	0	1863	1417	0	1775	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						37			346			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	594	348	0	0	550	133	380	4	329	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	625	366	0	0	579	140	400	4	346	0	0	0
Lane Group Flow (vph)	625	366	0	0	579	140	0	404	346	0	0	0
v/c Ratio	1.07	0.28			1.07	0.32		1.03	0.59			
Control Delay	77.2	2.2			95.0	22.6		94.0	8.4			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	77.2	2.2			95.0	22.6		94.0	8.4			
Queue Length 50th (ft)	~461	45			~412	50		~279	0			
Queue Length 95th (ft)	m#556	m33			#619	103		#463	77			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	586	1304			540	437		391	582			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	1.07	0.28			1.07	0.32		1.03	0.59			

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Existing + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1775	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1775	1417			
Volume (vph)	594	348	0	0	550	133	380	4	329	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	625	366	0	0	579	140	400	4	346	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	26	0	0	270	0	0	0
Lane Group Flow (vph)	625	366	0	0	579	114	0	404	76	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	37.0	70.0			29.0	29.0		22.0	22.0			
Effective Green, g (s)	37.0	70.0			29.0	29.0		22.0	22.0			
Actuated g/C Ratio	0.37	0.70			0.29	0.29		0.22	0.22			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	586	1304			540	411		391	312			
v/s Ratio Prot	c0.39	0.20			c0.31							
v/s Ratio Perm						0.08		0.23	0.05			
v/c Ratio	1.07	0.28			1.07	0.28		1.03	0.24			
Uniform Delay, d1	31.5	5.6			35.5	27.4		39.0	32.1			
Progression Factor	0.94	0.33			1.00	1.00		1.00	1.00			
Incremental Delay, d2	46.5	0.1			59.5	0.4		54.3	1.9			
Delay (s)	76.2	1.9			95.0	27.8		93.3	34.0			
Level of Service	E	A			F	C		F	C			
Approach Delay (s)		48.8			81.9			66.0			0.0	
Approach LOS		D			F			E			A	

Intersection Summary

HCM Average Control Delay	63.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

PM Existing + Project
8: Pala Rd (SR-76) & Pankey Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	27	665	27	38	704	7	14	6	31	0	3	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	28	700	28	40	741	7	15	6	33	0	3	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	748			728			1236	1599	364	1267	1610	374
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	748			728			1236	1599	364	1267	1610	374
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			95			88	93	95	100	97	98
cM capacity (veh/h)	856			871			119	97	633	106	96	623

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	28	467	262	40	494	254	54	16
Volume Left	28	0	0	40	0	0	15	0
Volume Right	0	0	28	0	0	7	33	13
cSH	856	1700	1700	871	1700	1700	223	296
Volume to Capacity	0.03	0.27	0.15	0.05	0.29	0.15	0.24	0.05
Queue Length 95th (ft)	3	0	0	4	0	0	23	4
Control Delay (s)	9.3	0.0	0.0	9.3	0.0	0.0	26.2	17.8
Lane LOS	A			A			D	C
Approach Delay (s)	0.4			0.5			26.2	17.8
Approach LOS							D	C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

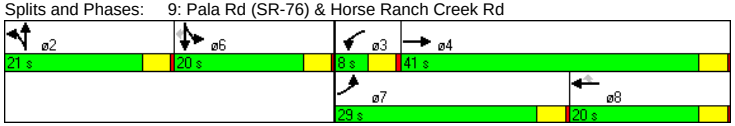
PM Existing + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	346	350	442	66	61	0	307		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	29.0	41.0	20.0	20.0	20.0	20.0	20.0	21.0	8.0
Total Split (%)	32.2%	45.6%	22.2%	22.2%	22.2%	22.2%	22.2%	23%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	19.1	36.1	12.8	12.8	8.4	8.4	8.4		
Actuated g/C Ratio	0.31	0.58	0.20	0.20	0.13	0.13	0.13		
v/c Ratio	0.75	0.18	0.64	0.20	0.32	0.18	0.19		
Control Delay	31.3	6.4	28.4	8.6	31.4	0.5	0.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	31.3	6.4	28.4	8.6	31.4	0.5	0.5		
LOS	C	A	C	A	C	A	A		
Approach Delay		18.8	25.9			5.6			
Approach LOS		B	C			A			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 62.6			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 48.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



PM Existing + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		250	0		0	150		150
Storage Lanes	1		0	1		1	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt						0.850					0.850	0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1583	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	1583	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						69					777	777
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2833			5160			734			1509	
Travel Time (s)		64.4			117.3			16.7			34.3	
Volume (vph)	346	350	0	0	442	66	0	0	0	61	0	307
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	364	368	0	0	465	69	0	0	0	64	0	323
Lane Group Flow (vph)	364	368	0	0	465	69	0	0	0	64	158	165
v/c Ratio	0.75	0.18			0.64	0.20				0.32	0.18	0.19
Control Delay	31.3	6.4			28.4	8.6				31.4	0.5	0.5
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	31.3	6.4			28.4	8.6				31.4	0.5	0.5
Queue Length 50th (ft)	122	29			86	0				24	0	0
Queue Length 95th (ft)	241	55			152	31				64	0	0
Internal Link Dist (ft)		2753			5080			654			1429	
Turn Bay Length (ft)	250					250				150		150
Base Capacity (vph)	585	2153			877	403				350	931	909
Starvation Cap Reductn	0	0			0	0				0	0	0
Spillback Cap Reductn	0	0			0	0				0	0	0
Storage Cap Reductn	0	0			0	0				0	0	0
Reduced v/c Ratio	0.62	0.17			0.53	0.17				0.18	0.17	0.18

Intersection Summary
Area Type: Other

LOS Engineering

PM Existing + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

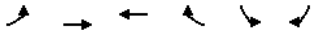
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.85	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1583	3539			3539	1417				1504	1441	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1583	3539			3539	1417				1504	1441	1346
Volume (vph)	346	350	0	0	442	66	0	0	0	61	0	307
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	364	368	0	0	465	69	0	0	0	64	0	323
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	137	143
Lane Group Flow (vph)	364	368	0	0	465	14	0	0	0	64	21	22
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	19.1	36.1			13.0	13.0				8.4	8.4	8.4
Effective Green, g (s)	19.1	36.1			13.0	13.0				8.4	8.4	8.4
Actuated g/C Ratio	0.31	0.58			0.21	0.21				0.14	0.14	0.14
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	486	2054			740	296				203	195	182
v/s Ratio Prot	c0.23	0.10			c0.13					c0.04	0.01	
v/s Ratio Perm						0.01						0.02
v/c Ratio	0.75	0.18			0.63	0.05				0.32	0.11	0.12
Uniform Delay, d1	19.4	6.1			22.4	19.7				24.3	23.6	23.7
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	6.2	0.0			1.7	0.1				0.9	0.2	0.3
Delay (s)	25.6	6.2			24.1	19.7				25.2	23.9	24.0
Level of Service	C	A			C	B				C	C	C
Approach Delay (s)		15.8			23.5			0.0			24.1	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM Average Control Delay	20.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	21.7	
Intersection Capacity Utilization	48.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing + Project
10: Pala Rd (SR-76) & Rice Canyon Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	19	335	426	8	8	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	20	353	448	8	8	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	457				845	453
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	457				845	453
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	97
cM capacity (veh/h)	1104				327	607

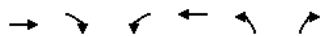
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	373	457	24
Volume Left	20	0	8
Volume Right	0	8	16
cSH	1104	1700	468
Volume to Capacity	0.02	0.27	0.05
Queue Length 95th (ft)	1	0	4
Control Delay (s)	0.6	0.0	13.1
Lane LOS	A		B
Approach Delay (s)	0.6	0.0	13.1
Approach LOS			B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		43.2%	ICU Level of Service A
Analysis Period (min)		15	

LOS Engineering

PM Existing + Project
11: Pala Rd (SR-76) & Couser Canyon Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	306	34	8	420	20	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	322	36	8	442	21	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			358		799	340
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			358		799	340
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		94	100
cM capacity (veh/h)			1201		352	702

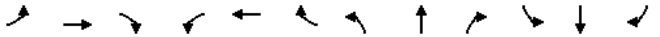
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	358	451	23
Volume Left	0	8	21
Volume Right	36	0	2
cSH	1700	1201	369
Volume to Capacity	0.21	0.01	0.06
Queue Length 95th (ft)	0	1	5
Control Delay (s)	0.0	0.2	15.4
Lane LOS		A	C
Approach Delay (s)	0.0	0.2	15.4
Approach LOS			C

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		38.5%	ICU Level of Service A
Analysis Period (min)		15	

LOS Engineering

PM Existing + Project
12: Pala Mesa Dr & Old Hwy 395

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	13	45	24	64	52	44	46	329	81	34	165	27
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	47	25	67	55	46	48	346	85	36	174	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	776	788	188	780	759	389	202			432		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	776	788	188	780	759	389	202			432		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	84	97	73	83	93	96			97		
cM capacity (veh/h)	241	302	854	254	314	659	1370			1128		

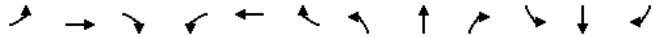
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	86	67	101	48	432	36	202
Volume Left	14	67	0	48	0	36	0
Volume Right	25	0	46	0	85	0	28
cSH	355	254	413	1370	1700	1128	1700
Volume to Capacity	0.24	0.27	0.24	0.04	0.25	0.03	0.12
Queue Length 95th (ft)	23	26	24	3	0	2	0
Control Delay (s)	18.4	24.2	16.5	7.7	0.0	8.3	0.0
Lane LOS	C	C	C	A		A	
Approach Delay (s)	18.4	19.6		0.8		1.2	
Approach LOS	C	C					

Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	46.8%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

PM Existing + Project
13: Pala Mesa Dr & Wilt Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	1	0	22	2	39	0	3	15	39	10	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1	0	23	2	41	0	3	16	41	11	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	43			1			81	95	1	92	74	23
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	43			1			81	95	1	92	74	23
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	99	95	99	100
cM capacity (veh/h)	1565			1622			887	783	1084	866	803	1054

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	3	66	19	53
Volume Left	2	23	0	41
Volume Right	0	41	16	1
cSH	1565	1622	1018	856
Volume to Capacity	0.00	0.01	0.02	0.06
Queue Length 95th (ft)	0	1	1	5
Control Delay (s)	4.9	2.6	8.6	9.5
Lane LOS	A	A	A	A
Approach Delay (s)	4.9	2.6	8.6	9.5
Approach LOS			A	A

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	19.9%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

PM Existing + Project

14: Stewart Canyon Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	8	3	18	22	1	151	21	300	19	185	195	19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	3	19	23	1	159	22	316	20	195	205	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1124	985	215	985	985	326	225			336		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1124	985	215	985	985	326	225			336		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	98	98	88	99	78	98			84		
cM capacity (veh/h)	123	205	825	190	205	715	1343			1223		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	31	183	22	336	195	225
Volume Left	8	23	22	0	195	0
Volume Right	19	159	0	20	0	20
cSH	285	525	1343	1700	1223	1700
Volume to Capacity	0.11	0.35	0.02	0.20	0.16	0.13
Queue Length 95th (ft)	9	39	1	0	14	0
Control Delay (s)	19.1	15.5	7.7	0.0	8.5	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	19.1	15.5	0.5		3.9	
Approach LOS	C	C				

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	50.2%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

PM Existing + Project

15: Reche Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	205	226	256	197	203	152
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	216	238	269	207	214	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1040	294	374			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1040	294	374			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	68	77			
cM capacity (veh/h)	197	746	1185			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	454	269	207	374
Volume Left	216	269	0	0
Volume Right	238	0	0	160
cSH	321	1185	1700	1700
Volume to Capacity	1.41	0.23	0.12	0.22
Queue Length 95th (ft)	594	22	0	0
Control Delay (s)	235.2	8.9	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	235.2	5.0		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	83.6		
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		

LOS Engineering

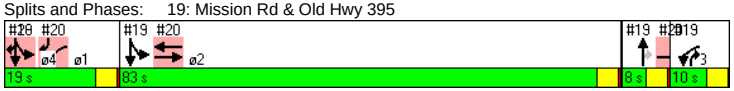
PM Existing + Project
19: Mission Rd & Old Hwy 395 — Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	315	688	49	318	970	36		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			8.0		20.0	20.0	8.0	8.0
Total Split (s)	29.0	0.0	8.0	29.0	83.0	83.0	19.0	10.0
Total Split (%)	24.2%	0.0%	6.7%	24.2%	69.2%	69.2%	16%	8%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes					Yes
Recall Mode			None		None	None	None	None
Act Effct Green (s)	25.0	120.0	4.0	33.0	79.0	79.0		
Actuated g/C Ratio	0.21	1.00	0.03	0.28	0.66	0.66		
v/c Ratio	1.01	0.51	0.84	0.86	0.98	0.03		
Control Delay	93.4	1.1	132.7	63.4	44.2	7.3		
Queue Delay	0.0	0.0	0.0	0.0	65.1	0.0		
Total Delay	93.4	1.1	132.7	63.4	109.3	7.3		
LOS	F	A	F	E	F	A		
Approach Delay	30.1		72.7			105.6		
Approach LOS	C		E			F		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 68.7 — Intersection LOS: E
Intersection Capacity Utilization 92.9% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 19: Mission Rd & Old Hwy 395



PM Existing + Project
19: Mission Rd & Old Hwy 395 — Queues

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	315	688	49	318	970	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	332	724	52	335	1021	38
Lane Group Flow (vph)	332	724	52	335	1021	38
v/c Ratio	1.01	0.51	0.84	0.86	0.98	0.03
Control Delay	93.4	1.1	132.7	63.4	44.2	7.3
Queue Delay	0.0	0.0	0.0	0.0	65.1	0.0
Total Delay	93.4	1.1	132.7	63.4	109.3	7.3
Queue Length 50th (ft)	~255	7	41	247	700	10
Queue Length 95th (ft)	m#350	m1	#119	#411	#1059	22
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	330	1417	62	390	1042	1226
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	162	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.51	0.84	0.86	1.16	0.03

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

PM Existing + Project
19: Mission Rd & Old Hwy 395

HCM Signalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Volume (vph)	315	688	49	318	970	36
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	332	724	52	335	1021	38
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	332	724	52	335	1021	38
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	25.0	120.0	4.0	29.0	79.0	79.0
Effective Green, g (s)	25.0	120.0	4.0	29.0	79.0	79.0
Actuated g/C Ratio	0.21	1.00	0.03	0.24	0.66	0.66
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	330	1417	62	390	1042	1226
v/s Ratio Prot	c0.21		0.03	c0.18	c0.64	0.02
v/s Ratio Perm		0.51		0.06		
v/c Ratio	1.01	0.51	0.84	0.86	0.98	0.03
Uniform Delay, d1	47.5	0.0	57.7	43.5	19.7	7.2
Progression Factor	1.09	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.1	0.9	60.1	16.9	22.8	0.0
Delay (s)	93.6	0.9	117.8	60.4	42.5	7.2
Level of Service	F	A	F	E	D	A
Approach Delay (s)	30.0		68.1			41.2
Approach LOS	C		E			D

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

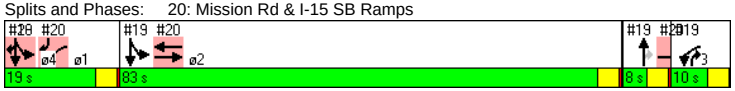
PM Existing + Project
20: Mission Rd & I-15 SB Ramps

Timings

Lane Group	EBT	WBL	WBT	SBT	SBR	ø3
Lane Configurations						
Volume (vph)	1197	44	330	2	675	
Turn Type		Prot			custom	
Protected Phases	2 3	1	2	4	1 4	3
Permitted Phases					4	
Detector Phases	2 3	1	2	4	1 4	
Minimum Initial (s)		4.0	4.0	4.0		4.0
Minimum Split (s)		8.0	20.0	8.0		8.0
Total Split (s)	91.0	19.0	83.0	10.0	29.0	8.0
Total Split (%)	75.8%	15.8%	69.2%	8.3%	24.2%	7%
Yellow Time (s)		3.5	3.5	3.5		3.5
All-Red Time (s)		0.5	0.5	0.5		0.5
Lead/Lag		Lead	Lag	Lag		Lead
Lead-Lag Optimize?				Yes		Yes
Recall Mode		None	None	None		None
Act Effct Green (s)	87.0	15.0	79.0	6.0	25.0	
Actuated g/C Ratio	0.72	0.12	0.66	0.05	0.21	
v/c Ratio	1.01	0.23	0.28	0.11	0.94	
Control Delay	29.1	50.8	9.3	57.3	31.1	
Queue Delay	56.8	0.0	0.0	0.8	0.0	
Total Delay	85.9	50.8	9.3	58.1	31.1	
LOS	F	D	A	E	C	
Approach Delay	85.9		14.2	31.5		
Approach LOS	F		B	C		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Natural Cycle: 120		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.01		
Intersection Signal Delay: 58.5	Intersection LOS: E	
Intersection Capacity Utilization 78.2%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



LOS Engineering

PM Existing + Project
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		0	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50					50	50	50
Trailing Detector (ft)		0		0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991										0.850
Flt Protected				0.950							0.962	
Satd. Flow (prot)	0	1846	0	1583	1863	0	0	0	0	0	1792	1417
Flt Permitted				0.950							0.962	
Satd. Flow (perm)	0	1846	0	1583	1863	0	0	0	0	0	1792	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8										581
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	1197	85	44	330	0	0	0	0	8	2	675
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1260	89	46	347	0	0	0	0	8	2	711
Lane Group Flow (vph)	0	1349	0	46	347	0	0	0	0	0	10	711
v/c Ratio		1.01		0.23	0.28						0.11	0.94
Control Delay		29.1		50.8	9.3						57.3	31.1
Queue Delay		56.8		0.0	0.0						0.8	0.0
Total Delay		85.9		50.8	9.3						58.1	31.1
Queue Length 50th (ft)		~835		33	104						8	113
Queue Length 95th (ft)		m#1188		70	150						26	#391
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1341		198	1226						90	755
Starvation Cap Reductn		142		0	0						0	0
Spillback Cap Reductn		170		0	0						26	0
Storage Cap Reductn		0		0	0						0	0
Reduced v/c Ratio		1.15		0.23	0.28						0.16	0.94

Intersection Summary	
Area Type:	Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Existing + Project
20: Mission Rd & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.96	1.00
Satd. Flow (prot)		1846		1583	1863						1791	1417
Flt Permitted		1.00		0.95	1.00						0.96	1.00
Satd. Flow (perm)		1846		1583	1863						1791	1417
Volume (vph)	0	1197	85	44	330	0	0	0	0	8	2	675
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1260	89	46	347	0	0	0	0	8	2	711
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	460
Lane Group Flow (vph)	0	1347	0	46	347	0	0	0	0	0	10	251
Turn Type				Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases												4
Actuated Green, G (s)		87.0		15.0	79.0						6.0	25.0
Effective Green, g (s)		87.0		15.0	79.0						6.0	25.0
Actuated g/C Ratio		0.72		0.12	0.66						0.05	0.21
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1338		198	1226						90	295
v/s Ratio Prot		c0.73		0.03	0.19						0.01	c0.18
v/s Ratio Perm												
v/c Ratio		1.01		0.23	0.28						0.11	0.85
Uniform Delay, d1		16.5		47.3	8.6						54.5	45.7
Progression Factor		0.73		1.00	1.00						1.00	1.00
Incremental Delay, d2		15.6		0.6	0.1						0.5	20.3
Delay (s)		27.7		47.9	8.7						55.0	66.0
Level of Service		C		D	A						E	E
Approach Delay (s)		27.7			13.3			0.0			65.9	
Approach LOS		C			B			A			E	

Intersection Summary					
HCM Average Control Delay	36.6	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.97				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	78.2%	ICU Level of Service	D		
Analysis Period (min)	15				

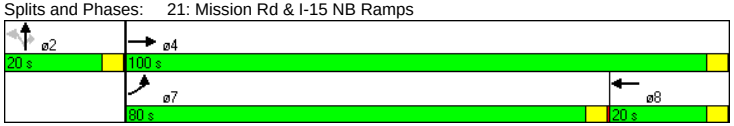
c Critical Lane Group

LOS Engineering

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	985	204	180	2	77
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	80.0	100.0	20.0	20.0	20.0
Total Split (%)	66.7%	83.3%	16.7%	16.7%	16.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	76.1	95.0	14.9	14.8	14.8
Actuated g/C Ratio	0.65	0.81	0.13	0.13	0.13
v/c Ratio	1.01	0.14	0.81	0.79	0.33
Control Delay	54.1	2.8	75.8	75.5	13.9
Queue Delay	25.0	0.0	0.0	0.0	0.0
Total Delay	79.1	2.8	75.8	75.5	13.9
LOS	E	A	E	E	B
Approach Delay		66.0	75.8	56.2	
Approach LOS		E	E	E	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 117.8		
Natural Cycle: 120		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.01		
Intersection Signal Delay: 65.6	Intersection LOS: E	
Intersection Capacity Utilization 89.9%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.998				0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1583	1863	0	0	1859	0	0	1775	1417	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	1583	1863	0	0	1859	0	0	1775	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1				81			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	985	204	0	0	180	3	166	2	77	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1037	215	0	0	189	3	175	2	81	0	0	0
Lane Group Flow (vph)	1037	215	0	0	192	0	0	177	81	0	0	0
v/c Ratio	1.01	0.14			0.81			0.79	0.33			
Control Delay	54.1	2.8			75.8			75.5	13.9			
Queue Delay	25.0	0.0			0.0			0.0	0.0			
Total Delay	79.1	2.8			75.8			75.5	13.9			
Queue Length 50th (ft)	~863	30			145			134	0			
Queue Length 95th (ft)	#1117	47			#259			#240	46			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	1023	1506			252			239	261			
Starvation Cap Reductn	66	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	1.08	0.14			0.76			0.74	0.31			

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

PM Existing + Project

21: Mission Rd & I-15 NB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			1.00			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1583	1863			1859			1775	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1583	1863			1859			1775	1417			
Volume (vph)	985	204	0	0	180	3	166	2	77	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1037	215	0	0	189	3	175	2	81	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	71	0	0	0
Lane Group Flow (vph)	1037	215	0	0	191	0	0	177	10	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	76.1	95.0			14.9			14.7	14.7			
Effective Green, g (s)	76.1	95.0			14.9			14.7	14.7			
Actuated g/C Ratio	0.65	0.81			0.13			0.12	0.12			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	1024	1504			235			222	177			
v/s Ratio Prot	c0.65	0.12			c0.10							
v/s Ratio Perm								0.10	0.01			
v/c Ratio	1.01	0.14			0.81			0.80	0.06			
Uniform Delay, d1	20.8	2.5			50.0			50.1	45.4			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	31.3	0.0			18.9			17.8	0.1			
Delay (s)	52.1	2.5			69.0			67.8	45.5			
Level of Service	D	A			E			E	D			
Approach Delay (s)		43.6			69.0			60.8			0.0	
Approach LOS		D			E			E			A	

Intersection Summary				
HCM Average Control Delay	49.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	117.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	89.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing + Project

22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	17	183	130	7	5	36
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	18	193	137	7	5	38
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	305	24	43			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	305	24	43			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	82	91			
cM capacity (veh/h)	627	1052	1565			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	211	144	43
Volume Left	18	137	0
Volume Right	193	0	38
cSH	995	1565	1700
Volume to Capacity	0.21	0.09	0.03
Queue Length 95th (ft)	20	7	0
Control Delay (s)	9.6	7.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	7.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing + Project

23: Baltimore Oriole & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	170	34	99	205	56	129
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	179	36	104	216	59	136
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	358	104			320	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	358	104			320	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	71	96			95	
cM capacity (veh/h)	610	950			1240	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	215	104	216	59	136
Volume Left	179	0	0	59	0
Volume Right	36	0	216	0	0
cSH	649	1700	1700	1240	1700
Volume to Capacity	0.33	0.06	0.13	0.05	0.08
Queue Length 95th (ft)	36	0	0	4	0
Control Delay (s)	13.3	0.0	0.0	8.0	0.0
Lane LOS	B			A	
Approach Delay (s)	13.3	0.0		2.4	
Approach LOS	B				

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	29.6%	ICU Level of Service	A
Analysis Period (min)	15		

PM Existing + Project

24: Longspur Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	222	41	263	200	52	247
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	234	43	277	211	55	260

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	277	277	211	55	260
Volume Left (vph)	234	0	0	55	0
Volume Right (vph)	43	0	211	0	0
Hadj (s)	0.11	0.03	-0.67	0.53	0.03
Departure Headway (s)	5.9	5.9	5.2	6.6	6.1
Degree Utilization, x	0.45	0.45	0.30	0.10	0.44
Capacity (veh/h)	578	593	669	521	571
Control Delay (s)	13.6	12.5	9.2	9.1	12.5
Approach Delay (s)	13.6	11.1		11.9	
Approach LOS	B	B		B	

Intersection Summary			
Delay	11.9		
HCM Level of Service	B		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

PM Existing + Project

25: Harvest Glen Ln & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	196	57	406	160	49	420
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	206	60	427	168	52	442

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	206	60	427	168	52	442
Volume Left (vph)	206	0	0	0	52	0
Volume Right (vph)	0	60	0	168	0	0
Hadj (s)	0.53	-0.67	0.03	-0.67	0.53	0.03
Departure Headway (s)	7.7	6.5	6.3	5.6	6.9	6.4
Degree Utilization, x	0.44	0.11	0.75	0.26	0.10	0.78
Capacity (veh/h)	431	510	560	623	501	551
Control Delay (s)	15.5	9.1	24.2	9.3	9.4	27.3
Approach Delay (s)	14.1		20.0		25.5	
Approach LOS	B		C		D	

Intersection Summary			
Delay	20.8		
HCM Level of Service	C		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing + Project

26: Pardee South Loop & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	23	508	0	34	507
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	24	535	0	36	534
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1140	535			535	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1140	535			535	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	96			97	
cM capacity (veh/h)	215	546			1033	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	24	535	0	36	534
Volume Left	0	0	0	36	0
Volume Right	24	0	0	0	0
cSH	546	1700	1700	1033	1700
Volume to Capacity	0.04	0.31	0.00	0.03	0.31
Queue Length 95th (ft)	3	0	0	3	0
Control Delay (s)	11.9	0.0	0.0	8.6	0.0
Lane LOS	B			A	
Approach Delay (s)	11.9	0.0		0.5	
Approach LOS	B				

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing + Project

27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	569	0	0	533
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	599	0	0	561
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	879	299			599	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	879	299			599	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	287	697			974	

Direction, Lane #	NB 1	NB 2	SB 1	SB 2
Volume Total	299	299	281	281
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.18	0.18	0.17	0.17
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0		0.0	
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	19.1%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing + Project

28: Connector Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	164	3	7	405	365	168
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	173	3	7	426	384	177

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	173	3	7	426	384	177
Volume Left (vph)	173	0	7	0	0	0
Volume Right (vph)	0	3	0	0	0	177
Hadj (s)	0.53	-0.67	0.53	0.03	0.03	-0.67
Departure Headway (s)	7.4	6.2	6.4	5.9	5.8	5.1
Degree Utilization, x	0.35	0.01	0.01	0.70	0.62	0.25
Capacity (veh/h)	451	526	538	590	610	685
Control Delay (s)	13.2	8.0	8.3	20.2	16.4	8.5
Approach Delay (s)	13.1		20.0		13.9	
Approach LOS	B		C		B	

Intersection Summary			
Delay	16.1		
HCM Level of Service	C		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing + Project
29: Connector Rd & Pankey Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	15	160	0	33	160	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	168	0	35	168	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	354	17			35	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354	17			35	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	84			89	
cM capacity (veh/h)	575	1061			1577	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	184	35	168
Volume Left	16	0	168
Volume Right	168	35	0
cSH	990	1700	1577
Volume to Capacity	0.19	0.02	0.11
Queue Length 95th (ft)	17	0	9
Control Delay (s)	9.5	0.0	7.6
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	7.6
Approach LOS	A		

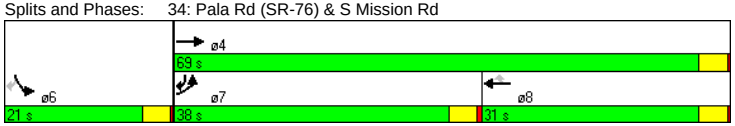
Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

PM Existing + Project
34: Pala Rd (SR-76) & S Mission Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	867	854	811	133	131	432
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	38.0	69.0	31.0	31.0	21.0	38.0
Total Split (%)	42.2%	76.7%	34.4%	34.4%	23.3%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	30.0	58.3	24.3	24.3	17.3	51.3
Actuated g/C Ratio	0.36	0.70	0.29	0.29	0.21	0.61
v/c Ratio	0.83	0.69	0.83	0.27	0.22	0.30
Control Delay	32.2	10.5	36.5	6.0	31.1	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	10.5	36.5	6.0	31.1	8.6
LOS	C	B	D	A	C	A
Approach Delay		21.4	32.2		13.8	
Approach LOS		C	C		B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 83.7		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.83		
Intersection Signal Delay: 23.3	Intersection LOS: C	
Intersection Capacity Utilization 64.2%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



PM Existing + Project
34: Pala Rd (SR-76) & S Mission Rd — Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				140		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	867	854	811	133	131	432
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	913	899	854	140	138	455
Lane Group Flow (vph)	913	899	854	140	138	455
v/c Ratio	0.83	0.69	0.83	0.27	0.22	0.30
Control Delay	32.2	10.5	36.5	6.0	31.1	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	10.5	36.5	6.0	31.1	8.6
Queue Length 50th (ft)	232	230	234	0	34	63
Queue Length 95th (ft)	308	347	307	41	60	92
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	1198	1346	1113	541	633	1572
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.67	0.77	0.26	0.22	0.29

Intersection Summary	
Area Type:	Other

LOS Engineering

PM Existing + Project
34: Pala Rd (SR-76) & S Mission Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Volume (vph)	867	854	811	133	131	432
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	913	899	854	140	138	455
RTOR Reduction (vph)	0	0	0	99	0	0
Lane Group Flow (vph)	913	899	854	41	138	455
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	30.0	58.3	24.3	24.3	17.3	47.3
Effective Green, g (s)	30.0	58.3	24.3	24.3	17.3	47.3
Actuated g/C Ratio	0.36	0.70	0.29	0.29	0.21	0.57
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1102	1299	1029	412	636	1530
v/s Ratio Prot	c0.30	0.48	c0.24		0.04	c0.11
v/s Ratio Perm				0.03		0.08
v/c Ratio	0.83	0.69	0.83	0.10	0.22	0.30
Uniform Delay, d1	24.5	7.4	27.7	21.7	27.5	9.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.3	1.6	5.7	0.1	0.8	0.1
Delay (s)	29.7	9.0	33.4	21.8	28.3	9.6
Level of Service	C	A	C	C	C	A
Approach Delay (s)		19.4	31.7		13.9	
Approach LOS		B	C		B	

Intersection Summary				
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	83.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

Appendix L

SANDAG Year 2030 Cumulative Map (Series 10)

County of San Diego
GP Update EIR

2030 CUMULATIVE
LOS and Volume Plot

FALLBROOK & BONSALL Area

2030 Proposed Network
Model Rerun 12/09/08
With Updated Land Uses

Levels of Service:

- A - C
- D
- E
- F

- Non-Circulation Element
- Zone Connector
- Traffic Analysis Zones

Forecasted Volumes:

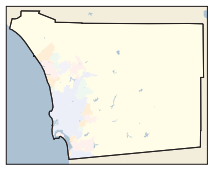
- # Adjusted Volume

Level of Service Calculations

Peak Hour Standards for State Facilities
New County Daily ADT LOS Standards for non-State:

6.1	84	38000	54000	70000	86000	108000	
6.2	75	22200	37000	44500	50000	57000	
4.1A	74	14800	24700	29600	33400	37000	
4.1B	86	13700	22800	27400	30800	34200	
4.1C	69	14800	24700	29600	33400	37000	
4.1D	81	13700	22800	27400	30800	34200	
4.2A	63	14800	24700	29600	33400	37000	
4.3A	98	5700	12500	19000	27000	32500	
4.3B	71	5000	10800	17200	25000	30000	
4.3C	41	2500	5450	8600	12500	15000	
2.1A	56	2800	6500	10300	15000	20500	
2.1B	64	3000	6000	9500	13500	18000	
2.1C	64	3000	6000	9500	13500	19000	
2.1D	52	3000	6000	9500	13500	18000	
2.1E	48	1900	4100	7100	10800	16200	
2.2A	55	3000	6000	9500	13500	18000	
2.2B	65	3000	6000	9500	13500	18000	
2.2C	65	3000	6000	9500	13500	18000	
2.2D	50	3000	6000	9500	13500	19000	
2.2E	45	1900	4100	7100	10800	16200	
2.2F	45	1550	3300	5600	8700	16200	
2.3A	54	1400	3000	5100	8000	12500	
2.3B	66	1400	3000	5100	8000	12500	
2.3C	42	1350	2700	4500	7000	11300	
LPR	39	1350	2700	4500	7000	11300	
SR	34	1350	2700	4500	7000	11300	

This traffic forecast is based on proprietary information of the County of San Diego and was produced to test the County's proposed DRAFT and BOARD land use assumptions. These data do not reflect SANDAG's 2030 Mobility Emphasis Cities/County Forecast.

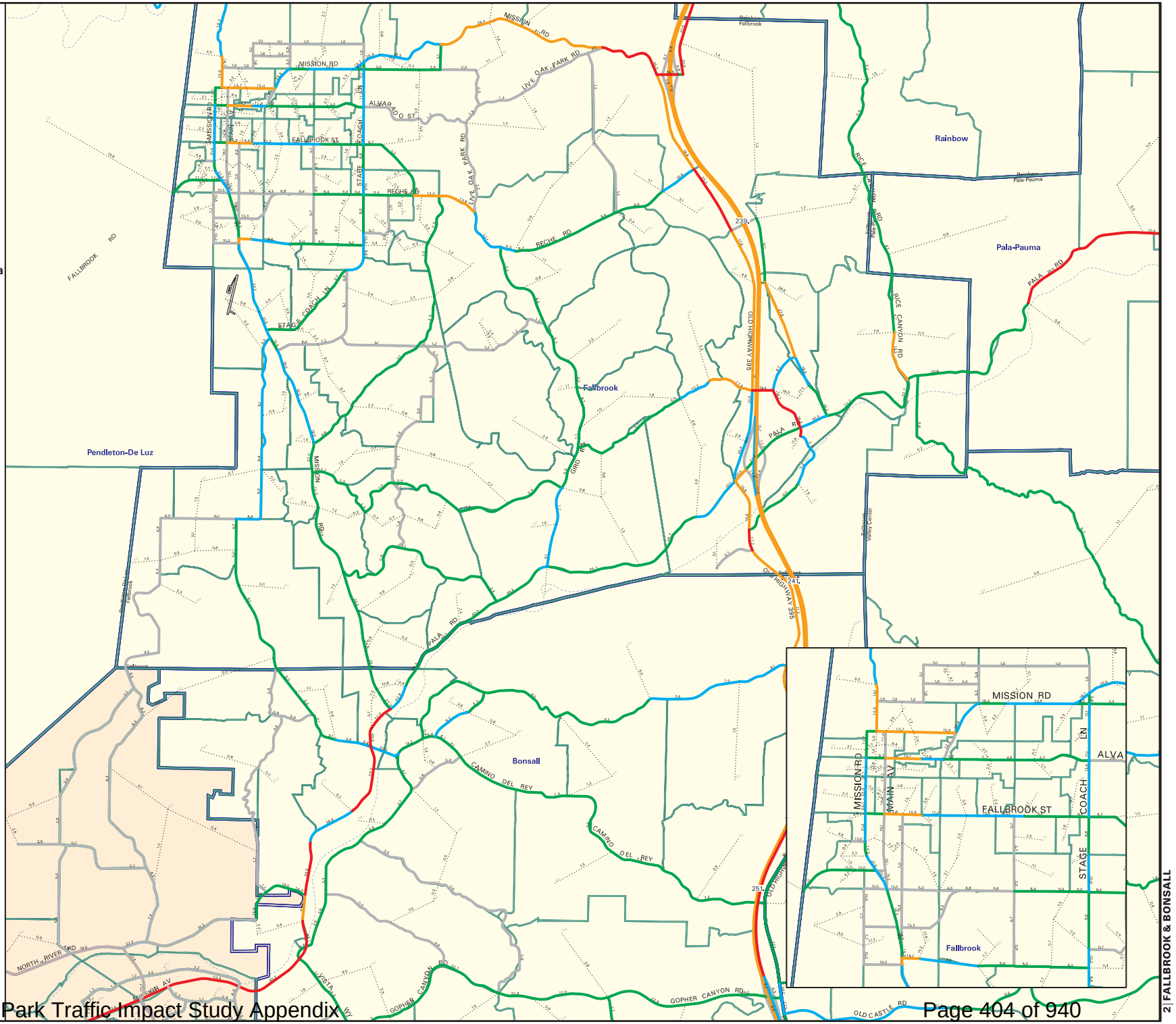


San Diego Region

Feet 0 1,200 2,400
Meters 144 432 720

SANDAG
San Diego's Regional Planning Agency

December 10, 2008



CUMULATIVE IMPACTS PROJECTS
SAN DIEGO COUNTY

Project Name	Community	GPA	SP/SPA	TM/TPM	Dwelling Units	Non-Residential Land Uses	Acres
PROJECTS INCONSISTENT WITH THE GENERAL PLAN UPDATE							
Brook Forest	**VALLEY CENTER**	**03-008**	**SP 00-001**	5177	84		225.56
MERRIAM MOUNTAINS, GPA, SP, REZ, TM, STP	**BONSALL**	**04-006**	**SP 04-006**	5381	2700	10.1 Acres General Commercial	321.16
FALLBROOK OAKS, GPA, REZ, TM, STP	**FALLBROOK**	**05-006**	**-**	5449	18		26.40
STAR RANCH	**MOUNTAIN EMPIRE**	**05-008**	**SP 05-002**	5459	460	Project proposes charter High School, Historic Ranch and Equestrian Facility	2160.00
PACIFIC SCENE GPA, SP, TM, REZ, OSV	**JAMUL-DULZURA**	**06-002**	**SP 06-001**	5445	55		85.97
WARNER RANCH, GPA, SP, REZ, TM, MUP, AD	**PALA-PAUMA**	**06-009**	**SP 06-002**	5508	900		430.00
CASTLE CREEK CONDOMINIUMS, GPA, SPA, REZ	**VALLEY CENTER**	**06-011**	**SPA 06-007**	5514	63		57.79
MAGNOLIA COURTS(GPA, TM, REZ, STP)	**LAKESIDE**	**07-009**	**-**	5541	38		5.19
PINE VALLEY PARK ESTATES	**CENTRAL MOUNTAIN**	**XX-X2**	**SP 03-001**	5318	22		38.00
SINGING HILLS, SP, TM, REZ, MUP	**CREST-DEHESA**	**XX-XX3**	**SP 04-005**	5380	See Note		526.14
MESQUITE TRAILS RANCH	**DESERT**		**SPA 01-001; SP 04-004**	5373	480		309.51
SPITSBERGER SUBDIVISION	**RAMONA**		**SPA 03-004**	5294	21		137.50
HARMONY GROVE MEADOWS	**NORTH COUNTY METRO**	**05-004**	**SP 05-001**	5430	207		111.09
PASSERELLE, CAMPUS PARK	**FALLBROOK**	**03-004**	**SPA 03-008**	5338	1088	10.81 Ac Office Professional, 8.3 Acres Town Center Mixed Use, 8.3 acres sports complex	500.00
MEADOWOOD	**FALLBROOK**	**04-002**	**SP 04-001**	5354	900		390.00
FUERTE RANCH ESTATES	**VALLE DE ORO**	**03-006**	**-**	5343	40		26.86
RANCHO LILAC	**VALLEY CENTER**	**04-008**	**SP 04-007**	5385	360		693.49
CAMPUS PARK WEST	**FALLBROOK**	**05-003**	**SPA 05-001**	5424	369	50,000 sf General Commercial, 8 ac Office Professional Use, 10 ac Highway Commercial	116.46
JACUMBA VALLEY RANCH GPA, SP, TM	**MOUNTAIN EMPIRE**	**06-014**	**SP 06-003**	5524	2125	37.5 Acres of General Commercial	1216.00
PALA MESA RESORT	**FALLBROOK**	**-**	**SPA 03-005**	5534	143		8.83

CUMULATIVE IMPACTS PROJECTS
SAN DIEGO COUNTY

Project Name	Community	GPA	SP/SPA	TM/TPM	Dwelling Units	Non-Residential Land Uses	Acres
CONSISTENT GPS'S							
PEACEFUL VALLEY RANCH	JAMUL-DULZURA	03-005	-	5341	51		152.76
Montecito Ranch	RAMONA	04-013	SP 01-001	5250	417		935.00
CUMMINGS RANCH, 805 PROPERTIES	RAMONA	03-007	SP 03-005	5344	9		682.02
PEPPERTREE PARK TM 4713	BONSALL	03-XX		4713	48		43.20
OTAY VILLAGE 13, GPA, SP, REZ, TM	OTAY	04-003; 06-019	SP 04-002	5361	2217		525.00
LAKE JENNINGS VILLAGE	LAKESIDE	05-005	-	5444	192		12
Sugarbush	NORTH COUNTY METRO	05-010	SP 03-003	5295	53		115.50
STONEMARSTONEMARK, GPA, REZ, TM	NORTH COUNTY METRO	06-001	-	5479	33		25.77
5853 LINNEA DEL CIELO, GPA, REZ, BC	SAN DIEGUITO	06-003	-				22.84
BONSALL TOWN CENTER, GPA, REZ, TM, STP	BONSALL	06-004	-	5490	61		25.85
HIGHWAY LOS COCHES, GPA, REZ,	LAKESIDE	06-006	-				2.97
ALTI, GPA, REZ,	VALLEY CENTER	06-007	-		N/A		288
FAABORG LOT SPLIT & REZONE REZ; TPM; GPA	RAMONA	07-005	-	21056	2		3.99
ORCHARD HILLS TM 27 LOT SUBDIVISION	NORTH COUNTY METRO	07-006	-	5533	27		9.83
EMBLY REZ	NORTH COUNTY METRO	07-007	-	21062	4		9.79
FLOIT (GPA, Rez, TM, STP)	LAKESIDE	07-008	-	5536	27		2.30
LAZY A RANCH, GPA, SP, TM, REZ, MUP	ALPINE	07-010	SP 07-002	5546	186		70.80
CHOCOLATE MOUNTAIN RANCH	ALPINE	99-05	-	5144	117		242.00
PETERSON	ALPINE	99-06	-	5210	25		63.42
ALPINE RANCH TM 5322	ALPINE	99-08	-	5322	29		254.00
ALPINE OAKS ESTATES	ALPINE	99-09	-	5330	9		38.68
SP AND 51 LOT SUB	VALLEY CENTER		SP 01-003	5263	51		273.00
Whitehall	SPRING VALLEY		SP 02-002	5299	211		176.58

CUMULATIVE IMPACTS PROJECTS
SAN DIEGO COUNTY

Project Name	Community	GPA	SP/SPA	TM/TPM	Dwelling Units	Non-Residential Land Uses	Acres
BORREGO WEST, SPA, REZ,TM, 178 LOTS	**DESERT**		**SP 92-001; SPA 05-002**	5319	177		166.27
The Bridges HCC Investors	**SAN DIEGUITO**		**SPA 01-004; SPA 03-006**	5270	216		445.00
THE BRIDGES	**SAN DIEGUITO**		**SPA 01-004; SPA 03-006**	5239	36		99.30
JUDD AND DILLARD,OTAY CROSSING	**OTAY**		**SPA 04-006**	5405	31	Commercial/Indsutrial Project	311.00
Borrego Spring Country Club	**DESERT**		**SPA 05-002**	5309	255		330.00
RANCHO CIELO	**SAN DIEGUITO**		**SPA 05-004**	5440	29		23.06
THE HIGHLANDS AT WARNER SPRINGS	**NORTH MOUNTAIN**		**SPA 06-001**	5450	28		149.00
VISTA RIDGE TM	**SAN DIEGUITO**		**SPA 06-002**	5418	8		20.00
VISTA HILLS, TM, REZ , STP, 8 LOTS	**SAN DIEGUITO**		**SPA 06-002**	5415	8		26.17
LAKE RANCHO VIEJO UNIT 3 SPA REMOVE RV PARKING	**FALLBROOK**		**SPA 07-001**				3.20
SUNROAD OTAY PARTNERS(SPA/TM)	**OTAY**		**SPA 07-003**	5538	60	Commercial/Indsutrial Project	179.00
SAN DIEGO CORRECTIONAL FACILITY	**OTAY**		**SPA 06-005**				39.09

Table 3-5. Projects Inconsistent with the Proposed General Plan Update

Project No.	Project Name	Required Approvals	Community	Dwelling Units	Acres
1	Park Alpine (TM 5433)	TMAlpine	41	117.54	
2	Rancho Nuevo (TM 5475)	TM	Alpine	18	60.14
3	Mckany (TPM 21044)	TPM	Alpine	4	1.53
4	Daoud Subdivision (TPM 20832)	TPM	Alpine	3	23.91
5	West Lilac Farms I & II (TM 5276)	TM	Bonsall	34	92.00
6	Dabbs (TM 5346)	TM	Bonsall	9	38.37
7	Merriam Mountains (GPA 04-006)	GPA/SP/TM/REZ	Bonsall	1200	321.16
8	Brisa Del Mar (TM 5492)	TM/	Bonsall	27	206.00
9	Tabata (TPM 20729)	TPM	Bonsall	4	33.75
10	Cunningham (TPM 20788)	TPM	Bonsall	3	26.11
11	Stehly Caminito Quieto (TPM 20799)	TPM	Bonsall	4	11.69
12	Tran (TPM 20835)	TPM	Bonsall	5	16.86
13	Northcutt, (TPM 20860)	TPM	Bonsall	2	11.77
14	Pfaff (TPM 21016)	TPM	Bonsall	2	7.79
15	Dienhart (TPM 20664)	TPM	Bonsall	3	28.36
16	Marquart Ranch (TM 5410)	TM	Bonsall	9	44.20
17	Twin Oaks 4 (TPM 20954)	TPM	Bonsall	4	37.93
18	Palisades Estates (TM 5158)	TM	Bonsall	38	408.40
19	Kendall Family Trust (TPM 20849)	TPM	Bonsall	2	5.01
20	Pine Creek Ranch (TM 5236)	TM	Central Mountain	19	109.08
21	Pine Valley Park Estates (SP 03-001)	GPA/SP/REZ/TM	Central Mountain	22	38.30
22	The Slope (TPM 20765)	TPM	Central Mountain	4	35.00
23	Kenyon (TPM 20857)	TPM	Central Mountain	3	15.88
24	Shellstrom, (TPM 21094)	TPM	Central Mountain	4	23.04
25	4740 Dehesa Road/Sloan Canyon Road (TM 5485)	TM	Crest-Dehesa	10	31.89
26	Kemerko (TPM 20716)	TPM	Crest-Dehesa	5	93.10
27	Price (TPM 20762)	TPM	Crest-Dehesa	3	24.30
28	Walls (TPM 21008)	TPM	Crest-Dehesa	5	72.00
29	Kearney (TPM 20715)	TPM	Crest-Dehesa	3	13.30
30	Williams (TPM 20875)	TPM	Crest-Dehesa	2	9.00
31	Bursztyn (TPM 20840)	TPM	Crest-Dehesa	4	23.52
32	Woodhead (TPM 20541)	TPM	Crest-Dehesa	4	24.00
33	Mesquite Trails Ranch (SP 04-004)	SP/TM/MUP	Desert	480	309.51
34	Borrego Country Club Estates (TM 5487)	TM	Desert	148	172.07
35	Borrego 50 (TM 5511)	TM	Desert	34	50.09
36	Borrego Springs Senior Condominiums (TM 5512)	TM	Desert	122	5.24
37	Yaqui Pass (TPM 5513)	TPM	Desert	72	33.10
38	Inland Land Development (TM 5528)	TM	Desert	331	136.67
39	Desert Diamond (TPM 21017)	TPM	Desert	5	169.84
40	Bowen/Jonas (TPM 21027)	TPM	Desert	5	80.00
41	Henderson Canyon (TPM 21058)	TPM	Desert	4	114.90
42	Chaffin (TM 5217)	TM	Fallbrook	31	455.86
43	Chaffin (TM 5227)	TM	Fallbrook	4	46.50
44	Chandler (TM 5284)	TM	Fallbrook	12	80.00
45	Passerelle, Campus Park (SP 03-004)	GPA/SPA/REZ/TM	Fallbrook	950	500.00
46	Meadowood (GPA 04-002)	GPA/SP/REZ/TM	Fallbrook	1248	390.00
47	Fallbrook Oaks (GPA 05-006)	GPA/TM/REZ	Fallbrook	18	26.40
48	Fallbrook Ranch (TM 5532)	TM	Fallbrook	11	41.00
49	Kern Property (TPM 20952)	TPM	Fallbrook	4	19.56
50	Campus Park West (GPA 05-003)	GPA/SPA/REZ/TM	Fallbrook	369	116
51	Hoskings Ranch, Genesee Properties	TM	Jamul-Dulzura	33	1417.40

Project No.	Project Name	Required Approvals	Community	Dwelling Units	Acres
	(TM 5312)				
52	Pacific Scene (GPA 06-002)	GPA/SP/TM/REZ	Jamul-Dulzura	55	85.97
53	Preski/Gonya (TPM 20720)	TPM	Jamul-Dulzura	4	40.33
54	Pijnenburg (TPM 20778)	TPM	Jamul-Dulzura	5	76.40
55	Jamul (TPM 20786)	TPM	Jamul-Dulzura	1	43.69
56	Hoskings Ranch Road (TPM 20863)	TPM	Jamul-Dulzura	3	150.27
57	Swift (TPM 20903)	TPM	Jamul-Dulzura	1	16.42
58	Skyline Truck Trail (TPM 21028)	TPM	Jamul-Dulzura	5	47.78
59	Ava Loma III (TPM 21039)	TPM	Jamul-Dulzura	4	87.90
60	Allen (TPM 21045)	TPM	Jamul-Dulzura	2	24.14
61	Hamilton (TPM 21060)	TPM	Jamul-Dulzura	2	24.29
62	Renteria (TPM 21107)	TPM	Jamul-Dulzura	4	60.38
63	Tibbot (TPM 20686)	TPM	Jamul-Dulzura	4	35.51
64	Robnett TPM 20726	TPM	Jamul-Dulzura	5	85.95
65	Titus Project (TPM 20965)	TPM	Jamul-Dulzura	3	11.10
66	Los Coches Development LLC (TM 5306)	TM	Lakeside	73	78.80
67	Schmidt Project (TM 5434)	TM	Lakeside	4	114.94
68	Magnolia Courts (GPA 07-009)	GPA/TM/REZ	Lakeside	38	5.19
69	Hiel (TPM 20925)	TPM	Lakeside	2	0.71
70	Parkside Villa (TPM 21048)	TPM	Lakeside	3	0.00
71	Bradley Avenue (TM 5422)	TM	Lakeside	30	1.25
72	Lakeside (TPM 20916)	TPM	Lakeside	3	1.21
73	Harvest Glen (TM 5366)	TM	Mountain Empire	40	284.43
74	Vaughan (TM 5417)	TM	Mountain Empire	13	81.15
75	Star Ranch (GPA 05-008)	GPA/SP/REZ/TM	Mountain Empire	460	2160.00
76	Potrero Valley Road (TM 5484)	TM	Mountain Empire	8	73.50
77	Arellano (TPM 20756)	TPM	Mountain Empire	3	17.27
78	Garza (TPM 20777)	TPM	Mountain Empire	5	53.33
79	Bennett (TPM 20784)	TPM	Mountain Empire	5	47.53
80	Powell Subdivision (TPM 20798)	TPM	Mountain Empire	4	40.00
81	Volli (TPM 20889)	TPM	Mountain Empire	4	40.00
82	Elder (TPM 20981)	TPM	Mountain Empire	5	109.25
84	Heald Development (TPM 21014)	TPM	Mountain Empire	5	36
85	Davis-Inman (TPM 21081)	TPM	Mountain Empire	4	97.00
86	Grizzle (TPM 20719)	TPM	Mountain Empire	5	245.00
87	Bartlett (TPM 20754)	TPM	Mountain Empire	4	164.70
88	Sugarbush (GPA 05-010)	GPA/SP/REZ/TM	N. County Metro	53	115.50
89	Merriam Mountains (04-006)	GPA/SP/TM/REZ	N. County Metro	1200	321.16
90	Kawano Subdivision (TM 5401)	TM	N. County Metro	9	10.27
91	Tai Estates (TM 5409)	TM	N. County Metro	11	46.88
92	Harmony Grove Meadows (GPA 05-004)	GPA/SP/REZ/TM	N. County Metro	207	111.09
93	Pizzuto Property (TPM 20846)	TPM	N. County Metro	3	40.00
94	Montiel Road Townhomes (GPA 04-007)	GPA/TM	N. County Metro	70	4.86
95	Rimsa TPM (TPM 21095)	TPM	N. County Metro	2	12.5
96	Ranchita Subdivision (TM 5516)	TM	North Mountain	13	147.88
97	Los Robles Ranch (TM 5526)	TM	North Mountain	15	646.00
98	Shadow Run Ranch LLC (TM 5223)	TM	Pala-Pauma	46	263.17
99	The Prominence at Pala (TM 5321)	TM	Pala-Pauma	37	413.93
100	Pala 114 (TM 5497)	TM	Pala-Pauma	11	113.89
101	Pauma Ranches (TM 5506)	TM	Pala-Pauma	22	99.83
102	Warner Ranch (GPA 06-009)	GPA/SP/TM/REZ/MUP	Pala-Pauma	900	430.00
103	Ruffin/Johnson (TPM 20725)	TPM	Pala-Pauma	5	73.11
104	Donald Jenkins (TPM 21023)	TPM	Pala-Pauma	2	10.35
105	Jay Long (TPM 21066)	TPM	Pala-Pauma	2	17.75

Project No.	Project Name	Required Approvals	Community	Dwelling Units	Acres
106	Pala Pauma (TPM 20611)	TPM	Pala-Pauma	4	54.66
107	Wexler (TPM 20913)	TPM	Pala-Pauma	4	4.80
108	Townsend (TPM 20736)	TPM	Pendleton-De Luz	4	20.00
109	Tenaja (TPM 21049)	TPM	Pendleton-De Luz	2	27.75
110	Oswald (TPM 20533)	TPM	Rainbow	4	47.20
111	Brown (TPM 20717)	TPM	Rainbow	4	31.18
112	Silvola (TPM 20658)	TPM	Rainbow	3	26.16
113	M.D.S. Dev. Corp./Deca (TM 4962)	TM	Ramona	30	75.00
114	Ramona Ridge Estates (TM 5008)	TM	Ramona	25	219.35
115	Rancho Esquilago (TM 5198)	TM	Ramona	38	147.68
116	Development Venture (TM 5254)	TM	Ramona	67	327.00
117	Spitsbergen Subdivision (03-004)	SPA/TM	Ramona	21	137.50
118	Lakeside Ventures (TM 5307)	TM	Ramona	8	202.00
119	Valley Park Condominiums (TM 5480)	TM	Ramona	62	2.87
120	McCandless (TPM 20564)	TPM	Ramona	5	41.00
121	Kvaas (TPM 20747)	TPM	Ramona	5	60.00
122	Edbell Parcel Map (TPM 20900)	TPM	Ramona	1	96.42
123	Harman (TPM 20907)	TPM	Ramona	4	195.35
124	Neuman (TPM 20962)	TPM	Ramona	4	39.40
125	Spitsbergen (TPM 21042)	TPM	Ramona	3	137.53
126	Filippini Parcel Map (TPM 20926)	TPM	Ramona	2	9.35
127	Sunset Vista (TM 5257)	TM	Ramona	7	9.57
128	Roberts (TM 5267)	TM	Ramona	8	50.62
129	Ramona (TPM 20466)	TPM	Ramona	2	19.82
130	Teyssier (TM 5194)	TM	Ramona	37	289.00
131	Highland Valley (TPM 21051)	TPM	Ramona	3	38
132	Victoria Shangrila (TM 5261)	TM	San Dieguito	38	79.67
133	Little Creek (TPM 20834)	TPM	San Dieguito	3	15.81
134	Oakrose Ranch (TM 5204)	TM	San Dieguito	10	39.66
135	Fuerte Ranch Estates (GPA 03-006)	GPA/REZ/TM	Valle De Oro	40	26.89
136	Spanish Trails (Formally Loranda) (TM 5173)	TM	Valley Center	175	435.39
138	Brook Forest (GPA 03-008)	GPA/SP/TM	Valley Center	84	225.56
139	Beauvais/Old Castle (TM 5315)	TM	Valley Center	11	23.16
140	Rancho Lilac (GPA 04-008)	GPA/SP/REZ/TM/MUP	Valley Center	360	693.49
141	Orchard Vista (TM 5507)	TM	Valley Center	11	25.24
142	Castle Creek Condominiums (GPA 06-011)	GPA/SPA/TM/REZ	Valley Center	63	57.79
143	McNally Road Parcel Map (TPM 21004)	TPM	Valley Center	4	78.30
144	Sukup (TM 5184)	TM	Valley Center	9	24.62
145	Garcia T.S.M. (TM 5458)	TM	Valley Center	8	17.40
146	Calle De Encinas (TPM 20780)	TPM	Valley Center	3	14.39
147	S.R. Polito Family Partnership LTD (TM 5001)	TM	Valley Center	18	69.2
148	Crews Development Valley Center Road (TPM 20828)	TPM	Valley Center	4	9.71
149	Fitzpatrick (TPM 20842)	TPM	Valley Center	4	10.72
150	Robinson (21105)	TPM	Valley Center	4	11
151	Goodnight Ranchos (TPM 21101)	TPM	Valley Center	2	5
152	Hancey TPM (TPM 20999)	TPM	Valley Center	4	14.75

GPA = General Plan Amendment
MUP = Major Use Permit
REZ = Rezone
SP = Specific Plan
SPA = Specific Plan Amendment

Project No.	Project Name	Required Approvals	Community	Dwelling Units	Acres

TM = Tentative Map
TPM = Tentative Parcel Map

Notes: 1- Communities with active projects having a total increase of less than 10 units were not included in the Cumulative Impacts Traffic Model.
2- This table includes both approved and active projects that are inconsistent with the General Plan Update

Source: County of San Diego 2008

CUMULATIVE Tribal Gaming Facilities - Trip Generation Estimates
County of San Diego – General Plan Update

BARONA RESERVATION – (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	300,000 sq. ft. (1)	100 trips/1000 square feet	30,000
RESORT HOTEL	400 rooms (1)	3 trips/room	1,200
GAS STATION w/FOOD MART	24 VFS (vehicle fueling station)	75 trips/VFS	1,800
GOLF COURSE	18-hole course (1)	700 trips/course	700
EVENT CENTER	20,000 sq. ft. (1)	40 trips/1000 square feet	800
CONVENTION CENTER	100,000 sq. ft.(1)	609.8 trips/acre	1,200 (2)
TOTAL DAILY TRIPS GENERATED			**35,700**

(1) Draft Chronology of Gaming Projects in San Diego dated June 28, 2006.
(2) Applied SANDAG rate per acre and assumed two acres

CAMPO RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	42,800 sq. ft. (1)	100 trips/1000 square feet	4,280
GAS STATION w/ FOOD MART	12 VFS (vehicle fueling station)	75 trips/VFS or 150 trips/pump	1,800
FUEL DEPOT	1 fuel depot	40 trips/day	40
HOTEL	150 rooms (1)	3 trips/room	450
HOTEL (PH III EXPANSION)	50,000 sq. ft. 100 rooms (2)	3 trips/room	300
RV PARKING	80 spaces (1)	4 trips/RV space	320
BOWLING CENTER	16 lanes (1)	10 trips/lane (4)	160
ENTERTAINMENT HALL	20,000 sq. ft. (1)	40 trips/1000 square feet (3)	800
CASINO ADMIN OFFICE	4,250 sq. ft. (1)	Auxiliary casino use	0
RESTAURANT	2,500 sq. ft.	Auxiliary casino use	0
TOTAL DAILY TRIPS GENERATED			**8,150**

(1) Environmental Evaluation dated July 11, 2007 prepared by Tierra Environmental
(2) County review comments for Environmental Evaluation for Campo Golden Acorn Hotel and Amenities project dated August 16, 2007
(3) Based on trip generation rate used for Barona Event Center.
(4) Due to rural location and co-location with casino, assumes one-third of the SANDAG rate of 30 trips/lane.

EWIIAAPAAYP RESERVATION (CUMULATIVE YEAR 2030) (3)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	80,500 sq. ft. (1)	100 trips/1000 square feet	8,050
HEALTH CLINIC	26,500 sq.ft (2)	20 trips/1000 square feet	530
TOTAL DAILY TRIPS GENERATED			**8,580 (4)**

(1) Total square footage of the Ewiiaapaap casino is 237,300 square feet (Environmental Assessment dated May 2003).
(2) Information based on Environmental Assessment dated August 2001
(3) Proposing a jointly managed casino with Viejas tribe – August 18, 2004 UT article
(4) Trip generation estimate may need to be adjusted depending on proximity to and relationship with Viejas casino

JAMUL RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	73,469 sq. ft. (1)	100 trips/1000 square feet	7,347
HOTEL	400 rooms (1)	3 trips/room	1,200
EVENT CENTER	1,200 seats (2)	0.606/seat (3)	828
TOTAL DAILY TRIPS GENERATED			**9,375**

(1) Chronology of Gaming and Tribal Enterprises in San Diego dated January 25, 2008.
(2) Based on information in project's Environmental Assessment dated September 2003
(3) Based on trip rate in project's Environmental Assessment (EA) dated September 2003. EA only identified seating and not square footage.

LA JOLLA RESERVATION (CUMULATIVE YEAR 2030) (1)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
CASINO	35,000 sq. ft. (1)	100 trips/1000 square feet	3,500
HOTEL	150 rooms (2)	3 trips/room	450
TOTAL DAILY TRIPS GENERATED			**3,950**

(1) Environmental Assessment dated December 2, 2005, prepared by Tierra Environmental
(2) Chronology of Gaming and Tribal Enterprises in San Diego dated January 25, 2008.

LA POSTA RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	10,000 sq. ft (1)	100 trips/1000 square feet	1,000
TOTAL DAILY TRIPS GENERATED			**1,000**

(1) Based on Traffic Impact Analysis (TIA) prepared by Linscott, Law, and Greenspan Engineers dated April 13, 2004.

PALA RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	123,000 sq. ft.(1)	100 trips/1000 square feet	12,300
HOTEL	557 rooms (2)	3 trips/room	1,671
MOTORCROSS RACEWAY	Unknown	Unknown	400 (3)
TOTAL DAILY TRIPS GENERATED			**14,371**

(1) Final Environmental Impact Report dated March 28, 2007 prepared by Tierra Environmental
(2) Chronology of Gaming and Tribal Enterprises in San Diego dated January 25, 2008.
(3) Place-holder assumption until more specific information becomes available

PAUMA RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA(1)	83,100 sq. ft (1)	100 trips/1000 square feet	8,310
HOTEL	400 rooms (1)	3 trips/room	1,200
RETAIL SHOPS	4,000 sq. ft.	27 trips/1000 square feet (2)	108
EVENT CENTER	34,000 sq. ft. (1)	40 trips/1000 square feet (3)	1,360
TOTAL DAILY TRIPS GENERATED			**10,978**

(1) Draft Environmental Impact Report dated July 27, 2007 prepared by Tierra Environmental
(2) Based on trip generation rate used for Viejas Outlet Center.
(3) Based on trip generation rate used for Barona Event Center.

RINCON RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	63,165 sq. ft (1)	100 trips/1000 square feet	6,317
RESORT HOTEL	700 rooms (1)	3 trips/room	2,100
TOTAL DAILY TRIPS GENERATED			**8,417**

(1) Chronology of Gaming and Tribal Enterprises in San Diego dated January 25, 2008.

SAN PASQUAL RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	62,000 sq.ft	100 trips/1000 square feet	6,200
RESTAURANT / LOUNGE	1,500 sq. ft.(2)	Auxiliary casino use	0
BUFFET RESTAURANT	350 seats (1)	Auxiliary casino use	0
HOTEL	161 rooms (3)	3 trips/room	483
OUTDOOR CONCERT VENUE	2,000 seats (4)	0.606/seat (5)	1,212
TOTAL DAILY TRIPS GENERATED			**7,895**

(1) Based on information from the project's Environmental Assessment dated June 2, 2003.
(2) Size unknown; assumption provided for planning purposes.
(3) Chronology of Gaming and Tribal Enterprises in San Diego dated January 25, 2008.
(4) Scope of work for traffic consultant dated December 18, 2007.
(5) Trip Generation assumption based on Jamul Event Center

SANTA YSABEL RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	19,000 sq. ft (1)	100 trips/1000 square feet	1,900
RESTAURANT/ BAR	unknown	Auxiliary casino use	0
TOTAL DAILY TRIPS GENERATED			**1,900**

(1) Based on Environmental Evaluation/Traffic Impact Analysis dated June 2004

SYCUAN RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	93,890 sq. ft (1)	100 trips/1000 square feet	9,389
THEATER	460 seats	0.606/seat (2)	279
RESERVATION TOTAL DAILY TRIPS GENERATED			**9,668**
SYCUAN RESERVATION – SINGING HILLS/SLOAN CANYON AREA (TAZ 2908)			
GAMING AREA EXPANSION	300 slots (3) (140,835 sq. ft.)	100 trips/1000 square feet	14,084
SINGING HILLS HOTEL	557 rooms (4)	3 trips/room	1,671
SINGLE FAMILY HOMES	74 units (5)	12 trips/unit (6)	888
EQUESTRIAN CENTER	1	--	100 (5)
RV PARK	85 spaces (5)	4 trips/space (5)	340
SINGING HILLS TOTAL DAILY TRIPS GENERATED			**17,083**
TOTAL DAILY TRIPS GENERATED			**26,751**

(1) Chronology of Gaming and Tribal Enterprises in San Diego dated January 25, 2008.
(2) Trip Generation assumption based on Jamul Event Center
(3) Expansion of 3,000 slot machines allowed by Sycuan Compact (SB 175)
(4) Size unknown. Assumed same size as Pala Hotel/Casino
(5) County response to comments Crestlake Estates EIR (July 2007)

VIEJAS RESERVATION (CUMULATIVE YEAR 2030)			
LAND USE TYPE	**LAND USE UNITS**	**TRIP RATE FACTOR**	**DAILY TRIPS**
GAMING AREA	133,000 sq. ft (1)	100 trips/1000 square feet	13,300
OUTLET CENTER	255,000 sq. ft.(1)	27 trips/1000 square feet (2)	6,885
NEW CASINO (3)	100,000 sq. ft.(4)	100 trips/1000 square feet	10,000
HOTEL	600 rooms (3)	3 trips/room	1,800
MULTIPLEX MOVIE THEATER (3)	1,000 seats (4)	0.606/seat (5)	606
CONCERT VENUE	12,000 seats (3)	0.606/seat (5)	7,272
TOTAL DAILY TRIPS GENERATED			**39,863**

(1) Draft Viejas TEIR dated August 2005. Includes a 18,000 SF expansion of the gaming area. Outlet Center square footage includes 83,000 square foot expansion (increase from 35 to 57 stores).
(2) Based on data from ITE Trip Generation Report
(3) Based on UT article dated January 9, 2008.
(4) Size / number of units are currently unknown. Assumption used solely for planning purposes.
(5) Trip Generation assumption based on Jamul Event Center

Comparison of Series 10 Cumulative Map and Series 11 ADTs as used in traffic study

Segments	2030 Series 10 Cumulative Map	2030 Series 11	Used in Traffic Study
Dulin Road			
Old Highway 395 to Pankey Road	7,700	Note (1)	7,700
Old Highway 395			
East Mission Road to Reche Road	19,900	16,000	19,900
Reche Road to Stewart Canyon Road	23,300	22,000	23,300
Stewart Canyon Road to Tecalote Lane	17,600	16,000	17,600
Tecalote Lane to Pala Mesa Drive	19,400	18,000	19,400
Pala Mesa Drive to SR-76 (Pala Road)	20,900	17,000	20,900
SR-76 (Pala Road) to Dulin Road	14,800	11,000	14,800
Dulin Road to W. Lilac Road	17,200	13,000	17,200
Reche Road			
Green Canyon Norte to Live Oak Park Road	13,800		13,800
Live Oak Park Road to Gird Road	12,100		12,100
Gird Road to Wilt Road	9,600	Note (1)	9,600
Wilt Road to Tecalote Road	8,900		8,900
Tecalote Drive to Old Highway 395	10,600		10,600
Stewart Canyon Road			
Old Hwy 395 to Horse Ranch Creek Rd	8,000	7,000	8,000
Pankey Road			
Street R/Pankey Place to SR-76 (Pala Rd)	8,600	7,000	8,600
SR-76 (Pala Road) to Shearer Crossing	11,900	Note (1)	11,900
Horse Ranch Creek Road			
Stewart Canyon Rd to Baltimore Oriole (#23)			7,900
Baltimore Oriole (#23) to Longspur Rd (#24)			11,400
Longspur Rd (#24) to Harvest Glen Ln (#25)			16,000
Harvest Glen Ln (#25) to Intersection (#26)	Note (2)		20,800
Intersection (#26) to Park/School (#27)			22,600
Park/Sch (#27) to Street R/Pankey Pl (#28)			22,800
Street R/Pankey Pl (#28) to SR-76 (Pala Rd)			13,600
Pala Mesa Drive			
Wilt Rd/Sage Rd to Old Highway 395	11,500	10,000	11,500
Old Highway 395 to Street R/Pankey Pl	Note (2)		7,500
Street R/Pankey Place			
Pala Mesa/Pankey to Horse Ranch Creek Rd	Note (2)		10,300

Notes: (1) Series 11 not used for areas embedded within County areas as County's Series 10 model has been calibraded to more detail than Series 11 model. (2) Series 10 and 11 traffic models did not have detailed information as used in traffic study, thus volumes used from manual assignment of 3Ps traffic

For SR-76, the higher AM and PM peak hour by direction volumes were used between the Series 10 Cumulative and Series 11. The table on the next page shows both model outputs with the higher of the two used for the analysis.

Higher Peak Hour Directional Volumes between Series 10 and Series 11 Models

State Route 76	AM (Eastbound)			AM (Westbound)			PM (Eastbound)			PM (Westbound)		
	Series 10	Series 11	Traffic Study	Series 10	Series 11	Traffic Study	Series 10	Series 11	Traffic Study	Series 10	Series 11	Traffic Study
Melrose Dr to E. Vista Way	**1368**	1193	1368	**2416**	2006	2416	**2651**	2372	2651	**1727**	1517	1727
E. Vista Way to North River Rd	**1187**	991	1187	**1984**	1904	1984	**2059**	1951	2059	**1419**	1224	1419
North River Rd to Olive Hill Rd	**1391**	1120	1391	**2421**	2372	2421	**2593**	2451	2593	**1611**	1393	1611
Olive Hill Rd to S Mission Rd	**1498**	1265	1498	**2567**	2524	2567	**2576**	2448	2576	**1851**	1587	1851
S Mission Rd to Via Monserate	**1092**	767	1092	**1733**	1587	1733	**2273**	1906	2273	**1501**	965	1501
Via Monserate to Gird Rd	**1140**	707	1140	**1796**	1757	1796	**2077**	1882	2077	**1361**	794	1361
Gird Rd to Sage Rd	**1131**	942	1131	**1339**	1248	1339	**1400**	1387	1400	**1236**	893	1236
Sage Rd to Old Hwy 395	**1218**	980	1218	**1361**	1334	1361	**1523**	1265	1523	**1448**	929	1448
Old Hwy 395 to I-15 SB Ramps	1343	**1600**	1600	**1265**	1245	1265	**1486**	1248	1486	**1531**	781	1531
I-15 SB Ramps to I-15 NB Ramps	**1022**	756	1022	**994**	569	994	**1357**	1334	1357	**1285**	462	1285
I-15 NB Ramps to Pankey Rd	**842**	668	842	**1045**	792	1045	**1449**	816	1449	**1062**	707	1062
Pankey Rd to Horse Ranch Creek Rd	604	**762**	762	**1184**	1109	1184	**1280**	1028	1280	**1357**	998	1357
Horse Ranch Creek Rd to Rice Cyn	604	**762**	762	**1184**	1109	1184	**1280**	1028	1280	**1357**	998	1357
Rice Cyn to Couser Cyn	**1724**	952	1724	**840**	615	840	**1032**	689	1032	**1343**	1117	1343
Couser Cyn to Pala Mission Rd	**857**	753	857	**678**	620	678	**848**	840	848	**1251**	1160	1251

Bold indicates higher volumes used between Series 10 cumulative and Series 11

County of San Diego
GP Update EIR

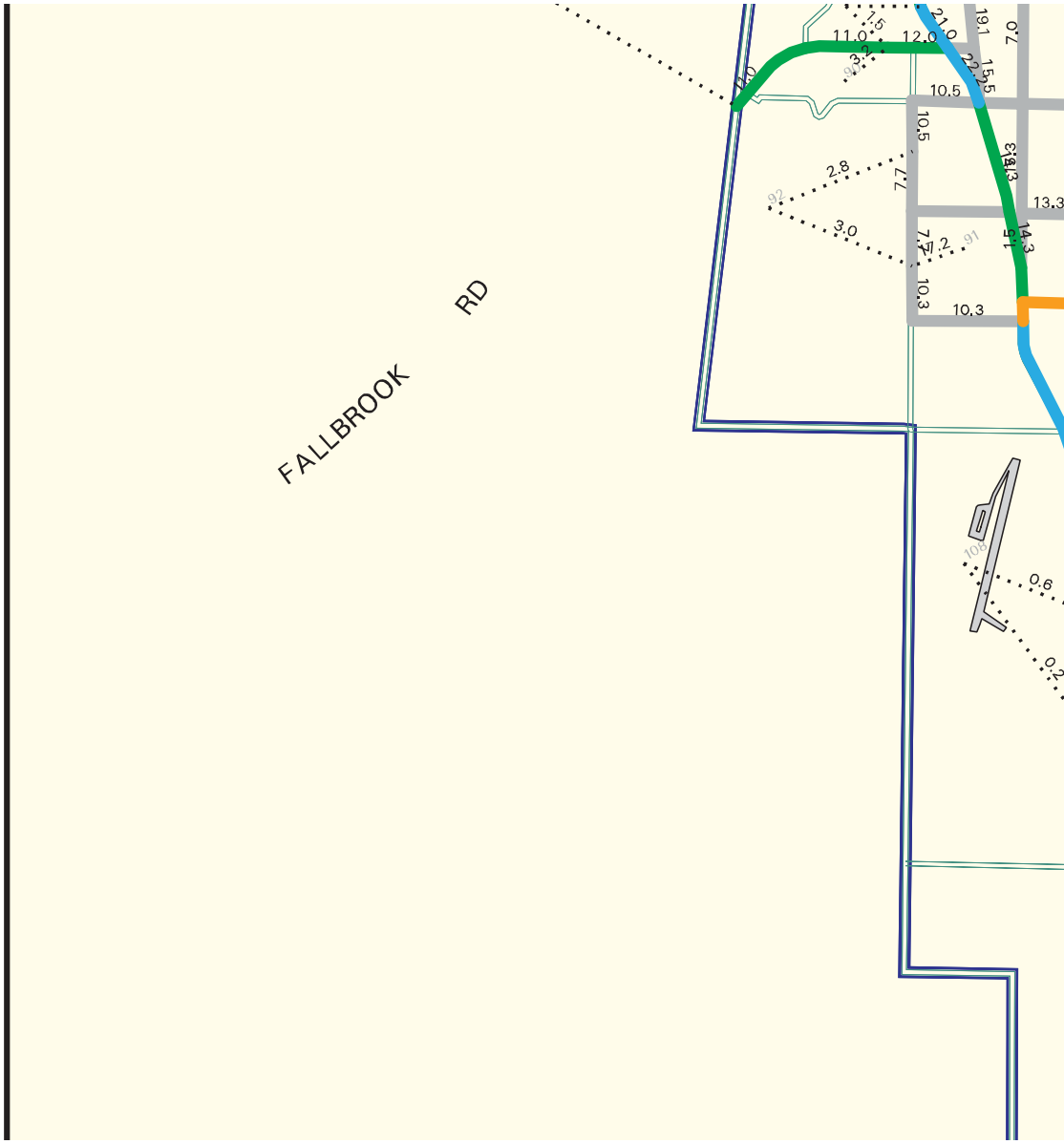
2030 CUMULATIVE
LOS and Volume Plot

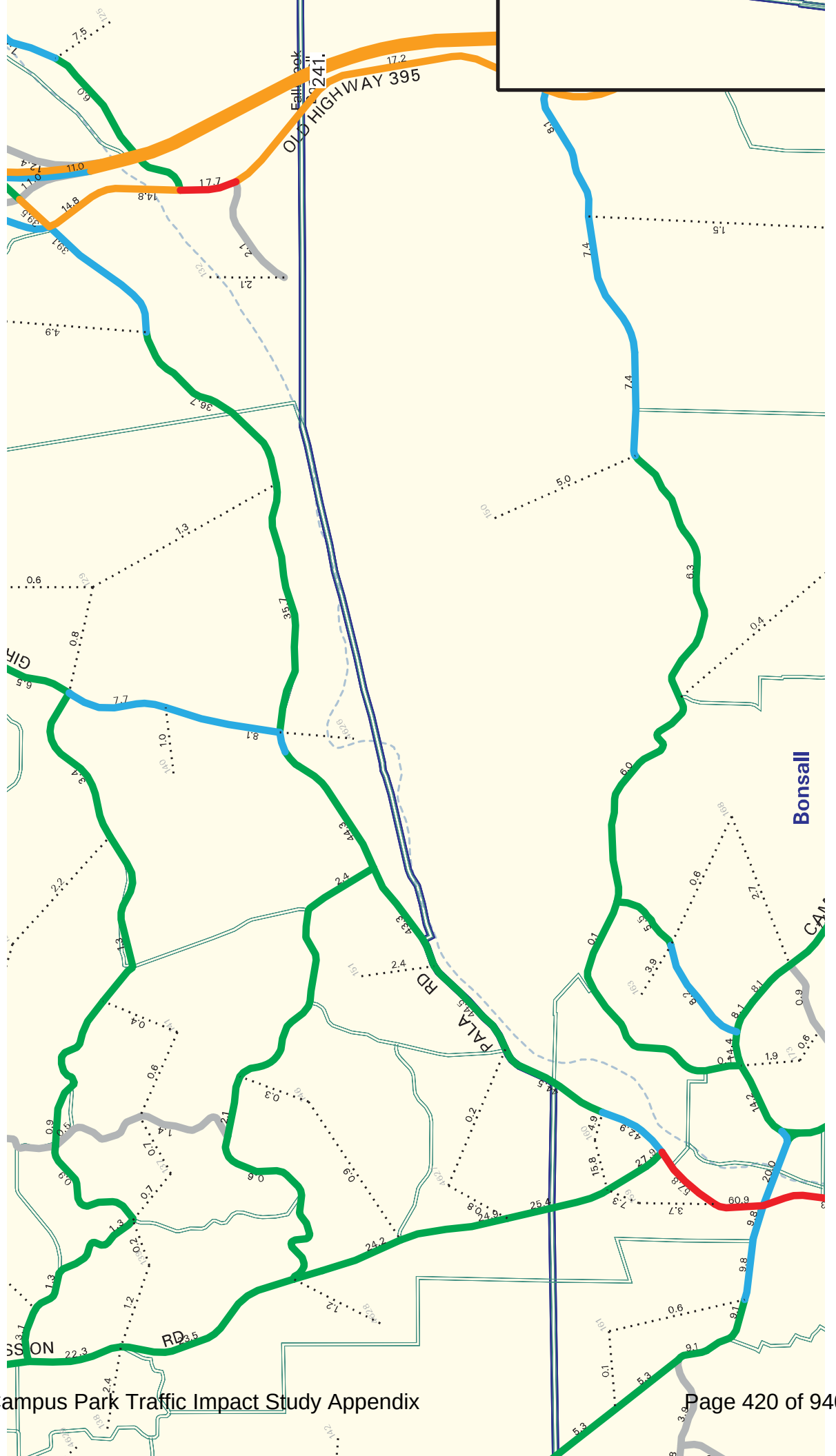
FALLBROOK & BONSALL Area

2030 Proposed Network
Model Rerun 12/09/08
With Updated Land Uses

Levels of Service:

- A - C
- D
- E
- F

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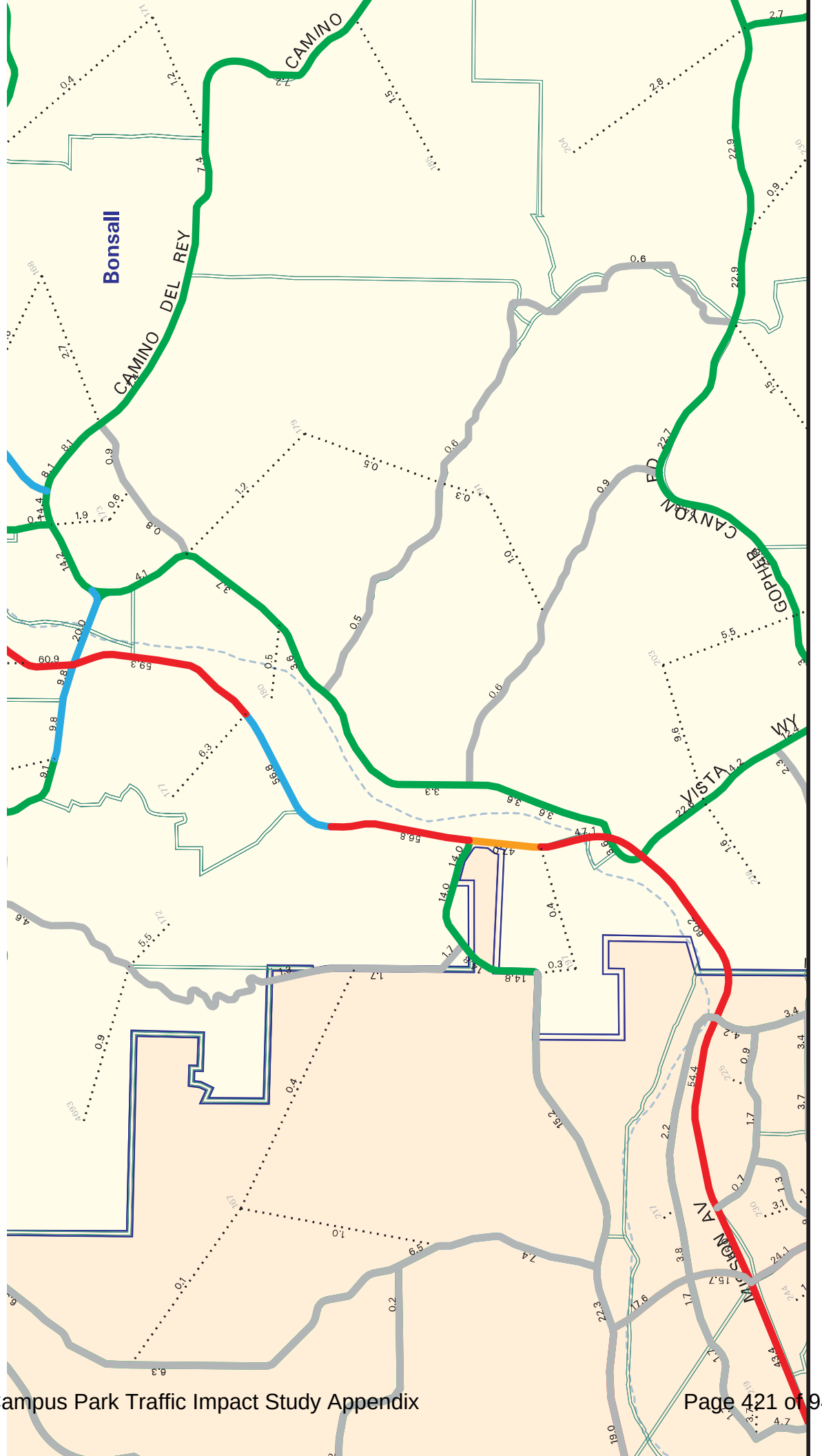
Bonsall
PALA RD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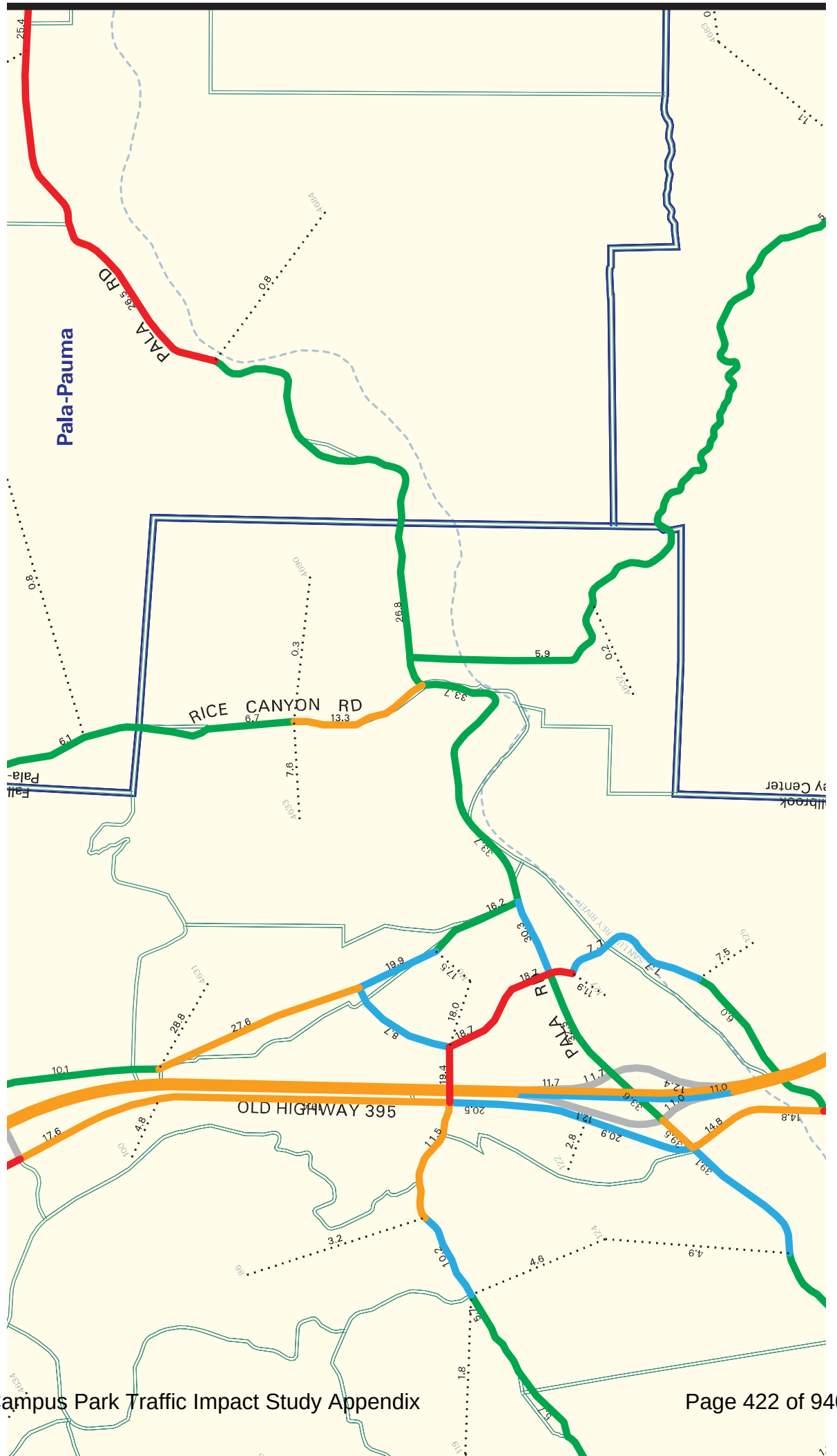
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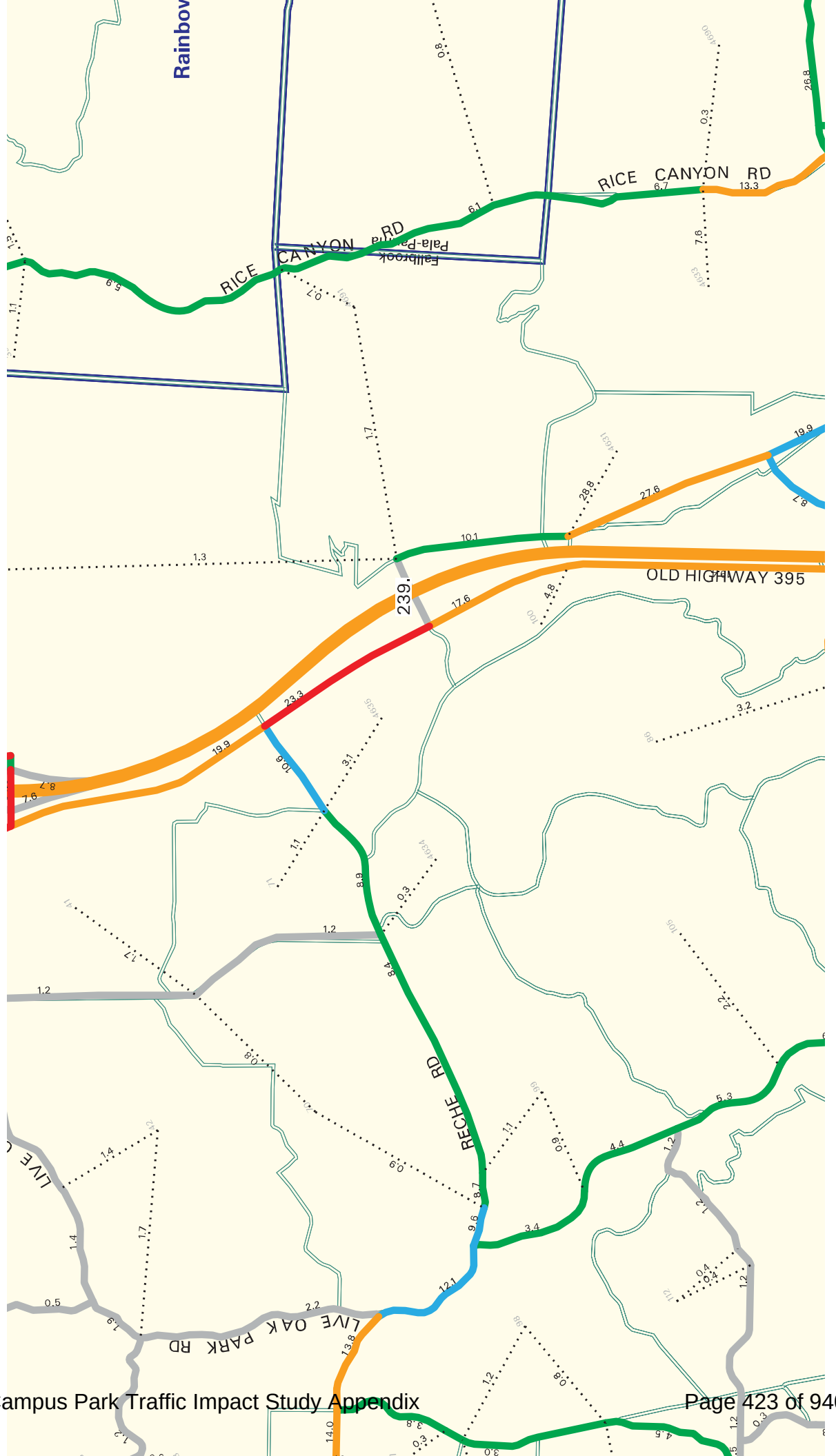
PALA RD
RICE CANYON RD
OLD HIGHWAY 395
PALA


RICE CANYON RD
RICE CANYON RD
OLD HIGHWAY 395
RECHE RD
LIVE OAK PARK RD
239

SANDAG Series 11 Transportation Forecast Information Center

Series 11 2030 Traffic Volume Forecast
February 2008 Update

The Transportation Forecast Information Center (TFIC) gives you quick access to transportation forecasts. You may use this tool to look at the forecasts on screen as well as print maps or tables. Click on a year below or click "help" for detailed instructions.

Forecast Years: 2003 2010 2020 2030 All Years Help

Forecasted average weekday traffic (AWT) volumes in thousands are displayed for freeways, ramps, and major and minor roads. Individual roadway segments can be selected to obtain additional information including street name, type of roadway, number of lanes, and posted speed. Traffic analysis zone (TAZ) zone connector volumes are shown and TAZ-level trip generation and land use forecasts are provided.

Forecast Year. Select an individual year (2003, 2010, 2020, or 2030) to obtain traffic forecasts for that year. Select "All Years" to obtain traffic volume forecasts for years 2003 through 2030. The volumes shown on the "All Year" map is for year 2030.

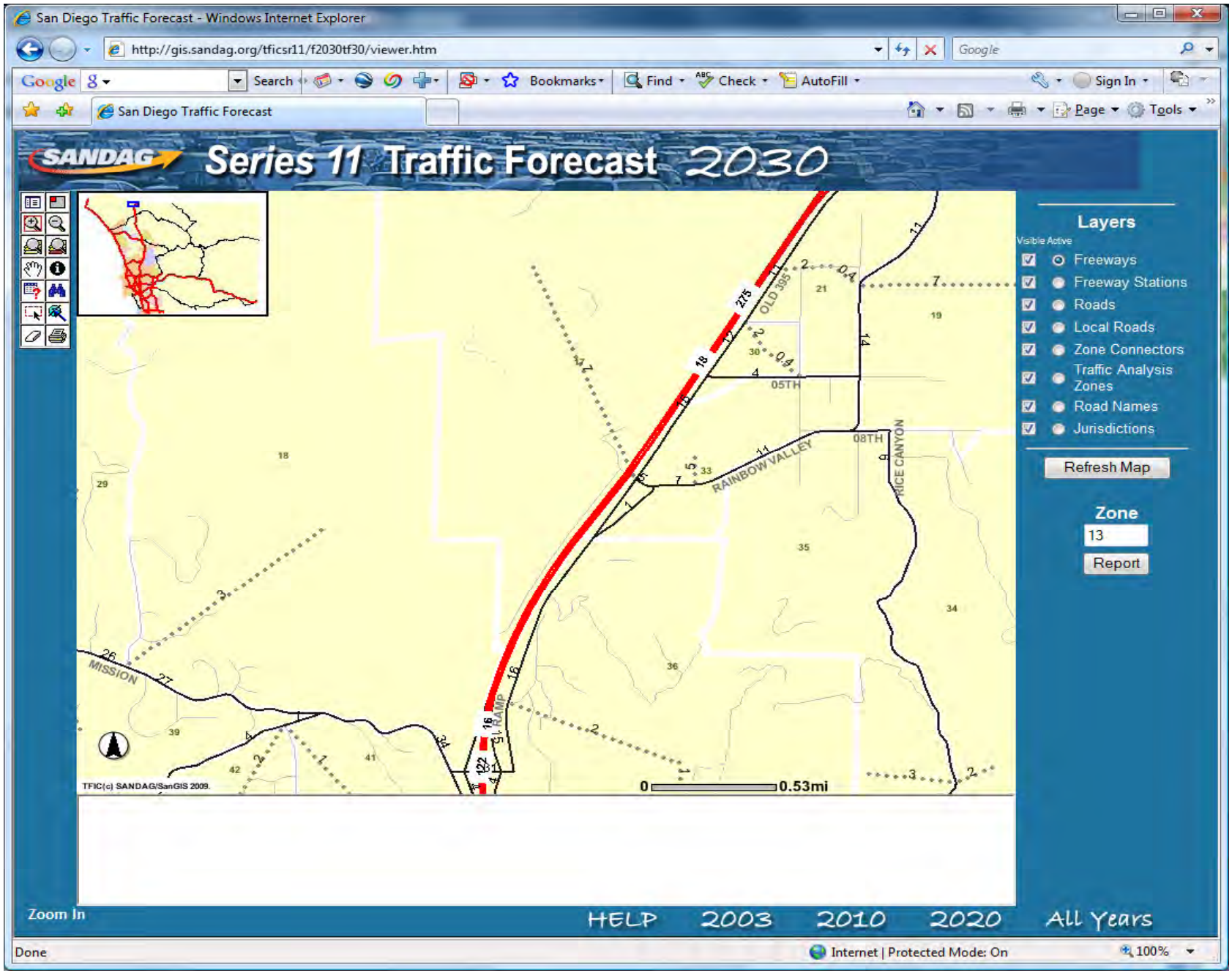
Source. SANDAG uses a regional transportation model to produce highway and transit forecasts for individual forecast years between 2003 and 2030. These forecasts are updated periodically to incorporate the most recent planning assumptions. Traffic forecasts shown here were completed in **October 2007** in support of the 2007 2030 Regional Transportation Plan (RTP). These traffic forecasts utilize the "Reasonably Expected" network as defined in the RTP, and the Final Series 11 2030 Regional Growth Forecast.

Forecasts differ from the TFIC Series 10, which was based on the Regional Transportation Plan (RTP) adopted in 2003 and Series 10 growth forecasts.

Disclaimer. We make every effort to produce accurate forecasts. If you find a traffic volume that appears to be in error, e-mail us at tfic@sandag.org with the location and description of the problem. We will make corrections to our databases and produce revised forecasts in the next update cycle.

SANDAG

Revised: Feburary, 2008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San Diego Traffic Forecast
SANDAG Series 11 Traffic Forecast 2030
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Visible Active
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Freeway Stations
Roads
Local Roads
Zone Connectors
Traffic Analysis Zones
Road Names
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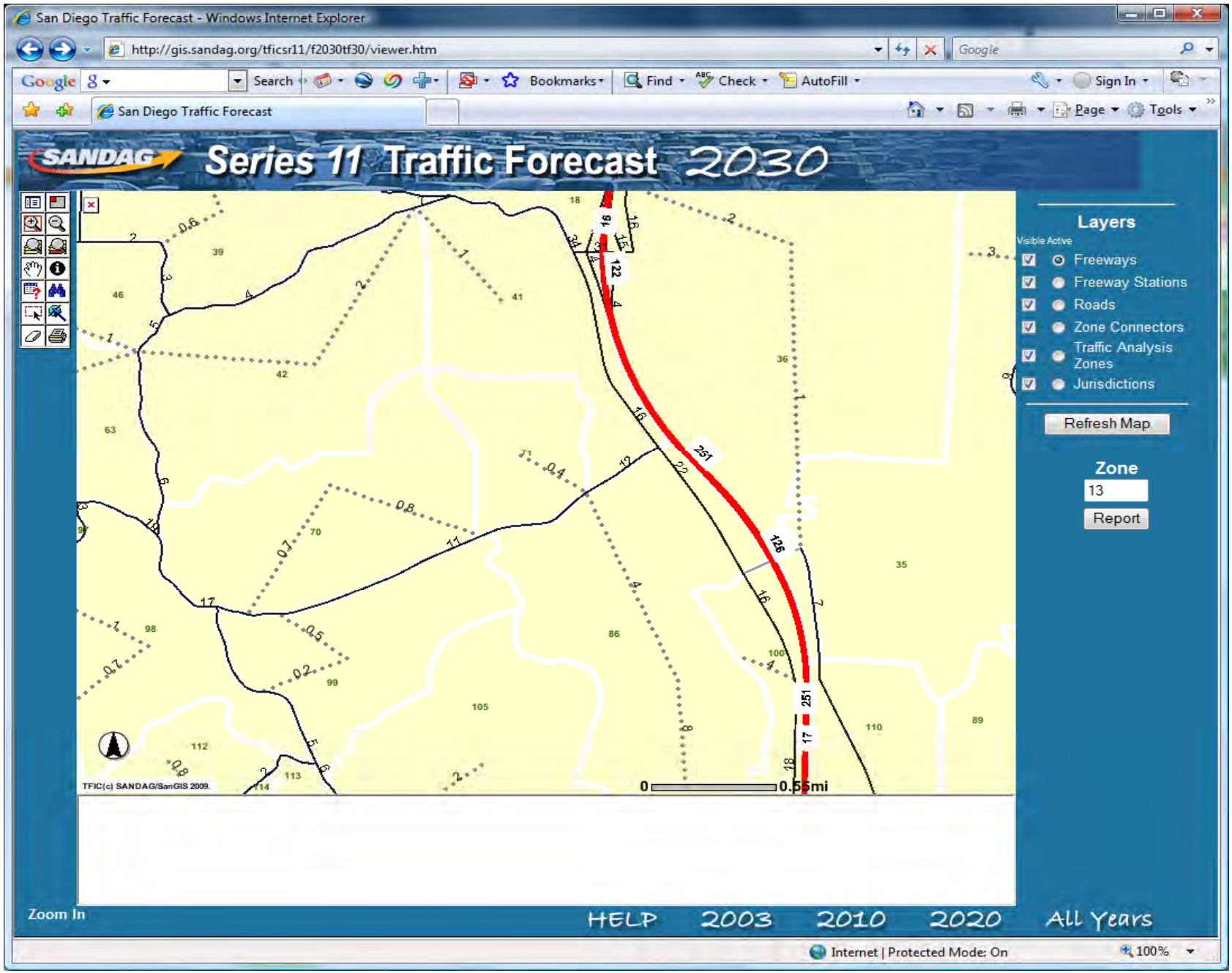
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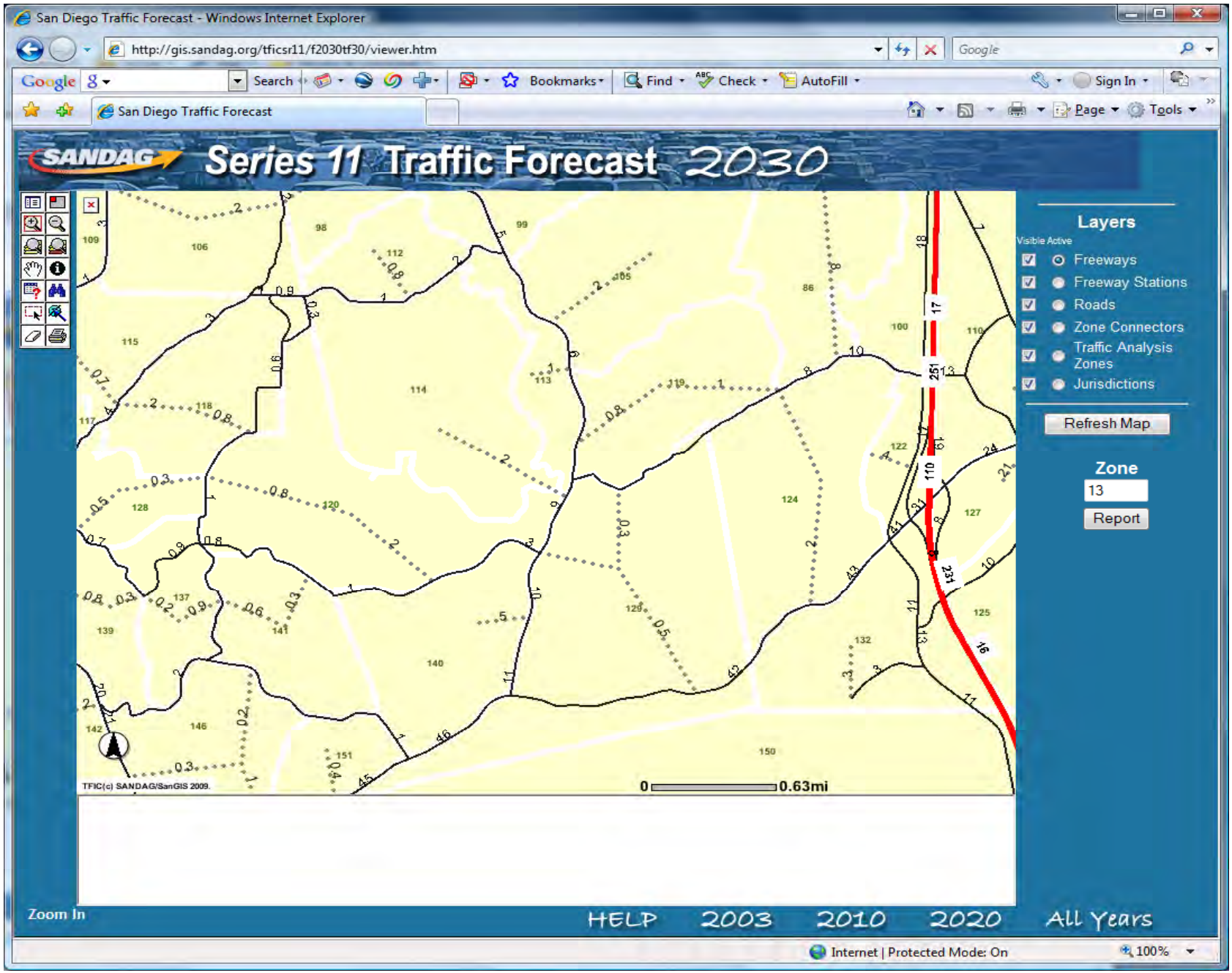
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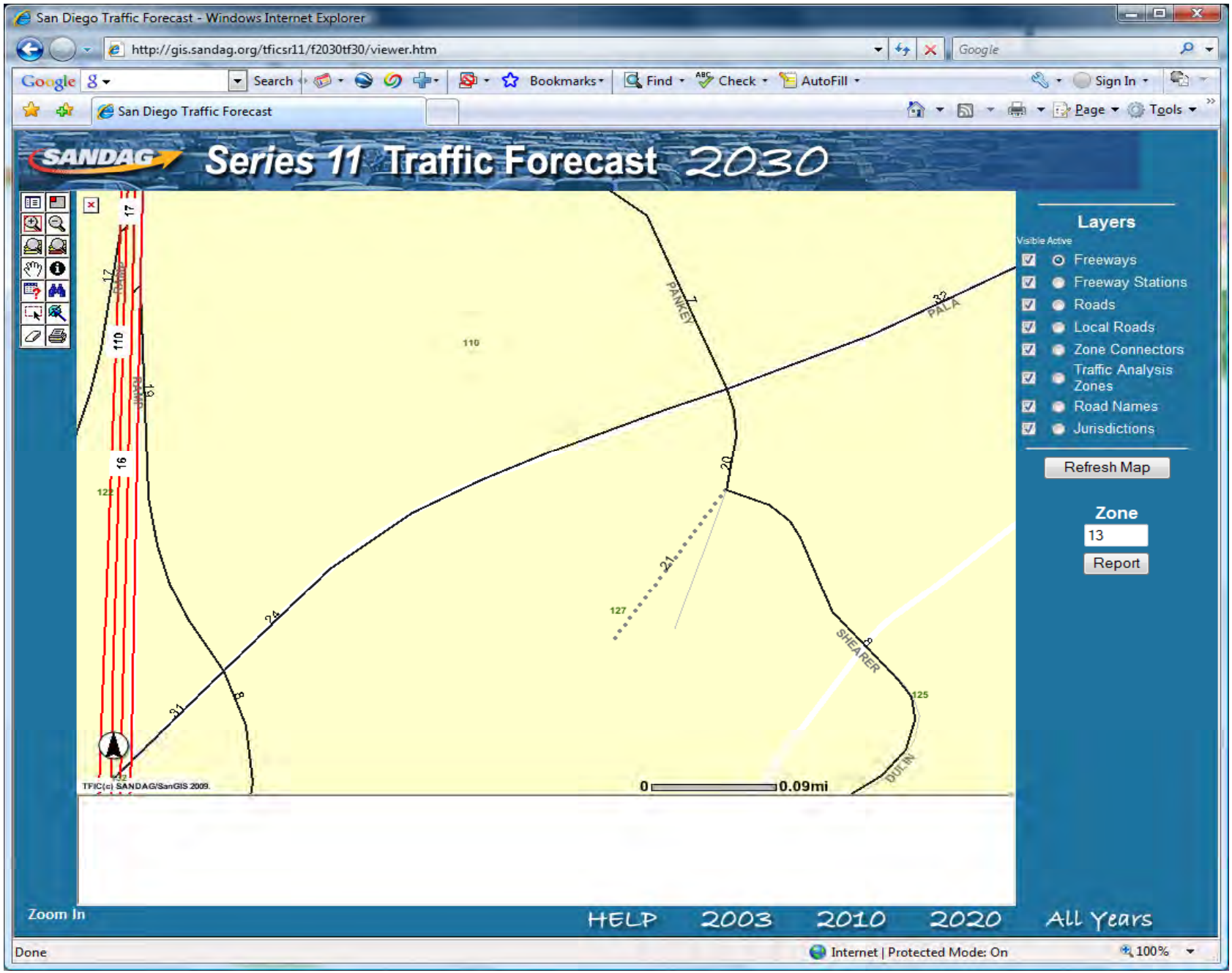
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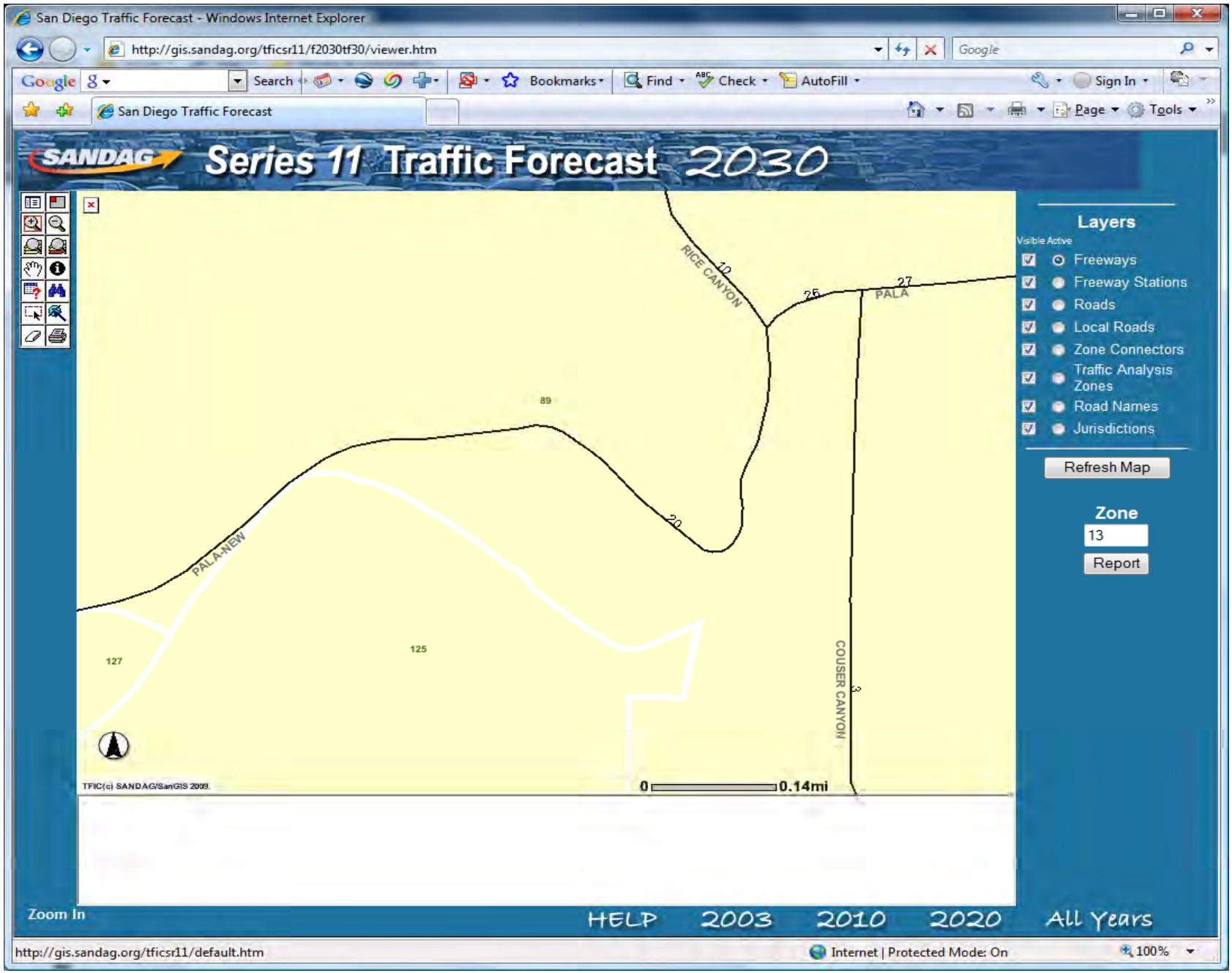
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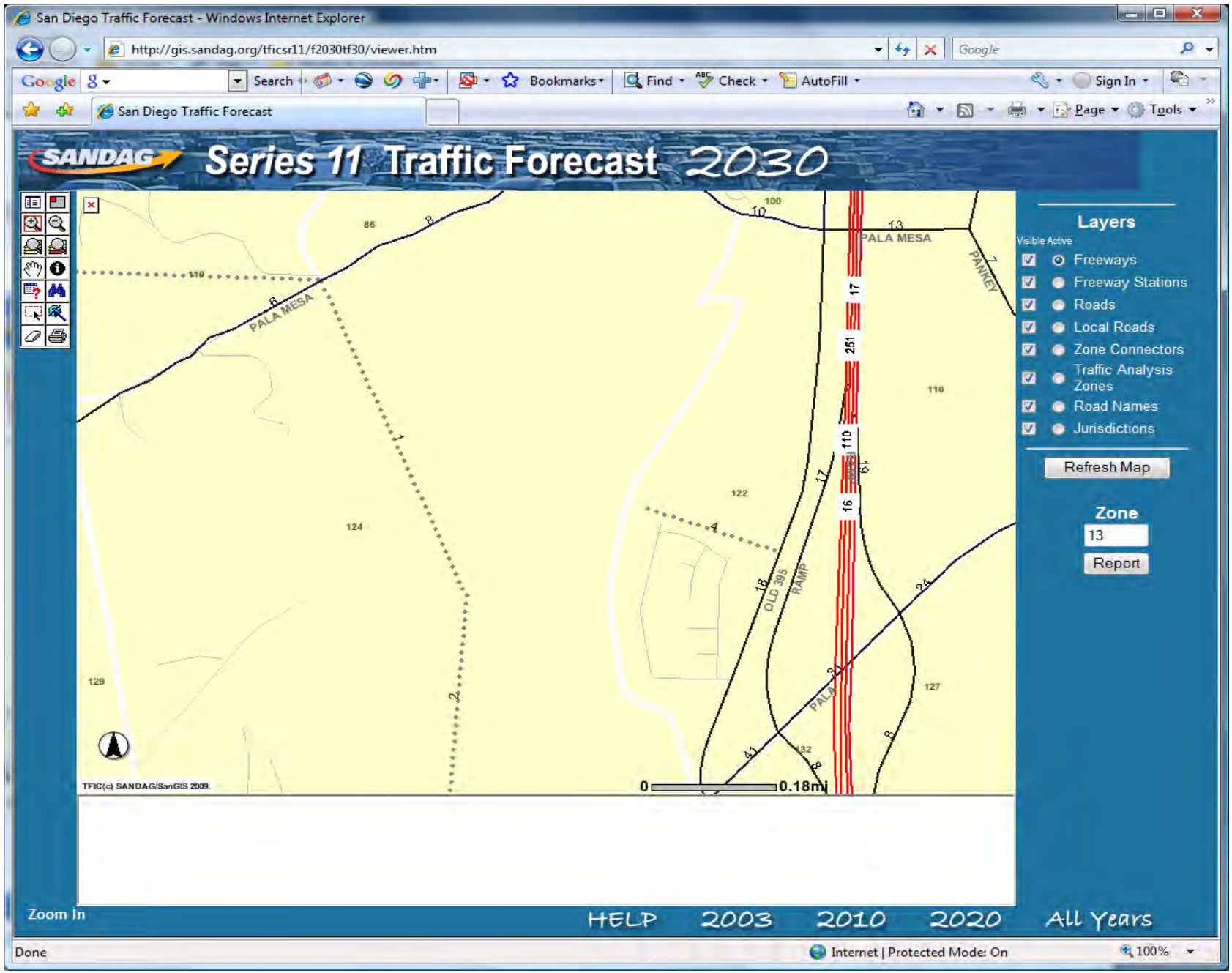
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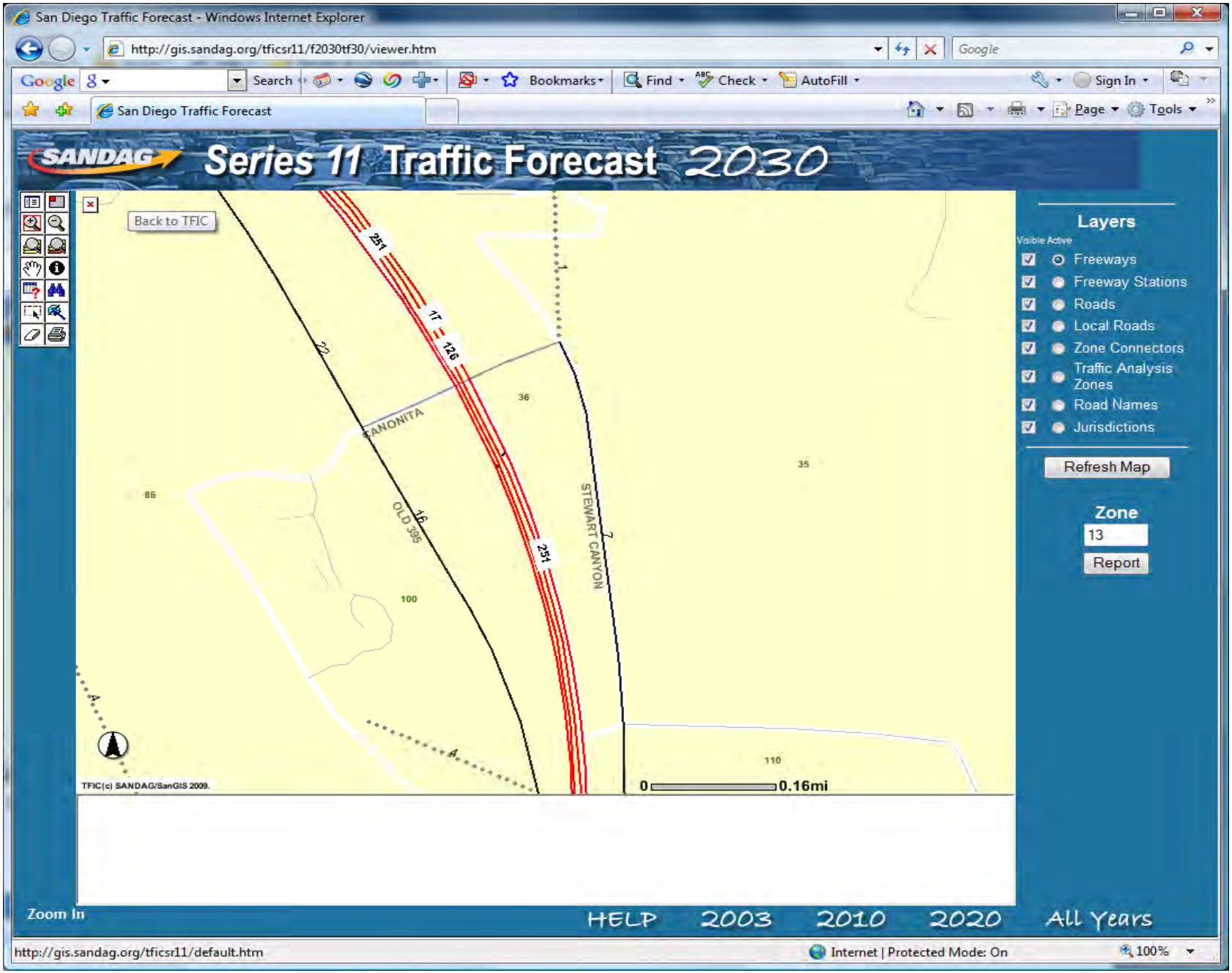
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Appendix M

Other Planned Roadway Improvements By Other Cumulative Projects

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	76	R28.0-31.9	1	122

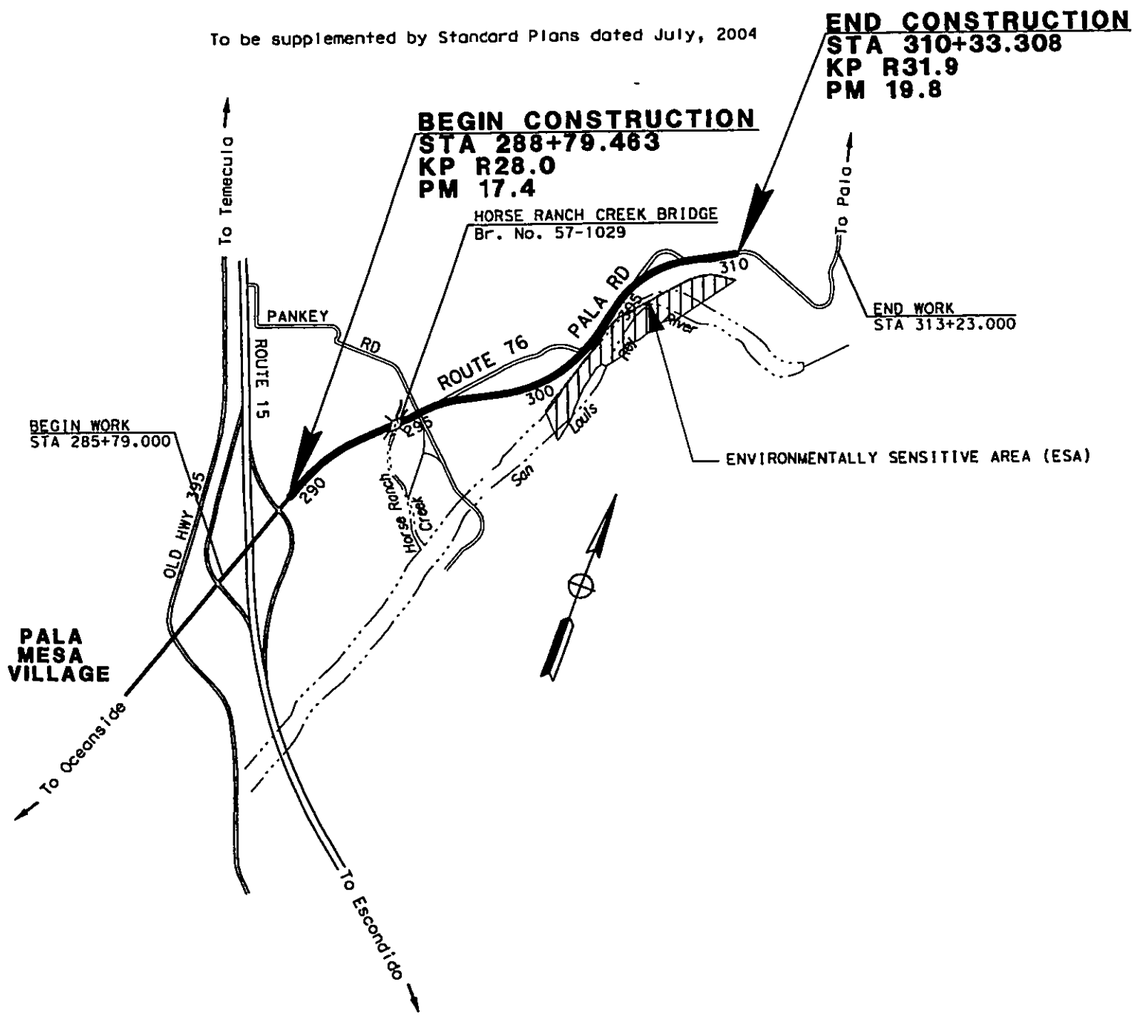
INDEX OF SHEETS

001	TITLE
002-008	TYPICAL CROSS SECTIONS
009	KEY MAP AND LINE INDEX
010-016	LAYOUT
017-023	PROFILE AND SUPERELEVATION DIAGRAM
024-028	CONSTRUCTION DETAILS
029-035	TEMPORARY WATER POLLUTION CONTROL
036-039	TEMPORARY WATER POLLUTION CONTROL DETAILS
040	TEMPORARY WATER POLLUTION CONTROL QUANTITIES
041-047	CONTOUR GRADING
048-054	DRAINAGE PLAN
055-058	DRAINAGE PROFILES
059-065	DRAINAGE DETAILS
066-068	DRAINAGE QUANTITIES
069-077	UTILITY PLAN
078-094	STAGE CONSTRUCTION AND TRAFFIC HANDLING
095-096	STAGE CONSTRUCTION QUANTITIES
097-103	PAVEMENT DELINEATION
104	PAVEMENT DELINEATION QUANTITIES
105	SUMMARY OF QUANTITIES
106-112	SIGN PLAN
113	SIGN QUANTITIES
114-120	PLANTING & IRRIGATION PLANS
121-122	SIGNAL, LIGHTING AND ELECTRICAL PLAN
	HORSE RANCH CREEK BRIDGE NO. 57-1029

PROJECT PLANS FOR CONSTRUCTION ON STATE HIGHWAY

IN SAN DIEGO COUNTY
ON ROUTE 76 FROM INTERSTATE 15
TO 2.2 km EAST

To be supplemented by Standard Plans dated July, 2004



NO SCALE

Project Engineer Date
Registered Civil Engineer

HADI SAMII
No. 46173
Exp. 12/31/06
CIVIL
STATE OF CALIFORNIA

Plans Approval Date

URS CORPORATION
1615 MURRAY CANYON RD,
SUITE 1000
SAN DIEGO, CA 92108

Contract No.

The Contractor shall possess the Class (or classes) of license as specified in the ''Notice to Contractors''.

PROJECT ENGINEER	DATE	PROJECT MANAGER	DATE

RELATIVE BORDER SCALE 0 20 40 60 80

CU 00000 EA 231501

Campus Park Traffic Impact Study Appendix

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	76	R28.0-31.9	9	122

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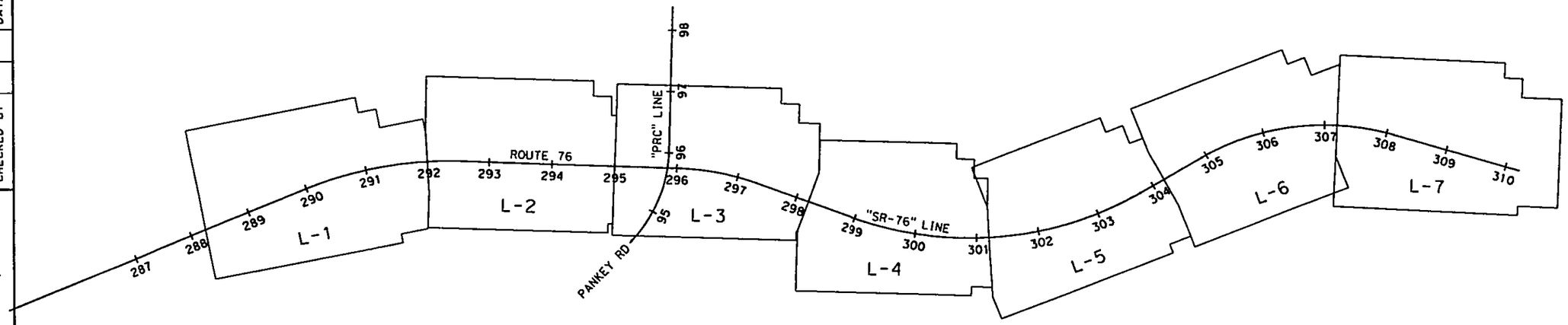
URS Corporation
1615 Murray Canyon Rd, Suite 1000
San Diego, CA 92108

DATE	REVISION No.	CALCULATED/ DESIGNED BY
	DATE REVISED	CHECKED BY

DESIGN OVERSIGHT



LINE INDEX

LINE	DESCRIPTION
"SR-76"	℄ ROUTE 76
"PRC"	℄ PANKEY ROAD CONSTRUCTION LINE

FINAL SUBMITTAL
NOT FOR CONSTRUCTION
JULY, 2006

· ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

KEY MAP AND LINE INDEX

SCALE 1:3500

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EA 231501

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
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Metric

DESIGN OVERSIGHT

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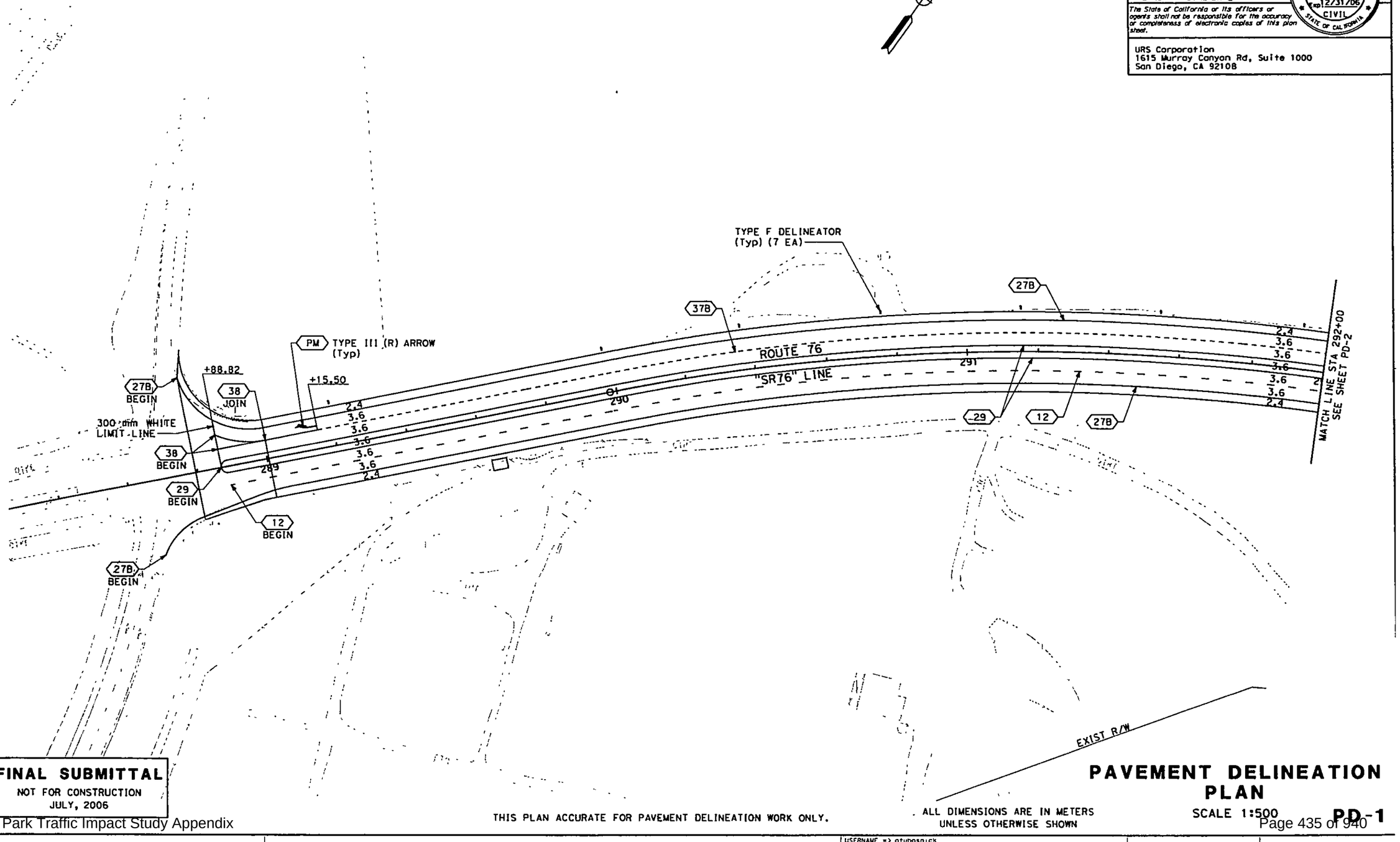
CHECKED BY

DATE	REVISION No.	DATE REVISED

LEGEND

XXX — TRAFFIC LINE DETAIL NUMBER

PM — PAVEMENT MARKING



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JULY, 2006

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PAVEMENT DELINEATION PLAN

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CU 00000

EA 231501

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	76	R28.0-31.9	98	122

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No. 46173
Exp. 12/31/06
CIVIL
REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

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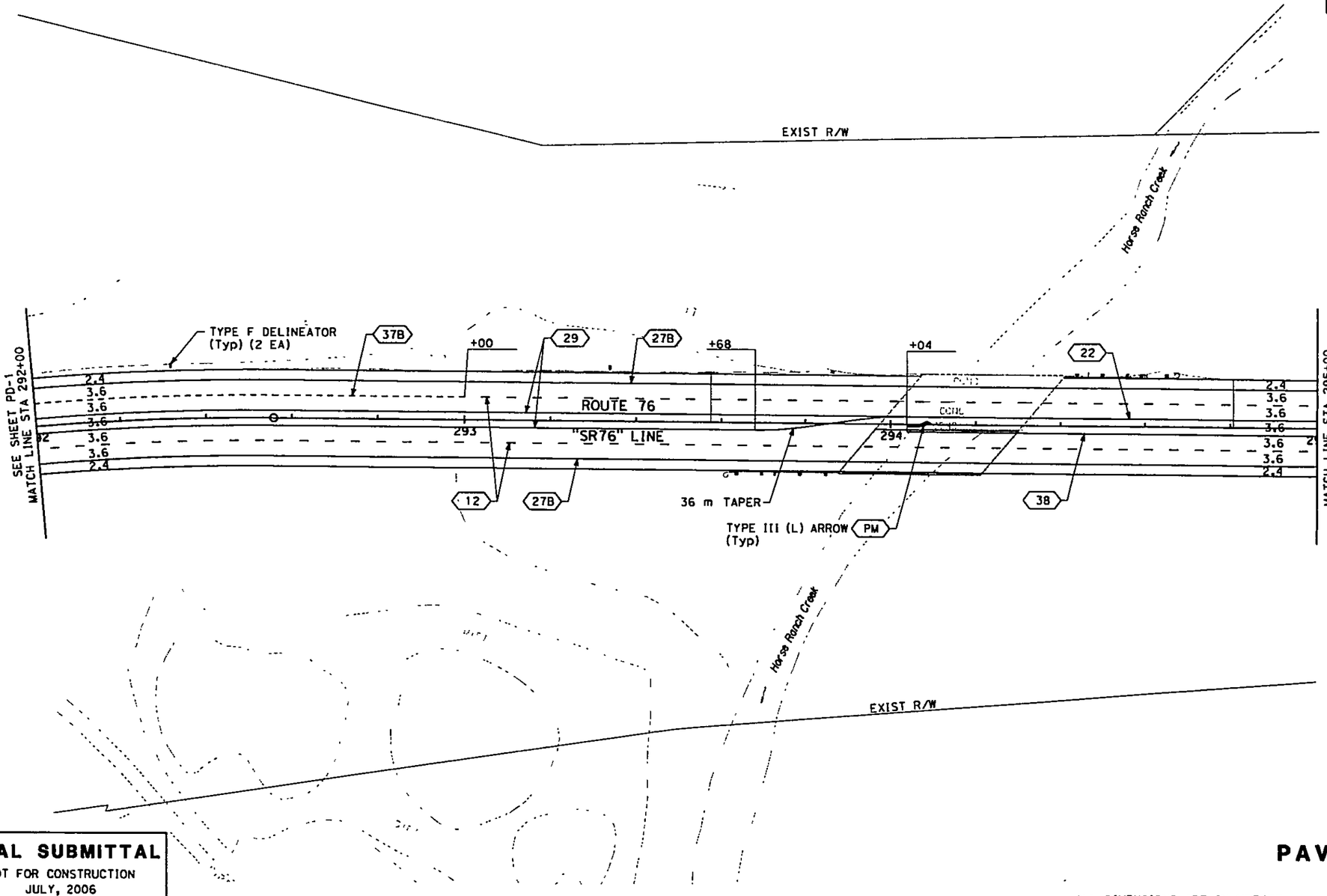
DATE REVISED



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JULY, 2006

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PAVEMENT DELINEATION PLAN

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CU 00000

EA 231501

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
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San Diego, CA 92108

DESIGN OVERSIGHT	CALCULATED/ DESIGNED BY	DATE	REVISION No.	DATE REVISED
	CHECKED BY			

PANKEY ROAD

EXIST R/W

PROP R/W

"STOP" PM

300 mm WHITE LIMIT LINE

"PRC" +95.56

"PRC" +55

"SR76" LINE

ROUTE 76

Exist ROUTE 76

TYPE III (L) ARROW (Typ)

TYPE F DELINEATOR (Typ) (7 EA)

TYPE VI (L) ARROW (Typ)

36 m TAPER

SEE SHEET PD-2 MATCH LINE STA 295+00

MATCH LINE STA 298+20 SEE SHEET PD-4

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NOT FOR CONSTRUCTION
JULY, 2006

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PAVEMENT DELINEATION PLAN

SCALE 1:500

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EA 231501

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
11	SD	76	R28.0-31.9	100	122

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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1615 Murray Canyon Rd, Suite 1000
San Diego, CA 92108

DATE | REVISION No. | DATE REVISED

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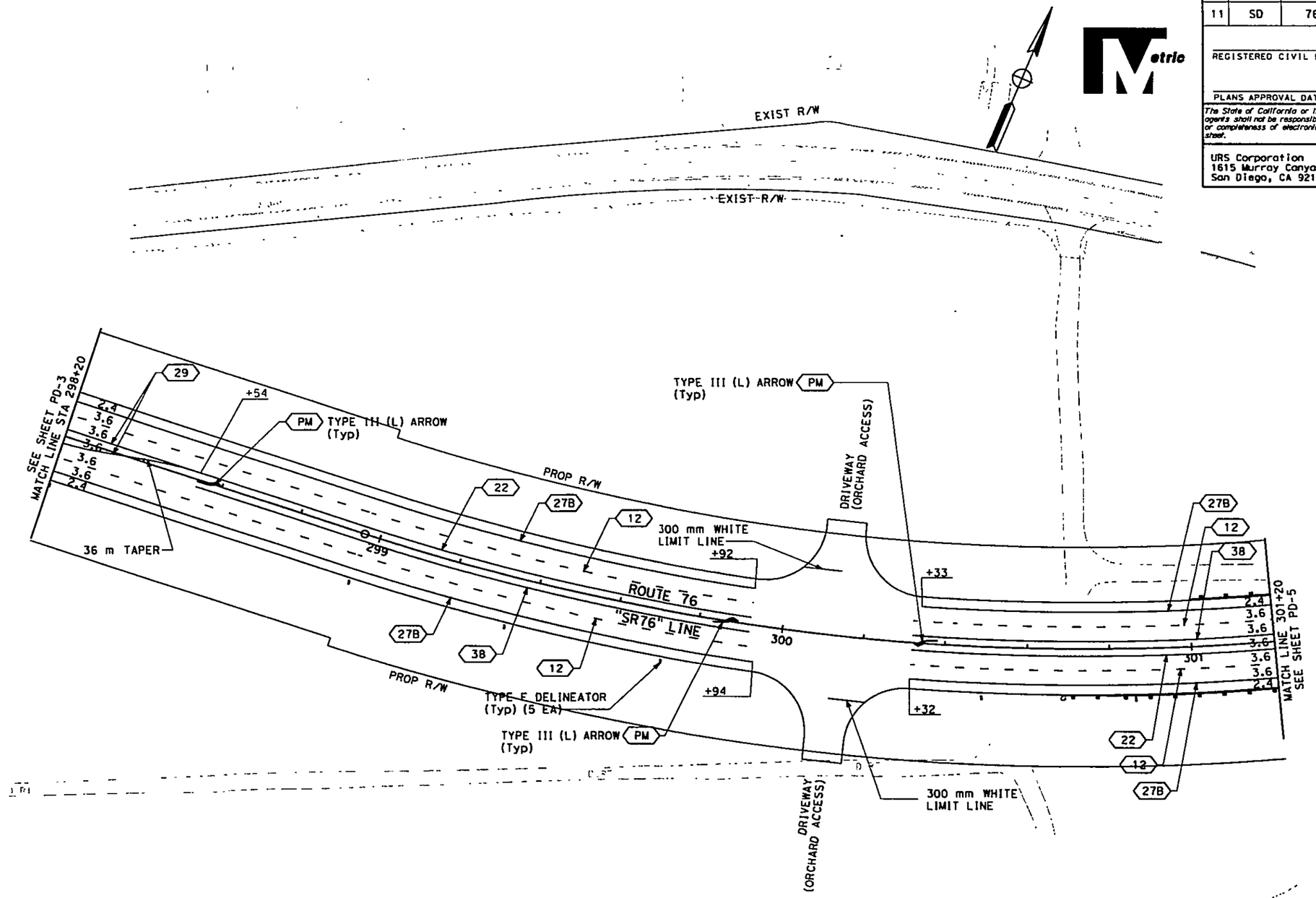

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NOT FOR CONSTRUCTION
JULY, 2006

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ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PAVEMENT DELINEATION PLAN

SCALE 1:500 **PD-4**

LAST REVISION

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CU 00000

EA 231501

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO	TOTAL SHEETS
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URS Corporation
1615 Murray Canyon Rd, Suite 1000
San Diego, CA 92108

DATE	REVISION No.	DATE REVISED

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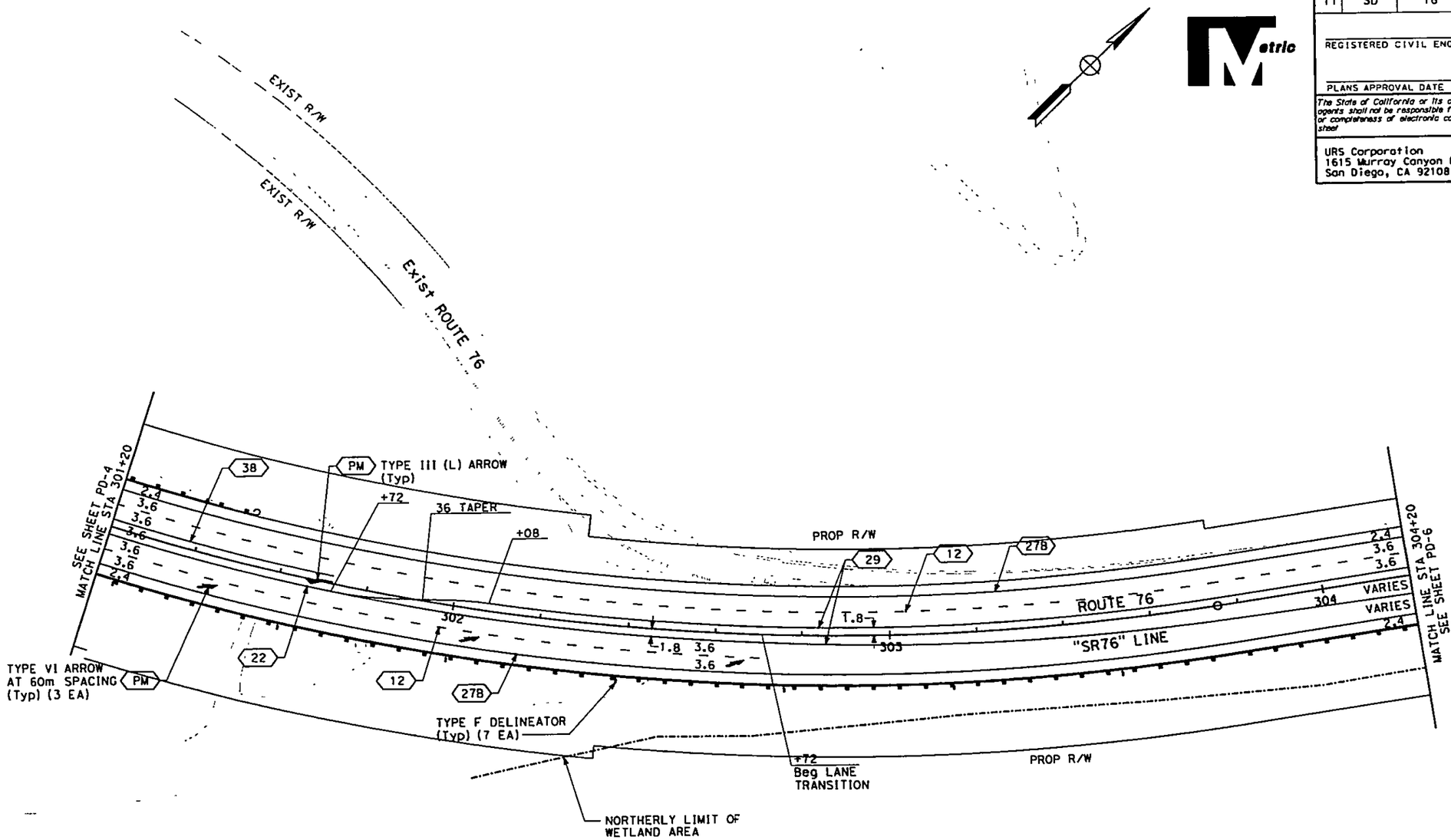

FINAL SUBMITTAL
NOT FOR CONSTRUCTION
JULY, 2006

THIS PLAN ACCURATE FOR PAVEMENT DELINEATION WORK ONLY.

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PAVEMENT DELINEATION PLAN

SCALE 1:500

PD-5

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CU 00000

EA 231501

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	76	R28.0-31.9	102	122

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER — Hadi Samii — No. 46173 — Exp 12/31/06 — CIVIL — STATE OF CALIFORNIA

URS Corporation
1615 Murroy Canyon Rd, Suite 1000
San Diego, CA 92108

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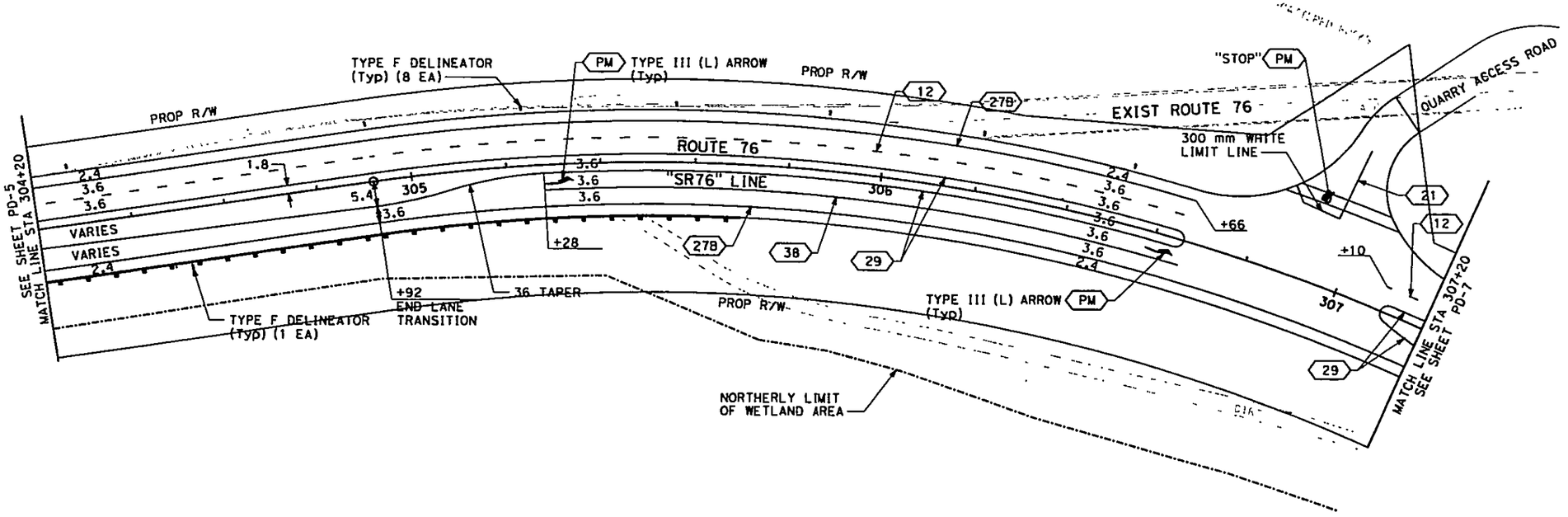

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JULY, 2006

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PAVEMENT DELINEATION PLAN

SCALE 1:500

PD-6

LAST REVISION

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	76	R28.0-31.9	103	122

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Hadi Samil — 46173 — Exp 12/31/06 — CIVIL — STATE OF CALIFORNIA

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San Diego, CA 92108

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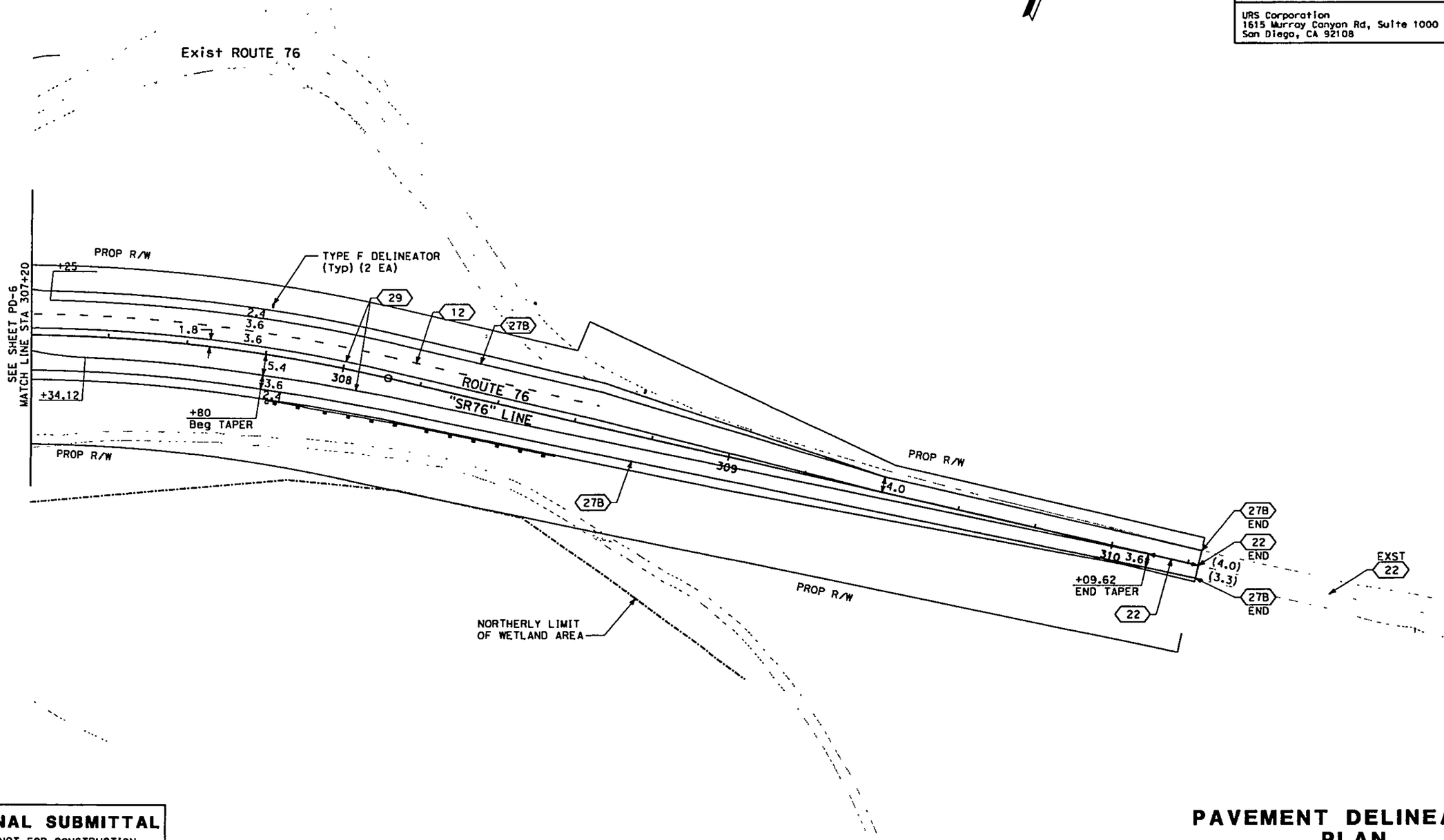

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PAVEMENT DELINEATION PLAN

SCALE 1:500

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EA 231501

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
11	SD	76	R28.0-31.9	104	122

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Hadi Samii No. 46173 Exp. 12/31/06 CIVIL STATE OF CALIFORNIA

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San Diego, CA 92108

Metric

PAVEMENT DELINEATION QUANTITIES

SHEET No.	DETAIL No. OR PAVEMENT MARKING	REMOVE PAVEMENT MARKER (N)	REMOVE PAINTED TRAFFIC STRIPE		PAVEMENT MARKER				PAINT TRAFFIC STRIPE (2-COAT)		CROSS-WALKS & LIMIT LINES	THERMOPLASTIC TRAFFIC STRIPE				THERMOPLASTIC PAVEMENT MARKING
					NON-REFLECTIVE	RETROREFLECTIVE										
			100 mm	200 mm	TYPE A	TYPE D	TYPE G	TYPE H	100 mm YELLOW	100 mm WHITE	300 mm WHITE	100 mm WHITE	150 mm WHITE	200 mm WHITE	200 mm WHITE (BROKEN 3.66-0.92)	
		EA	m2		EA				m		m	m				m2
PD-1	PM										10					3.90
	12						23			315						
	27B									680						
	29					86			624							
	37B						33			285						
	38						6							36		
PD-2	PM															3.90
	12						35			500						
	22					28			100							
	27B									600						
	29					56			402							
	37B									100						
	38						14							100		
PD-3	PM										15					15.78
	12						41			575						
	21								40							
	22					66			235							
	27B									555						
	29					10			60							
	38						33							240		
PD-4	PM										19					11.70
	12						36			525						
	22					64			230							
	27B									520						
	29					10			70							
	38						32							230		
PD-5	PM															15.60
	12						32			455						
	22					16			55							
	27B									600						
	29					36			250							
	38						8							52		
PD-6	PM										15					9.84
	12						17			245						
	21								17							
	27B									546						
	29					72			520							
	38						20							140		
PD-7	12						10			145						
	22					4			15							
	27B									600						
	29					80			580							
	SHEET TOTAL					528	340		3206	7246	59			802		60.72

(N) - NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.

DELINEATOR (CLASS 1)

SHEET No.	TYPE F
	EA
PD-1	7
PD-2	2
PD-3	7
PD-4	5
PD-5	7
PD-6	9
PD-7	2
TOTAL	39

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NOT FOR CONSTRUCTION
JULY, 2006

PAVEMENT DELINEATION QUANTITIES

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SCALE 1:500

PDQ-1

REVISION No. | DATE REVISED | DATE | CALCULATED/DESIGNED BY | CHECKED BY | DESIGN OVERSIGHT

Campus Park Traffic Impact Study Appendix
Page 442 of 940

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INTERGOVERNMENTAL AGREEMENT BETWEEN THE COUNTY OF SAN DIEGO AND THE PALA BAND OF MISSION INDIANS PURSUANT TO SECTION 10.8 OF PALA'S TRIBAL-STATE GAMING COMPACT

This Agreement ("Agreement") is entered into this first day of August, 2007, between the County of San Diego, a political subdivision of the State of California ("County"), and the Pala Band of Mission Indians, a federally recognized Indian Tribe located within the geographical boundaries of the County of San Diego, State of California ("Tribe"). The County and the Tribe shall be collectively referred to as the "Parties".

RECITALS

A. The Board of Supervisors of the County of San Diego and the Tribal Council of the Pala Band of Mission Indians recognize that each is a sovereign governmental entity with responsibility for the welfare of its people.

B. The County recognizes that all lands title to which are held in trust by the United States for the Tribe within the geographical boundaries of San Diego County (the "Reservation") are subject to Pala Tribal and applicable federal laws and regulatory authority. The Tribe recognizes that non-trust unincorporated lands located in San Diego County are subject to State law and County regulatory authority.

C. The County and the Tribe recognize that residents of the Reservation and the residents of San Diego County are neighbors with legitimate concerns over safety, development, and the character of life in San Diego County.

D. In 1988, Congress enacted the Indian Gaming Regulatory Act (P.L. 100-497, codified at 18 U.S.C. § 1166 *et seq.* and 25 U.S.C. § 2701, *et seq.*) ("IGRA") to regulate certain gaming on Indian lands in the United States. IGRA provides a regulatory framework for the operation of gaming by Indian tribes as a means, among other things, of promoting tribal economic development, self-sufficiency, and strong tribal government.

E. IGRA allocates regulatory authority over gaming among the federal government, the state in which a tribe has Indian land, and the tribe itself. IGRA makes Class III gaming activities lawful on the lands of federally-recognized Indian tribes only if such activities are, among other things, conducted in conformity with a tribal-state compact entered into between the Indian tribe and the state and approved by the Secretary of the Interior.

F. On September 10, 1999, the Tribe and the Governor of California entered into a tribal-state gaming compact (the "Compact") to permit the Tribe to conduct Class III gaming activities on its trust lands in compliance with IGRA. A Compact Amendment was approved by the Governor on June 21, 2004, ratified by the California State Legislature on July 1, 2004, and approved by the U.S. Department of the Interior on August 20, 2004.

G. Pursuant to IGRA and the Compact as amended, the Tribe intends to develop a two-story approximately 98,000 square foot expansion ("the Casino Expansion Project") of the existing Pala Casino and Hotel facility, to be located at currently paved parking areas and landscaped areas west of and adjacent to the existing Casino and Hotel facility. Approximately 44,700 square feet is to be devoted to gaming with 250 additional slot machines, and 53,300 square feet is to contain food service facilities, administrative areas, and indoor storage.

H. The Parties acknowledge that the Tribe's on-Reservation compact-related activities are not subject to the California Environmental Quality Act ("CEQA"). Pursuant to Section 10.8.1 of the Compact as amended, the Tribe caused to be prepared a Tribal Environmental Impact Report before the commencement of any planned expansion of its Gaming Facility. The Tribe issued a Notice of Preparation of a Draft TEIR on June 9, 2006 and subsequently issued the Draft TEIR on November 28, 2006. Public Notice was provided pursuant to the Compact. The County and the public reviewed and commented on both the Notice of Preparation and the Draft TEIR.

I. Section 10.8.8 of the Compact as amended requires the Tribe to negotiate with the County of San Diego and to enter into agreements containing provisions providing for the timely mitigation of any significant effect on the off-Reservation environment where such effect is attributable in whole or in part to the Casino Expansion Project unless the parties agree the particular mitigation is infeasible; relating to compensation for law enforcement, fire protection, emergency medical services and any other public services to be provided by the County to the Tribe as a consequence of the Casino Expansion Project; providing for reasonable compensation for programs designed to address gambling addiction; and providing for mitigation of any effect on public safety attributable to the Casino Expansion Project.

J. The Tribe and the County have a longstanding, government-to-government relationship based on mutual respect and consideration of their respective jurisdiction, laws, regulations and duties to their citizens.

NOW, THEREFORE, the Parties hereby agree that this Agreement shall satisfy the requirements of Section 10.8.8 of the Amended Compact and sets forth (1) the County and Tribe's obligations in providing Mitigation Measures for any potentially Significant Effect on the Off-Reservation Environment; (2) the provisions relating to compensation for law enforcement, fire protection, emergency medical services and any

other public services to be provided by the County to the Tribe as a consequence of the Casino Expansion Project; (3) provisions providing for reasonable compensation for programs designed to address gambling addiction; (4) provisions providing for mitigation of any effect on public safety attributable to the Casino Expansion Project; and (5) a continued strengthening of the government-to-government relationship between the County and the Tribe.

A. MITIGATION MEASURES ASSOCIATED WITH THE PROJECT

In preparing the Final Tribal Environmental Impact Report, the Tribe and the County met several times, including meetings between technical staff, to analyze the impacts of the Casino Expansion Project on the off-Reservation environment. In compliance with the Compact as amended, the parties analyzed each of the matters set forth in Section 10.8.1 of the Off-Reservation Environmental Impact Analysis Checklist. The parties agree that implementation of the following mitigation measures will address the off-Reservation environmental impacts of the Casino Expansion Project.

Unless otherwise stated, all mitigation measures, including first annual payments where annual payments are to occur, shall be performed by Tribe, and Tribe shall inform the County in writing of the completion of such measures, prior to the earlier of the following events: completion of the entire Casino Expansion Project, or Tribe's placing in operation a total of 2,400 Class III slot machines in the Casino and Casino Expansion combined. Tribe presently has fewer than 2,400 Class III slot machines in operation. As Tribe adds Class III slot machines to its Casino facilities, Tribe agrees to report the additional Class III slot machines to the County up to a total of 2,400 Class III machines.

County shall notify Tribe in writing of any concerns or need for clarifying information regarding completion of the mitigation measures contained in this Agreement. Tribe agrees to respond to requests for clarifying information and to cooperate with County in resolving concerns County may raise. In addition, Tribe shall promptly respond to County inquiries concerning compliance with mitigation measures set forth below that are to be complied with during future operation of the expanded Casino.

1. Aesthetics

New exterior lighting will be designed and constructed so as to meet or exceed standards consistent with the County's Dark Skies Ordinance.

2. Air Quality/Transit

a) Utilize construction dust suppression measures. During construction of the Casino Expansion Project, the Tribe shall require that contractors utilize standard techniques for dust suppression, such as watering of active construction areas,

application of surfactants to exposed soils, limiting of truck speeds on unpaved surfaces, and prohibiting grading activities if wind speeds exceed 25 miles per hour to minimize contribution of PM_{10} to the atmosphere. Tribe shall exercise reasonable measures to prevent dust from becoming a nuisance to off-Reservation residents and motorists on SR-76 and nearby County roads.

b) Sweep construction soil from roads. If soil material is carried over to adjacent roads, Tribe will assure the roads are swept in a timely manner.

c) Utilize low-emission construction equipment. During construction, whenever reasonably available and feasible, low-sulfur diesel equipment and electric equipment will be utilized.

d) Avoid use of portable generators. For construction activities, Tribe will use reasonable efforts to use only commercial electrical power in order to avoid and or minimize the use of portable gasoline and diesel engine generators.

e) Encourage use of buses/vans. Tribe will continually seek ways to expand the availability of van/bus services for Casino Guests, to reduce individual vehicular traffic levels, and where reasonably feasible, Tribe will contract with companies that use low-emission vehicles.

f) Encourage employee carpooling. Tribe will continue to encourage employees to carpool, vanpool or rideshare and provide ride-matching services.

g) Consider future transportation demand management and transit improvement recommendations. Though specific recommendations have not been determined, Tribe agrees to consider implementation of recommendations once they have been formulated for the following:

   (1) Transportation Demand Management Program – being developed by San Diego Association of Governments (SANDAG) and the Reservation Transportation Authority (RTA).

   (2) Park and Ride/Transit Facility at I-15/SR76 intersection - being considered by SANDAG.

   (3) Interregional Transit Service Plan – being developed by Riverside and San Diego county transit agencies.

h) Support improvements to North County Transit bus stop. If the use of bus service increases and an additional bus stop bench is warranted, Tribe agrees to install an additional bus stop bench (Wabash Valley bench, 8-foot long, royal blue, model #

PP307D). For the expanded Casino, Tribe will provide pedestrian access equivalent to what currently exists from the bus stop to the existing Casino.

3. Hazardous Materials

Tribe shall enter into a new contract with the County Office of Emergency Services (OES), Hazardous Incident Response Team (HIRT), for hazardous materials emergency response services. A copy of the contract is attached hereto as Appendix A. Tribe shall pay County annually the amount of $5,000 for the HIRT contract, with adjustments every two years consistent with changes in the Consumer Price Index for All Urban Consumers in the San Diego, California area (CPI Index), but in no event shall the annual increase be greater than 5% each year.

4. Water Resources

a) Groundwater. To avoid impacts to the off-Reservation areas of the Pala Basin, the Tribe agrees as follows:

(1) For the Casino Expansion Project's groundwater requirements, no new wells shall be placed in the area designated in Appendix B.

(2) All wastewater treatment plant effluent shall be disposed of via on-Reservation percolation ponds, or, in the alternative, the effluent shall be reclaimed for beneficial use such as landscaping and agricultural uses within the Pala Basin.

b) Storm Water – Tribe shall:

(1) Assure the use of appropriate construction best-management-practices (BMPs) at the Casino Expansion Project construction site to prevent off-Reservation water quality impacts throughout the duration of construction.

(2) Assure that the construction contractor has prepared and implements a storm water pollution prevention plan (SWPPP) to meet Environmental Protection Agency (EPA) NPDES requirements.

(3) Assure that runoff that goes off-Reservation from the parking and roof areas is treated via filters and oil-water separators.

5. Noise

a) Traffic Noise. Tribe shall not allow concentrated, heavy, truck traffic associated with construction of the Casino Expansion Project from 10 p.m. to 7 a.m.

b) Backup electrical generator testing. After the Casino Expansion Project's backup generators are installed, testing will not be performed from 7 p.m. to 7 a.m.

6. Traffic

Tribe and County agree that a combination of mitigation measures is required to adequately address potential traffic impacts. Although several of the Air Quality/Transit mitigation measures identified in Section A.2 are expected to reduce the traffic volume generated by the Casino Expansion Project, additional traffic, primarily between I-15 and the Pala Casino, will result from the project. To enhance traffic safety and reduce congestion at the I-15/SR76 interchange, on SR76 between the I-15 and the Pala Casino/Spa frontage, and along the Pala Casino/Spa frontage, Tribe agrees and County supports the following improvement projects:

a) Fair Share Contributions to I-15/SR76 Interchange Improvements. Tribe shall enter into an agreement with Caltrans and County to provide fair-share contributions to Caltrans for improvements to the I-15/SR76 interchange. For the purpose of this Agreement, "fair-share" shall mean a percentage derived by taking the trips generated by the Pala Casino as a percentage of total trips of all users. For example, if total trips at the interchange average 20,000 and Pala Casino generated trips total 2,000, the Tribe's fair share of the costs of the improvements would be 10%.

b) Financial Support to Assure SR76 Widening and Realignment from I-15 to Rosemary Mountain Quarry Entrance. Tribe shall enter into an agreement with Granite Construction Company to provide $13,000,000 in financial support to Granite Construction Company to facilitate widening and realigning SR76 from the I-15 easterly to the Rosemary Mountain Quarry entrance, a distance of approximately 1.3 miles.

c) SR76 Operational Improvements between Rosemary Mountain Quarry Entrance and Pala Casino Frontage. Tribe agrees to pay up to $20,000,000 to Caltrans for improvements to SR76 that will enhance safety and relieve congestion on SR76. Such improvements may include passing lanes, turnouts, shoulder widening, curve realignment, and intersection improvements. Tribe agrees to act reasonably in developing with Caltrans proposed improvements to SR76. Notwithstanding anything else to the contrary in this Agreement, when Caltrans has provided Tribe with proposed improvements, the Tribe has the right in its sole and absolute determination to agree or to disagree with the desired improvements. If the Tribe does not agree with a project proposed by Caltrans, such project shall not be funded by any portion of the $20,000,000. Tribe shall only pay Caltrans for an improvement to SR76 after a written agreement concerning that project has been entered into between Caltrans and the Tribe. If agreement between Tribe and Caltrans has not been reached as to the use of the $20,000,000, or any part thereof,

by June 30, 2010, Tribe shall no longer be obligated to pay for improvements pursuant to this paragraph 6.c.

d) Pala Casino/Spa SR76 Frontage Improvements. Tribe shall improve SR76 in accordance with Caltrans and County requirements along an approximately one mile segment of SR76 approaching the Casino Expansion Project and along the Casino frontage, from just east of Gomez Bridge to just west of Pala Bridge. Improvements may include an additional through lane in each direction, turn lanes, a second signalized intersection for ingress and/or egress for the Casino/Hotel, and landscaped medians. County agrees to expeditiously process all applications and submittals by Tribe for such improvements, and agrees to coordinate such improvements with Caltrans in order to allow the Tribe to expeditiously begin the construction of such improvements. At this time, the approximate cost of the improvements is $5,000,000. County agrees to accept all submissions to Caltrans in place of any additional encroachment submissions they would otherwise require.

e) All-Weather Crossings on Pala Mission Road. Within 12 months from the date of this Agreement, County will construct all-weather crossings to replace two dip sections on Pala Mission Road. County agrees to identify funds required in combination with uncommitted funds remaining from the August 6, 2003 Cooperative Agreement with Pala/County to fund the construction cost of the project.

7. Wastewater Treatment

a) Tribe shall construct a state-of-the-art Sequence Batch Reactor (SBR) wastewater treatment plant (WTP) to the satisfaction of Pala EPA that will replace the existing WTP and treat existing flows plus flows from the Casino Expansion Project. The new plant will be on-Reservation adjacent to the existing plant. Treatment will be to tertiary treatment standards. County agrees to expeditiously process all applications and submittals by Tribe for an encroachment permit required for any part of the new WTP.

b) All of the new WTP's effluent shall be disposed of via on-Reservation percolation ponds or be reclaimed for beneficial use such as landscaping and agricultural uses.

c) Tribe shall dispose of sludge off-Reservation at appropriately permitted landfills in accordance with applicable federal, state and local laws.

8. Solid Waste

a) Solid waste that is not diverted for recycling/reuse will be disposed of only at permitted off-Reservation landfills.

b) To minimize impacts to off-Reservation landfills, Tribe will, to the extent feasible, separate and divert solid waste to reuse or recycling including at a minimum all wastes consisting of cardboard, mixed paper, glass, plastic, copper, aluminum, tin, white goods and green waste resulting from landscaping activities. The goal of this activity is to separate or divert 50% of the solid waste of the facility.

c) During construction of the Casino Expansion Project, to the extent feasible, waste materials from construction activities shall be recycled or diverted for reuse. The goal of this activity is that 90% of inert wastes and 50% of non-inert wastes shall be recycled or diverted for reuse.

9. Security and Law Enforcement

The Tribe and the Sheriff, respectively, shall provide security and law enforcement as set forth below.

a) Security. The Tribe agrees to provide on-site security in the Casino Expansion Project during all hours of operations. The Tribe acknowledges that assistance from the County Sheriff may be required from time to time with respect to the apprehension and arrest of persons engaged in suspected criminal activity.

b) Law Enforcement Responsibilities. County and Tribe agree that under Public Law 280 (18 U.S.C. § 1162), the County and the County Sheriff have concurrent jurisdiction with the Tribe over crimes committed on the Reservation.

c) Compensation to County.

(1) Pursuant to an existing agreement between the Tribe and Sheriff, Tribe presently provides funding for two full-time deputy sheriff units.

(2) Tribe agrees to pay County $200,000 annually to provide the funding for a deputy sheriff unit. After the first annual payment, subsequent annual payments shall be increased consistent with changes in the Consumer Price Index for All Urban Consumers in the San Diego, California area (CPI Index), but in no event shall the annual increase be greater than 5% each year. This requirement is considered satisfied if Tribe's payments under the existing Tribe/Sheriff Agreement referenced in the preceding subparagraph meet or exceed this amount. Should the existing agreement be terminated or should Tribe cease paying at least $200,000 under the agreement referenced above, Tribe shall be obligated to pay the difference between $200,000 and the amount being paid under the agreement referenced above, for Sheriff's services.

d) County of San Diego District Attorney Tribal Liaison Project. The Tribe shall pay County annually for a portion of the cost of the District Attorney's Office – Tribal Liaison Project that consists of dedicated District Attorney Staff who work closely with Tribes in the San Diego region to prosecute Indian gaming-related crime. The first annual payment shall be $6,000 and subsequent annual payments shall be increased by the CPI Index but in no event shall the annual increase be greater than 5% each year. These funds will be due for as long as the District Attorney's Office has dedicated staff working solely on Indian gaming related crimes.

e) Criminal Prosecution Caseload. The Tribe shall pay County annually for costs of processing additional Criminal Prosecution Caseload. First annual payment shall be $15,000 and subsequent annual payments shall be increased by the CPI Index but in no event shall the annual increase be greater than 5% each year.

10. Public Health and Safety

a) Fire and Life Safety Services: The Pala Fire Department is presently continuously staffed by professional firefighters with emergency medical training and paramedics. The department is equipped with two fire engines, a rescue unit, a water tender, a 110 foot ladder truck, and a brush engine. The Tribe has initiated construction of a new fire station with training facilities. The department currently provides fire protection and emergency medical services to the Reservation, Casino/Hotel/Spa, as well as the surrounding non-Reservation rural area including SR76 through to the I-15 and Pala Temecula Road to the Riverside County line, and will provide such services to the proposed Casino Expansion Project. The Fire Department has mutual aid agreements with nearby fire departments. The Tribe agrees to continue providing these services to its Reservation/Casino/Spa facilities, including the proposed Casino Expansion Project.

b) Emergency Plan. Tribe shall coordinate with the County's emergency services programs to help assure public safety in the event of an emergency and will exchange emergency response policies and procedures, as needed and agreed upon by the Parties.

c) Regional Light/Air Unit. Tribe will cooperate with County with regard to its north county regional emergency response light/air unit. Such cooperation shall include both operational issues as well as ideas as to how to pay for the equipment required by the unit. The unit is being developed to assist emergency response personnel entering large facilities such as the Casino Expansion Project by providing a pre-positioned vehicle with twenty mobile self-contained breathing apparatus and emergency lighting capability.

11. Impacts of Gambling Addiction

a) Compensation to County. Tribe shall pay County $150,000 annually for programs designed to address gambling addiction. These funds shall be segregated by County and shall only be used for gambling addiction treatment programs. Beginning with the sixth annual payment, annual payments shall be increased commensurate with the annual change in the CPI Index but in no event shall the annual increase be greater than 5% each year.

b) Tribe shall continue its existing Responsible Gaming programs within the existing casino and shall expand this program to include the Casino Expansion Project area. Existing programs consist of the following:

1) Voluntary exclusion program
2) Involuntary exclusion program
3) In-casino responsible gaming signage
4) Responsible gaming communications including brochures
5) Training programs to educate staff on problem gaming including trained counselors
6) Non-monetary support for the California Council on Problem Gambling which provides the following throughout California:
    i. Conducts Responsible Gambling workshops for Casino employees
    ii. Staffs a 24 hour/day, 7 days/week "Problem Gambling Help Line" with live professional counselors who can provide first contact crisis intervention
    iii. Trains and certifies California Certified Gambling Counselors
    iv. Provides information on cost accessible programs for those with compulsive gambling program
    v. Maintains a "Speakers Bureau" of volunteers to help educate children and adults at schools and community service forums

B. DISPUTE RESOLUTION

1. In an effort to foster good government-government relationships, and to assure that the Tribe is not unreasonably prevented from engaging in activities authorized under the Compact and benefiting therefrom, while assuring that the off-Reservation environment is not negatively impacted by the construction and operation of the existing casino and the Casino Expansion Project, the County and the Tribe agree to the following:

a) The Tribe and the County shall make their best efforts to resolve disputes that occur under this Agreement by good faith negotiations whenever possible. Disputes between the Tribe and the County shall first be subjected to a process of

meeting and conferring in good faith in order to foster a spirit of cooperation and efficiency in the administration of the terms, provisions, and conditions of this Agreement as follows:

(i) Either party shall give the other, as soon as possible after the event giving rise to the concern, a written notice setting forth, with specificity, the issues to be resolved.

(ii) The parties shall meet and confer in a good faith attempt to resolve the dispute through negotiation not later than ten (10) days after receipt of the notice, unless both parties agree in writing to an extension of time. If the County asserts, and provides the Tribe with a reasonable basis for such assertion, that the Tribe's activities are causing an imminent danger to the public health and safety, the Tribe agrees to cease such activity until the County's concerns have been satisfied.

(iii) If the dispute is not resolved to the satisfaction of the parties within thirty (30) calendar days after the first meeting, then upon the request of either party in writing, the dispute shall be submitted to binding arbitration in accordance with this section. The Tribe and the County will submit to any arbitration proceeding as described in this section, and consent to the jurisdiction of the United States District Court for the Southern District of California and, if the United States District Court for the Southern District of California finds that it lacks jurisdiction, to the jurisdiction of the Superior Court for the County of San Diego, State of California, in each case for the purpose of compelling arbitration in the event either party refuses to arbitrate any arbitral dispute as contemplated herein, and for the enforcement of any decision and collection of any award of the arbitrator as contemplated herein. The disputes to be submitted to arbitration shall be limited to claims of breach or violation of this Agreement. The arbitrator shall reach decisions including providing the substance of outstanding and unresolved portions of such agreements to make possible their conclusion and resolutions of any disputes pursuant to this Agreement, within ninety (90) days of the disputes or issues being first submitted to him or her.

b) Arbitration Rules. Any dispute between the Tribe and the County arising out of or relating to this Agreement, or the breach thereof, shall be settled in accordance with the Commercial Arbitration Rules of the American Arbitration Association. The arbitration shall be held on the Tribe's land or, if unreasonably inconvenient under the circumstances, at such other location mutually agreeable to the parties. Each side shall bear its own costs, attorneys' fees, and one-half the costs and expenses of the American Arbitration Association and the arbitrator, unless the arbitrator rules otherwise. In any court action brought pursuant to this Agreement, neither party shall be entitled to recover attorney fees and costs except as otherwise provided by law. The arbitration shall be administered by a single neutral arbitrator. The provisions of Section 1283.05 of the California Code of Civil

Procedure shall apply; provided that no discovery authorized by that section may be conducted without leave of the arbitrator. The decision of the arbitrator shall be in writing, give reasons for the decision, and shall be binding.

Any party to an arbitration in which an award has been made pursuant to this Agreement may petition any federal court, or in the event the federal court finds that it lacks jurisdiction, any state court of competent jurisdiction to confirm the award. The County and the Tribe expressly consent to be sued in such courts for the purposes of confirmation of such an award, and for enforcement of the terms of this Agreement.

An award shall be confirmed, provided that:

(i) The award is limited to the purposes of arbitration stated in this Agreement.

(ii) No monetary damages are awarded other than decisions requiring the payment of sums pursuant to obligations of the parties under this Agreement. (Awards may be made by the arbitrator for only such payments, for injunctive relief, for creation or enforcement of provisions of such agreements, and for declaratory relief, all in respect only to this Agreement).

(iii) If an award is confirmed, judgment shall be entered in conformity therewith. The judgment so entered has the same force and effect as, and is subject to all the provisions of law relating to, a judgment in civil action; and may be enforced like any other judgment of the court in which it is entered.

(iv) In no instance shall the Parties to this Agreement be entitled to consequential damages, punitive damages, or lost profits

c) No Waiver or Preclusion of Other Means of Dispute Resolution. This Dispute Resolution Section may not be construed to waive, limit, or restrict any remedy that is otherwise available to either party, nor may this Section be construed to preclude, limit, or restrict the ability of the parties to pursue, by mutual agreement, any other method of dispute resolution, including, but not limited to, mediation or utilization of a technical advisor to the Tribal and State Gaming Agencies; provided that neither party is under any obligation to agree to such alternative method of dispute resolution.

C. CONSENT TO JURISDICTION: LIMITED EXPRESS WAIVER OF SOVEREIGN IMMUNITY

1. The Tribe expressly and irrevocably waives its sovereign immunity specifically and exclusively to the County for the limited purposes set forth in Subsection B.

Additionally, the Tribe does hereby unconditionally waive any claim or defense of exhaustion of tribal administrative or judicial remedies. This waiver shall commence as of the date of execution of this Agreement.

2. The express waivers and consents provided for under this Section shall extend to civil actions authorized by this Agreement, including, but not limited to, actions to compel arbitration, any arbitration proceeding herein, any action to confirm or enforce any judgment or arbitration award as provided herein, and any appellate proceedings emanating from a matter in which an immunity waiver has been granted. Except as stated herein or elsewhere in this Agreement, no other waivers or consents to be sued, either express or implied, are granted by either party.

3. Notwithstanding any other provision of this Agreement, the Tribe's waiver of sovereign immunity shall not extend to any assets of the Tribe other than the revenue stream from the Facility.

4. The Tribe does not waive any aspect of its sovereign immunity with respect to actions by third parties. This waiver is granted only to the County and not to any other individual or entity.

D. NOTICE

a) All notices required by this Agreement will be deemed to have been given when made in writing and delivered or mailed to the respective representatives of County and Tribe at their respective addresses as follows:

For the Tribe:

Tribal Chairman
Pala Band of Mission Indians
35008 Pala Temecula Road
PMB 50
Pala, CA 92059

For the County:

John Snyder, Director
Dept of Public Works
5555 Overland Ave, Suite 2156
San Diego, CA 92123

With a Copy To:

Howard Dickstein
Dickstein & Zerbi
1530 J Street, Suite 250
Sacramento, CA 95814

With a Copy to:

Claudia Anzures
Chief Deputy County Counsel
1600 Pacific Highway, Suite 355
San Diego, CA 92101

In lieu of written notice to the above addresses, any party may provide notices through the use of facsimile machines provided confirmation of delivery is obtained at the time of

transmission of the notices and provided the following facsimile telephone numbers are used:

To Tribe: Pala Band of Mission Indians, Fax: 1-760-891-3584
Howard Dickstein, Fax: 916-669-0350

To County: Chief Administrative Office, Fax: 619-531-5476
County Counsel, Fax: 619-531-6005
Public Works, Fax: 858-268-0461

Any party may change the address or facsimile number to which such communications are to be given by providing the other parties with written notice of such change at least fifteen (15) calendar days prior to the effective date of the change.

All notices will be effective upon receipt and will be deemed received through delivery if personally served or served using facsimile machines, or on the fifth (5th) day following deposit in the mail if sent by first class mail.

E. MISCELLANEOUS PROVISIONS

a. Term of Agreement. The term of this Agreement commences on the date of execution and runs concurrent with the term of the Compact.

b. No Third Party Beneficiaries. This Agreement is not intended to, and will not be construed to, confer a benefit or create any right on a third party, or the power or right to bring an action to enforce any of its terms.

c. Amendments. This Agreement may be amended only by written instrument duly signed and executed by the County and the Tribe.

d. Waiver. The waiver by either party or any of its officers, agents or employees, or the failure of either party or its officers, agents or employees to take action with respect to any right conferred by, or any breach of any obligation or responsibility of this Agreement, will not be deemed to be a waiver of such obligation or responsibility, or subsequent breach of same, or of any terms, covenants or conditions of this Agreement, unless such waiver is expressly set forth in writing in a document signed and executed by the appropriate authority of the County or of the Tribe.

e. Authorized Representatives. The persons executing this Agreement on behalf of the parties hereto affirmatively represent that each has the requisite legal authority to enter into this Agreement on behalf of their respective party and to bind their respective party to the terms and conditions of this Agreement. The persons executing this Agreement on behalf of their respective party understand that both parties are relying on these representations in entering into this Agreement.

f. Successors in Interest. The terms of this Agreement will be binding on all successors in interest of each party.

g. Severability. The provisions of this Agreement are severable, and the adjudicated invalidity of any provision or portion of this Agreement shall not in and of itself affect the validity of any other provision or portion of this Agreement, and the remaining provisions of the Agreement shall remain in full force and effect. If a court of competent jurisdiction were to determine that a provision of this Agreement is invalid or unenforceable, then the parties agree to promptly use good faith efforts to amend this Agreement to reflect the original intent of the parties in accordance with applicable law and consistent with the Compact between the Tribe and the State of California. If the parties are unable to reach agreement, the parties will resolve the dispute in accordance with the Dispute Resolution Section of this Agreement.

h. Construction of Agreement. This Agreement shall be construed and enforced in accordance with the laws of the United States, the Tribe and the State of California.

i. Force Majeure. In the event of a forced delay in performance by either the Tribe or the County due to causes beyond the reasonable control of that party, including but not limited to fire, floods, catastrophic weather events or other natural disasters, epidemics, embargoes, war, acts of war (whether or not war is declared), insurrections, riots, civil commotion, strikes, lockouts or other labor disturbances, acts of God, acts or inaction by the other party its employees or agents, unusual delay in transportation, unavailability of materials, the time for performance shall be extended for the period of the forced delay.

j. Acknowledgement. The County acknowledges and agrees that the matters addressed herein are the only issues required of the Tribe in connection with the Tribe's development of the Project and its obligations under the Compact.

k. Entire Agreement.

(1) This Agreement constitutes the entire agreement between the County and the Tribe and supersedes all prior negotiations, representations, or other agreements, whether written or oral.

(2) In the event of a dispute between the parties as to the language of this Agreement or the construction or meaning of any term hereof, this Agreement will be deemed to have been drafted by the parties in equal parts so that no presumptions or inferences concerning its terms or interpretation may be construed against any party to this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the day and year above set forth.

TRIBE:

PALA BAND OF MISSION INDIANS,
a federally recognized Indian Tribe

By:

_____
Robert Smith, Chairman

COUNTY:

COUNTY OF SAN DIEGO
a political subdivision of the State of California
By:

_____
Clerk of the Board of Supervisors

PROPOSAL TO PROVIDE HIRT SERVICES
TO THE PALA BAND OF MISSION INDIANS

The Unified San Diego County Emergency Services Organization proposes to provide Hazardous Materials Emergency Response Services to the Pala Indian Reservation. This response would be on an as needed basis and be available on a twenty-four (24) hour/seven (7) day a week basis. The Hazardous Materials Incident Response Team (HIRT) will provide the actual response when requested. Provider response standards will be in accordance with Section 100.0 "HIRT Provider Response Standards" of the HIRT Policy and Procedures Manual. Section 100.0 is attached herein.

The Pala Fire Department will function as the Incident Commander (IC) for all hazardous materials responses on the Pala Reservation. The HIRT will not act as the Incident Commander for any reason. Other responsibilities of the responsible Fire Department include the safeguarding of personnel at the scene by restricting access to the scene, initiating containment (if it can be done safely) and isolating persons and materials until the arrival of HIRT. To ensure the most effective and safest possible response, all first responder personnel should be trained to First Responder Operational (FRO) standards.

HIRT will normally be requested through the San Diego Fire-Rescue Department's dispatch center.

Generally, the HIRT response will consist of one hazardous materials vehicle and four trained Hazmat Specialists from the San Diego Fire-Rescue Department (SDFD), as well as two hazardous materials specialists and one response vehicle from the San Diego County Department of Environmental Health Services, Hazardous Materials Division (HMD). The level of response may increase or decrease depending upon the severity of the incident.

The Pala Fire Department will be a non-voting member of the HIRT Policy Committee and a voting member of the HIRT Operations Committee. Any training offered by the HIRT program would be made available to them at no additional cost.

Accepted By

_____

Pala Band of Mission Indians

Accepted By

_____

Thomas Amabile
HIRT Administrator

UNIFIED SAN DIEGO COUNTY HAZMAT INCIDENT RESPONSE TEAM (HIRT)	SUBJECT: HIRT PROVIDER RESPONSE STANDARDS

SECTION 100.0	ADOPTED: 8/17/93	REVISED:

HIRT RESPONSE STANDARDS

I. TRAINING STANDARDS

All HIRT providers will:

A. Be trained to NFPA standards.

B. Meet all operational requirements of CCR Title 8 Section 5192 and 29 CFR 1910.120.

C. Be trained to perform entry in both level A and level B protective equipment.

II. OPERATING STANDARDS

A. Mitigation/Control Capabilities

The HIRT Provider responsible for mitigation/control actions will be able to:

1. Respond to reported incidents and advise the Incident Commander (IC) on additional local, State, Federal and private resources required to manage and/or mitigate the problem.

2. Perform technical response procedures in accordance with established standard operating procedures (SOPs), personal protection guidelines and all applicable State regulations.

3. Request use of the State of California Emergency reserve Account (ERA) for emergency cleanup.

4. Provide technical expertise, assistance and equipment at the incident.

5. Perform duties as directed by the IC.

6. Act as the IC's agent in the management of cleanup operations.

B. Public Health and Safety Capabilities

The HIRT Provider responsible for Public health and Safety issues will be able to:

1. Identify, or assist in the identification of, unknown spilled material at the scene.

2. Act as technical advisor on characteristics and direct health and environmental effects of the hazardous materials at the scene.

3. Assist the IC in determining the necessity for evacuation and establishing reentry criteria.

4. Sample contaminated soil, water or air to determine the extent of contamination and identify any public health concerns.

5. Provide analytical laboratory support as needed.

6. Assist the IC in identifying potential sources of hazardous materials release.

7. Provide information on proper protective actions at the scene.

8. Recommend cleanup levels and advise on the adequacy of cleanup both during and after the emergency.

9. Assist the IC in obtaining financial and other resources necessary for any required cleanup.

UNIFIED SAN DIEGO COUNTY HAZMAT INCIDENT RESPONSE TEAM (HIRT)	SUBJECT: HIRT PROVIDER RESPONSE STANDARDS

SECTION 100.0	ADOPTED: 8/17/93	REVISED:

10. Assist the agency having jurisdiction in obtaining appropriate enforcement action against any responsible party.

11. Provide on-scene liaison with Poison Control, Emergency Medical Services (EMS) and State and Federal agencies.

C. Capabilities Required of All Providers

All HIRT Providers will be able to perform the following functions:

1. Understand what hazardous materials are, the risks associated with them at an incident, and the potential outcomes associated with a hazmat emergency.

2. Recognize the presence of hazardous materials in an emergency situation.

3. Identify hazardous materials.

4. Understand the role of the individual trained to the first responder awareness level as well as the role of the DOT Emergency Response Guidebook.

5. Recognize the need for additional resources and advise the IC to make the appropriate notifications.

6. Basic hazard and risk assessment.

7. Select and use proper specialized chemical protective equipment.

8. Understand basic hazmat terms.

9. Basic and advanced control, containment and/or confinement operations within the capabilities of the resources and PPE

available within the unit.

10. Understand and implement decontamination procedures.

11. Understand the relevant SOPs and termination procedures.

12. Implement an employers (business) emergency response plan.

13. Classify, identify and verify known and unknown materials using field survey instruments and equipment.

14. Function within an assigned role in the Incident Command System.

15. Understand basic chemical and toxicological terminology and behavior.

16. Understand hazmat medical management protocols as established by the California Emergency Medical Services Authority (EMSA).

17. Rescue/Evacuation.

18. Isolation/Deny entry.

19. Contain/Control.

20. Exposure protection.

21. Communicate with the IC, first responder agencies, dispatch centers and State and Federal regulatory agencies.

UNIFIED SAN DIEGO COUNTY HAZMAT INCIDENT RESPONSE TEAM (HIRT)	SUBJECT: HIRT PROVIDER RESPONSE STANDARDS

SECTION 100.0	ADOPTED: 8/17/93	REVISED:

III. BACKUP TEAMS

A backup team must be provided as a rescue team for the personnel working in the hot zone. The backup team shall:

A. Be protected at the same level of protection as the team working in the hot zone.

B. Maintain line of sight contact among personnel operating in the hot zone.

C. Visually monitor personnel operating within the hot zone.

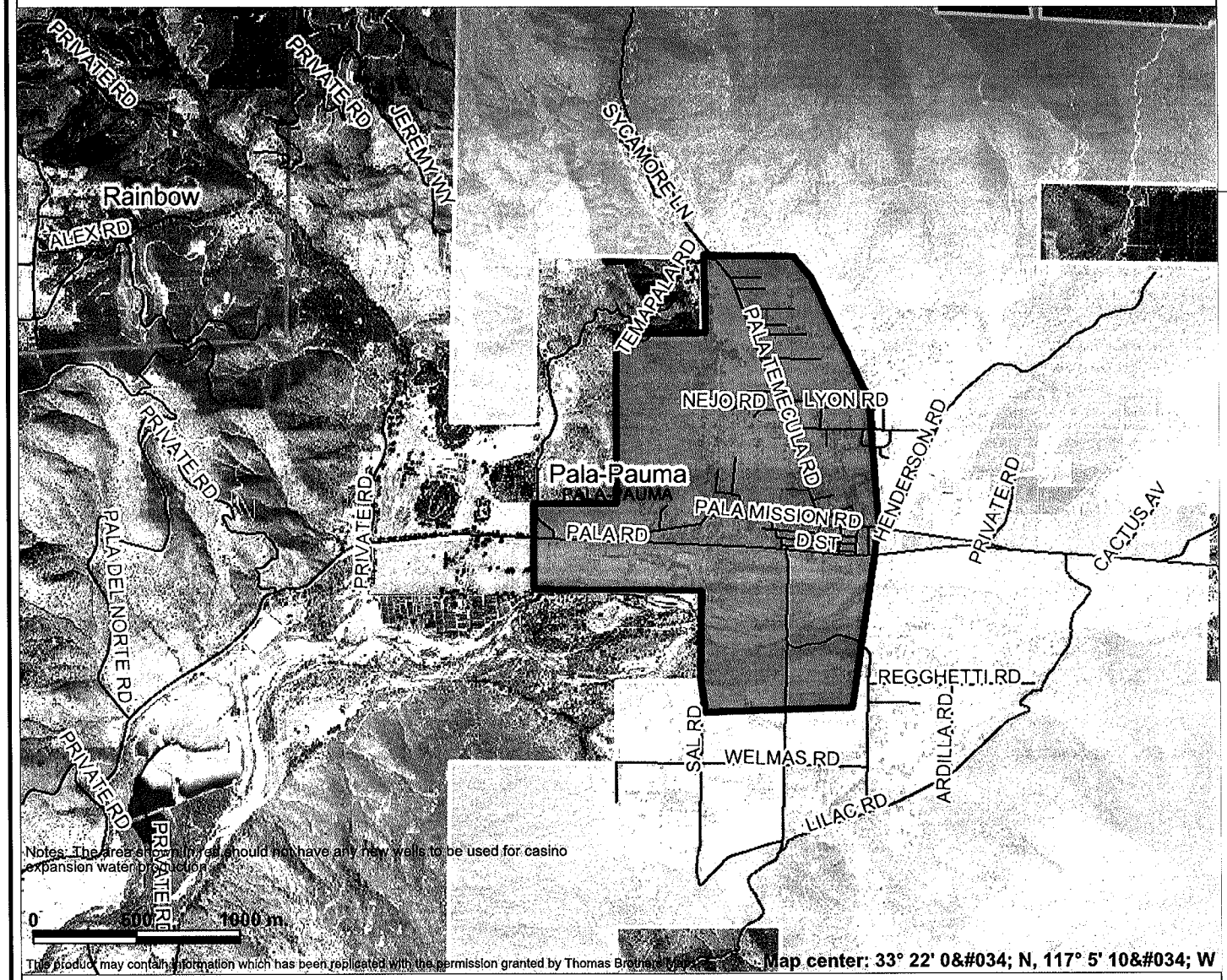
IV. RESPONSE TIMES

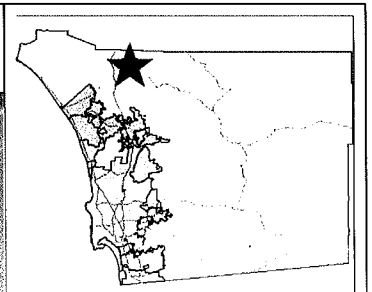
A. Each HIRT provider will meet a maximum response time of sixty minutes for ninety percent of all hazardous materials incidents dispatched.

B. A second, simultaneous, response will require a maximum response time of ninety minutes.

C. Response time begins at the time of dispatch and ends when the unit arrives on scene.

Area of No New Wells for Casino Expansion





Legend

- Highways
- Freeways
- Streets
- Water Bodies
- Water Bodies
- Indian Reservations
- Sponsor Groups
- Sponsor Groups
- Other
- Community Planning Area
- Community Planning Areas
- 2005 Orthophoto South West
- 2005 Orthophoto South East
- 2005 Orthophoto North West
- 2005 Orthophoto North East

Scale: 1:29,103

Map center: 33° 22' 0" N, 117° 5' 10" W

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DPLU GIS

Pictures of SR-76 currently being widened from 2 to 4 lanes. Pictures taken Dec 2008 and Jan 2009.

Intersection of SR-76 at Pankey Road. Pankey Road closed south of SR-76 due to SR-76 widening.



Looking west along SR-76 in the vicinity of Granite driveway



Looking west along SR-76 prior to Pankey Rd where new alignment deviates from existing alignment



Looking west along SR-76 just before I-15 interchange



Appendix N

Existing + Cumulative Intersection Level of Service Calculations

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	9	1188	1918	44	91	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	1251	2019	46	96	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2065				3312	2042
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2065				3312	2042
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				0	51
cM capacity (veh/h)	270				9	71

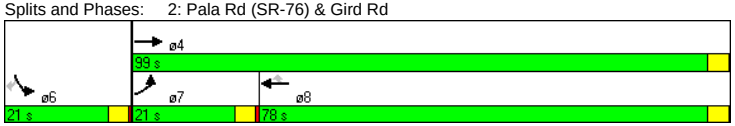
Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	9	1251	2065	131
Volume Left	9	0	0	96
Volume Right	0	0	46	35
cSH	270	1700	1700	12
Volume to Capacity	0.04	0.74	1.21	11.06
Queue Length 95th (ft)	3	0	0	Err
Control Delay (s)	18.8	0.0	0.0	Err
Lane LOS	C			F
Approach Delay (s)	0.1		0.0	Err
Approach LOS				F

Intersection Summary			
Average Delay	377.7		
Intersection Capacity Utilization	118.2%	ICU Level of Service	H
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	151	1136	1279	49	80	139
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	21.0	99.0	78.0	78.0	21.0	21.0
Total Split (%)	17.5%	82.5%	65.0%	65.0%	17.5%	17.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	14.9	93.1	74.2	74.2	11.2	11.2
Actuated g/C Ratio	0.13	0.83	0.66	0.66	0.10	0.10
v/c Ratio	0.76	0.77	1.09	0.06	0.53	0.53
Control Delay	70.4	9.7	76.7	7.7	61.0	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	9.7	76.7	7.7	61.0	15.2
LOS	E	A	E	A	E	B
Approach Delay		16.9	74.1		31.9	
Approach LOS		B	E		C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 112.3			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.09			
Intersection Signal Delay: 44.9		Intersection LOS: D	
Intersection Capacity Utilization 91.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				5		146
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	151	1136	1279	49	80	139
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	1196	1346	52	84	146
Lane Group Flow (vph)	159	1196	1346	52	84	146
v/c Ratio	0.76	0.77	1.09	0.06	0.53	0.53
Control Delay	70.4	9.7	76.7	7.7	61.0	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	9.7	76.7	7.7	61.0	15.2
Queue Length 50th (ft)	112	312	~1140	12	60	0
Queue Length 95th (ft)	#213	638	#1494	29	112	60
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	236	1549	1231	938	228	329
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.77	1.09	0.06	0.37	0.44

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Volume (vph)	151	1136	1279	49	80	139
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	1196	1346	52	84	146
RTOR Reduction (vph)	0	0	0	2	0	131
Lane Group Flow (vph)	159	1196	1346	50	84	15
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	14.9	93.1	74.2	74.2	11.2	11.2
Effective Green, g (s)	14.9	93.1	74.2	74.2	11.2	11.2
Actuated g/C Ratio	0.13	0.83	0.66	0.66	0.10	0.10
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	210	1544	1231	936	158	141
v/s Ratio Prot	0.10	c0.64	c0.72		c0.05	
v/s Ratio Perm				0.04		0.01
v/c Ratio	0.76	0.77	1.09	0.05	0.53	0.10
Uniform Delay, d1	47.0	4.6	19.0	6.7	48.1	46.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.4	2.5	55.1	0.0	3.4	0.3
Delay (s)	61.4	7.1	74.1	6.7	51.5	46.3
Level of Service	E	A	E	A	D	D
Approach Delay (s)		13.5	71.6		48.2	
Approach LOS		B	E		D	

Intersection Summary				
HCM Average Control Delay	43.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	112.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	91.6%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing + Cumulative
3: Pala Rd (SR-76) & Sage Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	2	1007	1536	2	8	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1060	1617	2	8	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1619				2682	1618
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1619				2682	1618
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				65	87
cM capacity (veh/h)	402				24	128

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	2	1060	1619	25
Volume Left	2	0	0	8
Volume Right	0	0	2	17
cSH	402	1700	1700	52
Volume to Capacity	0.01	0.62	0.95	0.48
Queue Length 95th (ft)	0	0	0	45
Control Delay (s)	14.0	0.0	0.0	125.8
Lane LOS	B			F
Approach Delay (s)	0.0		0.0	125.8
Approach LOS				F

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	91.0%	ICU Level of Service	E
Analysis Period (min)	15		

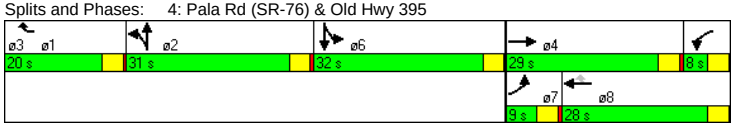
AM Existing + Cumulative
4: Pala Rd (SR-76) & Old Hwy 395

Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Configurations							
Volume (vph)	68	677	82	1112	122	193	212
Turn Type	Prot		Prot		custom		
Protected Phases	7	4	3	8	1	2	6
Permitted Phases					8		
Detector Phases	7	4	3	8	1	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	29.0	8.0	28.0	20.0	31.0	32.0
Total Split (%)	7.5%	24.2%	6.7%	23.3%	16.7%	25.8%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	Min
Act Effct Green (s)	5.0	25.0	4.0	24.0	33.6	27.0	28.0
Actuated g/C Ratio	0.05	0.23	0.04	0.22	0.31	0.25	0.26
v/c Ratio	1.00	1.08	1.48	1.51	0.27	1.59	1.62
Control Delay	160.1	96.3	326.5	269.0	15.5	304.2	316.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	160.1	96.3	326.5	269.0	15.5	304.2	316.9
LOS	F	F	F	F	B	F	F
Approach Delay		101.2		249.1		304.2	316.9
Approach LOS		F		F		F	F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 109.6		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.62		
Intersection Signal Delay: 235.9	Intersection LOS: F	
Intersection Capacity Utilization 101.5%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



AM Existing + Cumulative
4: Pala Rd (SR-76) & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.973				0.850		0.961			0.982	
Flt Protected	0.950			0.950				0.979			0.972	
Satd. Flow (prot)	1583	3444	0	1583	3539	1417	0	1753	0	0	1778	0
Flt Permitted	0.950			0.950				0.979			0.972	
Satd. Flow (perm)	1583	3444	0	1583	3539	1417	0	1753	0	0	1778	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19				69		16			6	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	68	677	145	82	1112	122	284	193	192	400	212	92
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	72	713	153	86	1171	128	299	203	202	421	223	97
Lane Group Flow (vph)	72	866	0	86	1171	128	0	704	0	0	741	0
v/c Ratio	1.00	1.08		1.48	1.51	0.27		1.59			1.62	
Control Delay	160.1	96.3		326.5	269.0	15.5		304.2			316.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	160.1	96.3		326.5	269.0	15.5		304.2			316.9	
Queue Length 50th (ft)	52	~354		~84	~605	30		~705			~755	
Queue Length 95th (ft)	#149	#485		#187	#741	79		#941			#992	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	72	800		58	775	518		444			458	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	1.00	1.08		1.48	1.51	0.25		1.59			1.62	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative
4: Pala Rd (SR-76) & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85		0.96			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (prot)	1583	3445		1583	3539	1417		1753			1779	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (perm)	1583	3445		1583	3539	1417		1753			1779	
Volume (vph)	68	677	145	82	1112	122	284	193	192	400	212	92
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	72	713	153	86	1171	128	299	203	202	421	223	97
RTOR Reduction (vph)	0	15	0	0	0	50	0	12	0	0	4	0
Lane Group Flow (vph)	72	851	0	86	1171	78	0	692	0	0	737	0
Turn Type	Prot			Prot		custom	Split			Split		
Protected Phases	7	4		3	8	1	2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.0	25.0		4.0	24.0	29.6		27.0			28.0	
Effective Green, g (s)	5.0	25.0		4.0	24.0	29.6		27.0			28.0	
Actuated g/C Ratio	0.05	0.23		0.04	0.22	0.27		0.25			0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	72	786		58	775	434		432			454	
v/s Ratio Prot	0.05	c0.25		0.05	c0.33	c0.01		c0.39			c0.41	
v/s Ratio Perm						0.05						
v/c Ratio	1.00	1.08		1.48	1.51	0.18		1.60			1.62	
Uniform Delay, d1	52.3	42.3		52.8	42.8	30.7		41.3			40.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	106.1	57.0		288.9	236.6	0.2		281.4			290.0	
Delay (s)	158.4	99.3		341.7	279.4	30.9		322.7			330.8	
Level of Service	F	F		F	F	C		F			F	
Approach Delay (s)		103.8			260.3			322.7			330.8	
Approach LOS		F			F			F			F	

Intersection Summary

HCM Average Control Delay	246.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	109.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	4	6	1032	3	9	427
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	6	1086	3	9	449
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		13				
Median type	None					
Median storage veh)						
Upstream signal (ft)						899
pX, platoon unblocked						
vC, conflicting volume	1556	1088			1089	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1556	1088			1089	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			99	
cM capacity (veh/h)	122	262			640	

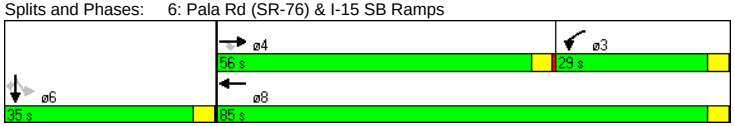
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	11	1089	459
Volume Left	4	0	9
Volume Right	6	3	0
cSH	306	1700	640
Volume to Capacity	0.03	0.64	0.01
Queue Length 95th (ft)	3	0	1
Control Delay (s)	25.6	0.0	0.4
Lane LOS	D		A
Approach Delay (s)	25.6	0.0	0.4
Approach LOS	D		

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		64.5%	ICU Level of Service C
Analysis Period (min)		15	

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Volume (vph)	927	350	314	782	1	570
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6	
Permitted Phases		4				6
Detector Phases	4	4	3	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	56.0	56.0	29.0	85.0	35.0	35.0
Total Split (%)	46.7%	46.7%	24.2%	70.8%	29.2%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	52.0	52.0	25.0	81.0	31.0	31.0
Actuated g/C Ratio	0.43	0.43	0.21	0.68	0.26	0.26
v/c Ratio	1.21	0.50	1.00	0.65	0.30	1.13
Control Delay	137.6	11.8	76.8	24.2	38.0	106.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	137.6	11.8	76.8	24.2	38.0	106.6
LOS	F	B	E	C	D	F
Approach Delay	103.1			39.3	93.8	
Approach LOS	F			D	F	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.21
Intersection Signal Delay: 78.2 Intersection LOS: E
Intersection Capacity Utilization 100.8% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



AM Existing + Cumulative
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	1863	1417	1583	1863	0	0	0	0	0	1775	1417
Flt Permitted				0.950							0.953	
Satd. Flow (perm)	0	1863	1417	1583	1863	0	0	0	0	0	1775	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			220									222
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	927	350	314	782	0	0	0	0	129	1	570
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	976	368	331	823	0	0	0	0	136	1	600
Lane Group Flow (vph)	0	976	368	331	823	0	0	0	0	0	137	600
v/c Ratio		1.21	0.50	1.00	0.65						0.30	1.13
Control Delay		137.6	11.8	76.8	24.2						38.0	106.6
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		137.6	11.8	76.8	24.2						38.0	106.6
Queue Length 50th (ft)		~923	74	~251	622						86	~404
Queue Length 95th (ft)		#1172	161	m243	m605						143	#632
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		807	739	330	1258						459	531
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.21	0.50	1.00	0.65						0.30	1.13

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

AM Existing + Cumulative
6: Pala Rd (SR-76) & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1775	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1775	1417
Volume (vph)	0	927	350	314	782	0	0	0	0	129	1	570
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	976	368	331	823	0	0	0	0	136	1	600
RTOR Reduction (vph)	0	0	125	0	0	0	0	0	0	0	0	165
Lane Group Flow (vph)	0	976	243	331	823	0	0	0	0	0	137	435
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		52.0	52.0	25.0	81.0						31.0	31.0
Effective Green, g (s)		52.0	52.0	25.0	81.0						31.0	31.0
Actuated g/C Ratio		0.43	0.43	0.21	0.68						0.26	0.26
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		807	614	330	1258						459	366
v/s Ratio Prot		c0.52		c0.21	0.44							
v/s Ratio Perm			0.17								0.08	c0.31
v/c Ratio		1.21	0.40	1.00	0.65						0.30	1.19
Uniform Delay, d1		34.0	23.3	47.5	11.3						35.8	44.5
Progression Factor		1.00	1.00	1.32	2.03						1.00	1.00
Incremental Delay, d2		105.7	0.4	15.6	0.1						1.7	109.3
Delay (s)		139.7	23.7	78.4	23.2						37.4	153.8
Level of Service		F	C	E	C						D	F
Approach Delay (s)		107.9			39.0			0.0			132.2	
Approach LOS		F			D			A			F	

Intersection Summary

HCM Average Control Delay	88.9	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.16				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	100.8%	ICU Level of Service	G		
Analysis Period (min)	15				

c Critical Lane Group

AM Existing + Cumulative
7: Pala Rd (SR-76) & I-15 NB Ramps

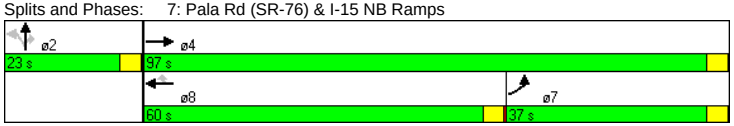
Timings

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Volume (vph)	500	568	846	125	0	267
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		2	
Permitted Phases				8		2
Detector Phases	7	4	8	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	97.0	60.0	60.0	23.0	23.0
Total Split (%)	30.8%	80.8%	50.0%	50.0%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	33.0	93.0	56.0	56.0	19.0	19.0
Actuated g/C Ratio	0.28	0.78	0.47	0.47	0.16	0.16
v/c Ratio	1.21	0.41	1.03	0.20	1.04	0.61
Control Delay	143.5	13.9	69.4	16.0	114.5	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	143.5	13.9	69.4	16.0	114.5	11.4
LOS	F	B	E	B	F	B
Approach Delay		74.5	62.5		63.9	
Approach LOS		E	E		E	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.21
Intersection Signal Delay: 67.8 Intersection LOS: E
Intersection Capacity Utilization 100.8% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



LOS Engineering

AM Existing + Cumulative
7: Pala Rd (SR-76) & I-15 NB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1583	1863	0	0	1863	1417	0	1770	1417	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1583	1863	0	0	1863	1417	0	1770	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						25			281			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	500	568	0	0	846	125	277	0	267	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	526	598	0	0	891	132	292	0	281	0	0	0
Lane Group Flow (vph)	526	598	0	0	891	132	0	292	281	0	0	0
v/c Ratio	1.21	0.41			1.03	0.20		1.04	0.61			
Control Delay	143.5	13.9			69.4	16.0		114.5	11.4			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	143.5	13.9			69.4	16.0		114.5	11.4			
Queue Length 50th (ft)	~486	334			~736	47		~245	0			
Queue Length 95th (ft)	m#386	m294			#982	87		#420	82			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	435	1444			869	675		280	461			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	1.21	0.41			1.03	0.20		1.04	0.61			

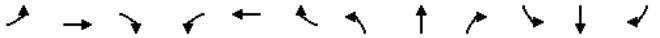
Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

AM Existing + Cumulative
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis



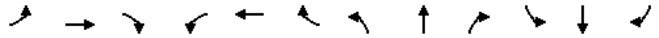
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1770	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1770	1417			
Volume (vph)	500	568	0	0	846	125	277	0	267	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	526	598	0	0	891	132	292	0	281	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	13	0	0	237	0	0	0
Lane Group Flow (vph)	526	598	0	0	891	119	0	292	44	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	33.0	93.0			56.0	56.0		19.0	19.0			
Effective Green, g (s)	33.0	93.0			56.0	56.0		19.0	19.0			
Actuated g/C Ratio	0.28	0.78			0.47	0.47		0.16	0.16			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	435	1444			869	661		280	224			
v/s Ratio Prot	c0.33	0.32			c0.48							
v/s Ratio Perm						0.08		0.17	0.03			
v/c Ratio	1.21	0.41			1.03	0.18		1.04	0.20			
Uniform Delay, d1	43.5	4.5			32.0	18.6		50.5	43.9			
Progression Factor	1.31	3.01			1.00	1.00		1.00	1.00			
Incremental Delay, d2	96.2	0.0			37.1	0.1		65.4	2.0			
Delay (s)	153.3	13.5			69.1	18.8		115.9	45.9			
Level of Service	F	B			E	B		F	D			
Approach Delay (s)		78.9			62.6			81.6			0.0	
Approach LOS		E			E			F			A	

Intersection Summary				
HCM Average Control Delay	73.3	HCM Level of Service		E
HCM Volume to Capacity ratio	1.08			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	100.8%	ICU Level of Service		G
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing + Cumulative
8: Pala Rd (SR-76) & Pankey Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	138	567	154	87	809	77	110	248	51	26	165	53
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	145	597	162	92	852	81	116	261	54	27	174	56
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	933			759			2186	2084	678	2228	2125	892
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	933			759			2186	2084	678	2228	2125	892
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			89			0	0	88	0	0	84
cM capacity (veh/h)	734			853			0	38	452	0	36	341

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	904	1024	431	257
Volume Left	145	92	116	27
Volume Right	162	81	54	56
cSH	734	853	0	0
Volume to Capacity	0.20	0.11	Err	Err
Queue Length 95th (ft)	18	9	Err	Err
Control Delay (s)	5.1	3.0	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	5.1	3.0	Err	Err
Approach LOS			F	F

Intersection Summary				
Average Delay		Err		
Intersection Capacity Utilization	121.4%	ICU Level of Service		H
Analysis Period (min)	15			

LOS Engineering

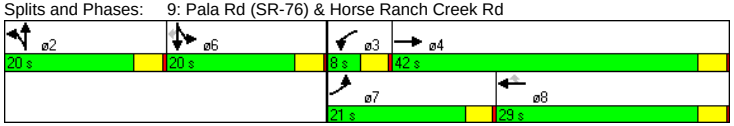
AM Existing + Cumulative
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	232	440	800	35	30	0	171		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	21.0	42.0	29.0	29.0	20.0	20.0	20.0	20.0	8.0
Total Split (%)	23.3%	46.7%	32.2%	32.2%	22.2%	22.2%	22.2%	22%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	9.9	33.6	19.6	19.6	6.9	6.9	6.9		
Actuated g/C Ratio	0.17	0.58	0.34	0.34	0.12	0.12	0.12		
v/c Ratio	0.47	0.23	0.71	0.07	0.18	0.13	0.13		
Control Delay	26.2	6.2	20.9	6.0	28.5	0.4	0.4		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	26.2	6.2	20.9	6.0	28.5	0.4	0.4		
LOS	C	A	C	A	C	A	A		
Approach Delay		13.1	20.3			4.6			
Approach LOS		B	C			A			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 58.4			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 42.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



LOS Engineering

AM Existing + Cumulative
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		250	0		0	150		150
Storage Lanes	2		0	1		1	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt						0.850					0.850	0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						37					594	594
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2833			5160			734			1509	
Travel Time (s)		64.4			117.3			16.7			34.3	
Volume (vph)	232	440	0	0	800	35	0	0	0	30	0	171
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	244	463	0	0	842	37	0	0	0	32	0	180
Lane Group Flow (vph)	244	463	0	0	842	37	0	0	0	32	90	90
v/c Ratio	0.47	0.23			0.71	0.07				0.18	0.13	0.13
Control Delay	26.2	6.2			20.9	6.0				28.5	0.4	0.4
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	26.2	6.2			20.9	6.0				28.5	0.4	0.4
Queue Length 50th (ft)	41	35			130	0				11	0	0
Queue Length 95th (ft)	78	60			215	17				37	0	0
Internal Link Dist (ft)		2753			5080			654			1429	
Turn Bay Length (ft)	250					250				150		150
Base Capacity (vph)	806	2183			1398	582				361	797	774
Starvation Cap Reductn	0	0			0	0				0	0	0
Spillback Cap Reductn	0	0			0	0				0	0	0
Storage Cap Reductn	0	0			0	0				0	0	0
Reduced v/c Ratio	0.30	0.21			0.60	0.06				0.09	0.11	0.12

Intersection Summary	
Area Type:	Other

LOS Engineering

AM Existing + Cumulative

9: Pala Rd (SR-76) & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.85	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3072	3539			3539	1417				1504	1441	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3072	3539			3539	1417				1504	1441	1346
Volume (vph)	232	440	0	0	800	35	0	0	0	30	0	171
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	244	463	0	0	842	37	0	0	0	32	0	180
RTOR Reduction (vph)	0	0	0	0	0	24	0	0	0	0	79	79
Lane Group Flow (vph)	244	463	0	0	842	13	0	0	0	32	11	11
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	9.9	33.6			19.7	19.7				6.9	6.9	6.9
Effective Green, g (s)	9.9	33.6			19.7	19.7				6.9	6.9	6.9
Actuated g/C Ratio	0.17	0.58			0.34	0.34				0.12	0.12	0.12
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	523	2047			1200	480				179	171	160
v/s Ratio Prot	c0.08	0.13			c0.24					c0.02	0.01	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.47	0.23			0.70	0.03				0.18	0.06	0.07
Uniform Delay, d1	21.7	5.9			16.7	12.8				23.0	22.7	22.7
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1			1.9	0.0				0.5	0.2	0.2
Delay (s)	22.4	6.0			18.5	12.8				23.5	22.9	22.9
Level of Service	C	A			B	B				C	C	C
Approach Delay (s)		11.7			18.3			0.0			23.0	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM Average Control Delay	16.2	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	42.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing + Cumulative

10: Pala Rd (SR-76) & Rice Canyon Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	30	1033	512	33	80	135
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	1087	539	35	84	142
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	574				1707	556
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	574				1707	556
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				13	73
cM capacity (veh/h)	999				97	530

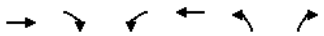
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1119	574	226
Volume Left	32	0	84
Volume Right	0	35	142
cSH	999	1700	199
Volume to Capacity	0.03	0.34	1.14
Queue Length 95th (ft)	2	0	276
Control Delay (s)	1.0	0.0	154.3
Lane LOS	A		F
Approach Delay (s)	1.0	0.0	154.3
Approach LOS			F

Intersection Summary			
Average Delay	18.8		
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

LOS Engineering

AM Existing + Cumulative

11: Pala Rd (SR-76) & Couser Canyon Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	976	33	6	495	50	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1027	35	6	521	53	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1062		1578	1045
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1062		1578	1045
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		56	89
cM capacity (veh/h)			656		119	278

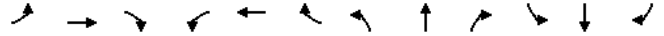
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1062	527	84
Volume Left	0	6	53
Volume Right	35	0	32
cSH	1700	656	152
Volume to Capacity	0.62	0.01	0.56
Queue Length 95th (ft)	0	1	70
Control Delay (s)	0.0	0.3	55.0
Lane LOS		A	F
Approach Delay (s)	0.0	0.3	55.0
Approach LOS			F

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		65.2%	ICU Level of Service C
Analysis Period (min)		15	

LOS Engineering

AM Existing + Cumulative

12: Pala Mesa Dr & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	250	86	300	59	41	57	52	368	75	107	717	24
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	263	91	316	62	43	60	55	387	79	113	755	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1571	1568	767	1877	1542	427	780			466		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1571	1568	767	1877	1542	427	780			466		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	3	21	0	55	90	93			90		
cM capacity (veh/h)	47	93	402	1	97	628	837			1095		

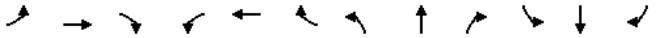
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	669	62	103	55	466	113	780
Volume Left	263	62	0	55	0	113	0
Volume Right	316	0	60	0	79	0	25
cSH	90	1	190	837	1700	1095	1700
Volume to Capacity	7.40	55.74	0.54	0.07	0.27	0.10	0.46
Queue Length 95th (ft)	Err	Err	71	5	0	9	0
Control Delay (s)	Err	Err	44.4	9.6	0.0	8.7	0.0
Lane LOS	F	F	E	A		A	
Approach Delay (s)	Err	3785.3		1.0		1.1	
Approach LOS	F	F					

Intersection Summary			
Average Delay		3256.1	
Intersection Capacity Utilization		95.9%	ICU Level of Service F
Analysis Period (min)		15	

LOS Engineering

AM Existing + Cumulative

13: Pala Mesa Dr & Wilt Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	42	0	10	23	12	0	61	133	29	18	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	44	0	11	24	13	0	64	140	31	19	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	37			44			107	104	44	270	98	31
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	37			44			107	104	44	270	98	31
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	92	86	94	98	100
cM capacity (veh/h)	1587			1577			856	784	1032	553	790	1050

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	45	47	204	49
Volume Left	1	11	0	31
Volume Right	0	13	140	0
cSH	1587	1577	938	625
Volume to Capacity	0.00	0.01	0.22	0.08
Queue Length 95th (ft)	0	1	21	6
Control Delay (s)	0.2	1.7	9.9	11.3
Lane LOS	A	A	A	B
Approach Delay (s)	0.2	1.7	9.9	11.3
Approach LOS			A	B

Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	32.4%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

AM Existing + Cumulative

14: Stewart Canyon Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	21	14	35	17	3	150	8	395	14	221	973	29
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	15	37	18	3	158	8	416	15	233	1024	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2097	1952	1039	1974	1960	423	1055			431		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2097	1952	1039	1974	1960	423	1055			431		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	2	71	87	32	94	75	99			79		
cM capacity (veh/h)	23	50	280	26	50	631	660			1129		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	74	179	8	431	233	1055
Volume Left	22	18	8	0	233	0
Volume Right	37	158	0	15	0	31
cSH	53	180	660	1700	1129	1700
Volume to Capacity	1.40	0.99	0.01	0.25	0.21	0.62
Queue Length 95th (ft)	168	203	1	0	19	0
Control Delay (s)	389.6	118.1	10.5	0.0	9.0	0.0
Lane LOS	F	F	B		A	
Approach Delay (s)	389.6	118.1	0.2		1.6	
Approach LOS	F	F				

Intersection Summary				
Average Delay	26.3			
Intersection Capacity Utilization	77.4%	ICU Level of Service	D	
Analysis Period (min)	15			

LOS Engineering

AM Existing + Cumulative
15: Reche Rd & Old Hwy 395

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	270	252	446	178	172	459
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	284	265	469	187	181	483
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1549	423	664			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1549	423	664			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	58	49			
cM capacity (veh/h)	62	631	925			

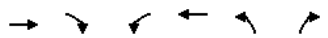
Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	549	469	187	664
Volume Left	284	469	0	0
Volume Right	265	0	0	483
cSH	109	925	1700	1700
Volume to Capacity	5.02	0.51	0.11	0.39
Queue Length 95th (ft)	Err	74	0	0
Control Delay (s)	Err	12.8	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	Err	9.2		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	2940.5		
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		

LOS Engineering

AM Existing + Cumulative
16: Reche Rd & Tecalote Dr

HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	383	16	3	394	10	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	403	17	3	415	11	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			420		833	412
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			420		833	412
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1139		338	640

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	420	418	15
Volume Left	0	3	11
Volume Right	17	0	4
cSH	1700	1139	391
Volume to Capacity	0.25	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.1	14.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.1	14.6
Approach LOS			B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	363	17	16	302	44	19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	382	18	17	318	46	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			400		743	391
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			400		743	391
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		88	97
cM capacity (veh/h)			1159		377	658

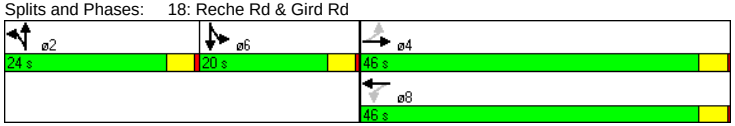
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	400	335	66
Volume Left	0	17	46
Volume Right	18	0	20
cSH	1700	1159	433
Volume to Capacity	0.24	0.01	0.15
Queue Length 95th (ft)	0	1	13
Control Delay (s)	0.0	0.5	14.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	14.8
Approach LOS			B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBT	ø6
Lane Configurations						
Volume (vph)	5	429	37	268	5	
Turn Type	Perm		Perm			
Protected Phases		4		8	2	6
Permitted Phases	4		8			
Detector Phases	4	4	8	8	2	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	46.0	46.0	46.0	46.0	24.0	20.0
Total Split (%)	51.1%	51.1%	51.1%	51.1%	26.7%	22%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	20.8	20.8	20.8	20.8	11.8	
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.23	
v/c Ratio	0.01	0.78	0.23	0.39	0.58	
Control Delay	9.4	21.0	14.3	12.3	24.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.4	21.0	14.3	12.3	24.3	
LOS	A	C	B	B	C	
Approach Delay		20.9		12.5	24.3	
Approach LOS		C		B	C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 51.5			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 19.2		Intersection LOS: B	
Intersection Capacity Utilization 53.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 18: Reche Rd & Gird Rd



AM Existing + Cumulative
18: Reche Rd & Gird Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	50		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967			0.996			0.968				
Flt Protected	0.950			0.950				0.964				
Satd. Flow (prot)	1583	1801	0	1583	1855	0	0	1738	0	0	1863	0
Flt Permitted	0.510			0.247				0.964				
Satd. Flow (perm)	850	1801	0	412	1855	0	0	1738	0	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			2			16				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		6958			6851			1674			1091	
Travel Time (s)		158.1			155.7			38.0			24.8	
Volume (vph)	5	429	121	37	268	8	167	5	53	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	452	127	39	282	8	176	5	56	0	0	0
Lane Group Flow (vph)	5	579	0	39	290	0	0	237	0	0	0	0
v/c Ratio	0.01	0.78		0.23	0.39			0.58				
Control Delay	9.4	21.0		14.3	12.3			24.3				
Queue Delay	0.0	0.0		0.0	0.0			0.0				
Total Delay	9.4	21.0		14.3	12.3			24.3				
Queue Length 50th (ft)	1	130		7	54			55				
Queue Length 95th (ft)	6	284		29	124			152				
Internal Link Dist (ft)		6878			6771			1594			1011	
Turn Bay Length (ft)	50			50								
Base Capacity (vph)	500	1068		243	1092			611				
Starvation Cap Reductn	0	0		0	0			0				
Spillback Cap Reductn	0	0		0	0			0				
Storage Cap Reductn	0	0		0	0			0				
Reduced v/c Ratio	0.01	0.54		0.16	0.27			0.39				

Intersection Summary

Area Type: Other

LOS Engineering

AM Existing + Cumulative
18: Reche Rd & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0				
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00				
Frt	1.00	0.97		1.00	1.00			0.97				
Flt Protected	0.95	1.00		0.95	1.00			0.96				
Satd. Flow (prot)	1583	1801		1583	1855			1739				
Flt Permitted	0.53	1.00		0.23	1.00			0.96				
Satd. Flow (perm)	891	1801		383	1855			1739				
Volume (vph)	5	429	121	37	268	8	167	5	53	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	452	127	39	282	8	176	5	56	0	0	0
RTOR Reduction (vph)	0	12	0	0	1	0	0	12	0	0	0	0
Lane Group Flow (vph)	5	567	0	39	289	0	0	225	0	0	0	0
Turn Type	Perm			Perm			Split			Split		
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8								
Actuated Green, G (s)	20.8	20.8		20.8	20.8			11.8				
Effective Green, g (s)	20.8	20.8		20.8	20.8			11.8				
Actuated g/C Ratio	0.41	0.41		0.41	0.41			0.23				
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0				
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0				
Lane Grp Cap (vph)	367	742		158	764			406				
v/s Ratio Prot		c0.31			0.16			c0.13				
v/s Ratio Perm	0.01			0.10								
v/c Ratio	0.01	0.76		0.25	0.38			0.55				
Uniform Delay, d1	8.8	12.7		9.7	10.3			17.0				
Progression Factor	1.00	1.00		1.00	1.00			1.00				
Incremental Delay, d2	0.0	4.7		0.8	0.3			1.6				
Delay (s)	8.8	17.4		10.5	10.7			18.7				
Level of Service	A	B		B	B			B				
Approach Delay (s)		17.4			10.6			18.7			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM Average Control Delay	15.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	17.9	
Intersection Capacity Utilization	53.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

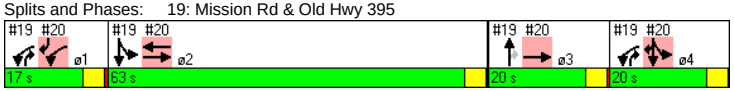
AM Existing + Cumulative
19: Mission Rd & Old Hwy 395 — Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	149	1000	72	156	843	48		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	37.0	0.0	20.0	37.0	63.0	63.0	17.0	20.0
Total Split (%)	30.8%	0.0%	16.7%	30.8%	52.5%	52.5%	14%	17%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	33.0	118.6	14.6	51.6	59.0	59.0		
Actuated g/C Ratio	0.28	1.00	0.12	0.44	0.50	0.50		
v/c Ratio	0.36	0.74	0.33	0.27	1.13	0.06		
Control Delay	41.1	3.9	51.7	22.8	102.3	16.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	41.1	3.9	51.7	22.8	102.3	16.1		
LOS	D	A	D	C	F	B		
Approach Delay	8.7		31.9			97.6		
Approach LOS	A		C			F		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 118.6
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 46.0 — Intersection LOS: D
Intersection Capacity Utilization 74.8% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 19: Mission Rd & Old Hwy 395



AM Existing + Cumulative
19: Mission Rd & Old Hwy 395 — Queues

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	149	1000	72	156	843	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	1053	76	164	887	51
Lane Group Flow (vph)	157	1053	76	164	887	51
v/c Ratio	0.36	0.74	0.33	0.27	1.13	0.06
Control Delay	41.1	3.9	51.7	22.8	102.3	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	3.9	51.7	22.8	102.3	16.1
Queue Length 50th (ft)	96	98	54	79	~801	20
Queue Length 95th (ft)	m109	m41	103	129	#1049	42
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	441	1417	251	616	788	927
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.74	0.30	0.27	1.13	0.06

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

AM Existing + Cumulative
19: Mission Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Volume (vph)	149	1000	72	156	843	48
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	1053	76	164	887	51
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	157	1053	76	164	887	51
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	33.0	118.6	14.6	47.6	59.0	59.0
Effective Green, g (s)	33.0	118.6	14.6	47.6	59.0	59.0
Actuated g/C Ratio	0.28	1.00	0.12	0.40	0.50	0.50
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	440	1417	229	617	787	927
v/s Ratio Prot	0.10		0.04	0.07	c0.56	0.03
v/s Ratio Perm		c0.74		0.04		
v/c Ratio	0.36	0.74	0.33	0.27	1.13	0.06
Uniform Delay, d1	34.3	0.0	47.5	23.8	29.8	15.4
Progression Factor	1.14	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	1.7	0.9	0.2	73.1	0.0
Delay (s)	39.2	1.7	48.4	24.0	102.9	15.4
Level of Service	D	A	D	C	F	B
Approach Delay (s)	6.6		31.7			98.1
Approach LOS	A		C			F

Intersection Summary			
HCM Average Control Delay	45.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	118.6	Sum of lost time (s)	4.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

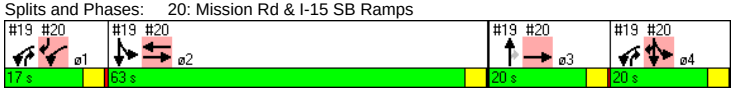
LOS Engineering

AM Existing + Cumulative
20: Mission Rd & I-15 SB Ramps — Timings

Lane Group	EBT	WBL	WBT	SBT	SBR	ø3
Lane Configurations						
Volume (vph)	706	117	358	8	806	
Turn Type		Prot			custom	
Protected Phases	2 3	1	2	4	1 4	3
Permitted Phases					4	
Detector Phases	2 3	1	2	4	1 4	
Minimum Initial (s)		4.0	4.0	4.0		4.0
Minimum Split (s)		8.0	20.0	20.0		20.0
Total Split (s)	83.0	17.0	63.0	20.0	37.0	20.0
Total Split (%)	69.2%	14.2%	52.5%	16.7%	30.8%	17%
Yellow Time (s)		3.5	3.5	3.5		3.5
All-Red Time (s)		0.5	0.5	0.5		0.5
Lead/Lag		Lead	Lag	Lag		Lead
Lead-Lag Optimize?		Yes	Yes	Yes		Yes
Recall Mode		None	Min	None		None
Act Effct Green (s)	77.6	13.0	59.0	16.0	33.0	
Actuated g/C Ratio	0.65	0.11	0.50	0.13	0.28	
v/c Ratio	0.87	0.71	0.41	0.07	1.07	
Control Delay	7.2	73.9	20.7	46.4	67.6	
Queue Delay	19.2	0.0	0.0	0.0	0.0	
Total Delay	26.5	73.9	20.7	46.4	67.6	
LOS	C	E	C	D	E	
Approach Delay	26.5		33.8	67.2		
Approach LOS	C		C	E		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 118.6		
Natural Cycle: 140		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.13		
Intersection Signal Delay: 42.7	Intersection LOS: D	
Intersection Capacity Utilization 81.3%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



LOS Engineering

AM Existing + Cumulative
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		0	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50					50	50	50
Trailing Detector (ft)		0		0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.963										0.850
Flt Protected				0.950							0.974	
Satd. Flow (prot)	0	1794	0	1583	1863	0	0	0	0	0	1814	1417
Flt Permitted				0.950							0.974	
Satd. Flow (perm)	0	1794	0	1583	1863	0	0	0	0	0	1814	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34										552
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	706	270	117	358	0	0	0	0	9	8	806
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	743	284	123	377	0	0	0	0	9	8	848
Lane Group Flow (vph)	0	1027	0	123	377	0	0	0	0	0	17	848
v/c Ratio		0.87		0.71	0.41						0.07	1.07
Control Delay		7.2		73.9	20.7						46.4	67.6
Queue Delay		19.2		0.0	0.0						0.0	0.0
Total Delay		26.5		73.9	20.7						46.4	67.6
Queue Length 50th (ft)		58		94	180						12	~398
Queue Length 95th (ft)		m73		#186	259						34	#646
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1207		173	927						245	793
Starvation Cap Reductn		203		0	0						0	0
Spillback Cap Reductn		0		0	0						0	0
Storage Cap Reductn		0		0	0						0	0
Reduced v/c Ratio		1.02		0.71	0.41						0.07	1.07

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

AM Existing + Cumulative
20: Mission Rd & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.96		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.97	1.00
Satd. Flow (prot)		1793		1583	1863						1815	1417
Flt Permitted		1.00		0.95	1.00						0.97	1.00
Satd. Flow (perm)		1793		1583	1863						1815	1417
Volume (vph)	0	706	270	117	358	0	0	0	0	9	8	806
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	743	284	123	377	0	0	0	0	9	8	848
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	0	0	0	398
Lane Group Flow (vph)	0	1015	0	123	377	0	0	0	0	0	17	450
Turn Type				Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases												4
Actuated Green, G (s)		77.6		13.0	59.0						16.0	33.0
Effective Green, g (s)		77.6		13.0	59.0						16.0	33.0
Actuated g/C Ratio		0.65		0.11	0.50						0.13	0.28
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1173		174	927						245	394
v/s Ratio Prot		c0.57		0.08	0.20						0.01	c0.32
v/s Ratio Perm												
v/c Ratio		0.87		0.71	0.41						0.07	1.14
Uniform Delay, d1		16.3		51.0	18.8						44.8	42.8
Progression Factor		0.27		1.00	1.00						1.00	1.00
Incremental Delay, d2		1.8		12.3	0.3						0.1	89.7
Delay (s)		6.1		63.3	19.1						44.9	132.5
Level of Service		A		E	B						D	F
Approach Delay (s)		6.1			29.9			0.0			130.7	
Approach LOS		A			C			A			F	

Intersection Summary			
HCM Average Control Delay	56.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	118.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

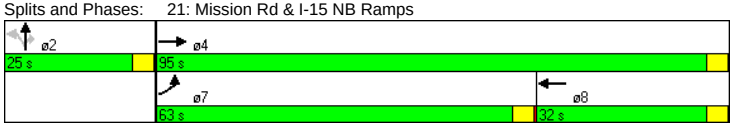
AM Existing + Cumulative
21: Mission Rd & I-15 NB Ramps

Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	515	169	288	4	80
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	63.0	95.0	32.0	25.0	25.0
Total Split (%)	52.5%	79.2%	26.7%	20.8%	20.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	31.0	53.6	17.9	14.3	14.3
Actuated g/C Ratio	0.40	0.69	0.23	0.18	0.18
v/c Ratio	0.86	0.14	0.74	0.66	0.25
Control Delay	36.1	4.2	43.0	45.6	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	4.2	43.0	45.6	11.3
LOS	D	A	D	D	B
Approach Delay		28.2	43.0	35.9	
Approach LOS		C	D	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 77.5		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 33.4	Intersection LOS: C	
Intersection Capacity Utilization 81.3%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



LOS Engineering

AM Existing + Cumulative
21: Mission Rd & I-15 NB Ramps

Queues

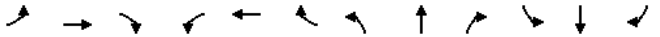
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.994				0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1583	1863	0	0	1852	0	0	1775	1417	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	1583	1863	0	0	1852	0	0	1775	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					2				84			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	515	169	0	0	288	12	200	4	80	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	542	178	0	0	303	13	211	4	84	0	0	0
Lane Group Flow (vph)	542	178	0	0	316	0	0	215	84	0	0	0
v/c Ratio	0.86	0.14			0.74			0.66	0.25			
Control Delay	36.1	4.2			43.0			45.6	11.3			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	36.1	4.2			43.0			45.6	11.3			
Queue Length 50th (ft)	219	22			133			92	0			
Queue Length 95th (ft)	453	50			327			242	44			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	917	1499			638			486	449			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.59	0.12			0.50			0.44	0.19			

Intersection Summary	
Area Type:	Other

LOS Engineering

AM Existing + Cumulative

21: Mission Rd & I-15 NB Ramps — HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1583	1863			1852			1776	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1583	1863			1852			1776	1417			
Volume (vph)	515	169	0	0	288	12	200	4	80	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	542	178	0	0	303	13	211	4	84	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	68	0	0	0
Lane Group Flow (vph)	542	178	0	0	314	0	0	215	16	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	31.0	53.6			18.6			14.3	14.3			
Effective Green, g (s)	31.0	53.6			18.6			14.3	14.3			
Actuated g/C Ratio	0.41	0.71			0.25			0.19	0.19			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	647	1316			454			335	267			
v/s Ratio Prot	c0.34	0.10			c0.17							
v/s Ratio Perm								0.12	0.01			
v/c Ratio	0.84	0.14			0.69			0.64	0.06			
Uniform Delay, d1	20.2	3.6			26.1			28.4	25.3			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	9.3	0.0			4.5			4.2	0.1			
Delay (s)	29.5	3.7			30.6			32.6	25.4			
Level of Service	C	A			C			C	C			
Approach Delay (s)		23.1			30.6			30.6			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM Average Control Delay	26.5	HCM Level of Service		C
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	75.9	Sum of lost time (s)		12.0
Intersection Capacity Utilization	81.3%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing + Cumulative

22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	20	226	148	5	11	22
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	238	156	5	12	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	340	23	35			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	340	23	35			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	77	90			
cM capacity (veh/h)	591	1054	1577			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	259	161	35
Volume Left	21	156	0
Volume Right	238	0	23
cSH	991	1577	1700
Volume to Capacity	0.26	0.10	0.02
Queue Length 95th (ft)	26	8	0
Control Delay (s)	9.9	7.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.9	7.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	8.2		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

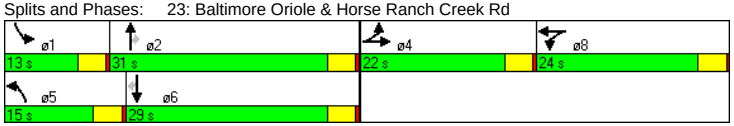
AM Existing + Cumulative
23: Baltimore Oriole & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	12	0	81	20	54	137	59	5	184	42
Turn Type	Split		Split		Prot		Perm	Prot		Perm
Protected Phases	4	4	8	8	5	2		1	6	
Permitted Phases							2			6
Detector Phases	4	4	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	22.0	22.0	24.0	24.0	15.0	31.0	31.0	13.0	29.0	29.0
Total Split (%)	24.4%	24.4%	26.7%	26.7%	16.7%	34.4%	34.4%	14.4%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	7.6	7.6	9.2	9.2	9.1	43.4	43.4	7.3	39.3	39.3
Actuated g/C Ratio	0.12	0.12	0.15	0.15	0.15	0.78	0.78	0.12	0.71	0.71
v/c Ratio	0.07	0.01	0.24	0.24	0.24	0.10	0.06	0.03	0.15	0.04
Control Delay	20.0	0.0	17.2	14.8	17.0	6.6	3.8	20.4	9.6	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	0.0	17.2	14.8	17.0	6.6	3.8	20.4	9.6	6.0
LOS	B	A	B	B	B	A	A	C	A	A
Approach Delay		15.3		16.0		8.2			9.2	
Approach LOS		B		B		A			A	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 55.5			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.24			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 32.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Baltimore Oriole & Horse Ranch Creek Rd



AM Existing + Cumulative
23: Baltimore Oriole & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.973				0.850			0.850
Flt Protected	0.950			0.950	0.976		0.950			0.950		
Satd. Flow (prot)	1583	1583	0	1504	1681	0	1583	1863	1417	1583	1863	1417
Flt Permitted	0.950			0.950	0.976		0.950			0.950		
Satd. Flow (perm)	1583	1583	0	1504	1681	0	1583	1863	1417	1583	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		635			11				62			44
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1047			1324			958			2343	
Travel Time (s)		23.8			30.1			21.8			53.3	
Volume (vph)	12	0	4	81	20	10	54	137	59	5	184	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	0	4	85	21	11	57	144	62	5	194	44
Lane Group Flow (vph)	13	4	0	55	62	0	57	144	62	5	194	44
v/c Ratio	0.07	0.01		0.24	0.24		0.24	0.10	0.06	0.03	0.15	0.04
Control Delay	20.0	0.0		17.2	14.8		17.0	6.6	3.8	20.4	9.6	6.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	0.0		17.2	14.8		17.0	6.6	3.8	20.4	9.6	6.0
Queue Length 50th (ft)	1	0		2	2		2	0	0	0	0	0
Queue Length 95th (ft)	18	0		46	46		46	74	21	10	107	20
Internal Link Dist (ft)		967			1244			878			2263	
Turn Bay Length (ft)												
Base Capacity (vph)	448	903		483	547		335	1504	1156	267	1432	1100
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.00		0.11	0.11		0.17	0.10	0.05	0.02	0.14	0.04

Intersection Summary	
Area Type:	Other

AM Existing + Cumulative
23: Baltimore Oriole & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	1583		1504	1682		1583	1863	1417	1583	1863	1417
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	1583		1504	1682		1583	1863	1417	1583	1863	1417
Volume (vph)	12	0	4	81	20	10	54	137	59	5	184	42
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	0	4	85	21	11	57	144	62	5	194	44
RTOR Reduction (vph)	0	4	0	0	10	0	0	0	23	0	0	18
Lane Group Flow (vph)	13	0	0	55	52	0	57	144	39	5	194	26
Turn Type	Split			Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	1.3	1.3		4.2	4.2		4.1	39.5	39.5	1.2	36.6	36.6
Effective Green, g (s)	1.3	1.3		4.2	4.2		4.1	39.5	39.5	1.2	36.6	36.6
Actuated g/C Ratio	0.02	0.02		0.07	0.07		0.07	0.64	0.64	0.02	0.59	0.59
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	33	33		102	114		104	1183	900	31	1096	834
v/s Ratio Prot	c0.01	0.00		c0.04	0.03		c0.04	c0.08		0.00	c0.10	
v/s Ratio Perm									0.03			0.02
v/c Ratio	0.39	0.00		0.54	0.45		0.55	0.12	0.04	0.16	0.18	0.03
Uniform Delay, d1	30.1	29.8		28.1	27.9		28.2	4.5	4.3	30.0	5.9	5.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	0.0		5.4	2.9		5.8	0.0	0.0	2.4	0.1	0.0
Delay (s)	37.6	29.8		33.5	30.8		33.9	4.5	4.3	32.4	6.0	5.4
Level of Service	D	C		C	C		C	A	A	C	A	A
Approach Delay (s)		35.8			32.0			10.9			6.4	
Approach LOS		D			C			B			A	

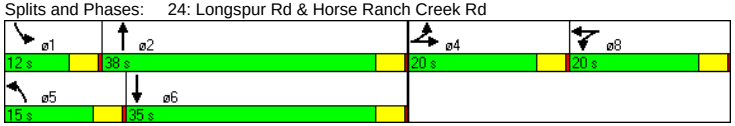
Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	62.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing + Cumulative
24: Longspur Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	ø1
Lane Configurations								
Volume (vph)	7	12	97	28	120	221	224	
Turn Type	Split		Split		Prot			
Protected Phases	4	4	8	8	5	2	6	1
Permitted Phases								
Detector Phases	4	4	8	8	5	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	38.0	35.0	12.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	42.2%	38.9%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None
Act Effct Green (s)	6.9	6.9	8.8	8.8	10.2	55.2	40.3	
Actuated g/C Ratio	0.09	0.09	0.11	0.11	0.13	0.72	0.52	
v/c Ratio	0.05	0.30	0.36	0.37	0.60	0.12	0.16	
Control Delay	31.9	19.2	35.5	35.0	41.7	4.5	11.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	31.9	19.2	35.5	35.0	41.7	4.5	11.1	
LOS	C	B	D	C	D	A	B	
Approach Delay		20.7		35.2		15.4	11.1	
Approach LOS		C		D		B	B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 77.1		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.60		
Intersection Signal Delay: 17.2	Intersection LOS: B	
Intersection Capacity Utilization 35.3%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 24: Longspur Rd & Horse Ranch Creek Rd



AM Existing + Cumulative
24: Longspur Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.886						0.965			0.972	
Flt Protected	0.950			0.950	0.971		0.950					
Satd. Flow (prot)	1583	1650	0	1504	1718	0	1583	3415	0	1667	3440	0
Flt Permitted	0.950			0.950	0.971		0.950					
Satd. Flow (perm)	1583	1650	0	1504	1718	0	1583	3415	0	1667	3440	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41						52			33	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1010			908			1206			958	
Travel Time (s)		23.0			20.6			27.4			21.8	
Volume (vph)	7	12	39	97	28	0	120	221	68	0	224	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	13	41	102	29	0	126	233	72	0	236	53
Lane Group Flow (vph)	7	54	0	60	71	0	126	305	0	0	289	0
v/c Ratio	0.05	0.30		0.36	0.37		0.60	0.12			0.16	
Control Delay	31.9	19.2		35.5	35.0		41.7	4.5			11.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	31.9	19.2		35.5	35.0		41.7	4.5			11.1	
Queue Length 50th (ft)	3	6		26	31		53	20			35	
Queue Length 95th (ft)	15	38		64	72		#117	44			68	
Internal Link Dist (ft)		930			828			1126			878	
Turn Bay Length (ft)												
Base Capacity (vph)	288	333		288	330		229	2461			1814	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.02	0.16		0.21	0.22		0.55	0.12			0.16	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing + Cumulative
24: Longspur Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95			0.95	
Frt	1.00	0.89		1.00	1.00		1.00	0.96			0.97	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00			1.00	
Satd. Flow (prot)	1583	1651		1504	1719		1583	3414			3442	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00			1.00	
Satd. Flow (perm)	1583	1651		1504	1719		1583	3414			3442	
Volume (vph)	7	12	39	97	28	0	120	221	68	0	224	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	13	41	102	29	0	126	233	72	0	236	53
RTOR Reduction (vph)	0	39	0	0	0	0	0	16	0	0	16	0
Lane Group Flow (vph)	7	15	0	60	71	0	126	289	0	0	273	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.5	4.5		7.8	7.8		10.2	54.6			40.4	
Effective Green, g (s)	4.5	4.5		7.8	7.8		10.2	54.6			40.4	
Actuated g/C Ratio	0.06	0.06		0.10	0.10		0.13	0.69			0.51	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	90	94		149	170		205	2363			1762	
v/s Ratio Prot	0.00	c0.01		0.04	c0.04		c0.08	0.08			c0.08	
v/s Ratio Perm												
v/c Ratio	0.08	0.16		0.40	0.42		0.61	0.12			0.15	
Uniform Delay, d1	35.2	35.4		33.4	33.4		32.5	4.1			10.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.4	0.8		1.8	1.7		5.4	0.1			0.2	
Delay (s)	35.6	36.2		35.1	35.1		37.9	4.2			10.4	
Level of Service	D	D		D	D		D	A			B	
Approach Delay (s)		36.2			35.1			14.0			10.4	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	17.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	35.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing + Cumulative
25: Harvest Glen Ln & Horse Ranch Creek Rd

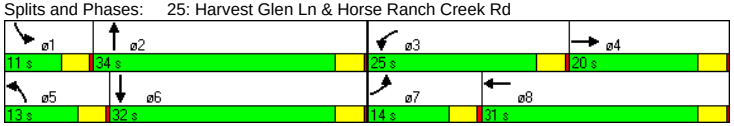
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	1	3	171	9	49	337	24	328
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	14.0	20.0	25.0	31.0	13.0	34.0	11.0	32.0
Total Split (%)	15.6%	22.2%	27.8%	34.4%	14.4%	37.8%	12.2%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.4	6.5	12.1	12.1	7.7	25.0	6.9	22.0
Actuated g/C Ratio	0.11	0.12	0.24	0.24	0.14	0.52	0.12	0.46
v/c Ratio	0.01	0.03	0.47	0.19	0.23	0.25	0.13	0.22
Control Delay	24.0	19.5	16.9	6.4	21.1	8.9	23.4	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	19.5	16.9	6.4	21.1	8.9	23.4	11.9
LOS	C	B	B	A	C	A	C	B
Approach Delay		20.1		13.5		10.1		12.7
Approach LOS		C		B		B		B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 48.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 11.8 Intersection LOS: B
Intersection Capacity Utilization 42.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 25: Harvest Glen Ln & Horse Ranch Creek Rd



LOS Engineering

AM Existing + Cumulative
25: Harvest Glen Ln & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.925			0.866			0.969			0.998	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1723	0	1583	1613	0	1583	3429	0	1583	3532	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1723	0	1583	1613	0	1583	3429	0	1583	3532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			76			40			2	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1058			1173			1033			1206	
Travel Time (s)		24.0			26.7			23.5			27.4	
Volume (vph)	1	3	3	171	9	72	49	337	89	24	328	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	3	3	180	9	76	52	355	94	25	345	5
Lane Group Flow (vph)	1	6	0	180	85	0	52	449	0	25	350	0
v/c Ratio	0.01	0.03		0.47	0.19		0.23	0.25		0.13	0.22	
Control Delay	24.0	19.5		16.9	6.4		21.1	8.9		23.4	11.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.0	19.5		16.9	6.4		21.1	8.9		23.4	11.9	
Queue Length 50th (ft)	0	0		14	1		4	16		2	14	
Queue Length 95th (ft)	4	11		110	30		47	108		29	95	
Internal Link Dist (ft)		978			1093			953			1126	
Turn Bay Length (ft)												
Base Capacity (vph)	294	460		628	773		287	2286		220	2207	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.00	0.01		0.29	0.11		0.18	0.20		0.11	0.16	

Intersection Summary

Area Type: Other

LOS Engineering

AM Existing + Cumulative
25: Harvest Glen Ln & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.87		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1723		1583	1613		1583	3428		1583	3532	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1723		1583	1613		1583	3428		1583	3532	
Volume (vph)	1	3	3	171	9	72	49	337	89	24	328	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	3	3	180	9	76	52	355	94	25	345	5
RTOR Reduction (vph)	0	3	0	0	60	0	0	22	0	0	1	0
Lane Group Flow (vph)	1	3	0	180	25	0	52	427	0	25	349	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.9	1.0		10.9	11.0		3.1	24.6		1.0	22.5	
Effective Green, g (s)	0.9	1.0		10.9	11.0		3.1	24.6		1.0	22.5	
Actuated g/C Ratio	0.02	0.02		0.20	0.21		0.06	0.46		0.02	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	27	32		323	332		92	1576		30	1485	
v/s Ratio Prot	0.00	0.00		c0.11	c0.02		c0.03	c0.12		0.02	0.10	
v/s Ratio Perm												
v/c Ratio	0.04	0.10		0.56	0.07		0.57	0.27		0.83	0.23	
Uniform Delay, d1	25.9	25.8		19.1	17.1		24.5	8.9		26.2	10.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	1.3		2.1	0.1		7.7	0.1		95.9	0.1	
Delay (s)	26.4	27.1		21.2	17.2		32.3	9.0		122.0	10.0	
Level of Service	C	C		C	B		C	A		F	B	
Approach Delay (s)		27.0			19.9			11.4			17.5	
Approach LOS		C			B			B			B	

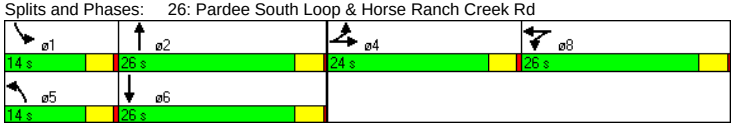
Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing + Cumulative
26: Pardee South Loop & Horse Ranch Creek Rd — Timings

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	0	228	0	36	393	33	472
Turn Type		Split		Prot		Prot	
Protected Phases	4	8	8	5	2	1	6
Permitted Phases							
Detector Phases	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	24.0	26.0	26.0	14.0	26.0	14.0	26.0
Total Split (%)	26.7%	28.9%	28.9%	15.6%	28.9%	15.6%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag				Lead	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.6	12.6	12.6	7.9	26.5	7.7	23.8
Actuated g/C Ratio	0.11	0.24	0.24	0.14	0.52	0.13	0.46
v/c Ratio	0.05	0.45	0.43	0.17	0.29	0.17	0.30
Control Delay	0.2	17.8	12.3	21.5	9.2	23.6	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.2	17.8	12.3	21.5	9.2	23.6	11.7
LOS	A	B	B	C	A	C	B
Approach Delay	0.2		14.8		10.1		12.5
Approach LOS	A		B		B		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 51.4		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.45		
Intersection Signal Delay: 11.9	Intersection LOS: B	
Intersection Capacity Utilization 43.3%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 26: Pardee South Loop & Horse Ranch Creek Rd



AM Existing + Cumulative
26: Pardee South Loop & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.914			0.971				
Flt Protected				0.950	0.979		0.950			0.950		
Satd. Flow (prot)	1667	1583	0	1504	1583	0	1583	3437	0	1583	3539	0
Flt Permitted				0.950	0.979		0.950			0.950		
Satd. Flow (perm)	1667	1583	0	1504	1583	0	1583	3437	0	1583	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		356			71			31				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		869			1419			1340			1033	
Travel Time (s)		19.8			32.3			30.5			23.5	
Volume (vph)	0	0	22	228	0	101	36	393	94	33	472	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	23	240	0	106	38	414	99	35	497	0
Lane Group Flow (vph)	0	23	0	161	185	0	38	513	0	35	497	0
v/c Ratio		0.05		0.45	0.43		0.17	0.29		0.17	0.30	
Control Delay		0.2		17.8	12.3		21.5	9.2		23.6	11.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		0.2		17.8	12.3		21.5	9.2		23.6	11.7	
Queue Length 50th (ft)		0		13	9		3	20		3	21	
Queue Length 95th (ft)		0		111	92		39	130		37	132	
Internal Link Dist (ft)		789			1339			1260			953	
Turn Bay Length (ft)												
Base Capacity (vph)		732		608	682		309	2101		295	2058	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.03		0.26	0.27		0.12	0.24		0.12	0.24	

Intersection Summary

Area Type: Other

LOS Engineering

AM Existing + Cumulative
26: Pardee South Loop & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt		0.85		1.00	0.91		1.00	0.97		1.00	1.00	
Flt Protected		1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583		1504	1584		1583	3437		1583	3539	
Flt Permitted		1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1583		1504	1584		1583	3437		1583	3539	
Volume (vph)	0	0	22	228	0	101	36	393	94	33	472	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	23	240	0	106	38	414	99	35	497	0
RTOR Reduction (vph)	0	23	0	0	56	0	0	17	0	0	0	0
Lane Group Flow (vph)	0	0	0	161	129	0	38	496	0	35	497	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		0.8		11.6	11.6		3.2	26.0		1.4	24.2	
Effective Green, g (s)		0.8		11.6	11.6		3.2	26.0		1.4	24.2	
Actuated g/C Ratio		0.01		0.21	0.21		0.06	0.47		0.03	0.43	
Clearance Time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		23		313	329		91	1601		40	1535	
v/s Ratio Prot		c0.00		c0.11	0.08		0.02	c0.14		c0.02	0.14	
v/s Ratio Perm												
v/c Ratio		0.01		0.51	0.39		0.42	0.31		0.88	0.32	
Uniform Delay, d1		27.1		19.6	19.1		25.4	9.3		27.1	10.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3		1.4	0.8		3.1	0.1		93.6	0.1	
Delay (s)		27.4		21.0	19.8		28.5	9.4		120.7	10.5	
Level of Service		C		C	B		C	A		F	B	
Approach Delay (s)		27.4			20.4			10.7			17.8	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	55.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

AM Existing + Cumulative
27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	144	379	215	0	744
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	152	399	226	0	783
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	904	313			625	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	904	313			625	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	78			100	
cM capacity (veh/h)	277	683			952	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	152	266	359	392	392
Volume Left	0	0	0	0	0
Volume Right	152	0	226	0	0
cSH	683	1700	1700	1700	1700
Volume to Capacity	0.22	0.16	0.21	0.23	0.23
Queue Length 95th (ft)	21	0	0	0	0
Control Delay (s)	11.8	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.8	0.0		0.0	
Approach LOS	B				

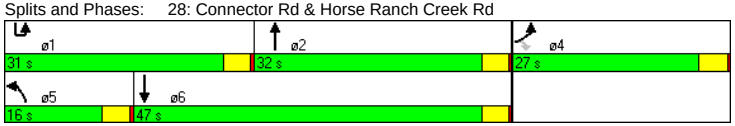
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

AM Existing + Cumulative
28: Connector Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	ø1
Lane Configurations						
Volume (vph)	153	4	3	262	195	
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	1
Permitted Phases		4				
Detector Phases	4	4	5	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	8.0
Total Split (s)	27.0	27.0	16.0	32.0	47.0	31.0
Total Split (%)	30.0%	30.0%	17.8%	35.6%	52.2%	34%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead	Lag	Lag	Lead
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	9.0	9.0	6.4	26.2	24.2	
Actuated g/C Ratio	0.20	0.20	0.13	0.61	0.56	
v/c Ratio	0.26	0.01	0.01	0.13	0.31	
Control Delay	9.7	8.0	14.0	4.0	3.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.7	8.0	14.0	4.0	3.1	
LOS	A	A	B	A	A	
Approach Delay	9.6			4.1	3.1	
Approach LOS	A			A	A	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 43.1		
Natural Cycle: 50		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.31		
Intersection Signal Delay: 4.4	Intersection LOS: A	
Intersection Capacity Utilization 29.1%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 28: Connector Rd & Horse Ranch Creek Rd



AM Existing + Cumulative
28: Connector Rd & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9		9
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	0.95
Frt		0.850				0.901	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	3072	1417	1583	3539	1667	3189	0
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	3072	1417	1583	3539	1667	3189	0
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		4				396	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30		30	
Link Distance (ft)	2875			1509		1400	
Travel Time (s)	65.3			34.3		31.8	
Volume (vph)	153	4	3	262	0	195	376
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	161	4	3	276	0	205	396
Lane Group Flow (vph)	161	4	3	276	0	601	0
v/c Ratio	0.26	0.01	0.01	0.13		0.31	
Control Delay	9.7	8.0	14.0	4.0		3.1	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	9.7	8.0	14.0	4.0		3.1	
Queue Length 50th (ft)	8	0	0	9		6	
Queue Length 95th (ft)	32	5	6	23		44	
Internal Link Dist (ft)	2795			1429		1320	
Turn Bay Length (ft)							
Base Capacity (vph)	1317	610	370	2535		2543	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	0.12	0.01	0.01	0.11		0.24	

Intersection Summary

Area Type: Other

LOS Engineering

AM Existing + Cumulative
28: Connector Rd & Horse Ranch Creek Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	0.97	1.00	1.00	0.95		0.95	
Frt	1.00	0.85	1.00	1.00		0.90	
Flt Protected	0.95	1.00	0.95	1.00		1.00	
Satd. Flow (prot)	3072	1417	1583	3539		3189	
Flt Permitted	0.95	1.00	0.95	1.00		1.00	
Satd. Flow (perm)	3072	1417	1583	3539		3189	
Volume (vph)	153	4	3	262	0	195	376
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	161	4	3	276	0	205	396
RTOR Reduction (vph)	0	3	0	0	0	187	0
Lane Group Flow (vph)	161	1	3	276	0	414	0
Turn Type		Perm	Prot		Prot		
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	8.0	8.0	1.3	29.1		23.8	
Effective Green, g (s)	8.0	8.0	1.3	29.1		23.8	
Actuated g/C Ratio	0.18	0.18	0.03	0.65		0.53	
Clearance Time (s)	4.0	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	545	251	46	2283		1683	
v/s Ratio Prot	c0.05		0.00	c0.08		c0.13	
v/s Ratio Perm		0.00					
v/c Ratio	0.30	0.00	0.07	0.12		0.25	
Uniform Delay, d1	16.1	15.3	21.3	3.1		5.8	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.3	0.0	0.6	0.0		0.1	
Delay (s)	16.4	15.3	21.9	3.1		5.9	
Level of Service	B	B	C	A		A	
Approach Delay (s)	16.4			3.3		5.9	
Approach LOS	B			A		A	

Intersection Summary				
HCM Average Control Delay	6.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	45.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

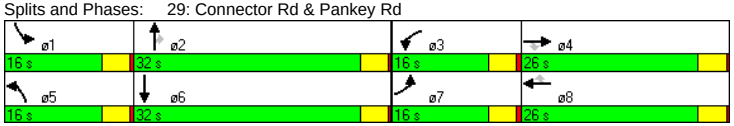
AM Existing + Cumulative
29: Connector Rd & Pankey Rd

Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	50	111	200	23	274	125	150	299	7	26	19
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot	
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	4	3	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	16.0	26.0	26.0	16.0	26.0	26.0	16.0	32.0	32.0	16.0	32.0
Total Split (%)	17.8%	28.9%	28.9%	17.8%	28.9%	28.9%	17.8%	35.6%	35.6%	17.8%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	7.8	16.1	16.1	6.9	13.4	13.4	10.4	26.9	26.9	7.0	18.9
Actuated g/C Ratio	0.13	0.29	0.29	0.12	0.24	0.24	0.19	0.50	0.50	0.12	0.35
v/c Ratio	0.25	0.33	0.33	0.13	0.65	0.30	0.54	0.34	0.01	0.15	0.04
Control Delay	31.1	17.7	6.2	32.9	28.3	7.0	34.5	18.5	12.0	32.8	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	17.7	6.2	32.9	28.3	7.0	34.5	18.5	12.0	32.8	20.2
LOS	C	B	A	C	C	A	C	B	B	C	C
Approach Delay		14.6			22.2			23.7			26.7
Approach LOS		B			C			C			C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 54.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 20.8		Intersection LOS: C	
Intersection Capacity Utilization 50.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 29: Connector Rd & Pankey Rd



LOS Engineering

AM Existing + Cumulative
29: Connector Rd & Pankey Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958	0.850			0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1695	1346	1583	1863	1417	1583	1863	1417	1583	1807	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1695	1346	1583	1863	1417	1583	1863	1417	1583	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21	165			132			7		5	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1256			2875			1488			1443	
Travel Time (s)		28.5			65.3			33.8			32.8	
Volume (vph)	50	111	200	23	274	125	150	299	7	26	19	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	117	211	24	288	132	158	315	7	27	20	5
Lane Group Flow (vph)	53	163	165	24	288	132	158	315	7	27	25	0
v/c Ratio	0.25	0.33	0.33	0.13	0.65	0.30	0.54	0.34	0.01	0.15	0.04	
Control Delay	31.1	17.7	6.2	32.9	28.3	7.0	34.5	18.5	12.0	32.8	20.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	31.1	17.7	6.2	32.9	28.3	7.0	34.5	18.5	12.0	32.8	20.2	
Queue Length 50th (ft)	16	26	0	7	82	0	44	70	0	8	6	
Queue Length 95th (ft)	59	114	46	35	215	41	#169	220	9	38	26	
Internal Link Dist (ft)		1176			2795			1408			1363	
Turn Bay Length (ft)												
Base Capacity (vph)	322	664	618	309	663	589	354	1031	787	310	910	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.25	0.27	0.08	0.43	0.22	0.45	0.31	0.01	0.09	0.03	

Intersection Summary	
Area Type:	Other
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

LOS Engineering

AM Existing + Cumulative
29: Connector Rd & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1695	1346	1583	1863	1417	1583	1863	1417	1583	1807	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1695	1346	1583	1863	1417	1583	1863	1417	1583	1807	
Volume (vph)	50	111	200	23	274	125	150	299	7	26	19	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	117	211	24	288	132	158	315	7	27	20	5
RTOR Reduction (vph)	0	16	127	0	0	106	0	0	4	0	3	0
Lane Group Flow (vph)	53	147	39	24	288	26	158	315	3	27	22	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.3	14.0	14.0	2.3	12.0	12.0	8.2	25.4	25.4	2.3	19.5	
Effective Green, g (s)	4.3	14.0	14.0	2.3	12.0	12.0	8.2	25.4	25.4	2.3	19.5	
Actuated g/C Ratio	0.07	0.23	0.23	0.04	0.20	0.20	0.14	0.42	0.42	0.04	0.32	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	113	396	314	61	373	283	216	789	600	61	587	
v/s Ratio Prot	c0.03	0.09		0.02	c0.15		c0.10	c0.17		0.02	0.01	
v/s Ratio Perm			0.03			0.02			0.00			
v/c Ratio	0.47	0.37	0.12	0.39	0.77	0.09	0.73	0.40	0.00	0.44	0.04	
Uniform Delay, d1	26.8	19.3	18.2	28.2	22.7	19.6	24.8	12.0	10.0	28.2	13.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	0.6	0.2	4.1	9.5	0.1	12.0	0.3	0.0	5.1	0.0	
Delay (s)	29.8	19.9	18.3	32.3	32.2	19.7	36.9	12.3	10.0	33.3	13.9	
Level of Service	C	B	B	C	C	B	D	B	B	C	B	
Approach Delay (s)		20.6			28.5			20.4			23.9	
Approach LOS		C			C			C			C	

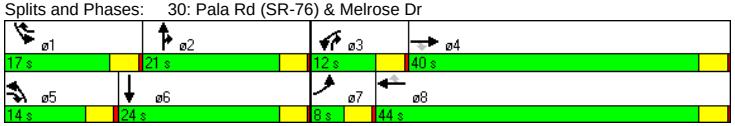
Intersection Summary			
HCM Average Control Delay	23.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing + Cumulative
30: Pala Rd (SR-76) & Melrose Dr — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	16	996	220	193	2138	50	450	8	203	157	157
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6
Permitted Phases			4			8					
Detector Phases	7	4	5	3	8	1	5	2	2 3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0		8.0	20.0
Total Split (s)	8.0	40.0	14.0	12.0	44.0	17.0	14.0	21.0	33.0	17.0	24.0
Total Split (%)	8.9%	44.4%	15.6%	13.3%	48.9%	18.9%	15.6%	23.3%	36.7%	18.9%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	4.0	32.0	46.0	8.0	40.9	56.8	10.0	18.1	30.1	11.9	20.0
Actuated g/C Ratio	0.04	0.37	0.53	0.09	0.48	0.66	0.12	0.21	0.35	0.14	0.23
v/c Ratio	0.25	0.80	0.27	0.71	1.34	0.06	1.32	0.02	0.39	0.75	1.08
Control Delay	50.6	29.4	2.2	53.7	180.0	2.0	197.9	29.8	16.7	58.2	95.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	29.4	2.2	53.7	180.0	2.0	197.9	29.8	16.7	58.2	95.3
LOS	D	C	A	D	F	A	F	C	B	E	F
Approach Delay		24.8			166.0			140.2			86.1
Approach LOS		C			F			F			F

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 86		
Natural Cycle: 140		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.34		
Intersection Signal Delay: 116.8	Intersection LOS: F	
Intersection Capacity Utilization 117.7%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 30: Pala Rd (SR-76) & Melrose Dr



AM Existing + Cumulative
30: Pala Rd (SR-76) & Melrose Dr

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	500		500	500		500	400		400	200		0
Storage Lanes	1		1	2		1	2		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.900	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			232			53			78		88	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1330			646			1034			733	
Travel Time (s)		30.2			14.7			23.5			16.7	
Volume (vph)	16	996	220	193	2138	50	450	8	203	157	157	314
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	1048	232	203	2251	53	474	8	214	165	165	331
Lane Group Flow (vph)	17	1048	232	203	2251	53	474	8	214	165	496	0
v/c Ratio	0.25	0.80	0.27	0.71	1.34	0.06	1.32	0.02	0.39	0.75	1.08	
Control Delay	50.6	29.4	2.2	53.7	180.0	2.0	197.9	29.8	16.7	58.2	95.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	50.6	29.4	2.2	53.7	180.0	2.0	197.9	29.8	16.7	58.2	95.3	
Queue Length 50th (ft)	9	261	0	56	~807	0	~174	4	54	86	~267	
Queue Length 95th (ft)	31	337	31	#110	#1059	12	#283	16	121	#185	#482	
Internal Link Dist (ft)		1250			566			954			653	
Turn Bay Length (ft)	500		500	500		500	400		400	200		
Base Capacity (vph)	69	1416	865	286	1683	934	358	392	547	237	458	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.25	0.74	0.27	0.71	1.34	0.06	1.32	0.02	0.39	0.70	1.08	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative
30: Pala Rd (SR-76) & Melrose Dr

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	
Volume (vph)	16	996	220	193	2138	50	450	8	203	157	157	314
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	1048	232	203	2251	53	474	8	214	165	165	331
RTOR Reduction (vph)	0	0	115	0	0	21	0	0	51	0	68	0
Lane Group Flow (vph)	17	1048	117	203	2251	32	474	8	163	165	428	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.5	34.4	44.4	8.0	40.9	52.8	10.0	18.1	30.1	11.9	20.0	
Effective Green, g (s)	1.5	34.4	44.4	8.0	40.9	52.8	10.0	18.1	30.1	11.9	20.0	
Actuated g/C Ratio	0.02	0.39	0.50	0.09	0.46	0.60	0.11	0.20	0.34	0.13	0.23	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	27	1377	776	278	1637	910	348	381	482	213	379	
v/s Ratio Prot	0.01	0.30	0.02	c0.07	c0.64	0.00	c0.15	0.00	0.11	0.10	c0.26	
v/s Ratio Perm			0.07			0.02						
v/c Ratio	0.63	0.76	0.15	0.73	1.38	0.03	1.36	0.02	0.34	0.77	1.13	
Uniform Delay, d1	43.2	23.4	11.8	39.1	23.8	7.3	39.2	28.1	21.7	37.0	34.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	38.0	2.5	0.1	9.5	172.7	0.0	180.5	0.1	0.4	16.0	86.1	
Delay (s)	81.2	26.0	11.9	48.6	196.5	7.3	219.7	28.2	22.1	53.0	120.3	
Level of Service	F	C	B	D	F	A	F	C	C	D	F	
Approach Delay (s)		24.2			180.5			156.8			103.5	
Approach LOS		C			F			F			F	

Intersection Summary				
HCM Average Control Delay	128.2	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.24			
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	117.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

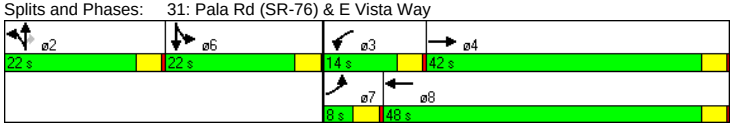
LOS Engineering

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Volume (vph)	74	939	288	1661	47	282	200
Turn Type	Prot		Prot			Perm	
Protected Phases	7	4	3	8	2		6
Permitted Phases						2	
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	42.0	14.0	48.0	22.0	22.0	22.0
Total Split (%)	8.0%	42.0%	14.0%	48.0%	22.0%	22.0%	22.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	Max
Act Effct Green (s)	4.0	38.0	10.0	44.0	18.0	18.0	18.0
Actuated g/C Ratio	0.04	0.38	0.10	0.44	0.18	0.18	0.18
v/c Ratio	1.24	1.02	0.99	2.16	1.14	0.60	1.34
Control Delay	232.8	60.4	94.5	547.0	131.4	9.9	201.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	232.8	60.4	94.5	547.0	131.4	9.9	201.3
LOS	F	E	F	F	F	A	F
Approach Delay		69.8		480.8	76.9		201.3
Approach LOS		E		F	E		F

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.16
Intersection Signal Delay: 267.7 Intersection LOS: F
Intersection Capacity Utilization 151.2% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 31: Pala Rd (SR-76) & E Vista Way



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		150	450		0	0		200	0		0
Storage Lanes	1		0	2		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.959			0.998				0.850		0.927	
Flt Protected	0.950			0.950				0.959			0.999	
Satd. Flow (prot)	1583	3394	0	3072	1859	0	0	1786	1417	0	1725	0
Flt Permitted	0.950			0.950				0.959			0.999	
Satd. Flow (perm)	1583	3394	0	3072	1859	0	0	1786	1417	0	1725	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		62			1				297		51	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		710			526			797			552	
Travel Time (s)		16.1			12.0			18.1			12.5	
Volume (vph)	74	939	350	288	1661	20	300	47	282	6	200	241
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	988	368	303	1748	21	316	49	297	6	211	254
Lane Group Flow (vph)	78	1356	0	303	1769	0	0	365	297	0	471	0
v/c Ratio	1.24	1.02		0.99	2.16			1.14	0.60		1.34	
Control Delay	232.8	60.4		94.5	547.0			131.4	9.9		201.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	232.8	60.4		94.5	547.0			131.4	9.9		201.3	
Queue Length 50th (ft)	~62	~472		101	~1840			~273	0		~368	
Queue Length 95th (ft)	#157	#608		#188	#2108			#451	75		#566	
Internal Link Dist (ft)		630			446			717			472	
Turn Bay Length (ft)	300			450					200			
Base Capacity (vph)	63	1328		307	819			321	499		352	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	1.24	1.02		0.99	2.16			1.14	0.60		1.34	

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing + Cumulative
31: Pala Rd (SR-76) & E Vista Way

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		0.97	1.00			1.00	1.00		1.00	
Frt	1.00	0.96		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (prot)	1583	3395		3072	1859			1785	1417		1726	
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (perm)	1583	3395		3072	1859			1785	1417		1726	
Volume (vph)	74	939	350	288	1661	20	300	47	282	6	200	241
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	988	368	303	1748	21	316	49	297	6	211	254
RTOR Reduction (vph)	0	38	0	0	1	0	0	0	244	0	42	0
Lane Group Flow (vph)	78	1318	0	303	1768	0	0	365	53	0	429	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)	4.0	38.0		10.0	44.0			18.0	18.0		18.0	
Effective Green, g (s)	4.0	38.0		10.0	44.0			18.0	18.0		18.0	
Actuated g/C Ratio	0.04	0.38		0.10	0.44			0.18	0.18		0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	63	1290		307	818			321	255		311	
v/s Ratio Prot	0.05	0.39		c0.10	c0.95			c0.20			c0.25	
v/s Ratio Perm									0.04			
v/c Ratio	1.24	1.02		0.99	2.16			1.14	0.21		1.38	
Uniform Delay, d1	48.0	31.0		44.9	28.0			41.0	34.9		41.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	190.6	30.6		47.4	526.9			92.7	1.9		189.9	
Delay (s)	238.6	61.6		92.3	554.9			133.7	36.8		230.9	
Level of Service	F	E		F	F			F	D		F	
Approach Delay (s)		71.2			487.3			90.2			230.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	276.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	151.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

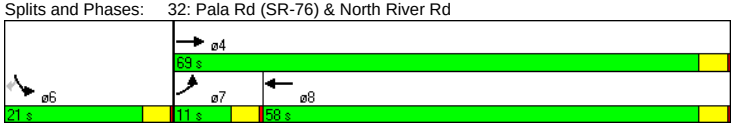
AM Existing + Cumulative
32: Pala Rd (SR-76) & North River Rd

Timings

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	170	1135	1869	145	185
Turn Type	Prot				Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phases	7	4	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	11.0	69.0	58.0	21.0	21.0
Total Split (%)	12.2%	76.7%	64.4%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	7.0	65.0	54.0	17.0	17.0
Actuated g/C Ratio	0.08	0.72	0.60	0.19	0.19
v/c Ratio	1.46	0.89	2.07	0.51	0.52
Control Delay	277.3	20.1	503.3	39.7	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	277.3	20.1	503.3	39.7	16.7
LOS	F	C	F	D	B
Approach Delay		53.6	503.3	26.8	
Approach LOS		D	F	C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 2.07		
Intersection Signal Delay: 307.6	Intersection LOS: F	
Intersection Capacity Utilization 146.0%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 32: Pala Rd (SR-76) & North River Rd



LOS Engineering

AM Existing + Cumulative
32: Pala Rd (SR-76) & North River Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	150			0	50	0
Storage Lanes	1			0	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.981			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1827	0	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1827	0	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			16			136
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		1356	1400		1286	
Travel Time (s)		30.8	31.8		29.2	
Volume (vph)	170	1135	1869	299	145	185
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	1195	1967	315	153	195
Lane Group Flow (vph)	179	1195	2282	0	153	195
v/c Ratio	1.46	0.89	2.07		0.51	0.52
Control Delay	277.3	20.1	503.3		39.7	16.7
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	277.3	20.1	503.3		39.7	16.7
Queue Length 50th (ft)	~140	441	~2097		79	29
Queue Length 95th (ft)	#268	#869	#2365		141	94
Internal Link Dist (ft)		1276	1320		1206	
Turn Bay Length (ft)	150				50	
Base Capacity (vph)	123	1346	1103		299	378
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	1.46	0.89	2.07		0.51	0.52

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing + Cumulative
32: Pala Rd (SR-76) & North River Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1863	1828		1583	1417
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1863	1828		1583	1417
Volume (vph)	170	1135	1869	299	145	185
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	1195	1967	315	153	195
RTOR Reduction (vph)	0	0	6	0	0	110
Lane Group Flow (vph)	179	1195	2276	0	153	85
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	7.0	65.0	54.0		17.0	17.0
Effective Green, g (s)	7.0	65.0	54.0		17.0	17.0
Actuated g/C Ratio	0.08	0.72	0.60		0.19	0.19
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	123	1346	1097		299	268
v/s Ratio Prot	c0.11	0.64	c1.24		c0.10	
v/s Ratio Perm						0.06
v/c Ratio	1.46	0.89	2.07		0.51	0.32
Uniform Delay, d1	41.5	9.7	18.0		32.8	31.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	244.1	7.5	486.6		6.1	3.1
Delay (s)	285.6	17.1	504.6		38.9	34.6
Level of Service	F	B	F		D	C
Approach Delay (s)		52.1	504.6		36.5	
Approach LOS		D	F		D	

Intersection Summary				
HCM Average Control Delay	308.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	146.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

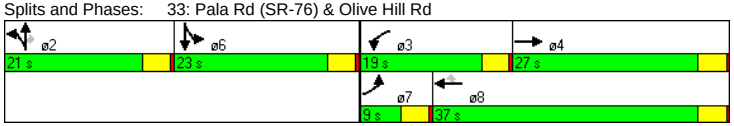
AM Existing + Cumulative
33: Pala Rd (SR-76) & Olive Hill Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	100	1080	469	1868	199	153	248	147	300
Turn Type	Prot		Prot		Perm		Perm	Split	
Protected Phases	7	4	3	8		2		6	6
Permitted Phases					8		2		
Detector Phases	7	4	3	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	27.0	19.0	37.0	37.0	21.0	21.0	23.0	23.0
Total Split (%)	10.0%	30.0%	21.1%	41.1%	41.1%	23.3%	23.3%	25.6%	25.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)	5.0	23.0	15.0	33.0	33.0	17.0	17.0	19.0	19.0
Actuated g/C Ratio	0.06	0.26	0.17	0.37	0.37	0.19	0.19	0.21	0.21
v/c Ratio	1.19	1.47	1.87	1.51	0.35	0.80	0.54	0.46	1.31
Control Delay	197.1	246.3	431.8	261.5	11.3	54.0	9.0	36.4	186.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	197.1	246.3	431.8	261.5	11.3	54.0	9.0	36.4	186.9
LOS	F	F	F	F	B	D	A	D	F
Approach Delay		242.6		273.4		32.2			152.3
Approach LOS		F		F		C			F

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.87		
Intersection Signal Delay: 225.3	Intersection LOS: F	
Intersection Capacity Utilization 119.6%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 33: Pala Rd (SR-76) & Olive Hill Rd



LOS Engineering

AM Existing + Cumulative
33: Pala Rd (SR-76) & Olive Hill Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		200	0		150	150		0
Storage Lanes	1		0	1		1	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979				0.850			0.850		0.941	
Flt Protected	0.950			0.950				0.979		0.950		
Satd. Flow (prot)	1583	3465	0	1583	3539	1417	0	1824	1417	1583	1753	0
Flt Permitted	0.950			0.950				0.979		0.950		
Satd. Flow (perm)	1583	3465	0	1583	3539	1417	0	1824	1417	1583	1753	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20				115			261		33	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		585			663			961			1186	
Travel Time (s)		13.3			15.1			21.8			27.0	
Volume (vph)	100	1080	178	469	1868	199	110	153	248	147	300	193
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	1137	187	494	1966	209	116	161	261	155	316	203
Lane Group Flow (vph)	105	1324	0	494	1966	209	0	277	261	155	519	0
v/c Ratio	1.19	1.47		1.87	1.51	0.35		0.80	0.54	0.46	1.31	
Control Delay	197.1	246.3		431.8	261.5	11.3		54.0	9.0	36.4	186.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	197.1	246.3		431.8	261.5	11.3		54.0	9.0	36.4	186.9	
Queue Length 50th (ft)	~73	~551		~433	~828	36		152	0	78	~371	
Queue Length 95th (ft)	#176	#685		#623	#965	89		#278	65	139	#568	
Internal Link Dist (ft)		505			583			881			1106	
Turn Bay Length (ft)	250			250		200			150	150		
Base Capacity (vph)	88	900		264	1298	592		345	479	334	396	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	1.19	1.47		1.87	1.51	0.35		0.80	0.54	0.46	1.31	

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative
33: Pala Rd (SR-76) & Olive Hill Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3464		1583	3539	1417		1825	1417	1583	1753	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3464		1583	3539	1417		1825	1417	1583	1753	
Volume (vph)	100	1080	178	469	1868	199	110	153	248	147	300	193
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	1137	187	494	1966	209	116	161	261	155	316	203
RTOR Reduction (vph)	0	15	0	0	0	73	0	0	212	0	26	0
Lane Group Flow (vph)	105	1309	0	494	1966	136	0	277	49	155	493	0
Turn Type	Prot			Prot		Perm	Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	5.0	23.0		15.0	33.0	33.0		17.0	17.0	19.0	19.0	
Effective Green, g (s)	5.0	23.0		15.0	33.0	33.0		17.0	17.0	19.0	19.0	
Actuated g/C Ratio	0.06	0.26		0.17	0.37	0.37		0.19	0.19	0.21	0.21	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	88	885		264	1298	520		345	268	334	370	
v/s Ratio Prot	0.07	0.38		c0.31	c0.56			c0.15		0.10	c0.28	
v/s Ratio Perm						0.10			0.03			
v/c Ratio	1.19	1.48		1.87	1.51	0.26		0.80	0.18	0.46	1.33	
Uniform Delay, d1	42.5	33.5		37.5	28.5	20.0		34.9	30.7	31.0	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	156.9	221.8		406.2	235.6	0.3		17.7	1.5	4.6	167.0	
Delay (s)	199.4	255.3		443.7	264.1	20.2		52.6	32.2	35.6	202.5	
Level of Service	F	F		F	F	C		D	C	D	F	
Approach Delay (s)		251.2			278.2			42.7			164.1	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM Average Control Delay	232.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	119.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

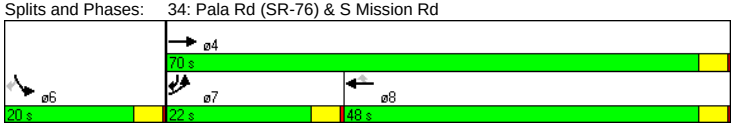
AM Existing + Cumulative
34: Pala Rd (SR-76) & S Mission Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	600	873	1660	196	219	900
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	22.0	70.0	48.0	48.0	20.0	22.0
Total Split (%)	24.4%	77.8%	53.3%	53.3%	22.2%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	18.0	66.0	44.0	44.0	16.0	38.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.42
v/c Ratio	1.03	0.67	1.01	0.26	0.42	0.90
Control Delay	81.0	9.4	48.2	2.8	35.7	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	9.4	48.2	2.8	35.7	37.4
LOS	F	A	D	A	D	D
Approach Delay		38.6	43.4		37.0	
Approach LOS		D	D		D	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.03		
Intersection Signal Delay: 40.2	Intersection LOS: D	
Intersection Capacity Utilization 87.7%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



AM Existing + Cumulative
34: Pala Rd (SR-76) & S Mission Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				206		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	600	873	1660	196	219	900
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	919	1747	206	231	947
Lane Group Flow (vph)	632	919	1747	206	231	947
v/c Ratio	1.03	0.67	1.01	0.26	0.42	0.90
Control Delay	81.0	9.4	48.2	2.8	35.7	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	9.4	48.2	2.8	35.7	37.4
Queue Length 50th (ft)	~200	227	~514	0	60	277
Queue Length 95th (ft)	#306	345	#691	34	96	#417
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	614	1366	1730	798	546	1053
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.67	1.01	0.26	0.42	0.90

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative
34: Pala Rd (SR-76) & S Mission Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Volume (vph)	600	873	1660	196	219	900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	919	1747	206	231	947
RTOR Reduction (vph)	0	0	0	105	0	0
Lane Group Flow (vph)	632	919	1747	101	231	947
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	18.0	66.0	44.0	44.0	16.0	34.0
Effective Green, g (s)	18.0	66.0	44.0	44.0	16.0	34.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.38
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	614	1366	1730	693	546	1053
v/s Ratio Prot	c0.21	0.49	c0.49		0.08	c0.18
v/s Ratio Perm				0.07		0.20
v/c Ratio	1.03	0.67	1.01	0.15	0.42	0.90
Uniform Delay, d1	36.0	6.3	23.0	12.7	32.9	26.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.0	1.3	24.1	0.1	2.4	10.3
Delay (s)	80.0	7.6	47.1	12.8	35.3	36.6
Level of Service	F	A	D	B	D	D
Approach Delay (s)		37.1	43.4		36.4	
Approach LOS		D	D		D	

Intersection Summary				
HCM Average Control Delay	39.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	87.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing + Cumulative
35: Reche Rd & Live Oak Park Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	79	475	425	63	82	162
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	83	500	447	66	86	171
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	514				1147	481
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	514				1147	481
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				57	71
cM capacity (veh/h)	1052				203	585

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	83	500	514	257
Volume Left	83	0	0	86
Volume Right	0	0	66	171
cSH	1052	1700	1700	358
Volume to Capacity	0.08	0.29	0.30	0.72
Queue Length 95th (ft)	6	0	0	134
Control Delay (s)	8.7	0.0	0.0	36.8
Lane LOS	A			E
Approach Delay (s)	1.2		0.0	36.8
Approach LOS				E

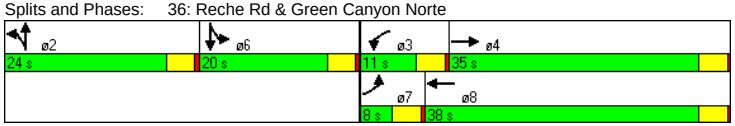
Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

AM Existing + Cumulative
36: Reche Rd & Green Canyon Norte — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	9	322	80	596	285	4	9
Turn Type	Prot		Prot		Split		
Protected Phases	7	4	3	8	2	2	6
Permitted Phases							
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	35.0	11.0	38.0	24.0	24.0	20.0
Total Split (%)	8.9%	38.9%	12.2%	42.2%	26.7%	26.7%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	None
Act Effct Green (s)	4.2	20.0	7.0	27.2	21.2	21.2	6.8
Actuated g/C Ratio	0.06	0.31	0.11	0.42	0.33	0.33	0.10
v/c Ratio	0.10	0.65	0.50	0.79	0.57	0.33	0.22
Control Delay	39.7	26.1	44.6	26.2	28.8	5.8	26.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	26.1	44.6	26.2	28.8	5.8	26.8
LOS	D	C	D	C	C	A	C
Approach Delay		26.5		28.4		19.1	26.8
Approach LOS		C		C		B	C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 64.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 25.0		Intersection LOS: C	
Intersection Capacity Utilization 69.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 36: Reche Rd & Green Canyon Norte



AM Existing + Cumulative
36: Reche Rd & Green Canyon Norte

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	150		0	150		0	150		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985						0.853			0.956	
Flt Protected	0.950			0.950			0.950				0.978	
Satd. Flow (prot)	1583	1835	0	1583	1863	0	1583	1589	0	0	1742	0
Flt Permitted	0.950			0.950			0.950				0.978	
Satd. Flow (perm)	1583	1835	0	1583	1863	0	1583	1589	0	0	1742	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7						215			13	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			4892			1501			1367	
Travel Time (s)		22.1			111.2			34.1			31.1	
Volume (vph)	9	322	37	80	596	0	285	4	204	17	9	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	339	39	84	627	0	300	4	215	18	9	13
Lane Group Flow (vph)	9	378	0	84	627	0	300	219	0	0	40	0
v/c Ratio	0.10	0.65		0.50	0.79		0.57	0.33			0.22	
Control Delay	39.7	26.1		44.6	26.2		28.8	5.8			26.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	39.7	26.1		44.6	26.2		28.8	5.8			26.8	
Queue Length 50th (ft)	4	141		35	214		111	1			11	
Queue Length 95th (ft)	19	235		#108	#470		#273	54			42	
Internal Link Dist (ft)		893			4812			1421			1287	
Turn Bay Length (ft)	150			150			150					
Base Capacity (vph)	93	777		173	908		524	670			377	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.10	0.49		0.49	0.69		0.57	0.33			0.11	

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing + Cumulative
36: Reche Rd & Green Canyon Norte

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1583	1834		1583	1863		1583	1588			1742	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (perm)	1583	1834		1583	1863		1583	1588			1742	
Volume (vph)	9	322	37	80	596	0	285	4	204	17	9	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	339	39	84	627	0	300	4	215	18	9	13
RTOR Reduction (vph)	0	5	0	0	0	0	0	149	0	0	12	0
Lane Group Flow (vph)	9	373	0	84	627	0	300	70	0	0	28	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	0.6	22.5		5.3	27.2		21.2	21.2			3.9	
Effective Green, g (s)	0.6	22.5		5.3	27.2		21.2	21.2			3.9	
Actuated g/C Ratio	0.01	0.33		0.08	0.39		0.31	0.31			0.06	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	14	599		122	735		487	489			99	
v/s Ratio Prot	0.01	0.20		c0.05	c0.34		c0.19	0.04			c0.02	
v/s Ratio Perm												
v/c Ratio	0.64	0.62		0.69	0.85		0.62	0.14			0.28	
Uniform Delay, d1	34.0	19.6		31.0	19.0		20.4	17.3			31.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	71.2	2.0		15.0	9.5		5.7	0.6			1.5	
Delay (s)	105.2	21.6		46.0	28.5		26.1	17.9			32.7	
Level of Service	F	C		D	C		C	B			C	
Approach Delay (s)		23.6			30.5			22.6			32.7	
Approach LOS		C			C			C			C	

Intersection Summary					
HCM Average Control Delay	26.5	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.69				
Actuated Cycle Length (s)	68.9	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	69.0%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

AM Existing + Cumulative
37: Pala Rd (SR-76) & Pala Mission Rd

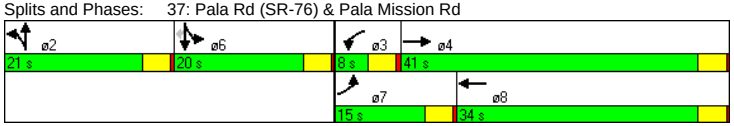
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	SBT	SBR
Lane Configurations							
Volume (vph)	238	430	16	252	23	11	159
Turn Type	Prot		Prot		Split		Perm
Protected Phases	7	4	3	8	2	6	
Permitted Phases							6
Detector Phases	7	4	3	8	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	41.0	8.0	34.0	21.0	20.0	20.0
Total Split (%)	16.7%	45.6%	8.9%	37.8%	23.3%	22.2%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	None	None
Act Effct Green (s)	11.3	29.4	4.1	15.2	17.5	7.6	7.6
Actuated g/C Ratio	0.17	0.45	0.06	0.23	0.27	0.11	0.11
v/c Ratio	0.92	0.30	0.19	0.69	0.06	0.21	0.54
Control Delay	70.9	13.3	40.9	31.7	23.0	31.4	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	13.3	40.9	31.7	23.0	31.4	12.7
LOS	E	B	D	C	C	C	B
Approach Delay		33.3		32.2		16.5	
Approach LOS		C		C		B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 65.6
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 30.1 Intersection LOS: C
Intersection Capacity Utilization 48.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 37: Pala Rd (SR-76) & Pala Mission Rd



LOS Engineering

AM Existing + Cumulative
37: Pala Rd (SR-76) & Pala Mission Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		0	200		0	0		50
Storage Lanes	1		0	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.984							0.850
Flt Protected	0.950			0.950			0.950				0.965	
Satd. Flow (prot)	1583	3522	0	1583	1833	0	1583	1863	0	0	1798	1417
Flt Permitted	0.950			0.950			0.950				0.965	
Satd. Flow (perm)	1583	3522	0	1583	1833	0	1583	1863	0	0	1798	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			7							167
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		941			1076			1007			1565	
Travel Time (s)		21.4			24.5			22.9			35.6	
Volume (vph)	238	430	16	16	252	29	23	0	0	29	11	159
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	251	453	17	17	265	31	24	0	0	31	12	167
Lane Group Flow (vph)	251	470	0	17	296	0	24	0	0	0	43	167
v/c Ratio	0.92	0.30		0.19	0.69		0.06				0.21	0.54
Control Delay	70.9	13.3		40.9	31.7		23.0				31.4	12.7
Queue Delay	0.0	0.0		0.0	0.0		0.0				0.0	0.0
Total Delay	70.9	13.3		40.9	31.7		23.0				31.4	12.7
Queue Length 50th (ft)	103	58		7	107		7				16	0
Queue Length 95th (ft)	#291	122		28	197		29				47	52
Internal Link Dist (ft)		861			996			927			1485	
Turn Bay Length (ft)	250			250			200					50
Base Capacity (vph)	274	1796		90	696		423				382	433
Starvation Cap Reductn	0	0		0	0		0				0	0
Spillback Cap Reductn	0	0		0	0		0				0	0
Storage Cap Reductn	0	0		0	0		0				0	0
Reduced v/c Ratio	0.92	0.26		0.19	0.43		0.06				0.11	0.39

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative

37: Pala Rd (SR-76) & Pala Mission Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0				4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00				1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00				1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95				0.97	1.00
Satd. Flow (prot)	1583	3520		1583	1833		1583				1798	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95				0.97	1.00
Satd. Flow (perm)	1583	3520		1583	1833		1583				1798	1417
Volume (vph)	238	430	16	16	252	29	23	0	0	29	11	159
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	251	453	17	17	265	31	24	0	0	31	12	167
RTOR Reduction (vph)	0	3	0	0	5	0	0	0	0	0	0	152
Lane Group Flow (vph)	251	467	0	17	291	0	24	0	0	0	43	15
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												6
Actuated Green, G (s)	11.3	29.4		0.7	18.8		17.5				6.1	6.1
Effective Green, g (s)	11.3	29.4		0.7	18.8		17.5				6.1	6.1
Actuated g/C Ratio	0.16	0.42		0.01	0.27		0.25				0.09	0.09
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0				4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0				3.0	3.0
Lane Grp Cap (vph)	257	1485		16	494		397				157	124
v/s Ratio Prot	c0.16	0.13		0.01	c0.16		c0.02				c0.02	
v/s Ratio Perm												0.01
v/c Ratio	0.98	0.31		1.06	0.59		0.06				0.27	0.12
Uniform Delay, d1	29.1	13.4		34.5	22.1		19.8				29.7	29.3
Progression Factor	1.00	1.00		1.00	1.00		1.00				1.00	1.00
Incremental Delay, d2	49.1	0.1		246.4	1.8		0.3				0.9	0.4
Delay (s)	78.2	13.6		280.9	23.9		20.1				30.7	29.7
Level of Service	E	B		F	C		C				C	C
Approach Delay (s)		36.1			37.9			20.1			29.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	69.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Cumulative
1: Pala Rd (SR-76) & Via Monserate

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	50	2041	1533	110	50	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	2148	1614	116	53	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1729				3925	1672
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1729				3925	1672
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				0	82
cM capacity (veh/h)	370				3	120

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	53	2148	1729	21
Volume Left	53	0	0	0
Volume Right	0	0	116	21
cSH	370	1700	1700	120
Volume to Capacity	0.14	1.26	1.02	0.18
Queue Length 95th (ft)	12	0	0	15
Control Delay (s)	16.3	0.0	0.0	41.3
Lane LOS	C			E
Approach Delay (s)	0.4		0.0	Err
Approach LOS				F

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		Err%	ICU Level of Service H
Analysis Period (min)		15	

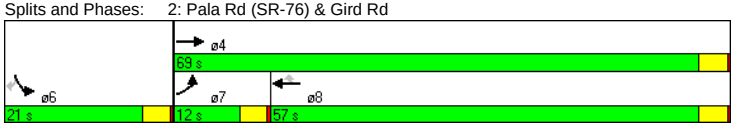
PM Existing + Cumulative
2: Pala Rd (SR-76) & Gird Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	220	1681	1273	120	60	80
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	69.0	57.0	57.0	21.0	21.0
Total Split (%)	13.3%	76.7%	63.3%	63.3%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	8.0	65.1	53.1	53.1	8.6	8.6
Actuated g/C Ratio	0.10	0.80	0.65	0.65	0.11	0.11
v/c Ratio	1.50	1.19	1.11	0.14	0.38	0.37
Control Delay	284.0	107.8	78.6	5.6	40.4	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	284.0	107.8	78.6	5.6	40.4	13.3
LOS	F	F	E	A	D	B
Approach Delay		128.2	72.3		24.9	
Approach LOS		F	E		C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 81.7		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.50		
Intersection Signal Delay: 101.3		Intersection LOS: F
Intersection Capacity Utilization 98.9%		ICU Level of Service F
Analysis Period (min) 15		

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				16		84
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	220	1681	1273	120	60	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1769	1340	126	63	84
Lane Group Flow (vph)	232	1769	1340	126	63	84
v/c Ratio	1.50	1.19	1.11	0.14	0.38	0.37
Control Delay	284.0	107.8	78.6	5.6	40.4	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	284.0	107.8	78.6	5.6	40.4	13.3
Queue Length 50th (ft)	~167	~1108	~793	19	31	0
Queue Length 95th (ft)	#317	#1449	#1103	44	68	39
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	155	1484	1210	926	299	336
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.50	1.19	1.11	0.14	0.21	0.25

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Volume (vph)	220	1681	1273	120	60	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1769	1340	126	63	84
RTOR Reduction (vph)	0	0	0	6	0	75
Lane Group Flow (vph)	232	1769	1340	120	63	9
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	8.0	65.1	53.1	53.1	8.6	8.6
Effective Green, g (s)	8.0	65.1	53.1	53.1	8.6	8.6
Actuated g/C Ratio	0.10	0.80	0.65	0.65	0.11	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	1484	1211	921	167	149
v/s Ratio Prot	c0.15	c0.95	0.72		c0.04	
v/s Ratio Perm				0.08		0.01
v/c Ratio	1.50	1.19	1.11	0.13	0.38	0.06
Uniform Delay, d1	36.9	8.3	14.3	5.5	34.1	32.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	254.3	93.4	60.2	0.1	1.4	0.2
Delay (s)	291.2	101.7	74.5	5.5	35.5	33.1
Level of Service	F	F	E	A	D	C
Approach Delay (s)		123.7	68.6		34.1	
Approach LOS		F	E		C	

Intersection Summary				
HCM Average Control Delay	97.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	81.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

PM Existing + Cumulative
3: Pala Rd (SR-76) & Sage Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	1521	1533	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1601	1614	11	11	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1624				3241	1619
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1624				3241	1619
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				0	92
cM capacity (veh/h)	400				10	127

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	11	1601	1624	21
Volume Left	11	0	0	11
Volume Right	0	0	11	11
cSH	400	1700	1700	19
Volume to Capacity	0.03	0.94	0.96	1.12
Queue Length 95th (ft)	2	0	0	74
Control Delay (s)	14.2	0.0	0.0	533.3
Lane LOS	B			F
Approach Delay (s)	0.1		0.0	533.3
Approach LOS				F

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		

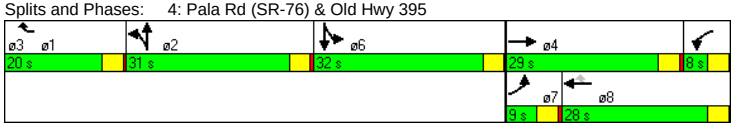
PM Existing + Cumulative
4: Pala Rd (SR-76) & Old Hwy 395

Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Configurations							
Volume (vph)	83	968	100	927	290	267	190
Turn Type	Prot		Prot		custom		
Protected Phases	7	4	3	8	1	2	6
Permitted Phases					8		
Detector Phases	7	4	3	8	1	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	29.0	8.0	28.0	20.0	31.0	32.0
Total Split (%)	7.5%	24.2%	6.7%	23.3%	16.7%	25.8%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	Min
Act Effct Green (s)	5.0	25.0	4.0	24.0	33.9	27.0	28.0
Actuated g/C Ratio	0.05	0.23	0.04	0.22	0.31	0.25	0.25
v/c Ratio	1.21	1.46	1.81	1.26	0.53	1.48	1.51
Control Delay	217.9	245.9	458.1	165.3	14.7	261.0	271.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	217.9	245.9	458.1	165.3	14.7	261.0	271.6
LOS	F	F	F	F	B	F	F
Approach Delay		243.9		154.4		261.0	271.6
Approach LOS		F		F		F	F

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 109.9			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.81			
Intersection Signal Delay: 220.4		Intersection LOS: F	
Intersection Capacity Utilization 104.3%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



PM Existing + Cumulative
4: Pala Rd (SR-76) & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981				0.850		0.970			0.974	
Flt Protected	0.950			0.950				0.983			0.975	
Satd. Flow (prot)	1583	3472	0	1583	3539	1417	0	1776	0	0	1769	0
Flt Permitted	0.950			0.950				0.983			0.975	
Satd. Flow (perm)	1583	3472	0	1583	3539	1417	0	1776	0	0	1769	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12				197		11			9	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	83	968	140	100	927	290	220	267	140	340	190	126
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	1019	147	105	976	305	232	281	147	358	200	133
Lane Group Flow (vph)	87	1166	0	105	976	305	0	660	0	0	691	0
v/c Ratio	1.21	1.46		1.81	1.26	0.53		1.48			1.51	
Control Delay	217.9	245.9		458.1	165.3	14.7		261.0			271.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	217.9	245.9		458.1	165.3	14.7		261.0			271.6	
Queue Length 50th (ft)	~75	~594		~112	~455	57		~643			~681	
Queue Length 95th (ft)	#181	#735		#225	#589	144		#876			#917	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	72	799		58	773	604		445			458	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	1.21	1.46		1.81	1.26	0.50		1.48			1.51	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative
4: Pala Rd (SR-76) & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (prot)	1583	3472		1583	3539	1417		1776			1769	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (perm)	1583	3472		1583	3539	1417		1776			1769	
Volume (vph)	83	968	140	100	927	290	220	267	140	340	190	126
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	87	1019	147	105	976	305	232	281	147	358	200	133
RTOR Reduction (vph)	0	9	0	0	0	143	0	8	0	0	7	0
Lane Group Flow (vph)	87	1157	0	105	976	162	0	652	0	0	684	0
Turn Type	Prot			Prot		custom	Split			Split		
Protected Phases	7	4		3	8	1	2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.0	25.0		4.0	24.0	29.9		27.0			28.0	
Effective Green, g (s)	5.0	25.0		4.0	24.0	29.9		27.0			28.0	
Actuated g/C Ratio	0.05	0.23		0.04	0.22	0.27		0.25			0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	72	790		58	773	437		436			451	
v/s Ratio Prot	0.05	c0.33		0.07	c0.28	c0.02		c0.37			c0.39	
v/s Ratio Perm						0.09						
v/c Ratio	1.21	1.46		1.81	1.26	0.37		1.49			1.52	
Uniform Delay, d1	52.5	42.5		53.0	43.0	32.4		41.5			41.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	172.5	215.9		424.2	128.5	0.5		234.5			243.9	
Delay (s)	225.0	258.3		477.2	171.4	32.9		275.9			284.9	
Level of Service	F	F		F	F	C		F			F	
Approach Delay (s)		256.0			164.1			275.9			284.9	
Approach LOS		F			F			F			F	

Intersection Summary				
HCM Average Control Delay	232.4	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.34			
Actuated Cycle Length (s)	109.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	104.3%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	10	10	1227	8	10	510
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	11	1292	8	11	537
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		13				
Median type	None					
Median storage veh)						
Upstream signal (ft)						899
pX, platoon unblocked						
vC, conflicting volume	1854	1296			1300	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1854	1296			1300	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	87	95			98	
cM capacity (veh/h)	80	198			533	

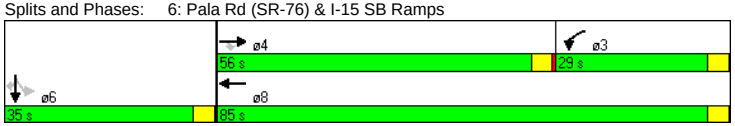
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	21	1300	547
Volume Left	11	0	11
Volume Right	11	8	0
cSH	159	1700	533
Volume to Capacity	0.13	0.76	0.02
Queue Length 95th (ft)	11	0	2
Control Delay (s)	40.6	0.0	0.6
Lane LOS	E		A
Approach Delay (s)	40.6	0.0	0.6
Approach LOS	E		

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		75.1%	ICU Level of Service D
Analysis Period (min)		15	

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Volume (vph)	1118	300	298	827	10	520
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6	
Permitted Phases		4				6
Detector Phases	4	4	3	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	56.0	56.0	29.0	85.0	35.0	35.0
Total Split (%)	46.7%	46.7%	24.2%	70.8%	29.2%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	52.0	52.0	24.7	80.7	31.3	31.3
Actuated g/C Ratio	0.43	0.43	0.21	0.67	0.26	0.26
v/c Ratio	1.46	0.45	0.96	0.70	0.53	1.05
Control Delay	242.1	13.8	71.5	28.9	43.0	82.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	242.1	13.8	71.5	28.9	43.0	82.2
LOS	F	B	E	C	D	F
Approach Delay	193.8			40.2	70.1	
Approach LOS	F			D	E	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 40 (33%), Referenced to phase 2: and 6:SBTL, Start of Green		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.46		
Intersection Signal Delay: 113.1	Intersection LOS: F	
Intersection Capacity Utilization 110.1%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



PM Existing + Cumulative
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.954	
Satd. Flow (prot)	0	1863	1417	1583	1863	0	0	0	0	0	1777	1417
Flt Permitted				0.950							0.954	
Satd. Flow (perm)	0	1863	1417	1583	1863	0	0	0	0	0	1777	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156									202
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	1118	300	298	827	0	0	0	0	221	10	520
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1177	316	314	871	0	0	0	0	233	11	547
Lane Group Flow (vph)	0	1177	316	314	871	0	0	0	0	0	244	547
v/c Ratio		1.46	0.45	0.96	0.70						0.53	1.05
Control Delay		242.1	13.8	71.5	28.9						43.0	82.2
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		242.1	13.8	71.5	28.9						43.0	82.2
Queue Length 50th (ft)		~1247	80	228	634						163	~342
Queue Length 95th (ft)		#1504	159	m206	m573						249	#563
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		807	702	330	1258						463	519
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.46	0.45	0.95	0.69						0.53	1.05

Intersection Summary	
Area Type:	Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Existing + Cumulative
6: Pala Rd (SR-76) & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1778	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1778	1417
Volume (vph)	0	1118	300	298	827	0	0	0	0	221	10	520
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1177	316	314	871	0	0	0	0	233	11	547
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	0	0	0	149
Lane Group Flow (vph)	0	1177	228	314	871	0	0	0	0	0	244	398
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		52.0	52.0	24.7	80.7						31.3	31.3
Effective Green, g (s)		52.0	52.0	24.7	80.7						31.3	31.3
Actuated g/C Ratio		0.43	0.43	0.21	0.67						0.26	0.26
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		807	614	326	1253						464	370
v/s Ratio Prot		c0.63		c0.20	0.47							
v/s Ratio Perm			0.16								0.14	c0.28
v/c Ratio		1.46	0.37	0.96	0.70						0.53	1.07
Uniform Delay, d1		34.0	23.0	47.2	12.1						38.0	44.4
Progression Factor		1.00	1.00	1.36	2.28						1.00	1.00
Incremental Delay, d2		213.2	0.4	8.2	0.2						4.2	68.2
Delay (s)		247.2	23.3	72.4	27.7						42.2	112.5
Level of Service		F	C	E	C						D	F
Approach Delay (s)		199.8			39.6			0.0			90.8	
Approach LOS		F			D			A			F	

Intersection Summary					
HCM Average Control Delay	120.2	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.23				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	110.1%	ICU Level of Service	H		
Analysis Period (min)	15				
c Critical Lane Group					

LOS Engineering

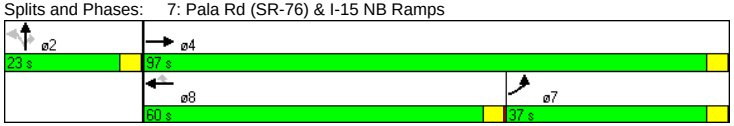
PM Existing + Cumulative
7: Pala Rd (SR-76) & I-15 NB Ramps

Timings

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Volume (vph)	600	769	765	257	10	242
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		2	
Permitted Phases				8		2
Detector Phases	7	4	8	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	97.0	60.0	60.0	23.0	23.0
Total Split (%)	30.8%	80.8%	50.0%	50.0%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	35.1	93.0	53.9	53.9	19.0	19.0
Actuated g/C Ratio	0.29	0.78	0.45	0.45	0.16	0.16
v/c Ratio	1.37	0.56	0.96	0.41	1.54	0.58
Control Delay	205.7	15.6	55.6	18.8	293.9	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	205.7	15.6	55.6	18.8	293.9	11.2
LOS	F	B	E	B	F	B
Approach Delay		99.0	46.3		189.0	
Approach LOS		F	D		F	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.54		
Intersection Signal Delay: 100.6	Intersection LOS: F	
Intersection Capacity Utilization 110.1%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



PM Existing + Cumulative
7: Pala Rd (SR-76) & I-15 NB Ramps

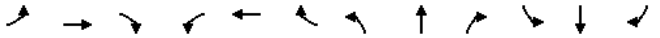
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	1583	1863	0	0	1863	1417	0	1777	1417	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	1583	1863	0	0	1863	1417	0	1777	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						57			255			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	600	769	0	0	765	257	400	10	242	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	809	0	0	805	271	421	11	255	0	0	0
Lane Group Flow (vph)	632	809	0	0	805	271	0	432	255	0	0	0
v/c Ratio	1.37	0.56			0.96	0.41		1.54	0.58			
Control Delay	205.7	15.6			55.6	18.8		293.9	11.2			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	205.7	15.6			55.6	18.8		293.9	11.2			
Queue Length 50th (ft)	~659	429			571	104		~470	0			
Queue Length 95th (ft)	m#438	m333			#839	172		#671	78			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	463	1444			869	692		281	439			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	1.37	0.56			0.93	0.39		1.54	0.58			

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

PM Existing + Cumulative
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis



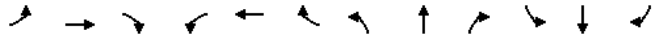
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1776	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1776	1417			
Volume (vph)	600	769	0	0	765	257	400	10	242	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	809	0	0	805	271	421	11	255	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	31	0	0	215	0	0	0
Lane Group Flow (vph)	632	809	0	0	805	240	0	432	40	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	35.1	93.0			53.9	53.9		19.0	19.0			
Effective Green, g (s)	35.1	93.0			53.9	53.9		19.0	19.0			
Actuated g/C Ratio	0.29	0.78			0.45	0.45		0.16	0.16			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	463	1444			837	636		281	224			
v/s Ratio Prot	c0.40	0.43			c0.43							
v/s Ratio Perm						0.17		0.24	0.03			
v/c Ratio	1.37	0.56			0.96	0.38		1.54	0.18			
Uniform Delay, d1	42.5	5.4			32.1	21.9		50.5	43.8			
Progression Factor	1.27	2.76			1.00	1.00		1.00	1.00			
Incremental Delay, d2	165.6	0.0			22.1	0.4		258.9	1.8			
Delay (s)	219.6	14.9			54.2	22.3		309.4	45.5			
Level of Service	F	B			D	C		F	D			
Approach Delay (s)		104.7			46.2			211.5			0.0	
Approach LOS		F			D			F			A	

Intersection Summary			
HCM Average Control Delay	107.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Cumulative
8: Pala Rd (SR-76) & Pankey Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	145	578	328	80	455	83	315	382	131	106	447	197
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	153	608	345	84	479	87	332	402	138	112	471	207
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	566			954			2220	1821	781	2116	1950	523
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	566			954			2220	1821	781	2116	1950	523
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	85			88			0	0	65	0	0	63
cM capacity (veh/h)	1006			721			0	58	395	0	48	554

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1106	651	872	789
Volume Left	153	84	332	112
Volume Right	345	87	138	207
cSH	1006	721	0	0
Volume to Capacity	0.15	0.12	Err	Err
Queue Length 95th (ft)	13	10	Err	Err
Control Delay (s)	4.0	3.0	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	4.0	3.0	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	176.4%	ICU Level of Service	H
Analysis Period (min)	15		

LOS Engineering

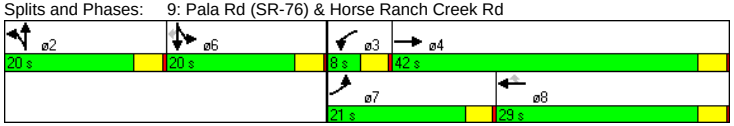
PM Existing + Cumulative
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	343	500	550	55	21	0	126		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	21.0	42.0	29.0	29.0	20.0	20.0	20.0	20.0	8.0
Total Split (%)	23.3%	46.7%	32.2%	32.2%	22.2%	22.2%	22.2%	22%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	11.5	30.1	14.4	14.4	6.7	6.7	6.7		
Actuated g/C Ratio	0.21	0.55	0.26	0.26	0.12	0.12	0.12		
v/c Ratio	0.56	0.27	0.62	0.14	0.11	0.28	0.31		
Control Delay	23.8	6.6	21.2	6.3	26.4	11.8	11.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	23.8	6.6	21.2	6.3	26.4	11.8	11.9		
LOS	C	A	C	A	C	B	B		
Approach Delay		13.6	19.9			13.8			
Approach LOS		B	B			B			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 54.7			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 39.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



LOS Engineering

PM Existing + Cumulative
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		250	0		0	150		150
Storage Lanes	2		0	1		1	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt						0.850					0.852	0.850
Flt Protected	0.950									0.950	0.999	
Satd. Flow (prot)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1443	1346
Flt Permitted	0.950									0.950	0.999	
Satd. Flow (perm)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1443	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						58					64	69
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2833			5160			734			1509	
Travel Time (s)		64.4			117.3			16.7			34.3	
Volume (vph)	343	500	0	0	550	55	0	0	0	21	0	126
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	361	526	0	0	579	58	0	0	0	22	0	133
Lane Group Flow (vph)	361	526	0	0	579	58	0	0	0	21	65	69
v/c Ratio	0.56	0.27			0.62	0.14				0.11	0.28	0.31
Control Delay	23.8	6.6			21.2	6.3				26.4	11.8	11.9
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	23.8	6.6			21.2	6.3				26.4	11.8	11.9
Queue Length 50th (ft)	53	40			83	0				6	0	0
Queue Length 95th (ft)	107	68			152	23				28	35	34
Internal Link Dist (ft)		2753			5080			654			1429	
Turn Bay Length (ft)	250					250				150		150
Base Capacity (vph)	879	2185			1369	584				382	414	393
Starvation Cap Reductn	0	0			0	0				0	0	0
Spillback Cap Reductn	0	0			0	0				0	0	0
Storage Cap Reductn	0	0			0	0				0	0	0
Reduced v/c Ratio	0.41	0.24			0.42	0.10				0.05	0.16	0.18

Intersection Summary	
Area Type:	Other

LOS Engineering

PM Existing + Cumulative

9: Pala Rd (SR-76) & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.85	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3072	3539			3539	1417				1504	1444	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3072	3539			3539	1417				1504	1444	1346
Volume (vph)	343	500	0	0	550	55	0	0	0	21	0	126
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	361	526	0	0	579	58	0	0	0	22	0	133
RTOR Reduction (vph)	0	0	0	0	0	42	0	0	0	0	56	61
Lane Group Flow (vph)	361	526	0	0	579	16	0	0	0	21	9	8
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	11.5	30.1			14.6	14.6				6.7	6.7	6.7
Effective Green, g (s)	11.5	30.1			14.6	14.6				6.7	6.7	6.7
Actuated g/C Ratio	0.21	0.55			0.27	0.27				0.12	0.12	0.12
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	648	1955			948	380				185	178	165
v/s Ratio Prot	c0.12	0.15			c0.16					c0.01	0.01	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.56	0.27			0.61	0.04				0.11	0.05	0.05
Uniform Delay, d1	19.2	6.4			17.5	14.8				21.3	21.1	21.1
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	1.0	0.1			1.2	0.0				0.3	0.1	0.1
Delay (s)	20.3	6.5			18.6	14.8				21.5	21.2	21.2
Level of Service	C	A			B	B				C	C	C
Approach Delay (s)		12.1			18.3			0.0			21.3	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM Average Control Delay	15.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	21.7	
Intersection Capacity Utilization	39.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing + Cumulative

10: Pala Rd (SR-76) & Rice Canyon Rd — HCM Unsignalized Intersection Capacity Analysis

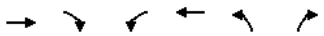
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	44	945	1159	30	50	65
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	46	995	1220	32	53	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1252				2323	1236
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1252				2323	1236
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				0	68
cM capacity (veh/h)	556				38	215

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1041	1252	121
Volume Left	46	0	53
Volume Right	0	32	68
cSH	556	1700	71
Volume to Capacity	0.08	0.74	1.71
Queue Length 95th (ft)	7	0	265
Control Delay (s)	2.9	0.0	472.0
Lane LOS	A		F
Approach Delay (s)	2.9	0.0	472.0
Approach LOS			F

Intersection Summary			
Average Delay	24.9		
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

LOS Engineering

PM Existing + Cumulative
11: Pala Rd (SR-76) & Couser Canyon Rd — HCM Unsignalized Intersection Capacity Analysis



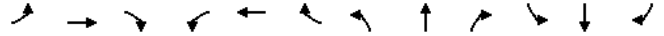
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	855	50	30	1102	47	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	900	53	32	1160	49	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			953		2149	926
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			953		2149	926
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		2	97
cM capacity (veh/h)			721		51	326

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	953	1192	60
Volume Left	0	32	49
Volume Right	53	0	11
cSH	1700	721	59
Volume to Capacity	0.56	0.04	1.01
Queue Length 95th (ft)	0	3	119
Control Delay (s)	0.0	1.6	233.2
Lane LOS		A	F
Approach Delay (s)	0.0	1.6	233.2
Approach LOS			F

Intersection Summary			
Average Delay		7.2	
Intersection Capacity Utilization		92.4%	ICU Level of Service F
Analysis Period (min)		15	

LOS Engineering

PM Existing + Cumulative
12: Pala Mesa Dr & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	150	105	200	110	129	183	110	810	108	160	480	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	158	111	211	116	136	193	116	853	114	168	505	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2229	2082	547	2249	2067	909	589			966		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2229	2082	547	2249	2067	909	589			966		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	61	0	0	42	88			76		
cM capacity (veh/h)	0	36	537	0	37	333	986			713		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	479	116	328	116	966	168	589
Volume Left	158	116	0	116	0	168	0
Volume Right	211	0	193	0	114	0	84
cSH	0	0	77	986	1700	713	1700
Volume to Capacity	Err	Err	4.29	0.12	0.57	0.24	0.35
Queue Length 95th (ft)	Err	Err	Err	10	0	23	0
Control Delay (s)	Err	Err	Err	9.1	0.0	11.6	0.0
Lane LOS	F	F	F	A		B	
Approach Delay (s)	Err	Err		1.0		2.6	
Approach LOS	F	F					

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		116.5%	ICU Level of Service H
Analysis Period (min)		15	

LOS Engineering

PM Existing + Cumulative
13: Pala Mesa Dr & Wilt Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	49	0	23	60	30	0	50	85	28	20	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	52	0	24	63	32	0	53	89	29	21	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	95			52			221	216	52	316	200	79
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			52			221	216	52	316	200	79
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	92	91	95	97	99
cM capacity (veh/h)	1512			1567			702	670	1022	540	684	987

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	62	119	142	61
Volume Left	11	24	0	29
Volume Right	0	32	89	11
cSH	1512	1567	856	636
Volume to Capacity	0.01	0.02	0.17	0.10
Queue Length 95th (ft)	1	1	15	8
Control Delay (s)	1.3	1.6	10.0	11.3
Lane LOS	A	A	B	B
Approach Delay (s)	1.3	1.6	10.0	11.3
Approach LOS			B	B

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	30.1%	ICU Level of Service		A
Analysis Period (min)	15			

LOS Engineering

PM Existing + Cumulative
14: Stewart Canyon Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	16	30	23	6	234	60	669	19	296	663	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	17	32	24	6	246	63	704	20	312	698	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2443	2214	740	2202	2246	714	782			724		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2443	2214	740	2202	2246	714	782			724		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	36	92	0	75	43	92			65		
cM capacity (veh/h)	5	26	417	10	25	431	836			878		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	59	277	63	724	312	782
Volume Left	11	24	63	0	312	0
Volume Right	32	246	0	20	0	84
cSH	21	87	836	1700	878	1700
Volume to Capacity	2.76	3.17	0.08	0.43	0.35	0.46
Queue Length 95th (ft)	190	Err	6	0	40	0
Control Delay (s)	1175.1	Err	9.7	0.0	11.3	0.0
Lane LOS	F	F	A		B	
Approach Delay (s)	1175.1	Err	0.8		3.2	
Approach LOS	F	F				

Intersection Summary				
Average Delay	1281.8			
Intersection Capacity Utilization	83.0%	ICU Level of Service		E
Analysis Period (min)	15			

LOS Engineering

PM Existing + Cumulative
15: Reche Rd & Old Hwy 395

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	290	205	831	212	60	350
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	305	216	875	223	63	368
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2220	247	432			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2220	247	432			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	73	22			
cM capacity (veh/h)	11	791	1128			

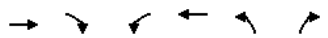
Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	521	875	223	432
Volume Left	305	875	0	0
Volume Right	216	0	0	368
cSH	18	1128	1700	1700
Volume to Capacity	28.70	0.78	0.13	0.25
Queue Length 95th (ft)	Err	206	0	0
Control Delay (s)	Err	18.2	0.0	0.0
Lane LOS	F	C		
Approach Delay (s)	Err	14.5		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	2548.6		
Intersection Capacity Utilization	118.2%	ICU Level of Service	H
Analysis Period (min)	15		

LOS Engineering

PM Existing + Cumulative
16: Reche Rd & Tecalote Dr

HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	392	30	0	494	20	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	413	32	0	520	21	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			444		948	428
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			444		948	428
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		93	98
cM capacity (veh/h)			1116		289	626

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	444	520	32
Volume Left	0	0	21
Volume Right	32	0	11
cSH	1700	1116	353
Volume to Capacity	0.26	0.00	0.09
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.0	0.0	16.2
Lane LOS			C
Approach Delay (s)	0.0	0.0	16.2
Approach LOS			C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing + Cumulative
17: Reche Rd & Wilt Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	442	30	30	404	30	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	465	32	32	425	32	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			497		969	481
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			497		969	481
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		88	98
cM capacity (veh/h)			1067		273	585

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	497	457	42
Volume Left	0	32	32
Volume Right	32	0	11
cSH	1700	1067	315
Volume to Capacity	0.29	0.03	0.13
Queue Length 95th (ft)	0	2	11
Control Delay (s)	0.0	0.9	18.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.9	18.2
Approach LOS			C

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

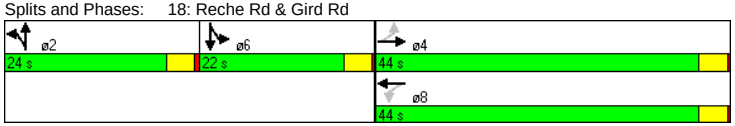
PM Existing + Cumulative
18: Reche Rd & Gird Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations						
Volume (vph)	10	462	50	364	10	10
Turn Type	Perm		Perm			
Protected Phases		4		8	2	6
Permitted Phases	4		8			
Detector Phases	4	4	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	44.0	44.0	44.0	44.0	24.0	22.0
Total Split (%)	48.9%	48.9%	48.9%	48.9%	26.7%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	22.1	22.1	22.1	22.1	10.6	6.3
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.20	0.12
v/c Ratio	0.04	0.79	0.38	0.51	0.52	0.05
Control Delay	9.3	20.6	19.5	13.3	24.7	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	20.6	19.5	13.3	24.7	28.3
LOS	A	C	B	B	C	C
Approach Delay		20.4		14.0	24.7	28.3
Approach LOS		C		B	C	C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 52.1			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 18.8		Intersection LOS: B	
Intersection Capacity Utilization 61.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 18: Reche Rd & Gird Rd



PM Existing + Cumulative
18: Reche Rd & Gird Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	50		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.969			0.992			0.970				
Flt Protected	0.950			0.950				0.965				
Satd. Flow (prot)	1583	1805	0	1583	1848	0	0	1744	0	0	1863	0
Flt Permitted	0.387			0.197				0.965				
Satd. Flow (perm)	645	1805	0	328	1848	0	0	1744	0	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			4			15				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		6958			6851			1674			1091	
Travel Time (s)		158.1			155.7			38.0			24.8	
Volume (vph)	10	462	120	50	364	20	130	10	40	0	10	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	486	126	53	383	21	137	11	42	0	11	0
Lane Group Flow (vph)	11	612	0	53	404	0	0	190	0	0	11	0
v/c Ratio	0.04	0.79		0.38	0.51			0.52			0.05	
Control Delay	9.3	20.6		19.5	13.3			24.7			28.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	9.3	20.6		19.5	13.3			24.7			28.3	
Queue Length 50th (ft)	2	136		10	78			45			3	
Queue Length 95th (ft)	10	303		42	176			132			20	
Internal Link Dist (ft)		6878			6771			1594			1011	
Turn Bay Length (ft)	50			50								
Base Capacity (vph)	376	1060		191	1079			598			550	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.58		0.28	0.37			0.32			0.02	

Intersection Summary	
Area Type:	Other

LOS Engineering

PM Existing + Cumulative
18: Reche Rd & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	0.99			0.97			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.97			1.00	
Satd. Flow (prot)	1583	1805		1583	1848			1744			1863	
Flt Permitted	0.42	1.00		0.22	1.00			0.97			1.00	
Satd. Flow (perm)	702	1805		366	1848			1744			1863	
Volume (vph)	10	462	120	50	364	20	130	10	40	0	10	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	486	126	53	383	21	137	11	42	0	11	0
RTOR Reduction (vph)	0	11	0	0	2	0	0	12	0	0	0	0
Lane Group Flow (vph)	11	601	0	53	402	0	0	178	0	0	11	0
Turn Type	Perm			Perm			Split			Split		
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8								
Actuated Green, G (s)	22.1	22.1		22.1	22.1			10.6			6.3	
Effective Green, g (s)	22.1	22.1		22.1	22.1			10.6			6.3	
Actuated g/C Ratio	0.43	0.43		0.43	0.43			0.21			0.12	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	304	782		159	801			362			230	
v/s Ratio Prot		c0.33			0.22			c0.10			c0.01	
v/s Ratio Perm	0.02			0.14								
v/c Ratio	0.04	0.77		0.33	0.50			0.49			0.05	
Uniform Delay, d1	8.3	12.3		9.6	10.5			17.8			19.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	4.6		1.2	0.5			1.1			0.1	
Delay (s)	8.4	16.9		10.8	11.0			18.9			19.8	
Level of Service	A	B		B	B			B			B	
Approach Delay (s)		16.7			10.9			18.9			19.8	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	15.0	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.58				
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

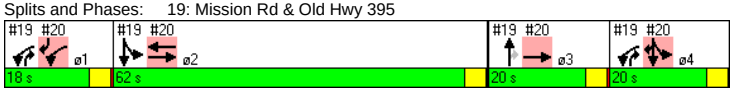
LOS Engineering

PM Existing + Cumulative
19: Mission Rd & Old Hwy 395 Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	246	840	103	219	1050	54		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	38.0	0.0	20.0	38.0	62.0	62.0	18.0	20.0
Total Split (%)	31.7%	0.0%	16.7%	31.7%	51.7%	51.7%	15%	17%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	32.5	118.5	16.0	52.5	58.0	58.0		
Actuated g/C Ratio	0.27	1.00	0.14	0.44	0.49	0.49		
v/c Ratio	0.60	0.62	0.43	0.37	1.43	0.06		
Control Delay	48.8	3.0	53.4	24.0	226.5	16.7		
Queue Delay	0.0	0.0	0.0	0.4	6.7	0.0		
Total Delay	48.8	3.0	53.4	24.4	233.2	16.7		
LOS	D	A	D	C	F	B		
Approach Delay	13.4		33.7			222.5		
Approach LOS	B		C			F		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 118.5			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 107.9		Intersection LOS: F	
Intersection Capacity Utilization 93.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 19: Mission Rd & Old Hwy 395



PM Existing + Cumulative
19: Mission Rd & Old Hwy 395 Queues

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	246	840	103	219	1050	54
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	259	884	108	231	1105	57
Lane Group Flow (vph)	259	884	108	231	1105	57
v/c Ratio	0.60	0.62	0.43	0.37	1.43	0.06
Control Delay	48.8	3.0	53.4	24.0	226.5	16.7
Queue Delay	0.0	0.0	0.0	0.4	6.7	0.0
Total Delay	48.8	3.0	53.4	24.4	233.2	16.7
Queue Length 50th (ft)	167	63	78	115	~1164	23
Queue Length 95th (ft)	m222	m46	137	180	#1422	47
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	444	1417	251	636	775	912
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	128	8	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.62	0.43	0.45	1.44	0.06

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

PM Existing + Cumulative
19: Mission Rd & Old Hwy 395 HCM Signalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Volume (vph)	246	840	103	219	1050	54
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	259	884	108	231	1105	57
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	259	884	108	231	1105	57
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	32.5	118.5	16.0	48.5	58.0	58.0
Effective Green, g (s)	32.5	118.5	16.0	48.5	58.0	58.0
Actuated g/C Ratio	0.27	1.00	0.14	0.41	0.49	0.49
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	434	1417	252	628	775	912
v/s Ratio Prot	0.16		0.06	0.10	c0.70	0.03
v/s Ratio Perm		c0.62		0.06		
v/c Ratio	0.60	0.62	0.43	0.37	1.43	0.06
Uniform Delay, d1	37.3	0.0	47.1	24.3	30.2	15.9
Progression Factor	1.18	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.4	1.2	0.4	199.1	0.0
Delay (s)	45.6	1.4	48.2	24.7	229.3	16.0
Level of Service	D	A	D	C	F	B
Approach Delay (s)	11.4		32.2			218.9
Approach LOS	B		C			F

Intersection Summary			
HCM Average Control Delay	105.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	4.0
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

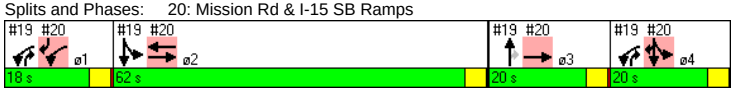
LOS Engineering

PM Existing + Cumulative
20: Mission Rd & I-15 SB Ramps Timings

Lane Group	EBT	WBL	WBT	SBT	SBR	ø3
Lane Configurations						
Volume (vph)	1159	80	484	10	602	
Turn Type		Prot			custom	
Protected Phases	2 3	1	2	4	1 4	3
Permitted Phases					4	
Detector Phases	2 3	1	2	4	1 4	
Minimum Initial (s)		4.0	4.0	4.0		4.0
Minimum Split (s)		8.0	20.0	20.0		20.0
Total Split (s)	82.0	18.0	62.0	20.0	38.0	20.0
Total Split (%)	68.3%	15.0%	51.7%	16.7%	31.7%	17%
Yellow Time (s)		3.5	3.5	3.5		3.5
All-Red Time (s)		0.5	0.5	0.5		0.5
Lead/Lag		Lead	Lag	Lag		Lead
Lead-Lag Optimize?		Yes	Yes	Yes		Yes
Recall Mode		None	Min	None		None
Act Effct Green (s)	78.0	12.5	58.0	16.0	32.5	
Actuated g/C Ratio	0.66	0.11	0.49	0.14	0.27	
v/c Ratio	1.08	0.50	0.56	0.09	0.88	
Control Delay	48.9	60.9	24.5	46.7	27.0	
Queue Delay	96.1	0.0	0.0	0.4	0.0	
Total Delay	145.1	60.9	24.5	47.1	27.0	
LOS	F	E	C	D	C	
Approach Delay	145.1		29.6	27.6		
Approach LOS	F		C	C		

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 118.5
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.43
Intersection Signal Delay: 88.3 Intersection LOS: F
Intersection Capacity Utilization 84.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



LOS Engineering

PM Existing + Cumulative
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		0	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50					50	50	50
Trailing Detector (ft)		0		0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990										0.850
Flt Protected				0.950							0.976	
Satd. Flow (prot)	0	1844	0	1583	1863	0	0	0	0	0	1818	1417
Flt Permitted				0.950							0.976	
Satd. Flow (perm)	0	1844	0	1583	1863	0	0	0	0	0	1818	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7										453
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	1159	90	80	484	0	0	0	0	10	10	602
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1220	95	84	509	0	0	0	0	11	11	634
Lane Group Flow (vph)	0	1315	0	84	509	0	0	0	0	0	22	634
v/c Ratio		1.08		0.50	0.56						0.09	0.88
Control Delay		48.9		60.9	24.5						46.7	27.0
Queue Delay		96.1		0.0	0.0						0.4	0.0
Total Delay		145.1		60.9	24.5						47.1	27.0
Queue Length 50th (ft)		~1152		62	273						15	148
Queue Length 95th (ft)		m110		115	380						41	#395
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1217		187	912						245	723
Starvation Cap Reductn		206		0	0						0	0
Spillback Cap Reductn		198		0	0						96	0
Storage Cap Reductn		0		0	0						0	0
Reduced v/c Ratio		1.30		0.45	0.56						0.15	0.88

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Existing + Cumulative
20: Mission Rd & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.98	1.00
Satd. Flow (prot)		1845		1583	1863						1817	1417
Flt Permitted		1.00		0.95	1.00						0.98	1.00
Satd. Flow (perm)		1845		1583	1863						1817	1417
Volume (vph)	0	1159	90	80	484	0	0	0	0	10	10	602
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1220	95	84	509	0	0	0	0	11	11	634
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	329
Lane Group Flow (vph)	0	1313	0	84	509	0	0	0	0	0	22	305
Turn Type				Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases												4
Actuated Green, G (s)		78.0		12.5	58.0						16.0	32.5
Effective Green, g (s)		78.0		12.5	58.0						16.0	32.5
Actuated g/C Ratio		0.66		0.11	0.49						0.14	0.27
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1214		167	912						245	389
v/s Ratio Prot		c0.71		0.05	0.27						0.01	c0.22
v/s Ratio Perm												
v/c Ratio		1.08		0.50	0.56						0.09	0.78
Uniform Delay, d1		20.2		50.1	21.2						44.9	39.8
Progression Factor		0.31		1.00	1.00						1.00	1.00
Incremental Delay, d2		38.2		2.4	0.7						0.2	10.0
Delay (s)		44.5		52.4	22.0						45.0	49.7
Level of Service		D		D	C						D	D
Approach Delay (s)		44.5			26.3			0.0			49.6	
Approach LOS		D			C			A			D	

Intersection Summary				
HCM Average Control Delay	41.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	118.5	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	84.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

LOS Engineering

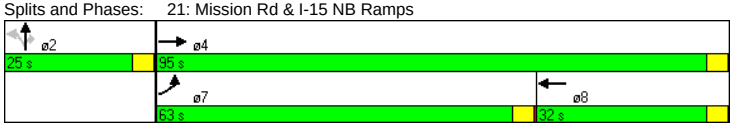
PM Existing + Cumulative
21: Mission Rd & I-15 NB Ramps

Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	916	273	214	10	170
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	63.0	95.0	32.0	25.0	25.0
Total Split (%)	52.5%	79.2%	26.7%	20.8%	20.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	59.1	82.1	19.0	21.0	21.0
Actuated g/C Ratio	0.53	0.74	0.17	0.19	0.19
v/c Ratio	1.14	0.21	0.74	1.13	0.45
Control Delay	106.3	4.8	57.5	130.3	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	106.3	4.8	57.5	130.3	13.5
LOS	F	A	E	F	B
Approach Delay		83.0	57.5	92.8	
Approach LOS		F	E	F	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 111.2		
Natural Cycle: 130		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.14		
Intersection Signal Delay: 82.7	Intersection LOS: F	
Intersection Capacity Utilization 98.5%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



LOS Engineering

PM Existing + Cumulative
21: Mission Rd & I-15 NB Ramps

Queues

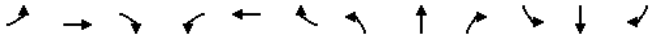
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.994				0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	1583	1863	0	0	1852	0	0	1777	1417	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	1583	1863	0	0	1852	0	0	1777	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					2				155			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	916	273	0	0	214	10	350	10	170	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	964	287	0	0	225	11	368	11	179	0	0	0
Lane Group Flow (vph)	964	287	0	0	236	0	0	379	179	0	0	0
v/c Ratio	1.14	0.21			0.74			1.13	0.45			
Control Delay	106.3	4.8			57.5			130.3	13.5			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	106.3	4.8			57.5			130.3	13.5			
Queue Length 50th (ft)	~809	54			160			~314	14			
Queue Length 95th (ft)	#1163	80			246			#548	83			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	842	1413			434			336	394			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	1.14	0.20			0.54			1.13	0.45			

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative

21: Mission Rd & I-15 NB Ramps — HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1583	1863			1851			1776	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1583	1863			1851			1776	1417			
Volume (vph)	916	273	0	0	214	10	350	10	170	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	964	287	0	0	225	11	368	11	179	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	126	0	0	0
Lane Group Flow (vph)	964	287	0	0	234	0	0	379	53	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	59.1	82.2			19.1			21.0	21.0			
Effective Green, g (s)	59.1	82.2			19.1			21.0	21.0			
Actuated g/C Ratio	0.53	0.74			0.17			0.19	0.19			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	841	1377			318			335	268			
v/s Ratio Prot	c0.61	0.15			c0.13							
v/s Ratio Perm								0.21	0.04			
v/c Ratio	1.15	0.21			0.74			1.13	0.20			
Uniform Delay, d1	26.1	4.5			43.7			45.1	38.0			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	79.7	0.1			8.6			89.6	0.4			
Delay (s)	105.7	4.5			52.3			134.7	38.4			
Level of Service	F	A			D			F	D			
Approach Delay (s)		82.5			52.3			103.8			0.0	
Approach LOS		F			D			F			A	

Intersection Summary			
HCM Average Control Delay	84.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	111.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Cumulative

22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	19	304	217	16	12	38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	20	320	228	17	13	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	506	33	53			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	506	33	53			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	69	85			
cM capacity (veh/h)	449	1041	1553			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	340	245	53
Volume Left	20	228	0
Volume Right	320	0	40
cSH	966	1553	1700
Volume to Capacity	0.35	0.15	0.03
Queue Length 95th (ft)	40	13	0
Control Delay (s)	10.7	7.3	0.0
Lane LOS	B	A	
Approach Delay (s)	10.7	7.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	8.5		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

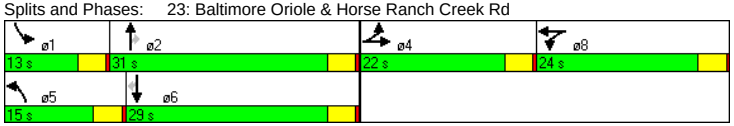
PM Existing + Cumulative
23: Baltimore Oriole & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	24	0	76	12	52	197	80	10	258	43
Turn Type	Split		Split		Prot		Perm	Prot		Perm
Protected Phases	4	4	8	8	5	2		1	6	
Permitted Phases							2			6
Detector Phases	4	4	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	22.0	22.0	24.0	24.0	15.0	31.0	31.0	13.0	29.0	29.0
Total Split (%)	24.4%	24.4%	26.7%	26.7%	16.7%	34.4%	34.4%	14.4%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	8.0	8.0	8.9	8.9	9.0	47.4	47.4	7.5	44.0	44.0
Actuated g/C Ratio	0.12	0.12	0.13	0.13	0.13	0.77	0.77	0.11	0.72	0.72
v/c Ratio	0.13	0.02	0.23	0.23	0.26	0.14	0.08	0.06	0.20	0.04
Control Delay	21.7	0.0	21.4	19.5	21.0	7.4	3.6	24.2	10.8	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	0.0	21.4	19.5	21.0	7.4	3.6	24.2	10.8	6.1
LOS	C	A	C	B	C	A	A	C	B	A
Approach Delay		15.0		20.4		8.7			10.6	
Approach LOS		B		C		A			B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 61.4			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 36.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Baltimore Oriole & Horse Ranch Creek Rd



LOS Engineering

PM Existing + Cumulative
23: Baltimore Oriole & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.986				0.850			0.850
Flt Protected	0.950			0.950	0.968		0.950			0.950		
Satd. Flow (prot)	1583	1583	0	1504	1689	0	1583	1863	1417	1583	1863	1417
Flt Permitted	0.950			0.950	0.968		0.950			0.950		
Satd. Flow (perm)	1583	1583	0	1504	1689	0	1583	1863	1417	1583	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		579			5				84			45
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1047			1324			958			2343	
Travel Time (s)		23.8			30.1			21.8			53.3	
Volume (vph)	24	0	10	76	12	5	52	197	80	10	258	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	0	11	80	13	5	55	207	84	11	272	45
Lane Group Flow (vph)	25	11	0	46	52	0	55	207	84	11	272	45
v/c Ratio	0.13	0.02		0.23	0.23		0.26	0.14	0.08	0.06	0.20	0.04
Control Delay	21.7	0.0		21.4	19.5		21.0	7.4	3.6	24.2	10.8	6.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	0.0		21.4	19.5		21.0	7.4	3.6	24.2	10.8	6.1
Queue Length 50th (ft)	1	0		2	2		2	0	0	1	0	0
Queue Length 95th (ft)	28	0		44	46		48	105	25	17	149	19
Internal Link Dist (ft)		967			1244			878			2263	
Turn Bay Length (ft)												
Base Capacity (vph)	426	849		438	495		299	1452	1123	244	1396	1073
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01		0.11	0.11		0.18	0.14	0.07	0.05	0.19	0.04

Intersection Summary	
Area Type:	Other

LOS Engineering

PM Existing + Cumulative
23: Baltimore Oriole & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	1583		1504	1689		1583	1863	1417	1583	1863	1417
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	1583		1504	1689		1583	1863	1417	1583	1863	1417
Volume (vph)	24	0	10	76	12	5	52	197	80	10	258	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	0	11	80	13	5	55	207	84	11	272	45
RTOR Reduction (vph)	0	10	0	0	5	0	0	0	30	0	0	18
Lane Group Flow (vph)	25	1	0	46	47	0	55	207	54	11	272	27
Turn Type	Split			Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	3.2	3.2		3.7	3.7		3.9	43.2	43.2	1.4	40.7	40.7
Effective Green, g (s)	3.2	3.2		3.7	3.7		3.9	43.2	43.2	1.4	40.7	40.7
Actuated g/C Ratio	0.05	0.05		0.05	0.05		0.06	0.64	0.64	0.02	0.60	0.60
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	75	75		82	93		91	1192	907	33	1123	854
v/s Ratio Prot	c0.02	0.00		c0.03	0.03		c0.03	0.11		0.01	c0.15	
v/s Ratio Perm									0.04			0.02
v/c Ratio	0.33	0.01		0.56	0.51		0.60	0.17	0.06	0.33	0.24	0.03
Uniform Delay, d1	31.1	30.6		31.1	31.0		31.0	4.9	4.5	32.6	6.2	5.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.0		8.5	4.3		10.8	0.1	0.0	5.9	0.1	0.0
Delay (s)	33.7	30.7		39.6	35.3		41.9	5.0	4.6	38.5	6.3	5.4
Level of Service	C	C		D	D		D	A	A	D	A	A
Approach Delay (s)		32.8			37.3			10.8			7.3	
Approach LOS		C			D			B			A	

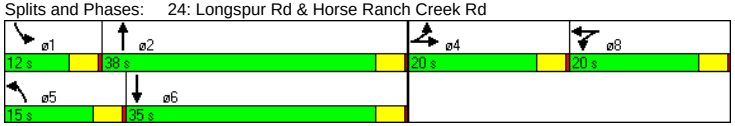
Intersection Summary				
HCM Average Control Delay	13.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.29			
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	36.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

PM Existing + Cumulative
24: Longspur Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	ø1
Lane Configurations								
Volume (vph)	6	15	79	12	127	328	298	
Turn Type	Split		Split		Prot			
Protected Phases	4	4	8	8	5	2	6	1
Permitted Phases								
Detector Phases	4	4	8	8	5	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	38.0	35.0	12.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	42.2%	38.9%	13%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None
Act Effct Green (s)	7.1	7.1	7.9	7.9	10.3	53.6	38.6	
Actuated g/C Ratio	0.09	0.09	0.10	0.10	0.13	0.70	0.50	
v/c Ratio	0.04	0.38	0.29	0.30	0.63	0.18	0.21	
Control Delay	30.8	17.8	35.3	35.0	43.5	5.2	12.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	30.8	17.8	35.3	35.0	43.5	5.2	12.3	
LOS	C	B	D	C	D	A	B	
Approach Delay		18.7		35.1		14.3	12.3	
Approach LOS		B		D		B	B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 76.6		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.63		
Intersection Signal Delay: 15.7	Intersection LOS: B	
Intersection Capacity Utilization 36.9%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 24: Longspur Rd & Horse Ranch Creek Rd



PM Existing + Cumulative
24: Longspur Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.881						0.969			0.978	
Flt Protected	0.950			0.950	0.964		0.950					
Satd. Flow (prot)	1583	1641	0	1504	1706	0	1583	3429	0	1667	3461	0
Flt Permitted	0.950			0.950	0.964		0.950					
Satd. Flow (perm)	1583	1641	0	1504	1706	0	1583	3429	0	1667	3461	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		61						41			24	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1010			908			1206			958	
Travel Time (s)		23.0			20.6			27.4			21.8	
Volume (vph)	6	15	58	79	12	0	127	328	85	0	298	51
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	6	16	61	83	13	0	134	345	89	0	314	54
Lane Group Flow (vph)	6	77	0	44	52	0	134	434	0	0	368	0
v/c Ratio	0.04	0.38		0.29	0.30		0.63	0.18			0.21	
Control Delay	30.8	17.8		35.3	35.0		43.5	5.2			12.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	30.8	17.8		35.3	35.0		43.5	5.2			12.3	
Queue Length 50th (ft)	3	7		18	23		56	31			48	
Queue Length 95th (ft)	13	45		51	57		#131	64			88	
Internal Link Dist (ft)		930			828			1126			878	
Turn Bay Length (ft)												
Base Capacity (vph)	293	354		282	320		227	2412			1755	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.02	0.22		0.16	0.16		0.59	0.18			0.21	

Intersection Summary	
Area Type:	Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Existing + Cumulative
24: Longspur Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95			0.95	
Frt	1.00	0.88		1.00	1.00		1.00	0.97			0.98	
Flt Protected	0.95	1.00		0.95	0.96		0.95	1.00			1.00	
Satd. Flow (prot)	1583	1641		1504	1706		1583	3430			3461	
Flt Permitted	0.95	1.00		0.95	0.96		0.95	1.00			1.00	
Satd. Flow (perm)	1583	1641		1504	1706		1583	3430			3461	
Volume (vph)	6	15	58	79	12	0	127	328	85	0	298	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	6	16	61	83	13	0	134	345	89	0	314	54
RTOR Reduction (vph)	0	56	0	0	0	0	0	13	0	0	12	0
Lane Group Flow (vph)	6	21	0	44	52	0	134	421	0	0	356	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.0	6.0		6.9	6.9		10.3	52.9			38.6	
Effective Green, g (s)	6.0	6.0		6.9	6.9		10.3	52.9			38.6	
Actuated g/C Ratio	0.08	0.08		0.09	0.09		0.13	0.68			0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	122	127		133	151		210	2332			1717	
v/s Ratio Prot	0.00	c0.01		0.03	c0.03		c0.08	0.12			c0.10	
v/s Ratio Perm												
v/c Ratio	0.05	0.16		0.33	0.34		0.64	0.18			0.21	
Uniform Delay, d1	33.3	33.6		33.3	33.3		32.0	4.5			11.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.6		1.5	1.4		6.2	0.2			0.3	
Delay (s)	33.4	34.2		34.7	34.7		38.2	4.7			11.3	
Level of Service	C	C		C	C		D	A			B	
Approach Delay (s)		34.1			34.7			12.6			11.3	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM Average Control Delay	15.7	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.29				
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

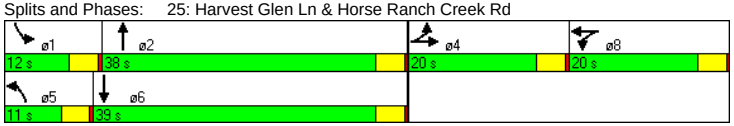
PM Existing + Cumulative
25: Harvest Glen Ln & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	1	10	128	14	40	503	85	348
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	11.0	38.0	12.0	39.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	12.2%	42.2%	13.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.1	7.1	10.5	10.5	7.3	33.8	8.8	37.9
Actuated g/C Ratio	0.10	0.10	0.16	0.16	0.10	0.52	0.13	0.58
v/c Ratio	0.01	0.12	0.37	0.36	0.26	0.41	0.45	0.18
Control Delay	27.0	21.1	24.6	18.6	29.8	11.8	29.9	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.0	21.1	24.6	18.6	29.8	11.8	29.9	9.6
LOS	C	C	C	B	C	B	C	A
Approach Delay		21.4		21.4		12.8		13.5
Approach LOS		C		C		B		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 65.2		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.45		
Intersection Signal Delay: 14.3	Intersection LOS: B	
Intersection Capacity Utilization 47.0%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 25: Harvest Glen Ln & Horse Ranch Creek Rd



LOS Engineering

PM Existing + Cumulative
25: Harvest Glen Ln & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.925			0.942			0.958			0.998	
Flt Protected	0.950			0.950	0.977		0.950			0.950		
Satd. Flow (prot)	1583	1723	0	1504	1629	0	1583	3391	0	1583	3532	0
Flt Permitted	0.950			0.950	0.977		0.950			0.950		
Satd. Flow (perm)	1583	1723	0	1504	1629	0	1583	3391	0	1583	3532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			31			72			1	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1058			1173			1033			1206	
Travel Time (s)		24.0			26.7			23.5			27.4	
Volume (vph)	1	10	10	128	14	37	40	503	193	85	348	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	11	11	135	15	39	42	529	203	89	366	4
Lane Group Flow (vph)	1	22	0	88	101	0	42	732	0	89	370	0
v/c Ratio	0.01	0.12		0.37	0.36		0.26	0.41		0.45	0.18	
Control Delay	27.0	21.1		24.6	18.6		29.8	11.8		29.9	9.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	27.0	21.1		24.6	18.6		29.8	11.8		29.9	9.6	
Queue Length 50th (ft)	0	2		18	14		9	65		18	14	
Queue Length 95th (ft)	5	24		75	69		45	170		79	87	
Internal Link Dist (ft)		978			1093			953			1126	
Turn Bay Length (ft)												
Base Capacity (vph)	350	390		383	437		177	2156		214	2338	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.00	0.06		0.23	0.23		0.24	0.34		0.42	0.16	

Intersection Summary	
Area Type:	Other

LOS Engineering

PM Existing + Cumulative
25: Harvest Glen Ln & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.94		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1723		1504	1629		1583	3392		1583	3533	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1723		1504	1629		1583	3392		1583	3533	
Volume (vph)	1	10	10	128	14	37	40	503	193	85	348	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	11	11	135	15	39	42	529	203	89	366	4
RTOR Reduction (vph)	0	11	0	0	27	0	0	36	0	0	0	0
Lane Group Flow (vph)	1	11	0	88	74	0	42	696	0	89	370	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	2.8	2.8		9.6	9.6		2.8	34.6		5.7	37.5	
Effective Green, g (s)	2.8	2.8		9.6	9.6		2.8	34.6		5.7	37.5	
Actuated g/C Ratio	0.04	0.04		0.14	0.14		0.04	0.50		0.08	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	65	70		210	228		65	1708		131	1928	
v/s Ratio Prot	0.00	c0.01		c0.06	0.05		0.03	c0.21		c0.06	c0.10	
v/s Ratio Perm												
v/c Ratio	0.02	0.16		0.42	0.33		0.65	0.41		0.68	0.19	
Uniform Delay, d1	31.6	31.8		27.0	26.6		32.5	10.6		30.6	7.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.1		1.4	0.8		20.0	0.2		13.1	0.0	
Delay (s)	31.7	32.9		28.4	27.5		52.4	10.8		43.7	8.0	
Level of Service	C	C		C	C		D	B		D	A	
Approach Delay (s)		32.9			27.9			13.1			14.9	
Approach LOS		C			C			B			B	

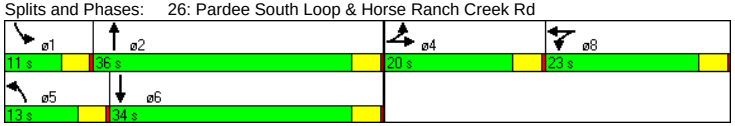
Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

PM Existing + Cumulative
26: Pardee South Loop & Horse Ranch Creek Rd — Timings

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	0	118	0	15	686	117	372
Turn Type		Split		Prot		Prot	
Protected Phases	4	8	8	5	2	1	6
Permitted Phases							
Detector Phases	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	23.0	23.0	13.0	36.0	11.0	34.0
Total Split (%)	22.2%	25.6%	25.6%	14.4%	40.0%	12.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag				Lead	Lag	Lead	Lag
Lead-Lag Optimize?				Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.2	10.0	10.0	7.0	33.6	8.2	44.8
Actuated g/C Ratio	0.08	0.15	0.15	0.09	0.51	0.12	0.68
v/c Ratio	0.01	0.38	0.34	0.11	0.55	0.63	0.16
Control Delay	0.0	25.8	14.8	28.9	11.9	40.5	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	25.8	14.8	28.9	11.9	40.5	6.2
LOS	A	C	B	C	B	D	A
Approach Delay	0.0		20.0		12.2		14.4
Approach LOS	A		C		B		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 66.2		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.63		
Intersection Signal Delay: 13.7	Intersection LOS: B	
Intersection Capacity Utilization 54.9%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 26: Pardee South Loop & Horse Ranch Creek Rd



PM Existing + Cumulative
26: Pardee South Loop & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.915			0.963				
Flt Protected				0.950	0.979		0.950			0.950		
Satd. Flow (prot)	1667	1583	0	1504	1585	0	1583	3408	0	1583	3539	0
Flt Permitted				0.950	0.979		0.950			0.950		
Satd. Flow (perm)	1667	1583	0	1504	1585	0	1583	3408	0	1583	3539	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		437			53			55				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		869			1419			1340			1033	
Travel Time (s)		19.8			32.3			30.5			23.5	
Volume (vph)	0	0	4	118	0	50	15	686	226	117	372	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	4	124	0	53	16	722	238	123	392	0
Lane Group Flow (vph)	0	4	0	83	94	0	16	960	0	123	392	0
v/c Ratio		0.01		0.38	0.34		0.11	0.55		0.63	0.16	
Control Delay		0.0		25.8	14.8		28.9	11.9		40.5	6.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay		0.0		25.8	14.8		28.9	11.9		40.5	6.2	
Queue Length 50th (ft)		0		20	9		4	94		30	15	
Queue Length 95th (ft)		0		75	57		24	223		#146	88	
Internal Link Dist (ft)		789			1339			1260			953	
Turn Bay Length (ft)												
Base Capacity (vph)		675		414	475		206	2027		195	2416	
Starvation Cap Reductn		0		0	0		0	0		0	0	
Spillback Cap Reductn		0		0	0		0	0		0	0	
Storage Cap Reductn		0		0	0		0	0		0	0	
Reduced v/c Ratio		0.01		0.20	0.20		0.08	0.47		0.63	0.16	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative
26: Pardee South Loop & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt		0.85		1.00	0.92		1.00	0.96		1.00	1.00	
Flt Protected		1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1583		1504	1585		1583	3408		1583	3539	
Flt Permitted		1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1583		1504	1585		1583	3408		1583	3539	
Volume (vph)	0	0	4	118	0	50	15	686	226	117	372	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	4	124	0	53	16	722	238	123	392	0
RTOR Reduction (vph)	0	4	0	0	46	0	0	26	0	0	0	0
Lane Group Flow (vph)	0	0	0	83	48	0	16	934	0	123	392	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		1.0		9.2	9.2		1.4	37.5		8.2	44.3	
Effective Green, g (s)		1.0		9.2	9.2		1.4	37.5		8.2	44.3	
Actuated g/C Ratio		0.01		0.13	0.13		0.02	0.52		0.11	0.62	
Clearance Time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		22		192	203		31	1777		181	2180	
v/s Ratio Prot		c0.00		c0.06	0.03		0.01	c0.27		c0.08	0.11	
v/s Ratio Perm												
v/c Ratio		0.00		0.43	0.24		0.52	0.53		0.68	0.18	
Uniform Delay, d1		35.0		28.9	28.2		34.9	11.3		30.6	6.0	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0		1.6	0.6		13.7	0.3		9.7	0.0	
Delay (s)		35.0		30.5	28.8		48.7	11.6		40.3	6.0	
Level of Service		D		C	C		D	B		D	A	
Approach Delay (s)		35.0			29.6			12.2			14.2	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM Average Control Delay	14.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	71.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	54.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing + Cumulative
27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	62	865	43	0	503
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	65	911	45	0	529
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1198	478			956	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1198	478			956	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	88			100	
cM capacity (veh/h)	178	534			715	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	65	607	349	265	265
Volume Left	0	0	0	0	0
Volume Right	65	0	45	0	0
cSH	534	1700	1700	1700	1700
Volume to Capacity	0.12	0.36	0.21	0.16	0.16
Queue Length 95th (ft)	10	0	0	0	0
Control Delay (s)	12.7	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.7	0.0		0.0	
Approach LOS	B				

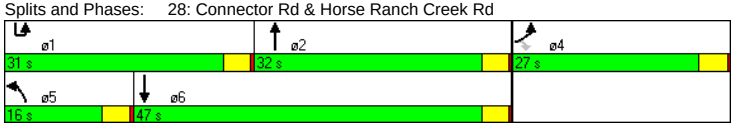
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

PM Existing + Cumulative
28: Connector Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	ø1
Lane Configurations						
Volume (vph)	495	2	5	391	143	
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	1
Permitted Phases		4				
Detector Phases	4	4	5	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	8.0
Total Split (s)	27.0	27.0	16.0	32.0	47.0	31.0
Total Split (%)	30.0%	30.0%	17.8%	35.6%	52.2%	34%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead	Lag	Lag	Lead
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	10.7	10.7	5.8	10.5	9.2	
Actuated g/C Ratio	0.36	0.36	0.15	0.35	0.31	
v/c Ratio	0.47	0.00	0.02	0.33	0.41	
Control Delay	9.6	6.5	17.0	8.0	4.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.6	6.5	17.0	8.0	4.8	
LOS	A	A	B	A	A	
Approach Delay	9.6			8.1	4.8	
Approach LOS	A			A	A	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 29.9			
Natural Cycle: 50			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 7.5		Intersection LOS: A	
Intersection Capacity Utilization 37.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 28: Connector Rd & Horse Ranch Creek Rd



PM Existing + Cumulative
28: Connector Rd & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9		9
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	0.95
Frt		0.850				0.895	
Flt Protected	0.950		0.950				
Satd. Flow (prot)	3072	1417	1583	3539	1667	3168	0
Flt Permitted	0.950		0.950				
Satd. Flow (perm)	3072	1417	1583	3539	1667	3168	0
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		2				352	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30		30	
Link Distance (ft)	2875			1509		1400	
Travel Time (s)	65.3			34.3		31.8	
Volume (vph)	495	2	5	391	0	143	334
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	521	2	5	412	0	151	352
Lane Group Flow (vph)	521	2	5	412	0	503	0
v/c Ratio	0.47	0.00	0.02	0.33		0.41	
Control Delay	9.6	6.5	17.0	8.0		4.8	
Queue Delay	0.0	0.0	0.0	0.0		0.0	
Total Delay	9.6	6.5	17.0	8.0		4.8	
Queue Length 50th (ft)	22	0	1	18		6	
Queue Length 95th (ft)	90	3	9	55		48	
Internal Link Dist (ft)	2795			1429		1320	
Turn Bay Length (ft)							
Base Capacity (vph)	1710	790	441	2130		2272	
Starvation Cap Reductn	0	0	0	0		0	
Spillback Cap Reductn	0	0	0	0		0	
Storage Cap Reductn	0	0	0	0		0	
Reduced v/c Ratio	0.30	0.00	0.01	0.19		0.22	

Intersection Summary

Area Type: Other

LOS Engineering

PM Existing + Cumulative
28: Connector Rd & Horse Ranch Creek Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	0.97	1.00	1.00	0.95		0.95	
Frt	1.00	0.85	1.00	1.00		0.90	
Flt Protected	0.95	1.00	0.95	1.00		1.00	
Satd. Flow (prot)	3072	1417	1583	3539		3168	
Flt Permitted	0.95	1.00	0.95	1.00		1.00	
Satd. Flow (perm)	3072	1417	1583	3539		3168	
Volume (vph)	495	2	5	391	0	143	334
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	521	2	5	412	0	151	352
RTOR Reduction (vph)	0	1	0	0	0	253	0
Lane Group Flow (vph)	521	1	5	412	0	250	0
Turn Type		Perm	Prot		Prot		
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	10.7	10.7	0.8	14.0		9.2	
Effective Green, g (s)	10.7	10.7	0.8	14.0		9.2	
Actuated g/C Ratio	0.33	0.33	0.02	0.43		0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	1005	464	39	1515		891	
v/s Ratio Prot	c0.17		0.00	c0.12		0.08	
v/s Ratio Perm		0.00					
v/c Ratio	0.52	0.00	0.13	0.27		0.28	
Uniform Delay, d1	8.9	7.4	15.6	6.1		9.2	
Progression Factor	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.5	0.0	1.5	0.1		0.2	
Delay (s)	9.4	7.4	17.1	6.1		9.3	
Level of Service	A	A	B	A		A	
Approach Delay (s)	9.4			6.3		9.3	
Approach LOS	A			A		A	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	32.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Cumulative
29: Connector Rd & Pankey Rd

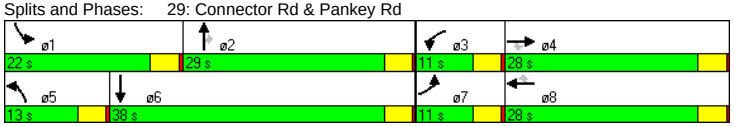
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	75	442	300	11	238	126	200	373	27	108	436
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot	
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	4	3	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	13.0	29.0	29.0	22.0	38.0
Total Split (%)	12.2%	31.1%	31.1%	12.2%	31.1%	31.1%	14.4%	32.2%	32.2%	24.4%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	6.9	24.8	24.8	6.2	18.1	18.1	9.3	23.8	23.8	10.3	22.2
Actuated g/C Ratio	0.10	0.35	0.35	0.08	0.26	0.26	0.13	0.34	0.34	0.14	0.32
v/c Ratio	0.53	0.75	0.47	0.10	0.52	0.29	1.01	0.62	0.06	0.51	0.80
Control Delay	49.1	32.2	5.6	39.7	30.0	7.0	102.8	27.9	9.0	38.2	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	32.2	5.6	39.7	30.0	7.0	102.8	27.9	9.0	38.2	33.6
LOS	D	C	A	D	C	A	F	C	A	D	C
Approach Delay		24.0			22.5			52.1			34.5
Approach LOS		C			C			D			C

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 70.4
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 33.4 Intersection LOS: C
Intersection Capacity Utilization 81.9% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 29: Connector Rd & Pankey Rd



LOS Engineering

PM Existing + Cumulative
29: Connector Rd & Pankey Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1855	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1855	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			316			133			28		2	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1256			2875			1488			1443	
Travel Time (s)		28.5			65.3			33.8			32.8	
Volume (vph)	75	442	300	11	238	126	200	373	27	108	436	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	465	316	12	251	133	211	393	28	114	459	11
Lane Group Flow (vph)	79	465	316	12	251	133	211	393	28	114	470	0
v/c Ratio	0.53	0.75	0.47	0.10	0.52	0.29	1.01	0.62	0.06	0.51	0.80	
Control Delay	49.1	32.2	5.6	39.7	30.0	7.0	102.8	27.9	9.0	38.2	33.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	49.1	32.2	5.6	39.7	30.0	7.0	102.8	27.9	9.0	38.2	33.6	
Queue Length 50th (ft)	32	171	0	5	97	0	~92	143	0	45	175	
Queue Length 95th (ft)	#110	#483	68	24	195	42	#295	302	19	109	327	
Internal Link Dist (ft)		1176			2795			1408			1363	
Turn Bay Length (ft)												
Base Capacity (vph)	156	641	689	142	598	545	209	669	527	360	778	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.51	0.73	0.46	0.08	0.42	0.24	1.01	0.59	0.05	0.32	0.60	

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative
29: Connector Rd & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1856	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1856	
Volume (vph)	75	442	300	11	238	126	200	373	27	108	436	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	465	316	12	251	133	211	393	28	114	459	11
RTOR Reduction (vph)	0	0	211	0	0	96	0	0	19	0	1	0
Lane Group Flow (vph)	79	465	105	12	251	37	211	393	9	114	469	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	5.4	24.8	24.8	1.1	20.5	20.5	9.3	23.8	23.8	8.8	23.3	
Effective Green, g (s)	5.4	24.8	24.8	1.1	20.5	20.5	9.3	23.8	23.8	8.8	23.3	
Actuated g/C Ratio	0.07	0.33	0.33	0.01	0.28	0.28	0.12	0.32	0.32	0.12	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	115	589	448	23	513	390	198	595	453	187	580	
v/s Ratio Prot	c0.05	c0.26		0.01	0.13		c0.13	0.21		0.07	c0.25	
v/s Ratio Perm			0.08			0.03			0.01			
v/c Ratio	0.69	0.79	0.23	0.52	0.49	0.09	1.07	0.66	0.02	0.61	0.81	
Uniform Delay, d1	33.7	22.5	18.0	36.4	22.6	20.1	32.6	21.9	17.4	31.2	23.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.7	7.0	0.3	19.7	0.7	0.1	82.4	2.8	0.0	5.5	8.1	
Delay (s)	49.4	29.4	18.3	56.1	23.4	20.2	115.0	24.6	17.4	36.8	31.7	
Level of Service	D	C	B	E	C	C	F	C	B	D	C	
Approach Delay (s)		27.2			23.3			54.5			32.7	
Approach LOS		C			C			D			C	

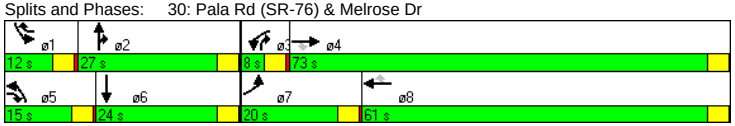
Intersection Summary			
HCM Average Control Delay	34.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	74.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

PM Existing + Cumulative
30: Pala Rd (SR-76) & Melrose Dr — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	200	2186	360	90	1614	10	300	200	348	100	200
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6
Permitted Phases			4			8					
Detector Phases	7	4	5	3	8	1	5	2	2 3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0		8.0	20.0
Total Split (s)	20.0	73.0	15.0	8.0	61.0	12.0	15.0	27.0	35.0	12.0	24.0
Total Split (%)	16.7%	60.8%	12.5%	6.7%	50.8%	10.0%	12.5%	22.5%	29.2%	10.0%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	16.0	69.0	84.0	4.0	57.0	69.0	11.0	23.0	31.0	8.0	20.0
Actuated g/C Ratio	0.13	0.58	0.70	0.03	0.48	0.58	0.09	0.19	0.26	0.07	0.17
v/c Ratio	1.00	1.13	0.36	0.93	1.01	0.01	1.12	0.59	0.96	0.99	0.85
Control Delay	114.4	91.8	4.6	130.0	56.3	5.4	139.3	51.9	80.1	141.3	72.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	114.4	91.8	4.6	130.0	56.3	5.4	139.3	51.9	80.1	141.3	72.4
LOS	F	F	A	F	E	A	F	D	F	F	E
Approach Delay		82.0			59.9			94.4			92.0
Approach LOS		F			E			F			F

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 77.8		Intersection LOS: E	
Intersection Capacity Utilization 100.7%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 30: Pala Rd (SR-76) & Melrose Dr



PM Existing + Cumulative
30: Pala Rd (SR-76) & Melrose Dr

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	500		500	500		500	400		400	200		0
Storage Lanes	1		1	2		1	2		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1807	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			177			11			19		9	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1330			646			1034			733	
Travel Time (s)		30.2			14.7			23.5			16.7	
Volume (vph)	200	2186	360	90	1614	10	300	200	348	100	200	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2301	379	95	1699	11	316	211	366	105	211	53
Lane Group Flow (vph)	211	2301	379	95	1699	11	316	211	366	105	264	0
v/c Ratio	1.00	1.13	0.36	0.93	1.01	0.01	1.12	0.59	0.96	0.99	0.85	
Control Delay	114.4	91.8	4.6	130.0	56.3	5.4	139.3	51.9	80.1	141.3	72.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	114.4	91.8	4.6	130.0	56.3	5.4	139.3	51.9	80.1	141.3	72.4	
Queue Length 50th (ft)	166	~1088	49	38	~695	0	~145	150	269	83	195	
Queue Length 95th (ft)	#326	#1223	92	#94	#867	8	#238	233	#465	#200	#341	
Internal Link Dist (ft)		1250			566			954			653	
Turn Bay Length (ft)	500		500	500		500	400		400	200		
Base Capacity (vph)	211	2035	1045	102	1681	819	282	357	380	106	309	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.00	1.13	0.36	0.93	1.01	0.01	1.12	0.59	0.96	0.99	0.85	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative
30: Pala Rd (SR-76) & Melrose Dr

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1807	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1807	
Volume (vph)	200	2186	360	90	1614	10	300	200	348	100	200	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2301	379	95	1699	11	316	211	366	105	211	53
RTOR Reduction (vph)	0	0	59	0	0	5	0	0	14	0	8	0
Lane Group Flow (vph)	211	2301	320	95	1699	6	316	211	352	105	257	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	16.0	69.0	80.0	4.0	57.0	65.0	11.0	23.0	31.0	8.0	20.0	
Effective Green, g (s)	16.0	69.0	80.0	4.0	57.0	65.0	11.0	23.0	31.0	8.0	20.0	
Actuated g/C Ratio	0.13	0.58	0.67	0.03	0.48	0.54	0.09	0.19	0.26	0.07	0.17	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	211	2035	992	102	1681	815	282	357	366	106	301	
v/s Ratio Prot	0.13	c0.65	0.03	0.03	0.48	0.00	c0.10	0.11	c0.25	0.07	0.14	
v/s Ratio Perm			0.20			0.00						
v/c Ratio	1.00	1.13	0.32	0.93	1.01	0.01	1.12	0.59	0.96	0.99	0.85	
Uniform Delay, d1	52.0	25.5	8.5	57.9	31.5	12.7	54.5	44.2	43.9	56.0	48.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	62.0	65.7	0.2	67.1	24.6	0.0	90.0	7.0	36.8	84.2	25.0	
Delay (s)	114.0	91.2	8.7	124.9	56.1	12.7	144.5	51.2	80.7	140.2	73.6	
Level of Service	F	F	A	F	E	B	F	D	F	F	E	
Approach Delay (s)		82.0			59.5			96.3			92.5	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	78.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.10			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	100.7%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

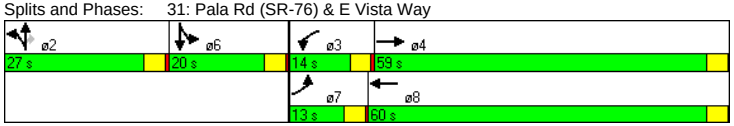
PM Existing + Cumulative
31: Pala Rd (SR-76) & E Vista Way

Timings

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Volume (vph)	100	2024	395	1184	70	357	80
Turn Type	Prot		Prot			Perm	
Protected Phases	7	4	3	8	2		6
Permitted Phases						2	
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	13.0	59.0	14.0	60.0	27.0	27.0	20.0
Total Split (%)	10.8%	49.2%	11.7%	50.0%	22.5%	22.5%	16.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	Max
Act Effct Green (s)	9.0	55.0	10.0	56.0	23.0	23.0	16.0
Actuated g/C Ratio	0.08	0.46	0.08	0.47	0.19	0.19	0.13
v/c Ratio	0.88	1.60	1.62	1.48	1.14	0.71	0.66
Control Delay	111.0	299.5	333.5	248.1	135.1	16.5	54.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.0	299.5	333.5	248.1	135.1	16.5	54.6
LOS	F	F	F	F	F	B	D
Approach Delay		292.1		269.1	76.9		54.6
Approach LOS		F		F	E		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.63	
Intersection Signal Delay: 245.9	Intersection LOS: F
Intersection Capacity Utilization 124.0%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 31: Pala Rd (SR-76) & E Vista Way



PM Existing + Cumulative
31: Pala Rd (SR-76) & E Vista Way

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		150	450		0	0		200	0		0
Storage Lanes	1		0	2		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975			0.996				0.850		0.941	
Flt Protected	0.950			0.950				0.961			0.997	
Satd. Flow (prot)	1583	3451	0	3072	1855	0	0	1790	1417	0	1748	0
Flt Permitted	0.950			0.950				0.961			0.997	
Satd. Flow (perm)	1583	3451	0	3072	1855	0	0	1790	1417	0	1748	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			1				320		27	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		710			526			797			552	
Travel Time (s)		16.1			12.0			18.1			12.5	
Volume (vph)	100	2024	400	395	1184	30	300	70	357	10	80	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	2131	421	416	1246	32	316	74	376	11	84	74
Lane Group Flow (vph)	105	2552	0	416	1278	0	0	390	376	0	169	0
v/c Ratio	0.88	1.60		1.62	1.48			1.14	0.71		0.66	
Control Delay	111.0	299.5		333.5	248.1			135.1	16.5		54.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	111.0	299.5		333.5	248.1			135.1	16.5		54.6	
Queue Length 50th (ft)	82	~1496		~239	~1373			~352	37		106	
Queue Length 95th (ft)	#190	#1628		#342	#1638			#547	151		#183	
Internal Link Dist (ft)		630			446			717			472	
Turn Bay Length (ft)	300			450					200			
Base Capacity (vph)	119	1595		256	866			343	530		256	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.88	1.60		1.63	1.48			1.14	0.71		0.66	

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

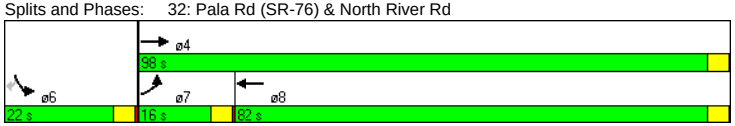
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		0.97	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (prot)	1583	3452		3072	1856			1790	1417		1747	
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (perm)	1583	3452		3072	1856			1790	1417		1747	
Volume (vph)	100	2024	400	395	1184	30	300	70	357	10	80	70
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	2131	421	416	1246	32	316	74	376	11	84	74
RTOR Reduction (vph)	0	14	0	0	1	0	0	0	259	0	23	0
Lane Group Flow (vph)	105	2538	0	416	1277	0	0	390	117	0	146	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)	9.0	55.0		10.0	56.0			23.0	23.0		16.0	
Effective Green, g (s)	9.0	55.0		10.0	56.0			23.0	23.0		16.0	
Actuated g/C Ratio	0.08	0.46		0.08	0.47			0.19	0.19		0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	119	1582		256	866			343	272		233	
v/s Ratio Prot	0.07	c0.74		c0.14	0.69			c0.22			c0.08	
v/s Ratio Perm									0.08			
v/c Ratio	0.88	1.60		1.62	1.48			1.14	0.43		0.62	
Uniform Delay, d1	55.0	32.5		55.0	32.0			48.5	42.7		49.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	48.1	275.1		298.5	220.1			91.1	4.9		12.0	
Delay (s)	103.0	307.6		353.5	252.1			139.6	47.7		61.2	
Level of Service	F	F		F	F			F	D		E	
Approach Delay (s)		299.5			277.0			94.5			61.2	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	254.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	124.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	200	2311	1479	245	200
Turn Type	Prot				Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phases	7	4	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	16.0	98.0	82.0	22.0	22.0
Total Split (%)	13.3%	81.7%	68.3%	18.3%	18.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	12.0	94.0	78.0	18.0	18.0
Actuated g/C Ratio	0.10	0.78	0.65	0.15	0.15
v/c Ratio	1.34	1.67	1.42	1.09	0.57
Control Delay	229.1	322.5	218.8	131.9	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	229.1	322.5	218.8	131.9	16.6
LOS	F	F	F	F	B
Approach Delay		315.1	218.8	80.0	
Approach LOS		F	F	E	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.67		
Intersection Signal Delay: 258.1		Intersection LOS: F
Intersection Capacity Utilization 143.5%		ICU Level of Service H
Analysis Period (min) 15		

Splits and Phases: 32: Pala Rd (SR-76) & North River Rd



PM Existing + Cumulative
32: Pala Rd (SR-76) & North River Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	150			0	50	0
Storage Lanes	1			0	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.988			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1840	0	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1840	0	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			8			183
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		1356	1400		1286	
Travel Time (s)		30.8	31.8		29.2	
Volume (vph)	200	2311	1479	143	245	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2433	1557	151	258	211
Lane Group Flow (vph)	211	2433	1708	0	258	211
v/c Ratio	1.34	1.67	1.42		1.09	0.57
Control Delay	229.1	322.5	218.8		131.9	16.6
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	229.1	322.5	218.8		131.9	16.6
Queue Length 50th (ft)	~213	~2745	~1799		~224	19
Queue Length 95th (ft)	#369	#2997	#2067		#394	97
Internal Link Dist (ft)		1276	1320		1206	
Turn Bay Length (ft)	150				50	
Base Capacity (vph)	158	1459	1199		237	368
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	1.34	1.67	1.42		1.09	0.57

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative
32: Pala Rd (SR-76) & North River Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1863	1841		1583	1417
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1863	1841		1583	1417
Volume (vph)	200	2311	1479	143	245	200
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2433	1557	151	258	211
RTOR Reduction (vph)	0	0	3	0	0	156
Lane Group Flow (vph)	211	2433	1705	0	258	55
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	12.0	94.0	78.0		18.0	18.0
Effective Green, g (s)	12.0	94.0	78.0		18.0	18.0
Actuated g/C Ratio	0.10	0.78	0.65		0.15	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	158	1459	1197		237	213
v/s Ratio Prot	0.13	c1.31	0.93		c0.16	
v/s Ratio Perm						0.04
v/c Ratio	1.34	1.67	1.42		1.09	0.26
Uniform Delay, d1	54.0	13.0	21.0		51.0	45.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	187.5	303.5	196.0		84.1	2.9
Delay (s)	241.5	316.5	217.0		135.1	48.1
Level of Service	F	F	F		F	D
Approach Delay (s)		310.5	217.0		95.9	
Approach LOS		F	F		F	

Intersection Summary

HCM Average Control Delay	256.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	143.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

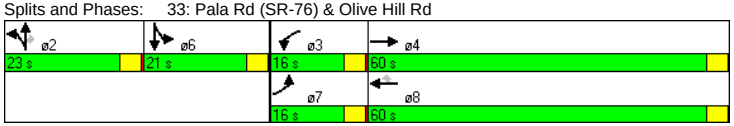
PM Existing + Cumulative
33: Pala Rd (SR-76) & Olive Hill Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	150	2207	247	1522	147	200	348	148	200
Turn Type	Prot		Prot		Perm		Perm	Split	
Protected Phases	7	4	3	8		2		6	6
Permitted Phases					8		2		
Detector Phases	7	4	3	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	16.0	60.0	16.0	60.0	60.0	23.0	23.0	21.0	21.0
Total Split (%)	13.3%	50.0%	13.3%	50.0%	50.0%	19.2%	19.2%	17.5%	17.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)	12.0	56.0	12.0	56.0	56.0	19.0	19.0	17.0	17.0
Actuated g/C Ratio	0.10	0.47	0.10	0.47	0.47	0.16	0.16	0.14	0.14
v/c Ratio	1.00	1.55	1.65	0.97	0.22	1.09	0.92	0.70	1.11
Control Delay	126.0	276.2	351.3	47.6	8.7	126.2	50.5	66.3	134.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.0	276.2	351.3	47.6	8.7	126.2	50.5	66.3	134.2
LOS	F	F	F	D	A	F	D	E	F
Approach Delay		267.4		83.8		85.6			110.7
Approach LOS		F		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.65	
Intersection Signal Delay: 170.7	Intersection LOS: F
Intersection Capacity Utilization 127.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 33: Pala Rd (SR-76) & Olive Hill Rd



LOS Engineering

PM Existing + Cumulative
33: Pala Rd (SR-76) & Olive Hill Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		200	0		150	150		0
Storage Lanes	1		0	1		1	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850			0.850		0.957	
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1583	3497	0	1583	3539	1417	0	1833	1417	1583	1783	0
Flt Permitted	0.950			0.950				0.984		0.950		
Satd. Flow (perm)	1583	3497	0	1583	3539	1417	0	1833	1417	1583	1783	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				93			207		14	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		585			663			961			1186	
Travel Time (s)		13.3			15.1			21.8			27.0	
Volume (vph)	150	2207	200	247	1522	147	100	200	348	148	200	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	2323	211	260	1602	155	105	211	366	156	211	84
Lane Group Flow (vph)	158	2534	0	260	1602	155	0	316	366	156	295	0
v/c Ratio	1.00	1.55		1.65	0.97	0.22		1.09	0.92	0.70	1.11	
Control Delay	126.0	276.2		351.3	47.6	8.7		126.2	50.5	66.3	134.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	126.0	276.2		351.3	47.6	8.7		126.2	50.5	66.3	134.2	
Queue Length 50th (ft)	124	~1465		~292	621	26		~275	130	117	~253	
Queue Length 95th (ft)	#266	#1598		#461	#798	67		#456	#316	#209	#433	
Internal Link Dist (ft)		505			583			881			1106	
Turn Bay Length (ft)	250			250		200			150	150		
Base Capacity (vph)	158	1638		158	1652	711		290	399	224	265	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	1.00	1.55		1.65	0.97	0.22		1.09	0.92	0.70	1.11	

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative
33: Pala Rd (SR-76) & Olive Hill Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3495		1583	3539	1417		1832	1417	1583	1783	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3495		1583	3539	1417		1832	1417	1583	1783	
Volume (vph)	150	2207	200	247	1522	147	100	200	348	148	200	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	2323	211	260	1602	155	105	211	366	156	211	84
RTOR Reduction (vph)	0	6	0	0	0	50	0	0	174	0	12	0
Lane Group Flow (vph)	158	2528	0	260	1602	105	0	316	192	156	283	0
Turn Type	Prot			Prot		Perm	Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	12.0	56.0		12.0	56.0	56.0		19.0	19.0	17.0	17.0	
Effective Green, g (s)	12.0	56.0		12.0	56.0	56.0		19.0	19.0	17.0	17.0	
Actuated g/C Ratio	0.10	0.47		0.10	0.47	0.47		0.16	0.16	0.14	0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	158	1631		158	1652	661		290	224	224	253	
v/s Ratio Prot	0.10	c0.72		c0.16	0.45			c0.17		0.10	c0.16	
v/s Ratio Perm						0.07			0.14			
v/c Ratio	1.00	1.55		1.65	0.97	0.16		1.09	0.86	0.70	1.12	
Uniform Delay, d1	54.0	32.0		54.0	31.2	18.4		50.5	49.2	49.0	51.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	71.6	250.6		317.1	15.4	0.1		78.9	32.0	16.5	92.2	
Delay (s)	125.6	282.6		371.1	46.5	18.6		129.4	81.2	65.5	143.7	
Level of Service	F	F		F	D	B		F	F	E	F	
Approach Delay (s)		273.4			86.2			103.5			116.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	176.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	127.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

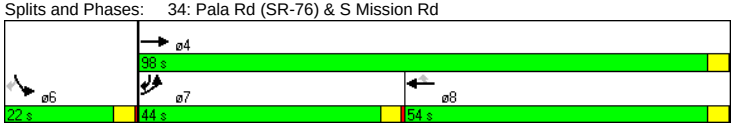
PM Existing + Cumulative
34: Pala Rd (SR-76) & S Mission Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1000	1745	1363	213	282	550
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	44.0	98.0	54.0	54.0	22.0	44.0
Total Split (%)	36.7%	81.7%	45.0%	45.0%	18.3%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	40.0	94.0	50.0	50.0	18.0	62.0
Actuated g/C Ratio	0.33	0.78	0.42	0.42	0.15	0.52
v/c Ratio	1.03	1.26	0.97	0.32	0.64	0.45
Control Delay	75.2	140.3	52.5	5.7	55.2	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.2	140.3	52.5	5.7	55.2	19.7
LOS	E	F	D	A	E	B
Approach Delay		116.6	46.2		31.7	
Approach LOS		F	D		C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.26			
Intersection Signal Delay: 81.4		Intersection LOS: F	
Intersection Capacity Utilization 107.5%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



PM Existing + Cumulative
34: Pala Rd (SR-76) & S Mission Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				198		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	1000	1745	1363	213	282	550
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1837	1435	224	297	579
Lane Group Flow (vph)	1053	1837	1435	224	297	579
v/c Ratio	1.03	1.26	0.97	0.32	0.64	0.45
Control Delay	75.2	140.3	52.5	5.7	55.2	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.2	140.3	52.5	5.7	55.2	19.7
Queue Length 50th (ft)	~449	~1785	564	12	112	154
Queue Length 95th (ft)	#580	#2049	#730	61	161	206
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	1024	1459	1475	706	461	1288
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	1.26	0.97	0.32	0.64	0.45

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative
34: Pala Rd (SR-76) & S Mission Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Volume (vph)	1000	1745	1363	213	282	550
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1837	1435	224	297	579
RTOR Reduction (vph)	0	0	0	116	0	0
Lane Group Flow (vph)	1053	1837	1435	109	297	579
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	40.0	94.0	50.0	50.0	18.0	58.0
Effective Green, g (s)	40.0	94.0	50.0	50.0	18.0	58.0
Actuated g/C Ratio	0.33	0.78	0.42	0.42	0.15	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1024	1459	1475	590	461	1288
v/s Ratio Prot	0.34	c0.99	0.41		c0.10	0.15
v/s Ratio Perm				0.08		0.08
v/c Ratio	1.03	1.26	0.97	0.18	0.64	0.45
Uniform Delay, d1	40.0	13.0	34.3	22.1	48.0	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	35.6	122.3	17.3	0.2	6.8	0.3
Delay (s)	75.6	135.3	51.6	22.3	54.8	20.7
Level of Service	E	F	D	C	D	C
Approach Delay (s)		113.5	47.6		32.3	
Approach LOS		F	D		C	

Intersection Summary				
HCM Average Control Delay	80.3	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.16			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	107.5%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing + Cumulative
35: Reche Rd & Live Oak Park Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	50	466	511	43	46	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	491	538	45	48	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	583				1156	561
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	583				1156	561
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				76	90
cM capacity (veh/h)	991				206	527

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	53	491	583	101
Volume Left	53	0	0	48
Volume Right	0	0	45	53
cSH	991	1700	1700	302
Volume to Capacity	0.05	0.29	0.34	0.34
Queue Length 95th (ft)	4	0	0	36
Control Delay (s)	8.8	0.0	0.0	22.8
Lane LOS	A			C
Approach Delay (s)	0.9		0.0	22.8
Approach LOS				C

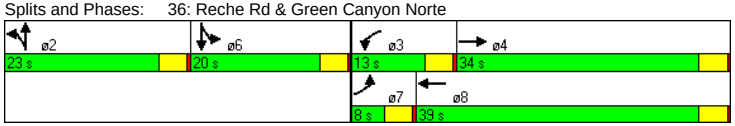
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

PM Existing + Cumulative
36: Reche Rd & Green Canyon Norte — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	10	411	84	566	120	10	0
Turn Type	Prot		Prot		Split		
Protected Phases	7	4	3	8	2	2	6
Permitted Phases							
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	34.0	13.0	39.0	23.0	23.0	20.0
Total Split (%)	8.9%	37.8%	14.4%	43.3%	25.6%	25.6%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	None
Act Effct Green (s)	4.2	21.8	8.0	29.9	20.4	20.4	6.4
Actuated g/C Ratio	0.06	0.34	0.12	0.47	0.32	0.32	0.09
v/c Ratio	0.12	0.77	0.46	0.70	0.25	0.18	0.17
Control Delay	40.3	29.0	39.2	19.4	24.1	8.5	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	29.0	39.2	19.4	24.1	8.5	21.2
LOS	D	C	D	B	C	A	C
Approach Delay		29.2		21.9		17.1	21.2
Approach LOS		C		C		B	C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 63.8			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 23.6		Intersection LOS: C	
Intersection Capacity Utilization 57.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 36: Reche Rd & Green Canyon Norte



PM Existing + Cumulative
36: Reche Rd & Green Canyon Norte — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	150		0	150		0	150		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.997			0.866			0.906	
Flt Protected	0.950			0.950			0.950				0.985	
Satd. Flow (prot)	1583	1833	0	1583	1857	0	1583	1613	0	0	1662	0
Flt Permitted	0.950			0.950			0.950				0.985	
Satd. Flow (perm)	1583	1833	0	1583	1857	0	1583	1613	0	0	1662	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			1			91			21	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			4892			1501			1367	
Travel Time (s)		22.1			111.2			34.1			31.1	
Volume (vph)	10	411	50	84	566	11	120	10	86	9	0	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	433	53	88	596	12	126	11	91	9	0	21
Lane Group Flow (vph)	11	486	0	88	608	0	126	102	0	0	30	0
v/c Ratio	0.12	0.77		0.46	0.70		0.25	0.18			0.17	
Control Delay	40.3	29.0		39.2	19.4		24.1	8.5			21.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	40.3	29.0		39.2	19.4		24.1	8.5			21.2	
Queue Length 50th (ft)	4	153		30	132		34	3			3	
Queue Length 95th (ft)	22	321		90	391		103	42			29	
Internal Link Dist (ft)		893			4812			1421			1287	
Turn Bay Length (ft)	150			150			150					
Base Capacity (vph)	95	786		220	984		507	578			360	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.12	0.62		0.40	0.62		0.25	0.18			0.08	

Intersection Summary
Area Type: Other

LOS Engineering

PM Existing + Cumulative
36: Reche Rd & Green Canyon Norte — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87			0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1583	1832		1583	1857		1583	1613			1662	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1583	1832		1583	1857		1583	1613			1662	
Volume (vph)	10	411	50	84	566	11	120	10	86	9	0	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	433	53	88	596	12	126	11	91	9	0	21
RTOR Reduction (vph)	0	5	0	0	1	0	0	64	0	0	20	0
Lane Group Flow (vph)	11	481	0	88	607	0	126	38	0	0	10	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	0.6	24.2		6.3	29.9		20.4	20.4			2.4	
Effective Green, g (s)	0.6	24.2		6.3	29.9		20.4	20.4			2.4	
Actuated g/C Ratio	0.01	0.35		0.09	0.43		0.29	0.29			0.03	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	14	640		144	801		466	475			58	
v/s Ratio Prot	0.01	0.26		c0.06	c0.33		c0.08	0.02			c0.01	
v/s Ratio Perm												
v/c Ratio	0.79	0.75		0.61	0.76		0.27	0.08			0.17	
Uniform Delay, d1	34.3	19.9		30.3	16.6		18.7	17.7			32.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	130.6	5.0		7.5	4.1		1.4	0.3			1.4	
Delay (s)	164.9	24.9		37.8	20.8		20.2	18.0			33.9	
Level of Service	F	C		D	C		C	B			C	
Approach Delay (s)		28.0			22.9			19.2			33.9	
Approach LOS		C			C			B			C	

Intersection Summary				
HCM Average Control Delay	24.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	69.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	57.9%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing + Cumulative
37: Pala Rd (SR-76) & Pala Mission Rd

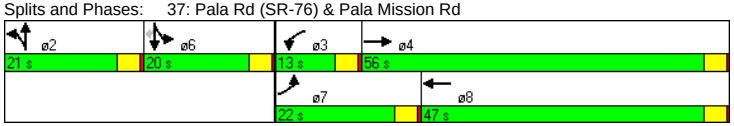
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Volume (vph)	243	513	50	664	13	20	30	185
Turn Type	Prot		Prot		Split			Perm
Protected Phases	7	4	3	8	2	2	6	
Permitted Phases								6
Detector Phases	7	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	22.0	56.0	13.0	47.0	21.0	21.0	20.0	20.0
Total Split (%)	20.0%	50.9%	11.8%	42.7%	19.1%	19.1%	18.2%	18.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	None	None
Act Effct Green (s)	18.0	55.1	7.9	43.1	17.0	17.0	8.9	8.9
Actuated g/C Ratio	0.17	0.53	0.08	0.42	0.17	0.17	0.09	0.09
v/c Ratio	0.92	0.31	0.44	0.94	0.05	0.11	0.34	0.65
Control Delay	81.3	14.8	57.7	51.5	38.3	29.0	49.7	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.3	14.8	57.7	51.5	38.3	29.0	49.7	17.1
LOS	F	B	E	D	D	C	D	B
Approach Delay		35.1		51.9		31.9	24.1	
Approach LOS		D		D		C	C	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 103
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 40.5 Intersection LOS: D
Intersection Capacity Utilization 71.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 37: Pala Rd (SR-76) & Pala Mission Rd



PM Existing + Cumulative
37: Pala Rd (SR-76) & Pala Mission Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		0	200		0	0		50
Storage Lanes	1		0	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.993			0.948				0.850
Flt Protected	0.950			0.950			0.950				0.981	
Satd. Flow (prot)	1583	3500	0	1583	1850	0	1583	1766	0	0	1827	1417
Flt Permitted	0.950			0.950			0.950				0.981	
Satd. Flow (perm)	1583	3500	0	1583	1850	0	1583	1766	0	0	1827	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			2			11				195
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		941			1076			1007			1565	
Travel Time (s)		21.4			24.5			22.9			35.6	
Volume (vph)	243	513	39	50	664	30	13	20	10	20	30	185
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	256	540	41	53	699	32	14	21	11	21	32	195
Lane Group Flow (vph)	256	581	0	53	731	0	14	32	0	0	53	195
v/c Ratio	0.92	0.31		0.44	0.94		0.05	0.11			0.34	0.65
Control Delay	81.3	14.8		57.7	51.5		38.3	29.0			49.7	17.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	81.3	14.8		57.7	51.5		38.3	29.0			49.7	17.1
Queue Length 50th (ft)	166	110		33	446		8	12			33	0
Queue Length 95th (ft)	#341	166		77	#757		27	41			72	66
Internal Link Dist (ft)		861			996			927			1485	
Turn Bay Length (ft)	250			250			200					50
Base Capacity (vph)	277	1879		135	775		261	301			266	373
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.92	0.31		0.39	0.94		0.05	0.11			0.20	0.52

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Existing + Cumulative

37: Pala Rd (SR-76) & Pala Mission Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1583	3502		1583	1851		1583	1767			1827	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (perm)	1583	3502		1583	1851		1583	1767			1827	1417
Volume (vph)	243	513	39	50	664	30	13	20	10	20	30	185
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	256	540	41	53	699	32	14	21	11	21	32	195
RTOR Reduction (vph)	0	5	0	0	1	0	0	9	0	0	0	178
Lane Group Flow (vph)	256	576	0	53	730	0	14	23	0	0	53	17
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												6
Actuated Green, G (s)	18.0	55.1		6.8	43.9		17.0	17.0			8.9	8.9
Effective Green, g (s)	18.0	55.1		6.8	43.9		17.0	17.0			8.9	8.9
Actuated g/C Ratio	0.17	0.53		0.07	0.42		0.16	0.16			0.09	0.09
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	275	1859		104	783		259	289			157	121
v/s Ratio Prot	c0.16	0.16		0.03	c0.39		0.01	c0.01			c0.03	
v/s Ratio Perm												0.01
v/c Ratio	0.93	0.31		0.51	0.93		0.05	0.08			0.34	0.14
Uniform Delay, d1	42.3	13.7		46.9	28.5		36.6	36.8			44.7	43.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	36.2	0.1		3.9	17.7		0.4	0.5			1.3	0.5
Delay (s)	78.5	13.8		50.8	46.3		37.0	37.3			46.0	44.4
Level of Service	E	B		D	D		D	D			D	D
Approach Delay (s)		33.6			46.6			37.2			44.8	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	103.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

Appendix O

Existing + Cumulative + Project Intersection Level of Service Calculations

AM Existing + Cumulative + Project
1: Pala Rd (SR-76) & Via Monserate

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	9	1237	1969	44	91	33
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	1302	2073	46	96	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2119				3417	2096
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2119				3417	2096
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				0	47
cM capacity (veh/h)	257				8	66

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	9	1302	2119	131
Volume Left	9	0	0	96
Volume Right	0	0	46	35
cSH	257	1700	1700	10
Volume to Capacity	0.04	0.77	1.25	12.96
Queue Length 95th (ft)	3	0	0	Err
Control Delay (s)	19.5	0.0	0.0	Err
Lane LOS	C			F
Approach Delay (s)	0.1		0.0	Err
Approach LOS				F

Intersection Summary			
Average Delay	366.6		
Intersection Capacity Utilization	120.8%	ICU Level of Service	H
Analysis Period (min)	15		

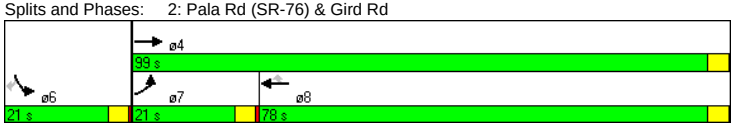
AM Existing + Cumulative + Project
2: Pala Rd (SR-76) & Gird Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	151	1185	1330	49	80	139
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	21.0	99.0	78.0	78.0	21.0	21.0
Total Split (%)	17.5%	82.5%	65.0%	65.0%	17.5%	17.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	14.9	93.1	74.2	74.2	11.2	11.2
Actuated g/C Ratio	0.13	0.83	0.66	0.66	0.10	0.10
v/c Ratio	0.76	0.81	1.14	0.06	0.53	0.53
Control Delay	70.4	11.2	93.9	7.7	61.0	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	11.2	93.9	7.7	61.0	15.2
LOS	E	B	F	A	E	B
Approach Delay		17.9	90.8		31.9	
Approach LOS		B	F		C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 112.3			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 53.2		Intersection LOS: D	
Intersection Capacity Utilization 94.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				5		146
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	151	1185	1330	49	80	139
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	1247	1400	52	84	146
Lane Group Flow (vph)	159	1247	1400	52	84	146
v/c Ratio	0.76	0.81	1.14	0.06	0.53	0.53
Control Delay	70.4	11.2	93.9	7.7	61.0	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.4	11.2	93.9	7.7	61.0	15.2
Queue Length 50th (ft)	112	352	~1223	12	60	0
Queue Length 95th (ft)	#213	736	#1580	29	112	60
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	236	1549	1231	938	228	329
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.81	1.14	0.06	0.37	0.44

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Volume (vph)	151	1185	1330	49	80	139
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	1247	1400	52	84	146
RTOR Reduction (vph)	0	0	0	2	0	131
Lane Group Flow (vph)	159	1247	1400	50	84	15
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	14.9	93.1	74.2	74.2	11.2	11.2
Effective Green, g (s)	14.9	93.1	74.2	74.2	11.2	11.2
Actuated g/C Ratio	0.13	0.83	0.66	0.66	0.10	0.10
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	210	1544	1231	936	158	141
v/s Ratio Prot	0.10	c0.67	c0.75		c0.05	
v/s Ratio Perm				0.04		0.01
v/c Ratio	0.76	0.81	1.14	0.05	0.53	0.10
Uniform Delay, d1	47.0	5.0	19.0	6.7	48.1	46.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.4	3.2	72.2	0.0	3.4	0.3
Delay (s)	61.4	8.2	91.2	6.7	51.5	46.3
Level of Service	E	A	F	A	D	D
Approach Delay (s)		14.2	88.2		48.2	
Approach LOS		B	F		D	

Intersection Summary				
HCM Average Control Delay	51.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	112.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	94.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing + Cumulative + Project
3: Pala Rd (SR-76) & Sage Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	2	1056	1587	2	8	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1112	1671	2	8	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1673				2787	1672
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1673				2787	1672
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				59	86
cM capacity (veh/h)	383				21	118

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	2	1112	1673	25
Volume Left	2	0	0	8
Volume Right	0	0	2	17
cSH	383	1700	1700	46
Volume to Capacity	0.01	0.65	0.98	0.55
Queue Length 95th (ft)	0	0	0	51
Control Delay (s)	14.4	0.0	0.0	154.9
Lane LOS	B			F
Approach Delay (s)	0.0		0.0	154.9
Approach LOS				F

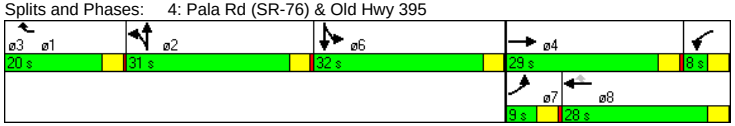
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		

AM Existing + Cumulative + Project
4: Pala Rd (SR-76) & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Configurations							
Volume (vph)	94	700	82	1130	122	207	227
Turn Type	Prot		Prot		custom		
Protected Phases	7	4	3	8	1	2	6
Permitted Phases					8		
Detector Phases	7	4	3	8	1	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	29.0	8.0	28.0	20.0	31.0	32.0
Total Split (%)	7.5%	24.2%	6.7%	23.3%	16.7%	25.8%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	Min
Act Effct Green (s)	5.0	25.0	4.0	24.0	33.6	27.0	28.0
Actuated g/C Ratio	0.05	0.23	0.04	0.22	0.31	0.25	0.26
v/c Ratio	1.38	1.11	1.48	1.53	0.27	1.62	1.73
Control Delay	274.7	106.5	326.5	278.9	15.7	318.6	363.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	274.7	106.5	326.5	278.9	15.7	318.6	363.3
LOS	F	F	F	F	B	F	F
Approach Delay		123.3		257.8		318.6	363.3
Approach LOS		F		F		F	F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 109.6		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.73		
Intersection Signal Delay: 256.3	Intersection LOS: F	
Intersection Capacity Utilization 106.5%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



AM Existing + Cumulative + Project
4: Pala Rd (SR-76) & Old Hwy 395

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974				0.850		0.962			0.978	
Flt Protected	0.950			0.950				0.980			0.974	
Satd. Flow (prot)	1583	3447	0	1583	3539	1417	0	1756	0	0	1774	0
Flt Permitted	0.950			0.950				0.980			0.974	
Satd. Flow (perm)	1583	3447	0	1583	3539	1417	0	1756	0	0	1774	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18				68		15			8	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	94	700	145	82	1130	122	284	207	192	400	227	125
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	737	153	86	1189	128	299	218	202	421	239	132
Lane Group Flow (vph)	99	890	0	86	1189	128	0	719	0	0	792	0
v/c Ratio	1.38	1.11		1.48	1.53	0.27		1.62			1.73	
Control Delay	274.7	106.5		326.5	278.9	15.7		318.6			363.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	274.7	106.5		326.5	278.9	15.7		318.6			363.3	
Queue Length 50th (ft)	~92	~374		~84	~618	31		~728			~830	
Queue Length 95th (ft)	#203	#505		#187	#756	79		#964			#1072	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	72	800		58	775	518		444			459	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	1.38	1.11		1.48	1.53	0.25		1.62			1.73	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative + Project
4: Pala Rd (SR-76) & Old Hwy 395

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	0.97		1.00	1.00	0.85		0.96			0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (prot)	1583	3448		1583	3539	1417		1756			1774	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (perm)	1583	3448		1583	3539	1417		1756			1774	
Volume (vph)	94	700	145	82	1130	122	284	207	192	400	227	125
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	737	153	86	1189	128	299	218	202	421	239	132
RTOR Reduction (vph)	0	14	0	0	0	50	0	11	0	0	6	0
Lane Group Flow (vph)	99	876	0	86	1189	78	0	708	0	0	786	0
Turn Type	Prot			Prot		custom	Split			Split		
Protected Phases	7	4		3	8	1	2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.0	25.0		4.0	24.0	29.6		27.0			28.0	
Effective Green, g (s)	5.0	25.0		4.0	24.0	29.6		27.0			28.0	
Actuated g/C Ratio	0.05	0.23		0.04	0.22	0.27		0.25			0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	72	786		58	775	434		433			453	
v/s Ratio Prot	0.06	c0.25		0.05	c0.34	c0.01		c0.40			c0.44	
v/s Ratio Perm						0.05						
v/c Ratio	1.38	1.11		1.48	1.53	0.18		1.63			1.74	
Uniform Delay, d1	52.3	42.3		52.8	42.8	30.7		41.3			40.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	234.7	68.4		288.9	246.9	0.2		295.8			340.0	
Delay (s)	287.0	110.7		341.7	289.7	30.9		337.1			380.8	
Level of Service	F	F		F	F	C		F			F	
Approach Delay (s)		128.3			269.3			337.1			380.8	
Approach LOS		F			F			F			F	

Intersection Summary

HCM Average Control Delay	268.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.48		
Actuated Cycle Length (s)	109.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	106.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

AM Existing + Cumulative + Project
5: Dulin Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	12	6	1046	10	9	442
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	13	6	1101	11	9	465
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		13				
Median type	None					
Median storage veh)						
Upstream signal (ft)						899
pX, platoon unblocked						
vC, conflicting volume	1591	1106			1112	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1591	1106			1112	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	98			98	
cM capacity (veh/h)	116	256			628	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	19	1112	475
Volume Left	13	0	9
Volume Right	6	11	0
cSH	175	1700	628
Volume to Capacity	0.11	0.65	0.02
Queue Length 95th (ft)	9	0	1
Control Delay (s)	32.9	0.0	0.4
Lane LOS	D		A
Approach Delay (s)	32.9	0.0	0.4
Approach LOS	D		

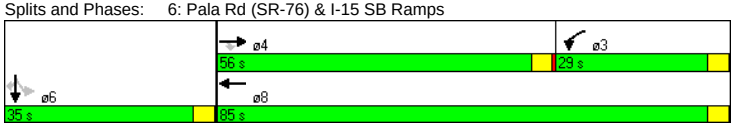
Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		65.7%	ICU Level of Service C
Analysis Period (min)		15	

AM Existing + Cumulative + Project
6: Pala Rd (SR-76) & I-15 SB Ramps — Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Volume (vph)	950	350	400	800	1	570
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6	
Permitted Phases		4				6
Detector Phases	4	4	3	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	56.0	56.0	29.0	85.0	35.0	35.0
Total Split (%)	46.7%	46.7%	24.2%	70.8%	29.2%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	52.0	52.0	25.0	81.0	31.0	31.0
Actuated g/C Ratio	0.43	0.43	0.21	0.68	0.26	0.26
v/c Ratio	1.24	0.50	1.28	0.67	0.32	1.14
Control Delay	149.6	12.2	174.3	24.1	38.3	111.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	149.6	12.2	174.3	24.1	38.3	111.9
LOS	F	B	F	C	D	F
Approach Delay	112.7			74.2	97.5	
Approach LOS	F			E	F	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 40 (33%), Referenced to phase 2: and 6:SBTL, Start of Green		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.28		
Intersection Signal Delay: 94.9	Intersection LOS: F	
Intersection Capacity Utilization 106.3%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



AM Existing + Cumulative + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.953	
Satd. Flow (prot)	0	1863	1417	1583	1863	0	0	0	0	0	1775	1417
Flt Permitted				0.950							0.953	
Satd. Flow (perm)	0	1863	1417	1583	1863	0	0	0	0	0	1775	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			214									214
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	950	350	400	800	0	0	0	0	138	1	570
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1000	368	421	842	0	0	0	0	145	1	600
Lane Group Flow (vph)	0	1000	368	421	842	0	0	0	0	0	146	600
v/c Ratio		1.24	0.50	1.28	0.67						0.32	1.14
Control Delay		149.6	12.2	174.3	24.1						38.3	111.9
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		149.6	12.2	174.3	24.1						38.3	111.9
Queue Length 50th (ft)		~961	77	~410	642						92	~414
Queue Length 95th (ft)		#1214	166	m#334	m571						152	#642
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		807	735	330	1258						459	525
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.24	0.50	1.28	0.67						0.32	1.14

Intersection Summary	
Area Type:	Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

AM Existing + Cumulative + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1775	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1775	1417
Volume (vph)	0	950	350	400	800	0	0	0	0	138	1	570
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1000	368	421	842	0	0	0	0	145	1	600
RTOR Reduction (vph)	0	0	121	0	0	0	0	0	0	0	0	159
Lane Group Flow (vph)	0	1000	247	421	842	0	0	0	0	0	146	441
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		52.0	52.0	25.0	81.0						31.0	31.0
Effective Green, g (s)		52.0	52.0	25.0	81.0						31.0	31.0
Actuated g/C Ratio		0.43	0.43	0.21	0.68						0.26	0.26
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		807	614	330	1258						459	366
v/s Ratio Prot		c0.54		c0.27	0.45							
v/s Ratio Perm			0.17								0.08	c0.31
v/c Ratio		1.24	0.40	1.28	0.67						0.32	1.21
Uniform Delay, d1		34.0	23.3	47.5	11.6						36.0	44.5
Progression Factor		1.00	1.00	1.31	1.98						1.00	1.00
Incremental Delay, d2		118.1	0.4	126.3	0.1						1.8	115.6
Delay (s)		152.1	23.8	188.4	23.0						37.8	160.1
Level of Service		F	C	F	C						D	F
Approach Delay (s)		117.6			78.1			0.0			136.2	
Approach LOS		F			E			A			F	

Intersection Summary					
HCM Average Control Delay	107.0	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.24				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	106.3%	ICU Level of Service	G		
Analysis Period (min)	15				
c Critical Lane Group					

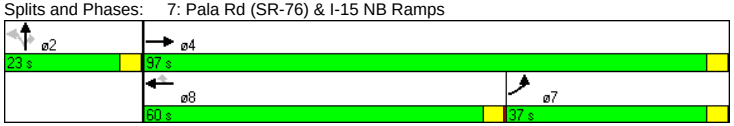
AM Existing + Cumulative + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

Timings

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Volume (vph)	500	600	950	139	0	340
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		2	
Permitted Phases				8		2
Detector Phases	7	4	8	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	97.0	60.0	60.0	23.0	23.0
Total Split (%)	30.8%	80.8%	50.0%	50.0%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	33.0	93.0	56.0	56.0	19.0	19.0
Actuated g/C Ratio	0.28	0.78	0.47	0.47	0.16	0.16
v/c Ratio	1.21	0.44	1.15	0.22	1.04	0.68
Control Delay	143.4	14.2	112.1	16.6	114.5	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	143.4	14.2	112.1	16.6	114.5	11.9
LOS	F	B	F	B	F	B
Approach Delay		72.9	100.0		58.0	
Approach LOS		E	F		E	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green		
Natural Cycle: 140		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.21		
Intersection Signal Delay: 80.1	Intersection LOS: F	
Intersection Capacity Utilization 106.3%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



AM Existing + Cumulative + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

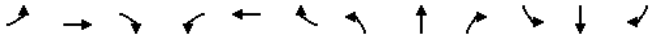
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.950				
Satd. Flow (prot)	1583	1863	0	0	1863	1417	0	1770	1417	0	0	0
Flt Permitted	0.950							0.950				
Satd. Flow (perm)	1583	1863	0	0	1863	1417	0	1770	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						25			358			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	500	600	0	0	950	139	277	0	340	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	526	632	0	0	1000	146	292	0	358	0	0	0
Lane Group Flow (vph)	526	632	0	0	1000	146	0	292	358	0	0	0
v/c Ratio	1.21	0.44			1.15	0.22		1.04	0.68			
Control Delay	143.4	14.2			112.1	16.6		114.5	11.9			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	143.4	14.2			112.1	16.6		114.5	11.9			
Queue Length 50th (ft)	~485	352			~911	53		~245	0			
Queue Length 95th (ft)	m#374	m303			#1164	97		#420	94			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	435	1444			869	675		280	526			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	1.21	0.44			1.15	0.22		1.04	0.68			

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

AM Existing + Cumulative + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis



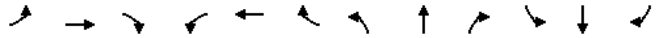
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1770	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1770	1417			
Volume (vph)	500	600	0	0	950	139	277	0	340	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	526	632	0	0	1000	146	292	0	358	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	13	0	0	301	0	0	0
Lane Group Flow (vph)	526	632	0	0	1000	133	0	292	57	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	33.0	93.0			56.0	56.0		19.0	19.0			
Effective Green, g (s)	33.0	93.0			56.0	56.0		19.0	19.0			
Actuated g/C Ratio	0.28	0.78			0.47	0.47		0.16	0.16			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	435	1444			869	661		280	224			
v/s Ratio Prot	c0.33	0.34			c0.54							
v/s Ratio Perm						0.09		0.17	0.04			
v/c Ratio	1.21	0.44			1.15	0.20		1.04	0.25			
Uniform Delay, d1	43.5	4.6			32.0	18.8		50.5	44.3			
Progression Factor	1.31	2.99			1.00	1.00		1.00	1.00			
Incremental Delay, d2	96.2	0.0			81.1	0.2		65.4	2.7			
Delay (s)	153.2	13.8			113.1	19.0		115.9	47.0			
Level of Service	F	B			F	B		F	D			
Approach Delay (s)		77.1			101.1			77.9			0.0	
Approach LOS		E			F			E			A	

Intersection Summary				
HCM Average Control Delay	86.6	HCM Level of Service		F
HCM Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	106.3%	ICU Level of Service		G
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing + Cumulative + Project
8: Pala Rd (SR-76) & Pankey Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	140	670	154	195	920	77	110	256	168	26	187	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	147	705	162	205	968	81	116	269	177	27	197	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1049			867			2662	2541	786	2812	2582	1009
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1049			867			2662	2541	786	2812	2582	1009
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	78			74			0	0	55	0	0	78
cM capacity (veh/h)	663			776			0	15	392	0	15	292

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1015	1255	562	287
Volume Left	147	205	116	27
Volume Right	162	81	177	63
cSH	663	776	0	0
Volume to Capacity	0.22	0.26	Err	Err
Queue Length 95th (ft)	21	27	Err	Err
Control Delay (s)	6.4	8.4	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	6.4	8.4	Err	Err
Approach LOS			F	F

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	143.5%	ICU Level of Service		H
Analysis Period (min)	15			

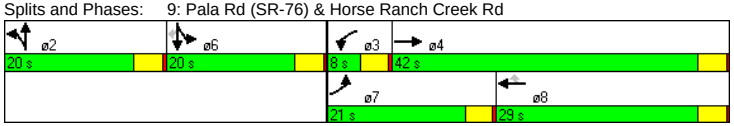
LOS Engineering

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	452	440	800	80	70	0	390		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	21.0	42.0	29.0	29.0	20.0	20.0	20.0	20.0	8.0
Total Split (%)	23.3%	46.7%	32.2%	32.2%	22.2%	22.2%	22.2%	22%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	14.6	39.5	20.9	20.9	9.1	9.1	9.1		
Actuated g/C Ratio	0.22	0.59	0.31	0.31	0.14	0.14	0.14		
v/c Ratio	0.71	0.22	0.76	0.17	0.36	0.29	0.30		
Control Delay	31.6	6.7	26.2	5.7	33.2	1.0	1.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	31.6	6.7	26.2	5.7	33.2	1.0	1.1		
LOS	C	A	C	A	C	A	A		
Approach Delay		19.3	24.4			6.0			
Approach LOS		B	C			A			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 66.6			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 18.6		Intersection LOS: B	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



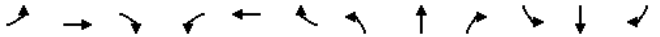
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		250	0		0	150		150
Storage Lanes	2		0	1		1	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt						0.850					0.850	0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						84					594	594
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2833			5160			734			1509	
Travel Time (s)		64.4			117.3			16.7			34.3	
Volume (vph)	452	440	0	0	800	80	0	0	0	70	0	390
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	476	463	0	0	842	84	0	0	0	74	0	411
Lane Group Flow (vph)	476	463	0	0	842	84	0	0	0	74	203	208
v/c Ratio	0.71	0.22			0.76	0.17				0.36	0.29	0.30
Control Delay	31.6	6.7			26.2	5.7				33.2	1.0	1.1
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	31.6	6.7			26.2	5.7				33.2	1.0	1.1
Queue Length 50th (ft)	96	39			164	0				31	0	0
Queue Length 95th (ft)	159	71			252	29				72	0	0
Internal Link Dist (ft)		2753			5080			654			1429	
Turn Bay Length (ft)	250					250				150		150
Base Capacity (vph)	767	2172			1264	560				332	781	760
Starvation Cap Reductn	0	0			0	0				0	0	0
Spillback Cap Reductn	0	0			0	0				0	0	0
Storage Cap Reductn	0	0			0	0				0	0	0
Reduced v/c Ratio	0.62	0.21			0.67	0.15				0.22	0.26	0.27

Intersection Summary	
Area Type:	Other

AM Existing + Cumulative + Project

9: Pala Rd (SR-76) & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis



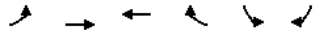
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.85	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3072	3539			3539	1417				1504	1441	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3072	3539			3539	1417				1504	1441	1346
Volume (vph)	452	440	0	0	800	80	0	0	0	70	0	390
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	476	463	0	0	842	84	0	0	0	74	0	411
RTOR Reduction (vph)	0	0	0	0	0	57	0	0	0	0	175	179
Lane Group Flow (vph)	476	463	0	0	842	27	0	0	0	74	28	29
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	14.6	39.5			20.9	20.9				9.1	9.1	9.1
Effective Green, g (s)	14.6	39.5			20.9	20.9				9.1	9.1	9.1
Actuated g/C Ratio	0.22	0.60			0.32	0.32				0.14	0.14	0.14
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	678	2112			1117	447				207	198	185
v/s Ratio Prot	c0.15	0.13			c0.24					c0.05	0.02	
v/s Ratio Perm						0.02						0.02
v/c Ratio	0.70	0.22			0.75	0.06				0.36	0.14	0.15
Uniform Delay, d1	23.8	6.2			20.3	15.8				25.9	25.1	25.2
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	3.3	0.1			2.9	0.1				1.1	0.3	0.4
Delay (s)	27.1	6.2			23.3	15.9				27.0	25.4	25.6
Level of Service	C	A			C	B				C	C	C
Approach Delay (s)		16.8			22.6			0.0			25.7	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM Average Control Delay	20.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing + Cumulative + Project

10: Pala Rd (SR-76) & Rice Canyon Rd — HCM Unsignalized Intersection Capacity Analysis



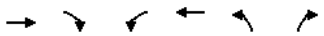
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	32	1071	552	33	80	140
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	34	1127	581	35	84	147
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	616				1793	598
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	616				1793	598
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				2	71
cM capacity (veh/h)	964				86	502

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1161	616	232
Volume Left	34	0	84
Volume Right	0	35	147
cSH	964	1700	181
Volume to Capacity	0.03	0.36	1.28
Queue Length 95th (ft)	3	0	325
Control Delay (s)	1.2	0.0	211.4
Lane LOS	A		F
Approach Delay (s)	1.2	0.0	211.4
Approach LOS			F

Intersection Summary			
Average Delay	25.0		
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		

LOS Engineering

AM Existing + Cumulative + Project
11: Pala Rd (SR-76) & Couser Canyon Rd — HCM Unsignalized Intersection Capacity Analysis



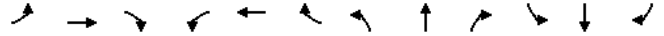
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1010	37	6	520	65	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1063	39	6	547	68	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1102		1643	1083
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1102		1643	1083
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		37	88
cM capacity (veh/h)			633		109	264

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1102	554	100
Volume Left	0	6	68
Volume Right	39	0	32
cSH	1700	633	134
Volume to Capacity	0.65	0.01	0.75
Queue Length 95th (ft)	0	1	109
Control Delay (s)	0.0	0.3	86.2
Lane LOS		A	F
Approach Delay (s)	0.0	0.3	86.2
Approach LOS			F

Intersection Summary			
Average Delay		5.0	
Intersection Capacity Utilization		68.1%	ICU Level of Service C
Analysis Period (min)		15	

LOS Engineering

AM Existing + Cumulative + Project
12: Pala Mesa Dr & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	250	120	300	114	62	75	52	368	121	143	717	24
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	263	126	316	120	65	79	55	387	127	151	755	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1677	1693	767	1995	1642	451	780			515		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1677	1693	767	1995	1642	451	780			515		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	21	0	18	87	93			86		
cM capacity (veh/h)	18	74	402	0	80	608	837			1051		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	705	120	144	55	515	151	780
Volume Left	263	120	0	55	0	151	0
Volume Right	316	0	79	0	127	0	25
cSH	42	0	153	837	1700	1051	1700
Volume to Capacity	16.79	Err	0.95	0.07	0.30	0.14	0.46
Queue Length 95th (ft)	Err	Err	171	5	0	12	0
Control Delay (s)	Err	Err	117.2	9.6	0.0	9.0	0.0
Lane LOS	F	F	F	A		A	
Approach Delay (s)	Err	Err		0.9		1.5	
Approach LOS	F	F					

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		102.2%	ICU Level of Service G
Analysis Period (min)		15	

LOS Engineering

AM Existing + Cumulative + Project
13: Pala Mesa Dr & Wilt Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	3	0	12	3	20	0	61	138	36	18	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	3	0	13	3	21	0	64	145	38	19	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	24			3			54	55	3	222	44	14
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	24			3			54	55	3	222	44	14
tC, single (s)	4.3			4.3			7.3	6.7	6.4	7.3	6.7	6.4
tC, 2 stage (s)												
tF (s)	2.4			2.4			3.7	4.2	3.5	3.7	4.2	3.5
p0 queue free %	100			99			100	92	86	93	98	100
cM capacity (veh/h)	1481			1508			879	796	1030	558	806	1016

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	37	209	57
Volume Left	1	13	0	38
Volume Right	0	21	145	0
cSH	1481	1508	945	622
Volume to Capacity	0.00	0.01	0.22	0.09
Queue Length 95th (ft)	0	1	21	8
Control Delay (s)	1.9	2.6	9.9	11.4
Lane LOS	A	A	A	B
Approach Delay (s)	1.9	2.6	9.9	11.4
Approach LOS			A	B

Intersection Summary				
Average Delay	9.2			
Intersection Capacity Utilization	28.4%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

AM Existing + Cumulative + Project
14: Stewart Canyon Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	21	19	35	23	5	273	8	404	16	302	1003	29
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	20	37	24	5	287	8	425	17	318	1056	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2439	2166	1071	2189	2173	434	1086			442		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2439	2166	1071	2189	2173	434	1086			442		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	40	86	0	84	54	99			72		
cM capacity (veh/h)	8	33	268	12	33	622	642			1118		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	79	317	8	442	318	1086
Volume Left	22	24	8	0	318	0
Volume Right	37	287	0	17	0	31
cSH	22	118	642	1700	1118	1700
Volume to Capacity	3.53	2.69	0.01	0.26	0.28	0.64
Queue Length 95th (ft)	Err	724	1	0	29	0
Control Delay (s)	Err	841.3	10.7	0.0	9.5	0.0
Lane LOS	F	F	B		A	
Approach Delay (s)	Err	841.3	0.2		2.1	
Approach LOS	F	F				

Intersection Summary				
Average Delay	470.6			
Intersection Capacity Utilization	87.4%	ICU Level of Service	E	
Analysis Period (min)	15			

LOS Engineering

AM Existing + Cumulative + Project

15: Reche Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	270	280	475	281	255	459
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	284	295	500	296	268	483
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1806	510	752			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1806	510	752			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	48	42			
cM capacity (veh/h)	36	563	858			

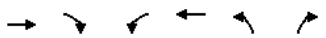
Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	579	500	296	752
Volume Left	284	500	0	0
Volume Right	295	0	0	483
cSH	69	858	1700	1700
Volume to Capacity	8.35	0.58	0.17	0.44
Queue Length 95th (ft)	Err	96	0	0
Control Delay (s)	Err	14.9	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	Err	9.4		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	2726.0		
Intersection Capacity Utilization	116.9%	ICU Level of Service	H
Analysis Period (min)	15		

LOS Engineering

AM Existing + Cumulative + Project

16: Reche Rd & Tecalote Dr — HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	409	16	3	417	10	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	431	17	3	439	11	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			447		884	439
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			447		884	439
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	99
cM capacity (veh/h)			1113		315	618

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	447	442	15
Volume Left	0	3	11
Volume Right	17	0	4
cSH	1700	1113	366
Volume to Capacity	0.26	0.00	0.04
Queue Length 95th (ft)	0	0	3
Control Delay (s)	0.0	0.1	15.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	15.2
Approach LOS			C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

AM Existing + Cumulative + Project
17: Reche Rd & Wilt Rd

HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	389	17	16	325	44	19
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	409	18	17	342	46	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			427		794	418
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			427		794	418
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		87	97
cM capacity (veh/h)			1132		352	635

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	427	359	66
Volume Left	0	17	46
Volume Right	18	0	20
cSH	1700	1132	406
Volume to Capacity	0.25	0.01	0.16
Queue Length 95th (ft)	0	1	14
Control Delay (s)	0.0	0.5	15.6
Lane LOS		A	C
Approach Delay (s)	0.0	0.5	15.6
Approach LOS			C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

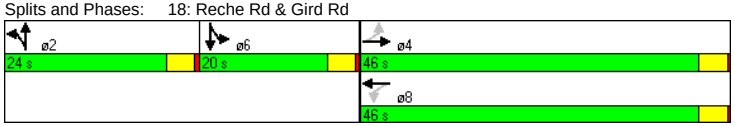
AM Existing + Cumulative + Project
18: Reche Rd & Gird Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBT	ø6
Lane Configurations						
Volume (vph)	5	455	37	291	5	
Turn Type	Perm		Perm			
Protected Phases		4		8	2	6
Permitted Phases	4		8			
Detector Phases	4	4	8	8	2	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	46.0	46.0	46.0	46.0	24.0	20.0
Total Split (%)	51.1%	51.1%	51.1%	51.1%	26.7%	22%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	22.3	22.3	22.3	22.3	11.9	
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.22	
v/c Ratio	0.01	0.79	0.25	0.40	0.59	
Control Delay	9.2	21.1	14.7	12.2	25.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.2	21.1	14.7	12.2	25.6	
LOS	A	C	B	B	C	
Approach Delay		21.0		12.5	25.6	
Approach LOS		C		B	C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 53.2			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 19.4		Intersection LOS: B	
Intersection Capacity Utilization 53.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 18: Reche Rd & Gird Rd



AM Existing + Cumulative + Project
18: Reche Rd & Gird Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	50		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.969			0.996			0.968				
Flt Protected	0.950			0.950				0.964				
Satd. Flow (prot)	1583	1805	0	1583	1855	0	0	1738	0	0	1863	0
Flt Permitted	0.486			0.224				0.964				
Satd. Flow (perm)	810	1805	0	373	1855	0	0	1738	0	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			2			16				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		6958			6851			1674			1091	
Travel Time (s)		158.1			155.7			38.0			24.8	
Volume (vph)	5	455	121	37	291	8	167	5	53	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	479	127	39	306	8	176	5	56	0	0	0
Lane Group Flow (vph)	5	606	0	39	314	0	0	237	0	0	0	0
v/c Ratio	0.01	0.79		0.25	0.40			0.59				
Control Delay	9.2	21.1		14.7	12.2			25.6				
Queue Delay	0.0	0.0		0.0	0.0			0.0				
Total Delay	9.2	21.1		14.7	12.2			25.6				
Queue Length 50th (ft)	1	141		7	61			59				
Queue Length 95th (ft)	6	301		29	134			160				
Internal Link Dist (ft)		6878			6771			1594			1011	
Turn Bay Length (ft)	50			50								
Base Capacity (vph)	476	1068		219	1090			598				
Starvation Cap Reductn	0	0		0	0			0				
Spillback Cap Reductn	0	0		0	0			0				
Storage Cap Reductn	0	0		0	0			0				
Reduced v/c Ratio	0.01	0.57		0.18	0.29			0.40				

Intersection Summary	
Area Type:	Other

LOS Engineering

AM Existing + Cumulative + Project
18: Reche Rd & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0				
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00				
Frt	1.00	0.97		1.00	1.00			0.97				
Flt Protected	0.95	1.00		0.95	1.00			0.96				
Satd. Flow (prot)	1583	1804		1583	1856			1739				
Flt Permitted	0.51	1.00		0.22	1.00			0.96				
Satd. Flow (perm)	851	1804		362	1856			1739				
Volume (vph)	5	455	121	37	291	8	167	5	53	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	5	479	127	39	306	8	176	5	56	0	0	0
RTOR Reduction (vph)	0	11	0	0	1	0	0	12	0	0	0	0
Lane Group Flow (vph)	5	595	0	39	313	0	0	225	0	0	0	0
Turn Type	Perm			Perm			Split			Split		
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8								
Actuated Green, G (s)	22.3	22.3		22.3	22.3			11.9				
Effective Green, g (s)	22.3	22.3		22.3	22.3			11.9				
Actuated g/C Ratio	0.43	0.43		0.43	0.43			0.23				
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0				
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0				
Lane Grp Cap (vph)	364	771		155	793			396				
v/s Ratio Prot		c0.33			0.17			c0.13				
v/s Ratio Perm	0.01			0.11								
v/c Ratio	0.01	0.77		0.25	0.39			0.57				
Uniform Delay, d1	8.6	12.8		9.6	10.3			17.9				
Progression Factor	1.00	1.00		1.00	1.00			1.00				
Incremental Delay, d2	0.0	4.8		0.9	0.3			1.9				
Delay (s)	8.6	17.6		10.5	10.6			19.7				
Level of Service	A	B		B	B			B				
Approach Delay (s)		17.5			10.6			19.7			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM Average Control Delay	15.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	52.2	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	53.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

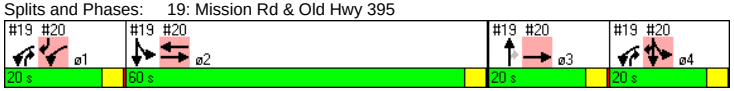
AM Existing + Cumulative + Project
19: Mission Rd & Old Hwy 395 — Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	220	1000	81	250	843	60		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	40.0	0.0	20.0	40.0	60.0	60.0	20.0	20.0
Total Split (%)	33.3%	0.0%	16.7%	33.3%	50.0%	50.0%	17%	17%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	36.0	120.0	16.0	56.0	56.0	56.0		
Actuated g/C Ratio	0.30	1.00	0.13	0.47	0.47	0.47		
v/c Ratio	0.49	0.74	0.34	0.40	1.20	0.07		
Control Delay	40.6	3.4	51.6	23.3	133.5	18.1		
Queue Delay	0.0	0.0	0.0	0.0	15.4	0.0		
Total Delay	40.6	3.4	51.6	23.3	148.9	18.1		
LOS	D	A	D	C	F	B		
Approach Delay	10.1		30.2			140.3		
Approach LOS	B		C			F		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 140
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 60.7 — Intersection LOS: E
Intersection Capacity Utilization 79.2% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 19: Mission Rd & Old Hwy 395



AM Existing + Cumulative + Project
19: Mission Rd & Old Hwy 395 — Queues

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	220	1000	81	250	843	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1053	85	263	887	63
Lane Group Flow (vph)	232	1053	85	263	887	63
v/c Ratio	0.49	0.74	0.34	0.40	1.20	0.07
Control Delay	40.6	3.4	51.6	23.3	133.5	18.1
Queue Delay	0.0	0.0	0.0	0.0	15.4	0.0
Total Delay	40.6	3.4	51.6	23.3	148.9	18.1
Queue Length 50th (ft)	138	82	61	130	~834	26
Queue Length 95th (ft)	m144	m18	112	200	#1081	53
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	475	1417	248	661	739	869
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	10	21	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.74	0.34	0.40	1.24	0.07

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

AM Existing + Cumulative + Project
19: Mission Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Volume (vph)	220	1000	81	250	843	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1053	85	263	887	63
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	232	1053	85	263	887	63
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	36.0	120.0	16.0	52.0	56.0	56.0
Effective Green, g (s)	36.0	120.0	16.0	52.0	56.0	56.0
Actuated g/C Ratio	0.30	1.00	0.13	0.43	0.47	0.47
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	475	1417	248	661	739	869
v/s Ratio Prot	0.15		0.05	0.12	c0.56	0.03
v/s Ratio Perm		c0.74		0.07		
v/c Ratio	0.49	0.74	0.34	0.40	1.20	0.07
Uniform Delay, d1	34.4	0.0	47.2	23.3	32.0	17.7
Progression Factor	1.12	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	1.3	0.8	0.4	102.9	0.0
Delay (s)	38.8	1.3	48.1	23.7	134.9	17.7
Level of Service	D	A	D	C	F	B
Approach Delay (s)	8.1		29.6			127.1
Approach LOS	A		C			F

Intersection Summary			
HCM Average Control Delay	54.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

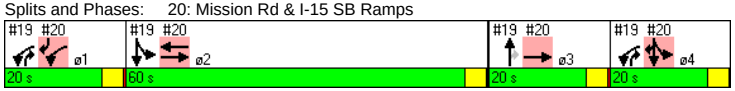
LOS Engineering

AM Existing + Cumulative + Project
20: Mission Rd & I-15 SB Ramps — Timings

Lane Group	EBT	WBL	WBT	SBT	SBR	ø3
Lane Configurations						
Volume (vph)	800	117	370	8	865	
Turn Type		Prot			custom	
Protected Phases	2 3	1	2	4	1 4	3
Permitted Phases					4	
Detector Phases	2 3	1	2	4	1 4	
Minimum Initial (s)		4.0	4.0	4.0		4.0
Minimum Split (s)		8.0	20.0	20.0		20.0
Total Split (s)	80.0	20.0	60.0	20.0	40.0	20.0
Total Split (%)	66.7%	16.7%	50.0%	16.7%	33.3%	17%
Yellow Time (s)		3.5	3.5	3.5		3.5
All-Red Time (s)		0.5	0.5	0.5		0.5
Lead/Lag		Lead	Lag	Lag		Lead
Lead-Lag Optimize?		Yes	Yes	Yes		Yes
Recall Mode		None	Min	None		None
Act Effct Green (s)	76.0	16.0	56.0	16.0	36.0	
Actuated g/C Ratio	0.63	0.13	0.47	0.13	0.30	
v/c Ratio	0.98	0.58	0.45	0.07	1.14	
Control Delay	14.3	60.9	23.6	46.4	96.5	
Queue Delay	65.8	0.0	0.0	0.1	0.0	
Total Delay	80.1	60.9	23.6	46.5	96.5	
LOS	F	E	C	D	F	
Approach Delay	80.1		32.6	95.6		
Approach LOS	F		C	F		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Natural Cycle: 140		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.20		
Intersection Signal Delay: 76.2	Intersection LOS: E	
Intersection Capacity Utilization 86.0%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



LOS Engineering

AM Existing + Cumulative + Project
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		0	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50					50	50	50
Trailing Detector (ft)		0		0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.966										0.850
Flt Protected				0.950							0.974	
Satd. Flow (prot)	0	1799	0	1583	1863	0	0	0	0	0	1814	1417
Flt Permitted				0.950							0.974	
Satd. Flow (perm)	0	1799	0	1583	1863	0	0	0	0	0	1814	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28										531
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	800	270	117	370	0	0	0	0	9	8	865
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	842	284	123	389	0	0	0	0	9	8	911
Lane Group Flow (vph)	0	1126	0	123	389	0	0	0	0	0	17	911
v/c Ratio		0.98		0.58	0.45						0.07	1.14
Control Delay		14.3		60.9	23.6						46.4	96.5
Queue Delay		65.8		0.0	0.0						0.1	0.0
Total Delay		80.1		60.9	23.6						46.5	96.5
Queue Length 50th (ft)		147		91	198						12	~520
Queue Length 95th (ft)		m148		157	283						34	#772
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1150		211	869						242	797
Starvation Cap Reductn		180		0	0						0	0
Spillback Cap Reductn		18		0	0						24	0
Storage Cap Reductn		0		0	0						0	0
Reduced v/c Ratio		1.16		0.58	0.45						0.08	1.14

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

AM Existing + Cumulative + Project
20: Mission Rd & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.97		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.97	1.00
Satd. Flow (prot)		1799		1583	1863						1815	1417
Flt Permitted		1.00		0.95	1.00						0.97	1.00
Satd. Flow (perm)		1799		1583	1863						1815	1417
Volume (vph)	0	800	270	117	370	0	0	0	0	9	8	865
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	842	284	123	389	0	0	0	0	9	8	911
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	0	0	0	372
Lane Group Flow (vph)	0	1116	0	123	389	0	0	0	0	0	17	539
Turn Type				Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases												4
Actuated Green, G (s)		76.0		16.0	56.0						16.0	36.0
Effective Green, g (s)		76.0		16.0	56.0						16.0	36.0
Actuated g/C Ratio		0.63		0.13	0.47						0.13	0.30
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1139		211	869						242	425
v/s Ratio Prot		c0.62		0.08	0.21						0.01	c0.38
v/s Ratio Perm												
v/c Ratio		0.98		0.58	0.45						0.07	1.27
Uniform Delay, d1		21.3		48.9	21.6						45.5	42.0
Progression Factor		0.37		1.00	1.00						1.00	1.00
Incremental Delay, d2		4.4		4.1	0.4						0.1	138.5
Delay (s)		12.2		52.9	21.9						45.6	180.5
Level of Service		B		D	C						D	F
Approach Delay (s)		12.2			29.4			0.0			178.0	
Approach LOS		B			C			A			F	

Intersection Summary				
HCM Average Control Delay	75.6	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

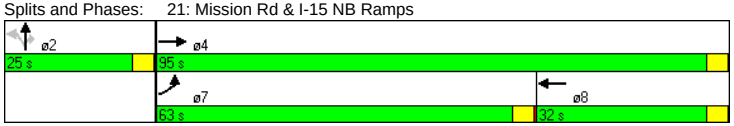
AM Existing + Cumulative + Project
21: Mission Rd & I-15 NB Ramps

Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	600	178	300	4	80
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	63.0	95.0	32.0	25.0	25.0
Total Split (%)	52.5%	79.2%	26.7%	20.8%	20.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	38.8	63.3	19.8	15.1	15.1
Actuated g/C Ratio	0.44	0.72	0.23	0.17	0.17
v/c Ratio	0.91	0.14	0.78	0.70	0.27
Control Delay	41.5	4.0	50.2	53.5	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.5	4.0	50.2	53.5	11.9
LOS	D	A	D	D	B
Approach Delay		33.0	50.2	41.8	
Approach LOS		C	D	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 87.9		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.91		
Intersection Signal Delay: 38.7	Intersection LOS: D	
Intersection Capacity Utilization 86.0%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



LOS Engineering

AM Existing + Cumulative + Project
21: Mission Rd & I-15 NB Ramps

Queues

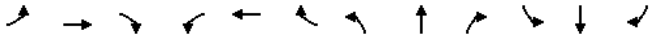
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.995				0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	1583	1863	0	0	1853	0	0	1775	1417	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	1583	1863	0	0	1853	0	0	1775	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					2				84			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	600	178	0	0	300	12	200	4	80	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	187	0	0	316	13	211	4	84	0	0	0
Lane Group Flow (vph)	632	187	0	0	329	0	0	215	84	0	0	0
v/c Ratio	0.91	0.14			0.78			0.70	0.27			
Control Delay	41.5	4.0			50.2			53.5	11.9			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	41.5	4.0			50.2			53.5	11.9			
Queue Length 50th (ft)	327	27			182			121	0			
Queue Length 95th (ft)	577	53			#363			#246	45			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	892	1487			582			435	410			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.71	0.13			0.57			0.49	0.20			

Intersection Summary	
Area Type:	Other
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

LOS Engineering

AM Existing + Cumulative + Project

21: Mission Rd & I-15 NB Ramps — HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1583	1863			1853			1776	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1583	1863			1853			1776	1417			
Volume (vph)	600	178	0	0	300	12	200	4	80	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	187	0	0	316	13	211	4	84	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	69	0	0	0
Lane Group Flow (vph)	632	187	0	0	327	0	0	215	15	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	38.8	63.3			20.5			15.1	15.1			
Effective Green, g (s)	38.8	63.3			20.5			15.1	15.1			
Actuated g/C Ratio	0.45	0.73			0.24			0.17	0.17			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	711	1365			440			310	248			
v/s Ratio Prot	c0.40	0.10			c0.18							
v/s Ratio Perm								0.12	0.01			
v/c Ratio	0.89	0.14			0.74			0.69	0.06			
Uniform Delay, d1	21.8	3.4			30.5			33.5	29.7			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	13.0	0.0			6.7			6.6	0.1			
Delay (s)	34.8	3.5			37.2			40.0	29.8			
Level of Service	C	A			D			D	C			
Approach Delay (s)		27.7			37.2			37.2			0.0	
Approach LOS		C			D			D			A	

Intersection Summary				
HCM Average Control Delay	31.8	HCM Level of Service		C
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	86.4	Sum of lost time (s)		12.0
Intersection Capacity Utilization	86.0%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing + Cumulative + Project

22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	20	314	279	7	16	22
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	331	294	7	17	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	623	28	40			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	623	28	40			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	68	81			
cM capacity (veh/h)	366	1047	1570			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	352	301	40
Volume Left	21	294	0
Volume Right	331	0	23
cSH	942	1570	1700
Volume to Capacity	0.37	0.19	0.02
Queue Length 95th (ft)	44	17	0
Control Delay (s)	11.1	7.7	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	7.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	9.0		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

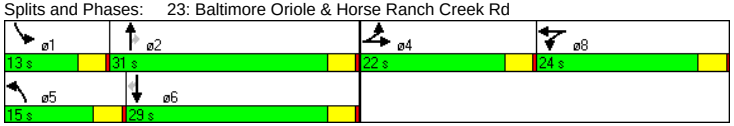
AM Existing + Cumulative + Project
23: Baltimore Oriole & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	12	2	217	26	54	226	180	29	253	42
Turn Type	Split		Split		Prot		Perm	Prot		Perm
Protected Phases	4	4	8	8	5	2		1	6	
Permitted Phases							2			6
Detector Phases	4	4	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	22.0	22.0	24.0	24.0	15.0	31.0	31.0	13.0	29.0	29.0
Total Split (%)	24.4%	24.4%	26.7%	26.7%	16.7%	34.4%	34.4%	14.4%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	7.6	7.6	13.1	13.1	9.0	30.4	30.4	8.2	27.0	27.0
Actuated g/C Ratio	0.12	0.12	0.22	0.22	0.14	0.53	0.53	0.13	0.47	0.47
v/c Ratio	0.07	0.03	0.44	0.43	0.25	0.24	0.22	0.16	0.30	0.06
Control Delay	25.3	20.2	18.9	16.0	22.4	10.2	3.3	25.1	13.2	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	20.2	18.9	16.0	22.4	10.2	3.3	25.1	13.2	6.6
LOS	C	C	B	B	C	B	A	C	B	A
Approach Delay		23.7		17.4		9.0			13.5	
Approach LOS		C		B		A			B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 57.2			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 12.8		Intersection LOS: B	
Intersection Capacity Utilization 41.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Baltimore Oriole & Horse Ranch Creek Rd



AM Existing + Cumulative + Project
23: Baltimore Oriole & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.900			0.948				0.850			0.850
Flt Protected	0.950			0.950	0.976		0.950			0.950		
Satd. Flow (prot)	1583	1676	0	1504	1637	0	1583	1863	1417	1583	1863	1417
Flt Permitted	0.950			0.950	0.976		0.950			0.950		
Satd. Flow (perm)	1583	1676	0	1504	1637	0	1583	1863	1417	1583	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			27				189			44
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1047			1324			958			2343	
Travel Time (s)		23.8			30.1			21.8			53.3	
Volume (vph)	12	2	4	217	26	54	54	226	180	29	253	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	2	4	228	27	57	57	238	189	31	266	44
Lane Group Flow (vph)	13	6	0	147	165	0	57	238	189	31	266	44
v/c Ratio	0.07	0.03		0.44	0.43		0.25	0.24	0.22	0.16	0.30	0.06
Control Delay	25.3	20.2		18.9	16.0		22.4	10.2	3.3	25.1	13.2	6.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.3	20.2		18.9	16.0		22.4	10.2	3.3	25.1	13.2	6.6
Queue Length 50th (ft)	1	0		12	11		5	18	0	3	20	0
Queue Length 95th (ft)	21	11		112	110		55	143	42	37	168	22
Internal Link Dist (ft)		967			1244			878			2263	
Turn Bay Length (ft)												
Base Capacity (vph)	439	468		556	622		323	1200	980	262	1125	873
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.01		0.26	0.27		0.18	0.20	0.19	0.12	0.24	0.05

Intersection Summary	
Area Type:	Other

AM Existing + Cumulative + Project
23: Baltimore Oriole & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	1676		1504	1638		1583	1863	1417	1583	1863	1417
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	1676		1504	1638		1583	1863	1417	1583	1863	1417
Volume (vph)	12	2	4	217	26	54	54	226	180	29	253	42
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	2	4	228	27	57	57	238	189	31	266	44
RTOR Reduction (vph)	0	4	0	0	22	0	0	0	96	0	0	24
Lane Group Flow (vph)	13	2	0	147	143	0	57	238	93	31	266	20
Turn Type	Split			Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	1.2	1.2		12.2	12.2		3.8	30.0	30.0	1.4	27.6	27.6
Effective Green, g (s)	1.2	1.2		12.2	12.2		3.8	30.0	30.0	1.4	27.6	27.6
Actuated g/C Ratio	0.02	0.02		0.20	0.20		0.06	0.49	0.49	0.02	0.45	0.45
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	31	33		302	329		99	919	699	36	846	643
v/s Ratio Prot	c0.01	0.00		c0.10	0.09		c0.04	0.13		0.02	c0.14	
v/s Ratio Perm									0.07			0.01
v/c Ratio	0.42	0.06		0.49	0.44		0.58	0.26	0.13	0.86	0.31	0.03
Uniform Delay, d1	29.5	29.2		21.5	21.3		27.7	8.9	8.4	29.6	10.6	9.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.9	0.8		1.2	0.9		7.9	0.2	0.1	95.3	0.2	0.0
Delay (s)	38.4	30.1		22.8	22.2		35.6	9.1	8.4	124.9	10.8	9.2
Level of Service	D	C		C	C		D	A	A	F	B	A
Approach Delay (s)		35.7			22.5			12.0			21.0	
Approach LOS		D			C			B			C	

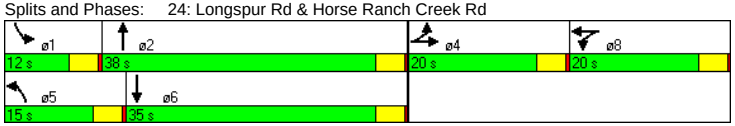
Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing + Cumulative + Project
24: Longspur Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	7	29	206	39	120	396	30	399
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	38.0	12.0	35.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	42.2%	13.3%	38.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	7.3	7.3	11.7	11.7	9.8	44.8	6.9	37.7
Actuated g/C Ratio	0.09	0.09	0.15	0.15	0.12	0.57	0.08	0.48
v/c Ratio	0.05	0.38	0.61	0.60	0.65	0.33	0.25	0.28
Control Delay	33.4	23.9	42.3	37.1	49.3	9.9	40.4	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	23.9	42.3	37.1	49.3	9.9	40.4	15.5
LOS	C	C	D	D	D	A	D	B
Approach Delay		24.7		39.6		16.2		17.1
Approach LOS		C		D		B		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 78.4		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.65		
Intersection Signal Delay: 21.0	Intersection LOS: C	
Intersection Capacity Utilization 46.1%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 24: Longspur Rd & Horse Ranch Creek Rd



AM Existing + Cumulative + Project
24: Longspur Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.915			0.965			0.945			0.983	
Flt Protected	0.950			0.950	0.975		0.950			0.950		
Satd. Flow (prot)	1583	1704	0	1504	1665	0	1583	3345	0	1583	3479	0
Flt Permitted	0.950			0.950	0.975		0.950			0.950		
Satd. Flow (perm)	1583	1704	0	1504	1665	0	1583	3345	0	1583	3479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41			15			148			16	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1010			908			1206			958	
Travel Time (s)		23.0			20.6			27.4			21.8	
Volume (vph)	7	29	39	206	39	35	120	396	229	30	399	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	31	41	217	41	37	126	417	241	32	420	53
Lane Group Flow (vph)	7	72	0	138	157	0	126	658	0	32	473	0
v/c Ratio	0.05	0.38		0.61	0.60		0.65	0.33		0.25	0.28	
Control Delay	33.4	23.9		42.3	37.1		49.3	9.9		40.4	15.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.4	23.9		42.3	37.1		49.3	9.9		40.4	15.5	
Queue Length 50th (ft)	3	14		65	66		57	55		15	77	
Queue Length 95th (ft)	15	53		129	133		#133	145		43	131	
Internal Link Dist (ft)		930			828			1126			878	
Turn Bay Length (ft)												
Base Capacity (vph)	285	341		292	335		215	1974		148	1679	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.02	0.21		0.47	0.47		0.59	0.33		0.22	0.28	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing + Cumulative + Project
24: Longspur Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.96		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1704		1504	1665		1583	3345		1583	3480	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1704		1504	1665		1583	3345		1583	3480	
Volume (vph)	7	29	39	206	39	35	120	396	229	30	399	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	7	31	41	217	41	37	126	417	241	32	420	53
RTOR Reduction (vph)	0	38	0	0	13	0	0	67	0	0	8	0
Lane Group Flow (vph)	7	34	0	138	144	0	126	591	0	32	465	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.1	6.1		11.7	11.7		8.5	44.8		3.0	39.3	
Effective Green, g (s)	6.1	6.1		11.7	11.7		8.5	44.8		3.0	39.3	
Actuated g/C Ratio	0.07	0.07		0.14	0.14		0.10	0.55		0.04	0.48	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	118	127		216	239		165	1836		58	1676	
v/s Ratio Prot	0.00	c0.02		c0.09	0.09		c0.08	c0.18		0.02	0.13	
v/s Ratio Perm												
v/c Ratio	0.06	0.27		0.64	0.60		0.76	0.32		0.55	0.28	
Uniform Delay, d1	35.1	35.6		33.0	32.8		35.6	10.1		38.6	12.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	1.1		6.1	4.2		18.7	0.5		10.9	0.4	
Delay (s)	35.3	36.8		39.0	37.0		54.3	10.5		49.5	13.1	
Level of Service	D	D		D	D		D	B		D	B	
Approach Delay (s)		36.6			38.0			17.6			15.4	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

AM Existing + Cumulative + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd

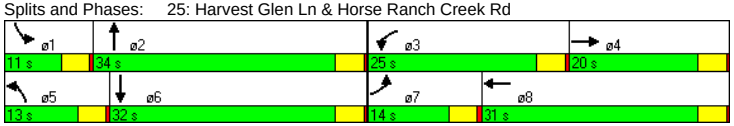
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	1	15	254	18	49	644	66	570
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	14.0	20.0	25.0	31.0	13.0	34.0	11.0	32.0
Total Split (%)	15.6%	22.2%	27.8%	34.4%	14.4%	37.8%	12.2%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.0	6.5	14.2	14.5	7.3	24.1	6.9	23.6
Actuated g/C Ratio	0.10	0.10	0.26	0.27	0.12	0.44	0.12	0.43
v/c Ratio	0.01	0.10	0.65	0.25	0.26	0.60	0.37	0.40
Control Delay	33.0	30.4	27.6	7.8	30.8	15.4	34.8	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	30.4	27.6	7.8	30.8	15.4	34.8	14.7
LOS	C	C	C	A	C	B	C	B
Approach Delay		30.6		21.3		16.2		16.7
Approach LOS		C		C		B		B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 54.6
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 17.5 Intersection LOS: B
Intersection Capacity Utilization 61.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 25: Harvest Glen Ln & Horse Ranch Creek Rd



LOS Engineering

AM Existing + Cumulative + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.976			0.873			0.960			0.999	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1818	0	1583	1626	0	1583	3398	0	1583	3536	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1818	0	1583	1626	0	1583	3398	0	1583	3536	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			106			62			1	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1058			1173			1033			1206	
Travel Time (s)		24.0			26.7			23.5			27.4	
Volume (vph)	1	15	3	254	18	101	49	644	235	66	570	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	16	3	267	19	106	52	678	247	69	600	5
Lane Group Flow (vph)	1	19	0	267	125	0	52	925	0	69	605	0
v/c Ratio	0.01	0.10		0.65	0.25		0.26	0.60		0.37	0.40	
Control Delay	33.0	30.4		27.6	7.8		30.8	15.4		34.8	14.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.0	30.4		27.6	7.8		30.8	15.4		34.8	14.7	
Queue Length 50th (ft)	0	5		74	4		15	117		20	73	
Queue Length 95th (ft)	5	28		205	46		59	266		#82	176	
Internal Link Dist (ft)		978			1093			953			1126	
Turn Bay Length (ft)												
Base Capacity (vph)	252	424		569	742		248	1784		198	1765	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.00	0.04		0.47	0.17		0.21	0.52		0.35	0.34	

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.87		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1819		1583	1626		1583	3397		1583	3535	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1819		1583	1626		1583	3397		1583	3535	
Volume (vph)	1	15	3	254	18	101	49	644	235	66	570	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	16	3	267	19	106	52	678	247	69	600	5
RTOR Reduction (vph)	0	3	0	0	80	0	0	37	0	0	1	0
Lane Group Flow (vph)	1	16	0	267	45	0	52	888	0	69	604	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.8	1.1		14.2	14.5		4.1	24.1		3.6	23.6	
Effective Green, g (s)	0.8	1.1		14.2	14.5		4.1	24.1		3.6	23.6	
Actuated g/C Ratio	0.01	0.02		0.24	0.25		0.07	0.41		0.06	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	21	34		381	400		110	1388		97	1414	
v/s Ratio Prot	0.00	c0.01		c0.17	0.03		0.03	c0.26		c0.04	0.17	
v/s Ratio Perm												
v/c Ratio	0.05	0.47		0.70	0.11		0.47	0.64		0.71	0.43	
Uniform Delay, d1	28.7	28.7		20.5	17.3		26.4	14.0		27.2	12.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	10.0		5.7	0.1		3.2	1.0		21.7	0.2	
Delay (s)	29.7	38.7		26.2	17.4		29.6	15.0		48.9	13.0	
Level of Service	C	D		C	B		C	B		D	B	
Approach Delay (s)		38.2			23.4			15.8			16.7	
Approach LOS		D			C			B			B	

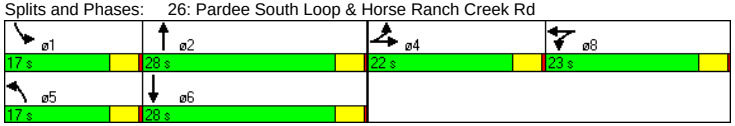
Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	59.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing + Cumulative + Project
26: Pardee South Loop & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	62	0	228	0	54	759	40	769
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	22.0	22.0	23.0	23.0	17.0	28.0	17.0	28.0
Total Split (%)	24.4%	24.4%	25.6%	25.6%	18.9%	31.1%	18.9%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	8.3	8.3	12.2	12.2	8.0	27.5	7.5	27.1
Actuated g/C Ratio	0.13	0.13	0.20	0.20	0.12	0.44	0.11	0.44
v/c Ratio	0.33	0.09	0.57	0.54	0.30	0.58	0.23	0.54
Control Delay	33.7	0.4	32.3	20.0	33.8	19.9	33.8	19.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	0.4	32.3	20.0	33.8	19.9	33.8	19.9
LOS	C	A	C	B	C	B	C	B
Approach Delay		19.7		25.5		20.7		20.5
Approach LOS		B		C		C		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 61.9			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 21.4		Intersection LOS: C	
Intersection Capacity Utilization 54.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 26: Pardee South Loop & Horse Ranch Creek Rd



AM Existing + Cumulative + Project
26: Pardee South Loop & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.903			0.983			0.996	
Flt Protected	0.950			0.950	0.983		0.950			0.950		
Satd. Flow (prot)	1583	1583	0	1504	1571	0	1583	3479	0	1583	3525	0
Flt Permitted	0.950			0.950	0.983		0.950			0.950		
Satd. Flow (perm)	1583	1583	0	1504	1571	0	1583	3479	0	1583	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		345			92			14			3	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		869			1419			1340			1033	
Travel Time (s)		19.8			32.3			30.5			23.5	
Volume (vph)	62	0	45	228	0	126	54	759	94	40	769	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	65	0	47	240	0	133	57	799	99	42	809	22
Lane Group Flow (vph)	65	47	0	167	206	0	57	898	0	42	831	0
v/c Ratio	0.33	0.09		0.57	0.54		0.30	0.58		0.23	0.54	
Control Delay	33.7	0.4		32.3	20.0		33.8	19.9		33.8	19.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.7	0.4		32.3	20.0		33.8	19.9		33.8	19.9	
Queue Length 50th (ft)	26	0		68	44		22	165		17	153	
Queue Length 95th (ft)	68	0		143	118		62	#323		50	#282	
Internal Link Dist (ft)		789			1339			1260			953	
Turn Bay Length (ft)												
Base Capacity (vph)	390	650		441	526		303	1633		301	1629	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.17	0.07		0.38	0.39		0.19	0.55		0.14	0.51	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Existing + Cumulative + Project
26: Pardee South Loop & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.90		1.00	0.98		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1583		1504	1570		1583	3481		1583	3525	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1583		1504	1570		1583	3481		1583	3525	
Volume (vph)	62	0	45	228	0	126	54	759	94	40	769	21
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	65	0	47	240	0	133	57	799	99	42	809	22
RTOR Reduction (vph)	0	43	0	0	75	0	0	8	0	0	2	0
Lane Group Flow (vph)	65	4	0	167	131	0	57	890	0	42	829	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.9	4.9		12.2	12.2		4.7	27.5		4.3	27.1	
Effective Green, g (s)	4.9	4.9		12.2	12.2		4.7	27.5		4.3	27.1	
Actuated g/C Ratio	0.08	0.08		0.19	0.19		0.07	0.42		0.07	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	120		283	295		115	1475		105	1472	
v/s Ratio Prot	c0.04	0.00		c0.11	0.08		c0.04	c0.26		0.03	0.24	
v/s Ratio Perm												
v/c Ratio	0.54	0.03		0.59	0.45		0.50	0.60		0.40	0.56	
Uniform Delay, d1	28.9	27.8		24.1	23.4		29.0	14.5		29.1	14.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.9	0.1		3.3	1.1		3.3	0.7		2.5	0.5	
Delay (s)	33.8	27.9		27.3	24.4		32.3	15.2		31.6	14.9	
Level of Service	C	C		C	C		C	B		C	B	
Approach Delay (s)		31.3			25.7			16.2			15.7	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	18.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	64.9	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	54.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

AM Existing + Cumulative + Project

27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	144	763	215	0	1093
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	152	803	226	0	1151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1492	515			1029	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1492	515			1029	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	70			100	
cM capacity (veh/h)	114	505			670	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	152	535	494	575	575
Volume Left	0	0	0	0	0
Volume Right	152	0	226	0	0
cSH	505	1700	1700	1700	1700
Volume to Capacity	0.30	0.31	0.29	0.34	0.34
Queue Length 95th (ft)	31	0	0	0	0
Control Delay (s)	15.2	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	15.2	0.0		0.0	
Approach LOS	C				

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

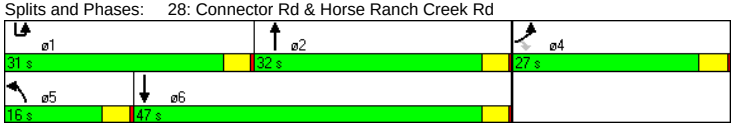
AM Existing + Cumulative + Project

28: Connector Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Configurations						
Volume (vph)	274	10	5	525	190	448
Turn Type		Perm	Prot		Prot	
Protected Phases	4		5	2	1	6
Permitted Phases		4				
Detector Phases	4	4	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	27.0	27.0	16.0	32.0	31.0	47.0
Total Split (%)	30.0%	30.0%	17.8%	35.6%	34.4%	52.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	Min	None	Min
Act Effct Green (s)	9.7	9.7	6.0	19.4	11.1	30.1
Actuated g/C Ratio	0.20	0.20	0.11	0.43	0.23	0.66
v/c Ratio	0.46	0.04	0.03	0.37	0.54	0.42
Control Delay	19.9	11.3	26.2	15.2	22.6	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	11.3	26.2	15.2	22.6	4.3
LOS	B	B	C	B	C	A
Approach Delay	19.6			15.3		7.4
Approach LOS	B			B		A

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 45.5			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 11.4		Intersection LOS: B	
Intersection Capacity Utilization 49.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 28: Connector Rd & Horse Ranch Creek Rd



AM Existing + Cumulative + Project
28: Connector Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9		9
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	0.95
Frt		0.850				0.923	
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	3072	1417	1583	3539	1583	3267	0
Flt Permitted	0.950		0.950		0.950		
Satd. Flow (perm)	3072	1417	1583	3539	1583	3267	0
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		11				405	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30		30	
Link Distance (ft)	2875			1509		1400	
Travel Time (s)	65.3			34.3		31.8	
Volume (vph)	274	10	5	525	190	448	472
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	288	11	5	553	200	472	497
Lane Group Flow (vph)	288	11	5	553	200	969	0
v/c Ratio	0.46	0.04	0.03	0.37	0.54	0.42	
Control Delay	19.9	11.3	26.2	15.2	22.6	4.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	19.9	11.3	26.2	15.2	22.6	4.3	
Queue Length 50th (ft)	32	0	1	62	43	28	
Queue Length 95th (ft)	83	11	11	138	121	113	
Internal Link Dist (ft)	2795			1429		1320	
Turn Bay Length (ft)							
Base Capacity (vph)	1183	552	330	1966	685	2522	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.24	0.02	0.02	0.28	0.29	0.38	

Intersection Summary
Area Type: Other

LOS Engineering

AM Existing + Cumulative + Project
28: Connector Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	0.92	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	3072	1417	1583	3539	1583	3267	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	3072	1417	1583	3539	1583	3267	
Volume (vph)	274	10	5	525	190	448	472
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	288	11	5	553	200	472	497
RTOR Reduction (vph)	0	9	0	0	0	169	0
Lane Group Flow (vph)	288	2	5	553	200	800	0
Turn Type		Perm	Prot		Prot		
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	7.8	7.8	0.9	20.5	9.2	28.8	
Effective Green, g (s)	7.8	7.8	0.9	20.5	9.2	28.8	
Actuated g/C Ratio	0.16	0.16	0.02	0.41	0.19	0.58	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	484	223	29	1466	294	1901	
v/s Ratio Prot	c0.09		0.00	0.16	c0.13	c0.24	
v/s Ratio Perm		0.00					
v/c Ratio	0.60	0.01	0.17	0.38	0.68	0.42	
Uniform Delay, d1	19.4	17.6	23.9	10.1	18.8	5.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	0.0	2.8	0.2	6.3	0.2	
Delay (s)	21.3	17.6	26.8	10.2	25.1	5.9	
Level of Service	C	B	C	B	C	A	
Approach Delay (s)	21.2			10.4		9.2	
Approach LOS	C			B		A	

Intersection Summary				
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	49.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

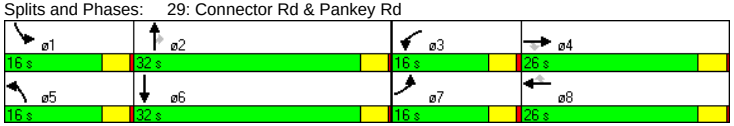
AM Existing + Cumulative + Project
29: Connector Rd & Pankey Rd

Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	50	124	200	52	299	219	150	299	17	142	19
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot	
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	4	3	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	16.0	26.0	26.0	16.0	26.0	26.0	16.0	32.0	32.0	16.0	32.0
Total Split (%)	17.8%	28.9%	28.9%	17.8%	28.9%	28.9%	17.8%	35.6%	35.6%	17.8%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	8.1	15.3	15.3	8.2	15.4	15.4	10.6	18.2	18.2	10.4	18.1
Actuated g/C Ratio	0.13	0.25	0.25	0.13	0.25	0.25	0.17	0.30	0.30	0.17	0.30
v/c Ratio	0.27	0.38	0.37	0.27	0.67	0.43	0.59	0.56	0.04	0.57	0.05
Control Delay	35.5	24.3	7.2	35.5	31.7	6.9	41.4	27.3	10.8	40.6	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	24.3	7.2	35.5	31.7	6.9	41.4	27.3	10.8	40.6	19.6
LOS	D	C	A	D	C	A	D	C	B	D	B
Approach Delay		18.3			22.5			31.2			37.6
Approach LOS		B			C			C			D

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 60.8		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.67		
Intersection Signal Delay: 25.7	Intersection LOS: C	
Intersection Capacity Utilization 56.9%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 29: Connector Rd & Pankey Rd



LOS Engineering

AM Existing + Cumulative + Project
29: Connector Rd & Pankey Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967	0.850			0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1711	1346	1583	1863	1417	1583	1863	1417	1583	1807	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1711	1346	1583	1863	1417	1583	1863	1417	1583	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15	174			231			18		5	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1256			2875			1488			1443	
Travel Time (s)		28.5			65.3			33.8			32.8	
Volume (vph)	50	124	200	52	299	219	150	299	17	142	19	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	131	211	55	315	231	158	315	18	149	20	5
Lane Group Flow (vph)	53	168	174	55	315	231	158	315	18	149	25	0
v/c Ratio	0.27	0.38	0.37	0.27	0.67	0.43	0.59	0.56	0.04	0.57	0.05	
Control Delay	35.5	24.3	7.2	35.5	31.7	6.9	41.4	27.3	10.8	40.6	19.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	35.5	24.3	7.2	35.5	31.7	6.9	41.4	27.3	10.8	40.6	19.6	
Queue Length 50th (ft)	21	56	0	22	122	0	62	122	0	58	7	
Queue Length 95th (ft)	62	134	51	63	249	55	#179	230	16	#165	26	
Internal Link Dist (ft)		1176			2795			1408			1363	
Turn Bay Length (ft)												
Base Capacity (vph)	298	615	588	298	659	651	322	790	611	321	768	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.18	0.27	0.30	0.18	0.48	0.35	0.49	0.40	0.03	0.46	0.03	

Intersection Summary	
Area Type:	Other
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

LOS Engineering

AM Existing + Cumulative + Project
29: Connector Rd & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1711	1346	1583	1863	1417	1583	1863	1417	1583	1807	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1711	1346	1583	1863	1417	1583	1863	1417	1583	1807	
Volume (vph)	50	124	200	52	299	219	150	299	17	142	19	5
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	131	211	55	315	231	158	315	18	149	20	5
RTOR Reduction (vph)	0	11	131	0	0	174	0	0	13	0	4	0
Lane Group Flow (vph)	53	157	43	55	315	57	158	315	5	149	21	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	4.4	15.4	15.4	4.4	15.4	15.4	8.2	18.3	18.3	8.0	18.1	
Effective Green, g (s)	4.4	15.4	15.4	4.4	15.4	15.4	8.2	18.3	18.3	8.0	18.1	
Actuated g/C Ratio	0.07	0.25	0.25	0.07	0.25	0.25	0.13	0.29	0.29	0.13	0.29	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	112	424	334	112	462	351	209	549	418	204	527	
v/s Ratio Prot	0.03	0.09		c0.03	c0.17		c0.10	c0.17		0.09	0.01	
v/s Ratio Perm			0.03			0.04			0.00			
v/c Ratio	0.47	0.37	0.13	0.49	0.68	0.16	0.76	0.57	0.01	0.73	0.04	
Uniform Delay, d1	27.7	19.3	18.1	27.8	21.1	18.3	26.0	18.6	15.5	26.0	15.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	0.5	0.2	3.4	4.1	0.2	14.4	1.5	0.0	12.6	0.0	
Delay (s)	30.9	19.9	18.3	31.1	25.3	18.5	40.4	20.0	15.5	38.6	15.8	
Level of Service	C	B	B	C	C	B	D	C	B	D	B	
Approach Delay (s)		20.7			23.2			26.4			35.3	
Approach LOS		C			C			C			D	

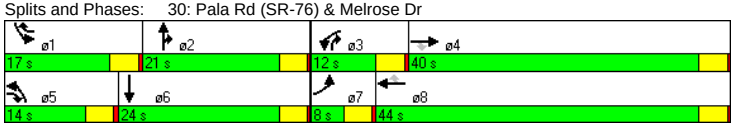
Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing + Cumulative + Project
30: Pala Rd (SR-76) & Melrose Dr — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	16	1000	220	200	2150	50	450	8	210	157	157
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6
Permitted Phases			4			8					
Detector Phases	7	4	5	3	8	1	5	2	2 3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0		8.0	20.0
Total Split (s)	8.0	40.0	14.0	12.0	44.0	17.0	14.0	21.0	33.0	17.0	24.0
Total Split (%)	8.9%	44.4%	15.6%	13.3%	48.9%	18.9%	15.6%	23.3%	36.7%	18.9%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	4.0	32.0	46.0	8.0	41.0	56.9	10.0	18.1	30.1	11.9	20.0
Actuated g/C Ratio	0.04	0.37	0.53	0.09	0.48	0.66	0.12	0.21	0.35	0.14	0.23
v/c Ratio	0.25	0.80	0.27	0.74	1.34	0.06	1.32	0.02	0.40	0.75	1.08
Control Delay	50.6	29.5	2.2	55.6	182.8	2.0	197.9	29.8	17.1	58.3	95.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	29.5	2.2	55.6	182.8	2.0	197.9	29.8	17.1	58.3	95.3
LOS	D	C	A	E	F	A	F	C	B	E	F
Approach Delay		24.9			168.4			139.2			86.1
Approach LOS		C			F			F			F

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 86.1		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.34		
Intersection Signal Delay: 118.0	Intersection LOS: F	
Intersection Capacity Utilization 118.0%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 30: Pala Rd (SR-76) & Melrose Dr



AM Existing + Cumulative + Project
30: Pala Rd (SR-76) & Melrose Dr

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	500		500	500		500	400		400	200		0
Storage Lanes	1		1	2		1	2		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.900	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			232			53			78		88	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1330			646			1034			733	
Travel Time (s)		30.2			14.7			23.5			16.7	
Volume (vph)	16	1000	220	200	2150	50	450	8	210	157	157	314
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	1053	232	211	2263	53	474	8	221	165	165	331
Lane Group Flow (vph)	17	1053	232	211	2263	53	474	8	221	165	496	0
v/c Ratio	0.25	0.80	0.27	0.74	1.34	0.06	1.32	0.02	0.40	0.75	1.08	
Control Delay	50.6	29.5	2.2	55.6	182.8	2.0	197.9	29.8	17.1	58.3	95.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	50.6	29.5	2.2	55.6	182.8	2.0	197.9	29.8	17.1	58.3	95.3	
Queue Length 50th (ft)	9	263	0	58	~815	0	~174	4	57	86	~268	
Queue Length 95th (ft)	31	340	31	#116	#1066	12	#283	16	126	#185	#482	
Internal Link Dist (ft)		1250			566			954			653	
Turn Bay Length (ft)	500		500	500		500	400		400	200		
Base Capacity (vph)	69	1416	865	286	1683	934	358	392	547	237	458	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.25	0.74	0.27	0.74	1.34	0.06	1.32	0.02	0.40	0.70	1.08	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative + Project
30: Pala Rd (SR-76) & Melrose Dr

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1676	
Volume (vph)	16	1000	220	200	2150	50	450	8	210	157	157	314
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	1053	232	211	2263	53	474	8	221	165	165	331
RTOR Reduction (vph)	0	0	115	0	0	21	0	0	51	0	68	0
Lane Group Flow (vph)	17	1053	117	211	2263	32	474	8	170	165	428	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.5	34.4	44.4	8.0	40.9	52.8	10.0	18.1	30.1	11.9	20.0	
Effective Green, g (s)	1.5	34.4	44.4	8.0	40.9	52.8	10.0	18.1	30.1	11.9	20.0	
Actuated g/C Ratio	0.02	0.39	0.50	0.09	0.46	0.60	0.11	0.20	0.34	0.13	0.23	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	27	1377	776	278	1637	910	348	381	482	213	379	
v/s Ratio Prot	0.01	0.30	0.02	c0.07	c0.64	0.00	c0.15	0.00	0.12	0.10	c0.26	
v/s Ratio Perm			0.07			0.02						
v/c Ratio	0.63	0.76	0.15	0.76	1.38	0.03	1.36	0.02	0.35	0.77	1.13	
Uniform Delay, d1	43.2	23.5	11.8	39.3	23.8	7.3	39.2	28.1	21.8	37.0	34.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	38.0	2.6	0.1	11.3	176.0	0.0	180.5	0.1	0.4	16.0	86.1	
Delay (s)	81.2	26.1	11.9	50.5	199.7	7.3	219.7	28.2	22.3	53.0	120.3	
Level of Service	F	C	B	D	F	A	F	C	C	D	F	
Approach Delay (s)		24.3			183.2			155.5			103.5	
Approach LOS		C			F			F			F	

Intersection Summary				
HCM Average Control Delay	129.5	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.24			
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	118.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Existing + Cumulative + Project
31: Pala Rd (SR-76) & E Vista Way

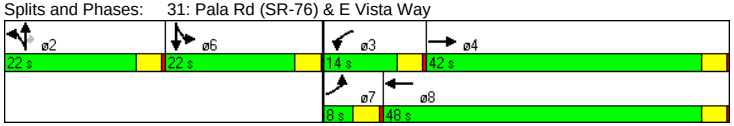
Timings

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Volume (vph)	74	950	300	1680	47	286	200
Turn Type	Prot		Prot			Perm	
Protected Phases	7	4	3	8	2		6
Permitted Phases						2	
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	42.0	14.0	48.0	22.0	22.0	22.0
Total Split (%)	8.0%	42.0%	14.0%	48.0%	22.0%	22.0%	22.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	Max
Act Effct Green (s)	4.0	38.0	10.0	44.0	18.0	18.0	18.0
Actuated g/C Ratio	0.04	0.38	0.10	0.44	0.18	0.18	0.18
v/c Ratio	1.24	1.03	1.03	2.18	1.14	0.60	1.34
Control Delay	232.8	62.7	104.5	557.7	131.4	9.9	201.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	232.8	62.7	104.5	557.7	131.4	9.9	201.3
LOS	F	E	F	F	F	A	F
Approach Delay		71.9		489.7	76.5		201.3
Approach LOS		E		F	E		F

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.18
Intersection Signal Delay: 273.2 Intersection LOS: F
Intersection Capacity Utilization 152.2% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 31: Pala Rd (SR-76) & E Vista Way



LOS Engineering

AM Existing + Cumulative + Project
31: Pala Rd (SR-76) & E Vista Way

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		150	450		0	0		200	0		0
Storage Lanes	1		0	2		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.960			0.998				0.850		0.927	
Flt Protected	0.950			0.950				0.959			0.999	
Satd. Flow (prot)	1583	3398	0	3072	1859	0	0	1786	1417	0	1725	0
Flt Permitted	0.950			0.950				0.959			0.999	
Satd. Flow (perm)	1583	3398	0	3072	1859	0	0	1786	1417	0	1725	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		61			1				301		51	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		710			526			797			552	
Travel Time (s)		16.1			12.0			18.1			12.5	
Volume (vph)	74	950	350	300	1680	20	300	47	286	6	200	241
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1000	368	316	1768	21	316	49	301	6	211	254
Lane Group Flow (vph)	78	1368	0	316	1789	0	0	365	301	0	471	0
v/c Ratio	1.24	1.03		1.03	2.18			1.14	0.60		1.34	
Control Delay	232.8	62.7		104.5	557.7			131.4	9.9		201.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	232.8	62.7		104.5	557.7			131.4	9.9		201.3	
Queue Length 50th (ft)	~62	~480		~111	~1867			~273	0		~368	
Queue Length 95th (ft)	#157	#618		#198	#2134			#451	76		#566	
Internal Link Dist (ft)		630			446			717			472	
Turn Bay Length (ft)	300			450					200			
Base Capacity (vph)	63	1329		307	819			321	502		352	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	1.24	1.03		1.03	2.18			1.14	0.60		1.34	

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative + Project
31: Pala Rd (SR-76) & E Vista Way

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		0.97	1.00			1.00	1.00		1.00	
Frt	1.00	0.96		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (prot)	1583	3396		3072	1859			1785	1417		1726	
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (perm)	1583	3396		3072	1859			1785	1417		1726	
Volume (vph)	74	950	350	300	1680	20	300	47	286	6	200	241
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1000	368	316	1768	21	316	49	301	6	211	254
RTOR Reduction (vph)	0	38	0	0	1	0	0	0	247	0	42	0
Lane Group Flow (vph)	78	1330	0	316	1788	0	0	365	54	0	429	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)	4.0	38.0		10.0	44.0			18.0	18.0		18.0	
Effective Green, g (s)	4.0	38.0		10.0	44.0			18.0	18.0		18.0	
Actuated g/C Ratio	0.04	0.38		0.10	0.44			0.18	0.18		0.18	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	63	1290		307	818			321	255		311	
v/s Ratio Prot	0.05	0.39		c0.10	c0.96			c0.20			c0.25	
v/s Ratio Perm									0.04			
v/c Ratio	1.24	1.03		1.03	2.19			1.14	0.21		1.38	
Uniform Delay, d1	48.0	31.0		45.0	28.0			41.0	35.0		41.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	190.6	33.4		59.1	537.9			92.7	1.9		189.9	
Delay (s)	238.6	64.4		104.1	565.9			133.7	36.9		230.9	
Level of Service	F	E		F	F			F	D		F	
Approach Delay (s)		73.8			496.6			89.9			230.9	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	281.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	152.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

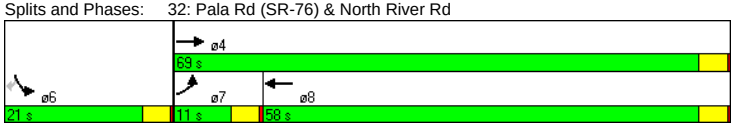
AM Existing + Cumulative + Project
32: Pala Rd (SR-76) & North River Rd

Timings

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	170	1150	1900	150	185
Turn Type	Prot				Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phases	7	4	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	11.0	69.0	58.0	21.0	21.0
Total Split (%)	12.2%	76.7%	64.4%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	7.0	65.0	54.0	17.0	17.0
Actuated g/C Ratio	0.08	0.72	0.60	0.19	0.19
v/c Ratio	1.46	0.90	2.10	0.53	0.52
Control Delay	277.3	21.3	516.1	40.2	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	277.3	21.3	516.1	40.2	16.9
LOS	F	C	F	D	B
Approach Delay		54.3	516.1	27.3	
Approach LOS		D	F	C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 2.10		
Intersection Signal Delay: 315.4	Intersection LOS: F	
Intersection Capacity Utilization 148.0%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 32: Pala Rd (SR-76) & North River Rd



Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	150			0	50	0
Storage Lanes	1			0	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.982			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1829	0	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1829	0	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			16			135
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		1356	1400		1286	
Travel Time (s)		30.8	31.8		29.2	
Volume (vph)	170	1150	1900	300	150	185
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	1211	2000	316	158	195
Lane Group Flow (vph)	179	1211	2316	0	158	195
v/c Ratio	1.46	0.90	2.10		0.53	0.52
Control Delay	277.3	21.3	516.1		40.2	16.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	277.3	21.3	516.1		40.2	16.9
Queue Length 50th (ft)	~140	457	~2138		82	29
Queue Length 95th (ft)	#268	#888	#2405		145	94
Internal Link Dist (ft)		1276	1320		1206	
Turn Bay Length (ft)	150				50	
Base Capacity (vph)	123	1346	1104		299	377
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	1.46	0.90	2.10		0.53	0.52

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1863	1828		1583	1417
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1863	1828		1583	1417
Volume (vph)	170	1150	1900	300	150	185
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	1211	2000	316	158	195
RTOR Reduction (vph)	0	0	6	0	0	110
Lane Group Flow (vph)	179	1211	2310	0	158	86
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	7.0	65.0	54.0		17.0	17.0
Effective Green, g (s)	7.0	65.0	54.0		17.0	17.0
Actuated g/C Ratio	0.08	0.72	0.60		0.19	0.19
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	123	1346	1097		299	268
v/s Ratio Prot	c0.11	0.65	c1.26		c0.10	
v/s Ratio Perm						0.06
v/c Ratio	1.46	0.90	2.11		0.53	0.32
Uniform Delay, d1	41.5	9.9	18.0		32.9	31.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	244.1	8.3	500.5		6.5	3.1
Delay (s)	285.6	18.3	518.5		39.4	34.6
Level of Service	F	B	F		D	C
Approach Delay (s)		52.7	518.5		36.8	
Approach LOS		D	F		D	

Intersection Summary				
HCM Average Control Delay	317.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.70		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	148.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing + Cumulative + Project
33: Pala Rd (SR-76) & Olive Hill Rd

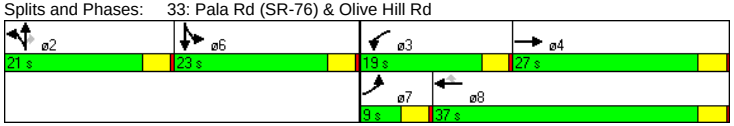
Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	100	1100	470	1900	200	153	250	150	300
Turn Type	Prot		Prot		Perm		Perm	Split	
Protected Phases	7	4	3	8		2		6	6
Permitted Phases					8		2		
Detector Phases	7	4	3	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	27.0	19.0	37.0	37.0	21.0	21.0	23.0	23.0
Total Split (%)	10.0%	30.0%	21.1%	41.1%	41.1%	23.3%	23.3%	25.6%	25.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)	5.0	23.0	15.0	33.0	33.0	17.0	17.0	19.0	19.0
Actuated g/C Ratio	0.06	0.26	0.17	0.37	0.37	0.19	0.19	0.21	0.21
v/c Ratio	1.19	1.49	1.88	1.54	0.36	0.80	0.55	0.47	1.31
Control Delay	197.1	256.4	433.5	272.9	11.5	54.0	9.0	36.6	186.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	197.1	256.4	433.5	272.9	11.5	54.0	9.0	36.6	186.9
LOS	F	F	F	F	B	D	A	D	F
Approach Delay		252.1		281.9		32.1			151.9
Approach LOS		F		F		C			F

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.88
Intersection Signal Delay: 232.4 Intersection LOS: F
Intersection Capacity Utilization 120.2% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 33: Pala Rd (SR-76) & Olive Hill Rd



LOS Engineering

AM Existing + Cumulative + Project
33: Pala Rd (SR-76) & Olive Hill Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		200	0		150	150		0
Storage Lanes	1		0	1		1	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.979				0.850			0.850		0.941	
Flt Protected	0.950			0.950				0.979		0.950		
Satd. Flow (prot)	1583	3465	0	1583	3539	1417	0	1824	1417	1583	1753	0
Flt Permitted	0.950			0.950				0.979		0.950		
Satd. Flow (perm)	1583	3465	0	1583	3539	1417	0	1824	1417	1583	1753	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19				114			263		33	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		585			663			961			1186	
Travel Time (s)		13.3			15.1			21.8			27.0	
Volume (vph)	100	1100	178	470	1900	200	110	153	250	150	300	193
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	1158	187	495	2000	211	116	161	263	158	316	203
Lane Group Flow (vph)	105	1345	0	495	2000	211	0	277	263	158	519	0
v/c Ratio	1.19	1.49		1.88	1.54	0.36		0.80	0.55	0.47	1.31	
Control Delay	197.1	256.4		433.5	272.9	11.5		54.0	9.0	36.6	186.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	197.1	256.4		433.5	272.9	11.5		54.0	9.0	36.6	186.9	
Queue Length 50th (ft)	~73	~564		~434	~850	37		152	0	79	~371	
Queue Length 95th (ft)	#176	#699		#623	#987	91		#278	66	140	#568	
Internal Link Dist (ft)		505			583			881			1106	
Turn Bay Length (ft)	250			250		200			150	150		
Base Capacity (vph)	88	900		264	1298	592		345	481	334	396	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	1.19	1.49		1.88	1.54	0.36		0.80	0.55	0.47	1.31	

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

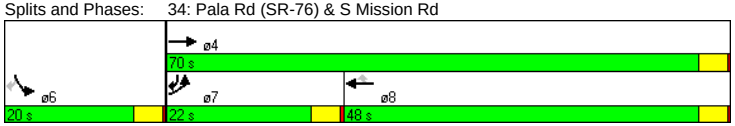
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3465		1583	3539	1417		1825	1417	1583	1753	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3465		1583	3539	1417		1825	1417	1583	1753	
Volume (vph)	100	1100	178	470	1900	200	110	153	250	150	300	193
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	1158	187	495	2000	211	116	161	263	158	316	203
RTOR Reduction (vph)	0	14	0	0	0	72	0	0	213	0	26	0
Lane Group Flow (vph)	105	1331	0	495	2000	139	0	277	50	158	493	0
Turn Type	Prot			Prot		Perm	Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	5.0	23.0		15.0	33.0	33.0		17.0	17.0	19.0	19.0	
Effective Green, g (s)	5.0	23.0		15.0	33.0	33.0		17.0	17.0	19.0	19.0	
Actuated g/C Ratio	0.06	0.26		0.17	0.37	0.37		0.19	0.19	0.21	0.21	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	88	886		264	1298	520		345	268	334	370	
v/s Ratio Prot	0.07	0.38		c0.31	c0.57			c0.15		0.10	c0.28	
v/s Ratio Perm						0.10			0.04			
v/c Ratio	1.19	1.50		1.88	1.54	0.27		0.80	0.19	0.47	1.33	
Uniform Delay, d1	42.5	33.5		37.5	28.5	20.0		34.9	30.7	31.1	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	156.9	231.9		407.9	247.3	0.3		17.7	1.5	4.7	167.0	
Delay (s)	199.4	265.4		445.4	275.8	20.3		52.6	32.2	35.9	202.5	
Level of Service	F	F		F	F	C		D	C	D	F	
Approach Delay (s)		260.6			286.9			42.7			163.6	
Approach LOS		F			F			D			F	

Intersection Summary			
HCM Average Control Delay	239.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	120.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	600	900	1700	202	239	900
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	22.0	70.0	48.0	48.0	20.0	22.0
Total Split (%)	24.4%	77.8%	53.3%	53.3%	22.2%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	18.0	66.0	44.0	44.0	16.0	38.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.42
v/c Ratio	1.03	0.69	1.03	0.27	0.46	0.90
Control Delay	81.0	9.9	55.2	2.8	36.3	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	9.9	55.2	2.8	36.3	37.4
LOS	F	A	E	A	D	D
Approach Delay		38.4	49.6		37.1	
Approach LOS		D	D		D	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.03		
Intersection Signal Delay: 42.8	Intersection LOS: D	
Intersection Capacity Utilization 88.8%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				213		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	600	900	1700	202	239	900
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	947	1789	213	252	947
Lane Group Flow (vph)	632	947	1789	213	252	947
v/c Ratio	1.03	0.69	1.03	0.27	0.46	0.90
Control Delay	81.0	9.9	55.2	2.8	36.3	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	9.9	55.2	2.8	36.3	37.4
Queue Length 50th (ft)	~200	242	~581	0	67	277
Queue Length 95th (ft)	#306	369	#717	35	104	#417
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	614	1366	1730	802	546	1053
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.69	1.03	0.27	0.46	0.90

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Volume (vph)	600	900	1700	202	239	900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	947	1789	213	252	947
RTOR Reduction (vph)	0	0	0	109	0	0
Lane Group Flow (vph)	632	947	1789	104	252	947
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	18.0	66.0	44.0	44.0	16.0	34.0
Effective Green, g (s)	18.0	66.0	44.0	44.0	16.0	34.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.38
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	614	1366	1730	693	546	1053
v/s Ratio Prot	c0.21	0.51	c0.51		0.08	c0.18
v/s Ratio Perm				0.07		0.20
v/c Ratio	1.03	0.69	1.03	0.15	0.46	0.90
Uniform Delay, d1	36.0	6.5	23.0	12.7	33.1	26.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.0	1.5	31.0	0.1	2.8	10.3
Delay (s)	80.0	8.1	54.0	12.8	35.9	36.6
Level of Service	F	A	D	B	D	D
Approach Delay (s)		36.9	49.6		36.5	
Approach LOS		D	D		D	

Intersection Summary				
HCM Average Control Delay	42.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

AM Existing + Cumulative + Project
35: Reche Rd & Live Oak Park Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	79	496	446	65	87	162
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	83	522	469	68	92	171
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	538				1192	504
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	538				1192	504
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	92				52	70
cM capacity (veh/h)	1030				190	568

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	83	522	538	262
Volume Left	83	0	0	92
Volume Right	0	0	68	171
cSH	1030	1700	1700	335
Volume to Capacity	0.08	0.31	0.32	0.78
Queue Length 95th (ft)	7	0	0	159
Control Delay (s)	8.8	0.0	0.0	45.3
Lane LOS	A			E
Approach Delay (s)	1.2		0.0	45.3
Approach LOS				E

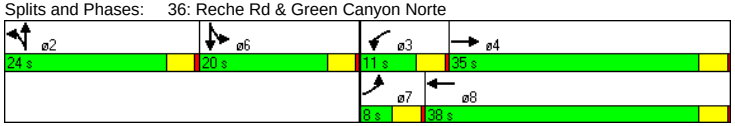
Intersection Summary			
Average Delay	9.0		
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

AM Existing + Cumulative + Project
36: Reche Rd & Green Canyon Norte — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	9	331	81	610	285	4	9
Turn Type	Prot		Prot		Split		
Protected Phases	7	4	3	8	2	2	6
Permitted Phases							
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	35.0	11.0	38.0	24.0	24.0	20.0
Total Split (%)	8.9%	38.9%	12.2%	42.2%	26.7%	26.7%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	None
Act Effct Green (s)	4.1	21.0	7.0	28.1	21.2	21.2	7.0
Actuated g/C Ratio	0.06	0.32	0.10	0.43	0.33	0.33	0.10
v/c Ratio	0.10	0.65	0.52	0.80	0.58	0.34	0.25
Control Delay	40.1	26.0	45.9	27.0	29.6	5.9	28.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	26.0	45.9	27.0	29.6	5.9	28.4
LOS	D	C	D	C	C	A	C
Approach Delay		26.3		29.2		19.4	28.4
Approach LOS		C		C		B	C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 65.2			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 25.5		Intersection LOS: C	
Intersection Capacity Utilization 70.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 36: Reche Rd & Green Canyon Norte



AM Existing + Cumulative + Project
36: Reche Rd & Green Canyon Norte

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	150		0	150		0	150		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.999			0.853			0.963	
Flt Protected	0.950			0.950			0.950				0.974	
Satd. Flow (prot)	1583	1835	0	1583	1861	0	1583	1589	0	0	1747	0
Flt Permitted	0.950			0.950			0.950				0.974	
Satd. Flow (perm)	1583	1835	0	1583	1861	0	1583	1589	0	0	1747	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7						220			13	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			4892			1501			1367	
Travel Time (s)		22.1			111.2			34.1			31.1	
Volume (vph)	9	331	37	81	610	4	285	4	209	24	9	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	348	39	85	642	4	300	4	220	25	9	13
Lane Group Flow (vph)	9	387	0	85	646	0	300	224	0	0	47	0
v/c Ratio	0.10	0.65		0.52	0.80		0.58	0.34			0.25	
Control Delay	40.1	26.0		45.9	27.0		29.6	5.9			28.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	40.1	26.0		45.9	27.0		29.6	5.9			28.4	
Queue Length 50th (ft)	4	146		37	226		117	1			14	
Queue Length 95th (ft)	19	244		#111	#498		#276	55			48	
Internal Link Dist (ft)		893			4812			1421			1287	
Turn Bay Length (ft)	150			150			150					
Base Capacity (vph)	92	775		170	905		514	664			374	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.10	0.50		0.50	0.71		0.58	0.34			0.13	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative + Project
36: Reche Rd & Green Canyon Norte

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1583	1835		1583	1861		1583	1588			1747	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.97	
Satd. Flow (perm)	1583	1835		1583	1861		1583	1588			1747	
Volume (vph)	9	331	37	81	610	4	285	4	209	24	9	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	348	39	85	642	4	300	4	220	25	9	13
RTOR Reduction (vph)	0	5	0	0	0	0	0	153	0	0	12	0
Lane Group Flow (vph)	9	382	0	85	646	0	300	71	0	0	35	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	0.6	23.4		5.3	28.1		21.2	21.2			4.1	
Effective Green, g (s)	0.6	23.4		5.3	28.1		21.2	21.2			4.1	
Actuated g/C Ratio	0.01	0.33		0.08	0.40		0.30	0.30			0.06	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	14	613		120	747		479	481			102	
v/s Ratio Prot	0.01	0.21		c0.05	c0.35		c0.19	0.04			c0.02	
v/s Ratio Perm												
v/c Ratio	0.64	0.62		0.71	0.86		0.63	0.15			0.34	
Uniform Delay, d1	34.6	19.6		31.6	19.2		21.0	17.8			31.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	71.2	2.0		17.4	10.2		6.1	0.6			2.0	
Delay (s)	105.8	21.6		49.0	29.4		27.1	18.4			33.6	
Level of Service	F	C		D	C		C	B			C	
Approach Delay (s)		23.5			31.7			23.4			33.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

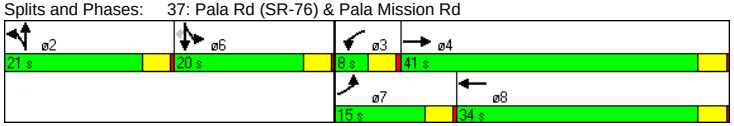
AM Existing + Cumulative + Project
37: Pala Rd (SR-76) & Pala Mission Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	SBT	SBR
Lane Configurations							
Volume (vph)	240	439	16	264	31	11	164
Turn Type	Prot		Prot		Split		Perm
Protected Phases	7	4	3	8	2	6	
Permitted Phases							6
Detector Phases	7	4	3	8	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	41.0	8.0	34.0	21.0	20.0	20.0
Total Split (%)	16.7%	45.6%	8.9%	37.8%	23.3%	22.2%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	None	None
Act Effct Green (s)	11.3	29.9	4.1	15.7	17.5	7.7	7.7
Actuated g/C Ratio	0.17	0.45	0.06	0.24	0.26	0.11	0.11
v/c Ratio	0.93	0.32	0.19	0.70	0.08	0.21	0.55
Control Delay	74.4	13.2	41.5	32.1	23.6	31.7	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.4	13.2	41.5	32.1	23.6	31.7	12.8
LOS	E	B	D	C	C	C	B
Approach Delay		33.7		32.6		16.6	
Approach LOS		C		C		B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 66.2			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 30.4		Intersection LOS: C	
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 37: Pala Rd (SR-76) & Pala Mission Rd



LOS Engineering

AM Existing + Cumulative + Project
37: Pala Rd (SR-76) & Pala Mission Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		0	200		0	0		50
Storage Lanes	1		0	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.985							0.850
Flt Protected	0.950			0.950			0.950				0.965	
Satd. Flow (prot)	1583	3497	0	1583	1835	0	1583	1863	0	0	1798	1417
Flt Permitted	0.950			0.950			0.950				0.965	
Satd. Flow (perm)	1583	3497	0	1583	1835	0	1583	1863	0	0	1798	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			7							173
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		941			1076			1007			1565	
Travel Time (s)		21.4			24.5			22.9			35.6	
Volume (vph)	240	439	39	16	264	29	31	0	0	29	11	164
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	253	462	41	17	278	31	33	0	0	31	12	173
Lane Group Flow (vph)	253	503	0	17	309	0	33	0	0	0	43	173
v/c Ratio	0.93	0.32		0.19	0.70		0.08				0.21	0.55
Control Delay	74.4	13.2		41.5	32.1		23.6				31.7	12.8
Queue Delay	0.0	0.0		0.0	0.0		0.0				0.0	0.0
Total Delay	74.4	13.2		41.5	32.1		23.6				31.7	12.8
Queue Length 50th (ft)	105	62		7	113		10				17	0
Queue Length 95th (ft)	#298	130		29	207		37				48	53
Internal Link Dist (ft)		861			996			927			1485	
Turn Bay Length (ft)	250			250			200					50
Base Capacity (vph)	271	1785		89	696		419				379	435
Starvation Cap Reductn	0	0		0	0		0				0	0
Spillback Cap Reductn	0	0		0	0		0				0	0
Storage Cap Reductn	0	0		0	0		0				0	0
Reduced v/c Ratio	0.93	0.28		0.19	0.44		0.08				0.11	0.40

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

AM Existing + Cumulative + Project
37: Pala Rd (SR-76) & Pala Mission Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0				4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00				1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00				1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95				0.97	1.00
Satd. Flow (prot)	1583	3496		1583	1835		1583				1798	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95				0.97	1.00
Satd. Flow (perm)	1583	3496		1583	1835		1583				1798	1417
Volume (vph)	240	439	39	16	264	29	31	0	0	29	11	164
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	253	462	41	17	278	31	33	0	0	31	12	173
RTOR Reduction (vph)	0	7	0	0	5	0	0	0	0	0	0	158
Lane Group Flow (vph)	253	496	0	17	304	0	33	0	0	0	43	15
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												6
Actuated Green, G (s)	11.3	29.9		0.7	19.3		17.5				6.2	6.2
Effective Green, g (s)	11.3	29.9		0.7	19.3		17.5				6.2	6.2
Actuated g/C Ratio	0.16	0.43		0.01	0.27		0.25				0.09	0.09
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0				4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0				3.0	3.0
Lane Grp Cap (vph)	254	1487		16	504		394				159	125
v/s Ratio Prot	c0.16	0.14		0.01	c0.17		c0.02				c0.02	
v/s Ratio Perm												0.01
v/c Ratio	1.00	0.33		1.06	0.60		0.08				0.27	0.12
Uniform Delay, d1	29.5	13.5		34.8	22.2		20.3				29.9	29.5
Progression Factor	1.00	1.00		1.00	1.00		1.00				1.00	1.00
Incremental Delay, d2	55.0	0.1		246.4	2.0		0.4				0.9	0.4
Delay (s)	84.5	13.7		281.2	24.2		20.7				30.9	30.0
Level of Service	F	B		F	C		C				C	C
Approach Delay (s)		37.4			37.6			20.7			30.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Cumulative + Project
1: Pala Rd (SR-76) & Via Monserate — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	50	2120	1600	110	50	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	2232	1684	116	53	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1800				4079	1742
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1800				4079	1742
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				0	80
cM capacity (veh/h)	342				2	107

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	53	2232	1800	74
Volume Left	53	0	0	53
Volume Right	0	0	116	21
cSH	342	1700	1700	3
Volume to Capacity	0.15	1.31	1.06	21.78
Queue Length 95th (ft)	13	0	0	Err
Control Delay (s)	17.4	0.0	0.0	Err
Lane LOS	C			F
Approach Delay (s)	0.4		0.0	Err
Approach LOS				F

Intersection Summary			
Average Delay	177.4		
Intersection Capacity Utilization	122.7%	ICU Level of Service	H
Analysis Period (min)	15		

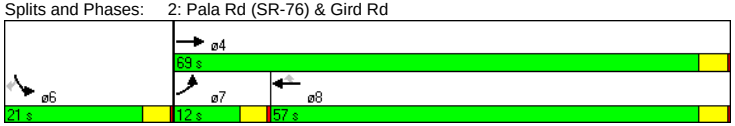
LOS Engineering

PM Existing + Cumulative + Project
2: Pala Rd (SR-76) & Gird Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	220	1760	1340	120	60	80
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	69.0	57.0	57.0	21.0	21.0
Total Split (%)	13.3%	76.7%	63.3%	63.3%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	8.0	65.1	53.1	53.1	8.6	8.6
Actuated g/C Ratio	0.10	0.80	0.65	0.65	0.11	0.11
v/c Ratio	1.50	1.25	1.17	0.14	0.38	0.37
Control Delay	284.0	132.7	102.5	5.6	40.4	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	284.0	132.7	102.5	5.6	40.4	13.3
LOS	F	F	F	A	D	B
Approach Delay		149.6	94.6		24.9	
Approach LOS		F	F		C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 81.7			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 122.3		Intersection LOS: F	
Intersection Capacity Utilization 103.0%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



LOS Engineering

PM Existing + Cumulative + Project
2: Pala Rd (SR-76) & Gird Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				16		84
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	220	1760	1340	120	60	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1853	1411	126	63	84
Lane Group Flow (vph)	232	1853	1411	126	63	84
v/c Ratio	1.50	1.25	1.17	0.14	0.38	0.37
Control Delay	284.0	132.7	102.5	5.6	40.4	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	284.0	132.7	102.5	5.6	40.4	13.3
Queue Length 50th (ft)	~167	~1198	~869	19	31	0
Queue Length 95th (ft)	#317	#1546	#1186	44	68	39
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	155	1484	1210	926	299	336
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.50	1.25	1.17	0.14	0.21	0.25

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
2: Pala Rd (SR-76) & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1863	1863	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1863	1863	1417	1583	1417
Volume (vph)	220	1760	1340	120	60	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1853	1411	126	63	84
RTOR Reduction (vph)	0	0	0	6	0	75
Lane Group Flow (vph)	232	1853	1411	120	63	9
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	8.0	65.1	53.1	53.1	8.6	8.6
Effective Green, g (s)	8.0	65.1	53.1	53.1	8.6	8.6
Actuated g/C Ratio	0.10	0.80	0.65	0.65	0.11	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	155	1484	1211	921	167	149
v/s Ratio Prot	c0.15	c0.99	0.76		c0.04	
v/s Ratio Perm				0.08		0.01
v/c Ratio	1.50	1.25	1.17	0.13	0.38	0.06
Uniform Delay, d1	36.9	8.3	14.3	5.5	34.1	32.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	254.3	117.7	83.6	0.1	1.4	0.2
Delay (s)	291.2	126.0	97.9	5.5	35.5	33.1
Level of Service	F	F	F	A	D	C
Approach Delay (s)		144.4	90.4		34.1	
Approach LOS		F	F		C	

Intersection Summary				
HCM Average Control Delay	118.0	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	81.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	103.0%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing + Cumulative + Project
3: Pala Rd (SR-76) & Sage Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	1600	1600	10	10	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1684	1684	11	11	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1695				3395	1689
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1695				3395	1689
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				0	91
cM capacity (veh/h)	376				8	116

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	11	1684	1695	21
Volume Left	11	0	0	11
Volume Right	0	0	11	11
cSH	376	1700	1700	15
Volume to Capacity	0.03	0.99	1.00	1.40
Queue Length 95th (ft)	2	0	0	80
Control Delay (s)	14.8	0.0	0.0	733.2
Lane LOS	B			F
Approach Delay (s)	0.1		0.0	733.2
Approach LOS				F

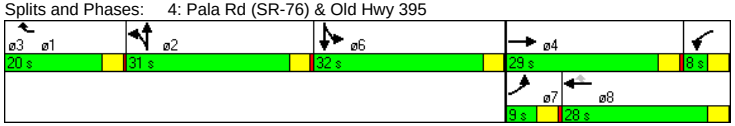
Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		

PM Existing + Cumulative + Project
4: Pala Rd (SR-76) & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT
Lane Configurations							
Volume (vph)	130	1000	100	960	290	290	210
Turn Type	Prot		Prot		custom		
Protected Phases	7	4	3	8	1	2	6
Permitted Phases					8		
Detector Phases	7	4	3	8	1	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	9.0	29.0	8.0	28.0	20.0	31.0	32.0
Total Split (%)	7.5%	24.2%	6.7%	23.3%	16.7%	25.8%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	Min	Min	Min
Act Effct Green (s)	5.0	25.0	4.0	24.0	33.9	27.0	28.0
Actuated g/C Ratio	0.05	0.23	0.04	0.22	0.31	0.25	0.25
v/c Ratio	1.90	1.50	1.81	1.31	0.54	1.54	1.63
Control Delay	483.0	264.1	458.2	184.0	15.4	283.5	323.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	483.0	264.1	458.2	184.0	15.4	283.5	323.0
LOS	F	F	F	F	B	F	F
Approach Delay		286.6		168.1		283.5	323.0
Approach LOS		F		F		F	F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 109.9		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.90		
Intersection Signal Delay: 252.4	Intersection LOS: F	
Intersection Capacity Utilization 108.8%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



PM Existing + Cumulative + Project
4: Pala Rd (SR-76) & Old Hwy 395

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982				0.850		0.971			0.970	
Flt Protected	0.950			0.950				0.983			0.977	
Satd. Flow (prot)	1583	3476	0	1583	3539	1417	0	1778	0	0	1765	0
Flt Permitted	0.950			0.950				0.983			0.977	
Satd. Flow (perm)	1583	3476	0	1583	3539	1417	0	1778	0	0	1765	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11				190		11			11	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	130	1000	140	100	960	290	220	290	140	340	210	160
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	1053	147	105	1011	305	232	305	147	358	221	168
Lane Group Flow (vph)	137	1200	0	105	1011	305	0	684	0	0	747	0
v/c Ratio	1.90	1.50		1.81	1.31	0.54		1.54			1.63	
Control Delay	483.0	264.1		458.2	184.0	15.4		283.5			323.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0			0.0	
Total Delay	483.0	264.1		458.2	184.0	15.4		283.5			323.0	
Queue Length 50th (ft)	~149	~622		~112	~483	61		~679			~764	
Queue Length 95th (ft)	#275	#763		#225	#617	150		#914			#1006	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	72	799		58	773	599		445			458	
Starvation Cap Reductn	0	0		0	0	0		0			0	
Spillback Cap Reductn	0	0		0	0	0		0			0	
Storage Cap Reductn	0	0		0	0	0		0			0	
Reduced v/c Ratio	1.90	1.50		1.81	1.31	0.51		1.54			1.63	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
4: Pala Rd (SR-76) & Old Hwy 395

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00			1.00	
Frt	1.00	0.98		1.00	1.00	0.85		0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (prot)	1583	3474		1583	3539	1417		1779			1764	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98			0.98	
Satd. Flow (perm)	1583	3474		1583	3539	1417		1779			1764	
Volume (vph)	130	1000	140	100	960	290	220	290	140	340	210	160
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	1053	147	105	1011	305	232	305	147	358	221	168
RTOR Reduction (vph)	0	8	0	0	0	138	0	8	0	0	8	0
Lane Group Flow (vph)	137	1192	0	105	1011	167	0	676	0	0	739	0
Turn Type	Prot			Prot		custom	Split			Split		
Protected Phases	7	4		3	8	1	2	2		6	6	
Permitted Phases						8						
Actuated Green, G (s)	5.0	25.0		4.0	24.0	29.9		27.0			28.0	
Effective Green, g (s)	5.0	25.0		4.0	24.0	29.9		27.0			28.0	
Actuated g/C Ratio	0.05	0.23		0.04	0.22	0.27		0.25			0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	72	790		58	773	437		437			449	
v/s Ratio Prot	0.09	c0.34		0.07	c0.29	c0.02		c0.38			c0.42	
v/s Ratio Perm						0.10						
v/c Ratio	1.90	1.51		1.81	1.31	0.38		1.55			1.65	
Uniform Delay, d1	52.5	42.5		53.0	43.0	32.5		41.5			41.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	453.5	235.3		424.2	147.8	0.6		257.0			300.3	
Delay (s)	505.9	277.7		477.2	190.8	33.0		298.4			341.3	
Level of Service	F	F		F	F	C		F			F	
Approach Delay (s)		301.1			178.1			298.4			341.3	
Approach LOS		F			F			F			F	

Intersection Summary

HCM Average Control Delay	266.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.40		
Actuated Cycle Length (s)	109.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	108.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

PM Existing + Cumulative + Project
5: Dulin Rd & Old Hwy 395 HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	20	10	1250	20	10	530
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	11	1316	21	11	558
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		13				
Median type	None					
Median storage veh)						
Upstream signal (ft)						899
pX, platoon unblocked						
vC, conflicting volume	1905	1326			1337	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1905	1326			1337	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	94			98	
cM capacity (veh/h)	74	190			516	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	32	1337	568
Volume Left	21	0	11
Volume Right	11	21	0
cSH	111	1700	516
Volume to Capacity	0.28	0.79	0.02
Queue Length 95th (ft)	27	0	2
Control Delay (s)	56.4	0.0	0.6
Lane LOS	F		A
Approach Delay (s)	56.4	0.0	0.6
Approach LOS	F		

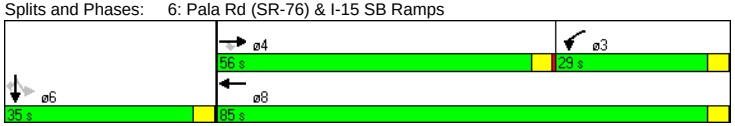
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

PM Existing + Cumulative + Project
6: Pala Rd (SR-76) & I-15 SB Ramps Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR
Lane Configurations						
Volume (vph)	1150	300	400	860	10	520
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	6	
Permitted Phases		4				6
Detector Phases	4	4	3	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	56.0	56.0	29.0	85.0	35.0	35.0
Total Split (%)	46.7%	46.7%	24.2%	70.8%	29.2%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	52.0	52.0	25.0	81.0	31.0	31.0
Actuated g/C Ratio	0.43	0.43	0.21	0.68	0.26	0.26
v/c Ratio	1.50	0.45	1.28	0.72	0.58	1.08
Control Delay	260.2	14.1	175.0	27.7	44.6	92.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	260.2	14.1	175.0	27.7	44.6	92.8
LOS	F	B	F	C	D	F
Approach Delay	209.3			74.4	77.1	
Approach LOS	F			E	E	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2: and 6:SBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 131.2		Intersection LOS: F	
Intersection Capacity Utilization 117.2%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



PM Existing + Cumulative + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.954	
Satd. Flow (prot)	0	1863	1417	1583	1863	0	0	0	0	0	1777	1417
Flt Permitted				0.950							0.954	
Satd. Flow (perm)	0	1863	1417	1583	1863	0	0	0	0	0	1777	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152									188
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	1150	300	400	860	0	0	0	0	240	10	520
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1211	316	421	905	0	0	0	0	253	11	547
Lane Group Flow (vph)	0	1211	316	421	905	0	0	0	0	0	264	547
v/c Ratio		1.50	0.45	1.28	0.72						0.58	1.08
Control Delay		260.2	14.1	175.0	27.7						44.6	92.8
Queue Delay		0.0	0.0	0.0	0.0						0.0	0.0
Total Delay		260.2	14.1	175.0	27.7						44.6	92.8
Queue Length 50th (ft)		~1301	83	~404	667						179	~359
Queue Length 95th (ft)		#1562	161	m#291	m557						269	#581
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		807	700	330	1258						459	505
Starvation Cap Reductn		0	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.50	0.45	1.28	0.72						0.58	1.08

Intersection Summary	
Area Type:	Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Existing + Cumulative + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		1863	1417	1583	1863						1778	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		1863	1417	1583	1863						1778	1417
Volume (vph)	0	1150	300	400	860	0	0	0	0	240	10	520
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1211	316	421	905	0	0	0	0	253	11	547
RTOR Reduction (vph)	0	0	86	0	0	0	0	0	0	0	0	139
Lane Group Flow (vph)	0	1211	230	421	905	0	0	0	0	0	264	408
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		52.0	52.0	25.0	81.0						31.0	31.0
Effective Green, g (s)		52.0	52.0	25.0	81.0						31.0	31.0
Actuated g/C Ratio		0.43	0.43	0.21	0.68						0.26	0.26
Clearance Time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	3.0
Lane Grp Cap (vph)		807	614	330	1258						459	366
v/s Ratio Prot		c0.65		c0.27	0.49							
v/s Ratio Perm			0.16								0.15	c0.29
v/c Ratio		1.50	0.37	1.28	0.72						0.58	1.11
Uniform Delay, d1		34.0	23.0	47.5	12.3						38.8	44.5
Progression Factor		1.00	1.00	1.33	2.12						1.00	1.00
Incremental Delay, d2		231.8	0.4	126.3	0.2						5.2	81.4
Delay (s)		265.8	23.4	189.5	26.2						43.9	125.9
Level of Service		F	C	F	C						D	F
Approach Delay (s)		215.6			78.1			0.0			99.2	
Approach LOS		F			E			A			F	

Intersection Summary					
HCM Average Control Delay	140.1	HCM Level of Service	F		
HCM Volume to Capacity ratio	1.34				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	117.2%	ICU Level of Service	H		
Analysis Period (min)	15				
c Critical Lane Group					

LOS Engineering

PM Existing + Cumulative + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

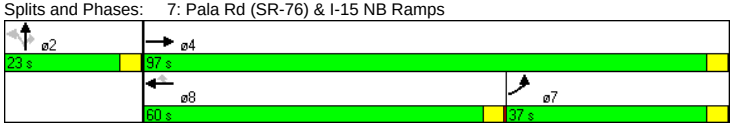
Timings

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Volume (vph)	600	820	900	270	10	370
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		2	
Permitted Phases				8		2
Detector Phases	7	4	8	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	97.0	60.0	60.0	23.0	23.0
Total Split (%)	30.8%	80.8%	50.0%	50.0%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	C-Min	C-Min
Act Effct Green (s)	33.0	93.0	56.0	56.0	19.0	19.0
Actuated g/C Ratio	0.28	0.78	0.47	0.47	0.16	0.16
v/c Ratio	1.45	0.60	1.09	0.41	1.54	0.88
Control Delay	243.6	16.2	89.6	19.2	293.9	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	243.6	16.2	89.6	19.2	293.9	39.4
LOS	F	B	F	B	F	D
Approach Delay		112.3	73.3		173.3	
Approach LOS		F	E		F	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.54
Intersection Signal Delay: 112.9 Intersection LOS: F
Intersection Capacity Utilization 117.2% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



PM Existing + Cumulative + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

Queues

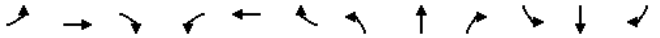
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850			0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	1583	1863	0	0	1863	1417	0	1777	1417	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	1583	1863	0	0	1863	1417	0	1777	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						51			256			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	600	820	0	0	900	270	400	10	370	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	863	0	0	947	284	421	11	389	0	0	0
Lane Group Flow (vph)	632	863	0	0	947	284	0	432	389	0	0	0
v/c Ratio	1.45	0.60			1.09	0.41		1.54	0.88			
Control Delay	243.6	16.2			89.6	19.2		293.9	39.4			
Queue Delay	0.0	0.0			0.0	0.0		0.0	0.0			
Total Delay	243.6	16.2			89.6	19.2		293.9	39.4			
Queue Length 50th (ft)	~658	454			~826	115		~470	106			
Queue Length 95th (ft)	m#426	m346			#1076	187		#671	#290			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	435	1444			869	688		281	440			
Starvation Cap Reductn	0	0			0	0		0	0			
Spillback Cap Reductn	0	0			0	0		0	0			
Storage Cap Reductn	0	0			0	0		0	0			
Reduced v/c Ratio	1.45	0.60			1.09	0.41		1.54	0.88			

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

PM Existing + Cumulative + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis



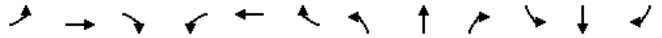
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1583	1863			1863	1417		1776	1417			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	1583	1863			1863	1417		1776	1417			
Volume (vph)	600	820	0	0	900	270	400	10	370	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	863	0	0	947	284	421	11	389	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	27	0	0	215	0	0	0
Lane Group Flow (vph)	632	863	0	0	947	257	0	432	174	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	33.0	93.0			56.0	56.0		19.0	19.0			
Effective Green, g (s)	33.0	93.0			56.0	56.0		19.0	19.0			
Actuated g/C Ratio	0.28	0.78			0.47	0.47		0.16	0.16			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)	435	1444			869	661		281	224			
v/s Ratio Prot	c0.40	0.46			c0.51							
v/s Ratio Perm						0.18		0.24	0.12			
v/c Ratio	1.45	0.60			1.09	0.39		1.54	0.77			
Uniform Delay, d1	43.5	5.7			32.0	20.8		50.5	48.4			
Progression Factor	1.25	2.72			1.00	1.00		1.00	1.00			
Incremental Delay, d2	205.0	0.1			57.9	0.4		258.9	22.6			
Delay (s)	259.4	15.4			89.9	21.2		309.4	71.0			
Level of Service	F	B			F	C		F	E			
Approach Delay (s)		118.5			74.1			196.5			0.0	
Approach LOS		F			E			F			A	

Intersection Summary			
HCM Average Control Delay	121.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.28		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	117.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Cumulative + Project
8: Pala Rd (SR-76) & Pankey Rd

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	152	750	328	200	600	83	315	408	305	106	459	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	160	789	345	211	632	87	332	429	321	112	483	211
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	719			1135			2831	2422	962	2914	2551	675
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	719			1135			2831	2422	962	2914	2551	675
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	82			66			0	0	0	0	0	54
cM capacity (veh/h)	882			616			0	17	310	0	14	454

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1295	929	1082	805
Volume Left	160	211	332	112
Volume Right	345	87	321	211
cSH	882	616	0	0
Volume to Capacity	0.18	0.34	Err	Err
Queue Length 95th (ft)	16	38	Err	Err
Control Delay (s)	6.0	9.5	Err	Err
Lane LOS	A	A	F	F
Approach Delay (s)	6.0	9.5	Err	Err
Approach LOS			F	F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	190.3%	ICU Level of Service	H
Analysis Period (min)	15		

LOS Engineering

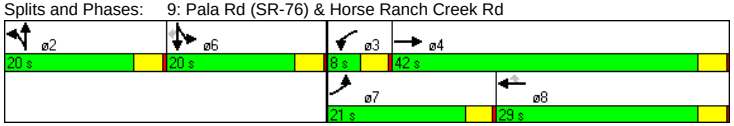
PM Existing + Cumulative + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	689	500	550	121	82	0	370		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	21.0	42.0	29.0	29.0	20.0	20.0	20.0	20.0	8.0
Total Split (%)	23.3%	46.7%	32.2%	32.2%	22.2%	22.2%	22.2%	22%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	17.3	37.5	16.2	16.2	9.3	9.3	9.3		
Actuated g/C Ratio	0.27	0.58	0.25	0.25	0.14	0.14	0.14		
v/c Ratio	0.88	0.26	0.65	0.28	0.40	0.26	0.27		
Control Delay	40.1	7.3	25.5	6.1	31.8	0.9	0.9		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	40.1	7.3	25.5	6.1	31.8	0.9	0.9		
LOS	D	A	C	A	C	A	A		
Approach Delay		26.3	22.0			6.5			
Approach LOS		C	C			A			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 64.6			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 21.2		Intersection LOS: C	
Intersection Capacity Utilization 53.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



PM Existing + Cumulative + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		250	0		0	150		150
Storage Lanes	2		0	1		1	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt						0.850					0.850	0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						127					617	617
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2833			5160			734			1509	
Travel Time (s)		64.4			117.3			16.7			34.3	
Volume (vph)	689	500	0	0	550	121	0	0	0	82	0	370
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	725	526	0	0	579	127	0	0	0	86	0	389
Lane Group Flow (vph)	725	526	0	0	579	127	0	0	0	86	194	195
v/c Ratio	0.88	0.26			0.65	0.28				0.40	0.26	0.27
Control Delay	40.1	7.3			25.5	6.1				31.8	0.9	0.9
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	40.1	7.3			25.5	6.1				31.8	0.9	0.9
Queue Length 50th (ft)	138	46			104	0				32	0	0
Queue Length 95th (ft)	#303	83			167	36				78	0	0
Internal Link Dist (ft)		2753			5080			654			1429	
Turn Bay Length (ft)	250					250				150		150
Base Capacity (vph)	821	2111			1213	569				340	803	782
Starvation Cap Reductn	0	0			0	0				0	0	0
Spillback Cap Reductn	0	0			0	0				0	0	0
Storage Cap Reductn	0	0			0	0				0	0	0
Reduced v/c Ratio	0.88	0.25			0.48	0.22				0.25	0.24	0.25

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

PM Existing + Cumulative + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.85	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3072	3539			3539	1417				1504	1441	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3072	3539			3539	1417				1504	1441	1346
Volume (vph)	689	500	0	0	550	121	0	0	0	82	0	370
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	725	526	0	0	579	127	0	0	0	86	0	389
RTOR Reduction (vph)	0	0	0	0	0	95	0	0	0	0	166	167
Lane Group Flow (vph)	725	526	0	0	579	32	0	0	0	86	28	28
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	17.3	37.5			16.2	16.2				9.3	9.3	9.3
Effective Green, g (s)	17.3	37.5			16.2	16.2				9.3	9.3	9.3
Actuated g/C Ratio	0.27	0.58			0.25	0.25				0.14	0.14	0.14
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	825	2061			890	356				217	208	194
v/s Ratio Prot	c0.24	0.15			c0.16					c0.06	0.02	
v/s Ratio Perm						0.02						0.02
v/c Ratio	0.88	0.26			0.65	0.09				0.40	0.13	0.15
Uniform Delay, d1	22.5	6.6			21.6	18.5				25.0	24.0	24.1
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	10.5	0.1			1.7	0.1				1.2	0.3	0.3
Delay (s)	33.1	6.7			23.3	18.6				26.2	24.3	24.4
Level of Service	C	A			C	B				C	C	C
Approach Delay (s)		22.0			22.4			0.0			24.7	
Approach LOS		C			C			A			C	

Intersection Summary				
HCM Average Control Delay	22.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	64.4	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	53.2%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing + Cumulative + Project
10: Pala Rd (SR-76) & Rice Canyon Rd

HCM Unsignalized Intersection Capacity Analysis

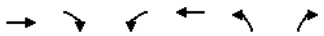
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	50	1000	1220	30	50	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	1053	1284	32	53	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1316				2458	1300
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1316				2458	1300
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				0	63
cM capacity (veh/h)	525				30	197

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1105	1316	126
Volume Left	53	0	53
Volume Right	0	32	74
cSH	525	1700	60
Volume to Capacity	0.10	0.77	2.11
Queue Length 95th (ft)	8	0	305
Control Delay (s)	3.8	0.0	659.3
Lane LOS	A		F
Approach Delay (s)	3.8	0.0	659.3
Approach LOS			F

Intersection Summary			
Average Delay	34.3		
Intersection Capacity Utilization	107.9%	ICU Level of Service	G
Analysis Period (min)	15		

LOS Engineering

PM Existing + Cumulative + Project
11: Pala Rd (SR-76) & Couser Canyon Rd — HCM Unsignalized Intersection Capacity Analysis



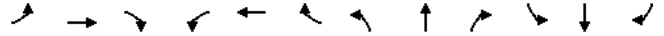
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	890	70	30	1150	60	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	937	74	32	1211	63	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1011		2247	974
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1011		2247	974
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		0	97
cM capacity (veh/h)			686		44	306

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1011	1242	74
Volume Left	0	32	63
Volume Right	74	0	11
cSH	1700	686	50
Volume to Capacity	0.59	0.05	1.48
Queue Length 95th (ft)	0	4	174
Control Delay (s)	0.0	1.9	427.4
Lane LOS		A	F
Approach Delay (s)	0.0	1.9	427.4
Approach LOS			F

Intersection Summary			
Average Delay			14.6
Intersection Capacity Utilization			95.7%
Analysis Period (min)			15
ICU Level of Service			F

LOS Engineering

PM Existing + Cumulative + Project
12: Pala Mesa Dr & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	150	145	200	174	176	232	110	810	189	199	480	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	158	153	211	183	185	244	116	853	199	209	505	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2387	2249	547	2395	2192	952	589			1052		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2387	2249	547	2395	2192	952	589			1052		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	61	0	0	22	88			68		
cM capacity (veh/h)	0	25	537	0	27	315	986			662		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	521	183	429	116	1052	209	589
Volume Left	158	183	0	116	0	209	0
Volume Right	211	0	244	0	199	0	84
cSH	0	0	57	986	1700	662	1700
Volume to Capacity	Err	Err	7.56	0.12	0.62	0.32	0.35
Queue Length 95th (ft)	Err	Err	Err	10	0	34	0
Control Delay (s)	Err	Err	Err	9.1	0.0	12.9	0.0
Lane LOS	F	F	F	A		B	
Approach Delay (s)	Err	Err		0.9		3.4	
Approach LOS	F	F					

Intersection Summary			
Average Delay			Err
Intersection Capacity Utilization			131.4%
Analysis Period (min)			15
ICU Level of Service			H

LOS Engineering

PM Existing + Cumulative + Project
13: Pala Mesa Dr & Wilt Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	10	0	30	10	40	0	50	90	40	20	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	11	0	32	11	42	0	53	95	42	21	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	53			11			147	147	11	247	126	32
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	53			11			147	147	11	247	126	32
tC, single (s)	4.3			4.3			7.3	6.7	6.4	7.3	6.7	6.4
tC, 2 stage (s)												
tF (s)	2.4			2.4			3.7	4.2	3.5	3.7	4.2	3.5
p0 queue free %	99			98			100	92	91	92	97	99
cM capacity (veh/h)	1445			1499			740	692	1020	561	711	993

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	84	147	74
Volume Left	11	32	0	42
Volume Right	0	42	95	11
cSH	1445	1499	873	639
Volume to Capacity	0.01	0.02	0.17	0.12
Queue Length 95th (ft)	1	2	15	10
Control Delay (s)	3.8	2.9	10.0	11.4
Lane LOS	A	A	A	B
Approach Delay (s)	3.8	2.9	10.0	11.4
Approach LOS			A	B

Intersection Summary				
Average Delay	8.1			
Intersection Capacity Utilization	27.3%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

PM Existing + Cumulative + Project
14: Stewart Canyon Rd & Old Hwy 395 — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	21	30	26	13	350	60	710	26	464	690	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	22	32	27	14	368	63	747	27	488	726	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2994	2646	768	2633	2675	761	811			775		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2994	2646	768	2633	2675	761	811			775		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	92	0	0	9	92			42		
cM capacity (veh/h)	0	9	401	0	9	405	815			841		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	64	409	63	775	488	811
Volume Left	11	27	63	0	488	0
Volume Right	32	368	0	27	0	84
cSH	0	0	815	1700	841	1700
Volume to Capacity	Err	Err	0.08	0.46	0.58	0.48
Queue Length 95th (ft)	Err	Err	6	0	96	0
Control Delay (s)	Err	Err	9.8	0.0	15.0	0.0
Lane LOS	F	F	A		C	
Approach Delay (s)	Err	Err	0.7		5.7	
Approach LOS	F	F				

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	104.2%	ICU Level of Service	G	
Analysis Period (min)	15			

LOS Engineering

PM Existing + Cumulative + Project
15: Reche Rd & Old Hwy 395

HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	290	250	870	330	210	350
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	305	263	916	347	221	368
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2584	405	589			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2584	405	589			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	59	7			
cM capacity (veh/h)	2	646	986			

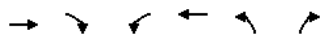
Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	568	916	347	589
Volume Left	305	916	0	0
Volume Right	263	0	0	368
cSH	4	986	1700	1700
Volume to Capacity	153.72	0.93	0.20	0.35
Queue Length 95th (ft)	Err	367	0	0
Control Delay (s)	Err	34.9	0.0	0.0
Lane LOS	F	D		
Approach Delay (s)	Err	25.3		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	2360.8		
Intersection Capacity Utilization	131.5%	ICU Level of Service	H
Analysis Period (min)	15		

LOS Engineering

PM Existing + Cumulative + Project
16: Reche Rd & Tecalote Dr

HCM Unsignalized Intersection Capacity Analysis



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	430	30	0	530	20	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	453	32	0	558	21	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			484		1026	468
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			484		1026	468
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		92	98
cM capacity (veh/h)			1079		260	595

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	484	558	32
Volume Left	0	0	21
Volume Right	32	0	11
cSH	1700	1079	320
Volume to Capacity	0.28	0.00	0.10
Queue Length 95th (ft)	0	0	8
Control Delay (s)	0.0	0.0	17.5
Lane LOS			C
Approach Delay (s)	0.0	0.0	17.5
Approach LOS			C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

PM Existing + Cumulative + Project
17: Reche Rd & Wilt Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	480	30	30	440	30	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	505	32	32	463	32	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			537		1047	521
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			537		1047	521
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		87	98
cM capacity (veh/h)			1031		245	555

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	537	495	42
Volume Left	0	32	32
Volume Right	32	0	11
cSH	1700	1031	285
Volume to Capacity	0.32	0.03	0.15
Queue Length 95th (ft)	0	2	13
Control Delay (s)	0.0	0.9	19.8
Lane LOS		A	C
Approach Delay (s)	0.0	0.9	19.8
Approach LOS			C

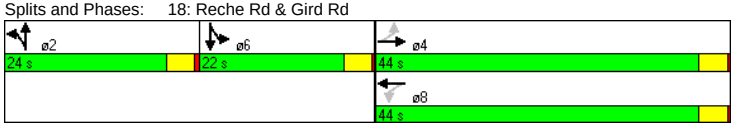
Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

PM Existing + Cumulative + Project
18: Reche Rd & Gird Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations						
Volume (vph)	10	500	50	400	10	10
Turn Type	Perm		Perm			
Protected Phases		4		8	2	6
Permitted Phases	4		8			
Detector Phases	4	4	8	8	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	44.0	44.0	44.0	44.0	24.0	22.0
Total Split (%)	48.9%	48.9%	48.9%	48.9%	26.7%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	24.1	24.1	24.1	24.1	10.8	6.3
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.20	0.12
v/c Ratio	0.04	0.80	0.44	0.54	0.53	0.05
Control Delay	9.2	21.0	23.8	13.4	25.9	29.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.2	21.0	23.8	13.4	25.9	29.2
LOS	A	C	C	B	C	C
Approach Delay		20.8		14.5	25.9	29.2
Approach LOS		C		B	C	C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 54.2			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 19.3		Intersection LOS: B	
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 18: Reche Rd & Gird Rd



PM Existing + Cumulative + Project
18: Reche Rd & Gird Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	50		0	50		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.971			0.993			0.970				
Flt Protected	0.950			0.950				0.965				
Satd. Flow (prot)	1583	1809	0	1583	1850	0	0	1744	0	0	1863	0
Flt Permitted	0.351			0.163				0.965				
Satd. Flow (perm)	585	1809	0	272	1850	0	0	1744	0	0	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17			4			15				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		6958			6851			1674			1091	
Travel Time (s)		158.1			155.7			38.0			24.8	
Volume (vph)	10	500	120	50	400	20	130	10	40	0	10	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	526	126	53	421	21	137	11	42	0	11	0
Lane Group Flow (vph)	11	652	0	53	442	0	0	190	0	0	11	0
v/c Ratio	0.04	0.80		0.44	0.54			0.53			0.05	
Control Delay	9.2	21.0		23.8	13.4			25.9			29.2	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	9.2	21.0		23.8	13.4			25.9			29.2	
Queue Length 50th (ft)	2	153		10	89			49			3	
Queue Length 95th (ft)	10	336		48	196			132			20	
Internal Link Dist (ft)		6878			6771			1594			1011	
Turn Bay Length (ft)	50			50								
Base Capacity (vph)	340	1058		158	1077			579			531	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.03	0.62		0.34	0.41			0.33			0.02	

Intersection Summary	
Area Type:	Other

LOS Engineering

PM Existing + Cumulative + Project
18: Reche Rd & Gird Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.97		1.00	0.99			0.97			1.00	
Flt Protected	0.95	1.00		0.95	1.00			0.97			1.00	
Satd. Flow (prot)	1583	1809		1583	1849			1744			1863	
Flt Permitted	0.39	1.00		0.20	1.00			0.97			1.00	
Satd. Flow (perm)	653	1809		334	1849			1744			1863	
Volume (vph)	10	500	120	50	400	20	130	10	40	0	10	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	526	126	53	421	21	137	11	42	0	11	0
RTOR Reduction (vph)	0	9	0	0	2	0	0	12	0	0	0	0
Lane Group Flow (vph)	11	643	0	53	440	0	0	178	0	0	11	0
Turn Type	Perm			Perm			Split			Split		
Protected Phases		4			8		2	2		6	6	
Permitted Phases	4			8								
Actuated Green, G (s)	24.1	24.1		24.1	24.1			10.8			6.3	
Effective Green, g (s)	24.1	24.1		24.1	24.1			10.8			6.3	
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.20			0.12	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	296	819		151	838			354			221	
v/s Ratio Prot		c0.36			0.24			c0.10			c0.01	
v/s Ratio Perm	0.02			0.16								
v/c Ratio	0.04	0.78		0.35	0.52			0.50			0.05	
Uniform Delay, d1	8.1	12.3		9.5	10.4			18.8			20.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	5.0		1.4	0.6			1.1			0.1	
Delay (s)	8.1	17.3		10.9	11.0			19.9			20.9	
Level of Service	A	B		B	B			B			C	
Approach Delay (s)		17.2			11.0			19.9			20.9	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM Average Control Delay	15.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	53.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	63.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

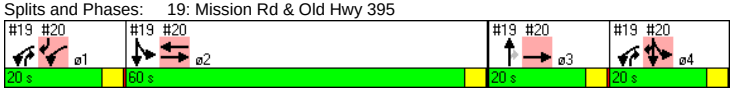
LOS Engineering

PM Existing + Cumulative + Project
19: Mission Rd & Old Hwy 395 — Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	380	840	120	320	1050	70		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	40.0	0.0	20.0	40.0	60.0	60.0	20.0	20.0
Total Split (%)	33.3%	0.0%	16.7%	33.3%	50.0%	50.0%	17%	17%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	36.0	120.0	16.0	56.0	56.0	56.0		
Actuated g/C Ratio	0.30	1.00	0.13	0.47	0.47	0.47		
v/c Ratio	0.84	0.62	0.51	0.51	1.50	0.09		
Control Delay	54.3	1.9	56.3	25.8	257.6	18.2		
Queue Delay	5.1	0.0	0.0	2.1	9.2	0.0		
Total Delay	59.4	1.9	56.3	27.9	266.8	18.2		
LOS	E	A	E	C	F	B		
Approach Delay	19.8		35.6			251.2		
Approach LOS	B		D			F		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Natural Cycle: 150			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 115.5		Intersection LOS: F	
Intersection Capacity Utilization 101.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 19: Mission Rd & Old Hwy 395



PM Existing + Cumulative + Project
19: Mission Rd & Old Hwy 395 — Queues

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	380	840	120	320	1050	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	884	126	337	1105	74
Lane Group Flow (vph)	400	884	126	337	1105	74
v/c Ratio	0.84	0.62	0.51	0.51	1.50	0.09
Control Delay	54.3	1.9	56.3	25.8	257.6	18.2
Queue Delay	5.1	0.0	0.0	2.1	9.2	0.0
Total Delay	59.4	1.9	56.3	27.9	266.8	18.2
Queue Length 50th (ft)	281	27	92	178	~1186	31
Queue Length 95th (ft)	m325	m0	156	267	#1444	60
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	475	1417	248	661	739	869
Starvation Cap Reductn	39	0	0	0	0	0
Spillback Cap Reductn	0	0	0	193	10	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.62	0.51	0.72	1.52	0.09

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

PM Existing + Cumulative + Project
19: Mission Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	1583	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	1583	1863
Volume (vph)	380	840	120	320	1050	70
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	884	126	337	1105	74
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	400	884	126	337	1105	74
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	36.0	120.0	16.0	52.0	56.0	56.0
Effective Green, g (s)	36.0	120.0	16.0	52.0	56.0	56.0
Actuated g/C Ratio	0.30	1.00	0.13	0.43	0.47	0.47
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	475	1417	248	661	739	869
v/s Ratio Prot	c0.25		0.07	0.15	c0.70	0.04
v/s Ratio Perm		c0.62		0.08		
v/c Ratio	0.84	0.62	0.51	0.51	1.50	0.09
Uniform Delay, d1	39.3	0.0	48.3	24.7	32.0	17.8
Progression Factor	1.14	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	1.0	1.6	0.6	230.0	0.0
Delay (s)	51.5	1.0	50.0	25.4	262.0	17.8
Level of Service	D	A	D	C	F	B
Approach Delay (s)	16.7		32.1			246.7
Approach LOS	B		C			F

Intersection Summary			
HCM Average Control Delay	111.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

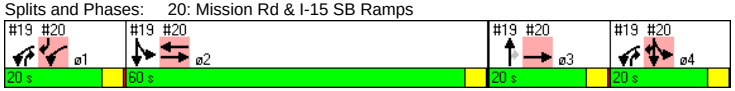
LOS Engineering

PM Existing + Cumulative + Project
20: Mission Rd & I-15 SB Ramps — Timings

Lane Group	EBT	WBL	WBT	SBT	SBR	ø3
Lane Configurations						
Volume (vph)	1260	80	500	10	720	
Turn Type		Prot			custom	
Protected Phases	2 3	1	2	4	1 4	3
Permitted Phases					4	
Detector Phases	2 3	1	2	4	1 4	
Minimum Initial (s)		4.0	4.0	4.0		4.0
Minimum Split (s)		8.0	20.0	20.0		20.0
Total Split (s)	80.0	20.0	60.0	20.0	40.0	20.0
Total Split (%)	66.7%	16.7%	50.0%	16.7%	33.3%	17%
Yellow Time (s)		3.5	3.5	3.5		3.5
All-Red Time (s)		0.5	0.5	0.5		0.5
Lead/Lag		Lead	Lag	Lag		Lead
Lead-Lag Optimize?		Yes	Yes	Yes		Yes
Recall Mode		None	Min	None		None
Act Effct Green (s)	76.0	16.0	56.0	16.0	36.0	
Actuated g/C Ratio	0.63	0.13	0.47	0.13	0.30	
v/c Ratio	1.21	0.40	0.61	0.09	1.04	
Control Delay	112.2	53.9	27.5	46.8	61.1	
Queue Delay	118.5	0.0	0.0	0.6	46.7	
Total Delay	230.7	53.9	27.5	47.4	107.8	
LOS	F	D	C	D	F	
Approach Delay	230.7		31.1	106.0		
Approach LOS	F		C	F		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.50		
Intersection Signal Delay: 152.8	Intersection LOS: F	
Intersection Capacity Utilization 84.3%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



LOS Engineering

PM Existing + Cumulative + Project
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		0	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50					50	50	50
Trailing Detector (ft)		0		0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991										0.850
Flt Protected				0.950							0.976	
Satd. Flow (prot)	0	1846	0	1583	1863	0	0	0	0	0	1818	1417
Flt Permitted				0.950							0.976	
Satd. Flow (perm)	0	1846	0	1583	1863	0	0	0	0	0	1818	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6										438
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	1260	90	80	500	0	0	0	0	10	10	720
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1326	95	84	526	0	0	0	0	11	11	758
Lane Group Flow (vph)	0	1421	0	84	526	0	0	0	0	0	22	758
v/c Ratio		1.21		0.40	0.61						0.09	1.04
Control Delay		112.2		53.9	27.5						46.8	61.1
Queue Delay		118.5		0.0	0.0						0.6	46.7
Total Delay		230.7		53.9	27.5						47.4	107.8
Queue Length 50th (ft)		~1352		60	295						15	~377
Queue Length 95th (ft)		m179		113	412						41	#618
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1171		211	869						242	732
Starvation Cap Reductn		182		0	0						0	0
Spillback Cap Reductn		210		0	0						111	75
Storage Cap Reductn		0		0	0						0	0
Reduced v/c Ratio		1.48		0.40	0.61						0.17	1.15

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Existing + Cumulative + Project
20: Mission Rd & I-15 SB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		1.00		1.00	1.00						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.98	1.00
Satd. Flow (prot)		1846		1583	1863						1817	1417
Flt Permitted		1.00		0.95	1.00						0.98	1.00
Satd. Flow (perm)		1846		1583	1863						1817	1417
Volume (vph)	0	1260	90	80	500	0	0	0	0	10	10	720
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1326	95	84	526	0	0	0	0	11	11	758
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	307
Lane Group Flow (vph)	0	1419	0	84	526	0	0	0	0	0	22	451
Turn Type				Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases												4
Actuated Green, G (s)		76.0		16.0	56.0						16.0	36.0
Effective Green, g (s)		76.0		16.0	56.0						16.0	36.0
Actuated g/C Ratio		0.63		0.13	0.47						0.13	0.30
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1169		211	869						242	425
v/s Ratio Prot		c0.77		0.05	0.28						0.01	c0.32
v/s Ratio Perm												
v/c Ratio		1.21		0.40	0.61						0.09	1.06
Uniform Delay, d1		22.0		47.6	23.8						45.6	42.0
Progression Factor		0.44		1.00	1.00						1.00	1.00
Incremental Delay, d2		96.9		1.2	1.2						0.2	61.1
Delay (s)		106.7		48.8	25.0						45.8	103.1
Level of Service		F		D	C						D	F
Approach Delay (s)		106.7			28.3			0.0			101.5	
Approach LOS		F			C			A			F	

Intersection Summary			
HCM Average Control Delay	88.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

PM Existing + Cumulative + Project
21: Mission Rd & I-15 NB Ramps

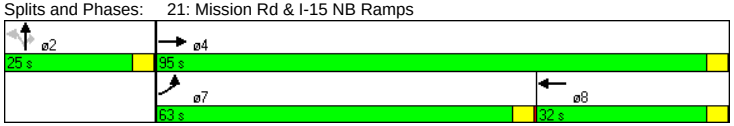
Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	1000	290	230	10	170
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	63.0	95.0	32.0	25.0	25.0
Total Split (%)	52.5%	79.2%	26.7%	20.8%	20.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	59.1	83.2	20.1	21.0	21.0
Actuated g/C Ratio	0.53	0.74	0.18	0.19	0.19
v/c Ratio	1.26	0.22	0.76	1.14	0.46
Control Delay	154.9	4.9	58.2	134.7	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	154.9	4.9	58.2	134.7	13.7
LOS	F	A	E	F	B
Approach Delay		121.2	58.2	95.9	
Approach LOS		F	E	F	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 112.3
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 107.3 Intersection LOS: F
Intersection Capacity Utilization 104.5% ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



LOS Engineering

PM Existing + Cumulative + Project
21: Mission Rd & I-15 NB Ramps

Queues

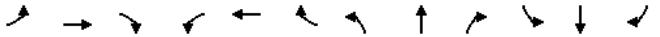
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	1		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.994				0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	1583	1863	0	0	1852	0	0	1777	1417	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	1583	1863	0	0	1852	0	0	1777	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					2				155			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	1000	290	0	0	230	10	350	10	170	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	305	0	0	242	11	368	11	179	0	0	0
Lane Group Flow (vph)	1053	305	0	0	253	0	0	379	179	0	0	0
v/c Ratio	1.26	0.22			0.76			1.14	0.46			
Control Delay	154.9	4.9			58.2			134.7	13.7			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	154.9	4.9			58.2			134.7	13.7			
Queue Length 50th (ft)	~959	58			174			~320	14			
Queue Length 95th (ft)	#1325	86			262			#554	84			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	833	1413			434			333	391			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	1.26	0.22			0.58			1.14	0.46			

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
21: Mission Rd & I-15 NB Ramps — HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	1.00	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	1583	1863			1852			1776	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	1583	1863			1852			1776	1417			
Volume (vph)	1000	290	0	0	230	10	350	10	170	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	305	0	0	242	11	368	11	179	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	126	0	0	0
Lane Group Flow (vph)	1053	305	0	0	251	0	0	379	53	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	59.1	83.3			20.2			21.0	21.0			
Effective Green, g (s)	59.1	83.3			20.2			21.0	21.0			
Actuated g/C Ratio	0.53	0.74			0.18			0.19	0.19			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	833	1382			333			332	265			
v/s Ratio Prot	c0.67	0.16			c0.14							
v/s Ratio Perm								0.21	0.04			
v/c Ratio	1.26	0.22			0.75			1.14	0.20			
Uniform Delay, d1	26.6	4.5			43.7			45.6	38.6			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	128.4	0.1			9.4			93.5	0.4			
Delay (s)	155.0	4.6			53.1			139.1	38.9			
Level of Service	F	A			D			F	D			
Approach Delay (s)		121.2			53.1			107.0			0.0	
Approach LOS		F			D			F			A	

Intersection Summary			
HCM Average Control Delay	109.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	112.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Cumulative + Project
22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	19	484	343	23	17	38
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	20	509	361	24	18	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	784	38	58			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	784	38	58			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	51	77			
cM capacity (veh/h)	277	1034	1546			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	529	385	58
Volume Left	20	361	0
Volume Right	509	0	40
cSH	937	1546	1700
Volume to Capacity	0.56	0.23	0.03
Queue Length 95th (ft)	91	23	0
Control Delay (s)	13.7	7.7	0.0
Lane LOS	B	A	
Approach Delay (s)	13.7	7.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	10.5		
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

LOS Engineering

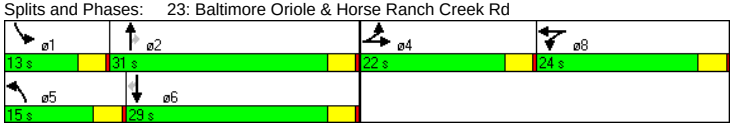
PM Existing + Cumulative + Project
23: Baltimore Oriole & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	24	7	246	15	52	296	285	66	387	43
Turn Type	Split		Split		Prot		Perm	Prot		Perm
Protected Phases	4	4	8	8	5	2		1	6	
Permitted Phases							2			6
Detector Phases	4	4	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	22.0	22.0	24.0	24.0	15.0	31.0	31.0	13.0	29.0	29.0
Total Split (%)	24.4%	24.4%	26.7%	26.7%	16.7%	34.4%	34.4%	14.4%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	7.4	7.4	12.6	12.6	8.3	30.4	30.4	8.4	33.5	33.5
Actuated g/C Ratio	0.11	0.11	0.20	0.20	0.12	0.49	0.49	0.13	0.54	0.54
v/c Ratio	0.15	0.09	0.51	0.49	0.29	0.35	0.36	0.35	0.41	0.06
Control Delay	31.1	21.6	26.6	23.3	30.8	15.7	3.9	31.0	15.6	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	21.6	26.6	23.3	30.8	15.7	3.9	31.0	15.6	6.7
LOS	C	C	C	C	C	B	A	C	B	A
Approach Delay		27.1		24.8		11.6			16.9	
Approach LOS		C		C		B			B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 62.6
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 16.5 — Intersection LOS: B
Intersection Capacity Utilization 48.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 23: Baltimore Oriole & Horse Ranch Creek Rd



LOS Engineering

PM Existing + Cumulative + Project
23: Baltimore Oriole & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.908			0.963				0.850			0.850
Flt Protected	0.950			0.950	0.968		0.950			0.950		
Satd. Flow (prot)	1583	1691	0	1504	1650	0	1583	1863	1417	1583	1863	1417
Flt Permitted	0.950			0.950	0.968		0.950			0.950		
Satd. Flow (perm)	1583	1691	0	1504	1650	0	1583	1863	1417	1583	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			17				300			45
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1047			1324			958			2343	
Travel Time (s)		23.8			30.1			21.8			53.3	
Volume (vph)	24	7	10	246	15	39	52	296	285	66	387	43
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	7	11	259	16	41	55	312	300	69	407	45
Lane Group Flow (vph)	25	18	0	151	165	0	55	312	300	69	407	45
v/c Ratio	0.15	0.09		0.51	0.49		0.29	0.35	0.36	0.35	0.41	0.06
Control Delay	31.1	21.6		26.6	23.3		30.8	15.7	3.9	31.0	15.6	6.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	21.6		26.6	23.3		30.8	15.7	3.9	31.0	15.6	6.7
Queue Length 50th (ft)	5	1		31	30		11	59	0	14	41	0
Queue Length 95th (ft)	34	22		124	123		58	194	51	71	274	22
Internal Link Dist (ft)		967			1244			878			2263	
Turn Bay Length (ft)												
Base Capacity (vph)	390	425		471	529		269	1057	934	241	1073	836
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.04		0.32	0.31		0.20	0.30	0.32	0.29	0.38	0.05

Intersection Summary

Area Type: Other

LOS Engineering

PM Existing + Cumulative + Project
23: Baltimore Oriole & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	1692		1504	1650		1583	1863	1417	1583	1863	1417
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	1692		1504	1650		1583	1863	1417	1583	1863	1417
Volume (vph)	24	7	10	246	15	39	52	296	285	66	387	43
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	7	11	259	16	41	55	312	300	69	407	45
RTOR Reduction (vph)	0	11	0	0	14	0	0	0	160	0	0	23
Lane Group Flow (vph)	25	7	0	151	151	0	55	312	140	69	407	22
Turn Type	Split			Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	2.7	2.7		11.6	11.6		3.3	31.1	31.1	5.2	33.0	33.0
Effective Green, g (s)	2.7	2.7		11.6	11.6		3.3	31.1	31.1	5.2	33.0	33.0
Actuated g/C Ratio	0.04	0.04		0.17	0.17		0.05	0.47	0.47	0.08	0.50	0.50
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	64	69		262	287		78	870	662	124	923	702
v/s Ratio Prot	c0.02	0.00		c0.10	0.09		0.03	0.17		c0.04	c0.22	
v/s Ratio Perm									0.10			0.02
v/c Ratio	0.39	0.11		0.58	0.53		0.71	0.36	0.21	0.56	0.44	0.03
Uniform Delay, d1	31.1	30.8		25.2	25.0		31.2	11.4	10.5	29.6	10.8	8.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.7		3.1	1.7		25.1	0.3	0.2	5.3	0.3	0.0
Delay (s)	35.1	31.5		28.3	26.7		56.2	11.6	10.7	34.9	11.2	8.6
Level of Service	D	C		C	C		E	B	B	C	B	A
Approach Delay (s)		33.6			27.5			14.9			14.1	
Approach LOS		C			C			B			B	

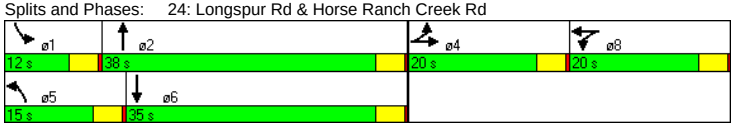
Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

PM Existing + Cumulative + Project
24: Longspur Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	6	36	301	35	127	591	52	545
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	38.0	12.0	35.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	42.2%	13.3%	38.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	7.7	7.7	13.3	13.3	9.9	39.4	7.2	34.8
Actuated g/C Ratio	0.10	0.10	0.17	0.17	0.13	0.51	0.09	0.45
v/c Ratio	0.04	0.45	0.72	0.70	0.68	0.52	0.39	0.39
Control Delay	33.3	23.1	47.3	42.2	52.3	15.3	44.3	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	23.1	47.3	42.2	52.3	15.3	44.3	18.0
LOS	C	C	D	D	D	B	D	B
Approach Delay		23.7		44.6		20.0		20.1
Approach LOS		C		D		C		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 76.8			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 24.6		Intersection LOS: C	
Intersection Capacity Utilization 56.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 24: Longspur Rd & Horse Ranch Creek Rd



PM Existing + Cumulative + Project
24: Longspur Rd & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.908			0.969			0.951			0.987	
Flt Protected	0.950			0.950	0.970		0.950			0.950		
Satd. Flow (prot)	1583	1691	0	1504	1663	0	1583	3366	0	1583	3493	0
Flt Permitted	0.950			0.950	0.970		0.950			0.950		
Satd. Flow (perm)	1583	1691	0	1504	1663	0	1583	3366	0	1583	3493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		61			13			104			12	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1010			908			1206			958	
Travel Time (s)		23.0			20.6			27.4			21.8	
Volume (vph)	6	36	58	301	35	41	127	591	285	52	545	51
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	6	38	61	317	37	43	134	622	300	55	574	54
Lane Group Flow (vph)	6	99	0	187	210	0	134	922	0	55	628	0
v/c Ratio	0.04	0.45		0.72	0.70		0.68	0.52		0.39	0.39	
Control Delay	33.3	23.1		47.3	42.2		52.3	15.3		44.3	18.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.3	23.1		47.3	42.2		52.3	15.3		44.3	18.0	
Queue Length 50th (ft)	3	18		92	96		65	165		27	120	
Queue Length 95th (ft)	14	63		#190	#188		#147	250		65	183	
Internal Link Dist (ft)		930			828			1126			878	
Turn Bay Length (ft)												
Base Capacity (vph)	292	362		306	349		218	1776		156	1590	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.02	0.27		0.61	0.60		0.61	0.52		0.35	0.39	

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Existing + Cumulative + Project
24: Longspur Rd & Horse Ranch Creek Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.97		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1691		1504	1664		1583	3366		1583	3494	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1691		1504	1664		1583	3366		1583	3494	
Volume (vph)	6	36	58	301	35	41	127	591	285	52	545	51
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	6	38	61	317	37	43	134	622	300	55	574	54
RTOR Reduction (vph)	0	56	0	0	11	0	0	52	0	0	7	0
Lane Group Flow (vph)	6	43	0	187	199	0	134	870	0	55	621	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.3	6.3		13.3	13.3		8.2	39.3		4.4	35.5	
Effective Green, g (s)	6.3	6.3		13.3	13.3		8.2	39.3		4.4	35.5	
Actuated g/C Ratio	0.08	0.08		0.17	0.17		0.10	0.50		0.06	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	126	134		252	279		164	1668		88	1564	
v/s Ratio Prot	0.00	c0.03		c0.12	0.12		c0.08	c0.26		0.03	0.18	
v/s Ratio Perm												
v/c Ratio	0.05	0.32		0.74	0.71		0.82	0.52		0.62	0.40	
Uniform Delay, d1	33.7	34.5		31.4	31.2		34.8	13.6		36.6	14.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	1.4		11.2	8.4		25.9	1.2		13.0	0.8	
Delay (s)	33.9	35.9		42.5	39.6		60.8	14.8		49.7	15.5	
Level of Service	C	D		D	D		E	B		D	B	
Approach Delay (s)		35.7			41.0			20.6			18.2	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM Average Control Delay	24.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	79.3	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	56.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

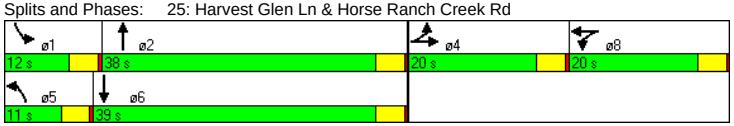
PM Existing + Cumulative + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	1	26	324	31	40	909	134	768
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	11.0	38.0	12.0	39.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	12.2%	42.2%	13.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.8	6.8	14.3	14.3	6.5	33.8	8.1	39.9
Actuated g/C Ratio	0.09	0.09	0.19	0.19	0.08	0.45	0.11	0.53
v/c Ratio	0.01	0.23	0.77	0.75	0.32	0.85	0.82	0.43
Control Delay	33.0	30.2	49.4	41.6	42.1	25.4	72.8	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	30.2	49.4	41.6	42.1	25.4	72.8	14.5
LOS	C	C	D	D	D	C	E	B
Approach Delay		30.3		45.3		25.9		23.2
Approach LOS		C		D		C		C

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 74.8		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.85		
Intersection Signal Delay: 28.3	Intersection LOS: C	
Intersection Capacity Utilization 74.0%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 25: Harvest Glen Ln & Horse Ranch Creek Rd



LOS Engineering

PM Existing + Cumulative + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.957			0.941			0.958			0.999	
Flt Protected	0.950			0.950	0.977		0.950			0.950		
Satd. Flow (prot)	1583	1783	0	1504	1627	0	1583	3391	0	1583	3536	0
Flt Permitted	0.950			0.950	0.977		0.950			0.950		
Satd. Flow (perm)	1583	1783	0	1504	1627	0	1583	3391	0	1583	3536	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			31			73			1	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1058			1173			1033			1206	
Travel Time (s)		24.0			26.7			23.5			27.4	
Volume (vph)	1	26	10	324	31	94	40	909	353	134	768	4
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	27	11	341	33	99	42	957	372	141	808	4
Lane Group Flow (vph)	1	38	0	221	252	0	42	1329	0	141	812	0
v/c Ratio	0.01	0.23		0.77	0.75		0.32	0.85		0.82	0.43	
Control Delay	33.0	30.2		49.4	41.6		42.1	25.4		72.8	14.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.0	30.2		49.4	41.6		42.1	25.4		72.8	14.5	
Queue Length 50th (ft)	1	13		111	110		20	304		72	152	
Queue Length 95th (ft)	5	42		#230	#231		52	#471		#183	216	
Internal Link Dist (ft)		978			1093			953			1126	
Turn Bay Length (ft)												
Base Capacity (vph)	289	334		317	368		140	1586		172	1886	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.00	0.11		0.70	0.68		0.30	0.84		0.82	0.43	

Intersection Summary	
Area Type:	Other
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

LOS Engineering

PM Existing + Cumulative + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.94		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1782		1504	1627		1583	3391		1583	3537	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1782		1504	1627		1583	3391		1583	3537	
Volume (vph)	1	26	10	324	31	94	40	909	353	134	768	4
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	27	11	341	33	99	42	957	372	141	808	4
RTOR Reduction (vph)	0	10	0	0	25	0	0	40	0	0	0	0
Lane Group Flow (vph)	1	28	0	221	227	0	42	1289	0	141	812	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.2	4.2		14.3	14.3		3.8	35.6		8.1	39.9	
Effective Green, g (s)	4.2	4.2		14.3	14.3		3.8	35.6		8.1	39.9	
Actuated g/C Ratio	0.05	0.05		0.18	0.18		0.05	0.46		0.10	0.51	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	85	96		275	298		77	1544		164	1805	
v/s Ratio Prot	0.00	c0.02		c0.15	0.14		0.03	c0.38		c0.09	0.23	
v/s Ratio Perm												
v/c Ratio	0.01	0.29		0.80	0.76		0.55	0.83		0.86	0.45	
Uniform Delay, d1	35.0	35.6		30.6	30.3		36.4	18.7		34.5	12.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.7		15.5	10.9		7.7	4.1		33.4	0.2	
Delay (s)	35.1	37.2		46.1	41.2		44.0	22.8		67.9	12.4	
Level of Service	D	D		D	D		D	C		E	B	
Approach Delay (s)		37.2			43.5			23.4			20.6	
Approach LOS		D			D			C			C	

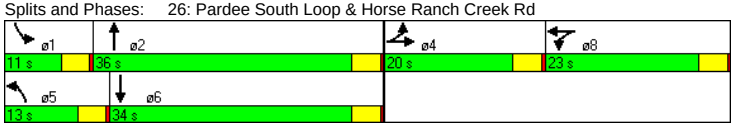
Intersection Summary			
HCM Average Control Delay	26.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	78.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

PM Existing + Cumulative + Project
26: Pardee South Loop & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	35	0	118	0	76	1194	151	879
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	23.0	23.0	13.0	36.0	11.0	34.0
Total Split (%)	22.2%	22.2%	25.6%	25.6%	14.4%	40.0%	12.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.4	7.4	9.9	9.9	8.0	38.7	7.1	43.0
Actuated g/C Ratio	0.10	0.10	0.13	0.13	0.10	0.53	0.10	0.59
v/c Ratio	0.25	0.04	0.46	0.40	0.48	0.81	1.03	0.49
Control Delay	34.9	0.2	36.2	16.0	41.4	22.9	118.7	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	0.2	36.2	16.0	41.4	22.9	118.7	15.0
LOS	C	A	D	B	D	C	F	B
Approach Delay		24.0		25.2		23.8		29.2
Approach LOS		C		C		C		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 73.2			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 26.0		Intersection LOS: C	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 26: Pardee South Loop & Horse Ranch Creek Rd



PM Existing + Cumulative + Project
26: Pardee South Loop & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.894			0.976			0.988	
Flt Protected	0.950			0.950	0.986		0.950			0.950		
Satd. Flow (prot)	1583	1583	0	1504	1560	0	1583	3454	0	1583	3497	0
Flt Permitted	0.950			0.950	0.986		0.950			0.950		
Satd. Flow (perm)	1583	1583	0	1504	1560	0	1583	3454	0	1583	3497	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		324			77			27			11	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		869			1419			1340			1033	
Travel Time (s)		19.8			32.3			30.5			23.5	
Volume (vph)	35	0	16	118	0	73	76	1194	226	151	879	75
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	0	17	124	0	77	80	1257	238	159	925	79
Lane Group Flow (vph)	37	17	0	92	109	0	80	1495	0	159	1004	0
v/c Ratio	0.25	0.04		0.46	0.40		0.48	0.81		1.03	0.49	
Control Delay	34.9	0.2		36.2	16.0		41.4	22.9		118.7	15.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.9	0.2		36.2	16.0		41.4	22.9		118.7	15.0	
Queue Length 50th (ft)	15	0		40	13		33	319		~75	182	
Queue Length 95th (ft)	44	0		86	58		80	#563		#208	292	
Internal Link Dist (ft)		789			1339			1260			953	
Turn Bay Length (ft)												
Base Capacity (vph)	298	561		344	416		184	1840		154	2058	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.12	0.03		0.27	0.26		0.43	0.81		1.03	0.49	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
26: Pardee South Loop & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.89		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1583		1504	1559		1583	3455		1583	3497	
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1583		1504	1559		1583	3455		1583	3497	
Volume (vph)	35	0	16	118	0	73	76	1194	226	151	879	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	0	17	124	0	77	80	1257	238	159	925	79
RTOR Reduction (vph)	0	16	0	0	68	0	0	13	0	0	5	0
Lane Group Flow (vph)	37	1	0	92	41	0	80	1482	0	159	999	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.9	4.9		8.7	8.7		5.3	40.5		7.1	42.3	
Effective Green, g (s)	4.9	4.9		8.7	8.7		5.3	40.5		7.1	42.3	
Actuated g/C Ratio	0.06	0.06		0.11	0.11		0.07	0.52		0.09	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	100	100		169	176		109	1813		146	1916	
v/s Ratio Prot	c0.02	0.00		c0.06	0.03		0.05	c0.43		c0.10	0.29	
v/s Ratio Perm												
v/c Ratio	0.37	0.01		0.54	0.23		0.73	0.82		1.09	0.52	
Uniform Delay, d1	34.7	33.9		32.4	31.2		35.3	15.3		35.1	11.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.0		3.6	0.7		22.3	3.0		100.3	0.3	
Delay (s)	37.0	33.9		35.9	31.9		57.6	18.3		135.4	11.3	
Level of Service	D	C		D	C		E	B		F	B	
Approach Delay (s)		36.0			33.7			20.3			28.3	
Approach LOS		D			C			C			C	

Intersection Summary

HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

PM Existing + Cumulative + Project
27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	62	1434	43	0	1036
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	65	1509	45	0	1091
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2077	777			1555	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2077	777			1555	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	81			100	
cM capacity (veh/h)	46	339			422	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	65	1006	548	545	545
Volume Left	0	0	0	0	0
Volume Right	65	0	45	0	0
cSH	339	1700	1700	1700	1700
Volume to Capacity	0.19	0.59	0.32	0.32	0.32
Queue Length 95th (ft)	17	0	0	0	0
Control Delay (s)	18.1	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	18.1	0.0		0.0	
Approach LOS	C				

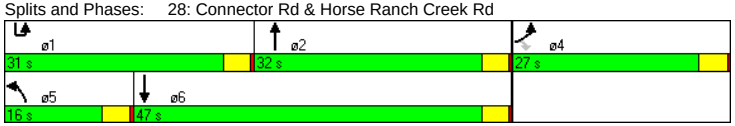
Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		52.0%	ICU Level of Service A
Analysis Period (min)		15	

PM Existing + Cumulative + Project
28: Connector Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Configurations						
Volume (vph)	659	5	12	796	50	508
Turn Type		Perm	Prot		Prot	
Protected Phases	4		5	2	1	6
Permitted Phases		4				
Detector Phases	4	4	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	27.0	27.0	16.0	32.0	31.0	47.0
Total Split (%)	30.0%	30.0%	17.8%	35.6%	34.4%	52.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	Min	None	Min
Act Effct Green (s)	18.1	18.1	6.7	19.1	7.7	23.5
Actuated g/C Ratio	0.34	0.34	0.11	0.36	0.14	0.45
v/c Ratio	0.66	0.01	0.07	0.65	0.24	0.64
Control Delay	20.8	11.6	32.8	18.2	29.8	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	11.6	32.8	18.2	29.8	9.1
LOS	C	B	C	B	C	A
Approach Delay	20.8			18.4		10.1
Approach LOS	C			B		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 52.7		
Natural Cycle: 50		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.66		
Intersection Signal Delay: 15.5	Intersection LOS: B	
Intersection Capacity Utilization 64.5%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 28: Connector Rd & Horse Ranch Creek Rd



PM Existing + Cumulative + Project
28: Connector Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9		9
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	0.95
Frt		0.850				0.925	
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	3072	1417	1583	3539	1583	3274	0
Flt Permitted	0.950		0.950		0.950		
Satd. Flow (perm)	3072	1417	1583	3539	1583	3274	0
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		5				378	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30		30	
Link Distance (ft)	2875			1509		1400	
Travel Time (s)	65.3			34.3		31.8	
Volume (vph)	659	5	12	796	50	508	502
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	694	5	13	838	53	535	528
Lane Group Flow (vph)	694	5	13	838	53	1063	0
v/c Ratio	0.66	0.01	0.07	0.65	0.24	0.64	
Control Delay	20.8	11.6	32.8	18.2	29.8	9.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.8	11.6	32.8	18.2	29.8	9.1	
Queue Length 50th (ft)	109	0	4	136	18	71	
Queue Length 95th (ft)	211	7	22	216	54	187	
Internal Link Dist (ft)	2795			1429		1320	
Turn Bay Length (ft)							
Base Capacity (vph)	1298	602	310	1695	582	2160	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.53	0.01	0.04	0.49	0.09	0.49	

Intersection Summary

Area Type: Other

LOS Engineering

PM Existing + Cumulative + Project
28: Connector Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	0.93	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	3072	1417	1583	3539	1583	3276	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	3072	1417	1583	3539	1583	3276	
Volume (vph)	659	5	12	796	50	508	502
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	694	5	13	838	53	535	528
RTOR Reduction (vph)	0	3	0	0	0	215	0
Lane Group Flow (vph)	694	2	13	838	53	848	0
Turn Type		Perm	Prot		Prot		
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	18.1	18.1	1.0	20.4	4.1	23.5	
Effective Green, g (s)	18.1	18.1	1.0	20.4	4.1	23.5	
Actuated g/C Ratio	0.33	0.33	0.02	0.37	0.08	0.43	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1018	470	29	1322	119	1410	
v/s Ratio Prot	c0.23		0.01	0.24	c0.03	c0.26	
v/s Ratio Perm		0.00					
v/c Ratio	0.68	0.00	0.45	0.63	0.45	0.60	
Uniform Delay, d1	15.8	12.2	26.5	14.0	24.2	11.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.9	0.0	10.6	1.0	2.6	0.7	
Delay (s)	17.7	12.2	37.2	15.0	26.8	12.7	
Level of Service	B	B	D	B	C	B	
Approach Delay (s)	17.6			15.4		13.3	
Approach LOS	B			B		B	

Intersection Summary

HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

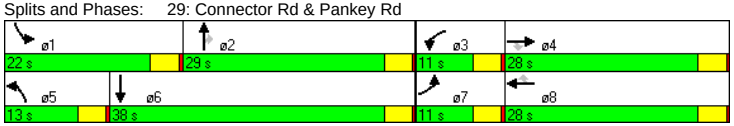
PM Existing + Cumulative + Project
29: Connector Rd & Pankey Rd

Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	75	474	300	26	256	286	200	373	60	268	436
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot	
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	4	3	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	13.0	29.0	29.0	22.0	38.0
Total Split (%)	12.2%	31.1%	31.1%	12.2%	31.1%	31.1%	14.4%	32.2%	32.2%	24.4%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	6.8	25.3	25.3	6.4	20.7	20.7	9.2	20.0	20.0	16.8	27.5
Actuated g/C Ratio	0.08	0.32	0.32	0.08	0.27	0.27	0.12	0.26	0.26	0.22	0.35
v/c Ratio	0.59	0.87	0.49	0.22	0.54	0.50	1.13	0.82	0.15	0.83	0.72
Control Delay	57.3	46.6	6.2	43.6	32.1	6.7	143.5	43.9	7.8	53.9	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	46.6	6.2	43.6	32.1	6.7	143.5	43.9	7.8	53.9	29.1
LOS	E	D	A	D	C	A	F	D	A	D	C
Approach Delay		33.3			19.8			72.0			38.4
Approach LOS		C			B			E			D

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 78.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 40.7		Intersection LOS: D	
Intersection Capacity Utilization 83.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 29: Connector Rd & Pankey Rd



LOS Engineering

PM Existing + Cumulative + Project
29: Connector Rd & Pankey Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1855	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1855	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			316			301			63		2	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1256			2875			1488			1443	
Travel Time (s)		28.5			65.3			33.8			32.8	
Volume (vph)	75	474	300	26	256	286	200	373	60	268	436	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	499	316	27	269	301	211	393	63	282	459	11
Lane Group Flow (vph)	79	499	316	27	269	301	211	393	63	282	470	0
v/c Ratio	0.59	0.87	0.49	0.22	0.54	0.50	1.13	0.82	0.15	0.83	0.72	
Control Delay	57.3	46.6	6.2	43.6	32.1	6.7	143.5	43.9	7.8	53.9	29.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	57.3	46.6	6.2	43.6	32.1	6.7	143.5	43.9	7.8	53.9	29.1	
Queue Length 50th (ft)	39	234	0	13	125	0	~128	178	0	133	185	
Queue Length 95th (ft)	#110	#530	68	41	210	62	#295	#335	29	#302	327	
Internal Link Dist (ft)		1176			2795			1408			1363	
Turn Bay Length (ft)												
Base Capacity (vph)	139	573	649	132	559	636	186	566	474	364	753	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.57	0.87	0.49	0.20	0.48	0.47	1.13	0.69	0.13	0.77	0.62	

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
29: Connector Rd & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1856	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1856	
Volume (vph)	75	474	300	26	256	286	200	373	60	268	436	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	499	316	27	269	301	211	393	63	282	459	11
RTOR Reduction (vph)	0	0	217	0	0	217	0	0	47	0	1	0
Lane Group Flow (vph)	79	499	99	27	269	84	211	393	16	282	469	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	5.3	25.3	25.3	2.4	22.4	22.4	9.2	20.0	20.0	16.8	27.6	
Effective Green, g (s)	5.3	25.3	25.3	2.4	22.4	22.4	9.2	20.0	20.0	16.8	27.6	
Actuated g/C Ratio	0.07	0.31	0.31	0.03	0.28	0.28	0.11	0.25	0.25	0.21	0.34	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	104	556	423	47	518	394	181	463	352	330	636	
v/s Ratio Prot	c0.05	c0.28		0.02	0.14		c0.13	c0.21		c0.18	0.25	
v/s Ratio Perm			0.07			0.06			0.01			
v/c Ratio	0.76	0.90	0.23	0.57	0.52	0.21	1.17	0.85	0.04	0.85	0.74	
Uniform Delay, d1	37.0	26.4	20.4	38.5	24.5	22.3	35.6	28.8	23.0	30.7	23.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	26.7	17.1	0.3	15.9	0.9	0.3	118.6	13.5	0.1	18.9	4.4	
Delay (s)	63.7	43.4	20.7	54.4	25.4	22.6	154.2	42.4	23.0	49.6	27.7	
Level of Service	E	D	C	D	C	C	F	D	C	D	C	
Approach Delay (s)		37.2			25.3			75.9			35.9	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM Average Control Delay	43.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	80.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

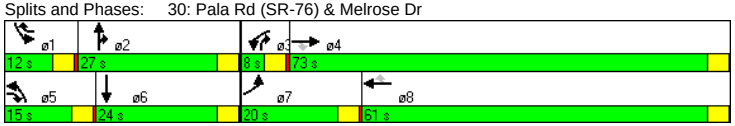
LOS Engineering

PM Existing + Cumulative + Project
30: Pala Rd (SR-76) & Melrose Dr — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	200	2200	360	100	1620	10	300	200	360	100	200
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6
Permitted Phases			4			8					
Detector Phases	7	4	5	3	8	1	5	2	2 3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0		8.0	20.0
Total Split (s)	20.0	73.0	15.0	8.0	61.0	12.0	15.0	27.0	35.0	12.0	24.0
Total Split (%)	16.7%	60.8%	12.5%	6.7%	50.8%	10.0%	12.5%	22.5%	29.2%	10.0%	20.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	16.0	69.0	84.0	4.0	57.0	69.0	11.0	23.0	31.0	8.0	20.0
Actuated g/C Ratio	0.13	0.58	0.70	0.03	0.48	0.58	0.09	0.19	0.26	0.07	0.17
v/c Ratio	1.00	1.14	0.36	1.03	1.01	0.01	1.12	0.59	1.00	0.99	0.85
Control Delay	114.4	94.8	4.6	153.8	57.2	5.4	139.3	51.9	88.3	141.3	72.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	114.4	94.8	4.6	153.8	57.2	5.4	139.3	51.9	88.3	141.3	72.4
LOS	F	F	A	F	E	A	F	D	F	F	E
Approach Delay		84.5			62.5			97.6			92.0
Approach LOS		F			E			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Natural Cycle: 140		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.14		
Intersection Signal Delay: 80.3	Intersection LOS: F	
Intersection Capacity Utilization 101.9%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 30: Pala Rd (SR-76) & Melrose Dr



LOS Engineering

PM Existing + Cumulative + Project
30: Pala Rd (SR-76) & Melrose Dr

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	500		500	500		500	400		400	200		0
Storage Lanes	1		1	2		1	2		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1807	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			176			11			19		9	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1330			646			1034			733	
Travel Time (s)		30.2			14.7			23.5			16.7	
Volume (vph)	200	2200	360	100	1620	10	300	200	360	100	200	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2316	379	105	1705	11	316	211	379	105	211	53
Lane Group Flow (vph)	211	2316	379	105	1705	11	316	211	379	105	264	0
v/c Ratio	1.00	1.14	0.36	1.03	1.01	0.01	1.12	0.59	1.00	0.99	0.85	
Control Delay	114.4	94.8	4.6	153.8	57.2	5.4	139.3	51.9	88.3	141.3	72.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	114.4	94.8	4.6	153.8	57.2	5.4	139.3	51.9	88.3	141.3	72.4	
Queue Length 50th (ft)	166	~1101	49	~44	~704	0	~145	150	282	83	195	
Queue Length 95th (ft)	#326	#1236	93	#104	#872	8	#238	233	#489	#200	#341	
Internal Link Dist (ft)		1250			566			954			653	
Turn Bay Length (ft)	500		500	500		500	400		400	200		
Base Capacity (vph)	211	2035	1045	102	1681	819	282	357	380	106	309	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.00	1.14	0.36	1.03	1.01	0.01	1.12	0.59	1.00	0.99	0.85	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
30: Pala Rd (SR-76) & Melrose Dr

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1807	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	3072	3539	1417	3072	1863	1417	1583	1807	
Volume (vph)	200	2200	360	100	1620	10	300	200	360	100	200	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2316	379	105	1705	11	316	211	379	105	211	53
RTOR Reduction (vph)	0	0	59	0	0	5	0	0	14	0	8	0
Lane Group Flow (vph)	211	2316	320	105	1705	6	316	211	365	105	257	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	16.0	69.0	80.0	4.0	57.0	65.0	11.0	23.0	31.0	8.0	20.0	
Effective Green, g (s)	16.0	69.0	80.0	4.0	57.0	65.0	11.0	23.0	31.0	8.0	20.0	
Actuated g/C Ratio	0.13	0.58	0.67	0.03	0.48	0.54	0.09	0.19	0.26	0.07	0.17	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	211	2035	992	102	1681	815	282	357	366	106	301	
v/s Ratio Prot	0.13	c0.65	0.03	0.03	0.48	0.00	c0.10	0.11	c0.26	0.07	0.14	
v/s Ratio Perm			0.20			0.00						
v/c Ratio	1.00	1.14	0.32	1.03	1.01	0.01	1.12	0.59	1.00	0.99	0.85	
Uniform Delay, d1	52.0	25.5	8.5	58.0	31.5	12.7	54.5	44.2	44.5	56.0	48.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	62.0	68.7	0.2	97.3	25.6	0.0	90.0	7.0	45.9	84.2	25.0	
Delay (s)	114.0	94.2	8.7	155.3	57.1	12.7	144.5	51.2	90.4	140.2	73.6	
Level of Service	F	F	A	F	E	B	F	D	F	F	E	
Approach Delay (s)		84.5			62.4			100.1			92.5	
Approach LOS		F			E			F			F	

Intersection Summary				
HCM Average Control Delay	80.7	HCM Level of Service	F	
HCM Volume to Capacity ratio	1.11			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	101.9%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

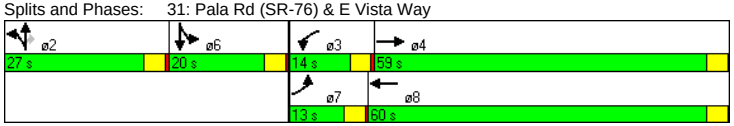
PM Existing + Cumulative + Project
31: Pala Rd (SR-76) & E Vista Way

Timings

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Volume (vph)	100	2050	400	1200	70	370	80
Turn Type	Prot		Prot			Perm	
Protected Phases	7	4	3	8	2		6
Permitted Phases						2	
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	13.0	59.0	14.0	60.0	27.0	27.0	20.0
Total Split (%)	10.8%	49.2%	11.7%	50.0%	22.5%	22.5%	16.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	Max
Act Effct Green (s)	9.0	55.0	10.0	56.0	23.0	23.0	16.0
Actuated g/C Ratio	0.08	0.46	0.08	0.47	0.19	0.19	0.13
v/c Ratio	0.88	1.61	1.64	1.50	1.14	0.73	0.66
Control Delay	111.0	306.1	341.6	256.6	135.1	18.5	54.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.0	306.1	341.6	256.6	135.1	18.5	54.6
LOS	F	F	F	F	F	B	D
Approach Delay		298.4		277.5	76.9		54.6
Approach LOS		F		F	E		D

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.64		
Intersection Signal Delay: 251.7	Intersection LOS: F	
Intersection Capacity Utilization 124.8%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 31: Pala Rd (SR-76) & E Vista Way



PM Existing + Cumulative + Project
31: Pala Rd (SR-76) & E Vista Way

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		150	450		0	0		200	0		0
Storage Lanes	1		0	2		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.996				0.850		0.941	
Flt Protected	0.950			0.950				0.961			0.997	
Satd. Flow (prot)	1583	3454	0	3072	1855	0	0	1790	1417	0	1748	0
Flt Permitted	0.950			0.950				0.961			0.997	
Satd. Flow (perm)	1583	3454	0	3072	1855	0	0	1790	1417	0	1748	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			1				320		27	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		710			526			797			552	
Travel Time (s)		16.1			12.0			18.1			12.5	
Volume (vph)	100	2050	400	400	1200	30	300	70	370	10	80	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	2158	421	421	1263	32	316	74	389	11	84	74
Lane Group Flow (vph)	105	2579	0	421	1295	0	0	390	389	0	169	0
v/c Ratio	0.88	1.61		1.64	1.50			1.14	0.73		0.66	
Control Delay	111.0	306.1		341.6	256.6			135.1	18.5		54.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	111.0	306.1		341.6	256.6			135.1	18.5		54.6	
Queue Length 50th (ft)	82	~1518		~243	~1401			~352	46		106	
Queue Length 95th (ft)	#190	#1651		#346	#1666			#547	167		#183	
Internal Link Dist (ft)		630			446			717			472	
Turn Bay Length (ft)	300			450					200			
Base Capacity (vph)	119	1597		256	866			343	530		256	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.88	1.61		1.64	1.50			1.14	0.73		0.66	

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

PM Existing + Cumulative + Project
31: Pala Rd (SR-76) & E Vista Way

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		0.97	1.00			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (prot)	1583	3453		3072	1856			1790	1417		1747	
Flt Permitted	0.95	1.00		0.95	1.00			0.96	1.00		1.00	
Satd. Flow (perm)	1583	3453		3072	1856			1790	1417		1747	
Volume (vph)	100	2050	400	400	1200	30	300	70	370	10	80	70
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	2158	421	421	1263	32	316	74	389	11	84	74
RTOR Reduction (vph)	0	14	0	0	1	0	0	0	259	0	23	0
Lane Group Flow (vph)	105	2565	0	421	1294	0	0	390	130	0	146	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			
Actuated Green, G (s)	9.0	55.0		10.0	56.0			23.0	23.0		16.0	
Effective Green, g (s)	9.0	55.0		10.0	56.0			23.0	23.0		16.0	
Actuated g/C Ratio	0.08	0.46		0.08	0.47			0.19	0.19		0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	119	1583		256	866			343	272		233	
v/s Ratio Prot	0.07	c0.74		c0.14	0.70			c0.22			c0.08	
v/s Ratio Perm									0.09			
v/c Ratio	0.88	1.62		1.64	1.49			1.14	0.48		0.62	
Uniform Delay, d1	55.0	32.5		55.0	32.0			48.5	43.2		49.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	48.1	282.2		307.0	228.8			91.1	5.9		12.0	
Delay (s)	103.0	314.7		362.0	260.8			139.6	49.1		61.2	
Level of Service	F	F		F	F			F	D		E	
Approach Delay (s)		306.4			285.6			94.4			61.2	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	261.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	124.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

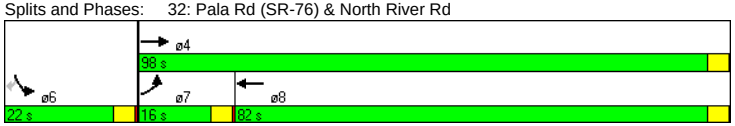
PM Existing + Cumulative + Project
32: Pala Rd (SR-76) & North River Rd

Timings

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	200	2350	1500	250	200
Turn Type	Prot				Perm
Protected Phases	7	4	8	6	
Permitted Phases					6
Detector Phases	7	4	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	16.0	98.0	82.0	22.0	22.0
Total Split (%)	13.3%	81.7%	68.3%	18.3%	18.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Max	Max
Act Effct Green (s)	12.0	94.0	78.0	18.0	18.0
Actuated g/C Ratio	0.10	0.78	0.65	0.15	0.15
v/c Ratio	1.34	1.70	1.45	1.11	0.58
Control Delay	229.1	335.1	229.4	138.0	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	229.1	335.1	229.4	138.0	16.9
LOS	F	F	F	F	B
Approach Delay		326.7	229.4	84.1	
Approach LOS		F	F	F	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.70		
Intersection Signal Delay: 268.7	Intersection LOS: F	
Intersection Capacity Utilization 145.8%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 32: Pala Rd (SR-76) & North River Rd



PM Existing + Cumulative + Project
32: Pala Rd (SR-76) & North River Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	150			0	50	0
Storage Lanes	1			0	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.988			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1863	1840	0	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1863	1840	0	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			9			181
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		1356	1400		1286	
Travel Time (s)		30.8	31.8		29.2	
Volume (vph)	200	2350	1500	150	250	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2474	1579	158	263	211
Lane Group Flow (vph)	211	2474	1737	0	263	211
v/c Ratio	1.34	1.70	1.45		1.11	0.58
Control Delay	229.1	335.1	229.4		138.0	16.9
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	229.1	335.1	229.4		138.0	16.9
Queue Length 50th (ft)	~213	~2812	~1845		~233	20
Queue Length 95th (ft)	#369	#3063	#2116		#402	99
Internal Link Dist (ft)		1276	1320		1206	
Turn Bay Length (ft)	150				50	
Base Capacity (vph)	158	1459	1199		237	366
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	1.34	1.70	1.45		1.11	0.58

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
32: Pala Rd (SR-76) & North River Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1583	1863	1840		1583	1417
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1583	1863	1840		1583	1417
Volume (vph)	200	2350	1500	150	250	200
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2474	1579	158	263	211
RTOR Reduction (vph)	0	0	3	0	0	154
Lane Group Flow (vph)	211	2474	1734	0	263	57
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	12.0	94.0	78.0		18.0	18.0
Effective Green, g (s)	12.0	94.0	78.0		18.0	18.0
Actuated g/C Ratio	0.10	0.78	0.65		0.15	0.15
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	158	1459	1196		237	213
v/s Ratio Prot	0.13	c1.33	0.94		c0.17	
v/s Ratio Perm						0.04
v/c Ratio	1.34	1.70	1.45		1.11	0.27
Uniform Delay, d1	54.0	13.0	21.0		51.0	45.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	187.5	316.0	207.1		91.0	3.1
Delay (s)	241.5	329.0	228.1		142.0	48.2
Level of Service	F	F	F		F	D
Approach Delay (s)		322.2	228.1		100.3	
Approach LOS		F	F		F	

Intersection Summary				
HCM Average Control Delay	267.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	145.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

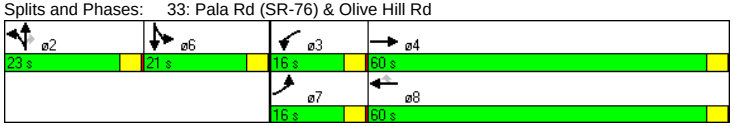
PM Existing + Cumulative + Project
33: Pala Rd (SR-76) & Olive Hill Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	150	2250	250	1550	150	200	350	150	200
Turn Type	Prot		Prot		Perm		Perm	Split	
Protected Phases	7	4	3	8		2		6	6
Permitted Phases					8		2		
Detector Phases	7	4	3	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	16.0	60.0	16.0	60.0	60.0	23.0	23.0	21.0	21.0
Total Split (%)	13.3%	50.0%	13.3%	50.0%	50.0%	19.2%	19.2%	17.5%	17.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)	12.0	56.0	12.0	56.0	56.0	19.0	19.0	17.0	17.0
Actuated g/C Ratio	0.10	0.47	0.10	0.47	0.47	0.16	0.16	0.14	0.14
v/c Ratio	1.00	1.58	1.66	0.99	0.22	1.09	0.93	0.71	1.11
Control Delay	126.0	288.6	359.2	51.5	8.9	126.2	52.6	67.0	134.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	126.0	288.6	359.2	51.5	8.9	126.2	52.6	67.0	134.2
LOS	F	F	F	D	A	F	D	E	F
Approach Delay		279.3		87.6		86.6			110.7
Approach LOS		F		F		F			F

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.66	
Intersection Signal Delay: 177.8	Intersection LOS: F
Intersection Capacity Utilization 128.8%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 33: Pala Rd (SR-76) & Olive Hill Rd



LOS Engineering

PM Existing + Cumulative + Project
33: Pala Rd (SR-76) & Olive Hill Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		200	0		150	150		0
Storage Lanes	1		0	1		1	0		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850			0.850		0.957	
Flt Protected	0.950			0.950				0.984		0.950		
Satd. Flow (prot)	1583	3497	0	1583	3539	1417	0	1833	1417	1583	1783	0
Flt Permitted	0.950			0.950				0.984		0.950		
Satd. Flow (perm)	1583	3497	0	1583	3539	1417	0	1833	1417	1583	1783	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				93			205		14	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		585			663			961			1186	
Travel Time (s)		13.3			15.1			21.8			27.0	
Volume (vph)	150	2250	200	250	1550	150	100	200	350	150	200	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	2368	211	263	1632	158	105	211	368	158	211	84
Lane Group Flow (vph)	158	2579	0	263	1632	158	0	316	368	158	295	0
v/c Ratio	1.00	1.58		1.66	0.99	0.22		1.09	0.93	0.71	1.11	
Control Delay	126.0	288.6		359.2	51.5	8.9		126.2	52.6	67.0	134.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	126.0	288.6		359.2	51.5	8.9		126.2	52.6	67.0	134.2	
Queue Length 50th (ft)	124	~1504		~296	642	28		~275	134	118	~253	
Queue Length 95th (ft)	#266	#1637		#466	#823	69		#456	#324	#213	#433	
Internal Link Dist (ft)		505			583			881			1106	
Turn Bay Length (ft)	250			250		200			150	150		
Base Capacity (vph)	158	1637		158	1652	711		290	397	224	265	
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	1.00	1.58		1.66	0.99	0.22		1.09	0.93	0.71	1.11	

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
33: Pala Rd (SR-76) & Olive Hill Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85		1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3496		1583	3539	1417		1832	1417	1583	1783	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3496		1583	3539	1417		1832	1417	1583	1783	
Volume (vph)	150	2250	200	250	1550	150	100	200	350	150	200	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	2368	211	263	1632	158	105	211	368	158	211	84
RTOR Reduction (vph)	0	5	0	0	0	50	0	0	173	0	12	0
Lane Group Flow (vph)	158	2574	0	263	1632	108	0	316	195	158	283	0
Turn Type	Prot			Prot		Perm	Split		Perm	Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8			2			
Actuated Green, G (s)	12.0	56.0		12.0	56.0	56.0		19.0	19.0	17.0	17.0	
Effective Green, g (s)	12.0	56.0		12.0	56.0	56.0		19.0	19.0	17.0	17.0	
Actuated g/C Ratio	0.10	0.47		0.10	0.47	0.47		0.16	0.16	0.14	0.14	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	158	1631		158	1652	661		290	224	224	253	
v/s Ratio Prot	0.10	c0.74		c0.17	0.46			c0.17		0.10	c0.16	
v/s Ratio Perm						0.08			0.14			
v/c Ratio	1.00	1.58		1.66	0.99	0.16		1.09	0.87	0.71	1.12	
Uniform Delay, d1	54.0	32.0		54.0	31.7	18.5		50.5	49.3	49.1	51.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	71.6	263.1		325.3	19.1	0.1		78.9	34.4	17.0	92.2	
Delay (s)	125.6	295.1		379.3	50.8	18.6		129.4	83.7	66.2	143.7	
Level of Service	F	F		F	D	B		F	F	E	F	
Approach Delay (s)		285.3			90.4			104.8			116.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	184.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	128.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

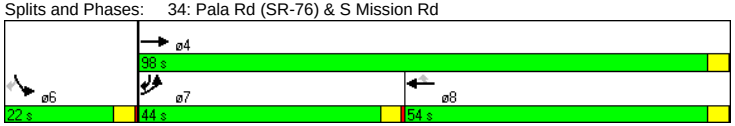
PM Existing + Cumulative + Project
34: Pala Rd (SR-76) & S Mission Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1000	1800	1400	240	300	550
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	44.0	98.0	54.0	54.0	22.0	44.0
Total Split (%)	36.7%	81.7%	45.0%	45.0%	18.3%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	40.0	94.0	50.0	50.0	18.0	62.0
Actuated g/C Ratio	0.33	0.78	0.42	0.42	0.15	0.52
v/c Ratio	1.03	1.30	1.00	0.35	0.69	0.45
Control Delay	75.2	158.0	58.6	6.0	56.8	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.2	158.0	58.6	6.0	56.8	19.7
LOS	E	F	E	A	E	B
Approach Delay		128.4	50.9		32.8	
Approach LOS		F	D		C	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Natural Cycle: 150		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.30		
Intersection Signal Delay: 89.0	Intersection LOS: F	
Intersection Capacity Utilization 111.0%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



PM Existing + Cumulative + Project
34: Pala Rd (SR-76) & S Mission Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				218		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	1000	1800	1400	240	300	550
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1895	1474	253	316	579
Lane Group Flow (vph)	1053	1895	1474	253	316	579
v/c Ratio	1.03	1.30	1.00	0.35	0.69	0.45
Control Delay	75.2	158.0	58.6	6.0	56.8	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.2	158.0	58.6	6.0	56.8	19.7
Queue Length 50th (ft)	~449	~1878	591	16	121	154
Queue Length 95th (ft)	#580	#2141	#764	70	171	206
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	1024	1459	1475	718	461	1288
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	1.30	1.00	0.35	0.69	0.45

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
34: Pala Rd (SR-76) & S Mission Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	1863	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	1863	3539	1417	3072	2493
Volume (vph)	1000	1800	1400	240	300	550
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1895	1474	253	316	579
RTOR Reduction (vph)	0	0	0	127	0	0
Lane Group Flow (vph)	1053	1895	1474	126	316	579
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	40.0	94.0	50.0	50.0	18.0	58.0
Effective Green, g (s)	40.0	94.0	50.0	50.0	18.0	58.0
Actuated g/C Ratio	0.33	0.78	0.42	0.42	0.15	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1024	1459	1475	590	461	1288
v/s Ratio Prot	0.34	c1.02	0.42		c0.10	0.15
v/s Ratio Perm				0.09		0.08
v/c Ratio	1.03	1.30	1.00	0.21	0.69	0.45
Uniform Delay, d1	40.0	13.0	35.0	22.4	48.3	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	35.6	139.6	23.1	0.2	8.1	0.3
Delay (s)	75.6	152.6	58.1	22.6	56.4	20.7
Level of Service	E	F	E	C	E	C
Approach Delay (s)		125.1	52.9		33.3	
Approach LOS		F	D		C	

Intersection Summary				
HCM Average Control Delay	88.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	111.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Cumulative + Project
35: Reche Rd & Live Oak Park Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	50	500	540	50	50	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	526	568	53	53	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	621				1226	595
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	621				1226	595
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				72	90
cM capacity (veh/h)	960				186	504

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	53	526	621	105
Volume Left	53	0	0	53
Volume Right	0	0	53	53
cSH	960	1700	1700	272
Volume to Capacity	0.05	0.31	0.37	0.39
Queue Length 95th (ft)	4	0	0	44
Control Delay (s)	9.0	0.0	0.0	26.3
Lane LOS	A			D
Approach Delay (s)	0.8		0.0	26.3
Approach LOS				D

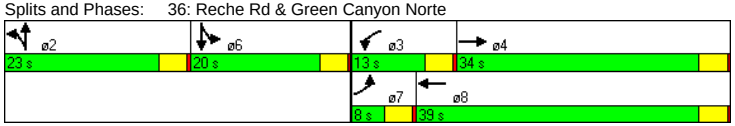
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

PM Existing + Cumulative + Project
36: Reche Rd & Green Canyon Norte — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Volume (vph)	10	430	90	580	120	10	0
Turn Type	Prot		Prot		Split		
Protected Phases	7	4	3	8	2	2	6
Permitted Phases							
Detector Phases	7	4	3	8	2	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	8.0	34.0	13.0	39.0	23.0	23.0	20.0
Total Split (%)	8.9%	37.8%	14.4%	43.3%	25.6%	25.6%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	Max	Max	None
Act Effct Green (s)	4.2	23.6	8.1	31.7	20.4	20.4	6.8
Actuated g/C Ratio	0.06	0.35	0.12	0.47	0.30	0.30	0.09
v/c Ratio	0.12	0.79	0.52	0.73	0.26	0.19	0.23
Control Delay	42.3	31.4	43.9	21.8	26.4	8.7	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	31.4	43.9	21.8	26.4	8.7	24.9
LOS	D	C	D	C	C	A	C
Approach Delay		31.7		24.7		18.3	24.9
Approach LOS		C		C		B	C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 67.9			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 26.1		Intersection LOS: C	
Intersection Capacity Utilization 58.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 36: Reche Rd & Green Canyon Norte



PM Existing + Cumulative + Project
36: Reche Rd & Green Canyon Norte — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	150		0	150		0	150		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.995			0.866			0.932	
Flt Protected	0.950			0.950			0.950				0.976	
Satd. Flow (prot)	1583	1833	0	1583	1853	0	1583	1613	0	0	1694	0
Flt Permitted	0.950			0.950			0.950				0.976	
Satd. Flow (perm)	1583	1833	0	1583	1853	0	1583	1613	0	0	1694	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			2			95			21	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		973			4892			1501			1367	
Travel Time (s)		22.1			111.2			34.1			31.1	
Volume (vph)	10	430	50	90	580	20	120	10	90	20	0	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	453	53	95	611	21	126	11	95	21	0	21
Lane Group Flow (vph)	11	506	0	95	632	0	126	106	0	0	42	0
v/c Ratio	0.12	0.79		0.52	0.73		0.26	0.19			0.23	
Control Delay	42.3	31.4		43.9	21.8		26.4	8.7			24.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay	42.3	31.4		43.9	21.8		26.4	8.7			24.9	
Queue Length 50th (ft)	5	212		44	208		50	4			10	
Queue Length 95th (ft)	22	#354		#105	#465		105	43			40	
Internal Link Dist (ft)		893			4812			1421			1287	
Turn Bay Length (ft)	150			150			150					
Base Capacity (vph)	89	761		208	962		477	552			359	
Starvation Cap Reductn	0	0		0	0		0	0			0	
Spillback Cap Reductn	0	0		0	0		0	0			0	
Storage Cap Reductn	0	0		0	0		0	0			0	
Reduced v/c Ratio	0.12	0.66		0.46	0.66		0.26	0.19			0.12	

Intersection Summary
Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Existing + Cumulative + Project
36: Reche Rd & Green Canyon Norte — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1583	1833		1583	1853		1583	1612			1695	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (perm)	1583	1833		1583	1853		1583	1612			1695	
Volume (vph)	10	430	50	90	580	20	120	10	90	20	0	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	453	53	95	611	21	126	11	95	21	0	21
RTOR Reduction (vph)	0	4	0	0	1	0	0	68	0	0	20	0
Lane Group Flow (vph)	11	502	0	95	631	0	126	38	0	0	22	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	0.7	26.0		6.4	31.7		20.4	20.4			3.9	
Effective Green, g (s)	0.7	26.0		6.4	31.7		20.4	20.4			3.9	
Actuated g/C Ratio	0.01	0.36		0.09	0.44		0.28	0.28			0.05	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	15	656		139	808		444	452			91	
v/s Ratio Prot	0.01	0.27		c0.06	c0.34		c0.08	0.02			c0.01	
v/s Ratio Perm												
v/c Ratio	0.73	0.76		0.68	0.78		0.28	0.08			0.24	
Uniform Delay, d1	35.9	20.6		32.2	17.5		20.4	19.3			33.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	103.2	5.3		13.0	4.9		1.6	0.4			1.4	
Delay (s)	139.1	25.9		45.2	22.5		22.0	19.6			34.4	
Level of Service	F	C		D	C		C	B			C	
Approach Delay (s)		28.3			25.4			20.9			34.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	26.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

PM Existing + Cumulative + Project
37: Pala Rd (SR-76) & Pala Mission Rd

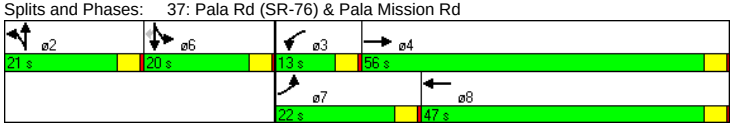
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	SBR
Lane Configurations								
Volume (vph)	250	530	50	680	40	20	30	190
Turn Type	Prot		Prot		Split			Perm
Protected Phases	7	4	3	8	2	2	6	
Permitted Phases								6
Detector Phases	7	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	22.0	56.0	13.0	47.0	21.0	21.0	20.0	20.0
Total Split (%)	20.0%	50.9%	11.8%	42.7%	19.1%	19.1%	18.2%	18.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	None	None
Act Effct Green (s)	18.0	55.1	7.9	43.0	17.0	17.0	8.9	8.9
Actuated g/C Ratio	0.17	0.53	0.08	0.42	0.17	0.17	0.09	0.09
v/c Ratio	0.95	0.33	0.44	0.97	0.16	0.11	0.34	0.66
Control Delay	86.4	14.9	57.8	55.6	39.9	29.1	49.6	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.4	14.9	57.8	55.6	39.9	29.1	49.6	17.1
LOS	F	B	E	E	D	C	D	B
Approach Delay		36.4		55.7		35.2	23.9	
Approach LOS		D		E		D	C	

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 103
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 42.5 Intersection LOS: D
Intersection Capacity Utilization 72.4% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 37: Pala Rd (SR-76) & Pala Mission Rd



LOS Engineering

PM Existing + Cumulative + Project
37: Pala Rd (SR-76) & Pala Mission Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		0	200		0	0		50
Storage Lanes	1		0	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	50
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.987			0.994			0.948				0.850
Flt Protected	0.950			0.950			0.950				0.981	
Satd. Flow (prot)	1583	3493	0	1583	1852	0	1583	1766	0	0	1827	1417
Flt Permitted	0.950			0.950			0.950				0.981	
Satd. Flow (perm)	1583	3493	0	1583	1852	0	1583	1766	0	0	1827	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			2			11				200
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		941			1076			1007			1565	
Travel Time (s)		21.4			24.5			22.9			35.6	
Volume (vph)	250	530	50	50	680	30	40	20	10	20	30	190
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	263	558	53	53	716	32	42	21	11	21	32	200
Lane Group Flow (vph)	263	611	0	53	748	0	42	32	0	0	53	200
v/c Ratio	0.95	0.33		0.44	0.97		0.16	0.11			0.34	0.66
Control Delay	86.4	14.9		57.8	55.6		39.9	29.1			49.6	17.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0			0.0	0.0
Total Delay	86.4	14.9		57.8	55.6		39.9	29.1			49.6	17.1
Queue Length 50th (ft)	171	116		33	463		24	12			33	0
Queue Length 95th (ft)	#354	176		77	#786		59	41			72	68
Internal Link Dist (ft)		861			996			927			1485	
Turn Bay Length (ft)	250			250			200					50
Base Capacity (vph)	277	1875		135	775		261	301			266	377
Starvation Cap Reductn	0	0		0	0		0	0			0	0
Spillback Cap Reductn	0	0		0	0		0	0			0	0
Storage Cap Reductn	0	0		0	0		0	0			0	0
Reduced v/c Ratio	0.95	0.33		0.39	0.97		0.16	0.11			0.20	0.53

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Existing + Cumulative + Project
37: Pala Rd (SR-76) & Pala Mission Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (prot)	1583	3493		1583	1851		1583	1767			1827	1417
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			0.98	1.00
Satd. Flow (perm)	1583	3493		1583	1851		1583	1767			1827	1417
Volume (vph)	250	530	50	50	680	30	40	20	10	20	30	190
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	263	558	53	53	716	32	42	21	11	21	32	200
RTOR Reduction (vph)	0	6	0	0	1	0	0	9	0	0	0	183
Lane Group Flow (vph)	263	605	0	53	747	0	42	23	0	0	53	17
Turn Type	Prot			Prot			Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												6
Actuated Green, G (s)	18.0	55.1		6.8	43.9		17.0	17.0			8.9	8.9
Effective Green, g (s)	18.0	55.1		6.8	43.9		17.0	17.0			8.9	8.9
Actuated g/C Ratio	0.17	0.53		0.07	0.42		0.16	0.16			0.09	0.09
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	275	1854		104	783		259	289			157	121
v/s Ratio Prot	c0.17	0.17		0.03	c0.40		c0.03	0.01			c0.03	
v/s Ratio Perm												0.01
v/c Ratio	0.96	0.33		0.51	0.95		0.16	0.08			0.34	0.14
Uniform Delay, d1	42.5	13.8		46.9	29.0		37.3	36.8			44.7	43.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2	42.0	0.1		3.9	21.5		1.3	0.5			1.3	0.5
Delay (s)	84.5	13.9		50.8	50.5		38.6	37.3			46.0	44.5
Level of Service	F	B		D	D		D	D			D	D
Approach Delay (s)		35.2			50.5			38.1			44.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	42.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	103.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

Appendix P

SANDAG Year 2030 Series 10 Cumulative, 10 GP, and 11 Traffic Model Volumes

Higher ADTs used for Plan to Plan Analysis (Horizon Year Analysis)

Segments	2030 Series 10 Cumulative	2030 Series 11	2030 Existing GP	Higher ADT Used in Traffic Study
Old Highway 395				
East Mission Road to Reche Road	19,900	16,000	21,900	21,900
Reche Road to Stewart Canyon Road	23,300	22,000	25,200	25,200
Stewart Canyon Road to Tecalote Lane	18,000	16,000	21,300	21,300
Tecalote Lane to Pala Mesa Drive	19,400	18,000	23,200	23,200
Pala Mesa Drive to SR-76 (Pala Road)	20,900	17,000	23,400	23,400
Stewart Canyon Road				
Old Hwy 395 to Horse Ranch Creek Rd	8,800	7,000	Not Shown	8,800
Pankey Road				
Street R/Pankey Place to SR-76 (Pala Rd)	8,900	7,000	See note(1)	8,900
SR-76 (Pala Road) to Shearer Crossing	20,000	20,000	6,500	20,000
Horse Ranch Creek Road				
Stewart Canyon Rd to Baltimore Oriole (#23)	Note 1: Series 10 and 11 traffic models did not have detailed information (manuall assignment on Horse Ranch Creek Road and on Street R/Pankey Place) as used in traffic study, thus volumes in traffic study are based on the detailed manual assignment of 3Ps traffic.			
Baltimore Oriole (#23) to Longspur Rd (#24)				
Longspur Rd (#24) to Harvest Glen Ln (#25)				
Harvest Glen Ln (#25) to Intersection (#26)				
Intersection (#26) to Park/School (#27)				
Park/Sch (#27) to Street R/Pankey Pl (#28)				
Street R/Pankey Pl (#28) to SR-76 (Pala Rd)				
Pala Mesa Drive				
Wilt Rd/Sage Rd to Old Highway 395	11,500	10,000	9,200	11,500
Old Highway 395 to Street R/Pankey Pl		See note(1)		7,500
Street R/Pankey Place				
Pala Mesa/Pankey to Horse Ranch Creek Rd	10,300	Not Shown	Not Shown	10,300

Higher Peak Hour Directional Volumes between Series 10 and Series 11 Models

State Route 76	AM (Eastbound)			AM (Westbound)			PM (Eastbound)			PM (Westbound)		
	Series 10	Series 11	Traffic Study	Series 10	Series 11	Traffic Study	Series 10	Series 11	Traffic Study	Series 10	Series 11	Traffic Study
Melrose Dr to E. Vista Way	**1368**	1193	1368	**2416**	2006	2416	**2651**	2372	2651	**1727**	1517	1727
E. Vista Way to North River Rd	**1187**	991	1187	**1984**	1904	1984	**2059**	1951	2059	**1419**	1224	1419
North River Rd to Olive Hill Rd	**1391**	1120	1391	**2421**	2372	2421	**2593**	2451	2593	**1611**	1393	1611
Olive Hill Rd to S Mission Rd	**1498**	1265	1498	**2567**	2524	2567	**2576**	2448	2576	**1851**	1587	1851
S Mission Rd to Via Monserate	**1092**	767	1092	**1733**	1587	1733	**2273**	1906	2273	**1501**	965	1501
Via Monserate to Gird Rd	**1140**	707	1140	**1796**	1757	1796	**2077**	1882	2077	**1361**	794	1361
Gird Rd to Sage Rd	**1131**	942	1131	**1339**	1248	1339	**1400**	1387	1400	**1236**	893	1236
Sage Rd to Old Hwy 395	**1218**	980	1218	**1361**	1334	1361	**1523**	1265	1523	**1448**	929	1448
Old Hwy 395 to I-15 SB Ramps	1343	**1600**	1600	**1265**	1245	1265	**1486**	1248	1486	**1531**	781	1531
I-15 SB Ramps to I-15 NB Ramps	**1022**	756	1022	**994**	569	994	**1357**	1334	1357	**1285**	462	1285
I-15 NB Ramps to Pankey Rd	**842**	668	842	**1045**	792	1045	**1449**	816	1449	**1062**	707	1062
Pankey Rd to Horse Ranch Creek Rd	604	**762**	762	**1184**	1109	1184	**1280**	1028	1280	**1357**	998	1357
Horse Ranch Creek Rd to Rice Cyn	604	**762**	762	**1184**	1109	1184	**1280**	1028	1280	**1357**	998	1357
Rice Cyn to Couser Cyn	**1724**	952	1724	**840**	615	840	**1032**	689	1032	**1343**	1117	1343
Couser Cyn to Pala Mission Rd	**857**	753	857	**678**	620	678	**848**	840	848	**1251**	1160	1251

Bold indicates higher volumes used between Series 10 cumulative and Series 11

County of San Diego
GP Update EIR

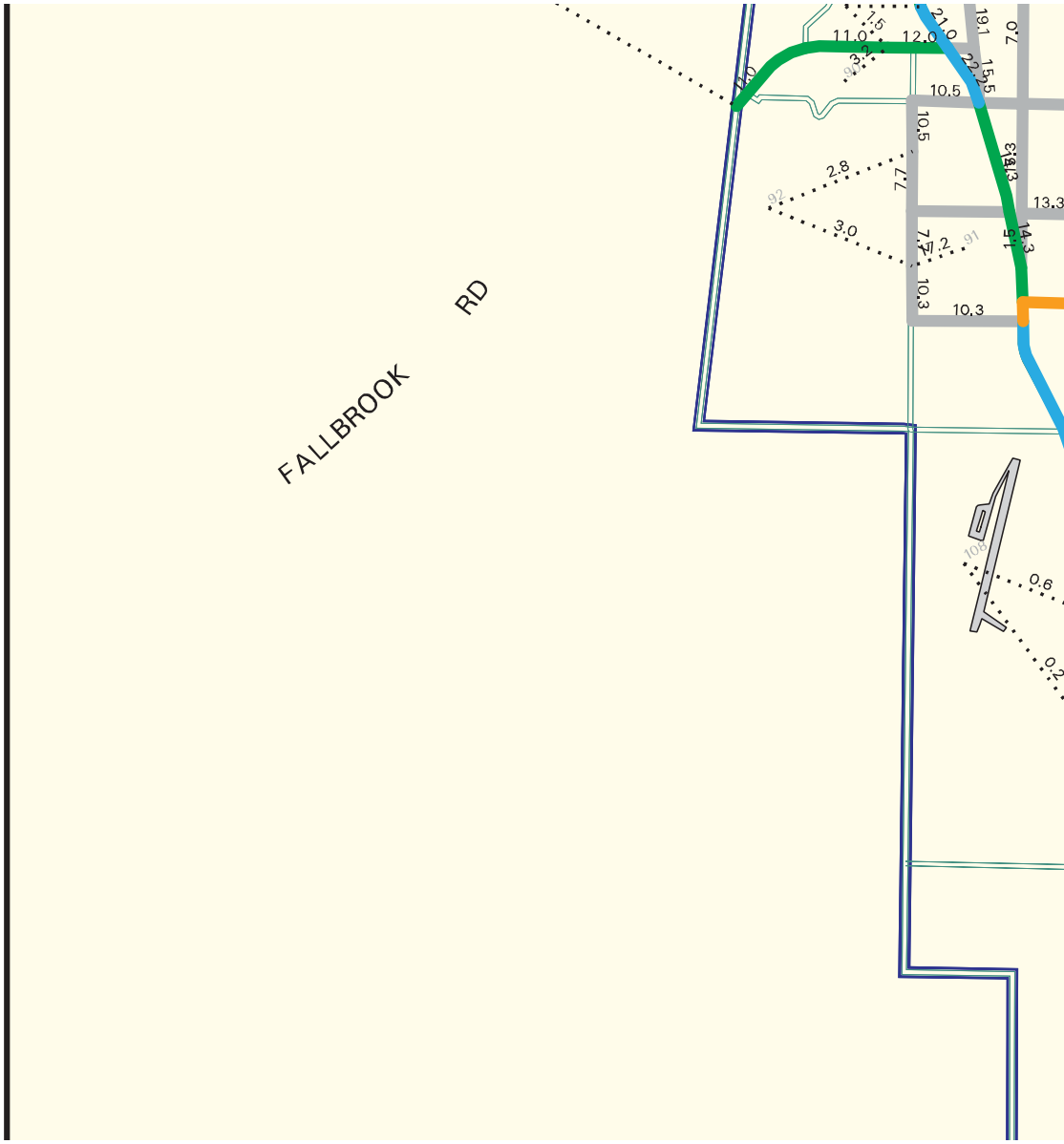
2030 CUMULATIVE
LOS and Volume Plot

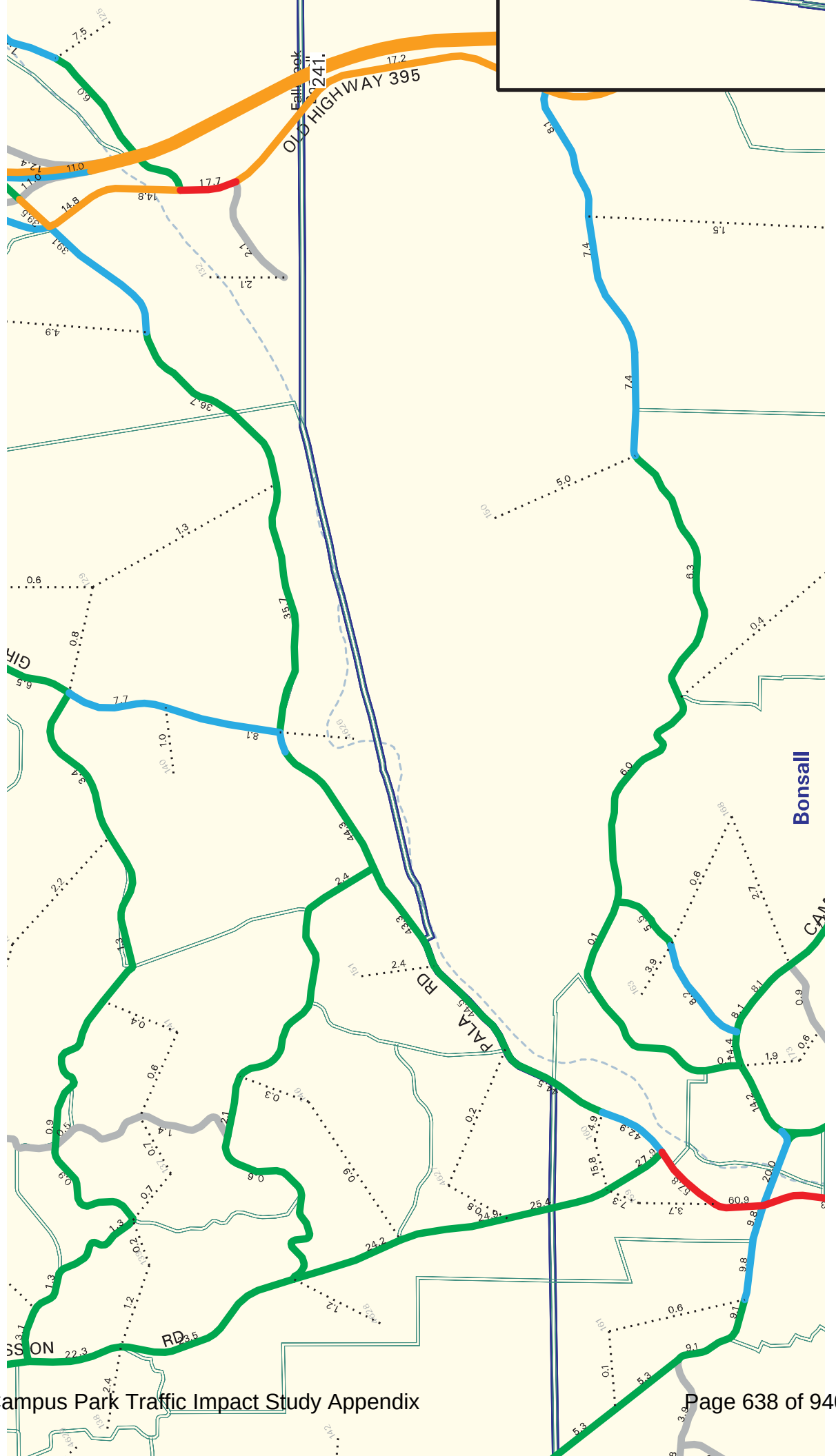
FALLBROOK & BONSALL Area

2030 Proposed Network
Model Rerun 12/09/08
With Updated Land Uses

Levels of Service:

- A - C
- D
- E
- F

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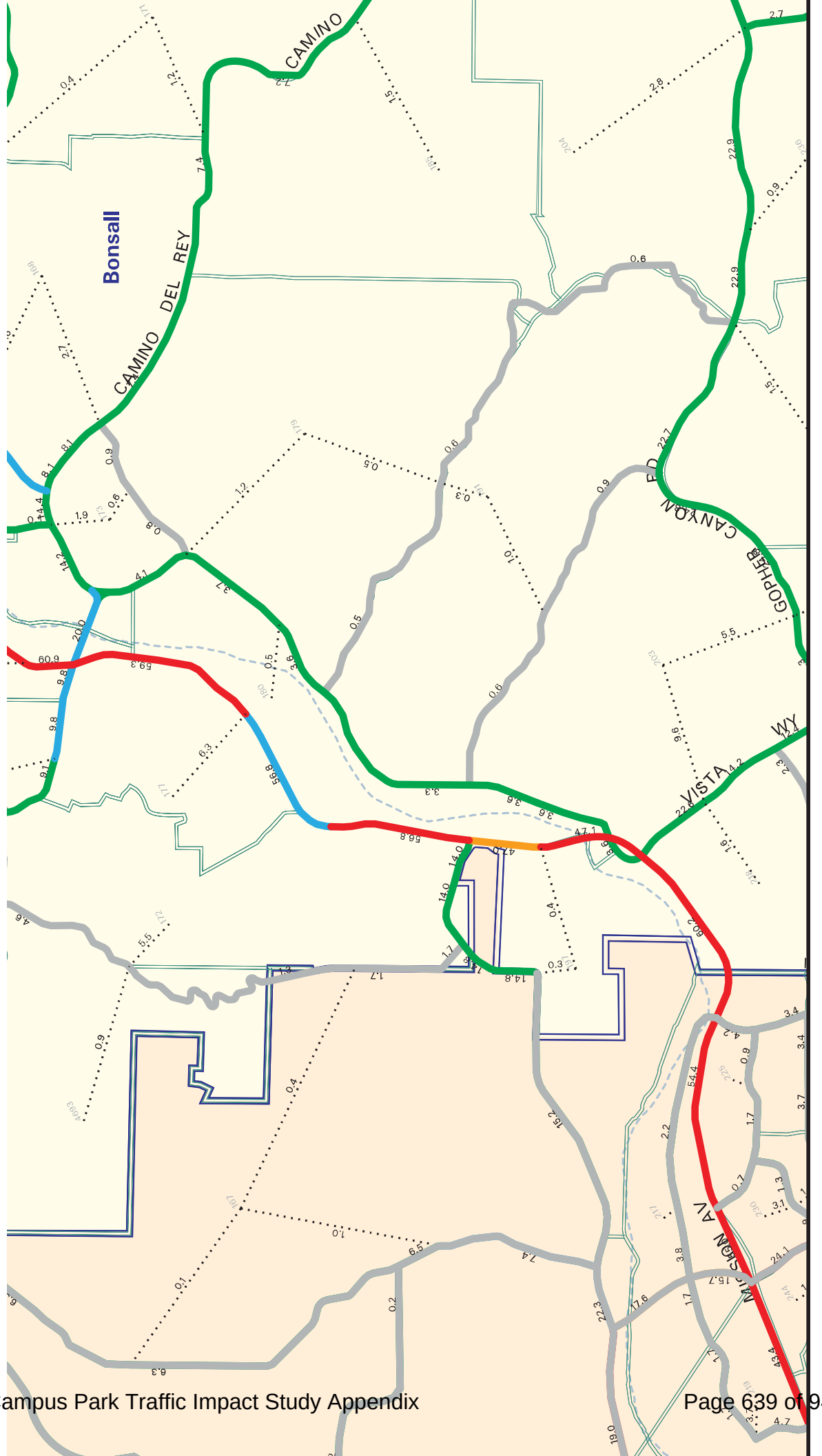
Bonsall
PALA RD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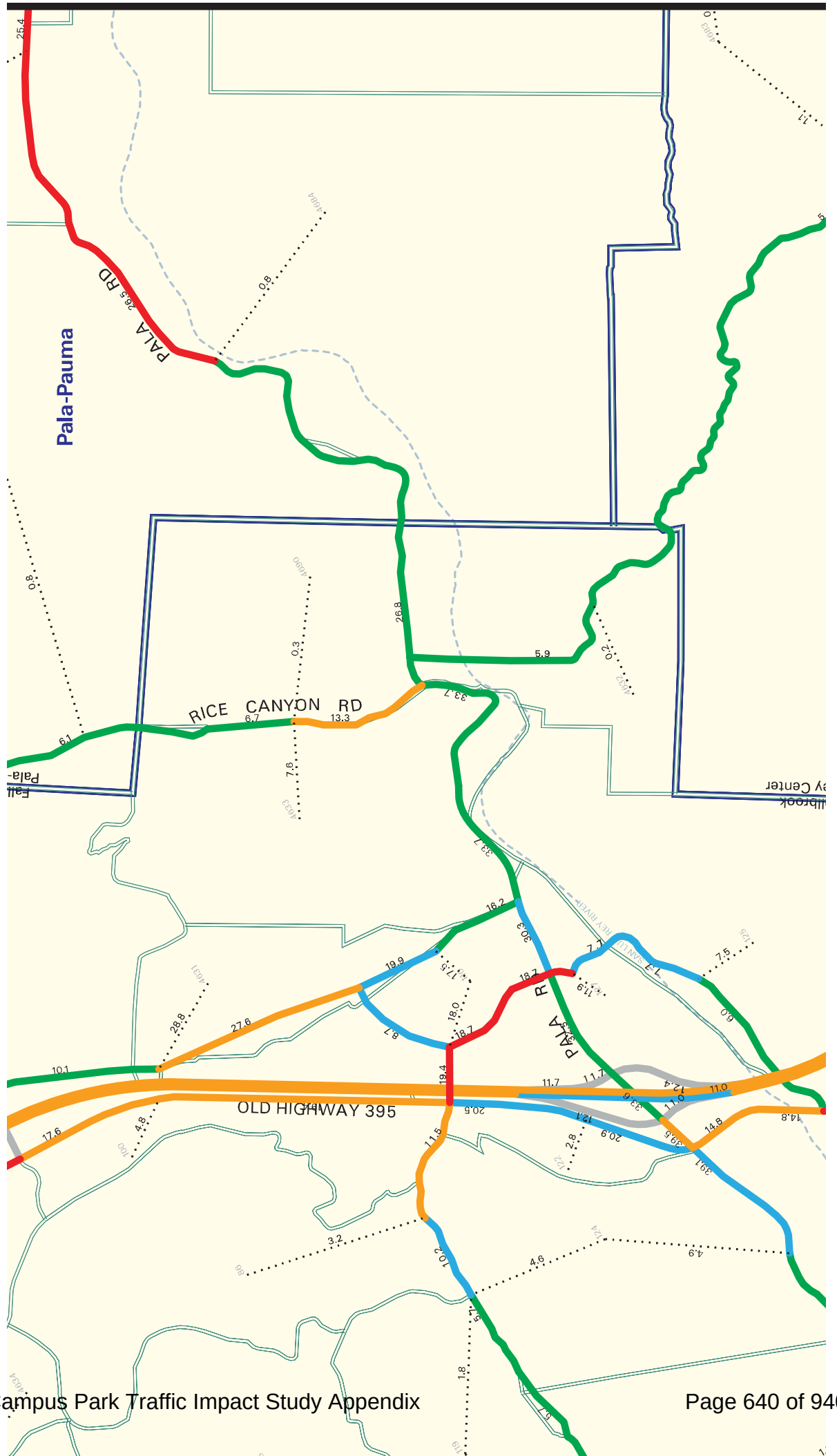
VISTA WY
MISSION AV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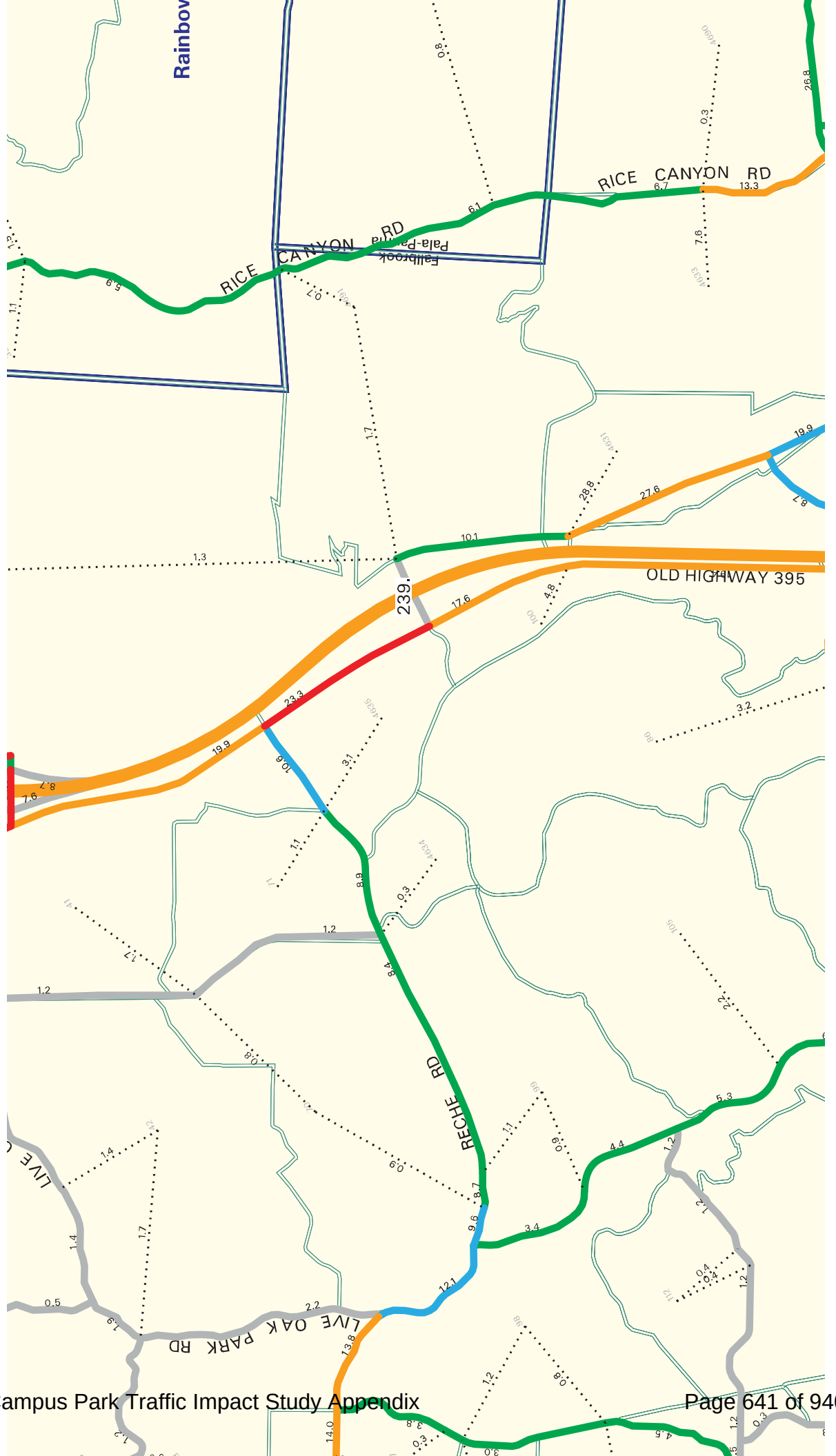
PALA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RICE CANYON RD
OLD HIGHWAY 395
RECHE RD
LIVE OAK PARK RD
239

SANDAG Series 11 Transportation Forecast Information Center

Series 11 2030 Traffic Volume Forecast
February 2008 Update

The Transportation Forecast Information Center (TFIC) gives you quick access to transportation forecasts. You may use this tool to look at the forecasts on screen as well as print maps or tables. Click on a year below or click "help" for detailed instructions.

Forecast Years: 2003 2010 2020 2030 All Years Help

Forecasted average weekday traffic (AWT) volumes in thousands are displayed for freeways, ramps, and major and minor roads. Individual roadway segments can be selected to obtain additional information including street name, type of roadway, number of lanes, and posted speed. Traffic analysis zone (TAZ) zone connector volumes are shown and TAZ-level trip generation and land use forecasts are provided.

Forecast Year. Select an individual year (2003, 2010, 2020, or 2030) to obtain traffic forecasts for that year. Select "All Years" to obtain traffic volume forecasts for years 2003 through 2030. The volumes shown on the "All Year" map is for year 2030.

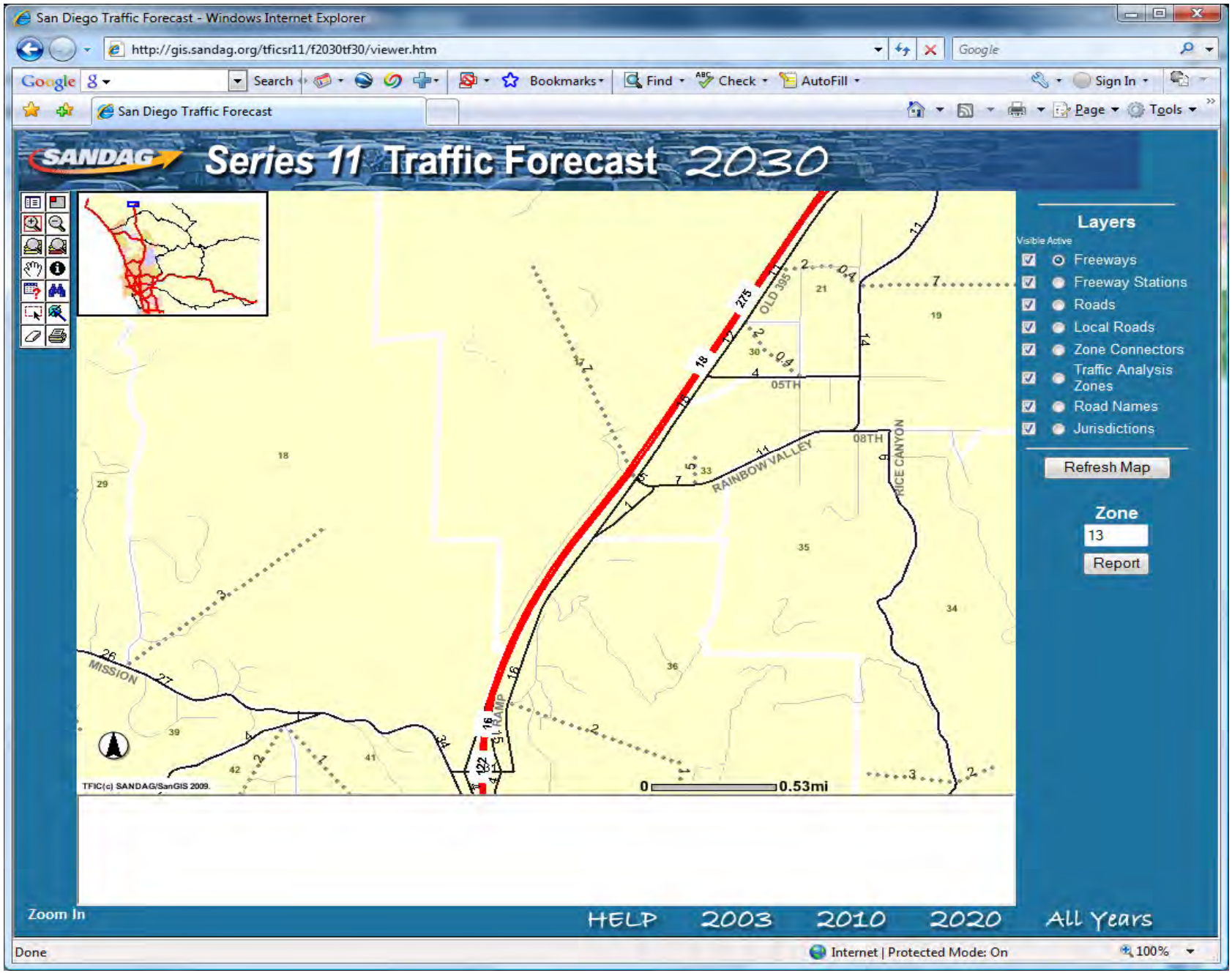
Source. SANDAG uses a regional transportation model to produce highway and transit forecasts for individual forecast years between 2003 and 2030. These forecasts are updated periodically to incorporate the most recent planning assumptions. Traffic forecasts shown here were completed in **October 2007** in support of the 2007 2030 Regional Transportation Plan (RTP). These traffic forecasts utilize the "Reasonably Expected" network as defined in the RTP, and the Final Series 11 2030 Regional Growth Forecast.

Forecasts differ from the TFIC Series 10, which was based on the Regional Transportation Plan (RTP) adopted in 2003 and Series 10 growth forecasts.

Disclaimer. We make every effort to produce accurate forecasts. If you find a traffic volume that appears to be in error, e-mail us at tfic@sandag.org with the location and description of the problem. We will make corrections to our databases and produce revised forecasts in the next update cycle.

SANDAG

Revised: Feburary, 2008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Traffic Analysis Zones
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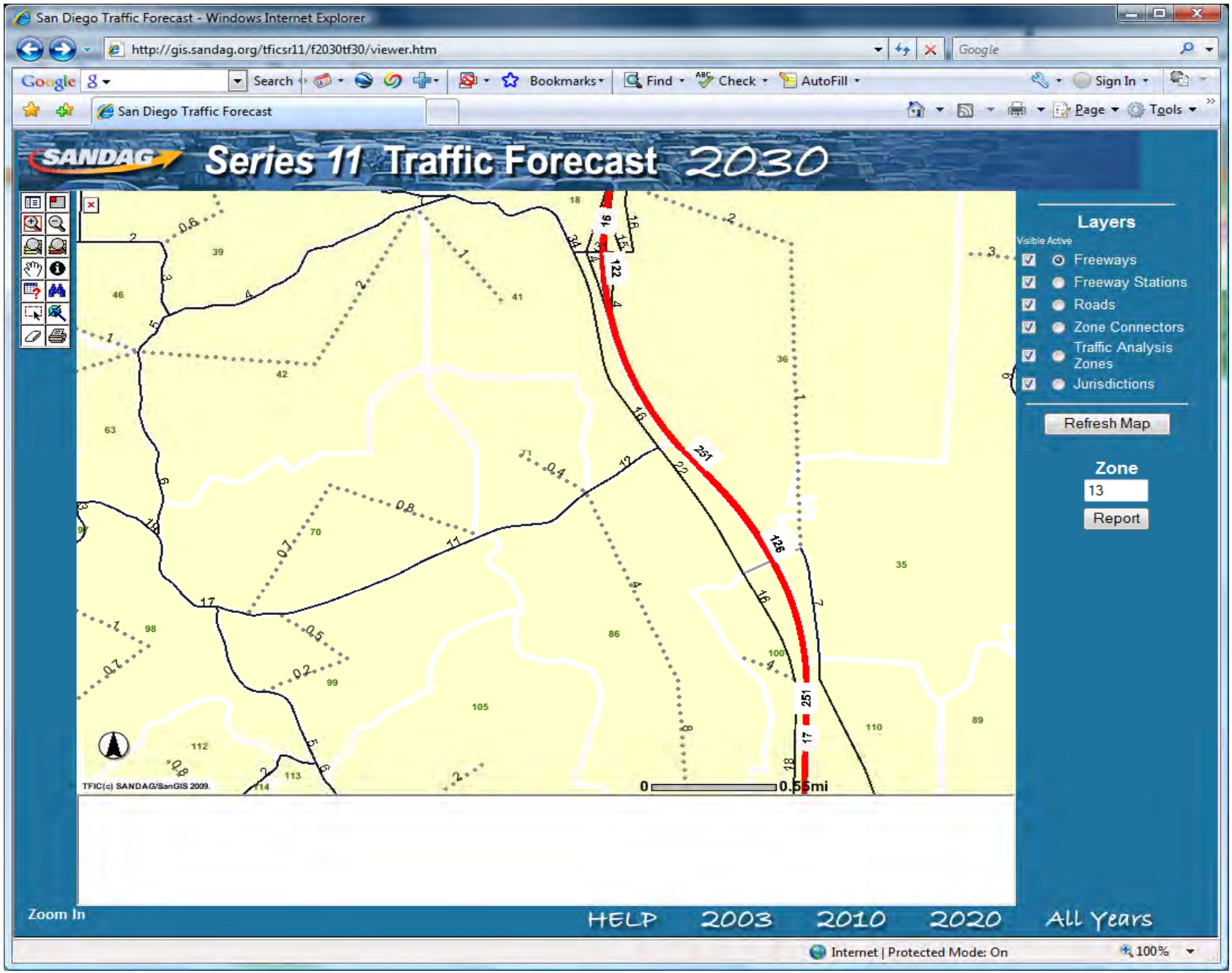
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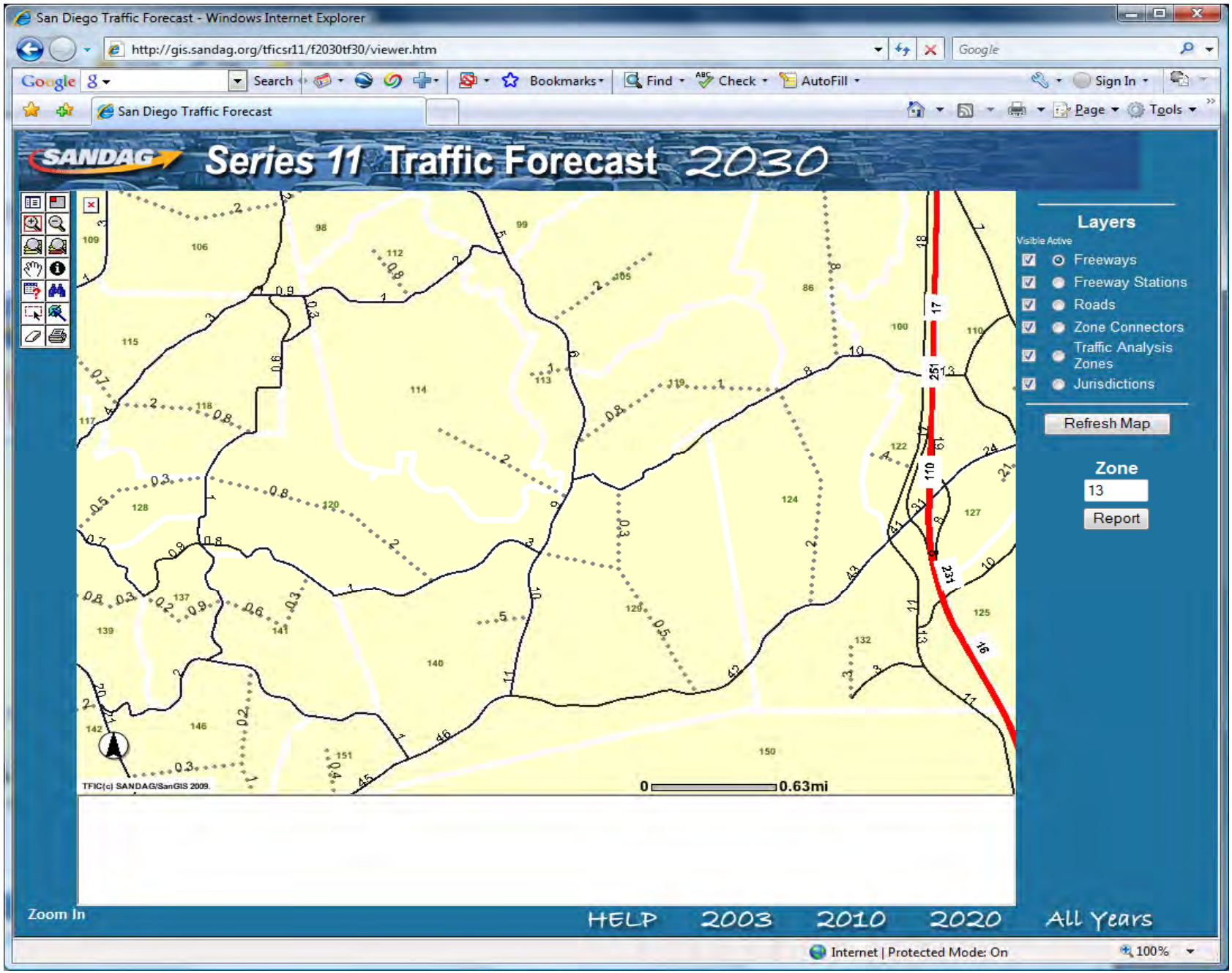
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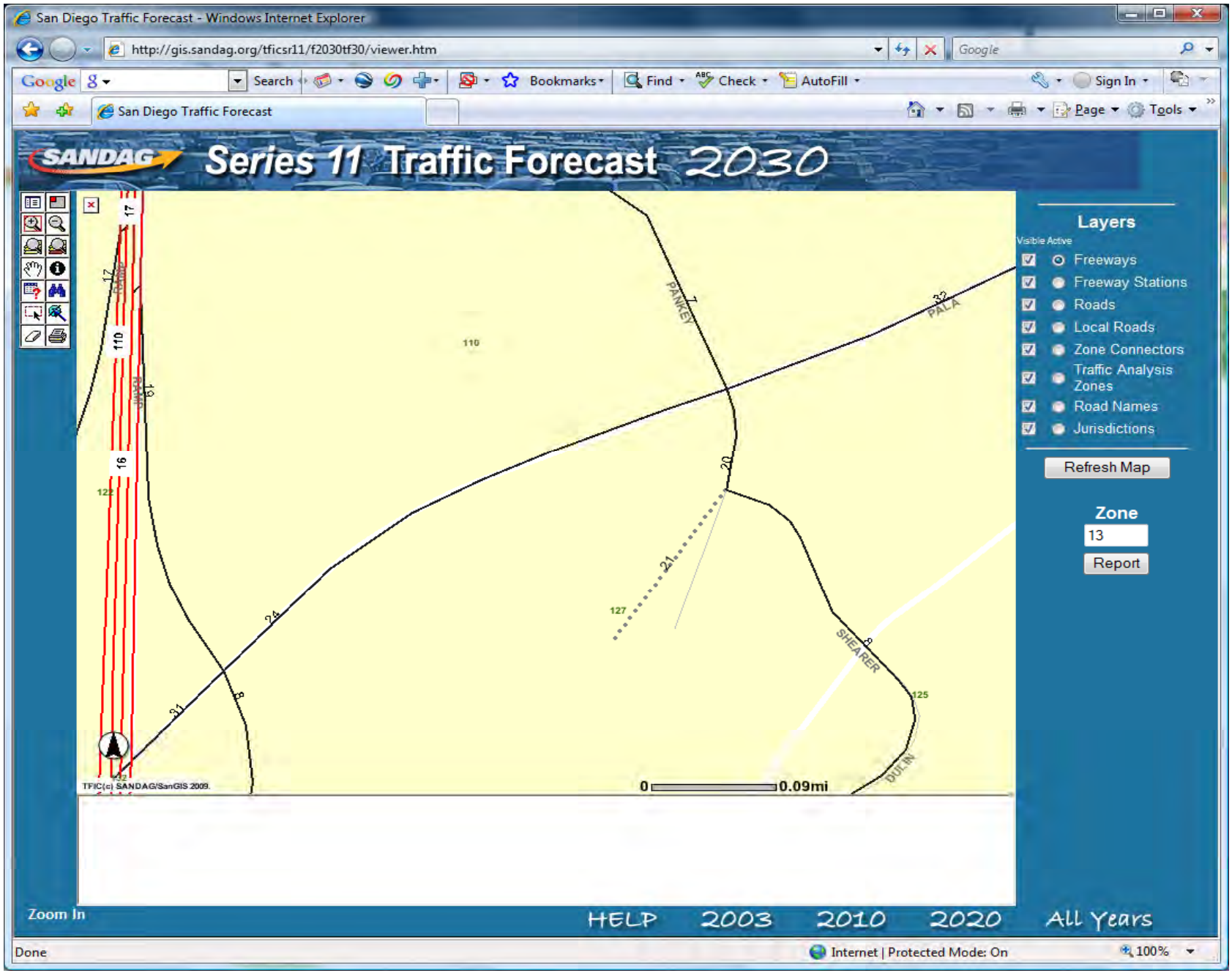
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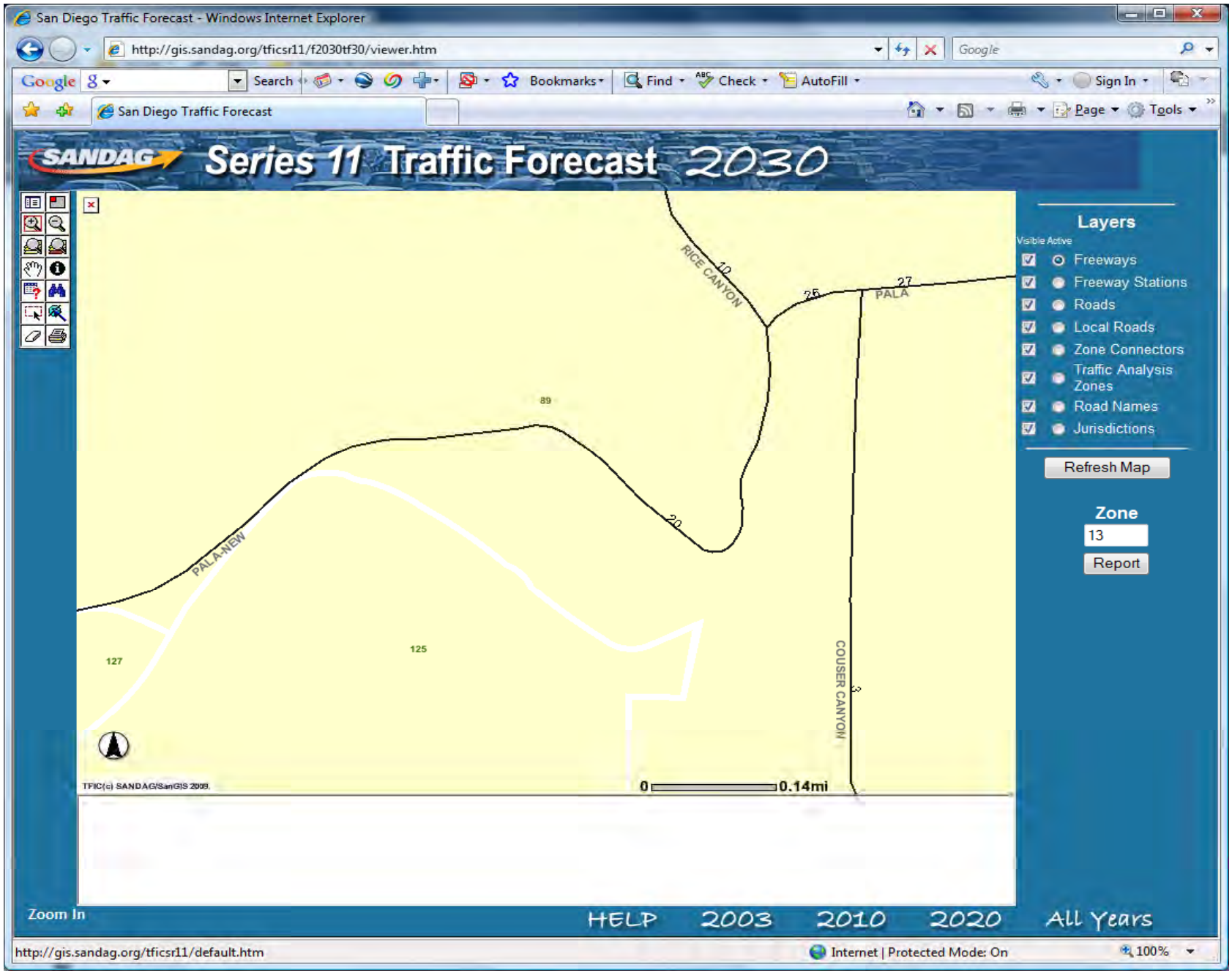
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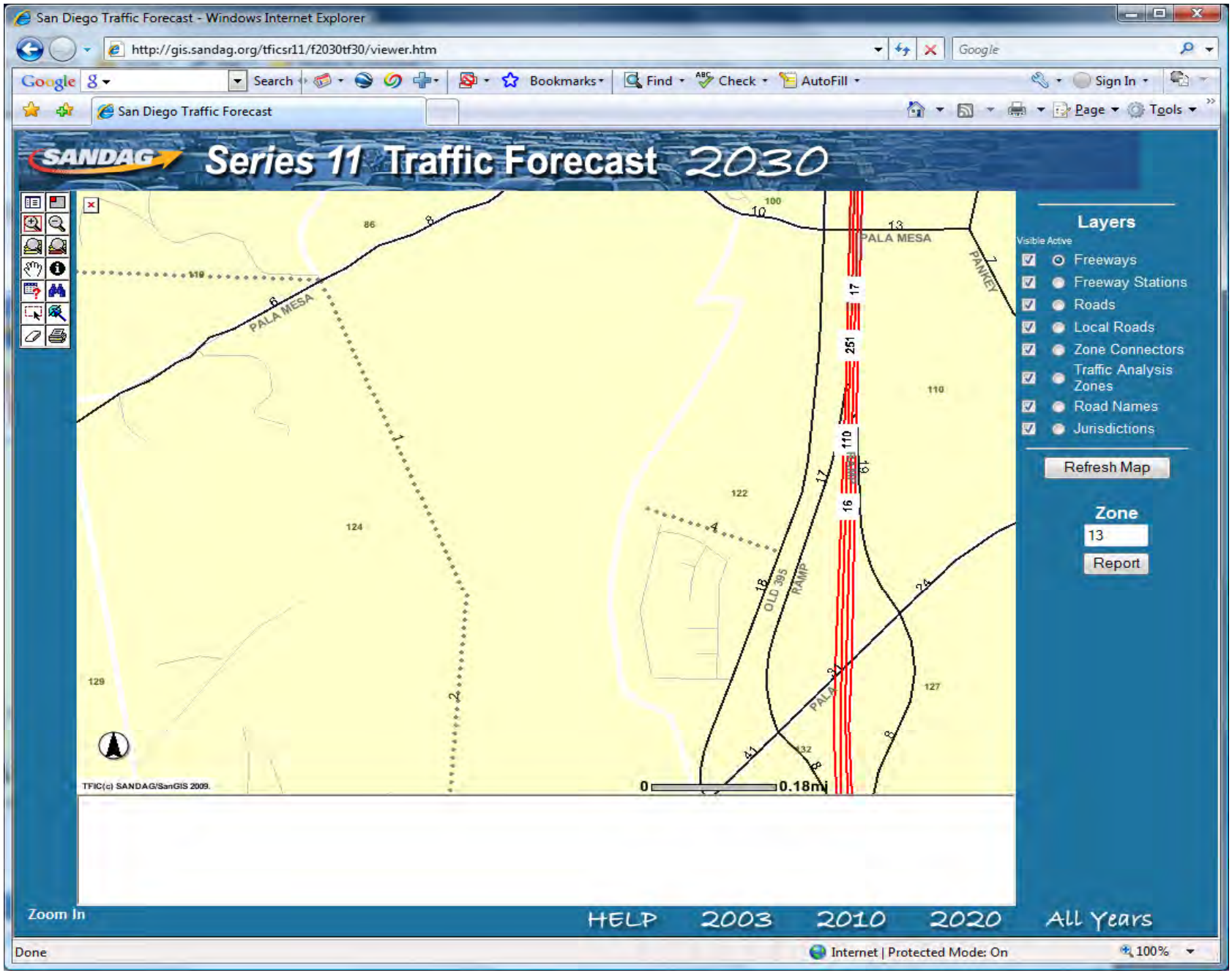
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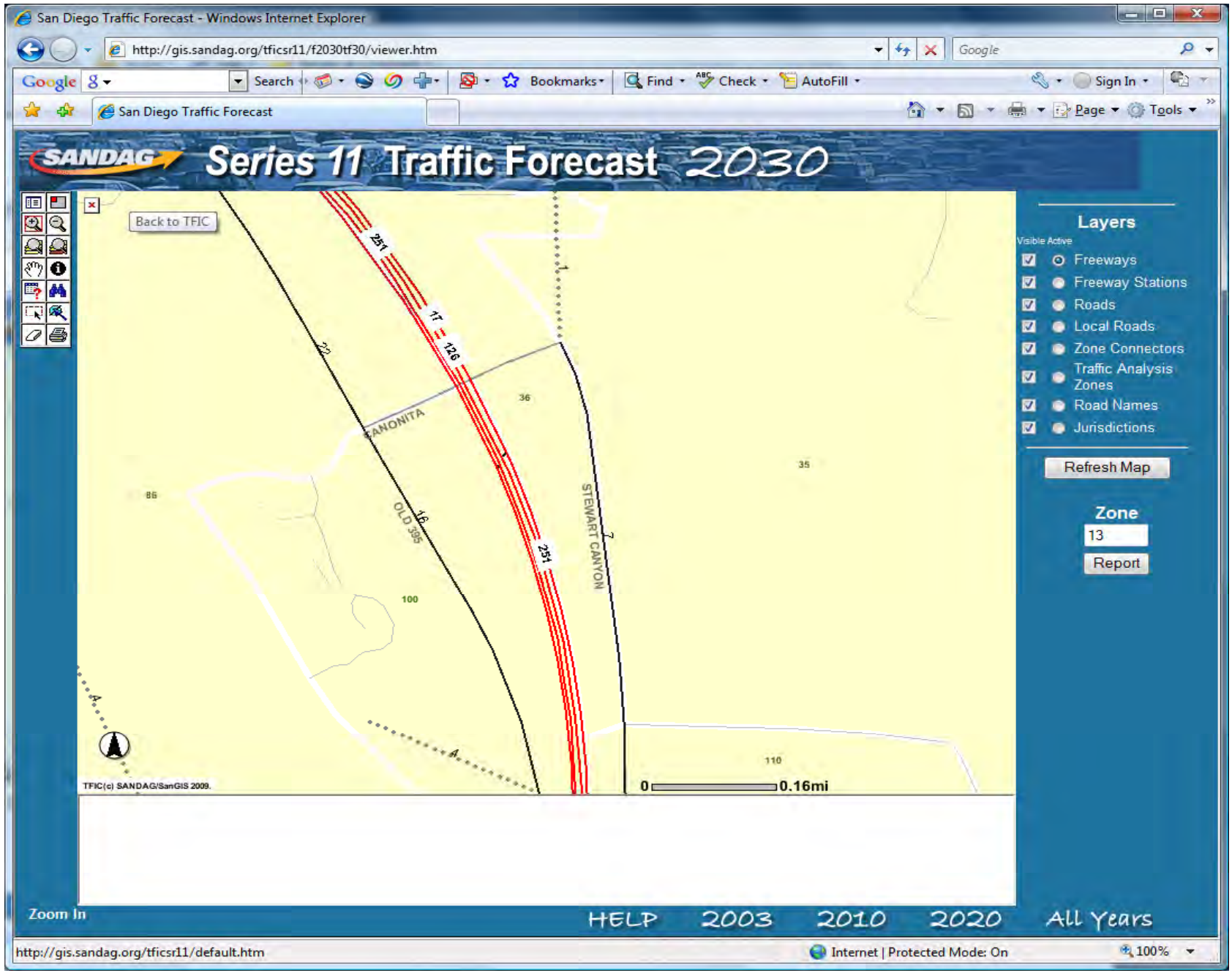
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County of San Diego
GP Update EIR

2030 Existing GP
LOS and Volume Plot

FALLBROOK & BONSALL Area

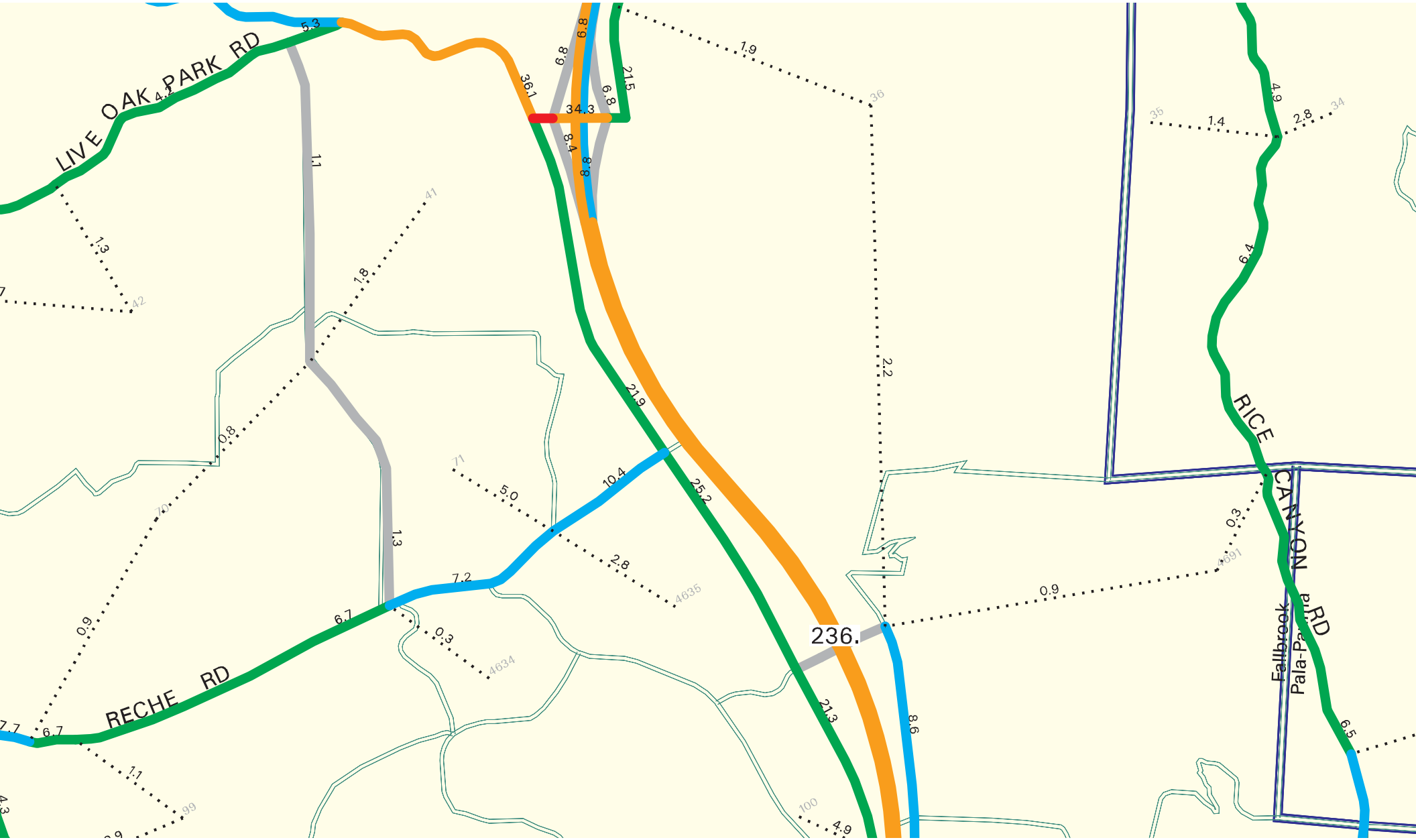
2030 Existing General Plan Network
2007 RTP Update
Model Run 07/15/08

Levels of Service:

A - C

D

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Pala-Pauma RD
Fallbrook
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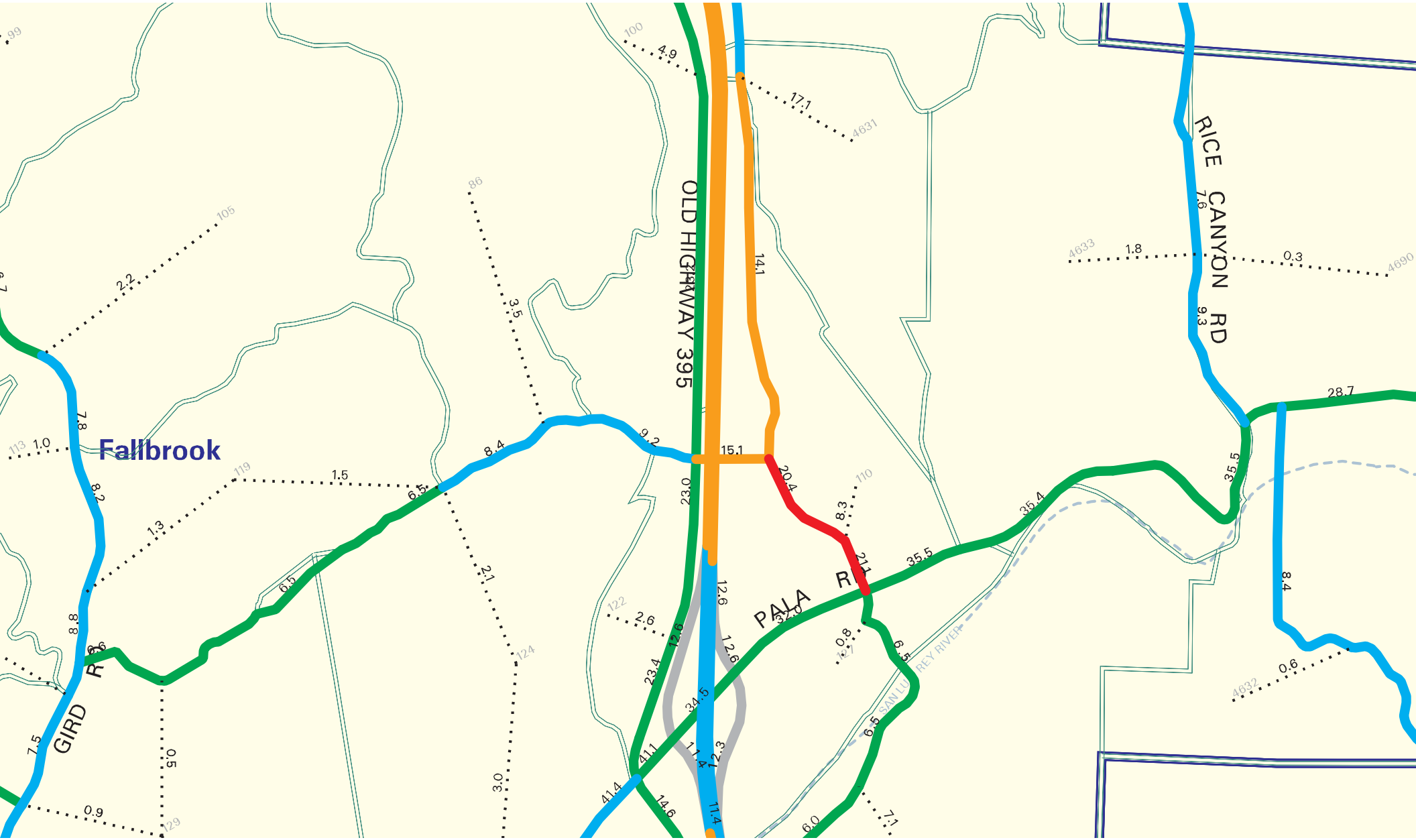
Fallbrook
OLD HIGHWAY 395
RICE CANYON RD
PALA R
GIRD R
SAN LUIS REY RIVER

Appendix Q

I-15/Stewart Canyon Interchange Status

From: "Ortiz, Francisco \"Nick\"" <Francisco.Ortiz@sdcounty.ca.gov>
To: Chris Brown <alchemycb@cox.net>
Cc: "Campbell, Dennis" <Dennis.Campbell@sdcounty.ca.gov>, "Areigat, Nael" <Nael.Areigat@sdcounty.ca.gov>, "Bankston, Troy" <Troy.Bankston@sdcounty.ca.gov>, "Citrano, Robert" <Robert.Citrano@sdcounty.ca.gov>
Conversation: Fallbrook interchange **Subject:** RE: Fallbrook interchange

Chris,

This is in response to your e-mail message regarding a “new” interchange north of Highway 76 and south of Mission Road on the I-15 that has been discussed at Fallbrook CPG meetings. Previous information provided to the County has identified that proposed new interchange would be located at I-15 and Stewart Canyon Road. Below is staff’s current understanding on the status of the proposed new I-15/Stewart Canyon Road interchange.

County information:

- The GP Update recommended roadway network does not include a new/proposed I-15/Stewart Canyon Road freeway interchange

- The County's TIF program does not assume a I-15/Stewart Canyon Road freeway interchange

- The County has not requested construction of the I-15/Stewart Canyon Road freeway interchange in order to mitigate the significant traffic impacts of the 3P projects.

Please contact Caltrans and SANDAG to confirm the following:

- The SANDAG 2030 RTP does not assume/include a I-15/Stewart Canyon Road freeway interchange

- I'm not aware of any Caltrans long-range plan and/or request for a I-15/Stewart Canyon Road freeway interchange

- Caltrans has not requested construction of the I-15/Stewart Canyon Road freeway interchange in order to mitigate the significant traffic impacts of the 3P projects.

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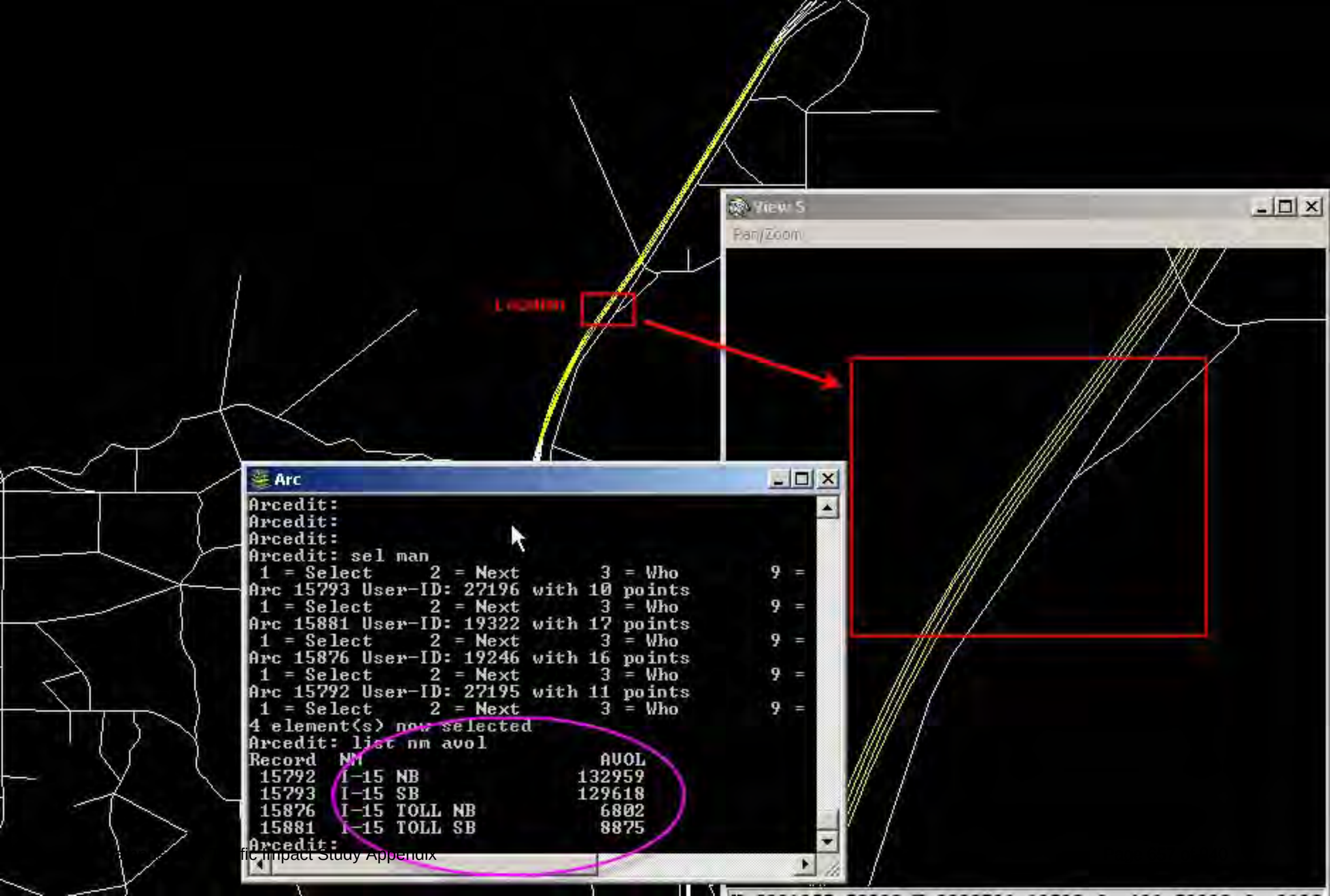
MS 0336

Appendix R

SANDAG Series 11 Traffic Model I-15 Directional Splits

HORIZON YEAR (2030) SANDAG VOLUME SPLIT ON I-15

I-15 Segment	Total	NB % split	SB % split
Rainbow Valley to Mission Rd	262,577	132,959 50.64%	129,618 49.36%
Mission Rd to SR-76	239,425	121,518 50.75%	117,907 49.25%
SR-76 to Escondido Hwy	218,013	107,204 49.17%	110,809 50.83%


View 5
Pan/Zoom
Arc
Arcedit:
Arcedit:
Arcedit:
Arcedit: sel man
1 = Select 2 = Next 3 = Who 9 =
Arc 15793 User-ID: 27196 with 10 points
1 = Select 2 = Next 3 = Who 9 =
Arc 15881 User-ID: 19322 with 17 points
1 = Select 2 = Next 3 = Who 9 =
Arc 15876 User-ID: 19246 with 16 points
1 = Select 2 = Next 3 = Who 9 =
Arc 15792 User-ID: 27195 with 11 points
1 = Select 2 = Next 3 = Who 9 =
4 element(s) now selected
Arcedit: list nm avol
Record NM AVOL
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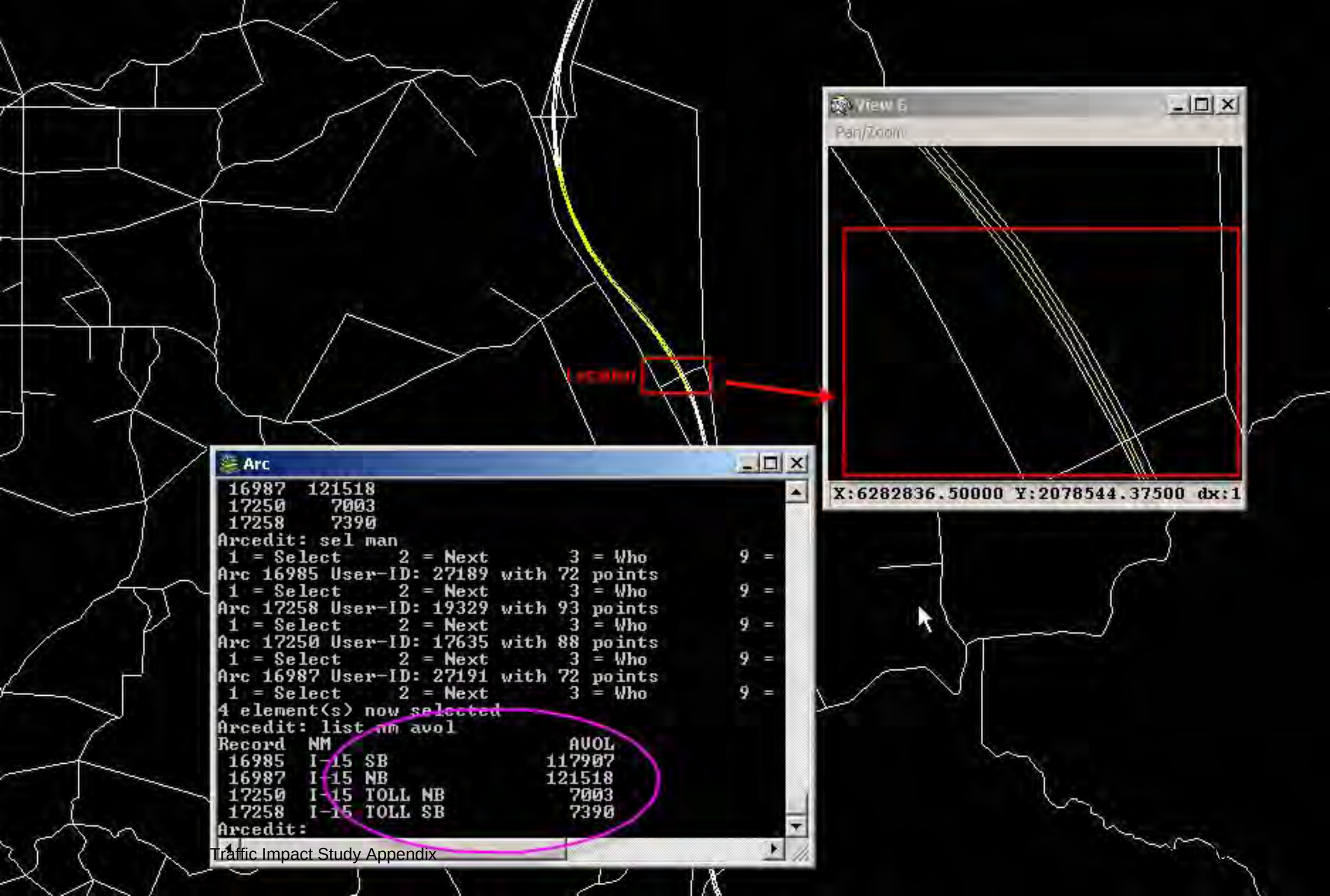
15793 I-15 SB 129618
15876 I-15 TOLL NB 6802
15881 I-15 TOLL SB 8875
Arcedit: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Arc
16987 121518
17250 7003
17258 7390
Arcedit: sel man
1 = Select 2 = Next 3 = Who 9 =
Arc 16985 User-ID: 27189 with 72 points
1 = Select 2 = Next 3 = Who 9 =
Arc 17258 User-ID: 19329 with 93 points
1 = Select 2 = Next 3 = Who 9 =
Arc 17250 User-ID: 17635 with 88 points
1 = Select 2 = Next 3 = Who 9 =
Arc 16987 User-ID: 27191 with 72 points
1 = Select 2 = Next 3 = Who 9 =
4 element(s) now selected
Arcedit: list nm avol
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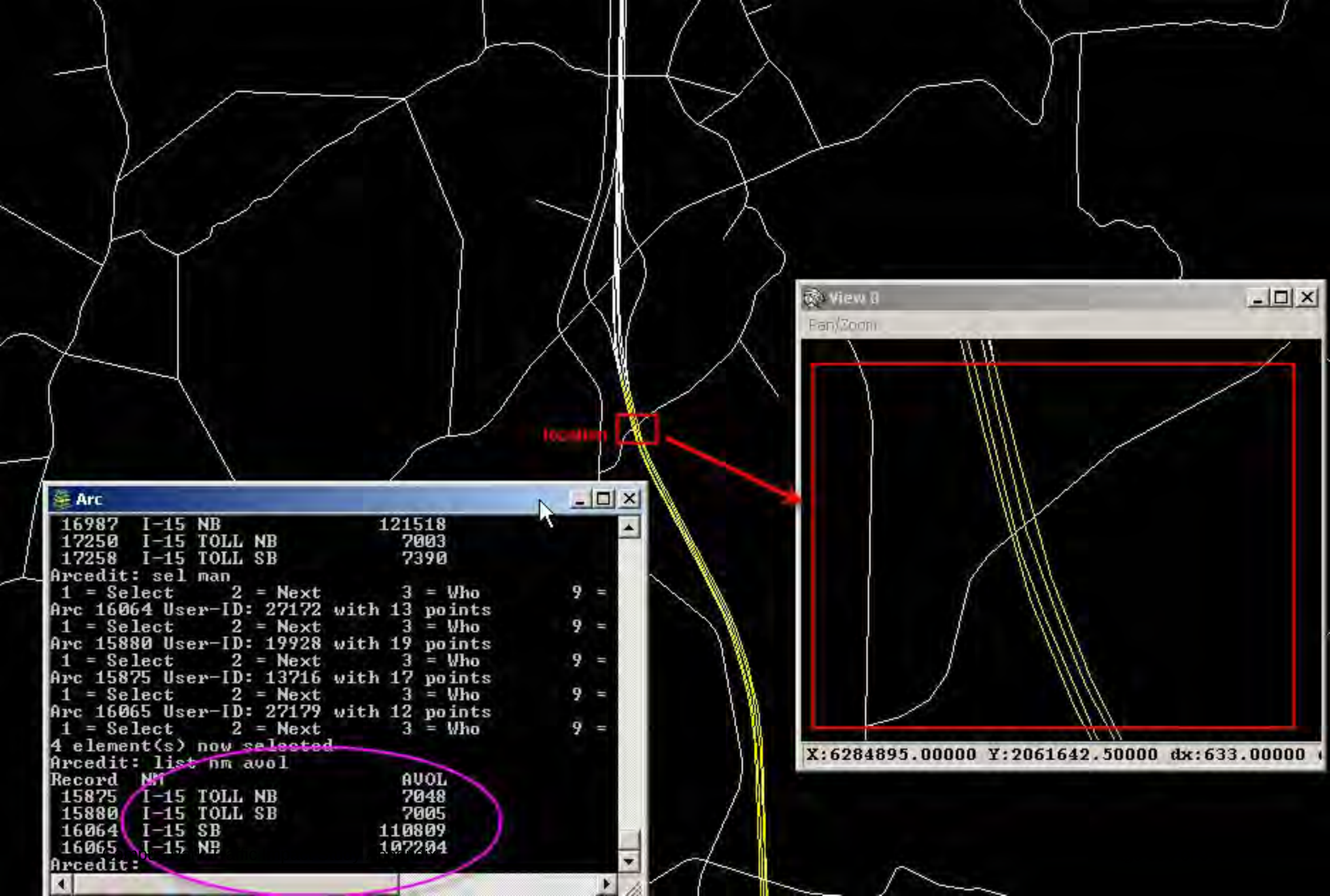
16985 I-15 SB 117907
16987 I-15 NB 121518
17250 I-15 TOLL NB 7003
17258 I-15 TOLL SB 7390
Arcedit: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Arc
16987 I-15 NB 121518
17250 I-15 TOLL NB 7003
17258 I-15 TOLL SB 7390
Arcedit: sel man
1 = Select 2 = Next 3 = Who 9 =
Arc 16064 User-ID: 27172 with 13 points
1 = Select 2 = Next 3 = Who 9 =
Arc 15880 User-ID: 19928 with 19 points
1 = Select 2 = Next 3 = Who 9 =
Arc 15875 User-ID: 13716 with 17 points
1 = Select 2 = Next 3 = Who 9 =
Arc 16065 User-ID: 27179 with 12 points
1 = Select 2 = Next 3 = Who 9 =
4 element(s) now selected
Arcedit: list nm avol
Record NM AVOL
15875 I-15 TOLL NB 7048
15880 I-15 TOLL SB 7005
16064 I-15 SB 110809
16065 I-15 NB 107204
Arcedit:

Appendix S

Horizon Year (2030) Intersection LOS Calculations

AM Horizon Year
1: Pala Rd (SR-76) & Via Monserate — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	1191	1919	50	100	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1254	2020	53	105	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2073				2694	1036
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2073				2694	1036
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				0	82
cM capacity (veh/h)	265				17	228

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	11	627	627	1347	726	42
Volume Left	11	0	0	0	0	0
Volume Right	0	0	0	0	53	42
cSH	265	1700	1700	1700	1700	228
Volume to Capacity	0.04	0.37	0.37	0.79	0.43	0.18
Queue Length 95th (ft)	3	0	0	0	0	16
Control Delay (s)	19.1	0.0	0.0	0.0	0.0	24.3
Lane LOS	C					C
Approach Delay (s)	0.2			0.0		Err
Approach LOS						F

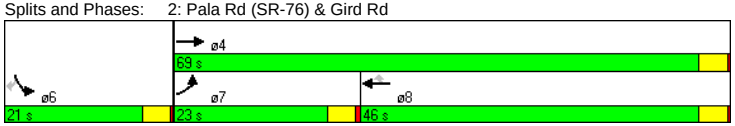
Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		Err%	ICU Level of Service H
Analysis Period (min)		15	

AM Horizon Year
2: Pala Rd (SR-76) & Gird Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	160	1151	1289	50	90	140
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	23.0	69.0	46.0	46.0	21.0	21.0
Total Split (%)	25.6%	76.7%	51.1%	51.1%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	12.0	43.6	31.0	31.0	10.1	10.1
Actuated g/C Ratio	0.18	0.69	0.49	0.49	0.16	0.16
v/c Ratio	0.58	0.50	0.78	0.08	0.38	0.42
Control Delay	36.4	4.8	18.5	9.6	34.7	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	4.8	18.5	9.6	34.7	10.5
LOS	D	A	B	A	C	B
Approach Delay		8.6	18.2		20.0	
Approach LOS		A	B		B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 63.3		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.78		
Intersection Signal Delay: 14.0		Intersection LOS: B
Intersection Capacity Utilization 61.1%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				10		147
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	160	1151	1289	50	90	140
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	1212	1357	53	95	147
Lane Group Flow (vph)	168	1212	1357	53	95	147
v/c Ratio	0.58	0.50	0.78	0.08	0.38	0.42
Control Delay	36.4	4.8	18.5	9.6	34.7	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	4.8	18.5	9.6	34.7	10.5
Queue Length 50th (ft)	63	76	221	8	36	0
Queue Length 95th (ft)	145	146	411	32	93	51
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	438	2785	2054	827	421	485
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.44	0.66	0.06	0.23	0.30

Intersection Summary
Area Type: Other

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Volume (vph)	160	1151	1289	50	90	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	1212	1357	53	95	147
RTOR Reduction (vph)	0	0	0	5	0	123
Lane Group Flow (vph)	168	1212	1357	48	95	24
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	9.7	44.7	31.0	31.0	10.1	10.1
Effective Green, g (s)	9.7	44.7	31.0	31.0	10.1	10.1
Actuated g/C Ratio	0.15	0.71	0.49	0.49	0.16	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	245	2519	1747	699	255	228
v/s Ratio Prot	c0.11	0.34	c0.38		c0.06	
v/s Ratio Perm				0.03		0.02
v/c Ratio	0.69	0.48	0.78	0.07	0.37	0.10
Uniform Delay, d1	25.1	4.0	13.1	8.3	23.5	22.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.7	0.1	2.2	0.0	0.9	0.2
Delay (s)	32.8	4.1	15.3	8.4	24.4	22.7
Level of Service	C	A	B	A	C	C
Approach Delay (s)		7.6	15.0		23.4	
Approach LOS		A	B		C	

Intersection Summary				
HCM Average Control Delay	12.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	62.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

AM Horizon Year
3: Pala Rd (SR-76) & Sage Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	1011	1539	10	0	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1064	1620	11	0	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1631				2178	815
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1631				2178	815
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	90
cM capacity (veh/h)	394				38	320

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	11	532	532	1080	551	32
Volume Left	11	0	0	0	0	0
Volume Right	0	0	0	0	11	32
cSH	394	1700	1700	1700	1700	320
Volume to Capacity	0.03	0.31	0.31	0.64	0.32	0.10
Queue Length 95th (ft)	2	0	0	0	0	8
Control Delay (s)	14.4	0.0	0.0	0.0	0.0	17.5
Lane LOS	B					C
Approach Delay (s)	0.1			0.0		17.5
Approach LOS						C

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		52.9%	ICU Level of Service A
Analysis Period (min)		15	

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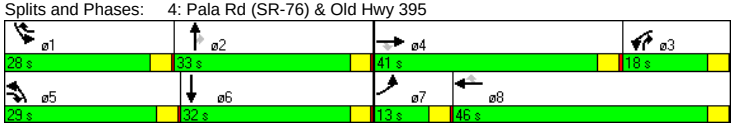
AM Horizon Year
4: Pala Rd (SR-76) & Old Hwy 395 — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	74	677	160	90	1122	200	290	196	200	500	215
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	5	3	8	1	5	2	3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	13.0	41.0	29.0	18.0	46.0	28.0	29.0	33.0	18.0	28.0	32.0
Total Split (%)	10.8%	34.2%	24.2%	15.0%	38.3%	23.3%	24.2%	27.5%	15.0%	23.3%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	Min	None	None	Min	Min	Min	None	Min	Min
Act Effct Green (s)	8.4	27.2	50.2	16.6	38.7	64.5	23.0	24.1	40.6	21.4	22.5
Actuated g/C Ratio	0.08	0.26	0.47	0.16	0.36	0.61	0.22	0.23	0.38	0.20	0.21
v/c Ratio	0.63	0.79	0.22	0.39	0.92	0.23	0.89	0.49	0.37	0.85	0.84
Control Delay	76.8	44.9	2.0	50.7	46.6	3.5	72.0	42.8	12.3	57.3	59.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.8	44.9	2.0	50.7	46.6	3.5	72.0	42.8	12.3	57.3	59.9
LOS	E	D	A	D	D	A	E	D	B	E	E
Approach Delay		40.0			40.7			46.2			58.3
Approach LOS		D			D			D			E

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 106.5		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.92		
Intersection Signal Delay: 45.3	Intersection LOS: D	
Intersection Capacity Utilization 84.1%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



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AM Horizon Year
4: Pala Rd (SR-76) & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	1		1	2		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1775	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1775	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168			171			41		18	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	74	677	160	90	1122	200	290	196	200	500	215	97
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	713	168	95	1181	211	305	206	211	526	226	102
Lane Group Flow (vph)	78	713	168	95	1181	211	305	206	211	526	328	0
v/c Ratio	0.63	0.79	0.22	0.39	0.92	0.23	0.89	0.49	0.37	0.85	0.84	
Control Delay	76.8	44.9	2.0	50.7	46.6	3.5	72.0	42.8	12.3	57.3	59.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	76.8	44.9	2.0	50.7	46.6	3.5	72.0	42.8	12.3	57.3	59.9	
Queue Length 50th (ft)	59	268	0	64	455	12	229	137	43	200	226	
Queue Length 95th (ft)	#133	320	20	128	#613	46	#405	213	89	#293	#356	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	136	1158	778	276	1386	917	380	501	586	703	472	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.57	0.62	0.22	0.34	0.85	0.23	0.80	0.41	0.36	0.75	0.69	

Intersection Summary
Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year
4: Pala Rd (SR-76) & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1776	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1776	
Volume (vph)	74	677	160	90	1122	200	290	196	200	500	215	97
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	713	168	95	1181	211	305	206	211	526	226	102
RTOR Reduction (vph)	0	0	89	0	0	75	0	0	25	0	14	0
Lane Group Flow (vph)	78	713	79	95	1181	136	305	206	186	526	314	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	6.5	27.2	50.2	18.0	38.7	60.1	23.0	24.1	42.1	21.4	22.5	
Effective Green, g (s)	6.5	27.2	50.2	18.0	38.7	60.1	23.0	24.1	42.1	21.4	22.5	
Actuated g/C Ratio	0.06	0.25	0.47	0.17	0.36	0.56	0.22	0.23	0.39	0.20	0.21	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	96	902	667	267	1284	851	341	421	559	616	375	
v/s Ratio Prot	0.05	c0.20	0.03	0.06	c0.33	0.03	c0.19	0.11	0.06	0.17	c0.18	
v/s Ratio Perm			0.03			0.06			0.08			
v/c Ratio	0.81	0.79	0.12	0.36	0.92	0.16	0.89	0.49	0.33	0.85	0.84	
Uniform Delay, d1	49.5	37.1	15.8	39.2	32.5	11.2	40.7	35.9	22.5	41.1	40.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	38.8	4.8	0.1	0.8	10.6	0.1	24.4	0.9	0.4	11.1	14.9	
Delay (s)	88.2	41.9	15.9	40.0	43.1	11.3	65.0	36.8	22.9	52.2	55.2	
Level of Service	F	D	B	D	D	B	E	D	C	D	E	
Approach Delay (s)		41.1			38.4			44.7			53.4	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	43.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	106.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	84.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Horizon Year
6: Pala Rd (SR-76) & I-15 SB Ramps

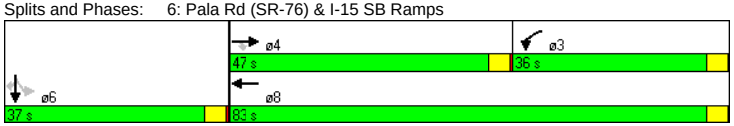
Timings

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	977	400	364	812	141	10	600
Turn Type		Perm	Prot		Perm		Perm
Protected Phases	4		3	8		6	
Permitted Phases		4			6		6
Detector Phases	4	4	3	8	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	47.0	47.0	36.0	83.0	37.0	37.0	37.0
Total Split (%)	39.2%	39.2%	30.0%	69.2%	30.8%	30.8%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	41.8	41.8	19.5	65.3	46.7	46.7	46.7
Actuated g/C Ratio	0.35	0.35	0.16	0.54	0.39	0.39	0.39
v/c Ratio	0.83	0.56	0.77	0.44	0.25	0.48	0.49
Control Delay	42.4	6.3	65.8	19.2	28.7	14.3	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	6.3	65.8	19.2	28.7	14.3	14.2
LOS	D	A	E	B	C	B	B
Approach Delay	31.9			33.6		16.9	
Approach LOS	C			C		B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 29.1 Intersection LOS: C
Intersection Capacity Utilization 63.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



LOS Engineering

AM Horizon Year
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	2		0	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850								0.855	0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1417	3072	3539	0	0	0	0	1504	1449	1346
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3539	1417	3072	3539	0	0	0	0	1504	1449	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			400								199	199
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	977	400	364	812	0	0	0	0	141	10	600
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1028	421	383	855	0	0	0	0	148	11	632
Lane Group Flow (vph)	0	1028	421	383	855	0	0	0	0	148	327	316
v/c Ratio		0.83	0.56	0.77	0.44					0.25	0.48	0.49
Control Delay		42.4	6.3	65.8	19.2					28.7	14.3	14.2
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		42.4	6.3	65.8	19.2					28.7	14.3	14.2
Queue Length 50th (ft)		371	10	164	360					83	75	66
Queue Length 95th (ft)		458	89	m0	m420					149	184	169
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		1315	778	819	2330					585	686	645
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.78	0.54	0.47	0.37					0.25	0.48	0.49

Intersection Summary

Area Type: Other
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

AM Horizon Year

6: Pala Rd (SR-76) & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	1417	3072	3539					1504	1449	1346
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	1417	3072	3539					1504	1449	1346
Volume (vph)	0	977	400	364	812	0	0	0	0	141	10	600
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1028	421	383	855	0	0	0	0	148	11	632
RTOR Reduction (vph)	0	0	261	0	0	0	0	0	0	0	122	122
Lane Group Flow (vph)	0	1028	160	383	855	0	0	0	0	148	205	194
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		41.8	41.8	19.5	65.3					46.7	46.7	46.7
Effective Green, g (s)		41.8	41.8	19.5	65.3					46.7	46.7	46.7
Actuated g/C Ratio		0.35	0.35	0.16	0.54					0.39	0.39	0.39
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1233	494	499	1926					585	564	524
v/s Ratio Prot		c0.29		c0.12	0.24							
v/s Ratio Perm			0.11							0.10	0.14	c0.14
v/c Ratio		0.83	0.32	0.77	0.44					0.25	0.36	0.37
Uniform Delay, d1		35.9	28.7	48.1	16.4					24.8	26.1	26.2
Progression Factor		1.00	1.00	1.23	1.17					1.00	1.00	1.00
Incremental Delay, d2		5.0	0.4	4.1	0.1					1.0	1.8	2.0
Delay (s)		40.9	29.1	63.0	19.4					25.9	27.9	28.2
Level of Service		D	C	E	B					C	C	C
Approach Delay (s)		37.5			32.9			0.0			27.6	
Approach LOS		D			C			A			C	

Intersection Summary				
HCM Average Control Delay	33.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	63.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

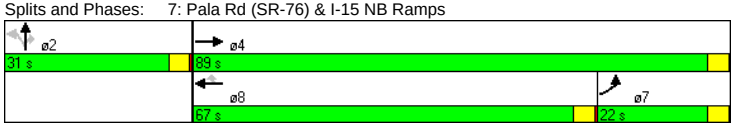
AM Horizon Year

7: Pala Rd (SR-76) & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Volume (vph)	550	568	896	126	280	10	317
Turn Type	Prot			Perm	Perm		Perm
Protected Phases	7	4	8			2	
Permitted Phases				8	2		2
Detector Phases	7	4	8	8	2	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	22.0	89.0	67.0	67.0	31.0	31.0	31.0
Total Split (%)	18.3%	74.2%	55.8%	55.8%	25.8%	25.8%	25.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	45.8	85.9	36.1	36.1	26.1	26.1	26.1
Actuated g/C Ratio	0.38	0.72	0.30	0.30	0.22	0.22	0.22
v/c Ratio	0.49	0.24	0.89	0.29	0.51	0.58	0.53
Control Delay	36.9	13.3	50.2	19.4	47.8	45.6	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	13.3	50.2	19.4	47.8	45.6	8.9
LOS	D	B	D	B	D	D	A
Approach Delay		24.9	46.4			31.0	
Approach LOS		C	D			C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 34.2		Intersection LOS: C	
Intersection Capacity Utilization 63.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



LOS Engineering

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	2		0	0		1	1		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Frt						0.850		0.950	0.850			
Flt Protected	0.950						0.950	0.970				
Satd. Flow (prot)	3072	3539	0	0	3539	1417	1504	1562	1346	0	0	0
Flt Permitted	0.950						0.950	0.970				
Satd. Flow (perm)	3072	3539	0	0	3539	1417	1504	1562	1346	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						51		19	265			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	550	568	0	0	896	126	280	10	317	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	579	598	0	0	943	133	295	11	334	0	0	0
Lane Group Flow (vph)	579	598	0	0	943	133	168	207	265	0	0	0
v/c Ratio	0.49	0.24			0.89	0.29	0.51	0.58	0.53			
Control Delay	36.9	13.3			50.2	19.4	47.8	45.6	8.9			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	36.9	13.3			50.2	19.4	47.8	45.6	8.9			
Queue Length 50th (ft)	114	93			366	47	123	146	0			
Queue Length 95th (ft)	m231	m206			400	89	196	232	76			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	1173	2575			1858	768	355	384	520			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.49	0.23			0.51	0.17	0.47	0.54	0.51			

Intersection Summary	
Area Type:	Other

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.95	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (prot)	3072	3539			3539	1417	1504	1562	1346			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (perm)	3072	3539			3539	1417	1504	1562	1346			
Volume (vph)	550	568	0	0	896	126	280	10	317	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	579	598	0	0	943	133	295	11	334	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	36	0	15	207	0	0	0
Lane Group Flow (vph)	579	598	0	0	943	97	168	192	58	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	45.8	85.9			36.1	36.1	26.1	26.1	26.1			
Effective Green, g (s)	45.8	85.9			36.1	36.1	26.1	26.1	26.1			
Actuated g/C Ratio	0.38	0.72			0.30	0.30	0.22	0.22	0.22			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	1172	2533			1065	426	327	340	293			
v/s Ratio Prot	c0.19	0.17			c0.27							
v/s Ratio Perm						0.07	0.11	0.12	0.04			
v/c Ratio	0.49	0.24			0.89	0.23	0.51	0.57	0.20			
Uniform Delay, d1	28.3	5.8			40.0	31.5	41.4	41.9	38.4			
Progression Factor	1.20	2.21			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.2	0.0			9.0	0.3	5.7	6.7	1.5			
Delay (s)	34.0	12.9			49.0	31.8	47.0	48.5	39.9			
Level of Service	C	B			D	C	D	D	D			
Approach Delay (s)		23.3			46.8			44.6			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM Average Control Delay	36.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

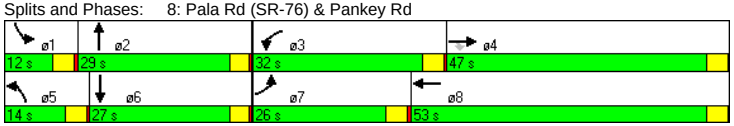
AM Horizon Year
8: Pala Rd (SR-76) & Pankey Rd

Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	148	577	160	102	839	120	262	40	178
Turn Type	Prot		Perm	Prot		Prot		Prot	
Protected Phases	7	4		3	8	5	2	1	6
Permitted Phases			4						
Detector Phases	7	4	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	26.0	47.0	47.0	32.0	53.0	14.0	29.0	12.0	27.0
Total Split (%)	21.7%	39.2%	39.2%	26.7%	44.2%	11.7%	24.2%	10.0%	22.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	12.9	29.0	29.0	11.1	27.2	8.8	15.7	7.8	12.4
Actuated g/C Ratio	0.17	0.40	0.40	0.15	0.38	0.12	0.22	0.10	0.17
v/c Ratio	0.57	0.43	0.25	0.45	0.74	0.34	0.45	0.26	0.41
Control Delay	42.6	18.0	4.1	42.4	25.1	41.2	31.1	45.5	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	18.0	4.1	42.4	25.1	41.2	31.1	45.5	31.1
LOS	D	B	A	D	C	D	C	D	C
Approach Delay		19.6			26.8		33.8		33.2
Approach LOS		B			C		C		C

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 72.4			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 26.3		Intersection LOS: C	
Intersection Capacity Utilization 61.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd



LOS Engineering

AM Horizon Year
8: Pala Rd (SR-76) & Pankey Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.985			0.971			0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3486	0	3072	3437	0	1583	3401	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3486	0	3072	3437	0	1583	3401	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168		11			22			37	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2232			2833			991			1488	
Travel Time (s)		50.7			64.4			22.5			33.8	
Volume (vph)	148	577	160	102	839	90	120	262	63	40	178	63
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	156	607	168	107	883	95	126	276	66	42	187	66
Lane Group Flow (vph)	156	607	168	107	978	0	126	342	0	42	253	0
v/c Ratio	0.57	0.43	0.25	0.45	0.74		0.34	0.45		0.26	0.41	
Control Delay	42.6	18.0	4.1	42.4	25.1		41.2	31.1		45.5	31.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	42.6	18.0	4.1	42.4	25.1		41.2	31.1		45.5	31.1	
Queue Length 50th (ft)	68	107	0	47	207		28	73		19	48	
Queue Length 95th (ft)	169	195	38	126	368		76	158		67	115	
Internal Link Dist (ft)		2152			2753			911			1408	
Turn Bay Length (ft)												
Base Capacity (vph)	453	1880	831	523	1903		464	1194		191	1093	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.34	0.32	0.20	0.20	0.51		0.27	0.29		0.22	0.23	

Intersection Summary	
Area Type:	Other

LOS Engineering

AM Horizon Year
8: Pala Rd (SR-76) & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3488		3072	3437		1583	3401	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3488		3072	3437		1583	3401	
Volume (vph)	148	577	160	102	839	90	120	262	63	40	178	63
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	156	607	168	107	883	95	126	276	66	42	187	66
RTOR Reduction (vph)	0	0	101	0	7	0	0	17	0	0	30	0
Lane Group Flow (vph)	156	607	67	107	971	0	126	325	0	42	223	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.1	29.0	29.0	8.3	27.2		6.1	15.7		3.7	13.3	
Effective Green, g (s)	10.1	29.0	29.0	8.3	27.2		6.1	15.7		3.7	13.3	
Actuated g/C Ratio	0.14	0.40	0.40	0.11	0.37		0.08	0.22		0.05	0.18	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	1412	565	181	1305		258	742		81	622	
v/s Ratio Prot	c0.10	0.17		0.07	c0.28		c0.04	c0.09		0.03	0.07	
v/s Ratio Perm			0.05									
v/c Ratio	0.71	0.43	0.12	0.59	0.74		0.49	0.44		0.52	0.36	
Uniform Delay, d1	29.9	15.9	13.8	30.6	19.7		31.8	24.7		33.6	26.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.0	0.2	0.1	5.1	2.3		1.5	0.4		5.5	0.4	
Delay (s)	39.9	16.1	13.9	35.7	22.1		33.3	25.1		39.1	26.3	
Level of Service	D	B	B	D	C		C	C		D	C	
Approach Delay (s)		19.7			23.4			27.3			28.1	
Approach LOS		B			C			C			C	

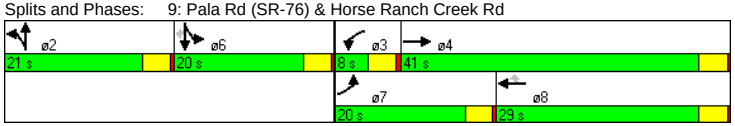
Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

AM Horizon Year
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	240	440	850	45	40	0	181		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	20.0	41.0	29.0	29.0	20.0	20.0	20.0	21.0	8.0
Total Split (%)	22.2%	45.6%	32.2%	32.2%	22.2%	22.2%	22.2%	23%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	10.2	35.3	21.1	21.1	7.3	7.3	7.3		
Actuated g/C Ratio	0.17	0.58	0.35	0.35	0.12	0.12	0.12		
v/c Ratio	0.49	0.22	0.73	0.09	0.23	0.14	0.14		
Control Delay	27.2	6.2	21.6	5.7	29.6	0.4	0.4		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	27.2	6.2	21.6	5.7	29.6	0.4	0.4		
LOS	C	A	C	A	C	A	A		
Approach Delay		13.7	20.8			5.7			
Approach LOS		B	C			A			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 60.5			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 16.2		Intersection LOS: B	
Intersection Capacity Utilization 44.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



AM Horizon Year

9: Pala Rd (SR-76) & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		250	0		0	150		150
Storage Lanes	2		0	1		1	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt						0.850					0.850	0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Flt Permitted	0.950									0.950		
Satd. Flow (perm)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1441	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						47					592	592
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2833			5160			734			1509	
Travel Time (s)		64.4			117.3			16.7			34.3	
Volume (vph)	240	440	0	0	850	45	0	0	0	40	0	181
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	253	463	0	0	895	47	0	0	0	42	0	191
Lane Group Flow (vph)	253	463	0	0	895	47	0	0	0	42	94	97
v/c Ratio	0.49	0.22			0.73	0.09				0.23	0.14	0.14
Control Delay	27.2	6.2			21.6	5.7				29.6	0.4	0.4
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	27.2	6.2			21.6	5.7				29.6	0.4	0.4
Queue Length 50th (ft)	45	36			144	0				15	0	0
Queue Length 95th (ft)	81	62			237	19				45	0	0
Internal Link Dist (ft)		2753			5080			654			1429	
Turn Bay Length (ft)	250					250				150		150
Base Capacity (vph)	749	2165			1383	582				352	791	768
Starvation Cap Reductn	0	0			0	0				0	0	0
Spillback Cap Reductn	0	0			0	0				0	0	0
Storage Cap Reductn	0	0			0	0				0	0	0
Reduced v/c Ratio	0.34	0.21			0.65	0.08				0.12	0.12	0.13

Intersection Summary

Area Type: Other

LOS Engineering

AM Horizon Year

9: Pala Rd (SR-76) & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.85	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3072	3539			3539	1417				1504	1441	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3072	3539			3539	1417				1504	1441	1346
Volume (vph)	240	440	0	0	850	45	0	0	0	40	0	181
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	253	463	0	0	895	47	0	0	0	42	0	191
RTOR Reduction (vph)	0	0	0	0	0	31	0	0	0	0	83	85
Lane Group Flow (vph)	253	463	0	0	895	16	0	0	0	42	11	12
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	10.2	35.3			21.1	21.1				7.3	7.3	7.3
Effective Green, g (s)	10.2	35.3			21.1	21.1				7.3	7.3	7.3
Actuated g/C Ratio	0.17	0.59			0.35	0.35				0.12	0.12	0.12
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	521	2075			1240	497				182	175	163
v/s Ratio Prot	c0.08	0.13			c0.25					c0.03	0.01	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.49	0.22			0.72	0.03				0.23	0.07	0.07
Uniform Delay, d1	22.6	5.9			17.0	12.8				23.9	23.4	23.4
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1			2.1	0.0				0.7	0.2	0.2
Delay (s)	23.3	6.0			19.1	12.9				24.6	23.6	23.6
Level of Service	C	A			B	B				C	C	C
Approach Delay (s)		12.1			18.8			0.0			23.8	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM Average Control Delay	16.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	60.2	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	44.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

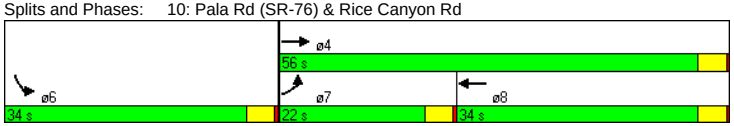
AM Horizon Year
10: Pala Rd (SR-76) & Rice Canyon Rd — Timings

Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	38	1042	520	90
Turn Type	Prot			
Protected Phases	7	4	8	6
Permitted Phases				
Detector Phases	7	4	8	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	22.0	56.0	34.0	34.0
Total Split (%)	24.4%	62.2%	37.8%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	None	None	Min
Act Effct Green (s)	6.8	19.6	16.0	10.0
Actuated g/C Ratio	0.15	0.51	0.42	0.26
v/c Ratio	0.16	0.61	0.40	0.54
Control Delay	21.0	8.3	10.9	13.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.0	8.3	10.9	13.9
LOS	C	A	B	B
Approach Delay		8.8	10.9	13.9
Approach LOS		A	B	B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 38.5
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 10.1 — Intersection LOS: B
Intersection Capacity Utilization 51.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 10: Pala Rd (SR-76) & Rice Canyon Rd



AM Horizon Year
10: Pala Rd (SR-76) & Rice Canyon Rd — Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.989		0.917	
Flt Protected	0.950				0.981	
Satd. Flow (prot)	1583	3539	3500	0	1499	0
Flt Permitted	0.950				0.981	
Satd. Flow (perm)	1583	3539	3500	0	1499	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			9		97	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		5160	470		1120	
Travel Time (s)		117.3	10.7		25.5	
Volume (vph)	38	1042	520	40	90	145
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	40	1097	547	42	95	153
Lane Group Flow (vph)	40	1097	589	0	248	0
v/c Ratio	0.16	0.61	0.40		0.54	
Control Delay	21.0	8.3	10.9		13.9	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	21.0	8.3	10.9		13.9	
Queue Length 50th (ft)	6	63	27		22	
Queue Length 95th (ft)	36	161	124		98	
Internal Link Dist (ft)		5080	390		1040	
Turn Bay Length (ft)						
Base Capacity (vph)	522	2628	2048		835	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.08	0.42	0.29		0.30	

Intersection Summary

Area Type: Other

AM Horizon Year

10: Pala Rd (SR-76) & Rice Canyon Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.99		0.92	
Flt Protected	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1583	3539	3501		1499	
Flt Permitted	0.95	1.00	1.00		0.98	
Satd. Flow (perm)	1583	3539	3501		1499	
Volume (vph)	38	1042	520	40	90	145
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	40	1097	547	42	95	153
RTOR Reduction (vph)	0	0	5	0	73	0
Lane Group Flow (vph)	40	1097	584	0	175	0
Turn Type	Prot					
Protected Phases	7	4	8		6	
Permitted Phases						
Actuated Green, G (s)	2.4	22.4	16.0		10.0	
Effective Green, g (s)	2.4	22.4	16.0		10.0	
Actuated g/C Ratio	0.06	0.55	0.40		0.25	
Clearance Time (s)	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	94	1962	1387		371	
v/s Ratio Prot	0.03	c0.31	0.17		c0.12	
v/s Ratio Perm						
v/c Ratio	0.43	0.56	0.42		0.47	
Uniform Delay, d1	18.3	5.8	8.8		12.9	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	3.1	0.3	0.2		0.9	
Delay (s)	21.4	6.2	9.0		13.9	
Level of Service	C	A	A		B	
Approach Delay (s)		6.7	9.0		13.9	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	40.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

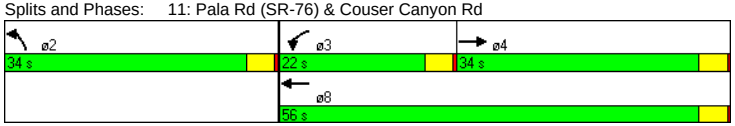
AM Horizon Year

11: Pala Rd (SR-76) & Couser Canyon Rd — Timings

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	986	10	505	65
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phases	4	3	8	2
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	34.0	22.0	56.0	34.0
Total Split (%)	37.8%	24.4%	62.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	Min
Act Effct Green (s)	19.5	6.1	20.8	7.8
Actuated g/C Ratio	0.52	0.13	0.56	0.21
v/c Ratio	0.59	0.05	0.27	0.31
Control Delay	8.4	22.0	4.4	14.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.4	22.0	4.4	14.2
LOS	A	C	A	B
Approach Delay	8.4		4.8	14.2
Approach LOS	A		A	B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 37.4		
Natural Cycle: 55		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.59		
Intersection Signal Delay: 7.6	Intersection LOS: A	
Intersection Capacity Utilization 41.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 11: Pala Rd (SR-76) & Couser Canyon Rd



LOS Engineering

AM Horizon Year
11: Pala Rd (SR-76) & Couser Canyon Rd — Queues

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50	
Trailing Detector (ft)	0		0	0	0	
Turning Speed (mph)		9	15		15	9
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.995				0.948	
Flt Protected			0.950		0.970	
Satd. Flow (prot)	3522	0	1583	3539	1533	0
Flt Permitted			0.950		0.970	
Satd. Flow (perm)	3522	0	1583	3539	1533	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	4				37	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	470			11023	1081	
Travel Time (s)	10.7			250.5	24.6	
Volume (vph)	986	36	10	505	65	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1038	38	11	532	68	42
Lane Group Flow (vph)	1076	0	11	532	110	0
v/c Ratio	0.59		0.05	0.27	0.31	
Control Delay	8.4		22.0	4.4	14.2	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	8.4		22.0	4.4	14.2	
Queue Length 50th (ft)	50		2	20	11	
Queue Length 95th (ft)	200		17	48	61	
Internal Link Dist (ft)	390			10943	1001	
Turn Bay Length (ft)						
Base Capacity (vph)	2240		508	2718	809	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.48		0.02	0.20	0.14	

Intersection Summary

Area Type: Other

LOS Engineering

AM Horizon Year
11: Pala Rd (SR-76) & Couser Canyon Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.95	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3520		1583	3539	1533	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3520		1583	3539	1533	
Volume (vph)	986	36	10	505	65	40
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1038	38	11	532	68	42
RTOR Reduction (vph)	2	0	0	0	30	0
Lane Group Flow (vph)	1074	0	11	532	80	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	19.5		0.9	24.4	7.8	
Effective Green, g (s)	19.5		0.9	24.4	7.8	
Actuated g/C Ratio	0.49		0.02	0.61	0.19	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1707		35	2148	297	
v/s Ratio Prot	c0.31		0.01	c0.15	c0.05	
v/s Ratio Perm						
v/c Ratio	0.63		0.31	0.25	0.27	
Uniform Delay, d1	7.7		19.3	3.7	13.8	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7		5.1	0.1	0.5	
Delay (s)	8.4		24.4	3.7	14.3	
Level of Service	A		C	A	B	
Approach Delay (s)	8.4			4.1	14.3	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	40.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

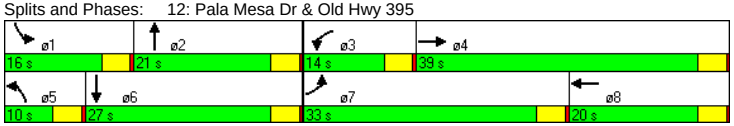
LOS Engineering

AM Horizon Year
12: Pala Mesa Dr & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	400	96	65	49	60	370	114	720
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	33.0	39.0	14.0	20.0	10.0	21.0	16.0	27.0
Total Split (%)	36.7%	43.3%	15.6%	22.2%	11.1%	23.3%	17.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	23.1	26.0	8.6	9.2	6.6	17.0	10.0	20.4
Actuated g/C Ratio	0.33	0.37	0.12	0.13	0.09	0.24	0.14	0.29
v/c Ratio	0.80	0.72	0.37	0.46	0.43	0.56	0.54	0.77
Control Delay	38.0	15.9	41.7	23.0	48.8	29.3	43.9	32.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	15.9	41.7	23.0	48.8	29.3	43.9	32.0
LOS	D	B	D	C	D	C	D	C
Approach Delay		25.2		29.5		31.6		33.6
Approach LOS		C		C		C		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 70			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 29.7		Intersection LOS: C	
Intersection Capacity Utilization 74.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395



LOS Engineering

AM Horizon Year
12: Pala Mesa Dr & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	0		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.876			0.911			0.972			0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1632	0	1583	1697	0	1583	3440	0	1583	3518	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1632	0	1583	1697	0	1583	3440	0	1583	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		307			71			27			4	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3628			1500			4464			5461	
Travel Time (s)		82.5			34.1			101.5			124.1	
Volume (vph)	400	96	450	65	49	72	60	370	84	114	720	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	101	474	68	52	76	63	389	88	120	758	32
Lane Group Flow (vph)	421	575	0	68	128	0	63	477	0	120	790	0
v/c Ratio	0.80	0.72		0.37	0.46		0.43	0.56		0.54	0.77	
Control Delay	38.0	15.9		41.7	23.0		48.8	29.3		43.9	32.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.0	15.9		41.7	23.0		48.8	29.3		43.9	32.0	
Queue Length 50th (ft)	188	118		32	27		31	107		57	190	
Queue Length 95th (ft)	#378	248		78	78		#94	181		122	#328	
Internal Link Dist (ft)		3548			1420			4384			5381	
Turn Bay Length (ft)							150			200		
Base Capacity (vph)	640	922		228	424		147	954		277	1205	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.66	0.62		0.30	0.30		0.43	0.50		0.43	0.66	

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year

12: Pala Mesa Dr & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.88		1.00	0.91		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1632		1583	1697		1583	3441		1583	3518	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1632		1583	1697		1583	3441		1583	3518	
Volume (vph)	400	96	450	65	49	72	60	370	84	114	720	30
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	101	474	68	52	76	63	389	88	120	758	32
RTOR Reduction (vph)	0	195	0	0	63	0	0	21	0	0	3	0
Lane Group Flow (vph)	421	380	0	68	65	0	63	456	0	120	787	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	23.1	26.0		4.7	7.6		4.2	17.0		7.6	20.4	
Effective Green, g (s)	23.1	26.0		4.7	7.6		4.2	17.0		7.6	20.4	
Actuated g/C Ratio	0.32	0.36		0.07	0.11		0.06	0.24		0.11	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	513	595		104	181		93	820		169	1007	
v/s Ratio Prot	c0.27	c0.23		0.04	0.04		0.04	0.13		c0.08	c0.22	
v/s Ratio Perm												
v/c Ratio	0.82	0.64		0.65	0.36		0.68	0.56		0.71	0.78	
Uniform Delay, d1	22.2	18.8		32.5	29.6		32.9	23.8		30.8	23.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.2	2.3		13.8	1.2		17.8	0.8		13.1	4.0	
Delay (s)	32.3	21.0		46.3	30.8		50.7	24.7		43.9	27.4	
Level of Service	C	C		D	C		D	C		D	C	
Approach Delay (s)		25.8			36.2			27.7			29.6	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	28.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

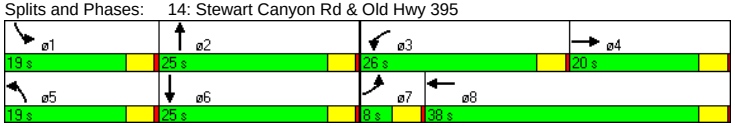
AM Horizon Year

14: Stewart Canyon Rd & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	30	25	134	18	10	401	229	980
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	8.0	20.0	26.0	38.0	19.0	25.0	19.0	25.0
Total Split (%)	8.9%	22.2%	28.9%	42.2%	21.1%	27.8%	21.1%	27.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	4.1	7.0	10.5	14.3	6.2	18.3	13.8	35.6
Actuated g/C Ratio	0.06	0.11	0.17	0.23	0.09	0.31	0.23	0.60
v/c Ratio	0.31	0.34	0.51	0.37	0.07	0.41	0.65	0.50
Control Delay	41.2	18.1	30.7	7.2	33.4	21.4	33.3	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	18.1	30.7	7.2	33.4	21.4	33.3	13.6
LOS	D	B	C	A	C	C	C	B
Approach Delay		24.8		17.4		21.6		17.2
Approach LOS		C		B		C		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 59.1		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.65		
Intersection Signal Delay: 18.6	Intersection LOS: B	
Intersection Capacity Utilization 58.7%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395



AM Horizon Year

14: Stewart Canyon Rd & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	200		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.899			0.865			0.990			0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1675	0	1583	1611	0	1583	3504	0	1583	3522	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1675	0	1583	1611	0	1583	3504	0	1583	3522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53			165			7			3	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1302			7424			5461			3410	
Travel Time (s)		29.6			168.7			124.1			77.5	
Volume (vph)	30	25	50	134	18	157	10	401	28	229	980	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	26	53	141	19	165	11	422	29	241	1032	32
Lane Group Flow (vph)	32	79	0	141	184	0	11	451	0	241	1064	0
v/c Ratio	0.31	0.34		0.51	0.37		0.07	0.41		0.65	0.50	
Control Delay	41.2	18.1		30.7	7.2		33.4	21.4		33.3	13.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.2	18.1		30.7	7.2		33.4	21.4		33.3	13.6	
Queue Length 50th (ft)	12	9		48	5		4	77		79	127	
Queue Length 95th (ft)	#47	49		112	51		20	142		#228	#361	
Internal Link Dist (ft)		1222			7344			5381			3330	
Turn Bay Length (ft)				200			100			100		
Base Capacity (vph)	102	418		491	785		319	1326		407	2121	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.31	0.19		0.29	0.23		0.03	0.34		0.59	0.50	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year

14: Stewart Canyon Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.87		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1675		1583	1612		1583	3505		1583	3523	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1675		1583	1612		1583	3505		1583	3523	
Volume (vph)	30	25	50	134	18	157	10	401	28	229	980	30
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	26	53	141	19	165	11	422	29	241	1032	32
RTOR Reduction (vph)	0	49	0	0	133	0	0	5	0	0	1	0
Lane Group Flow (vph)	32	30	0	141	51	0	11	446	0	241	1063	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.3	4.9		9.1	12.7		1.1	21.9		13.8	34.6	
Effective Green, g (s)	1.3	4.9		9.1	12.7		1.1	21.9		13.8	34.6	
Actuated g/C Ratio	0.02	0.07		0.14	0.19		0.02	0.33		0.21	0.53	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	31	125		219	312		27	1168		333	1855	
v/s Ratio Prot	0.02	0.02		c0.09	c0.03		0.01	0.13		c0.15	c0.30	
v/s Ratio Perm												
v/c Ratio	1.03	0.24		0.64	0.16		0.41	0.38		0.72	0.57	
Uniform Delay, d1	32.2	28.6		26.8	22.1		32.0	16.7		24.2	10.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	171.6	1.0		6.3	0.2		9.7	0.2		7.6	0.4	
Delay (s)	203.8	29.6		33.1	22.3		41.7	16.9		31.8	11.0	
Level of Service	F	C		C	C		D	B		C	B	
Approach Delay (s)		79.9			27.0			17.5			14.8	
Approach LOS		E			C			B			B	

Intersection Summary				
HCM Average Control Delay	20.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	58.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

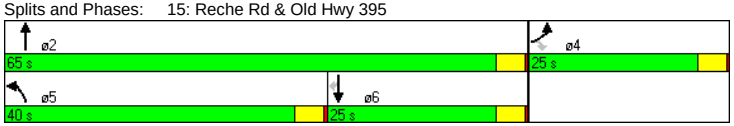
AM Horizon Year
15: Reche Rd & Old Hwy 395 Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	280	262	461	187	187	460
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	25.0	25.0	40.0	65.0	25.0	25.0
Total Split (%)	27.8%	27.8%	44.4%	72.2%	27.8%	27.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	16.1	16.1	23.5	38.8	10.8	10.8
Actuated g/C Ratio	0.25	0.25	0.37	0.61	0.17	0.17
v/c Ratio	0.74	0.49	0.83	0.09	0.33	0.75
Control Delay	38.0	7.1	33.2	5.3	27.7	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	7.1	33.2	5.3	27.7	11.5
LOS	D	A	C	A	C	B
Approach Delay	23.1			25.1	16.2	
Approach LOS	C			C	B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 63.8
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 21.4 Intersection LOS: C
Intersection Capacity Utilization 67.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 15: Reche Rd & Old Hwy 395



LOS Engineering

AM Horizon Year
15: Reche Rd & Old Hwy 395 Queues

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Storage Length (ft)	0	0	150			0
Storage Lanes	1	1	1			1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		276				484
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	2635			3410	4960	
Travel Time (s)	59.9			77.5	112.7	
Volume (vph)	280	262	461	187	187	460
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	295	276	485	197	197	484
Lane Group Flow (vph)	295	276	485	197	197	484
v/c Ratio	0.74	0.49	0.83	0.09	0.33	0.75
Control Delay	38.0	7.1	33.2	5.3	27.7	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	7.1	33.2	5.3	27.7	11.5
Queue Length 50th (ft)	103	0	164	15	37	0
Queue Length 95th (ft)	#290	62	#371	28	77	90
Internal Link Dist (ft)	2555			3330	4880	
Turn Bay Length (ft)			150			
Base Capacity (vph)	507	642	769	2543	1056	762
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.43	0.63	0.08	0.19	0.64

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year
15: Reche Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Volume (vph)	280	262	461	187	187	460
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	295	276	485	197	197	484
RTOR Reduction (vph)	0	205	0	0	0	397
Lane Group Flow (vph)	295	71	485	197	197	87
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	16.1	16.1	23.5	38.8	11.3	11.3
Effective Green, g (s)	16.1	16.1	23.5	38.8	11.3	11.3
Actuated g/C Ratio	0.26	0.26	0.37	0.62	0.18	0.18
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	405	363	591	2183	636	255
v/s Ratio Prot	c0.19		c0.31	0.06	0.06	
v/s Ratio Perm		0.05				c0.06
v/c Ratio	0.73	0.19	0.82	0.09	0.31	0.34
Uniform Delay, d1	21.4	18.3	17.8	4.9	22.4	22.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.4	0.3	8.9	0.0	0.3	0.8
Delay (s)	27.8	18.6	26.7	4.9	22.7	23.3
Level of Service	C	B	C	A	C	C
Approach Delay (s)	23.4			20.4	23.2	
Approach LOS	C			C	C	

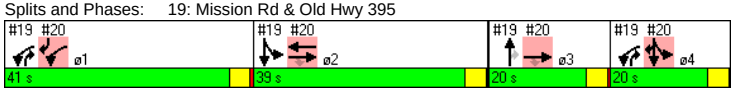
Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	62.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

AM Horizon Year
19: Mission Rd & Old Hwy 395 — Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	159	1120	81	206	850	58		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	61.0	0.0	20.0	61.0	39.0	39.0	41.0	20.0
Total Split (%)	50.8%	0.0%	16.7%	50.8%	32.5%	32.5%	34%	17%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	53.1	113.5	12.9	70.1	35.3	35.3		
Actuated g/C Ratio	0.47	1.00	0.11	0.62	0.31	0.31		
v/c Ratio	0.23	0.83	0.40	0.25	0.94	0.11		
Control Delay	21.8	6.2	53.7	10.3	57.1	31.5		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	21.8	6.2	53.7	10.3	57.1	31.5		
LOS	C	A	D	B	E	C		
Approach Delay	8.1		22.5			55.4		
Approach LOS	A		C			E		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 113.5			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 27.2		Intersection LOS: C	
Intersection Capacity Utilization 50.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 19: Mission Rd & Old Hwy 395



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	159	1120	81	206	850	58
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	167	1179	85	217	895	61
Lane Group Flow (vph)	167	1179	85	217	895	61
v/c Ratio	0.23	0.83	0.40	0.25	0.94	0.11
Control Delay	21.8	6.2	53.7	10.3	57.1	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	6.2	53.7	10.3	57.1	31.5
Queue Length 50th (ft)	76	170	61	66	350	34
Queue Length 95th (ft)	m91	m154	112	104	#499	69
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	802	1417	265	930	956	580
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.83	0.32	0.23	0.94	0.11

Intersection Summary	
Area Type:	Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Volume (vph)	159	1120	81	206	850	58
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	167	1179	85	217	895	61
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	167	1179	85	217	895	61
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	53.2	113.4	12.9	66.1	35.3	35.3
Effective Green, g (s)	53.2	113.4	12.9	66.1	35.3	35.3
Actuated g/C Ratio	0.47	1.00	0.11	0.58	0.31	0.31
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	743	1417	212	876	956	580
v/s Ratio Prot	0.11		0.05	0.12	c0.29	0.03
v/s Ratio Perm		c0.83		0.04		
v/c Ratio	0.22	0.83	0.40	0.25	0.94	0.11
Uniform Delay, d1	17.9	0.0	46.7	11.5	38.0	27.8
Progression Factor	1.17	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	2.6	1.2	0.1	15.8	0.1
Delay (s)	21.0	2.6	47.9	11.7	53.8	27.9
Level of Service	C	A	D	B	D	C
Approach Delay (s)	4.9		21.9			52.1
Approach LOS	A		C			D

Intersection Summary			
HCM Average Control Delay	24.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	113.4	Sum of lost time (s)	4.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

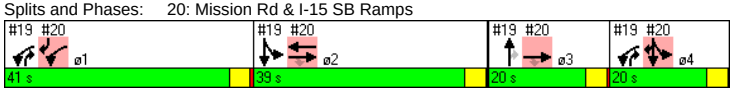
AM Horizon Year
20: Mission Rd & I-15 SB Ramps

Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR	ø3
Lane Configurations							
Volume (vph)	726	330	120	448	10	811	
Turn Type		Perm	Prot			custom	
Protected Phases	2 3		1	2	4	1 4	3
Permitted Phases		2 3				4	
Detector Phases	2 3	2 3	1	2	4	1 4	
Minimum Initial (s)			4.0	4.0	4.0		4.0
Minimum Split (s)			8.0	20.0	20.0		20.0
Total Split (s)	59.0	59.0	41.0	39.0	20.0	61.0	20.0
Total Split (%)	49.2%	49.2%	34.2%	32.5%	16.7%	50.8%	17%
Yellow Time (s)			3.5	3.5	3.5		3.5
All-Red Time (s)			0.5	0.5	0.5		0.5
Lead/Lag			Lead	Lag	Lag		Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes
Recall Mode			None	Min	None		None
Act Effct Green (s)	52.3	52.3	33.0	35.3	16.1	53.1	
Actuated g/C Ratio	0.46	0.46	0.29	0.31	0.14	0.47	
v/c Ratio	0.47	0.41	0.27	0.81	0.09	0.96	
Control Delay	6.5	0.9	32.8	50.5	46.4	36.5	
Queue Delay	0.4	0.5	0.0	0.0	0.0	0.0	
Total Delay	6.8	1.4	32.8	50.5	46.4	36.5	
LOS	A	A	C	D	D	D	
Approach Delay	5.1			46.8	36.8		
Approach LOS	A			D	D		

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 113.5	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 25.5	Intersection LOS: C
Intersection Capacity Utilization 86.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



LOS Engineering

AM Horizon Year
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.976	
Satd. Flow (prot)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Flt Permitted				0.950							0.976	
Satd. Flow (perm)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			347									431
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	726	330	120	448	0	0	0	0	10	10	811
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	764	347	126	472	0	0	0	0	11	11	854
Lane Group Flow (vph)	0	764	347	126	472	0	0	0	0	0	22	854
v/c Ratio		0.47	0.41	0.27	0.81						0.09	0.96
Control Delay		6.5	0.9	32.8	50.5						46.4	36.5
Queue Delay		0.4	0.5	0.0	0.0						0.0	0.0
Total Delay		6.8	1.4	32.8	50.5						46.4	36.5
Queue Length 50th (ft)		43	0	72	340						15	366
Queue Length 95th (ft)		m50	m0	125	#531						41	#709
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1731	870	521	580						258	931
Starvation Cap Reductn		447	208	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.60	0.52	0.24	0.81						0.09	0.92

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

AM Horizon Year
20: Mission Rd & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (prot)		3539	1417	1583	1863						1817	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (perm)		3539	1417	1583	1863						1817	1417
Volume (vph)	0	726	330	120	448	0	0	0	0	10	10	811
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	764	347	126	472	0	0	0	0	11	11	854
RTOR Reduction (vph)	0	0	187	0	0	0	0	0	0	0	0	229
Lane Group Flow (vph)	0	764	160	126	472	0	0	0	0	0	22	625
Turn Type			Perm	Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases			2 3									4
Actuated Green, G (s)		52.2	52.2	33.0	35.3						16.2	53.2
Effective Green, g (s)		52.2	52.2	33.0	35.3						16.2	53.2
Actuated g/C Ratio		0.46	0.46	0.29	0.31						0.14	0.47
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1629	652	461	580						260	665
v/s Ratio Prot		c0.22		0.08	c0.25						0.01	c0.44
v/s Ratio Perm			0.11									
v/c Ratio		0.47	0.24	0.27	0.81						0.08	0.94
Uniform Delay, d1		21.1	18.6	31.0	36.0						42.2	28.6
Progression Factor		0.27	0.01	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.1	0.1	0.3	8.6						0.1	21.4
Delay (s)		5.8	0.4	31.3	44.6						42.3	50.0
Level of Service		A	A	C	D						D	D
Approach Delay (s)		4.1			41.8			0.0			49.8	
Approach LOS		A			D			A			D	

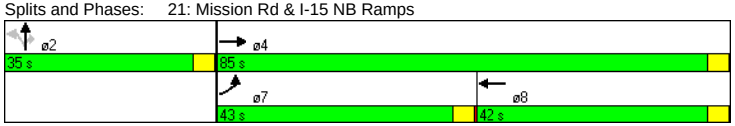
Intersection Summary				
HCM Average Control Delay	28.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	113.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	86.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

AM Horizon Year
21: Mission Rd & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	565	171	318	10	90
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	43.0	85.0	42.0	35.0	35.0
Total Split (%)	35.8%	70.8%	35.0%	29.2%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	18.1	40.2	17.5	15.3	15.3
Actuated g/C Ratio	0.28	0.62	0.27	0.24	0.24
v/c Ratio	0.70	0.16	0.71	0.65	0.23
Control Delay	27.6	6.0	31.9	33.4	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.6	6.0	31.9	33.4	8.0
LOS	C	A	C	C	A
Approach Delay		22.6	31.9	26.8	
Approach LOS		C	C	C	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 64.8		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.71		
Intersection Signal Delay: 25.8	Intersection LOS: C	
Intersection Capacity Utilization 86.4%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



AM Horizon Year
21: Mission Rd & I-15 NB Ramps — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.992				0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	3072	1863	0	0	1848	0	0	1777	1417	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3072	1863	0	0	1848	0	0	1777	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3				95			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	565	171	0	0	318	20	250	10	90	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	595	180	0	0	335	21	263	11	95	0	0	0
Lane Group Flow (vph)	595	180	0	0	356	0	0	274	95	0	0	0
v/c Ratio	0.70	0.16			0.71			0.65	0.23			
Control Delay	27.6	6.0			31.9			33.4	8.0			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	27.6	6.0			31.9			33.4	8.0			
Queue Length 50th (ft)	96	22			112			87	0			
Queue Length 95th (ft)	239	70			303			249	39			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	1457	1446			862			722	632			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.41	0.12			0.41			0.38	0.15			

Intersection Summary
Area Type: Other

LOS Engineering

AM Horizon Year
21: Mission Rd & I-15 NB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	0.97	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	3072	1863			1848			1777	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	3072	1863			1848			1777	1417			
Volume (vph)	565	171	0	0	318	20	250	10	90	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	595	180	0	0	335	21	263	11	95	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	72	0	0	0
Lane Group Flow (vph)	595	180	0	0	354	0	0	274	23	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	18.0	40.2			18.2			15.3	15.3			
Effective Green, g (s)	18.0	40.2			18.2			15.3	15.3			
Actuated g/C Ratio	0.28	0.63			0.29			0.24	0.24			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	871	1179			530			428	341			
v/s Ratio Prot	c0.19	0.10			c0.19							
v/s Ratio Perm								0.15	0.02			
v/c Ratio	0.68	0.15			0.67			0.64	0.07			
Uniform Delay, d1	20.2	4.7			20.0			21.6	18.6			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	2.2	0.1			3.2			3.3	0.1			
Delay (s)	22.4	4.8			23.2			24.9	18.7			
Level of Service	C	A			C			C	B			
Approach Delay (s)		18.3			23.2			23.3			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

AM Horizon Year

22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	30	232	159	18	25	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	244	167	19	26	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	396	42	58			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	396	42	58			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	76	89			
cM capacity (veh/h)	543	1029	1546			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	276	186	58
Volume Left	32	167	0
Volume Right	244	0	32
cSH	933	1546	1700
Volume to Capacity	0.30	0.11	0.03
Queue Length 95th (ft)	31	9	0
Control Delay (s)	10.5	6.9	0.0
Lane LOS	B	A	
Approach Delay (s)	10.5	6.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

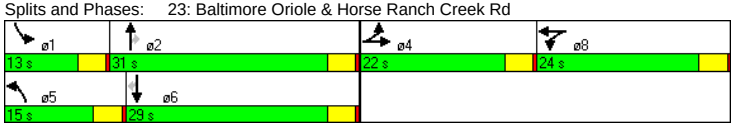
AM Horizon Year

23: Baltimore Oriole & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	20	8	94	34	60	151	69	16	191	50
Turn Type	Split		Split		Prot		Perm	Prot		Perm
Protected Phases	4	4	8	8	5	2		1	6	
Permitted Phases							2			6
Detector Phases	4	4	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	22.0	22.0	24.0	24.0	15.0	31.0	31.0	13.0	29.0	29.0
Total Split (%)	24.4%	24.4%	26.7%	26.7%	16.7%	34.4%	34.4%	14.4%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	7.7	7.7	10.3	10.3	9.1	36.5	36.5	7.6	33.1	33.1
Actuated g/C Ratio	0.12	0.12	0.17	0.17	0.14	0.63	0.63	0.12	0.57	0.57
v/c Ratio	0.11	0.09	0.29	0.28	0.28	0.14	0.08	0.09	0.19	0.06
Control Delay	22.4	16.6	19.6	16.7	21.4	9.4	4.3	24.1	12.8	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	16.6	19.6	16.7	21.4	9.4	4.3	24.1	12.8	6.5
LOS	C	B	B	B	C	A	A	C	B	A
Approach Delay		19.7		18.1		10.7			12.3	
Approach LOS		B		B		B			B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 58.2			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.29			
Intersection Signal Delay: 13.2		Intersection LOS: B	
Intersection Capacity Utilization 34.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Baltimore Oriole & Horse Ranch Creek Rd



LOS Engineering

AM Horizon Year

23: Baltimore Oriole & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.913			0.969				0.850			0.850
Flt Protected	0.950			0.950	0.983		0.950			0.950		
Satd. Flow (prot)	1583	1701	0	1504	1686	0	1583	1863	1417	1583	1863	1417
Flt Permitted	0.950			0.950	0.983		0.950			0.950		
Satd. Flow (perm)	1583	1701	0	1504	1686	0	1583	1863	1417	1583	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			14				73			53
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1047			1324			958			2343	
Travel Time (s)		23.8			30.1			21.8			53.3	
Volume (vph)	20	8	10	94	34	16	60	151	69	16	191	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	8	11	99	36	17	63	159	73	17	201	53
Lane Group Flow (vph)	21	19	0	71	81	0	63	159	73	17	201	53
v/c Ratio	0.11	0.09		0.29	0.28		0.28	0.14	0.08	0.09	0.19	0.06
Control Delay	22.4	16.6		19.6	16.7		21.4	9.4	4.3	24.1	12.8	6.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	16.6		19.6	16.7		21.4	9.4	4.3	24.1	12.8	6.5
Queue Length 50th (ft)	2	1		5	5		5	10	0	1	13	0
Queue Length 95th (ft)	25	19		57	57		51	86	24	22	116	23
Internal Link Dist (ft)		967			1244			878			2263	
Turn Bay Length (ft)												
Base Capacity (vph)	440	480		494	564		310	1315	1022	252	1255	972
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.04		0.14	0.14		0.20	0.12	0.07	0.07	0.16	0.05

Intersection Summary

Area Type: Other

LOS Engineering

AM Horizon Year

23: Baltimore Oriole & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	1701		1504	1685		1583	1863	1417	1583	1863	1417
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	1701		1504	1685		1583	1863	1417	1583	1863	1417
Volume (vph)	20	8	10	94	34	16	60	151	69	16	191	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	8	11	99	36	17	63	159	73	17	201	53
RTOR Reduction (vph)	0	10	0	0	12	0	0	0	33	0	0	26
Lane Group Flow (vph)	21	9	0	71	69	0	63	159	40	17	201	27
Turn Type	Split			Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	3.0	3.0		7.5	7.5		3.9	34.7	34.7	1.4	32.2	32.2
Effective Green, g (s)	3.0	3.0		7.5	7.5		3.9	34.7	34.7	1.4	32.2	32.2
Actuated g/C Ratio	0.05	0.05		0.12	0.12		0.06	0.55	0.55	0.02	0.51	0.51
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	76	82		180	202		99	1033	785	35	958	729
v/s Ratio Prot	c0.01	0.01		c0.05	0.04		c0.04	0.09		0.01	c0.11	
v/s Ratio Perm									0.03			0.02
v/c Ratio	0.28	0.10		0.39	0.34		0.64	0.15	0.05	0.49	0.21	0.04
Uniform Delay, d1	28.8	28.5		25.5	25.3		28.7	6.8	6.4	30.2	8.3	7.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.6		1.4	1.0		12.6	0.1	0.0	10.2	0.1	0.0
Delay (s)	30.7	29.1		26.9	26.3		41.3	6.9	6.4	40.5	8.4	7.5
Level of Service	C	C		C	C		D	A	A	D	A	A
Approach Delay (s)		29.9			26.6			14.1			10.2	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	62.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

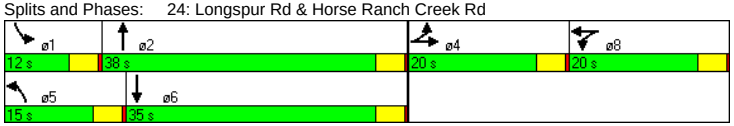
AM Horizon Year
24: Longspur Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	20	23	111	39	130	235	10	235
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	38.0	12.0	35.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	42.2%	13.3%	38.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	7.5	7.5	10.0	10.0	10.5	54.6	6.4	41.7
Actuated g/C Ratio	0.09	0.09	0.12	0.12	0.13	0.66	0.07	0.50
v/c Ratio	0.15	0.39	0.46	0.45	0.69	0.15	0.10	0.18
Control Delay	34.2	20.4	38.6	33.9	49.2	7.0	37.8	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	20.4	38.6	33.9	49.2	7.0	37.8	12.3
LOS	C	C	D	C	D	A	D	B
Approach Delay		23.4		36.0		19.4		13.2
Approach LOS		C		D		B		B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 83.1
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 20.6 — Intersection LOS: C
Intersection Capacity Utilization 37.7% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 24: Longspur Rd & Horse Ranch Creek Rd



AM Horizon Year
24: Longspur Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.897			0.974			0.962			0.970	
Flt Protected	0.950			0.950	0.981		0.950			0.950		
Satd. Flow (prot)	1583	1671	0	1504	1691	0	1583	3405	0	1583	3433	0
Flt Permitted	0.950			0.950	0.981		0.950			0.950		
Satd. Flow (perm)	1583	1671	0	1504	1691	0	1583	3405	0	1583	3433	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53			10			59			38	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1010			908			1206			958	
Travel Time (s)		23.0			20.6			27.4			21.8	
Volume (vph)	20	23	50	111	39	15	130	235	79	10	235	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	24	53	117	41	16	137	247	83	11	247	63
Lane Group Flow (vph)	21	77	0	81	93	0	137	330	0	11	310	0
v/c Ratio	0.15	0.39		0.46	0.45		0.69	0.15		0.10	0.18	
Control Delay	34.2	20.4		38.6	33.9		49.2	7.0		37.8	12.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.2	20.4		38.6	33.9		49.2	7.0		37.8	12.3	
Queue Length 50th (ft)	9	10		36	36		59	23		5	40	
Queue Length 95th (ft)	30	50		82	85		#144	71		21	77	
Internal Link Dist (ft)		930			828			1126			878	
Turn Bay Length (ft)												
Base Capacity (vph)	279	338		273	315		214	2257		140	1741	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.08	0.23		0.30	0.30		0.64	0.15		0.08	0.18	

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Horizon Year

24: Longspur Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.97		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1670		1504	1691		1583	3406		1583	3431	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1670		1504	1691		1583	3406		1583	3431	
Volume (vph)	20	23	50	111	39	15	130	235	79	10	235	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	24	53	117	41	16	137	247	83	11	247	63
RTOR Reduction (vph)	0	49	0	0	9	0	0	22	0	0	18	0
Lane Group Flow (vph)	21	28	0	81	84	0	137	308	0	11	292	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.6	6.6		9.0	9.0		10.5	54.0		1.5	45.0	
Effective Green, g (s)	6.6	6.6		9.0	9.0		10.5	54.0		1.5	45.0	
Actuated g/C Ratio	0.08	0.08		0.10	0.10		0.12	0.62		0.02	0.52	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	127		155	175		191	2112		27	1773	
v/s Ratio Prot	0.01	c0.02		c0.05	0.05		c0.09	0.09		0.01	c0.08	
v/s Ratio Perm												
v/c Ratio	0.17	0.22		0.52	0.48		0.72	0.15		0.41	0.16	
Uniform Delay, d1	37.7	37.8		37.0	36.8		36.9	6.9		42.4	11.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.9		3.2	2.1		12.1	0.1		9.7	0.2	
Delay (s)	38.4	38.7		40.2	38.9		49.0	7.1		52.1	11.3	
Level of Service	D	D		D	D		D	A		D	B	
Approach Delay (s)		38.6			39.5			19.4			12.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	87.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

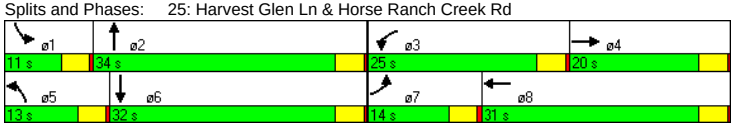
AM Horizon Year

25: Harvest Glen Ln & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	18	177	21	60	343	38	338
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	14.0	20.0	25.0	31.0	13.0	34.0	11.0	32.0
Total Split (%)	15.6%	22.2%	27.8%	34.4%	14.4%	37.8%	12.2%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.6	7.8	13.0	14.8	8.6	30.2	7.7	29.6
Actuated g/C Ratio	0.13	0.13	0.23	0.26	0.15	0.57	0.13	0.56
v/c Ratio	0.06	0.12	0.52	0.22	0.27	0.24	0.19	0.19
Control Delay	26.3	19.7	20.1	6.5	24.1	11.4	25.2	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.3	19.7	20.1	6.5	24.1	11.4	25.2	13.0
LOS	C	B	C	A	C	B	C	B
Approach Delay		21.5		15.1		12.9		14.1
Approach LOS		C		B		B		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 52.9		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.52		
Intersection Signal Delay: 14.1	Intersection LOS: B	
Intersection Capacity Utilization 43.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 25: Harvest Glen Ln & Horse Ranch Creek Rd



AM Horizon Year

25: Harvest Glen Ln & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.945			0.881			0.965			0.992	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1760	0	1583	1641	0	1583	3415	0	1583	3511	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1760	0	1583	1641	0	1583	3415	0	1583	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			85			47			7	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1058			1173			1033			1206	
Travel Time (s)		24.0			26.7			23.5			27.4	
Volume (vph)	10	18	10	177	21	81	60	343	104	38	338	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	19	11	186	22	85	63	361	109	40	356	21
Lane Group Flow (vph)	11	30	0	186	107	0	63	470	0	40	377	0
v/c Ratio	0.06	0.12		0.52	0.22		0.27	0.24		0.19	0.19	
Control Delay	26.3	19.7		20.1	6.5		24.1	11.4		25.2	13.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.3	19.7		20.1	6.5		24.1	11.4		25.2	13.0	
Queue Length 50th (ft)	1	2		15	2		5	17		3	15	
Queue Length 95th (ft)	18	29		118	39		57	118		42	106	
Internal Link Dist (ft)		978			1093			953			1126	
Turn Bay Length (ft)												
Base Capacity (vph)	302	494		588	771		288	2362		233	2368	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.06		0.32	0.14		0.22	0.20		0.17	0.16	

Intersection Summary

Area Type: Other

LOS Engineering

AM Horizon Year

25: Harvest Glen Ln & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.88		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1760		1583	1641		1583	3416		1583	3510	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1760		1583	1641		1583	3416		1583	3510	
Volume (vph)	10	18	10	177	21	81	60	343	104	38	338	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	19	11	186	22	85	63	361	109	40	356	21
RTOR Reduction (vph)	0	10	0	0	69	0	0	25	0	0	4	0
Lane Group Flow (vph)	11	20	0	186	38	0	63	445	0	40	373	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.1	3.2		8.9	11.0		3.0	27.3		2.4	26.7	
Effective Green, g (s)	1.1	3.2		8.9	11.0		3.0	27.3		2.4	26.7	
Actuated g/C Ratio	0.02	0.06		0.15	0.19		0.05	0.47		0.04	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	30	97		244	312		82	1613		66	1621	
v/s Ratio Prot	0.01	0.01		c0.12	c0.02		c0.04	c0.13		0.03	0.11	
v/s Ratio Perm												
v/c Ratio	0.37	0.20		0.76	0.12		0.77	0.28		0.61	0.23	
Uniform Delay, d1	28.0	26.1		23.4	19.4		27.1	9.3		27.2	9.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.4	1.0		13.1	0.2		34.2	0.1		14.7	0.1	
Delay (s)	35.5	27.1		36.6	19.6		61.3	9.3		42.0	9.4	
Level of Service	D	C		D	B		E	A		D	A	
Approach Delay (s)		29.3			30.4			15.5			12.6	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	18.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	57.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

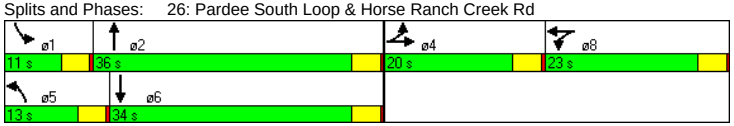
AM Horizon Year

26: Pardee South Loop & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	8	0	240	0	42	404	43	483
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	23.0	23.0	13.0	36.0	11.0	34.0
Total Split (%)	22.2%	22.2%	25.6%	25.6%	14.4%	40.0%	12.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.6	6.6	12.1	12.1	7.4	22.4	7.0	21.9
Actuated g/C Ratio	0.12	0.12	0.24	0.24	0.14	0.46	0.13	0.45
v/c Ratio	0.04	0.09	0.47	0.47	0.20	0.33	0.22	0.32
Control Delay	26.1	0.4	20.5	14.3	25.5	12.3	27.0	13.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	0.4	20.5	14.3	25.5	12.3	27.0	13.7
LOS	C	A	C	B	C	B	C	B
Approach Delay		4.8		17.1		13.3		14.8
Approach LOS		A		B		B		B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 48.7			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 44.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 26: Pardee South Loop & Horse Ranch Creek Rd



LOS Engineering

AM Horizon Year

26: Pardee South Loop & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.911			0.970			0.997	
Flt Protected	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (prot)	1583	1583	0	1504	1580	0	1583	3433	0	1583	3529	0
Flt Permitted	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (perm)	1583	1583	0	1504	1580	0	1583	3433	0	1583	3529	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		293			75			37			2	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		869			1419			1340			1033	
Travel Time (s)		19.8			32.3			30.5			23.5	
Volume (vph)	8	0	37	240	0	115	42	404	100	43	483	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	0	39	253	0	121	44	425	105	45	508	9
Lane Group Flow (vph)	8	39	0	171	203	0	44	530	0	45	517	0
v/c Ratio	0.04	0.09		0.47	0.47		0.20	0.33		0.22	0.32	
Control Delay	26.1	0.4		20.5	14.3		25.5	12.3		27.0	13.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.1	0.4		20.5	14.3		25.5	12.3		27.0	13.7	
Queue Length 50th (ft)	1	0		14	10		4	21		4	22	
Queue Length 95th (ft)	15	0		122	106		46	134		49	144	
Internal Link Dist (ft)		789			1339			1260			953	
Turn Bay Length (ft)												
Base Capacity (vph)	427	641		557	632		279	2192		225	2188	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.02	0.06		0.31	0.32		0.16	0.24		0.20	0.24	

Intersection Summary	
Area Type:	Other

LOS Engineering

AM Horizon Year

26: Pardee South Loop & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.91		1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1583		1504	1579		1583	3434		1583	3530	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1583		1504	1579		1583	3434		1583	3530	
Volume (vph)	8	0	37	240	0	115	42	404	100	43	483	9
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	0	39	253	0	121	44	425	105	45	508	9
RTOR Reduction (vph)	0	38	0	0	59	0	0	22	0	0	1	0
Lane Group Flow (vph)	8	1	0	171	144	0	44	508	0	45	516	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.9	1.9		10.9	10.9		2.5	21.8		2.1	21.4	
Effective Green, g (s)	1.9	1.9		10.9	10.9		2.5	21.8		2.1	21.4	
Actuated g/C Ratio	0.04	0.04		0.21	0.21		0.05	0.41		0.04	0.41	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	57	57		311	327		75	1421		63	1433	
v/s Ratio Prot	c0.01	0.00		c0.11	0.09		0.03	c0.15		c0.03	0.15	
v/s Ratio Perm												
v/c Ratio	0.14	0.02		0.55	0.44		0.59	0.36		0.71	0.36	
Uniform Delay, d1	24.6	24.5		18.7	18.2		24.6	10.6		25.0	10.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.2		2.0	0.9		11.2	0.2		31.7	0.2	
Delay (s)	25.7	24.7		20.7	19.2		35.8	10.8		56.7	11.0	
Level of Service	C	C		C	B		D	B		E	B	
Approach Delay (s)		24.9			19.9			12.7			14.7	
Approach LOS		C			B			B			B	

Intersection Summary				
HCM Average Control Delay	15.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	52.7	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	44.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Horizon Year

27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	150	386	230	0	751
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	158	406	242	0	791
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	923	324			648	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	923	324			648	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	76			100	
cM capacity (veh/h)	269	671			933	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	158	271	378	395	395
Volume Left	0	0	0	0	0
Volume Right	158	0	242	0	0
cSH	671	1700	1700	1700	1700
Volume to Capacity	0.24	0.16	0.22	0.23	0.23
Queue Length 95th (ft)	23	0	0	0	0
Control Delay (s)	12.0	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.0	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	35.1%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

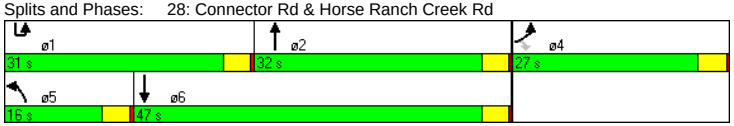
AM Horizon Year
28: Connector Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Configurations						
Volume (vph)	159	14	18	277	190	207
Turn Type		Perm	Prot		Prot	
Protected Phases	4		5	2	1	6
Permitted Phases		4				
Detector Phases	4	4	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	27.0	27.0	16.0	32.0	31.0	47.0
Total Split (%)	30.0%	30.0%	17.8%	35.6%	34.4%	52.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	Min	None	Min
Act Effct Green (s)	8.4	8.4	6.4	17.8	11.5	29.8
Actuated g/C Ratio	0.17	0.17	0.12	0.38	0.24	0.64
v/c Ratio	0.32	0.06	0.10	0.22	0.53	0.29
Control Delay	15.9	9.4	20.5	13.3	17.9	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.9	9.4	20.5	13.3	17.9	2.7
LOS	B	A	C	B	B	A
Approach Delay	15.4			13.7		6.4
Approach LOS	B			B		A

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 46.8
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 9.4 — Intersection LOS: A
Intersection Capacity Utilization 36.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 28: Connector Rd & Horse Ranch Creek Rd



LOS Engineering

AM Horizon Year
28: Connector Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9		9
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	0.95
Frt		0.850				0.903	
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	3072	1417	1583	3539	1583	3196	0
Flt Permitted	0.950		0.950		0.950		
Satd. Flow (perm)	3072	1417	1583	3539	1583	3196	0
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		15				404	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30		30	
Link Distance (ft)	2875			1509		1400	
Travel Time (s)	65.3			34.3		31.8	
Volume (vph)	159	14	18	277	190	207	384
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	167	15	19	292	200	218	404
Lane Group Flow (vph)	167	15	19	292	200	622	0
v/c Ratio	0.32	0.06	0.10	0.22	0.53	0.29	
Control Delay	15.9	9.4	20.5	13.3	17.9	2.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	15.9	9.4	20.5	13.3	17.9	2.7	
Queue Length 50th (ft)	15	0	3	26	34	7	
Queue Length 95th (ft)	42	11	19	64	90	47	
Internal Link Dist (ft)	2795			1429		1320	
Turn Bay Length (ft)							
Base Capacity (vph)	1166	547	326	2045	693	2527	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.03	0.06	0.14	0.29	0.25	

Intersection Summary

Area Type: Other

LOS Engineering

AM Horizon Year

28: Connector Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	0.90	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	3072	1417	1583	3539	1583	3194	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	3072	1417	1583	3539	1583	3194	
Volume (vph)	159	14	18	277	190	207	384
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	167	15	19	292	200	218	404
RTOR Reduction (vph)	0	13	0	0	0	168	0
Lane Group Flow (vph)	167	2	19	292	200	454	0
Turn Type		Perm	Prot		Prot		
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	7.4	7.4	1.4	20.3	10.3	29.2	
Effective Green, g (s)	7.4	7.4	1.4	20.3	10.3	29.2	
Actuated g/C Ratio	0.15	0.15	0.03	0.41	0.21	0.58	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	455	210	44	1437	326	1865	
v/s Ratio Prot	c0.05		0.01	0.08	c0.13	c0.14	
v/s Ratio Perm		0.00					
v/c Ratio	0.37	0.01	0.43	0.20	0.61	0.24	
Uniform Delay, d1	19.2	18.2	23.9	9.6	18.0	5.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.0	6.7	0.1	3.4	0.1	
Delay (s)	19.7	18.2	30.6	9.7	21.4	5.1	
Level of Service	B	B	C	A	C	A	
Approach Delay (s)	19.6			11.0		9.1	
Approach LOS	B			B		A	

Intersection Summary				
HCM Average Control Delay	11.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	36.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

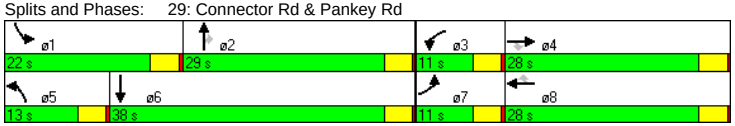
AM Horizon Year

29: Connector Rd & Pankey Rd — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	60	117	210	31	285	136	160	310	20	34	40
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot	
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	4	3	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	13.0	29.0	29.0	22.0	38.0
Total Split (%)	12.2%	31.1%	31.1%	12.2%	31.1%	31.1%	14.4%	32.2%	32.2%	24.4%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	6.9	15.8	15.8	6.7	13.8	13.8	10.8	26.2	26.2	7.3	12.5
Actuated g/C Ratio	0.12	0.29	0.29	0.11	0.25	0.25	0.20	0.50	0.50	0.12	0.24
v/c Ratio	0.32	0.34	0.33	0.18	0.64	0.31	0.52	0.35	0.03	0.18	0.14
Control Delay	34.3	17.6	6.1	33.4	26.9	6.5	36.5	18.4	9.3	31.6	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.3	17.6	6.1	33.4	26.9	6.5	36.5	18.4	9.3	31.6	15.3
LOS	C	B	A	C	C	A	D	B	A	C	B
Approach Delay		15.4			21.2			23.9			21.2
Approach LOS		B			C			C			C

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 52.7		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.64		
Intersection Signal Delay: 20.6	Intersection LOS: C	
Intersection Capacity Utilization 51.7%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 29: Connector Rd & Pankey Rd



LOS Engineering

AM Horizon Year
29: Connector Rd & Pankey Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.957	0.850			0.850			0.850		0.950	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1694	1346	1583	1863	1417	1583	1863	1417	1583	1770	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1694	1346	1583	1863	1417	1583	1863	1417	1583	1770	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22	171			143			21		21	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1256			2875			1488			1443	
Travel Time (s)		28.5			65.3			33.8			32.8	
Volume (vph)	60	117	210	31	285	136	160	310	20	34	40	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	123	221	33	300	143	168	326	21	36	42	21
Lane Group Flow (vph)	63	173	171	33	300	143	168	326	21	36	63	0
v/c Ratio	0.32	0.34	0.33	0.18	0.64	0.31	0.52	0.35	0.03	0.18	0.14	
Control Delay	34.3	17.6	6.1	33.4	26.9	6.5	36.5	18.4	9.3	31.6	15.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	34.3	17.6	6.1	33.4	26.9	6.5	36.5	18.4	9.3	31.6	15.3	
Queue Length 50th (ft)	18	26	0	9	81	0	48	72	0	10	12	
Queue Length 95th (ft)	70	118	46	43	207	40	#206	223	16	44	42	
Internal Link Dist (ft)		1176			2795			1408			1363	
Turn Bay Length (ft)												
Base Capacity (vph)	211	695	644	203	718	634	324	995	767	433	862	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.30	0.25	0.27	0.16	0.42	0.23	0.52	0.33	0.03	0.08	0.07	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Horizon Year
29: Connector Rd & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1693	1346	1583	1863	1417	1583	1863	1417	1583	1770	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1693	1346	1583	1863	1417	1583	1863	1417	1583	1770	
Volume (vph)	60	117	210	31	285	136	160	310	20	34	40	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	123	221	33	300	143	168	326	21	36	42	21
RTOR Reduction (vph)	0	17	131	0	0	113	0	0	12	0	15	0
Lane Group Flow (vph)	63	156	40	33	300	30	168	326	9	36	48	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.4	13.6	13.6	2.0	12.2	12.2	10.8	24.5	24.5	2.5	16.2	
Effective Green, g (s)	3.4	13.6	13.6	2.0	12.2	12.2	10.8	24.5	24.5	2.5	16.2	
Actuated g/C Ratio	0.06	0.23	0.23	0.03	0.21	0.21	0.18	0.42	0.42	0.04	0.28	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	92	393	312	54	388	295	292	779	592	68	489	
v/s Ratio Prot	c0.04	0.09		0.02	c0.16		c0.11	c0.18		0.02	0.03	
v/s Ratio Perm			0.03			0.02			0.01			
v/c Ratio	0.68	0.40	0.13	0.61	0.77	0.10	0.58	0.42	0.01	0.53	0.10	
Uniform Delay, d1	27.1	19.0	17.8	27.9	21.9	18.8	21.8	12.0	10.0	27.5	15.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.0	0.7	0.2	18.7	9.3	0.2	2.7	0.4	0.0	7.3	0.1	
Delay (s)	46.1	19.7	18.0	46.7	31.1	18.9	24.5	12.4	10.0	34.7	15.9	
Level of Service	D	B	B	D	C	B	C	B	A	C	B	
Approach Delay (s)		23.1			28.5			16.3			22.7	
Approach LOS		C			C			B			C	

Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	58.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	51.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

AM Horizon Year
34: Pala Rd (SR-76) & S Mission Rd

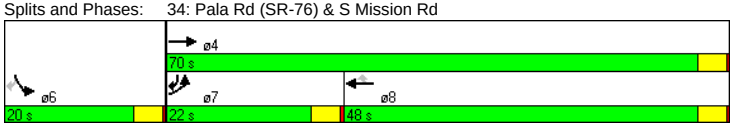
Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	600	873	1660	204	220	900
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	22.0	70.0	48.0	48.0	20.0	22.0
Total Split (%)	24.4%	77.8%	53.3%	53.3%	22.2%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	18.0	66.0	44.0	44.0	16.0	38.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.42
v/c Ratio	1.03	0.25	1.01	0.27	0.42	0.90
Control Delay	81.0	4.1	48.2	2.8	35.7	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	4.1	48.2	2.8	35.7	37.4
LOS	F	A	D	A	D	D
Approach Delay		35.4	43.2		37.0	
Approach LOS		D	D		D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 39.1 Intersection LOS: D
Intersection Capacity Utilization 87.7% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



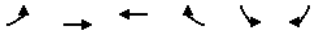
AM Horizon Year
34: Pala Rd (SR-76) & S Mission Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				215		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	600	873	1660	204	220	900
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	919	1747	215	232	947
Lane Group Flow (vph)	632	919	1747	215	232	947
v/c Ratio	1.03	0.25	1.01	0.27	0.42	0.90
Control Delay	81.0	4.1	48.2	2.8	35.7	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	4.1	48.2	2.8	35.7	37.4
Queue Length 50th (ft)	~200	51	~514	0	61	277
Queue Length 95th (ft)	#306	65	#691	35	96	#417
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	614	3729	1730	803	546	1053
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.25	1.01	0.27	0.42	0.90

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Volume (vph)	600	873	1660	204	220	900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	919	1747	215	232	947
RTOR Reduction (vph)	0	0	0	110	0	0
Lane Group Flow (vph)	632	919	1747	105	232	947
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	18.0	66.0	44.0	44.0	16.0	34.0
Effective Green, g (s)	18.0	66.0	44.0	44.0	16.0	34.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.38
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	614	3729	1730	693	546	1053
v/s Ratio Prot	c0.21	0.18	c0.49		0.08	c0.18
v/s Ratio Perm				0.07		0.20
v/c Ratio	1.03	0.25	1.01	0.15	0.42	0.90
Uniform Delay, d1	36.0	3.9	23.0	12.7	32.9	26.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.0	0.0	24.1	0.1	2.4	10.3
Delay (s)	80.0	3.9	47.1	12.8	35.3	36.6
Level of Service	F	A	D	B	D	D
Approach Delay (s)		34.9	43.3		36.4	
Approach LOS		C	D		D	

Intersection Summary			
HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Horizon Year
1: Pala Rd (SR-76) & Via Monserate — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	60	2051	1543	120	0	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	57	1943	1462	114	0	85
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1575				2604	788
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1575				2604	788
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	86				100	74
cM capacity (veh/h)	414				17	334

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	57	972	972	975	601	85
Volume Left	57	0	0	0	0	0
Volume Right	0	0	0	0	114	85
cSH	414	1700	1700	1700	1700	334
Volume to Capacity	0.14	0.57	0.57	0.57	0.35	0.26
Queue Length 95th (ft)	12	0	0	0	0	25
Control Delay (s)	15.1	0.0	0.0	0.0	0.0	19.4
Lane LOS	C					C
Approach Delay (s)	0.4			0.0		19.4
Approach LOS						C

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

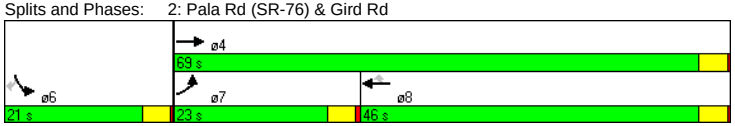
LOS Engineering

PM Horizon Year
2: Pala Rd (SR-76) & Gird Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	230	1691	1283	130	70	90
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	23.0	69.0	46.0	46.0	21.0	21.0
Total Split (%)	25.6%	76.7%	51.1%	51.1%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	14.6	51.2	32.3	32.3	8.9	8.9
Actuated g/C Ratio	0.21	0.75	0.47	0.47	0.13	0.13
v/c Ratio	0.72	0.68	0.81	0.20	0.36	0.36
Control Delay	41.3	5.9	20.6	10.4	36.9	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	5.9	20.6	10.4	36.9	12.0
LOS	D	A	C	B	D	B
Approach Delay		10.2	19.6		22.9	
Approach LOS		B	B		C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 68.7			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 64.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



LOS Engineering

PM Horizon Year
2: Pala Rd (SR-76) & Gird Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				26		95
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	230	1691	1283	130	70	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	242	1780	1351	137	74	95
Lane Group Flow (vph)	242	1780	1351	137	74	95
v/c Ratio	0.72	0.68	0.81	0.20	0.36	0.36
Control Delay	41.3	5.9	20.6	10.4	36.9	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	5.9	20.6	10.4	36.9	12.0
Queue Length 50th (ft)	102	142	253	27	32	0
Queue Length 95th (ft)	#218	256	392	65	77	42
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	426	2808	1925	783	365	400
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.63	0.70	0.17	0.20	0.24

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Horizon Year
2: Pala Rd (SR-76) & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Volume (vph)	230	1691	1283	130	70	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	242	1780	1351	137	74	95
RTOR Reduction (vph)	0	0	0	14	0	83
Lane Group Flow (vph)	242	1780	1351	123	74	12
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	14.6	51.2	32.6	32.6	8.9	8.9
Effective Green, g (s)	14.6	51.2	32.6	32.6	8.9	8.9
Actuated g/C Ratio	0.21	0.75	0.48	0.48	0.13	0.13
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	339	2661	1694	678	207	185
v/s Ratio Prot	0.15	c0.50	c0.38		c0.05	
v/s Ratio Perm				0.09		0.01
v/c Ratio	0.71	0.67	0.80	0.18	0.36	0.07
Uniform Delay, d1	24.8	4.2	15.0	10.1	27.0	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	0.6	2.7	0.1	1.1	0.2
Delay (s)	31.8	4.9	17.7	10.3	28.1	26.1
Level of Service	C	A	B	B	C	C
Approach Delay (s)		8.1	17.0		27.0	
Approach LOS		A	B		C	

Intersection Summary				
HCM Average Control Delay	12.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	68.1	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

PM Horizon Year
3: Pala Rd (SR-76) & Sage Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	20	1531	1543	20	0	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	20	1531	1543	20	0	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1563				2358	782
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1563				2358	782
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				100	88
cM capacity (veh/h)	419				28	337

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	20	766	766	1029	534	40
Volume Left	20	0	0	0	0	0
Volume Right	0	0	0	0	20	40
cSH	419	1700	1700	1700	1700	337
Volume to Capacity	0.05	0.45	0.45	0.61	0.31	0.12
Queue Length 95th (ft)	4	0	0	0	0	10
Control Delay (s)	14.0	0.0	0.0	0.0	0.0	17.1
Lane LOS	B					C
Approach Delay (s)	0.2			0.0		17.1
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

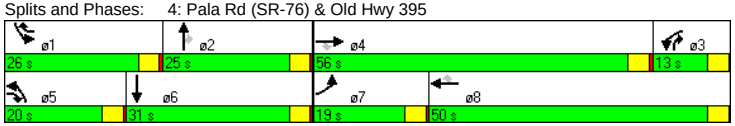
LOS Engineering

PM Horizon Year
4: Pala Rd (SR-76) & Old Hwy 395 — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	93	1068	150	110	1057	380	230	277	150	350	200
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	5	3	8	1	5	2	3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	19.0	56.0	20.0	13.0	50.0	26.0	20.0	25.0	13.0	26.0	31.0
Total Split (%)	15.8%	46.7%	16.7%	10.8%	41.7%	21.7%	16.7%	20.8%	10.8%	21.7%	25.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	Min	None	None	Min	Min	Min	None	Min	Min
Act Effct Green (s)	11.3	40.1	56.4	10.3	41.8	63.6	16.4	21.9	32.2	17.7	23.2
Actuated g/C Ratio	0.10	0.38	0.53	0.10	0.39	0.60	0.15	0.21	0.30	0.17	0.22
v/c Ratio	0.59	0.84	0.19	0.75	0.80	0.42	0.99	0.76	0.34	0.72	0.88
Control Delay	63.2	36.9	1.6	79.7	35.6	6.3	104.6	57.0	15.9	51.7	62.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	36.9	1.6	79.7	35.6	6.3	104.6	57.0	15.9	51.7	62.0
LOS	E	D	A	E	D	A	F	E	B	D	E
Approach Delay		34.7			31.5			64.2			56.8
Approach LOS		C			C			E			E

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 106.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 41.8		Intersection LOS: D	
Intersection Capacity Utilization 82.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



LOS Engineering

PM Horizon Year
4: Pala Rd (SR-76) & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	1		1	2		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.939	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1749	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1749	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			235			44		26	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	93	1068	150	110	1057	380	230	277	150	350	200	136
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	1124	158	116	1113	400	242	292	158	368	211	143
Lane Group Flow (vph)	98	1124	158	116	1113	400	242	292	158	368	354	0
v/c Ratio	0.59	0.84	0.19	0.75	0.80	0.42	0.99	0.76	0.34	0.72	0.88	
Control Delay	63.2	36.9	1.6	79.7	35.6	6.3	104.6	57.0	15.9	51.7	62.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.2	36.9	1.6	79.7	35.6	6.3	104.6	57.0	15.9	51.7	62.0	
Queue Length 50th (ft)	69	395	0	83	387	54	~199	203	38	131	229	
Queue Length 95th (ft)	129	456	18	#214	494	117	#384	#384	89	190	#412	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	214	1567	826	154	1486	933	244	386	460	619	453	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.46	0.72	0.19	0.75	0.75	0.43	0.99	0.76	0.34	0.59	0.78	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year
4: Pala Rd (SR-76) & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1750	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1750	
Volume (vph)	93	1068	150	110	1057	380	230	277	150	350	200	136
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	1124	158	116	1113	400	242	292	158	368	211	143
RTOR Reduction (vph)	0	0	75	0	0	104	0	0	30	0	20	0
Lane Group Flow (vph)	98	1124	83	116	1113	296	242	292	128	368	334	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	9.7	40.0	56.4	11.5	41.8	59.5	16.4	21.9	33.4	17.7	23.2	
Effective Green, g (s)	9.7	40.0	56.4	11.5	41.8	59.5	16.4	21.9	33.4	17.7	23.2	
Actuated g/C Ratio	0.09	0.37	0.53	0.11	0.39	0.56	0.15	0.20	0.31	0.17	0.22	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	143	1322	746	170	1381	840	242	381	442	508	379	
v/s Ratio Prot	0.06	c0.32	0.02	0.07	c0.31	0.06	c0.15	0.16	0.03	0.12	c0.19	
v/s Ratio Perm			0.04			0.15			0.06			
v/c Ratio	0.69	0.85	0.11	0.68	0.81	0.35	1.00	0.77	0.29	0.72	0.88	
Uniform Delay, d1	47.2	30.8	12.7	46.0	29.0	13.1	45.3	40.2	27.9	42.4	40.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.8	5.4	0.1	10.7	3.5	0.3	57.9	8.9	0.4	5.1	20.5	
Delay (s)	60.0	36.2	12.8	56.8	32.6	13.4	103.2	49.1	28.2	47.5	61.1	
Level of Service	E	D	B	E	C	B	F	D	C	D	E	
Approach Delay (s)		35.2			29.6			63.3			54.1	
Approach LOS		D			C			E			D	

Intersection Summary

HCM Average Control Delay	40.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	107.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

PM Horizon Year
6: Pala Rd (SR-76) & I-15 SB Ramps

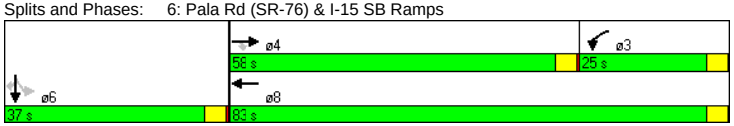
Timings

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	1268	300	298	1017	281	20	530
Turn Type		Perm	Prot		Perm		Perm
Protected Phases	4		3	8		6	
Permitted Phases		4			6		6
Detector Phases	4	4	3	8	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	58.0	58.0	25.0	83.0	37.0	37.0	37.0
Total Split (%)	48.3%	48.3%	20.8%	69.2%	30.8%	30.8%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	51.5	51.5	16.3	71.8	40.2	40.2	40.2
Actuated g/C Ratio	0.43	0.43	0.14	0.60	0.34	0.34	0.34
v/c Ratio	0.88	0.41	0.75	0.51	0.50	0.59	0.53
Control Delay	38.8	5.6	66.6	18.0	38.5	26.9	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	5.6	66.6	18.0	38.5	26.9	23.1
LOS	D	A	E	B	D	C	C
Approach Delay	32.5			29.0		29.0	
Approach LOS	C			C		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 30.5 Intersection LOS: C
Intersection Capacity Utilization 69.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



LOS Engineering

PM Horizon Year
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	2		0	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850								0.879	0.850
Flt Protected				0.950						0.950	0.993	
Satd. Flow (prot)	0	3539	1417	3072	3539	0	0	0	0	1504	1480	1346
Flt Permitted				0.950						0.950	0.993	
Satd. Flow (perm)	0	3539	1417	3072	3539	0	0	0	0	1504	1480	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			270								127	127
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	1268	300	298	1017	0	0	0	0	281	20	530
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1335	316	314	1071	0	0	0	0	296	21	558
Lane Group Flow (vph)	0	1335	316	314	1071	0	0	0	0	251	342	282
v/c Ratio		0.88	0.41	0.75	0.51					0.50	0.59	0.53
Control Delay		38.8	5.6	66.6	18.0					38.5	26.9	23.1
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		38.8	5.6	66.6	18.0					38.5	26.9	23.1
Queue Length 50th (ft)		463	20	115	390					169	157	103
Queue Length 95th (ft)		570	78	m155	488					274	287	211
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		1612	792	538	2331					504	580	535
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.83	0.40	0.58	0.46					0.50	0.59	0.53

Intersection Summary

Area Type: Other
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Horizon Year
6: Pala Rd (SR-76) & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.88	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		3539	1417	3072	3539					1504	1480	1346
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		3539	1417	3072	3539					1504	1480	1346
Volume (vph)	0	1268	300	298	1017	0	0	0	0	281	20	530
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1335	316	314	1071	0	0	0	0	296	21	558
RTOR Reduction (vph)	0	0	154	0	0	0	0	0	0	0	84	84
Lane Group Flow (vph)	0	1335	162	314	1071	0	0	0	0	251	258	198
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		51.5	51.5	16.3	71.8					40.2	40.2	40.2
Effective Green, g (s)		51.5	51.5	16.3	71.8					40.2	40.2	40.2
Actuated g/C Ratio		0.43	0.43	0.14	0.60					0.34	0.34	0.34
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1519	608	417	2118					504	496	451
v/s Ratio Prot		c0.38		c0.10	0.30							
v/s Ratio Perm			0.11							0.17	0.17	0.15
v/c Ratio		0.88	0.27	0.75	0.51					0.50	0.52	0.44
Uniform Delay, d1		31.4	22.1	49.9	13.9					31.8	32.1	31.1
Progression Factor		1.00	1.00	1.18	1.29					1.00	1.00	1.00
Incremental Delay, d2		6.1	0.2	5.2	0.1					3.5	3.9	3.1
Delay (s)		37.5	22.3	64.1	18.1					35.3	36.0	34.2
Level of Service		D	C	E	B					D	D	C
Approach Delay (s)		34.6			28.5			0.0			35.2	
Approach LOS		C			C			A			D	

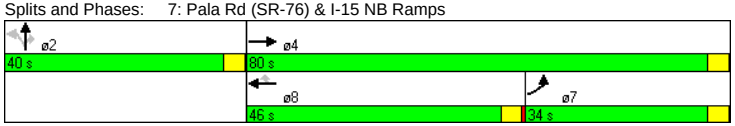
Intersection Summary				
HCM Average Control Delay	32.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	69.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

PM Horizon Year
7: Pala Rd (SR-76) & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Volume (vph)	600	949	865	337	450	20	322
Turn Type	Prot			Perm	Perm		Perm
Protected Phases	7	4	8			2	
Permitted Phases				8	2		2
Detector Phases	7	4	8	8	2	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	34.0	80.0	46.0	46.0	40.0	40.0	40.0
Total Split (%)	28.3%	66.7%	38.3%	38.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	28.8	70.0	37.1	37.1	42.0	42.0	42.0
Actuated g/C Ratio	0.24	0.58	0.31	0.31	0.35	0.35	0.35
v/c Ratio	0.86	0.48	0.83	0.70	0.48	0.54	0.50
Control Delay	67.8	29.4	45.5	32.6	36.5	36.5	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.8	29.4	45.5	32.6	36.5	36.5	20.4
LOS	E	C	D	C	D	D	C
Approach Delay		44.3	41.9			31.1	
Approach LOS		D	D			C	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green		
Natural Cycle: 60		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 40.5	Intersection LOS: D	
Intersection Capacity Utilization 69.3%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



PM Horizon Year
7: Pala Rd (SR-76) & I-15 NB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	2		0	0		1	1		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Frt						0.850		0.970	0.850			
Flt Protected	0.950						0.950	0.965				
Satd. Flow (prot)	3072	3539	0	0	3539	1417	1504	1587	1346	0	0	0
Flt Permitted	0.950						0.950	0.965				
Satd. Flow (perm)	3072	3539	0	0	3539	1417	1504	1587	1346	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						103		11	136			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	600	949	0	0	865	337	450	20	322	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	999	0	0	911	355	474	21	339	0	0	0
Lane Group Flow (vph)	632	999	0	0	911	355	252	303	279	0	0	0
v/c Ratio	0.86	0.48			0.83	0.70	0.48	0.54	0.50			
Control Delay	67.8	29.4			45.5	32.6	36.5	36.5	20.4			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	67.8	29.4			45.5	32.6	36.5	36.5	20.4			
Queue Length 50th (ft)	246	324			340	171	163	202	89			
Queue Length 95th (ft)	m264	m334			401	271	266	324	191			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	787	2264			1240	563	537	573	568			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.80	0.44			0.73	0.63	0.47	0.53	0.49			

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Horizon Year
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.97	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (prot)	3072	3539			3539	1417	1504	1587	1346			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.96	1.00			
Satd. Flow (perm)	3072	3539			3539	1417	1504	1587	1346			
Volume (vph)	600	949	0	0	865	337	450	20	322	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	999	0	0	911	355	474	21	339	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	71	0	7	88	0	0	0
Lane Group Flow (vph)	632	999	0	0	911	284	252	296	191	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	28.9	70.0			37.1	37.1	42.0	42.0	42.0			
Effective Green, g (s)	28.9	70.0			37.1	37.1	42.0	42.0	42.0			
Actuated g/C Ratio	0.24	0.58			0.31	0.31	0.35	0.35	0.35			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	740	2064			1094	438	526	555	471			
v/s Ratio Prot	c0.21	0.28			c0.26							
v/s Ratio Perm						0.20	0.17	0.19	0.14			
v/c Ratio	0.85	0.48			0.83	0.65	0.48	0.53	0.40			
Uniform Delay, d1	43.5	14.5			38.6	35.8	30.5	31.2	29.5			
Progression Factor	1.40	2.04			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	5.5	0.1			5.6	3.3	3.1	3.6	2.6			
Delay (s)	66.4	29.7			44.1	39.1	33.6	34.8	32.1			
Level of Service	E	C			D	D	C	C	C			
Approach Delay (s)		43.9			42.7			33.5			0.0	
Approach LOS		D			D			C			A	

Intersection Summary			
HCM Average Control Delay	41.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

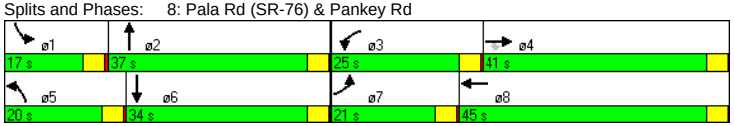
PM Horizon Year
8: Pala Rd (SR-76) & Pankey Rd — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	153	778	340	58	665	330	394	120	458
Turn Type	Prot		Perm	Prot		Prot		Prot	
Protected Phases	7	4		3	8	5	2	1	6
Permitted Phases			4						
Detector Phases	7	4	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	21.0	41.0	41.0	25.0	45.0	20.0	37.0	17.0	34.0
Total Split (%)	17.5%	34.2%	34.2%	20.8%	37.5%	16.7%	30.8%	14.2%	28.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	13.7	34.6	34.6	9.2	27.1	14.4	29.6	11.2	23.0
Actuated g/C Ratio	0.14	0.36	0.36	0.09	0.28	0.15	0.31	0.11	0.24
v/c Ratio	0.71	0.64	0.48	0.40	0.80	0.75	0.52	0.69	0.81
Control Delay	61.1	30.0	5.2	54.6	38.5	53.3	30.3	66.2	41.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.1	30.0	5.2	54.6	38.5	53.3	30.3	66.2	41.2
LOS	E	C	A	D	D	D	C	E	D
Approach Delay		27.1			39.7		39.0		45.0
Approach LOS		C			D		D		D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 95.3
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 36.4 — Intersection LOS: D
Intersection Capacity Utilization 73.9% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd



LOS Engineering

PM Horizon Year
8: Pala Rd (SR-76) & Pankey Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.982			0.959			0.953	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3476	0	3072	3394	0	1583	3373	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3476	0	3072	3394	0	1583	3373	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			358		13			44			58	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2232			2833			991			1488	
Travel Time (s)		50.7			64.4			22.5			33.8	
Volume (vph)	153	778	340	58	665	90	330	394	146	120	458	207
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	161	819	358	61	700	95	347	415	154	126	482	218
Lane Group Flow (vph)	161	819	358	61	795	0	347	569	0	126	700	0
v/c Ratio	0.71	0.64	0.48	0.40	0.80		0.75	0.52		0.69	0.81	
Control Delay	61.1	30.0	5.2	54.6	38.5		53.3	30.3		66.2	41.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	61.1	30.0	5.2	54.6	38.5		53.3	30.3		66.2	41.2	
Queue Length 50th (ft)	100	237	0	38	250		112	155		79	208	
Queue Length 95th (ft)	#215	341	64	88	341		#211	242		#189	316	
Internal Link Dist (ft)		2152			2753			911			1408	
Turn Bay Length (ft)												
Base Capacity (vph)	285	1411	780	314	1344		532	1204		214	1060	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.56	0.58	0.46	0.19	0.59		0.65	0.47		0.59	0.66	

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year
8: Pala Rd (SR-76) & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3476		3072	3396		1583	3374	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3476		3072	3396		1583	3374	
Volume (vph)	153	778	340	58	665	90	330	394	146	120	458	207
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	161	819	358	61	700	95	347	415	154	126	482	218
RTOR Reduction (vph)	0	0	230	0	9	0	0	31	0	0	43	0
Lane Group Flow (vph)	161	819	128	61	786	0	347	538	0	126	657	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	13.7	34.6	34.6	7.5	28.4		14.4	29.6		9.1	24.3	
Effective Green, g (s)	13.7	34.6	34.6	7.5	28.4		14.4	29.6		9.1	24.3	
Actuated g/C Ratio	0.14	0.36	0.36	0.08	0.29		0.15	0.31		0.09	0.25	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	224	1265	506	123	1020		457	1038		149	847	
v/s Ratio Prot	c0.10	0.23		0.04	c0.23		c0.11	0.16		0.08	c0.19	
v/s Ratio Perm			0.09									
v/c Ratio	0.72	0.65	0.25	0.50	0.77		0.76	0.52		0.85	0.78	
Uniform Delay, d1	39.7	26.0	22.0	42.8	31.2		39.5	27.7		43.2	33.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.5	1.2	0.3	3.1	3.6		7.1	0.4		33.3	4.5	
Delay (s)	50.2	27.2	22.2	46.0	34.9		46.6	28.2		76.4	38.2	
Level of Service	D	C	C	D	C		D	C		E	D	
Approach Delay (s)		28.6			35.7			35.2			44.0	
Approach LOS		C			D			D			D	

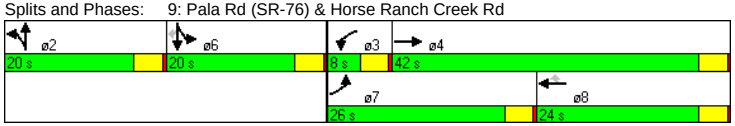
Intersection Summary				
HCM Average Control Delay	34.9	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	96.8	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

PM Horizon Year
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	354	750	740	64	29	0	73		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	26.0	42.0	24.0	24.0	20.0	20.0	20.0	20.0	8.0
Total Split (%)	28.9%	46.7%	26.7%	26.7%	22.2%	22.2%	22.2%	22%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	12.4	36.0	19.5	19.5	6.6	6.6	6.6		
Actuated g/C Ratio	0.21	0.60	0.32	0.32	0.11	0.11	0.11		
v/c Ratio	0.59	0.37	0.68	0.13	0.10	0.25	0.24		
Control Delay	25.9	6.9	21.9	5.9	26.9	17.1	12.7		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	25.9	6.9	21.9	5.9	26.9	17.1	12.7		
LOS	C	A	C	A	C	B	B		
Approach Delay		13.0	20.6			16.7			
Approach LOS		B	C			B			

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 60.2		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.68		
Intersection Signal Delay: 16.2	Intersection LOS: B	
Intersection Capacity Utilization 45.1%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



PM Horizon Year
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		250	0		0	150		150
Storage Lanes	2		0	1		1	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt						0.850					0.897	0.850
Flt Protected	0.950									0.950	0.985	
Satd. Flow (prot)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1498	1346
Flt Permitted	0.950									0.950	0.985	
Satd. Flow (perm)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1498	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						67					33	44
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2833			5160			734			1509	
Travel Time (s)		64.4			117.3			16.7			34.3	
Volume (vph)	354	750	0	0	740	64	0	0	0	29	0	73
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	373	789	0	0	779	67	0	0	0	31	0	77
Lane Group Flow (vph)	373	789	0	0	779	67	0	0	0	16	48	44
v/c Ratio	0.59	0.37			0.68	0.13				0.10	0.25	0.24
Control Delay	25.9	6.9			21.9	5.9				26.9	17.1	12.7
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	25.9	6.9			21.9	5.9				26.9	17.1	12.7
Queue Length 50th (ft)	63	65			124	0				5	5	0
Queue Length 95th (ft)	105	106			213	25				23	36	27
Internal Link Dist (ft)		2753			5080			654			1429	
Turn Bay Length (ft)	250					250				150		150
Base Capacity (vph)	971	2179			1172	514				347	371	345
Starvation Cap Reductn	0	0			0	0				0	0	0
Spillback Cap Reductn	0	0			0	0				0	0	0
Storage Cap Reductn	0	0			0	0				0	0	0
Reduced v/c Ratio	0.38	0.36			0.66	0.13				0.05	0.13	0.13

Intersection Summary
Area Type: Other

LOS Engineering

PM Horizon Year
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.90	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	0.98	1.00
Satd. Flow (prot)	3072	3539			3539	1417				1504	1497	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	0.98	1.00
Satd. Flow (perm)	3072	3539			3539	1417				1504	1497	1346
Volume (vph)	354	750	0	0	740	64	0	0	0	29	0	73
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	373	789	0	0	779	67	0	0	0	31	0	77
RTOR Reduction (vph)	0	0	0	0	0	45	0	0	0	0	29	39
Lane Group Flow (vph)	373	789	0	0	779	22	0	0	0	16	19	5
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	12.4	35.9			19.5	19.5				6.6	6.6	6.6
Effective Green, g (s)	12.4	35.9			19.5	19.5				6.6	6.6	6.6
Actuated g/C Ratio	0.21	0.60			0.32	0.32				0.11	0.11	0.11
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	635	2118			1150	461				165	165	148
v/s Ratio Prot	c0.12	0.22			c0.22					0.01	c0.01	
v/s Ratio Perm						0.02						0.00
v/c Ratio	0.59	0.37			0.68	0.05				0.10	0.11	0.03
Uniform Delay, d1	21.5	6.2			17.5	13.9				24.0	24.1	23.8
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	1.4	0.1			1.6	0.0				0.3	0.3	0.1
Delay (s)	22.9	6.3			19.1	13.9				24.3	24.4	23.9
Level of Service	C	A			B	B				C	C	C
Approach Delay (s)		11.7			18.7			0.0			24.2	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM Average Control Delay	15.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	21.5	
Intersection Capacity Utilization	45.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

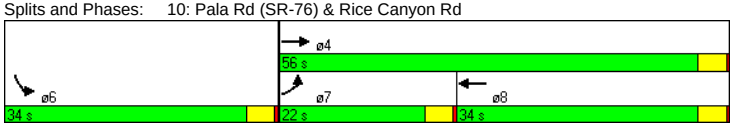
PM Horizon Year
10: Pala Rd (SR-76) & Rice Canyon Rd — Timings

Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	54	955	1169	60
Turn Type	Prot			
Protected Phases	7	4	8	6
Permitted Phases				
Detector Phases	7	4	8	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	22.0	56.0	34.0	34.0
Total Split (%)	24.4%	62.2%	37.8%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	None	None	Min
Act Effct Green (s)	7.5	37.4	30.7	8.3
Actuated g/C Ratio	0.13	0.69	0.57	0.15
v/c Ratio	0.28	0.41	0.64	0.48
Control Delay	27.2	4.3	12.2	18.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.2	4.3	12.2	18.2
LOS	C	A	B	B
Approach Delay		5.6	12.2	18.2
Approach LOS		A	B	B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 54
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 9.7 — Intersection LOS: A
Intersection Capacity Utilization 55.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 10: Pala Rd (SR-76) & Rice Canyon Rd



LOS Engineering

PM Horizon Year
10: Pala Rd (SR-76) & Rice Canyon Rd — Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.995		0.925	
Flt Protected	0.950				0.978	
Satd. Flow (prot)	1583	3539	3522	0	1508	0
Flt Permitted	0.950				0.978	
Satd. Flow (perm)	1583	3539	3522	0	1508	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			4		75	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		5160	470		1120	
Travel Time (s)		117.3	10.7		25.5	
Volume (vph)	54	955	1169	40	60	75
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	1005	1231	42	63	79
Lane Group Flow (vph)	57	1005	1273	0	142	0
v/c Ratio	0.28	0.41	0.64		0.48	
Control Delay	27.2	4.3	12.2		18.2	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	27.2	4.3	12.2		18.2	
Queue Length 50th (ft)	18	51	155		21	
Queue Length 95th (ft)	50	109	297		68	
Internal Link Dist (ft)		5080	390		1040	
Turn Bay Length (ft)						
Base Capacity (vph)	418	2690	2008		649	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.14	0.37	0.63		0.22	

Intersection Summary

Area Type: Other

LOS Engineering

PM Horizon Year
10: Pala Rd (SR-76) & Rice Canyon Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	1.00		0.92	
Flt Protected	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1583	3539	3522		1508	
Flt Permitted	0.95	1.00	1.00		0.98	
Satd. Flow (perm)	1583	3539	3522		1508	
Volume (vph)	54	955	1169	40	60	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	57	1005	1231	42	63	79
RTOR Reduction (vph)	0	0	2	0	64	0
Lane Group Flow (vph)	57	1005	1271	0	78	0
Turn Type	Prot					
Protected Phases	7	4	8		6	
Permitted Phases						
Actuated Green, G (s)	4.7	39.4	30.7		8.3	
Effective Green, g (s)	4.7	39.4	30.7		8.3	
Actuated g/C Ratio	0.08	0.71	0.55		0.15	
Clearance Time (s)	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	134	2503	1941		225	
v/s Ratio Prot	0.04	c0.28	c0.36		c0.05	
v/s Ratio Perm						
v/c Ratio	0.43	0.40	0.65		0.35	
Uniform Delay, d1	24.2	3.3	8.8		21.3	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.2	0.1	0.8		0.9	
Delay (s)	26.4	3.4	9.6		22.2	
Level of Service	C	A	A		C	
Approach Delay (s)		4.7	9.6		22.2	
Approach LOS		A	A		C	

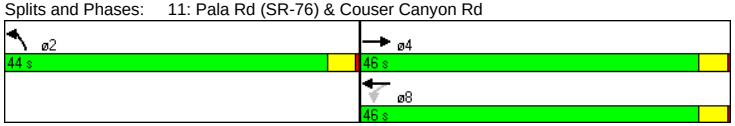
Intersection Summary			
HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

PM Horizon Year
11: Pala Rd (SR-76) & Couser Canyon Rd — Timings

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	865	40	1112	57
Turn Type		Perm		
Protected Phases	4		8	2
Permitted Phases		8		
Detector Phases	4	8	8	2
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	46.0	46.0	46.0	44.0
Total Split (%)	51.1%	51.1%	51.1%	48.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	Min
Act Effct Green (s)	18.6	18.6	18.6	7.2
Actuated g/C Ratio	0.54	0.54	0.54	0.21
v/c Ratio	0.51	0.25	0.61	0.24
Control Delay	5.7	8.1	6.6	13.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.7	8.1	6.6	13.1
LOS	A	A	A	B
Approach Delay	5.7		6.7	13.1
Approach LOS	A		A	B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 34.3		
Natural Cycle: 45		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.61		
Intersection Signal Delay: 6.5		Intersection LOS: A
Intersection Capacity Utilization 44.0%		ICU Level of Service A
Analysis Period (min) 15		

Splits and Phases: 11: Pala Rd (SR-76) & Couser Canyon Rd



PM Horizon Year
11: Pala Rd (SR-76) & Couser Canyon Rd — Queues

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50	
Trailing Detector (ft)	0		0	0	0	
Turning Speed (mph)		9	15		15	9
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.990				0.965	
Flt Protected			0.950		0.964	
Satd. Flow (prot)	3504	0	1583	3539	1550	0
Flt Permitted			0.188		0.964	
Satd. Flow (perm)	3504	0	313	3539	1550	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	10				21	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	470			11023	1081	
Travel Time (s)	10.7			250.5	24.6	
Volume (vph)	865	60	40	1112	57	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	911	63	42	1171	60	21
Lane Group Flow (vph)	974	0	42	1171	81	0
v/c Ratio	0.51		0.25	0.61	0.24	
Control Delay	5.7		8.1	6.6	13.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	5.7		8.1	6.6	13.1	
Queue Length 50th (ft)	41		3	55	9	
Queue Length 95th (ft)	87		17	113	42	
Internal Link Dist (ft)	390			10943	1001	
Turn Bay Length (ft)						
Base Capacity (vph)	2581		230	2604	941	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.38		0.18	0.45	0.09	

Intersection Summary

Area Type: Other

LOS Engineering

PM Horizon Year
11: Pala Rd (SR-76) & Couser Canyon Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.96	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	3505		1583	3539	1551	
Flt Permitted	1.00		0.26	1.00	0.96	
Satd. Flow (perm)	3505		436	3539	1551	
Volume (vph)	865	60	40	1112	57	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	911	63	42	1171	60	21
RTOR Reduction (vph)	4	0	0	0	17	0
Lane Group Flow (vph)	970	0	42	1171	64	0
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	18.6		18.6	18.6	7.2	
Effective Green, g (s)	18.6		18.6	18.6	7.2	
Actuated g/C Ratio	0.55		0.55	0.55	0.21	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1929		240	1947	330	
v/s Ratio Prot	0.28			c0.33	c0.04	
v/s Ratio Perm			0.10			
v/c Ratio	0.50		0.17	0.60	0.20	
Uniform Delay, d1	4.7		3.8	5.1	10.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		0.3	0.5	0.3	
Delay (s)	4.9		4.1	5.6	11.2	
Level of Service	A		A	A	B	
Approach Delay (s)	4.9			5.6	11.2	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	5.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	33.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

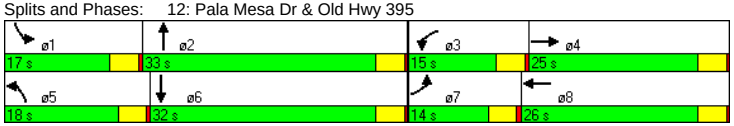
PM Horizon Year
12: Pala Mesa Dr & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	150	120	116	143	120	820	171	490
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	14.0	25.0	15.0	26.0	18.0	33.0	17.0	32.0
Total Split (%)	15.6%	27.8%	16.7%	28.9%	20.0%	36.7%	18.9%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	10.1	20.9	9.8	17.8	11.1	26.5	12.0	30.2
Actuated g/C Ratio	0.12	0.25	0.12	0.21	0.13	0.32	0.14	0.36
v/c Ratio	0.82	0.69	0.67	0.83	0.61	0.88	0.78	0.48
Control Delay	72.1	31.3	56.2	43.4	48.5	37.1	60.5	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	31.3	56.2	43.4	48.5	37.1	60.5	23.2
LOS	E	C	E	D	D	D	E	C
Approach Delay		44.3		46.7		38.4		31.7
Approach LOS		D		D		D		C

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 82.8
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 38.9 — Intersection LOS: D
Intersection Capacity Utilization 78.9% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395



LOS Engineering

PM Horizon Year
12: Pala Mesa Dr & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	0		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.906			0.914			0.981			0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1688	0	1583	1703	0	1583	3472	0	1583	3458	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1688	0	1583	1703	0	1583	3472	0	1583	3458	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		87			70			19			24	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3628			1500			4464			5461	
Travel Time (s)		82.5			34.1			101.5			124.1	
Volume (vph)	150	120	200	116	143	191	120	820	119	171	490	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	126	211	122	151	201	126	863	125	180	516	95
Lane Group Flow (vph)	158	337	0	122	352	0	126	988	0	180	611	0
v/c Ratio	0.82	0.69		0.67	0.83		0.61	0.88		0.78	0.48	
Control Delay	72.1	31.3		56.2	43.4		48.5	37.1		60.5	23.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	72.1	31.3		56.2	43.4		48.5	37.1		60.5	23.2	
Queue Length 50th (ft)	89	132		66	149		67	265		98	137	
Queue Length 95th (ft)	#206	#251		#139	#275		124	#385		#208	199	
Internal Link Dist (ft)		3548			1420			4384			5381	
Turn Bay Length (ft)							150			200		
Base Capacity (vph)	195	507		203	487		254	1203		249	1278	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.81	0.66		0.60	0.72		0.50	0.82		0.72	0.48	

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year

12: Pala Mesa Dr & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.91		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1688		1583	1703		1583	3472		1583	3457	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1688		1583	1703		1583	3472		1583	3457	
Volume (vph)	150	120	200	116	143	191	120	820	119	171	490	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	126	211	122	151	201	126	863	125	180	516	95
RTOR Reduction (vph)	0	66	0	0	54	0	0	13	0	0	15	0
Lane Group Flow (vph)	158	271	0	122	298	0	126	975	0	180	596	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.0	20.9		8.1	19.0		9.4	27.6		12.0	30.2	
Effective Green, g (s)	10.0	20.9		8.1	19.0		9.4	27.6		12.0	30.2	
Actuated g/C Ratio	0.12	0.25		0.10	0.22		0.11	0.33		0.14	0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	187	417		152	382		176	1133		225	1234	
v/s Ratio Prot	c0.10	0.16		0.08	c0.17		0.08	c0.28		c0.11	c0.17	
v/s Ratio Perm												
v/c Ratio	0.84	0.65		0.80	0.78		0.72	0.86		0.80	0.48	
Uniform Delay, d1	36.5	28.6		37.5	30.8		36.3	26.7		35.1	21.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.9	3.6		25.5	9.7		13.0	6.9		18.1	0.3	
Delay (s)	64.4	32.2		62.9	40.5		49.3	33.6		53.3	21.4	
Level of Service	E	C		E	D		D	C		D	C	
Approach Delay (s)		42.5			46.3			35.3			28.7	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	36.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

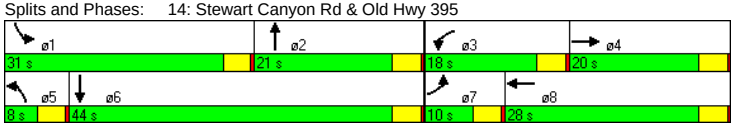
PM Horizon Year

14: Stewart Canyon Rd & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	20	25	117	13	70	679	302	673
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	10.0	20.0	18.0	28.0	8.0	21.0	31.0	44.0
Total Split (%)	11.1%	22.2%	20.0%	31.1%	8.9%	23.3%	34.4%	48.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.0	7.2	10.0	12.9	4.3	18.2	17.3	31.2
Actuated g/C Ratio	0.09	0.11	0.15	0.20	0.07	0.28	0.27	0.48
v/c Ratio	0.16	0.31	0.52	0.52	0.70	0.74	0.75	0.47
Control Delay	38.1	20.9	37.0	8.7	73.9	31.7	34.6	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	20.9	37.0	8.7	73.9	31.7	34.6	13.1
LOS	D	C	D	A	E	C	C	B
Approach Delay		25.0		17.5		35.6		19.2
Approach LOS		C		B		D		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 64.5		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.75		
Intersection Signal Delay: 24.6	Intersection LOS: C	
Intersection Capacity Utilization 66.8%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395



PM Horizon Year
14: Stewart Canyon Rd & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	200		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.907			0.858			0.995			0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1690	0	1583	1598	0	1583	3522	0	1583	3476	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1690	0	1583	1598	0	1583	3522	0	1583	3476	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			257			3			21	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1302			7424			5461			3410	
Travel Time (s)		29.6			168.7			124.1			77.5	
Volume (vph)	20	25	40	117	13	244	70	679	23	302	673	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	26	42	123	14	257	74	715	24	318	708	95
Lane Group Flow (vph)	21	68	0	123	271	0	74	739	0	318	803	0
v/c Ratio	0.16	0.31		0.52	0.52		0.70	0.74		0.75	0.47	
Control Delay	38.1	20.9		37.0	8.7		73.9	31.7		34.6	13.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.1	20.9		37.0	8.7		73.9	31.7		34.6	13.1	
Queue Length 50th (ft)	8	10		48	4		32	156		122	114	
Queue Length 95th (ft)	33	50		113	67		#125	#337		230	190	
Internal Link Dist (ft)		1222			7344			5381			3330	
Turn Bay Length (ft)				200			100			100		
Base Capacity (vph)	139	405		324	696		105	997		591	1932	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.17		0.38	0.39		0.70	0.74		0.54	0.42	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Horizon Year
14: Stewart Canyon Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.86		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1690		1583	1598		1583	3522		1583	3476	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1690		1583	1598		1583	3522		1583	3476	
Volume (vph)	20	25	40	117	13	244	70	679	23	302	673	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	26	42	123	14	257	74	715	24	318	708	95
RTOR Reduction (vph)	0	38	0	0	207	0	0	2	0	0	11	0
Lane Group Flow (vph)	21	30	0	123	64	0	74	737	0	318	792	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.9	6.5		8.3	12.9		4.3	18.2		17.3	31.2	
Effective Green, g (s)	1.9	6.5		8.3	12.9		4.3	18.2		17.3	31.2	
Actuated g/C Ratio	0.03	0.10		0.13	0.19		0.06	0.27		0.26	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	45	166		198	311		103	967		413	1636	
v/s Ratio Prot	0.01	0.02		c0.08	c0.04		0.05	c0.21		c0.20	0.23	
v/s Ratio Perm												
v/c Ratio	0.47	0.18		0.62	0.21		0.72	0.76		0.77	0.48	
Uniform Delay, d1	31.7	27.5		27.5	22.4		30.4	22.1		22.7	12.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.5	0.5		5.9	0.3		21.2	3.6		8.4	0.2	
Delay (s)	39.2	28.0		33.4	22.7		51.6	25.7		31.1	12.3	
Level of Service	D	C		C	C		D	C		C	B	
Approach Delay (s)		30.6			26.1			28.0			17.6	
Approach LOS		C			C			C			B	

Intersection Summary

HCM Average Control Delay	23.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	66.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

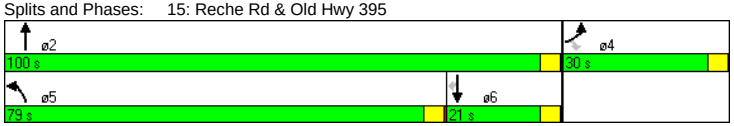
PM Horizon Year
15: Reche Rd & Old Hwy 395 — Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	300	215	841	222	70	400
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	30.0	30.0	79.0	100.0	21.0	21.0
Total Split (%)	23.1%	23.1%	60.8%	76.9%	16.2%	16.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	26.2	26.2	69.8	85.1	11.3	11.3
Actuated g/C Ratio	0.22	0.22	0.58	0.71	0.09	0.09
v/c Ratio	0.91	0.46	0.96	0.09	0.22	0.87
Control Delay	77.9	8.9	45.5	5.1	52.7	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.9	8.9	45.5	5.1	52.7	26.3
LOS	E	A	D	A	D	C
Approach Delay	49.1			37.0	30.3	
Approach LOS	D			D	C	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 119.4
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 38.5 — Intersection LOS: D
Intersection Capacity Utilization 86.4% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 15: Reche Rd & Old Hwy 395



LOS Engineering

PM Horizon Year
15: Reche Rd & Old Hwy 395 — Queues

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Storage Length (ft)	0	0	150			0
Storage Lanes	1	1	1			1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		226				388
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	2635			3410	4960	
Travel Time (s)	59.9			77.5	112.7	
Volume (vph)	300	215	841	222	70	400
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	226	885	234	74	421
Lane Group Flow (vph)	316	226	885	234	74	421
v/c Ratio	0.91	0.46	0.96	0.09	0.22	0.87
Control Delay	77.9	8.9	45.5	5.1	52.7	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.9	8.9	45.5	5.1	52.7	26.3
Queue Length 50th (ft)	251	0	593	25	29	25
Queue Length 95th (ft)	#463	71	#1002	37	54	#182
Internal Link Dist (ft)	2555			3330	4880	
Turn Bay Length (ft)			150			
Base Capacity (vph)	348	488	955	2615	485	529
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.46	0.93	0.09	0.15	0.80

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year
15: Reche Rd & Old Hwy 395 HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Volume (vph)	300	215	841	222	70	400
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	226	885	234	74	421
RTOR Reduction (vph)	0	176	0	0	0	351
Lane Group Flow (vph)	316	50	885	234	74	70
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	26.2	26.2	69.8	85.1	11.3	11.3
Effective Green, g (s)	26.2	26.2	69.8	85.1	11.3	11.3
Actuated g/C Ratio	0.22	0.22	0.59	0.71	0.09	0.09
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	348	311	926	2524	335	134
v/s Ratio Prot	c0.20		c0.56	0.07	0.02	
v/s Ratio Perm		0.04				c0.05
v/c Ratio	0.91	0.16	0.96	0.09	0.22	0.52
Uniform Delay, d1	45.4	37.6	23.3	5.2	49.9	51.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	26.3	0.2	19.5	0.0	0.3	3.6
Delay (s)	71.6	37.9	42.8	5.3	50.3	55.0
Level of Service	E	D	D	A	D	E
Approach Delay (s)	57.6			35.0	54.3	
Approach LOS	E			C	D	

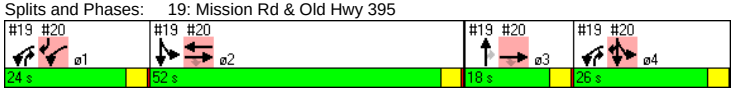
Intersection Summary			
HCM Average Control Delay	45.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	119.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

PM Horizon Year
19: Mission Rd & Old Hwy 395 Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	256	850	113	219	1200	64		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	50.0	0.0	18.0	50.0	52.0	52.0	24.0	26.0
Total Split (%)	41.7%	0.0%	15.0%	41.7%	43.3%	43.3%	20%	22%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	39.0	112.6	13.2	56.2	48.3	48.3		
Actuated g/C Ratio	0.35	1.00	0.12	0.50	0.43	0.43		
v/c Ratio	0.49	0.63	0.55	0.33	0.96	0.08		
Control Delay	35.9	2.9	58.7	17.8	49.5	22.0		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	35.9	2.9	58.7	17.8	49.5	22.0		
LOS	D	A	E	B	D	C		
Approach Delay	10.6		31.7			48.1		
Approach LOS	B		C			D		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 112.6		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.96		
Intersection Signal Delay: 30.7	Intersection LOS: C	
Intersection Capacity Utilization 67.4%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 19: Mission Rd & Old Hwy 395



PM Horizon Year
19: Mission Rd & Old Hwy 395 — Queues

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	256	850	113	219	1200	64
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	269	895	119	231	1263	67
Lane Group Flow (vph)	269	895	119	231	1263	67
v/c Ratio	0.49	0.63	0.55	0.33	0.96	0.08
Control Delay	35.9	2.9	58.7	17.8	49.5	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.9	2.9	58.7	17.8	49.5	22.0
Queue Length 50th (ft)	153	59	85	96	475	30
Queue Length 95th (ft)	m207	m44	151	150	#673	63
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	624	1417	233	775	1319	800
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.63	0.51	0.30	0.96	0.08

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Horizon Year
19: Mission Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Volume (vph)	256	850	113	219	1200	64
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	269	895	119	231	1263	67
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	269	895	119	231	1263	67
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	39.0	112.6	13.2	52.2	48.4	48.4
Effective Green, g (s)	39.0	112.6	13.2	52.2	48.4	48.4
Actuated g/C Ratio	0.35	1.00	0.12	0.46	0.43	0.43
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	548	1417	218	707	1320	801
v/s Ratio Prot	0.17		0.06	0.11	c0.41	0.04
v/s Ratio Perm		c0.63		0.05		
v/c Ratio	0.49	0.63	0.55	0.33	0.96	0.08
Uniform Delay, d1	29.0	0.0	46.9	19.1	31.1	19.0
Progression Factor	1.17	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.3	2.8	0.3	15.5	0.0
Delay (s)	34.5	1.3	49.7	19.4	46.6	19.0
Level of Service	C	A	D	B	D	B
Approach Delay (s)	9.0		29.7			45.2
Approach LOS	A		C			D

Intersection Summary				
HCM Average Control Delay	28.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	112.6	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	67.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

LOS Engineering

PM Horizon Year
20: Mission Rd & I-15 SB Ramps

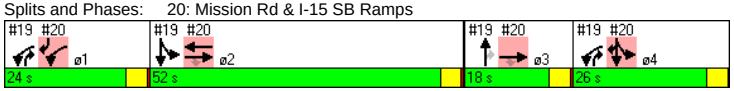
Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR	ø3
Lane Configurations							
Volume (vph)	1169	250	90	494	20	612	
Turn Type		Perm	Prot			custom	
Protected Phases	2 3		1	2	4	1 4	3
Permitted Phases		2 3				4	
Detector Phases	2 3	2 3	1	2	4	1 4	
Minimum Initial (s)			4.0	4.0	4.0		4.0
Minimum Split (s)			8.0	20.0	20.0		20.0
Total Split (s)	70.0	70.0	24.0	52.0	26.0	50.0	18.0
Total Split (%)	58.3%	58.3%	20.0%	43.3%	21.7%	41.7%	15%
Yellow Time (s)			3.5	3.5	3.5		3.5
All-Red Time (s)			0.5	0.5	0.5		0.5
Lead/Lag			Lead	Lag	Lag		Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes
Recall Mode			None	Min	None		None
Act Effct Green (s)	65.5	65.5	14.8	48.3	20.2	39.0	
Actuated g/C Ratio	0.58	0.58	0.13	0.43	0.18	0.35	
v/c Ratio	0.60	0.28	0.46	0.65	0.13	0.86	
Control Delay	4.9	0.4	52.8	31.9	41.5	24.7	
Queue Delay	0.7	0.0	0.0	0.0	0.0	0.0	
Total Delay	5.6	0.4	52.8	31.9	41.5	24.7	
LOS	A	A	D	C	D	C	
Approach Delay	4.7			35.1	25.7		
Approach LOS	A			D	C		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 112.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 16.5 Intersection LOS: B
Intersection Capacity Utilization 75.0% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



LOS Engineering

PM Horizon Year
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.976	
Satd. Flow (prot)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Flt Permitted				0.950							0.976	
Satd. Flow (perm)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			263									400
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	1169	250	90	494	0	0	0	0	20	20	612
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1231	263	95	520	0	0	0	0	21	21	644
Lane Group Flow (vph)	0	1231	263	95	520	0	0	0	0	0	42	644
v/c Ratio		0.60	0.28	0.46	0.65						0.13	0.86
Control Delay		4.9	0.4	52.8	31.9						41.5	24.7
Queue Delay		0.7	0.0	0.0	0.0						0.0	0.0
Total Delay		5.6	0.4	52.8	31.9						41.5	24.7
Queue Length 50th (ft)		57	0	66	311						26	181
Queue Length 95th (ft)		m70	m0	120	461						61	372
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		2089	944	283	800						358	801
Starvation Cap Reductn		473	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.76	0.28	0.34	0.65						0.12	0.80

Intersection Summary

Area Type: Other
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Horizon Year
20: Mission Rd & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (prot)		3539	1417	1583	1863						1817	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (perm)		3539	1417	1583	1863						1817	1417
Volume (vph)	0	1169	250	90	494	0	0	0	0	20	20	612
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1231	263	95	520	0	0	0	0	21	21	644
RTOR Reduction (vph)	0	0	110	0	0	0	0	0	0	0	0	261
Lane Group Flow (vph)	0	1231	153	95	520	0	0	0	0	0	42	383
Turn Type			Perm	Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases			2 3									4
Actuated Green, G (s)		65.6	65.6	14.8	48.4						20.2	39.0
Effective Green, g (s)		65.6	65.6	14.8	48.4						20.2	39.0
Actuated g/C Ratio		0.58	0.58	0.13	0.43						0.18	0.35
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		2062	826	208	801						326	491
v/s Ratio Prot		c0.35		0.06	c0.28						0.02	c0.27
v/s Ratio Perm			0.11									
v/c Ratio		0.60	0.19	0.46	0.65						0.13	0.78
Uniform Delay, d1		15.0	11.0	45.2	25.4						38.8	32.9
Progression Factor		0.26	0.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.2	0.1	1.6	1.8						0.2	7.7
Delay (s)		4.1	0.1	46.8	27.2						39.0	40.6
Level of Service		A	A	D	C						D	D
Approach Delay (s)		3.4			30.2			0.0			40.5	
Approach LOS		A			C			A			D	

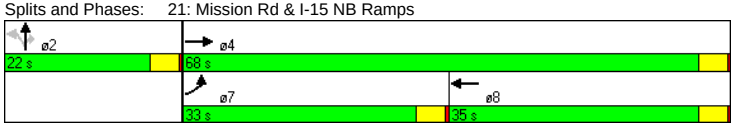
Intersection Summary				
HCM Average Control Delay	18.4	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	112.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	75.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

PM Horizon Year
21: Mission Rd & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	916	273	214	20	180
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	33.0	68.0	35.0	22.0	22.0
Total Split (%)	36.7%	75.6%	38.9%	24.4%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	27.9	46.4	14.5	18.1	18.1
Actuated g/C Ratio	0.38	0.64	0.20	0.25	0.25
v/c Ratio	0.82	0.24	0.66	0.90	0.38
Control Delay	28.0	6.0	35.2	54.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	6.0	35.2	54.4	6.9
LOS	C	A	D	D	A
Approach Delay		23.0	35.2	39.2	
Approach LOS		C	D	D	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 72.6		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.90		
Intersection Signal Delay: 29.0	Intersection LOS: C	
Intersection Capacity Utilization 75.0%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



PM Horizon Year
21: Mission Rd & I-15 NB Ramps — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.988				0.850			
Flt Protected	0.950							0.955				
Satd. Flow (prot)	3072	1863	0	0	1840	0	0	1779	1417	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3072	1863	0	0	1840	0	0	1779	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					6				189			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	916	273	0	0	214	20	360	20	180	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	964	287	0	0	225	21	379	21	189	0	0	0
Lane Group Flow (vph)	964	287	0	0	246	0	0	400	189	0	0	0
v/c Ratio	0.82	0.24			0.66			0.90	0.38			
Control Delay	28.0	6.0			35.2			54.4	6.9			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	28.0	6.0			35.2			54.4	6.9			
Queue Length 50th (ft)	194	47			102			178	0			
Queue Length 95th (ft)	#339	77			172			#380	50			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	1212	1325			646			445	496			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.80	0.22			0.38			0.90	0.38			

Intersection Summary
Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year
21: Mission Rd & I-15 NB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	0.97	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	3072	1863			1841			1778	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	3072	1863			1841			1778	1417			
Volume (vph)	916	273	0	0	214	20	360	20	180	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	964	287	0	0	225	21	379	21	189	0	0	0
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	142	0	0	0
Lane Group Flow (vph)	964	287	0	0	241	0	0	400	47	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	27.9	46.4			14.5			18.1	18.1			
Effective Green, g (s)	27.9	46.4			14.5			18.1	18.1			
Actuated g/C Ratio	0.38	0.64			0.20			0.25	0.25			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	1182	1192			368			444	354			
v/s Ratio Prot	c0.31	0.15			c0.13							
v/s Ratio Perm								0.22	0.03			
v/c Ratio	0.82	0.24			0.66			0.90	0.13			
Uniform Delay, d1	20.0	5.6			26.7			26.3	21.1			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	4.4	0.1			4.2			21.0	0.2			
Delay (s)	24.4	5.7			30.9			47.4	21.3			
Level of Service	C	A			C			D	C			
Approach Delay (s)		20.1			30.9			39.0			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Horizon Year

22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	20	310	224	23	25	100
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	326	236	24	26	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	575	79	132			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	575	79	132			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	67	84			
cM capacity (veh/h)	402	982	1454			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	347	260	132
Volume Left	21	236	0
Volume Right	326	0	105
cSH	903	1454	1700
Volume to Capacity	0.38	0.16	0.08
Queue Length 95th (ft)	46	14	0
Control Delay (s)	11.5	7.3	0.0
Lane LOS	B	A	
Approach Delay (s)	11.5	7.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

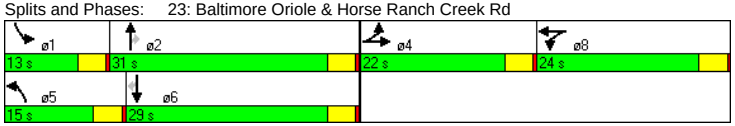
PM Horizon Year

23: Baltimore Oriole & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	30	13	90	27	60	211	95	24	271	50
Turn Type	Split		Split		Prot		Perm	Prot		Perm
Protected Phases	4	4	8	8	5	2		1	6	
Permitted Phases							2			6
Detector Phases	4	4	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	22.0	22.0	24.0	24.0	15.0	31.0	31.0	13.0	29.0	29.0
Total Split (%)	24.4%	24.4%	26.7%	26.7%	16.7%	34.4%	34.4%	14.4%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	7.8	7.8	9.2	9.2	8.9	43.6	43.6	7.4	37.2	37.2
Actuated g/C Ratio	0.11	0.11	0.13	0.13	0.13	0.66	0.66	0.10	0.57	0.57
v/c Ratio	0.18	0.17	0.33	0.32	0.31	0.18	0.10	0.16	0.27	0.06
Control Delay	25.9	17.4	25.5	21.2	25.4	9.7	3.7	29.2	14.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	17.4	25.5	21.2	25.4	9.7	3.7	29.2	14.9	6.1
LOS	C	B	C	C	C	A	A	C	B	A
Approach Delay		21.5		23.2		10.7			14.6	
Approach LOS		C		C		B			B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 65.6			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 38.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Baltimore Oriole & Horse Ranch Creek Rd



LOS Engineering

PM Horizon Year
23: Baltimore Oriole & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.910			0.966				0.850			0.850
Flt Protected	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (prot)	1583	1695	0	1504	1675	0	1583	1863	1417	1583	1863	1417
Flt Permitted	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (perm)	1583	1695	0	1504	1675	0	1583	1863	1417	1583	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			15				100			53
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1047			1324			958			2343	
Travel Time (s)		23.8			30.1			21.8			53.3	
Volume (vph)	30	13	20	90	27	16	60	211	95	24	271	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	14	21	95	28	17	63	222	100	25	285	53
Lane Group Flow (vph)	32	35	0	65	75	0	63	222	100	25	285	53
v/c Ratio	0.18	0.17		0.33	0.32		0.31	0.18	0.10	0.16	0.27	0.06
Control Delay	25.9	17.4		25.5	21.2		25.4	9.7	3.7	29.2	14.9	6.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	17.4		25.5	21.2		25.4	9.7	3.7	29.2	14.9	6.1
Queue Length 50th (ft)	8	4		17	16		17	35	0	7	73	0
Queue Length 95th (ft)	35	29		60	58		56	121	28	30	165	22
Internal Link Dist (ft)		967			1244			878			2263	
Turn Bay Length (ft)												
Base Capacity (vph)	395	438		411	469		273	1262	992	211	1164	905
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.08		0.16	0.16		0.23	0.18	0.10	0.12	0.24	0.06

Intersection Summary

Area Type: Other

LOS Engineering

PM Horizon Year
23: Baltimore Oriole & Horse Ranch Creek Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	1695		1504	1676		1583	1863	1417	1583	1863	1417
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	1695		1504	1676		1583	1863	1417	1583	1863	1417
Volume (vph)	30	13	20	90	27	16	60	211	95	24	271	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	14	21	95	28	17	63	222	100	25	285	53
RTOR Reduction (vph)	0	19	0	0	14	0	0	0	41	0	0	25
Lane Group Flow (vph)	32	16	0	65	61	0	63	222	59	25	285	28
Turn Type	Split			Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	5.1	5.1		6.3	6.3		6.0	41.6	41.6	1.6	37.2	37.2
Effective Green, g (s)	5.1	5.1		6.3	6.3		6.0	41.6	41.6	1.6	37.2	37.2
Actuated g/C Ratio	0.07	0.07		0.09	0.09		0.08	0.59	0.59	0.02	0.53	0.53
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	114	122		134	150		135	1098	835	36	982	747
v/s Ratio Prot	c0.02	0.01		c0.04	0.04		c0.04	0.12		0.02	c0.15	
v/s Ratio Perm									0.04			0.02
v/c Ratio	0.28	0.13		0.49	0.41		0.47	0.20	0.07	0.69	0.29	0.04
Uniform Delay, d1	31.0	30.7		30.6	30.4		30.8	6.8	6.2	34.3	9.3	8.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.5		2.8	1.8		2.5	0.1	0.0	44.9	0.2	0.0
Delay (s)	32.4	31.1		33.4	32.2		33.3	6.9	6.3	79.1	9.5	8.1
Level of Service	C	C		C	C		C	A	A	E	A	A
Approach Delay (s)		31.7			32.7			11.0			14.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

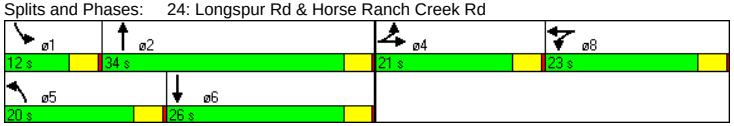
LOS Engineering

PM Horizon Year
24: Longspur Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	20	29	88	27	140	337	8	313
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	21.0	21.0	23.0	23.0	20.0	34.0	12.0	26.0
Total Split (%)	23.3%	23.3%	25.6%	25.6%	22.2%	37.8%	13.3%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	8.0	8.0	8.9	8.9	12.3	48.2	6.3	35.5
Actuated g/C Ratio	0.10	0.10	0.11	0.11	0.16	0.63	0.07	0.46
v/c Ratio	0.13	0.44	0.35	0.35	0.60	0.21	0.07	0.24
Control Delay	29.7	17.9	33.2	29.8	35.3	8.0	33.9	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	17.9	33.2	29.8	35.3	8.0	33.9	15.5
LOS	C	B	C	C	D	A	C	B
Approach Delay		19.9		31.4		14.6		15.9
Approach LOS		B		C		B		B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 76.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 17.3	Intersection LOS: B
Intersection Capacity Utilization 39.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 24: Longspur Rd & Horse Ranch Creek Rd



LOS Engineering

PM Horizon Year
24: Longspur Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.894			0.981			0.966			0.976	
Flt Protected	0.950			0.950	0.977		0.950			0.950		
Satd. Flow (prot)	1583	1665	0	1504	1696	0	1583	3419	0	1583	3454	0
Flt Permitted	0.950			0.950	0.977		0.950			0.950		
Satd. Flow (perm)	1583	1665	0	1504	1696	0	1583	3419	0	1583	3454	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		74			7			46			23	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1010			908			1206			958	
Travel Time (s)		23.0			20.6			27.4			21.8	
Volume (vph)	20	29	70	88	27	9	140	337	100	8	313	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	31	74	93	28	9	147	355	105	8	329	63
Lane Group Flow (vph)	21	105	0	60	70	0	147	460	0	8	392	0
v/c Ratio	0.13	0.44		0.35	0.35		0.60	0.21		0.07	0.24	
Control Delay	29.7	17.9		33.2	29.8		35.3	8.0		33.9	15.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	29.7	17.9		33.2	29.8		35.3	8.0		33.9	15.5	
Queue Length 50th (ft)	8	11		23	24		52	35		3	53	
Queue Length 95th (ft)	29	56		62	66		116	103		16	112	
Internal Link Dist (ft)		930			828			1126			878	
Turn Bay Length (ft)												
Base Capacity (vph)	323	399		339	387		325	2171		153	1617	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.07	0.26		0.18	0.18		0.45	0.21		0.05	0.24	

Intersection Summary	
Area Type:	Other

LOS Engineering

PM Horizon Year

24: Longspur Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	0.98		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1666		1504	1696		1583	3418		1583	3454	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1666		1504	1696		1583	3418		1583	3454	
Volume (vph)	20	29	70	88	27	9	140	337	100	8	313	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	31	74	93	28	9	147	355	105	8	329	63
RTOR Reduction (vph)	0	67	0	0	6	0	0	19	0	0	12	0
Lane Group Flow (vph)	21	38	0	60	64	0	147	441	0	8	380	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.1	7.1		8.0	8.0		11.2	47.6		1.4	37.8	
Effective Green, g (s)	7.1	7.1		8.0	8.0		11.2	47.6		1.4	37.8	
Actuated g/C Ratio	0.09	0.09		0.10	0.10		0.14	0.59		0.02	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	148		150	169		221	2031		28	1630	
v/s Ratio Prot	0.01	c0.02		c0.04	0.04		c0.09	0.13		0.01	c0.11	
v/s Ratio Perm												
v/c Ratio	0.15	0.25		0.40	0.38		0.67	0.22		0.29	0.23	
Uniform Delay, d1	33.7	34.0		33.8	33.7		32.7	7.6		38.9	12.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.9		1.7	1.4		7.3	0.2		5.6	0.3	
Delay (s)	34.2	34.9		35.5	35.1		40.0	7.8		44.4	12.9	
Level of Service	C	C		D	D		D	A		D	B	
Approach Delay (s)		34.8			35.3			15.6			13.5	
Approach LOS		C			D			B			B	

Intersection Summary				
HCM Average Control Delay	18.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	80.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	39.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

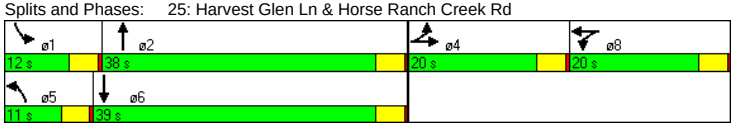
PM Horizon Year

25: Harvest Glen Ln & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	24	134	23	50	514	91	360
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	11.0	38.0	12.0	39.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	12.2%	42.2%	13.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.7	7.7	11.0	11.0	7.5	34.6	8.6	35.2
Actuated g/C Ratio	0.11	0.11	0.16	0.16	0.10	0.50	0.12	0.51
v/c Ratio	0.07	0.23	0.41	0.40	0.32	0.43	0.52	0.22
Control Delay	27.8	21.4	27.3	20.9	32.4	13.3	36.0	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.8	21.4	27.3	20.9	32.4	13.3	36.0	12.2
LOS	C	C	C	C	C	B	D	B
Approach Delay		22.7		23.9		14.6		16.9
Approach LOS		C		C		B		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 68.7		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.52		
Intersection Signal Delay: 16.9	Intersection LOS: B	
Intersection Capacity Utilization 48.5%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 25: Harvest Glen Ln & Horse Ranch Creek Rd



PM Horizon Year
25: Harvest Glen Ln & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.932			0.940			0.958			0.996	
Flt Protected	0.950			0.950	0.981		0.950			0.950		
Satd. Flow (prot)	1583	1736	0	1504	1632	0	1583	3391	0	1583	3525	0
Flt Permitted	0.950			0.950	0.981		0.950			0.950		
Satd. Flow (perm)	1583	1736	0	1504	1632	0	1583	3391	0	1583	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			32			73			4	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1058			1173			1033			1206	
Travel Time (s)		24.0			26.7			23.5			27.4	
Volume (vph)	10	24	20	134	23	43	50	514	200	91	360	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	25	21	141	24	45	53	541	211	96	379	11
Lane Group Flow (vph)	11	46	0	97	113	0	53	752	0	96	390	0
v/c Ratio	0.07	0.23		0.41	0.40		0.32	0.43		0.52	0.22	
Control Delay	27.8	21.4		27.3	20.9		32.4	13.3		36.0	12.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	27.8	21.4		27.3	20.9		32.4	13.3		36.0	12.2	
Queue Length 50th (ft)	3	8		31	26		17	103		30	51	
Queue Length 95th (ft)	19	39		85	80		57	184		#99	95	
Internal Link Dist (ft)		978			1093			953			1126	
Turn Bay Length (ft)												
Base Capacity (vph)	348	398		367	422		176	2086		199	2172	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.03	0.12		0.26	0.27		0.30	0.36		0.48	0.18	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Horizon Year
25: Harvest Glen Ln & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.93		1.00	0.94		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1735		1504	1632		1583	3390		1583	3524	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1735		1504	1632		1583	3390		1583	3524	
Volume (vph)	10	24	20	134	23	43	50	514	200	91	360	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	25	21	141	24	45	53	541	211	96	379	11
RTOR Reduction (vph)	0	20	0	0	27	0	0	38	0	0	2	0
Lane Group Flow (vph)	11	26	0	97	86	0	53	714	0	96	388	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.8	4.8		10.1	10.1		4.5	34.1		5.2	34.8	
Effective Green, g (s)	4.8	4.8		10.1	10.1		4.5	34.1		5.2	34.8	
Actuated g/C Ratio	0.07	0.07		0.14	0.14		0.06	0.49		0.07	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	108	119		216	235		101	1647		117	1747	
v/s Ratio Prot	0.01	c0.02		c0.06	0.05		0.03	c0.21		c0.06	0.11	
v/s Ratio Perm												
v/c Ratio	0.10	0.22		0.45	0.36		0.52	0.43		0.82	0.22	
Uniform Delay, d1	30.7	30.9		27.5	27.1		31.8	11.8		32.0	10.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.9		1.5	1.0		4.8	0.2		35.0	0.1	
Delay (s)	31.1	31.9		29.0	28.1		36.7	11.9		67.0	10.1	
Level of Service	C	C		C	C		D	B		E	B	
Approach Delay (s)		31.7			28.5			13.6			21.3	
Approach LOS		C			C			B			C	

Intersection Summary

HCM Average Control Delay	18.7	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	70.2	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	48.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

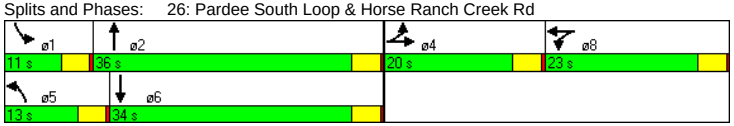
PM Horizon Year
26: Pardee South Loop & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	15	0	130	0	29	692	126	383
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	23.0	23.0	13.0	36.0	11.0	34.0
Total Split (%)	22.2%	22.2%	25.6%	25.6%	14.4%	40.0%	12.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.6	6.6	9.8	9.8	7.2	31.9	7.7	40.2
Actuated g/C Ratio	0.09	0.09	0.15	0.15	0.10	0.49	0.12	0.62
v/c Ratio	0.11	0.04	0.40	0.38	0.19	0.58	0.71	0.19
Control Delay	30.8	0.1	29.3	16.7	31.1	14.0	50.5	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	0.1	29.3	16.7	31.1	14.0	50.5	9.5
LOS	C	A	C	B	C	B	D	A
Approach Delay		14.1		22.4		14.5		19.4
Approach LOS		B		C		B		B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 65.2
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 16.9 — Intersection LOS: B
Intersection Capacity Utilization 56.6% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 26: Pardee South Loop & Horse Ranch Creek Rd



LOS Engineering

PM Horizon Year
26: Pardee South Loop & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.917			0.961			0.994	
Flt Protected	0.950			0.950	0.978		0.950			0.950		
Satd. Flow (prot)	1583	1583	0	1504	1587	0	1583	3401	0	1583	3518	0
Flt Permitted	0.950			0.950	0.978		0.950			0.950		
Satd. Flow (perm)	1583	1583	0	1504	1587	0	1583	3401	0	1583	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		418			60			60			5	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		869			1419			1340			1033	
Travel Time (s)		19.8			32.3			30.5			23.5	
Volume (vph)	15	0	18	130	0	57	29	692	240	126	383	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	0	19	137	0	60	31	728	253	133	403	16
Lane Group Flow (vph)	16	19	0	89	108	0	31	981	0	133	419	0
v/c Ratio	0.11	0.04		0.40	0.38		0.19	0.58		0.71	0.19	
Control Delay	30.8	0.1		29.3	16.7		31.1	14.0		50.5	9.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	30.8	0.1		29.3	16.7		31.1	14.0		50.5	9.5	
Queue Length 50th (ft)	4	0		22	11		7	97		33	17	
Queue Length 95th (ft)	25	0		83	65		39	247		#166	103	
Internal Link Dist (ft)		789			1339			1260			953	
Turn Bay Length (ft)												
Base Capacity (vph)	330	661		402	468		206	1930		188	2210	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.03		0.22	0.23		0.15	0.51		0.71	0.19	

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year

26: Pardee South Loop & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.92		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1583		1504	1587		1583	3402		1583	3519	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1583		1504	1587		1583	3402		1583	3519	
Volume (vph)	15	0	18	130	0	57	29	692	240	126	383	15
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	0	19	137	0	60	31	728	253	133	403	16
RTOR Reduction (vph)	0	18	0	0	52	0	0	30	0	0	2	0
Lane Group Flow (vph)	16	1	0	89	56	0	31	951	0	133	417	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	2.6	2.6		8.8	8.8		3.0	34.9		7.7	39.6	
Effective Green, g (s)	2.6	2.6		8.8	8.8		3.0	34.9		7.7	39.6	
Actuated g/C Ratio	0.04	0.04		0.13	0.13		0.04	0.50		0.11	0.57	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	59	59		189	200		68	1696		174	1991	
v/s Ratio Prot	c0.01	0.00		c0.06	0.04		0.02	c0.28		c0.08	0.12	
v/s Ratio Perm												
v/c Ratio	0.27	0.01		0.47	0.28		0.46	0.56		0.76	0.21	
Uniform Delay, d1	32.8	32.5		28.4	27.7		32.7	12.2		30.3	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.1		1.9	0.8		4.8	0.4		17.9	0.1	
Delay (s)	35.3	32.5		30.3	28.5		37.5	12.6		48.2	7.5	
Level of Service	D	C		C	C		D	B		D	A	
Approach Delay (s)		33.8			29.3			13.4			17.3	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	16.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	56.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Horizon Year

27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	70	871	50	0	517
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	74	917	53	0	544
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1215	485			969	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1215	485			969	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	86			100	
cM capacity (veh/h)	174	528			707	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	74	611	358	272	272
Volume Left	0	0	0	0	0
Volume Right	74	0	53	0	0
cSH	528	1700	1700	1700	1700
Volume to Capacity	0.14	0.36	0.21	0.16	0.16
Queue Length 95th (ft)	12	0	0	0	0
Control Delay (s)	12.9	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.9	0.0		0.0	
Approach LOS	B				

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

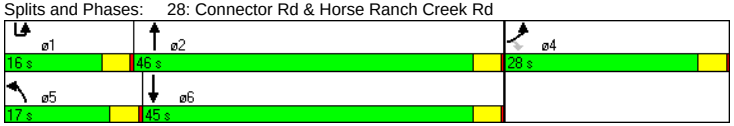
PM Horizon Year
28: Connector Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Configurations						
Volume (vph)	506	17	13	405	50	155
Turn Type		Perm	Prot		Prot	
Protected Phases	4		5	2	1	6
Permitted Phases		4				
Detector Phases	4	4	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	28.0	28.0	17.0	46.0	16.0	45.0
Total Split (%)	31.1%	31.1%	18.9%	51.1%	17.8%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	Min	None	Min
Act Effct Green (s)	12.1	12.1	6.4	10.5	7.1	12.6
Actuated g/C Ratio	0.34	0.34	0.15	0.30	0.17	0.35
v/c Ratio	0.51	0.04	0.06	0.41	0.20	0.38
Control Delay	12.6	6.6	22.1	13.5	19.8	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	6.6	22.1	13.5	19.8	4.4
LOS	B	A	C	B	B	A
Approach Delay	12.4			13.8		5.8
Approach LOS	B			B		A

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 35.5
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 10.4 — Intersection LOS: B
Intersection Capacity Utilization 44.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 28: Connector Rd & Horse Ranch Creek Rd



PM Horizon Year
28: Connector Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9		9
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	0.95
Frt		0.850				0.897	
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	3072	1417	1583	3539	1583	3175	0
Flt Permitted	0.950		0.950		0.950		
Satd. Flow (perm)	3072	1417	1583	3539	1583	3175	0
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		18				360	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30		30	
Link Distance (ft)	2875			1509		1400	
Travel Time (s)	65.3			34.3		31.8	
Volume (vph)	506	17	13	405	50	155	342
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	533	18	14	426	53	163	360
Lane Group Flow (vph)	533	18	14	426	53	523	0
v/c Ratio	0.51	0.04	0.06	0.41	0.20	0.38	
Control Delay	12.6	6.6	22.1	13.5	19.8	4.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.6	6.6	22.1	13.5	19.8	4.4	
Queue Length 50th (ft)	23	0	1	20	5	7	
Queue Length 95th (ft)	113	11	18	100	42	52	
Internal Link Dist (ft)	2795			1429		1320	
Turn Bay Length (ft)							
Base Capacity (vph)	1619	756	431	2268	423	2214	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.33	0.02	0.03	0.19	0.13	0.24	

Intersection Summary

Area Type: Other

PM Horizon Year
28: Connector Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	0.90	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	3072	1417	1583	3539	1583	3174	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	3072	1417	1583	3539	1583	3174	
Volume (vph)	506	17	13	405	50	155	342
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	533	18	14	426	53	163	360
RTOR Reduction (vph)	0	12	0	0	0	239	0
Lane Group Flow (vph)	533	6	14	426	53	284	0
Turn Type		Perm	Prot		Prot		
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	12.1	12.1	0.9	11.1	2.4	12.6	
Effective Green, g (s)	12.1	12.1	0.9	11.1	2.4	12.6	
Actuated g/C Ratio	0.32	0.32	0.02	0.30	0.06	0.34	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	989	456	38	1045	101	1064	
v/s Ratio Prot	c0.17		0.01	c0.12	c0.03	0.09	
v/s Ratio Perm		0.00					
v/c Ratio	0.54	0.01	0.37	0.41	0.52	0.27	
Uniform Delay, d1	10.5	8.7	18.1	10.6	17.0	9.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.0	6.0	0.3	4.8	0.1	
Delay (s)	11.0	8.7	24.0	10.9	21.9	9.3	
Level of Service	B	A	C	B	C	A	
Approach Delay (s)	11.0			11.3		10.4	
Approach LOS	B			B		B	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	37.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

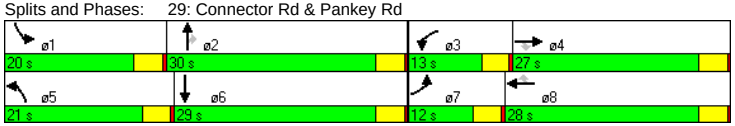
LOS Engineering

PM Horizon Year
29: Connector Rd & Pankey Rd — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	90	448	310	25	252	140	210	380	37	120	480
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot	
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	4	3	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	12.0	27.0	27.0	13.0	28.0	28.0	21.0	30.0	30.0	20.0	29.0
Total Split (%)	13.3%	30.0%	30.0%	14.4%	31.1%	31.1%	23.3%	33.3%	33.3%	22.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	7.6	24.9	24.9	7.0	20.1	20.1	14.8	31.0	31.0	11.5	25.2
Actuated g/C Ratio	0.09	0.31	0.31	0.08	0.25	0.25	0.18	0.38	0.38	0.14	0.31
v/c Ratio	0.66	0.87	0.51	0.21	0.58	0.32	0.77	0.56	0.07	0.58	0.91
Control Delay	60.6	48.4	6.5	42.2	34.1	6.8	51.9	27.4	8.3	44.8	52.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	48.4	6.5	42.2	34.1	6.8	51.9	27.4	8.3	44.8	52.4
LOS	E	D	A	D	C	A	D	C	A	D	D
Approach Delay		34.4			25.4			34.5			50.9
Approach LOS		C			C			C			D

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 81.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 37.0		Intersection LOS: D	
Intersection Capacity Utilization 86.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 29: Connector Rd & Pankey Rd



LOS Engineering

PM Horizon Year
29: Connector Rd & Pankey Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1852	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1852	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			326			147			39		2	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1256			2875			1488			1443	
Travel Time (s)		28.5			65.3			33.8			32.8	
Volume (vph)	90	448	310	25	252	140	210	380	37	120	480	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	472	326	26	265	147	221	400	39	126	505	21
Lane Group Flow (vph)	95	472	326	26	265	147	221	400	39	126	526	0
v/c Ratio	0.66	0.87	0.51	0.21	0.58	0.32	0.77	0.56	0.07	0.58	0.91	
Control Delay	60.6	48.4	6.5	42.2	34.1	6.8	51.9	27.4	8.3	44.8	52.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	60.6	48.4	6.5	42.2	34.1	6.8	51.9	27.4	8.3	44.8	52.4	
Queue Length 50th (ft)	48	226	0	13	129	0	107	165	0	62	264	
Queue Length 95th (ft)	#126	#505	71	39	206	44	#225	#319	23	120	#519	
Internal Link Dist (ft)		1176			2795			1408			1363	
Turn Bay Length (ft)												
Base Capacity (vph)	152	541	638	159	528	507	323	709	564	288	575	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.63	0.87	0.51	0.16	0.50	0.29	0.68	0.56	0.07	0.44	0.91	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Horizon Year
29: Connector Rd & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1852	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1852	
Volume (vph)	90	448	310	25	252	140	210	380	37	120	480	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	472	326	26	265	147	221	400	39	126	505	21
RTOR Reduction (vph)	0	0	230	0	0	109	0	0	25	0	1	0
Lane Group Flow (vph)	95	472	96	26	265	38	221	400	14	126	525	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	6.2	24.9	24.9	3.1	21.8	21.8	14.8	31.0	31.0	9.9	26.1	
Effective Green, g (s)	6.2	24.9	24.9	3.1	21.8	21.8	14.8	31.0	31.0	9.9	26.1	
Actuated g/C Ratio	0.07	0.29	0.29	0.04	0.26	0.26	0.17	0.37	0.37	0.12	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	116	519	395	58	478	364	276	680	517	185	569	
v/s Ratio Prot	c0.06	c0.27		0.02	0.14		c0.14	0.21		0.08	c0.28	
v/s Ratio Perm			0.07			0.03			0.01			
v/c Ratio	0.82	0.91	0.24	0.45	0.55	0.10	0.80	0.59	0.03	0.68	0.92	
Uniform Delay, d1	38.8	28.9	22.8	40.1	27.3	24.1	33.6	21.8	17.3	36.0	28.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	34.4	19.7	0.3	5.4	1.4	0.1	15.2	1.3	0.0	9.9	20.6	
Delay (s)	73.2	48.6	23.1	45.5	28.7	24.2	48.9	23.1	17.3	45.9	49.0	
Level of Service	E	D	C	D	C	C	D	C	B	D	D	
Approach Delay (s)		41.9			28.2			31.4			48.4	
Approach LOS		D			C			C			D	

Intersection Summary				
HCM Average Control Delay	38.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

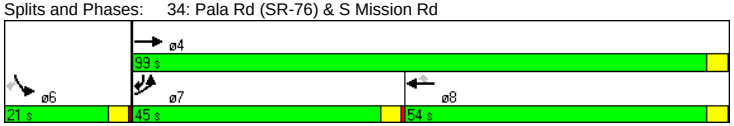
PM Horizon Year
34: Pala Rd (SR-76) & S Mission Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1000	1745	1363	223	282	550
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	45.0	99.0	54.0	54.0	21.0	45.0
Total Split (%)	37.5%	82.5%	45.0%	45.0%	17.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	41.0	95.0	50.0	50.0	17.0	62.0
Actuated g/C Ratio	0.34	0.79	0.42	0.42	0.14	0.52
v/c Ratio	1.00	0.46	0.97	0.33	0.68	0.45
Control Delay	68.2	4.5	52.5	5.7	57.8	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	4.5	52.5	5.7	57.8	19.7
LOS	E	A	D	A	E	B
Approach Delay		27.7	45.9		32.6	
Approach LOS		C	D		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 34.1 — Intersection LOS: C
Intersection Capacity Utilization 88.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



LOS Engineering

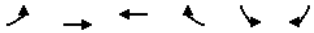
PM Horizon Year
34: Pala Rd (SR-76) & S Mission Rd — Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				208		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	1000	1745	1363	223	282	550
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1837	1435	235	297	579
Lane Group Flow (vph)	1053	1837	1435	235	297	579
v/c Ratio	1.00	0.46	0.97	0.33	0.68	0.45
Control Delay	68.2	4.5	52.5	5.7	57.8	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	4.5	52.5	5.7	57.8	19.7
Queue Length 50th (ft)	~421	139	564	12	114	154
Queue Length 95th (ft)	#570	159	#730	63	162	206
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	1050	4026	1475	712	435	1288
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.46	0.97	0.33	0.68	0.45

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

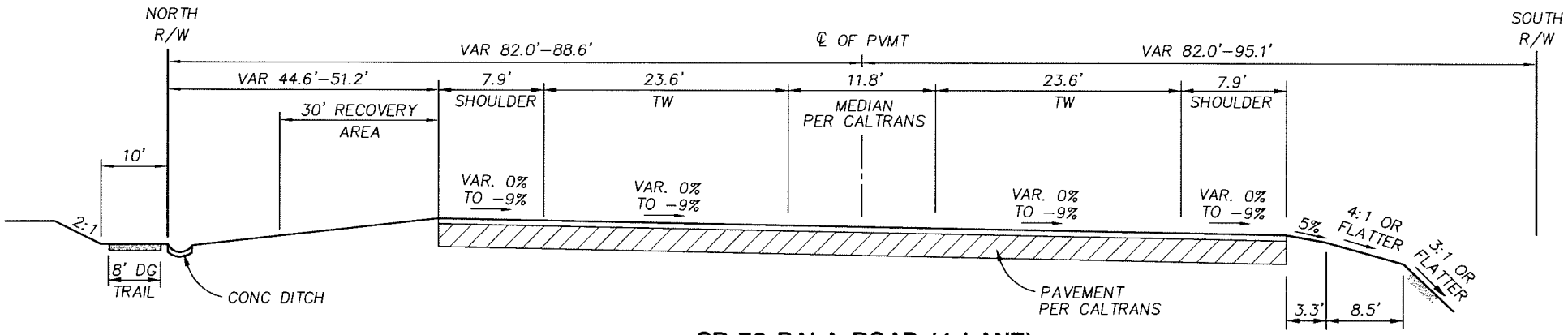


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Volume (vph)	1000	1745	1363	223	282	550
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1837	1435	235	297	579
RTOR Reduction (vph)	0	0	0	121	0	0
Lane Group Flow (vph)	1053	1837	1435	114	297	579
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	41.0	95.0	50.0	50.0	17.0	58.0
Effective Green, g (s)	41.0	95.0	50.0	50.0	17.0	58.0
Actuated g/C Ratio	0.34	0.79	0.42	0.42	0.14	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1050	4026	1475	590	435	1288
v/s Ratio Prot	c0.34	0.36	c0.41		c0.10	0.15
v/s Ratio Perm				0.08		0.08
v/c Ratio	1.00	0.46	0.97	0.19	0.68	0.45
Uniform Delay, d1	39.5	4.1	34.3	22.2	48.9	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.5	0.1	17.3	0.2	8.4	0.3
Delay (s)	68.0	4.2	51.6	22.4	57.3	20.7
Level of Service	E	A	D	C	E	C
Approach Delay (s)		27.4	47.5		33.1	
Approach LOS		C	D		C	

Intersection Summary			
HCM Average Control Delay	34.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

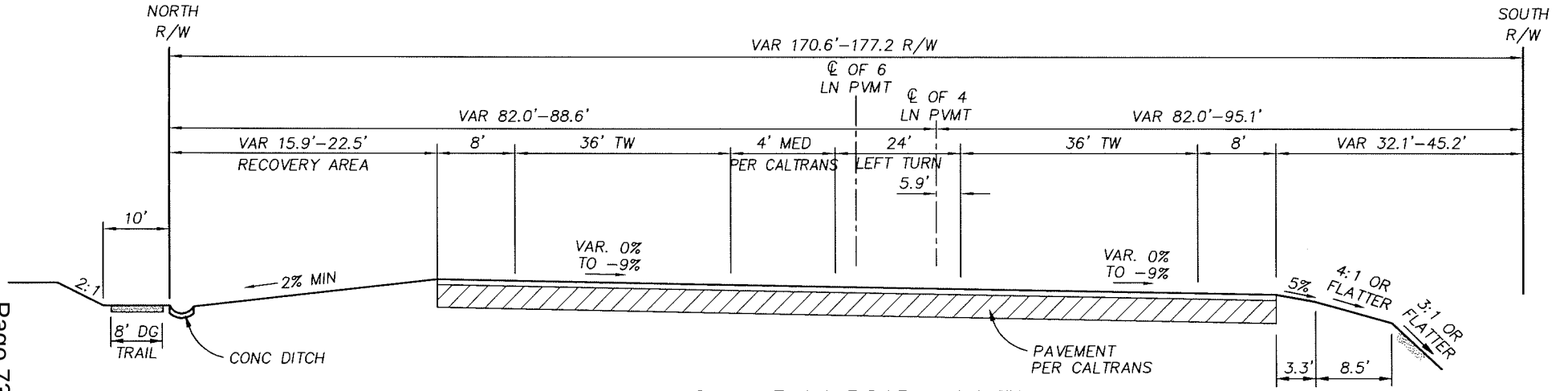
Appendix T

SR-76 Cross-section Right-Of-Way Along Project Frontage



SR-76 PALA ROAD (4 LANE)

NO SCALE



SR-76 PALA ROAD (6 LANE)

NO SCALE

Appendix U

Horizon Year (2030) + Project Intersection LOS Calculations

AM Horizon Year + Project
1: Pala Rd (SR-76) & Via Monserate

HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	1240	1970	50	100	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1305	2074	53	105	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2126				2774	1063
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2126				2774	1063
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				0	81
cM capacity (veh/h)	252				15	219

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	11	653	653	1382	744	42
Volume Left	11	0	0	0	0	0
Volume Right	0	0	0	0	53	42
cSH	252	1700	1700	1700	1700	219
Volume to Capacity	0.04	0.38	0.38	0.81	0.44	0.19
Queue Length 95th (ft)	3	0	0	0	0	17
Control Delay (s)	19.9	0.0	0.0	0.0	0.0	25.3
Lane LOS	C					D
Approach Delay (s)	0.2			0.0		Err
Approach LOS						F

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		Err%	ICU Level of Service H
Analysis Period (min)		15	

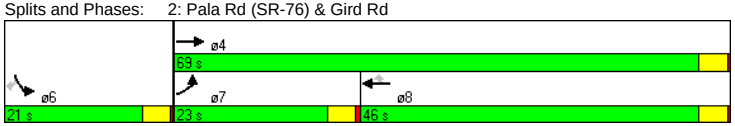
AM Horizon Year + Project
2: Pala Rd (SR-76) & Gird Rd

Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	160	1200	1340	50	90	140
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	23.0	69.0	46.0	46.0	21.0	21.0
Total Split (%)	25.6%	76.7%	51.1%	51.1%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	12.1	45.1	32.4	32.4	10.1	10.1
Actuated g/C Ratio	0.18	0.70	0.50	0.50	0.16	0.16
v/c Ratio	0.58	0.51	0.80	0.07	0.38	0.42
Control Delay	37.2	4.8	19.1	9.5	35.4	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	4.8	19.1	9.5	35.4	10.6
LOS	D	A	B	A	D	B
Approach Delay		8.6	18.8		20.3	
Approach LOS		A	B		C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 64.8		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.80		
Intersection Signal Delay: 14.3		Intersection LOS: B
Intersection Capacity Utilization 62.5%		ICU Level of Service B
Analysis Period (min) 15		

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				10		147
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	160	1200	1340	50	90	140
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	1263	1411	53	95	147
Lane Group Flow (vph)	168	1263	1411	53	95	147
v/c Ratio	0.58	0.51	0.80	0.07	0.38	0.42
Control Delay	37.2	4.8	19.1	9.5	35.4	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	4.8	19.1	9.5	35.4	10.6
Queue Length 50th (ft)	68	83	243	9	39	0
Queue Length 95th (ft)	145	155	438	32	93	51
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	429	2781	2047	824	411	477
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.45	0.69	0.06	0.23	0.31

Intersection Summary
Area Type: Other

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Volume (vph)	160	1200	1340	50	90	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	1263	1411	53	95	147
RTOR Reduction (vph)	0	0	0	5	0	124
Lane Group Flow (vph)	168	1263	1411	48	95	23
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	9.8	46.2	32.4	32.4	10.1	10.1
Effective Green, g (s)	9.8	46.2	32.4	32.4	10.1	10.1
Actuated g/C Ratio	0.15	0.72	0.50	0.50	0.16	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	241	2543	1783	714	249	223
v/s Ratio Prot	c0.11	0.36	c0.40		c0.06	
v/s Ratio Perm				0.03		0.02
v/c Ratio	0.70	0.50	0.79	0.07	0.38	0.10
Uniform Delay, d1	25.8	4.0	13.2	8.2	24.3	23.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	0.2	2.5	0.0	1.0	0.2
Delay (s)	34.3	4.1	15.6	8.2	25.3	23.4
Level of Service	C	A	B	A	C	C
Approach Delay (s)		7.7	15.4		24.2	
Approach LOS		A	B		C	

Intersection Summary				
HCM Average Control Delay	12.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	64.3	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

AM Horizon Year + Project
3: Pala Rd (SR-76) & Sage Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	1060	1590	10	0	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1116	1674	11	0	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1684				2258	842
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1684				2258	842
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	90
cM capacity (veh/h)	376				34	308

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	11	558	558	1116	568	32
Volume Left	11	0	0	0	0	0
Volume Right	0	0	0	0	11	32
cSH	376	1700	1700	1700	1700	308
Volume to Capacity	0.03	0.33	0.33	0.66	0.33	0.10
Queue Length 95th (ft)	2	0	0	0	0	8
Control Delay (s)	14.9	0.0	0.0	0.0	0.0	18.0
Lane LOS	B					C
Approach Delay (s)	0.1			0.0		18.0
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

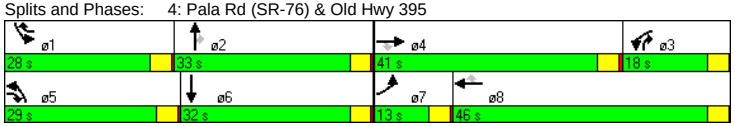
LOS Engineering

AM Horizon Year + Project
4: Pala Rd (SR-76) & Old Hwy 395 — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	100	700	160	90	1140	200	290	210	200	500	230
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	5	3	8	1	5	2	3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	13.0	41.0	29.0	18.0	46.0	28.0	29.0	33.0	18.0	28.0	32.0
Total Split (%)	10.8%	34.2%	24.2%	15.0%	38.3%	23.3%	24.2%	27.5%	15.0%	23.3%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	Min	None	None	Min	Min	Min	None	Min	Min
Act Effct Green (s)	9.0	29.9	53.8	20.2	41.0	67.6	23.9	27.5	47.7	22.6	26.1
Actuated g/C Ratio	0.08	0.26	0.46	0.17	0.35	0.58	0.21	0.24	0.41	0.19	0.22
v/c Ratio	0.85	0.81	0.23	0.35	0.96	0.24	0.94	0.50	0.35	0.88	0.92
Control Delay	103.5	48.1	1.9	50.2	55.3	3.6	82.4	43.5	12.4	63.0	69.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.5	48.1	1.9	50.2	55.3	3.6	82.4	43.5	12.4	63.0	69.8
LOS	F	D	A	D	E	A	F	D	B	E	E
Approach Delay		46.2			47.7			50.7			65.9
Approach LOS		D			D			D			E

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 116.2			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 51.8		Intersection LOS: D	
Intersection Capacity Utilization 89.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



LOS Engineering

AM Horizon Year + Project
4: Pala Rd (SR-76) & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	1		1	2		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1762	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1762	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168			168			38		22	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	100	700	160	90	1140	200	290	210	200	500	230	130
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	737	168	95	1200	211	305	221	211	526	242	137
Lane Group Flow (vph)	105	737	168	95	1200	211	305	221	211	526	379	0
v/c Ratio	0.85	0.81	0.23	0.35	0.96	0.24	0.94	0.50	0.35	0.88	0.92	
Control Delay	103.5	48.1	1.9	50.2	55.3	3.6	82.4	43.5	12.4	63.0	69.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	103.5	48.1	1.9	50.2	55.3	3.6	82.4	43.5	12.4	63.0	69.8	
Queue Length 50th (ft)	82	282	0	66	477	14	234	148	45	204	271	
Queue Length 95th (ft)	#190	331	20	128	#629	48	#405	228	91	#293	#447	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	123	1064	753	275	1271	892	338	460	604	628	436	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.85	0.69	0.22	0.35	0.94	0.24	0.90	0.48	0.35	0.84	0.87	

Intersection Summary
Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year + Project
4: Pala Rd (SR-76) & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1762	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1762	
Volume (vph)	100	700	160	90	1140	200	290	210	200	500	230	130
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	737	168	95	1200	211	305	221	211	526	242	137
RTOR Reduction (vph)	0	0	90	0	0	76	0	0	22	0	17	0
Lane Group Flow (vph)	105	737	78	95	1200	135	305	221	189	526	362	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	9.0	29.9	53.8	20.2	41.1	63.7	23.9	27.5	47.7	22.6	26.2	
Effective Green, g (s)	9.0	29.9	53.8	20.2	41.1	63.7	23.9	27.5	47.7	22.6	26.2	
Actuated g/C Ratio	0.08	0.26	0.46	0.17	0.35	0.55	0.21	0.24	0.41	0.19	0.23	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	123	911	656	275	1252	826	326	441	582	597	397	
v/s Ratio Prot	0.07	c0.21	0.02	0.06	c0.34	0.03	c0.19	0.12	0.06	0.17	c0.21	
v/s Ratio Perm			0.03			0.06			0.08			
v/c Ratio	0.85	0.81	0.12	0.35	0.96	0.16	0.94	0.50	0.32	0.88	0.91	
Uniform Delay, d1	52.9	40.5	17.7	42.2	36.7	13.0	45.4	38.4	23.3	45.5	43.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	40.3	5.4	0.1	0.8	16.3	0.1	33.2	0.9	0.3	14.3	24.7	
Delay (s)	93.2	45.8	17.8	42.9	53.0	13.1	78.6	39.3	23.6	59.7	68.6	
Level of Service	F	D	B	D	D	B	E	D	C	E	E	
Approach Delay (s)		46.1			46.8			51.1			63.4	
Approach LOS		D			D			D			E	

Intersection Summary				
HCM Average Control Delay	51.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	116.2	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	89.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Horizon Year + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

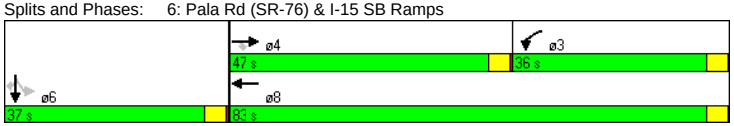
Timings

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	1000	400	450	830	150	10	600
Turn Type		Perm	Prot		Perm		Perm
Protected Phases	4		3	8		6	
Permitted Phases		4			6		6
Detector Phases	4	4	3	8	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	47.0	47.0	36.0	83.0	37.0	37.0	37.0
Total Split (%)	39.2%	39.2%	30.0%	69.2%	30.8%	30.8%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	42.7	42.7	21.8	68.5	43.5	43.5	43.5
Actuated g/C Ratio	0.36	0.36	0.18	0.57	0.36	0.36	0.36
v/c Ratio	0.84	0.56	0.85	0.43	0.29	0.50	0.52
Control Delay	42.0	6.7	65.8	15.8	31.8	16.5	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	6.7	65.8	15.8	31.8	16.5	16.4
LOS	D	A	E	B	C	B	B
Approach Delay	31.9			33.4		19.5	
Approach LOS	C			C		B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 29.7 Intersection LOS: C
Intersection Capacity Utilization 67.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



LOS Engineering

AM Horizon Year + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	2		0	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850								0.855	0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1417	3072	3539	0	0	0	0	1504	1449	1346
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3539	1417	3072	3539	0	0	0	0	1504	1449	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			391								192	192
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	1000	400	450	830	0	0	0	0	150	10	600
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1053	421	474	874	0	0	0	0	158	11	632
Lane Group Flow (vph)	0	1053	421	474	874	0	0	0	0	158	327	316
v/c Ratio		0.84	0.56	0.85	0.43					0.29	0.50	0.52
Control Delay		42.0	6.7	65.8	15.8					31.8	16.5	16.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		42.0	6.7	65.8	15.8					31.8	16.5	16.4
Queue Length 50th (ft)		376	15	188	225					93	84	74
Queue Length 95th (ft)		477	97	m232	m417					165	200	184
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		1327	776	819	2330					545	648	610
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.79	0.54	0.58	0.38					0.29	0.50	0.52

Intersection Summary

Area Type: Other
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

AM Horizon Year + Project
6: Pala Rd (SR-76) & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	1417	3072	3539					1504	1449	1346
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	1417	3072	3539					1504	1449	1346
Volume (vph)	0	1000	400	450	830	0	0	0	0	150	10	600
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1053	421	474	874	0	0	0	0	158	11	632
RTOR Reduction (vph)	0	0	252	0	0	0	0	0	0	0	122	122
Lane Group Flow (vph)	0	1053	169	474	874	0	0	0	0	158	205	194
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		42.7	42.7	21.8	68.5					43.5	43.5	43.5
Effective Green, g (s)		42.7	42.7	21.8	68.5					43.5	43.5	43.5
Actuated g/C Ratio		0.36	0.36	0.18	0.57					0.36	0.36	0.36
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1259	504	558	2020					545	525	488
v/s Ratio Prot		c0.30		c0.15	0.25							
v/s Ratio Perm			0.12							0.11	0.14	c0.14
v/c Ratio		0.84	0.34	0.85	0.43					0.29	0.39	0.40
Uniform Delay, d1		35.4	28.3	47.5	14.7					27.2	28.4	28.5
Progression Factor		1.00	1.00	1.19	1.08					1.00	1.00	1.00
Incremental Delay, d2		5.0	0.4	7.7	0.1					1.3	2.2	2.4
Delay (s)		40.4	28.7	64.1	16.0					28.6	30.6	30.9
Level of Service		D	C	E	B					C	C	C
Approach Delay (s)		37.1			32.9			0.0			30.3	
Approach LOS		D			C			A			C	

Intersection Summary				
HCM Average Control Delay	34.0	HCM Level of Service		C
HCM Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	67.2%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				

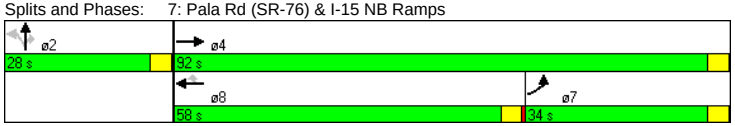
LOS Engineering

AM Horizon Year + Project
7: Pala Rd (SR-76) & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Volume (vph)	550	600	1000	140	280	10	390
Turn Type	Prot			Perm	Perm		Perm
Protected Phases	7	4	8			2	
Permitted Phases				8	2		2
Detector Phases	7	4	8	8	2	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	34.0	92.0	58.0	58.0	28.0	28.0	28.0
Total Split (%)	28.3%	76.7%	48.3%	48.3%	23.3%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	28.2	73.8	41.6	41.6	38.2	38.2	38.2
Actuated g/C Ratio	0.24	0.62	0.35	0.35	0.32	0.32	0.32
v/c Ratio	0.80	0.29	0.86	0.28	0.37	0.42	0.50
Control Delay	68.6	26.3	43.9	19.8	38.7	35.1	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.6	26.3	43.9	19.8	38.7	35.1	7.4
LOS	E	C	D	B	D	D	A
Approach Delay		46.5	41.0			23.4	
Approach LOS		D	D			C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 39.1		Intersection LOS: D	
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



LOS Engineering

AM Horizon Year + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	2		0	0		1	1		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Frt						0.850		0.939	0.850			
Flt Protected	0.950						0.950	0.973				
Satd. Flow (prot)	3072	3539	0	0	3539	1417	1504	1549	1346	0	0	0
Flt Permitted	0.950						0.950	0.973				
Satd. Flow (perm)	3072	3539	0	0	3539	1417	1504	1549	1346	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						43		25	325			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	550	600	0	0	1000	140	280	10	390	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	579	632	0	0	1053	147	295	11	411	0	0	0
Lane Group Flow (vph)	579	632	0	0	1053	147	179	213	325	0	0	0
v/c Ratio	0.80	0.29			0.86	0.28	0.37	0.42	0.50			
Control Delay	68.6	26.3			43.9	19.8	38.7	35.1	7.4			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	68.6	26.3			43.9	19.8	38.7	35.1	7.4			
Queue Length 50th (ft)	226	217			395	56	107	118	0			
Queue Length 95th (ft)	m236	m221			428	97	216	242	89			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	822	2595			1593	661	479	511	650			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.70	0.24			0.66	0.22	0.37	0.42	0.50			

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

AM Horizon Year + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.94	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (prot)	3072	3539			3539	1417	1504	1550	1346			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (perm)	3072	3539			3539	1417	1504	1550	1346			
Volume (vph)	550	600	0	0	1000	140	280	10	390	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	579	632	0	0	1053	147	295	11	411	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	28	0	17	222	0	0	0
Lane Group Flow (vph)	579	632	0	0	1053	119	179	196	103	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	28.2	73.8			41.6	41.6	38.2	38.2	38.2			
Effective Green, g (s)	28.2	73.8			41.6	41.6	38.2	38.2	38.2			
Actuated g/C Ratio	0.23	0.61			0.35	0.35	0.32	0.32	0.32			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	722	2176			1227	491	479	493	428			
v/s Ratio Prot	c0.19	0.18			c0.30							
v/s Ratio Perm						0.08	0.12	0.13	0.08			
v/c Ratio	0.80	0.29			0.86	0.24	0.37	0.40	0.24			
Uniform Delay, d1	43.3	10.8			36.5	28.0	31.6	31.9	30.2			
Progression Factor	1.47	2.50			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	4.1	0.0			6.2	0.3	2.2	2.4	1.3			
Delay (s)	67.5	27.1			42.6	28.2	33.9	34.3	31.5			
Level of Service	E	C			D	C	C	C	C			
Approach Delay (s)		46.5			40.8			32.9			0.0	
Approach LOS		D			D			C			A	

Intersection Summary

HCM Average Control Delay	41.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

AM Horizon Year + Project
8: Pala Rd (SR-76) & Pankey Rd

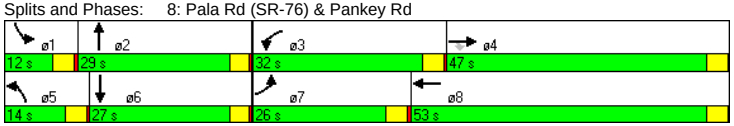
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	150	680	160	210	950	120	270	40	200
Turn Type	Prot		Perm	Prot		Prot		Prot	
Protected Phases	7	4		3	8	5	2	1	6
Permitted Phases			4						
Detector Phases	7	4	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	26.0	47.0	47.0	32.0	53.0	14.0	29.0	12.0	27.0
Total Split (%)	21.7%	39.2%	39.2%	26.7%	44.2%	11.7%	24.2%	10.0%	22.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	13.6	29.3	29.3	16.5	32.0	9.1	17.7	7.9	14.2
Actuated g/C Ratio	0.17	0.37	0.37	0.20	0.40	0.11	0.22	0.09	0.18
v/c Ratio	0.60	0.55	0.27	0.69	0.78	0.37	0.57	0.28	0.45
Control Delay	48.4	25.0	5.3	47.2	27.5	46.4	28.0	51.1	33.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.4	25.0	5.3	47.2	27.5	46.4	28.0	51.1	33.5
LOS	D	C	A	D	C	D	C	D	C
Approach Delay		25.4			30.8		31.9		35.8
Approach LOS		C			C		C		D

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 79.8
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 29.8 Intersection LOS: C
Intersection Capacity Utilization 68.3% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd



AM Horizon Year + Project
8: Pala Rd (SR-76) & Pankey Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.987			0.940			0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3493	0	3072	3327	0	1583	3401	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3493	0	3072	3327	0	1583	3401	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168		10			119			36	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2232			2833			991			1488	
Travel Time (s)		50.7			64.4			22.5			33.8	
Volume (vph)	150	680	160	210	950	90	120	270	180	40	200	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	716	168	221	1000	95	126	284	189	42	211	74
Lane Group Flow (vph)	158	716	168	221	1095	0	126	473	0	42	285	0
v/c Ratio	0.60	0.55	0.27	0.69	0.78		0.37	0.57		0.28	0.45	
Control Delay	48.4	25.0	5.3	47.2	27.5		46.4	28.0		51.1	33.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	48.4	25.0	5.3	47.2	27.5		46.4	28.0		51.1	33.5	
Queue Length 50th (ft)	80	161	0	111	264		32	94		21	64	
Queue Length 95th (ft)	184	294	47	239	459		81	188		70	133	
Internal Link Dist (ft)		2152			2753			911			1408	
Turn Bay Length (ft)												
Base Capacity (vph)	424	1728	778	512	1860		430	1161		177	1035	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.37	0.41	0.22	0.43	0.59		0.29	0.41		0.24	0.28	

Intersection Summary

Area Type: Other

AM Horizon Year + Project
8: Pala Rd (SR-76) & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3493		3072	3327		1583	3401	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3493		3072	3327		1583	3401	
Volume (vph)	150	680	160	210	950	90	120	270	180	40	200	70
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	716	168	221	1000	95	126	284	189	42	211	74
RTOR Reduction (vph)	0	0	106	0	6	0	0	93	0	0	29	0
Lane Group Flow (vph)	158	716	62	221	1089	0	126	380	0	42	256	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.7	29.4	29.4	13.3	32.0		6.3	17.7		3.7	15.1	
Effective Green, g (s)	10.7	29.4	29.4	13.3	32.0		6.3	17.7		3.7	15.1	
Actuated g/C Ratio	0.13	0.37	0.37	0.17	0.40		0.08	0.22		0.05	0.19	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	211	1299	520	263	1395		242	735		73	641	
v/s Ratio Prot	0.10	0.20		c0.14	c0.31		c0.04	c0.11		0.03	0.08	
v/s Ratio Perm			0.04									
v/c Ratio	0.75	0.55	0.12	0.84	0.78		0.52	0.52		0.58	0.40	
Uniform Delay, d1	33.4	20.1	16.8	32.4	21.0		35.4	27.4		37.4	28.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	0.5	0.1	20.8	2.9		2.0	0.6		10.5	0.4	
Delay (s)	46.9	20.6	16.9	53.2	23.9		37.5	28.1		47.9	28.9	
Level of Service	D	C	B	D	C		D	C		D	C	
Approach Delay (s)		24.0			28.8			30.0			31.4	
Approach LOS		C			C			C			C	

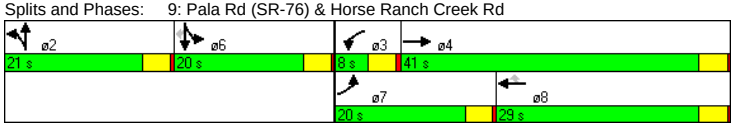
Intersection Summary			
HCM Average Control Delay	27.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

AM Horizon Year + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	460	440	850	90	80	0	400		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	20.0	41.0	29.0	29.0	20.0	20.0	20.0	21.0	8.0
Total Split (%)	22.2%	45.6%	32.2%	32.2%	22.2%	22.2%	22.2%	23%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	14.7	41.2	22.4	22.4	9.4	9.4	9.4		
Actuated g/C Ratio	0.21	0.60	0.33	0.33	0.14	0.14	0.14		
v/c Ratio	0.73	0.22	0.77	0.18	0.35	0.58	0.57		
Control Delay	34.0	6.8	26.8	5.6	32.5	12.1	11.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	34.0	6.8	26.8	5.6	32.5	12.1	11.3		
LOS	C	A	C	A	C	B	B		
Approach Delay		20.7	24.8			14.7			
Approach LOS		C	C			B			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 68.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 21.1		Intersection LOS: C	
Intersection Capacity Utilization 54.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



AM Horizon Year + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		250	0		0	150		150
Storage Lanes	2		0	1		1	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt						0.850					0.858	0.850
Flt Protected	0.950									0.950	0.997	
Satd. Flow (prot)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1450	1346
Flt Permitted	0.950									0.950	0.997	
Satd. Flow (perm)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1450	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						95					210	211
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2833			5160			734			1509	
Travel Time (s)		64.4			117.3			16.7			34.3	
Volume (vph)	460	440	0	0	850	90	0	0	0	80	0	400
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	484	463	0	0	895	95	0	0	0	84	0	421
Lane Group Flow (vph)	484	463	0	0	895	95	0	0	0	72	222	211
v/c Ratio	0.73	0.22			0.77	0.18				0.35	0.58	0.57
Control Delay	34.0	6.8			26.8	5.6				32.5	12.1	11.3
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	34.0	6.8			26.8	5.6				32.5	12.1	11.3
Queue Length 50th (ft)	101	39			176	0				31	5	0
Queue Length 95th (ft)	#182	77			278	31				68	65	56
Internal Link Dist (ft)		2753			5080			654			1429	
Turn Bay Length (ft)	250					250				150		150
Base Capacity (vph)	713	2166			1255	563				325	477	455
Starvation Cap Reductn	0	0			0	0				0	0	0
Spillback Cap Reductn	0	0			0	0				0	0	0
Storage Cap Reductn	0	0			0	0				0	0	0
Reduced v/c Ratio	0.68	0.21			0.71	0.17				0.22	0.47	0.46

Intersection Summary
Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.86	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3072	3539			3539	1417				1504	1451	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3072	3539			3539	1417				1504	1451	1346
Volume (vph)	460	440	0	0	850	90	0	0	0	80	0	400
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	484	463	0	0	895	95	0	0	0	84	0	421
RTOR Reduction (vph)	0	0	0	0	0	64	0	0	0	0	181	182
Lane Group Flow (vph)	484	463	0	0	895	31	0	0	0	72	41	29
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	14.7	41.2			22.5	22.5				9.4	9.4	9.4
Effective Green, g (s)	14.7	41.2			22.5	22.5				9.4	9.4	9.4
Actuated g/C Ratio	0.22	0.60			0.33	0.33				0.14	0.14	0.14
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	662	2138			1168	467				207	200	186
v/s Ratio Prot	c0.16	0.13			c0.25					c0.05	0.03	
v/s Ratio Perm						0.02						0.02
v/c Ratio	0.73	0.22			0.77	0.07				0.35	0.20	0.16
Uniform Delay, d1	24.9	6.1			20.5	15.7				26.6	26.1	25.9
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	4.2	0.1			3.1	0.1				1.0	0.5	0.4
Delay (s)	29.1	6.2			23.6	15.7				27.6	26.6	26.3
Level of Service	C	A			C	B				C	C	C
Approach Delay (s)		17.9			22.8			0.0			26.6	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM Average Control Delay	21.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	68.2	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	54.5%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

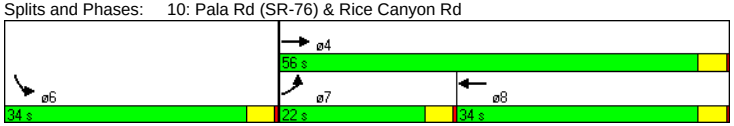
AM Horizon Year + Project
10: Pala Rd (SR-76) & Rice Canyon Rd — Timings

Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	40	1080	560	90
Turn Type	Prot			
Protected Phases	7	4	8	6
Permitted Phases				
Detector Phases	7	4	8	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	22.0	56.0	34.0	34.0
Total Split (%)	24.4%	62.2%	37.8%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	None	None	Min
Act Effct Green (s)	6.9	20.3	16.7	10.2
Actuated g/C Ratio	0.15	0.52	0.42	0.26
v/c Ratio	0.17	0.62	0.42	0.55
Control Delay	21.8	8.6	11.1	14.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.8	8.6	11.1	14.2
LOS	C	A	B	B
Approach Delay		9.1	11.1	14.2
Approach LOS		A	B	B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 39.4
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 10.3 — Intersection LOS: B
Intersection Capacity Utilization 52.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 10: Pala Rd (SR-76) & Rice Canyon Rd



AM Horizon Year + Project
10: Pala Rd (SR-76) & Rice Canyon Rd — Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.990		0.916	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1583	3539	3504	0	1499	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1583	3539	3504	0	1499	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			9		100	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		5160	470		1120	
Travel Time (s)		117.3	10.7		25.5	
Volume (vph)	40	1080	560	40	90	150
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	1137	589	42	95	158
Lane Group Flow (vph)	42	1137	631	0	253	0
v/c Ratio	0.17	0.62	0.42		0.55	
Control Delay	21.8	8.6	11.1		14.2	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	21.8	8.6	11.1		14.2	
Queue Length 50th (ft)	7	67	30		23	
Queue Length 95th (ft)	38	174	137		103	
Internal Link Dist (ft)		5080	390		1040	
Turn Bay Length (ft)						
Base Capacity (vph)	515	2621	2043		829	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.08	0.43	0.31		0.31	

Intersection Summary

Area Type: Other

AM Horizon Year + Project
10: Pala Rd (SR-76) & Rice Canyon Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	0.99		0.92	
Flt Protected	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1583	3539	3504		1498	
Flt Permitted	0.95	1.00	1.00		0.98	
Satd. Flow (perm)	1583	3539	3504		1498	
Volume (vph)	40	1080	560	40	90	150
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	1137	589	42	95	158
RTOR Reduction (vph)	0	0	5	0	75	0
Lane Group Flow (vph)	42	1137	626	0	178	0
Turn Type	Prot					
Protected Phases	7	4	8		6	
Permitted Phases						
Actuated Green, G (s)	2.4	23.1	16.7		10.2	
Effective Green, g (s)	2.4	23.1	16.7		10.2	
Actuated g/C Ratio	0.06	0.56	0.40		0.25	
Clearance Time (s)	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	92	1979	1417		370	
v/s Ratio Prot	0.03	c0.32	0.18		c0.12	
v/s Ratio Perm						
v/c Ratio	0.46	0.57	0.44		0.48	
Uniform Delay, d1	18.8	5.9	8.9		13.3	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	3.6	0.4	0.2		1.0	
Delay (s)	22.4	6.3	9.1		14.3	
Level of Service	C	A	A		B	
Approach Delay (s)		6.9	9.1		14.3	
Approach LOS		A	A		B	

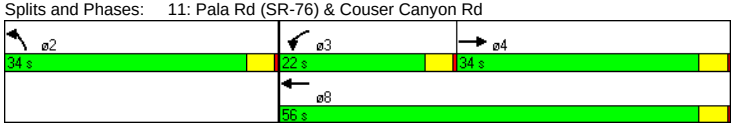
Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

AM Horizon Year + Project
11: Pala Rd (SR-76) & Couser Canyon Rd — Timings

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	1020	10	530	80
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phases	4	3	8	2
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	34.0	22.0	56.0	34.0
Total Split (%)	37.8%	24.4%	62.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	Min
Act Effct Green (s)	21.0	6.1	22.4	8.3
Actuated g/C Ratio	0.53	0.13	0.57	0.21
v/c Ratio	0.59	0.05	0.28	0.36
Control Delay	8.8	22.9	4.6	16.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.8	22.9	4.6	16.1
LOS	A	C	A	B
Approach Delay	8.8		5.0	16.1
Approach LOS	A		A	B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 39.4		
Natural Cycle: 55		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.59		
Intersection Signal Delay: 8.1	Intersection LOS: A	
Intersection Capacity Utilization 43.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 11: Pala Rd (SR-76) & Couser Canyon Rd



AM Horizon Year + Project
11: Pala Rd (SR-76) & Couser Canyon Rd — Queues

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50	
Trailing Detector (ft)	0		0	0	0	
Turning Speed (mph)		9	15		15	9
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.994				0.955	
Flt Protected			0.950		0.968	
Satd. Flow (prot)	3518	0	1583	3539	1541	0
Flt Permitted			0.950		0.968	
Satd. Flow (perm)	3518	0	1583	3539	1541	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	5				30	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	470			11023	1081	
Travel Time (s)	10.7			250.5	24.6	
Volume (vph)	1020	40	10	530	80	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1074	42	11	558	84	42
Lane Group Flow (vph)	1116	0	11	558	126	0
v/c Ratio	0.59		0.05	0.28	0.36	
Control Delay	8.8		22.9	4.6	16.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	8.8		22.9	4.6	16.1	
Queue Length 50th (ft)	56		2	23	16	
Queue Length 95th (ft)	220		17	55	73	
Internal Link Dist (ft)	390			10943	1001	
Turn Bay Length (ft)						
Base Capacity (vph)	2213		491	2696	789	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.50		0.02	0.21	0.16	

Intersection Summary
Area Type: Other

LOS Engineering

AM Horizon Year + Project
11: Pala Rd (SR-76) & Couser Canyon Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.95	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3519		1583	3539	1540	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3519		1583	3539	1540	
Volume (vph)	1020	40	10	530	80	40
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1074	42	11	558	84	42
RTOR Reduction (vph)	3	0	0	0	24	0
Lane Group Flow (vph)	1113	0	11	558	102	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	21.0		0.9	25.9	8.3	
Effective Green, g (s)	21.0		0.9	25.9	8.3	
Actuated g/C Ratio	0.50		0.02	0.61	0.20	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1751		34	2172	303	
v/s Ratio Prot	c0.32		0.01	c0.16	c0.07	
v/s Ratio Perm						
v/c Ratio	0.64		0.32	0.26	0.34	
Uniform Delay, d1	7.8		20.4	3.7	14.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.8		5.5	0.1	0.7	
Delay (s)	8.6		25.8	3.8	15.2	
Level of Service	A		C	A	B	
Approach Delay (s)	8.6			4.2	15.2	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	42.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

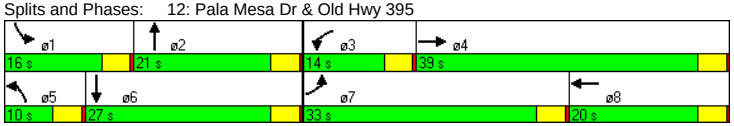
AM Horizon Year + Project
12: Pala Mesa Dr & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	400	130	120	70	60	370	150	720
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	33.0	39.0	14.0	20.0	10.0	21.0	16.0	27.0
Total Split (%)	36.7%	43.3%	15.6%	22.2%	11.1%	23.3%	17.8%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	23.6	25.4	9.6	11.2	6.6	16.6	10.9	20.6
Actuated g/C Ratio	0.32	0.35	0.13	0.15	0.09	0.23	0.15	0.28
v/c Ratio	0.82	0.85	0.62	0.55	0.45	0.65	0.68	0.79
Control Delay	40.5	27.2	52.1	29.4	50.9	31.9	52.4	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	27.2	52.1	29.4	50.9	31.9	52.4	34.3
LOS	D	C	D	C	D	C	D	C
Approach Delay		32.6		39.1		33.9		37.3
Approach LOS		C		D		C		D

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 72.7
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 35.1 — Intersection LOS: D
Intersection Capacity Utilization 79.9% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395



LOS Engineering

AM Horizon Year + Project
12: Pala Mesa Dr & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	0		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.884			0.916			0.961			0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1647	0	1583	1706	0	1583	3401	0	1583	3518	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1647	0	1583	1706	0	1583	3401	0	1583	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		226			62			48			4	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3628			1500			4464			5461	
Travel Time (s)		82.5			34.1			101.5			124.1	
Volume (vph)	400	130	450	120	70	90	60	370	130	150	720	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	137	474	126	74	95	63	389	137	158	758	32
Lane Group Flow (vph)	421	611	0	126	169	0	63	526	0	158	790	0
v/c Ratio	0.82	0.85		0.62	0.55		0.45	0.65		0.68	0.79	
Control Delay	40.5	27.2		52.1	29.4		50.9	31.9		52.4	34.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.5	27.2		52.1	29.4		50.9	31.9		52.4	34.3	
Queue Length 50th (ft)	199	194		65	53		33	124		80	203	
Queue Length 95th (ft)	#378	#345		#157	116		#94	#198		#185	#328	
Internal Link Dist (ft)		3548			1420			4384			5381	
Turn Bay Length (ft)							150			200		
Base Capacity (vph)	626	862		230	417		143	924		271	1174	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.67	0.71		0.55	0.41		0.44	0.57		0.58	0.67	

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year + Project
12: Pala Mesa Dr & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.88		1.00	0.92		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1646		1583	1706		1583	3401		1583	3518	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1646		1583	1706		1583	3401		1583	3518	
Volume (vph)	400	130	450	120	70	90	60	370	130	150	720	30
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	421	137	474	126	74	95	63	389	137	158	758	32
RTOR Reduction (vph)	0	147	0	0	55	0	0	37	0	0	3	0
Lane Group Flow (vph)	421	464	0	126	114	0	63	489	0	158	787	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	23.6	25.4		6.9	8.7		4.2	16.6		8.2	20.6	
Effective Green, g (s)	23.6	25.4		6.9	8.7		4.2	16.6		8.2	20.6	
Actuated g/C Ratio	0.32	0.35		0.09	0.12		0.06	0.23		0.11	0.28	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	511	572		149	203		91	772		178	991	
v/s Ratio Prot	c0.27	c0.28		0.08	0.07		0.04	0.14		c0.10	c0.22	
v/s Ratio Perm												
v/c Ratio	0.82	0.81		0.85	0.56		0.69	0.63		0.89	0.79	
Uniform Delay, d1	22.8	21.7		32.6	30.4		33.8	25.5		32.0	24.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.4	8.5		33.3	3.6		20.3	1.7		37.2	4.5	
Delay (s)	33.2	30.2		65.9	34.0		54.2	27.2		69.2	28.7	
Level of Service	C	C		E	C		D	C		E	C	
Approach Delay (s)		31.4			47.6			30.1			35.5	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM Average Control Delay	34.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	73.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

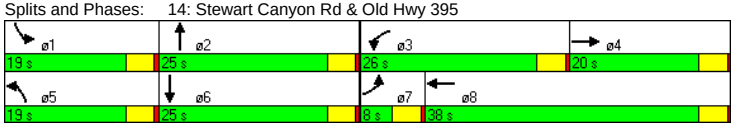
LOS Engineering

AM Horizon Year + Project
14: Stewart Canyon Rd & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	30	30	140	20	10	410	310	1010
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	8.0	20.0	26.0	38.0	19.0	25.0	19.0	25.0
Total Split (%)	8.9%	22.2%	28.9%	42.2%	21.1%	27.8%	21.1%	27.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	4.1	7.3	10.7	14.4	6.3	13.0	16.0	31.6
Actuated g/C Ratio	0.06	0.12	0.18	0.24	0.09	0.22	0.27	0.54
v/c Ratio	0.31	0.34	0.53	0.51	0.07	0.59	0.75	0.58
Control Delay	41.9	18.7	31.6	7.0	34.1	25.0	39.7	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.9	18.7	31.6	7.0	34.1	25.0	39.7	14.9
LOS	D	B	C	A	C	C	D	B
Approach Delay		25.0		14.8		25.2		20.6
Approach LOS		C		B		C		C

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 58.8		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.75		
Intersection Signal Delay: 20.6	Intersection LOS: C	
Intersection Capacity Utilization 67.2%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395



LOS Engineering

AM Horizon Year + Project
14: Stewart Canyon Rd & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	200		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.906			0.860			0.990			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1688	0	1583	1602	0	1583	3504	0	1583	3525	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1688	0	1583	1602	0	1583	3504	0	1583	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53			295			8			3	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1302			7424			5461			3410	
Travel Time (s)		29.6			168.7			124.1			77.5	
Volume (vph)	30	30	50	140	20	280	10	410	30	310	1010	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	32	53	147	21	295	11	432	32	326	1063	32
Lane Group Flow (vph)	32	85	0	147	316	0	11	464	0	326	1095	0
v/c Ratio	0.31	0.34		0.53	0.51		0.07	0.59		0.75	0.58	
Control Delay	41.9	18.7		31.6	7.0		34.1	25.0		39.7	14.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.9	18.7		31.6	7.0		34.1	25.0		39.7	14.9	
Queue Length 50th (ft)	12	11		50	5		4	81		116	135	
Queue Length 95th (ft)	#49	54		117	64		20	148		#342	#386	
Internal Link Dist (ft)		1222			7344			5381			3330	
Turn Bay Length (ft)				200			100			100		
Base Capacity (vph)	103	442		493	875		323	1139		432	1896	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.31	0.19		0.30	0.36		0.03	0.41		0.75	0.58	

Intersection Summary
Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year + Project
14: Stewart Canyon Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.86		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1689		1583	1602		1583	3503		1583	3524	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1689		1583	1602		1583	3503		1583	3524	
Volume (vph)	30	30	50	140	20	280	10	410	30	310	1010	30
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	32	53	147	21	295	11	432	32	326	1063	32
RTOR Reduction (vph)	0	48	0	0	229	0	0	6	0	0	2	0
Lane Group Flow (vph)	32	37	0	147	87	0	11	458	0	326	1093	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.3	6.6		9.1	14.4		1.1	16.7		16.0	31.6	
Effective Green, g (s)	1.3	6.6		9.1	14.4		1.1	16.7		16.0	31.6	
Actuated g/C Ratio	0.02	0.10		0.14	0.22		0.02	0.26		0.25	0.49	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	32	173		224	358		27	908		393	1729	
v/s Ratio Prot	0.02	0.02		c0.09	c0.05		0.01	0.13		c0.21	c0.31	
v/s Ratio Perm												
v/c Ratio	1.00	0.22		0.66	0.24		0.41	0.50		0.83	0.63	
Uniform Delay, d1	31.6	26.5		26.2	20.5		31.3	20.3		22.9	12.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	159.1	0.6		6.8	0.4		9.7	0.4		13.5	0.8	
Delay (s)	190.6	27.2		32.9	20.9		41.1	20.8		36.4	12.9	
Level of Service	F	C		C	C		D	C		D	B	
Approach Delay (s)		71.9			24.7			21.2			18.3	
Approach LOS		E			C			C			B	

Intersection Summary				
HCM Average Control Delay	22.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	64.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	67.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

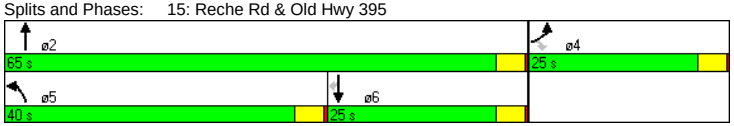
AM Horizon Year + Project
15: Reche Rd & Old Hwy 395 — Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	280	290	490	290	270	460
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	25.0	25.0	40.0	65.0	25.0	25.0
Total Split (%)	27.8%	27.8%	44.4%	72.2%	27.8%	27.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	16.6	16.6	26.0	42.9	12.4	12.4
Actuated g/C Ratio	0.24	0.24	0.38	0.63	0.18	0.18
v/c Ratio	0.77	0.53	0.85	0.14	0.44	0.74
Control Delay	42.1	7.5	35.9	5.4	29.5	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	7.5	35.9	5.4	29.5	10.9
LOS	D	A	D	A	C	B
Approach Delay	24.5			24.5	17.8	
Approach LOS	C			C	B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 68.3
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 22.2 — Intersection LOS: C
Intersection Capacity Utilization 68.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 15: Reche Rd & Old Hwy 395



LOS Engineering

AM Horizon Year + Project
15: Reche Rd & Old Hwy 395 — Queues

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Storage Length (ft)	0	0	150			0
Storage Lanes	1	1	1			1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		305				484
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	2635			3410	4960	
Travel Time (s)	59.9			77.5	112.7	
Volume (vph)	280	290	490	290	270	460
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	295	305	516	305	284	484
Lane Group Flow (vph)	295	305	516	305	284	484
v/c Ratio	0.77	0.53	0.85	0.14	0.44	0.74
Control Delay	42.1	7.5	35.9	5.4	29.5	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.1	7.5	35.9	5.4	29.5	10.9
Queue Length 50th (ft)	119	0	199	26	62	0
Queue Length 95th (ft)	#290	66	#431	42	107	90
Internal Link Dist (ft)	2555			3330	4880	
Turn Bay Length (ft)			150			
Base Capacity (vph)	478	641	747	2527	1012	751
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.48	0.69	0.12	0.28	0.64

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year + Project
15: Reche Rd & Old Hwy 395 HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Volume (vph)	280	290	490	290	270	460
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	295	305	516	305	284	484
RTOR Reduction (vph)	0	230	0	0	0	392
Lane Group Flow (vph)	295	75	516	305	284	92
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	16.6	16.6	26.0	42.9	12.9	12.9
Effective Green, g (s)	16.6	16.6	26.0	42.9	12.9	12.9
Actuated g/C Ratio	0.25	0.25	0.39	0.64	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	389	348	610	2249	676	271
v/s Ratio Prot	c0.19		c0.33	0.09	c0.08	
v/s Ratio Perm		0.05				0.07
v/c Ratio	0.76	0.22	0.85	0.14	0.42	0.34
Uniform Delay, d1	23.6	20.3	18.9	4.9	24.0	23.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.2	0.3	10.5	0.0	0.4	0.8
Delay (s)	31.8	20.6	29.4	4.9	24.4	24.4
Level of Service	C	C	C	A	C	C
Approach Delay (s)	26.1			20.3	24.4	
Approach LOS	C			C	C	

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

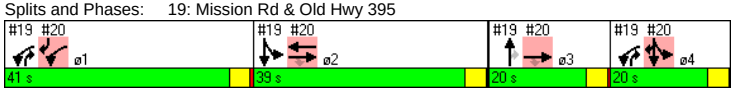
LOS Engineering

AM Horizon Year + Project
19: Mission Rd & Old Hwy 395 Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	230	1120	90	300	850	70		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	61.0	0.0	20.0	61.0	39.0	39.0	41.0	20.0
Total Split (%)	50.8%	0.0%	16.7%	50.8%	32.5%	32.5%	34%	17%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	57.0	117.7	13.6	74.7	35.0	35.0		
Actuated g/C Ratio	0.48	1.00	0.12	0.63	0.30	0.30		
v/c Ratio	0.32	0.83	0.44	0.35	0.98	0.13		
Control Delay	22.8	5.2	55.0	11.4	66.7	31.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	22.8	5.2	55.0	11.4	66.7	31.8		
LOS	C	A	D	B	E	C		
Approach Delay	8.2		21.5			64.1		
Approach LOS	A		C			E		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 117.7		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.01		
Intersection Signal Delay: 29.5	Intersection LOS: C	
Intersection Capacity Utilization 54.7%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 19: Mission Rd & Old Hwy 395



LOS Engineering

AM Horizon Year + Project
19: Mission Rd & Old Hwy 395 — Queues

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	230	1120	90	300	850	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	242	1179	95	316	895	74
Lane Group Flow (vph)	242	1179	95	316	895	74
v/c Ratio	0.32	0.83	0.44	0.35	0.98	0.13
Control Delay	22.8	5.2	55.0	11.4	66.7	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	5.2	55.0	11.4	66.7	31.8
Queue Length 50th (ft)	116	142	68	105	353	42
Queue Length 95th (ft)	m123	m117	123	158	#499	81
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	767	1417	253	899	914	554
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.83	0.38	0.35	0.98	0.13

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

AM Horizon Year + Project
19: Mission Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Volume (vph)	230	1120	90	300	850	70
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	242	1179	95	316	895	74
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	242	1179	95	316	895	74
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	57.0	117.6	13.6	70.6	35.0	35.0
Effective Green, g (s)	57.0	117.6	13.6	70.6	35.0	35.0
Actuated g/C Ratio	0.48	1.00	0.12	0.60	0.30	0.30
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	767	1417	215	899	914	554
v/s Ratio Prot	0.15		0.05	0.17	c0.29	0.04
v/s Ratio Perm		c0.83		0.05		
v/c Ratio	0.32	0.83	0.44	0.35	0.98	0.13
Uniform Delay, d1	18.4	0.0	48.5	11.9	40.9	30.2
Progression Factor	1.16	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	2.0	1.4	0.2	24.4	0.1
Delay (s)	21.5	2.0	49.9	12.1	65.4	30.3
Level of Service	C	A	D	B	E	C
Approach Delay (s)	5.3		20.9			62.7
Approach LOS	A		C			E

Intersection Summary				
HCM Average Control Delay	27.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	117.6	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

LOS Engineering

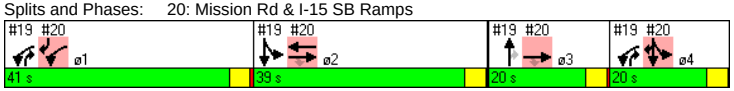
AM Horizon Year + Project
20: Mission Rd & I-15 SB Ramps

Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR	ø3
Lane Configurations							
Volume (vph)	820	330	120	460	10	870	
Turn Type		Perm	Prot			custom	
Protected Phases	2 3		1	2	4	1 4	3
Permitted Phases		2 3				4	
Detector Phases	2 3	2 3	1	2	4	1 4	
Minimum Initial (s)			4.0	4.0	4.0		4.0
Minimum Split (s)			8.0	20.0	20.0		20.0
Total Split (s)	59.0	59.0	41.0	39.0	20.0	61.0	20.0
Total Split (%)	49.2%	49.2%	34.2%	32.5%	16.7%	50.8%	17%
Yellow Time (s)			3.5	3.5	3.5		3.5
All-Red Time (s)			0.5	0.5	0.5		0.5
Lead/Lag			Lead	Lag	Lag		Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes
Recall Mode			None	Min	None		None
Act Effct Green (s)	52.7	52.7	37.0	35.0	16.0	57.0	
Actuated g/C Ratio	0.45	0.45	0.31	0.30	0.14	0.48	
v/c Ratio	0.55	0.42	0.25	0.87	0.09	1.01	
Control Delay	10.1	0.9	32.4	57.6	46.6	50.1	
Queue Delay	0.7	0.4	0.0	0.0	0.0	0.0	
Total Delay	10.8	1.3	32.4	57.6	46.6	50.1	
LOS	B	A	C	E	D	D	
Approach Delay	8.1			52.4	50.0		
Approach LOS	A			D	D		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 117.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 91.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.976	
Satd. Flow (prot)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Flt Permitted				0.950							0.976	
Satd. Flow (perm)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			347									426
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	820	330	120	460	0	0	0	0	10	10	870
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	863	347	126	484	0	0	0	0	11	11	916
Lane Group Flow (vph)	0	863	347	126	484	0	0	0	0	0	22	916
v/c Ratio		0.55	0.42	0.25	0.87						0.09	1.01
Control Delay		10.1	0.9	32.4	57.6						46.6	50.1
Queue Delay		0.7	0.4	0.0	0.0						0.0	0.0
Total Delay		10.8	1.3	32.4	57.6						46.6	50.1
Queue Length 50th (ft)		73	0	73	355						15	~563
Queue Length 95th (ft)		m82	m0	125	#552						41	#820
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1655	847	498	554						247	906
Starvation Cap Reductn		437	174	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.71	0.52	0.25	0.87						0.09	1.01

Intersection Summary
Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

AM Horizon Year + Project
20: Mission Rd & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (prot)		3539	1417	1583	1863						1817	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (perm)		3539	1417	1583	1863						1817	1417
Volume (vph)	0	820	330	120	460	0	0	0	0	10	10	870
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	863	347	126	484	0	0	0	0	11	11	916
RTOR Reduction (vph)	0	0	192	0	0	0	0	0	0	0	0	220
Lane Group Flow (vph)	0	863	155	126	484	0	0	0	0	0	22	696
Turn Type			Perm	Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases			2 3									4
Actuated Green, G (s)		52.6	52.6	37.0	35.0						16.0	57.0
Effective Green, g (s)		52.6	52.6	37.0	35.0						16.0	57.0
Actuated g/C Ratio		0.45	0.45	0.31	0.30						0.14	0.48
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1583	634	498	554						247	687
v/s Ratio Prot		c0.24		0.08	c0.26						0.01	c0.49
v/s Ratio Perm			0.11									
v/c Ratio		0.55	0.24	0.25	0.87						0.09	1.01
Uniform Delay, d1		23.8	20.2	30.0	39.2						44.4	30.3
Progression Factor		0.39	0.03	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.2	0.1	0.3	14.2						0.2	37.8
Delay (s)		9.5	0.8	30.3	53.4						44.6	68.1
Level of Service		A	A	C	D						D	E
Approach Delay (s)		7.0			48.6			0.0			67.6	
Approach LOS		A			D			A			E	

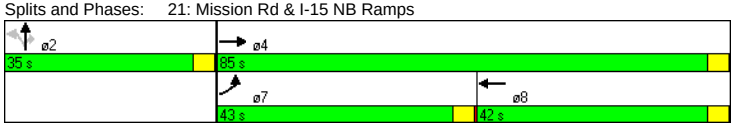
Intersection Summary				
HCM Average Control Delay	36.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	117.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	91.1%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

AM Horizon Year + Project
21: Mission Rd & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	650	180	330	10	90
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	43.0	85.0	42.0	35.0	35.0
Total Split (%)	35.8%	70.8%	35.0%	29.2%	29.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	21.3	45.2	19.1	16.3	16.3
Actuated g/C Ratio	0.30	0.64	0.27	0.23	0.23
v/c Ratio	0.74	0.16	0.73	0.67	0.24
Control Delay	29.6	6.0	35.5	37.4	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	6.0	35.5	37.4	8.6
LOS	C	A	D	D	A
Approach Delay		24.5	35.5	30.0	
Approach LOS		C	D	C	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 70.9		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.74		
Intersection Signal Delay: 28.3	Intersection LOS: C	
Intersection Capacity Utilization 91.1%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



AM Horizon Year + Project
21: Mission Rd & I-15 NB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.992				0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	3072	1863	0	0	1848	0	0	1777	1417	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3072	1863	0	0	1848	0	0	1777	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3				95			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	650	180	0	0	330	20	250	10	90	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	684	189	0	0	347	21	263	11	95	0	0	0
Lane Group Flow (vph)	684	189	0	0	368	0	0	274	95	0	0	0
v/c Ratio	0.74	0.16			0.73			0.67	0.24			
Control Delay	29.6	6.0			35.5			37.4	8.6			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	29.6	6.0			35.5			37.4	8.6			
Queue Length 50th (ft)	124	25			132			100	0			
Queue Length 95th (ft)	300	76			348			277	42			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	1421	1433			825			685	605			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.48	0.13			0.45			0.40	0.16			

Intersection Summary

Area Type: Other

LOS Engineering

AM Horizon Year + Project
21: Mission Rd & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	0.97	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	3072	1863			1848			1777	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	3072	1863			1848			1777	1417			
Volume (vph)	650	180	0	0	330	20	250	10	90	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	684	189	0	0	347	21	263	11	95	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	73	0	0	0
Lane Group Flow (vph)	684	189	0	0	366	0	0	274	22	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	21.3	45.2			19.9			16.3	16.3			
Effective Green, g (s)	21.3	45.2			19.9			16.3	16.3			
Actuated g/C Ratio	0.31	0.65			0.29			0.23	0.23			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	941	1212			529			417	332			
v/s Ratio Prot	c0.22	0.10			c0.20							
v/s Ratio Perm								0.15	0.02			
v/c Ratio	0.73	0.16			0.69			0.66	0.07			
Uniform Delay, d1	21.5	4.7			22.1			24.1	20.7			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	2.8	0.1			3.9			3.7	0.1			
Delay (s)	24.3	4.8			26.0			27.8	20.8			
Level of Service	C	A			C			C	C			
Approach Delay (s)		20.1			26.0			26.0			0.0	
Approach LOS		C			C			C			A	

Intersection Summary

HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	69.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

AM Horizon Year + Project

22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	30	320	290	20	30	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	337	305	21	32	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	679	47	63			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	679	47	63			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	67	80			
cM capacity (veh/h)	334	1022	1539			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	368	326	63
Volume Left	32	305	0
Volume Right	337	0	32
cSH	869	1539	1700
Volume to Capacity	0.42	0.20	0.04
Queue Length 95th (ft)	53	18	0
Control Delay (s)	12.2	7.5	0.0
Lane LOS	B	A	
Approach Delay (s)	12.2	7.5	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	9.1		
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

LOS Engineering

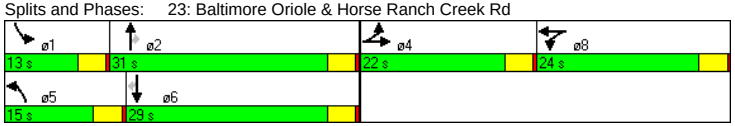
AM Horizon Year + Project

23: Baltimore Oriole & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	20	10	230	40	60	240	190	40	260	50
Turn Type	Split		Split		Prot		Perm	Prot		Perm
Protected Phases	4	4	8	8	5	2		1	6	
Permitted Phases							2			6
Detector Phases	4	4	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	22.0	22.0	24.0	24.0	15.0	31.0	31.0	13.0	29.0	29.0
Total Split (%)	24.4%	24.4%	26.7%	26.7%	16.7%	34.4%	34.4%	14.4%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	7.5	7.5	13.3	13.3	8.7	26.3	26.3	8.0	25.8	25.8
Actuated g/C Ratio	0.12	0.12	0.23	0.23	0.14	0.46	0.46	0.13	0.46	0.46
v/c Ratio	0.11	0.10	0.48	0.47	0.29	0.29	0.26	0.21	0.32	0.08
Control Delay	27.2	20.8	21.7	18.6	26.4	14.6	4.3	27.0	15.7	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	20.8	21.7	18.6	26.4	14.6	4.3	27.0	15.7	6.9
LOS	C	C	C	B	C	B	A	C	B	A
Approach Delay		23.9		20.1		12.1			15.7	
Approach LOS		C		C		B			B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 56.7			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 43.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Baltimore Oriole & Horse Ranch Creek Rd



LOS Engineering

AM Horizon Year + Project
23: Baltimore Oriole & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.925			0.949				0.850			0.850
Flt Protected	0.950			0.950	0.979		0.950			0.950		
Satd. Flow (prot)	1583	1723	0	1504	1644	0	1583	1863	1417	1583	1863	1417
Flt Permitted	0.950			0.950	0.979		0.950			0.950		
Satd. Flow (perm)	1583	1723	0	1504	1644	0	1583	1863	1417	1583	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			27				200			53
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1047			1324			958			2343	
Travel Time (s)		23.8			30.1			21.8			53.3	
Volume (vph)	20	10	10	230	40	60	60	240	190	40	260	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	11	11	242	42	63	63	253	200	42	274	53
Lane Group Flow (vph)	21	22	0	163	184	0	63	253	200	42	274	53
v/c Ratio	0.11	0.10		0.48	0.47		0.29	0.29	0.26	0.21	0.32	0.08
Control Delay	27.2	20.8		21.7	18.6		26.4	14.6	4.3	27.0	15.7	6.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	20.8		21.7	18.6		26.4	14.6	4.3	27.0	15.7	6.9
Queue Length 50th (ft)	2	1		14	13		6	20	0	4	22	0
Queue Length 95th (ft)	30	25		126	125		62	158	44	47	179	24
Internal Link Dist (ft)		967			1244			878			2263	
Turn Bay Length (ft)												
Base Capacity (vph)	440	487		543	611		310	1115	929	262	1084	847
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.05		0.30	0.30		0.20	0.23	0.22	0.16	0.25	0.06

Intersection Summary
Area Type: Other

LOS Engineering

AM Horizon Year + Project
23: Baltimore Oriole & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	1723		1504	1643		1583	1863	1417	1583	1863	1417
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	1723		1504	1643		1583	1863	1417	1583	1863	1417
Volume (vph)	20	10	10	230	40	60	60	240	190	40	260	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	11	11	242	42	63	63	253	200	42	274	53
RTOR Reduction (vph)	0	11	0	0	21	0	0	0	113	0	0	30
Lane Group Flow (vph)	21	11	0	163	163	0	63	253	87	42	274	23
Turn Type	Split			Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	2.5	2.5		12.2	12.2		3.3	25.9	25.9	2.8	25.4	25.4
Effective Green, g (s)	2.5	2.5		12.2	12.2		3.3	25.9	25.9	2.8	25.4	25.4
Actuated g/C Ratio	0.04	0.04		0.21	0.21		0.06	0.44	0.44	0.05	0.43	0.43
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	67	73		309	337		88	812	618	75	797	606
v/s Ratio Prot	c0.01	0.01		c0.11	0.10		c0.04	0.14		0.03	c0.15	
v/s Ratio Perm									0.06			0.02
v/c Ratio	0.31	0.16		0.53	0.48		0.72	0.31	0.14	0.56	0.34	0.04
Uniform Delay, d1	27.6	27.4		21.0	20.8		27.6	10.9	10.1	27.7	11.4	9.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	1.0		1.6	1.1		24.0	0.2	0.1	9.2	0.3	0.0
Delay (s)	30.3	28.4		22.7	21.9		51.6	11.2	10.2	36.9	11.7	9.9
Level of Service	C	C		C	C		D	B	B	D	B	A
Approach Delay (s)		29.3			22.3			15.7			14.3	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	17.5	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	43.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

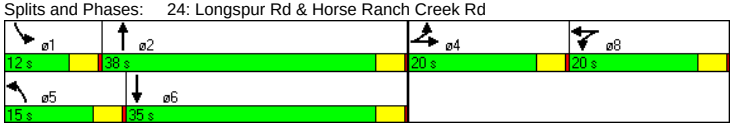
AM Horizon Year + Project
24: Longspur Rd & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	20	40	220	50	130	410	40	410
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	15.0	38.0	12.0	35.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	16.7%	42.2%	13.3%	38.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	7.8	7.8	12.3	12.3	10.0	40.6	7.0	35.8
Actuated g/C Ratio	0.10	0.10	0.16	0.16	0.13	0.53	0.09	0.46
v/c Ratio	0.13	0.44	0.65	0.64	0.69	0.37	0.30	0.30
Control Delay	35.0	24.5	44.2	38.3	52.7	11.7	41.5	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.0	24.5	44.2	38.3	52.7	11.7	41.5	16.4
LOS	C	C	D	D	D	B	D	B
Approach Delay		26.4		41.1		18.6		18.4
Approach LOS		C		D		B		B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 77.1			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 23.2		Intersection LOS: C	
Intersection Capacity Utilization 48.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 24: Longspur Rd & Horse Ranch Creek Rd



LOS Engineering

AM Horizon Year + Project
24: Longspur Rd & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.916			0.956			0.945			0.981	
Flt Protected	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (prot)	1583	1706	0	1504	1658	0	1583	3345	0	1583	3472	0
Flt Permitted	0.950			0.950	0.980		0.950			0.950		
Satd. Flow (perm)	1583	1706	0	1504	1658	0	1583	3345	0	1583	3472	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53			20			151			19	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1010			908			1206			958	
Travel Time (s)		23.0			20.6			27.4			21.8	
Volume (vph)	20	40	50	220	50	50	130	410	240	40	410	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	42	53	232	53	53	137	432	253	42	432	63
Lane Group Flow (vph)	21	95	0	157	181	0	137	685	0	42	495	0
v/c Ratio	0.13	0.44		0.65	0.64		0.69	0.37		0.30	0.30	
Control Delay	35.0	24.5		44.2	38.3		52.7	11.7		41.5	16.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.0	24.5		44.2	38.3		52.7	11.7		41.5	16.4	
Queue Length 50th (ft)	10	20		75	77		64	90		20	84	
Queue Length 95th (ft)	31	64		147	153		#152	156		53	140	
Internal Link Dist (ft)		930			828			1126			878	
Turn Bay Length (ft)												
Base Capacity (vph)	291	357		300	346		218	1832		155	1623	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.07	0.27		0.52	0.52		0.63	0.37		0.27	0.30	

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

AM Horizon Year + Project

24: Longspur Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.96		1.00	0.94		1.00	0.98	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1707		1504	1658		1583	3343		1583	3472	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1707		1504	1658		1583	3343		1583	3472	
Volume (vph)	20	40	50	220	50	50	130	410	240	40	410	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	42	53	232	53	53	137	432	253	42	432	63
RTOR Reduction (vph)	0	49	0	0	17	0	0	74	0	0	10	0
Lane Group Flow (vph)	21	46	0	157	164	0	137	611	0	42	485	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.4	6.4		12.3	12.3		8.3	40.6		4.4	36.7	
Effective Green, g (s)	6.4	6.4		12.3	12.3		8.3	40.6		4.4	36.7	
Actuated g/C Ratio	0.08	0.08		0.15	0.15		0.10	0.51		0.06	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	127	137		232	256		165	1703		87	1599	
v/s Ratio Prot	0.01	c0.03		c0.10	0.10		c0.09	c0.18		0.03	0.14	
v/s Ratio Perm												
v/c Ratio	0.17	0.34		0.68	0.64		0.83	0.36		0.48	0.30	
Uniform Delay, d1	34.2	34.6		31.8	31.6		35.0	11.7		36.5	13.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	1.5		7.6	5.4		28.3	0.6		4.2	0.5	
Delay (s)	34.8	36.1		39.4	37.0		63.3	12.3		40.7	14.0	
Level of Service	C	D		D	D		E	B		D	B	
Approach Delay (s)		35.9			38.1			20.8			16.1	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM Average Control Delay	23.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	48.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

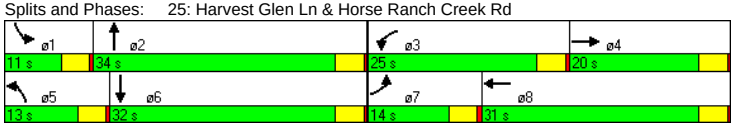
AM Horizon Year + Project

25: Harvest Glen Ln & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	30	260	30	60	650	80	580
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	14.0	20.0	25.0	31.0	13.0	34.0	11.0	32.0
Total Split (%)	15.6%	22.2%	27.8%	34.4%	14.4%	37.8%	12.2%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.4	7.0	15.6	19.8	7.6	27.4	7.1	29.6
Actuated g/C Ratio	0.09	0.10	0.24	0.30	0.11	0.41	0.10	0.45
v/c Ratio	0.08	0.23	0.73	0.26	0.37	0.66	0.51	0.40
Control Delay	38.3	29.8	37.5	8.1	39.2	20.3	46.7	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	29.8	37.5	8.1	39.2	20.3	46.7	17.9
LOS	D	C	D	A	D	C	D	B
Approach Delay		31.5		27.2		21.5		21.3
Approach LOS		C		C		C		C

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 66.2		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.73		
Intersection Signal Delay: 22.7	Intersection LOS: C	
Intersection Capacity Utilization 63.7%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 25: Harvest Glen Ln & Horse Ranch Creek Rd



AM Horizon Year + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.962			0.882			0.958			0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1792	0	1583	1643	0	1583	3391	0	1583	3522	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1792	0	1583	1643	0	1583	3391	0	1583	3522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			116			67			4	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1058			1173			1033			1206	
Travel Time (s)		24.0			26.7			23.5			27.4	
Volume (vph)	10	30	10	260	30	110	60	650	250	80	580	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	32	11	274	32	116	63	684	263	84	611	21
Lane Group Flow (vph)	11	43	0	274	148	0	63	947	0	84	632	0
v/c Ratio	0.08	0.23		0.73	0.26		0.37	0.66		0.51	0.40	
Control Delay	38.3	29.8		37.5	8.1		39.2	20.3		46.7	17.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	38.3	29.8		37.5	8.1		39.2	20.3		46.7	17.9	
Queue Length 50th (ft)	5	14		114	9		27	185		38	121	
Queue Length 95th (ft)	21	46		#222	56		70	282		#109	190	
Internal Link Dist (ft)		978			1093			953			1126	
Turn Bay Length (ft)												
Base Capacity (vph)	211	379		480	714		204	1568		170	1605	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.11		0.57	0.21		0.31	0.60		0.49	0.39	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Horizon Year + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.88		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1791		1583	1644		1583	3392		1583	3522	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1791		1583	1644		1583	3392		1583	3522	
Volume (vph)	10	30	10	260	30	110	60	650	250	80	580	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	32	11	274	32	116	63	684	263	84	611	21
RTOR Reduction (vph)	0	10	0	0	84	0	0	40	0	0	2	0
Lane Group Flow (vph)	11	33	0	274	64	0	63	907	0	84	630	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.2	5.4		15.6	19.8		4.4	28.6		5.5	29.7	
Effective Green, g (s)	1.2	5.4		15.6	19.8		4.4	28.6		5.5	29.7	
Actuated g/C Ratio	0.02	0.08		0.22	0.28		0.06	0.40		0.08	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	27	136		347	458		98	1364		122	1471	
v/s Ratio Prot	0.01	c0.02		c0.17	0.04		0.04	c0.27		c0.05	0.18	
v/s Ratio Perm												
v/c Ratio	0.41	0.24		0.79	0.14		0.64	0.66		0.69	0.43	
Uniform Delay, d1	34.6	30.9		26.2	19.3		32.6	17.3		32.0	14.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.7	0.9		11.3	0.1		13.5	1.2		15.0	0.2	
Delay (s)	44.3	31.8		37.5	19.4		46.1	18.6		46.9	14.9	
Level of Service	D	C		D	B		D	B		D	B	
Approach Delay (s)		34.4			31.2			20.3			18.6	
Approach LOS		C			C			C			B	

Intersection Summary

HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	71.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

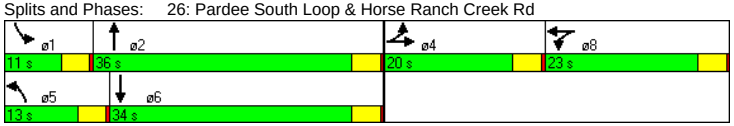
AM Horizon Year + Project
26: Pardee South Loop & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	70	0	240	0	60	770	50	780
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	23.0	23.0	13.0	36.0	11.0	34.0
Total Split (%)	22.2%	22.2%	25.6%	25.6%	14.4%	40.0%	12.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	8.8	8.8	12.9	12.9	7.8	31.3	6.9	30.5
Actuated g/C Ratio	0.13	0.13	0.20	0.20	0.12	0.50	0.10	0.49
v/c Ratio	0.35	0.15	0.59	0.56	0.34	0.52	0.32	0.49
Control Delay	35.3	0.8	34.0	21.1	37.8	17.9	39.6	18.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	0.8	34.0	21.1	37.8	17.9	39.6	18.7
LOS	D	A	C	C	D	B	D	B
Approach Delay		19.4		26.9		19.1		19.9
Approach LOS		B		C		B		B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 62			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 56.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 26: Pardee South Loop & Horse Ranch Creek Rd



AM Horizon Year + Project
26: Pardee South Loop & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.901			0.983			0.994	
Flt Protected	0.950			0.950	0.983		0.950			0.950		
Satd. Flow (prot)	1583	1583	0	1504	1567	0	1583	3479	0	1583	3518	0
Flt Permitted	0.950			0.950	0.983		0.950			0.950		
Satd. Flow (perm)	1583	1583	0	1504	1567	0	1583	3479	0	1583	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		235			99			17			5	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		869			1419			1340			1033	
Travel Time (s)		19.8			32.3			30.5			23.5	
Volume (vph)	70	0	60	240	0	140	60	770	100	50	780	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	0	63	253	0	147	63	811	105	53	821	32
Lane Group Flow (vph)	74	63	0	178	222	0	63	916	0	53	853	0
v/c Ratio	0.35	0.15		0.59	0.56		0.34	0.52		0.32	0.49	
Control Delay	35.3	0.8		34.0	21.1		37.8	17.9		39.6	18.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.3	0.8		34.0	21.1		37.8	17.9		39.6	18.7	
Queue Length 50th (ft)	29	0		73	48		25	173		21	163	
Queue Length 95th (ft)	78	0		161	134		72	288		65	277	
Internal Link Dist (ft)		789			1339			1260			953	
Turn Bay Length (ft)												
Base Capacity (vph)	366	546		442	530		228	1986		182	1945	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.20	0.12		0.40	0.42		0.28	0.46		0.29	0.44	

Intersection Summary	
Area Type:	Other

AM Horizon Year + Project

26: Pardee South Loop & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.90		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1583		1504	1567		1583	3478		1583	3519	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1583		1504	1567		1583	3478		1583	3519	
Volume (vph)	70	0	60	240	0	140	60	770	100	50	780	30
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	0	63	253	0	147	63	811	105	53	821	32
RTOR Reduction (vph)	0	58	0	0	82	0	0	9	0	0	3	0
Lane Group Flow (vph)	74	5	0	178	140	0	63	907	0	53	850	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.0	5.0		11.1	11.1		4.1	30.2		3.3	29.4	
Effective Green, g (s)	5.0	5.0		11.1	11.1		4.1	30.2		3.3	29.4	
Actuated g/C Ratio	0.08	0.08		0.17	0.17		0.06	0.46		0.05	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	121	121		254	265		99	1601		80	1577	
v/s Ratio Prot	c0.05	0.00		c0.12	0.09		c0.04	c0.26		0.03	0.24	
v/s Ratio Perm												
v/c Ratio	0.61	0.04		0.70	0.53		0.64	0.57		0.66	0.54	
Uniform Delay, d1	29.4	28.1		25.7	24.9		30.0	12.9		30.6	13.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.8	0.1		8.4	1.9		12.6	0.5		18.7	0.4	
Delay (s)	38.2	28.2		34.1	26.8		42.7	13.4		49.3	13.5	
Level of Service	D	C		C	C		D	B		D	B	
Approach Delay (s)		33.6			30.0			15.3			15.6	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM Average Control Delay	18.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	65.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

AM Horizon Year + Project

27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	150	770	230	0	1100
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	158	811	242	0	1158
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1511	526			1053	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1511	526			1053	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	68			100	
cM capacity (veh/h)	111	496			657	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	158	540	512	579	579
Volume Left	0	0	0	0	0
Volume Right	158	0	242	0	0
cSH	496	1700	1700	1700	1700
Volume to Capacity	0.32	0.32	0.30	0.34	0.34
Queue Length 95th (ft)	34	0	0	0	0
Control Delay (s)	15.6	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	15.6	0.0		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	45.7%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

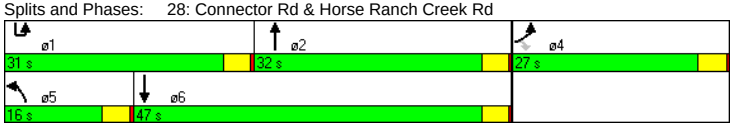
AM Horizon Year + Project
28: Connector Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Configurations						
Volume (vph)	280	20	20	540	190	460
Turn Type		Perm	Prot		Prot	
Protected Phases	4		5	2	1	6
Permitted Phases		4				
Detector Phases	4	4	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	27.0	27.0	16.0	32.0	31.0	47.0
Total Split (%)	30.0%	30.0%	17.8%	35.6%	34.4%	52.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	Min	None	Min
Act Effct Green (s)	9.9	9.9	6.5	19.7	11.2	30.3
Actuated g/C Ratio	0.21	0.21	0.12	0.43	0.23	0.66
v/c Ratio	0.47	0.07	0.11	0.37	0.54	0.43
Control Delay	20.3	10.1	26.9	15.3	22.9	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	10.1	26.9	15.3	22.9	4.6
LOS	C	B	C	B	C	A
Approach Delay	19.6			15.7		7.7
Approach LOS	B			B		A

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 46
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 11.7 — Intersection LOS: B
Intersection Capacity Utilization 50.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 28: Connector Rd & Horse Ranch Creek Rd



LOS Engineering

AM Horizon Year + Project
28: Connector Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9		9
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	0.95
Frt		0.850				0.923	
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	3072	1417	1583	3539	1583	3267	0
Flt Permitted	0.950		0.950		0.950		
Satd. Flow (perm)	3072	1417	1583	3539	1583	3267	0
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		21				403	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30		30	
Link Distance (ft)	2875			1509		1400	
Travel Time (s)	65.3			34.3		31.8	
Volume (vph)	280	20	20	540	190	460	480
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	295	21	21	568	200	484	505
Lane Group Flow (vph)	295	21	21	568	200	989	0
v/c Ratio	0.47	0.07	0.11	0.37	0.54	0.43	
Control Delay	20.3	10.1	26.9	15.3	22.9	4.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.3	10.1	26.9	15.3	22.9	4.6	
Queue Length 50th (ft)	34	0	5	65	44	30	
Queue Length 95th (ft)	86	16	26	143	122	126	
Internal Link Dist (ft)	2795			1429		1320	
Turn Bay Length (ft)							
Base Capacity (vph)	1175	555	329	1960	680	2511	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.25	0.04	0.06	0.29	0.29	0.39	

Intersection Summary

Area Type: Other

LOS Engineering

AM Horizon Year + Project
28: Connector Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	0.92	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	3072	1417	1583	3539	1583	3268	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	3072	1417	1583	3539	1583	3268	
Volume (vph)	280	20	20	540	190	460	480
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	295	21	21	568	200	484	505
RTOR Reduction (vph)	0	18	0	0	0	169	0
Lane Group Flow (vph)	295	3	21	568	200	820	0
Turn Type		Perm	Prot		Prot		
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	7.9	7.9	1.1	20.8	9.3	29.0	
Effective Green, g (s)	7.9	7.9	1.1	20.8	9.3	29.0	
Actuated g/C Ratio	0.16	0.16	0.02	0.42	0.19	0.58	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	485	224	35	1472	294	1895	
v/s Ratio Prot	c0.10		0.01	0.16	c0.13	c0.25	
v/s Ratio Perm		0.00					
v/c Ratio	0.61	0.01	0.60	0.39	0.68	0.43	
Uniform Delay, d1	19.6	17.8	24.2	10.2	19.0	5.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	0.0	24.7	0.2	6.3	0.2	
Delay (s)	21.8	17.8	48.9	10.3	25.3	6.0	
Level of Service	C	B	D	B	C	A	
Approach Delay (s)	21.5			11.7		9.3	
Approach LOS	C			B		A	

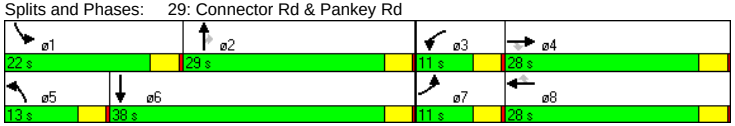
Intersection Summary				
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

AM Horizon Year + Project
29: Connector Rd & Pankey Rd — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	60	130	210	60	310	230	160	310	30	150	40
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot	
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	4	3	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	11.0	28.0	28.0	11.0	28.0	28.0	13.0	29.0	29.0	22.0	38.0
Total Split (%)	12.2%	31.1%	31.1%	12.2%	31.1%	31.1%	14.4%	32.2%	32.2%	24.4%	42.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	6.9	16.0	16.0	6.9	16.0	16.0	10.5	20.3	20.3	11.5	17.8
Actuated g/C Ratio	0.10	0.25	0.25	0.10	0.25	0.25	0.17	0.32	0.32	0.18	0.28
v/c Ratio	0.39	0.40	0.38	0.39	0.70	0.45	0.64	0.55	0.07	0.57	0.12
Control Delay	43.1	24.4	7.1	43.1	33.2	6.9	48.9	27.9	9.7	37.1	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	24.4	7.1	43.1	33.2	6.9	48.9	27.9	9.7	37.1	13.8
LOS	D	C	A	D	C	A	D	C	A	D	B
Approach Delay		19.8			24.1			33.5			30.5
Approach LOS		B			C			C			C

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 63.6		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.70		
Intersection Signal Delay: 26.6	Intersection LOS: C	
Intersection Capacity Utilization 59.0%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 29: Connector Rd & Pankey Rd



AM Horizon Year + Project
29: Connector Rd & Pankey Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.965	0.850			0.850			0.850		0.950	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1708	1346	1583	1863	1417	1583	1863	1417	1583	1770	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1708	1346	1583	1863	1417	1583	1863	1417	1583	1770	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16	180			242			32		21	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1256			2875			1488			1443	
Travel Time (s)		28.5			65.3			33.8			32.8	
Volume (vph)	60	130	210	60	310	230	160	310	30	150	40	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	137	221	63	326	242	168	326	32	158	42	21
Lane Group Flow (vph)	63	178	180	63	326	242	168	326	32	158	63	0
v/c Ratio	0.39	0.40	0.38	0.39	0.70	0.45	0.64	0.55	0.07	0.57	0.12	
Control Delay	43.1	24.4	7.1	43.1	33.2	6.9	48.9	27.9	9.7	37.1	13.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	43.1	24.4	7.1	43.1	33.2	6.9	48.9	27.9	9.7	37.1	13.8	
Queue Length 50th (ft)	26	61	0	26	127	0	71	127	0	63	13	
Queue Length 95th (ft)	#83	141	51	#83	257	56	#232	252	21	143	41	
Internal Link Dist (ft)		1176			2795			1408			1363	
Turn Bay Length (ft)												
Base Capacity (vph)	176	619	596	176	664	661	262	732	576	420	803	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.36	0.29	0.30	0.36	0.49	0.37	0.64	0.45	0.06	0.38	0.08	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

AM Horizon Year + Project
29: Connector Rd & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1708	1346	1583	1863	1417	1583	1863	1417	1583	1770	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1708	1346	1583	1863	1417	1583	1863	1417	1583	1770	
Volume (vph)	60	130	210	60	310	230	160	310	30	150	40	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	137	221	63	326	242	168	326	32	158	42	21
RTOR Reduction (vph)	0	12	136	0	0	183	0	0	22	0	15	0
Lane Group Flow (vph)	63	166	44	63	326	59	168	326	10	158	48	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	3.3	16.0	16.0	3.3	16.0	16.0	10.5	20.3	20.3	9.6	19.4	
Effective Green, g (s)	3.3	16.0	16.0	3.3	16.0	16.0	10.5	20.3	20.3	9.6	19.4	
Actuated g/C Ratio	0.05	0.25	0.25	0.05	0.25	0.25	0.16	0.31	0.31	0.15	0.30	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	80	419	330	80	457	348	255	580	441	233	527	
v/s Ratio Prot	c0.04	0.10		0.04	c0.18		c0.11	c0.18		0.10	0.03	
v/s Ratio Perm			0.03			0.04			0.01			
v/c Ratio	0.79	0.40	0.13	0.79	0.71	0.17	0.66	0.56	0.02	0.68	0.09	
Uniform Delay, d1	30.6	20.6	19.2	30.6	22.5	19.4	25.7	18.7	15.6	26.3	16.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	38.7	0.6	0.2	38.7	5.2	0.2	6.0	1.3	0.0	7.6	0.1	
Delay (s)	69.3	21.2	19.4	69.3	27.7	19.6	31.7	20.0	15.6	33.9	16.6	
Level of Service	E	C	B	E	C	B	C	B	B	C	B	
Approach Delay (s)		27.6			28.8			23.5			29.0	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	65.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

AM Horizon Year + Project
34: Pala Rd (SR-76) & S Mission Rd

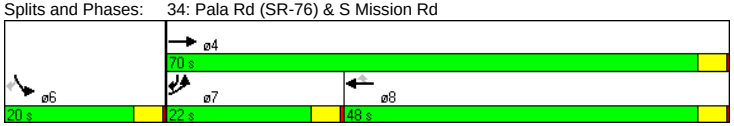
Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	600	900	1700	210	240	900
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	22.0	70.0	48.0	48.0	20.0	22.0
Total Split (%)	24.4%	77.8%	53.3%	53.3%	22.2%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	18.0	66.0	44.0	44.0	16.0	38.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.42
v/c Ratio	1.03	0.25	1.03	0.27	0.46	0.90
Control Delay	81.0	4.1	55.2	2.8	36.3	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	4.1	55.2	2.8	36.3	37.4
LOS	F	A	E	A	D	D
Approach Delay		34.9	49.4		37.2	
Approach LOS		C	D		D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 41.6 Intersection LOS: D
Intersection Capacity Utilization 88.8% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



LOS Engineering

AM Horizon Year + Project
34: Pala Rd (SR-76) & S Mission Rd

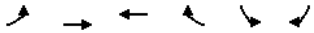
Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				221		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	600	900	1700	210	240	900
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	947	1789	221	253	947
Lane Group Flow (vph)	632	947	1789	221	253	947
v/c Ratio	1.03	0.25	1.03	0.27	0.46	0.90
Control Delay	81.0	4.1	55.2	2.8	36.3	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	4.1	55.2	2.8	36.3	37.4
Queue Length 50th (ft)	~200	53	~581	0	67	277
Queue Length 95th (ft)	#306	67	#717	35	104	#417
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	614	3729	1730	806	546	1053
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.25	1.03	0.27	0.46	0.90

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Volume (vph)	600	900	1700	210	240	900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	947	1789	221	253	947
RTOR Reduction (vph)	0	0	0	113	0	0
Lane Group Flow (vph)	632	947	1789	108	253	947
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	18.0	66.0	44.0	44.0	16.0	34.0
Effective Green, g (s)	18.0	66.0	44.0	44.0	16.0	34.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.38
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	614	3729	1730	693	546	1053
v/s Ratio Prot	c0.21	0.19	c0.51		0.08	c0.18
v/s Ratio Perm				0.08		0.20
v/c Ratio	1.03	0.25	1.03	0.16	0.46	0.90
Uniform Delay, d1	36.0	3.9	23.0	12.7	33.2	26.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.0	0.0	31.0	0.1	2.8	10.3
Delay (s)	80.0	4.0	54.0	12.8	36.0	36.6
Level of Service	F	A	D	B	D	D
Approach Delay (s)		34.4	49.5		36.5	
Approach LOS		C	D		D	

Intersection Summary			
HCM Average Control Delay	41.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Horizon Year + Project
1: Pala Rd (SR-76) & Via Monserate — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	60	2130	1610	120	60	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	2242	1695	126	63	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1821				3005	911
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1821				3005	911
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	81				0	89
cM capacity (veh/h)	332				9	277

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	63	1121	1121	1130	691	32
Volume Left	63	0	0	0	0	0
Volume Right	0	0	0	0	126	32
cSH	332	1700	1700	1700	1700	277
Volume to Capacity	0.19	0.66	0.66	0.66	0.41	0.11
Queue Length 95th (ft)	17	0	0	0	0	10
Control Delay (s)	18.4	0.0	0.0	0.0	0.0	19.7
Lane LOS	C					C
Approach Delay (s)	0.5			0.0		Err
Approach LOS						F

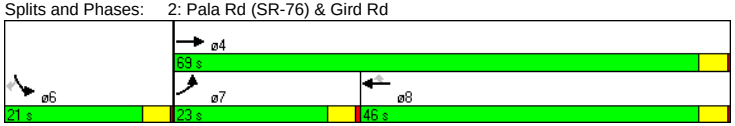
Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		Err%	ICU Level of Service H
Analysis Period (min)		15	

PM Horizon Year + Project
2: Pala Rd (SR-76) & Gird Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	230	1770	1350	130	70	90
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	23.0	69.0	46.0	46.0	21.0	21.0
Total Split (%)	25.6%	76.7%	51.1%	51.1%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	14.9	53.6	34.5	34.5	9.0	9.0
Actuated g/C Ratio	0.21	0.75	0.48	0.48	0.13	0.13
v/c Ratio	0.73	0.70	0.83	0.20	0.37	0.36
Control Delay	42.8	6.2	21.4	10.4	38.0	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	6.2	21.4	10.4	38.0	12.1
LOS	D	A	C	B	D	B
Approach Delay		10.4	20.4		23.5	
Approach LOS		B	C		C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 71.2		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.83		
Intersection Signal Delay: 15.1		Intersection LOS: B
Intersection Capacity Utilization 65.9%		ICU Level of Service C
Analysis Period (min) 15		

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



PM Horizon Year + Project
2: Pala Rd (SR-76) & Gird Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				25		95
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	230	1770	1350	130	70	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	242	1863	1421	137	74	95
Lane Group Flow (vph)	242	1863	1421	137	74	95
v/c Ratio	0.73	0.70	0.83	0.20	0.37	0.36
Control Delay	42.8	6.2	21.4	10.4	38.0	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	6.2	21.4	10.4	38.0	12.1
Queue Length 50th (ft)	112	160	286	28	35	0
Queue Length 95th (ft)	#218	282	425	66	77	42
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	412	2805	1914	778	353	390
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.66	0.74	0.18	0.21	0.24

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Horizon Year + Project
2: Pala Rd (SR-76) & Gird Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Volume (vph)	230	1770	1350	130	70	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	242	1863	1421	137	74	95
RTOR Reduction (vph)	0	0	0	13	0	83
Lane Group Flow (vph)	242	1863	1421	124	74	12
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	14.9	53.6	34.7	34.7	9.0	9.0
Effective Green, g (s)	14.9	53.6	34.7	34.7	9.0	9.0
Actuated g/C Ratio	0.21	0.76	0.49	0.49	0.13	0.13
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	334	2687	1739	696	202	181
v/s Ratio Prot	0.15	c0.53	c0.40		c0.05	
v/s Ratio Perm				0.09		0.01
v/c Ratio	0.72	0.69	0.82	0.18	0.37	0.07
Uniform Delay, d1	25.9	4.3	15.3	10.0	28.2	27.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	0.8	3.1	0.1	1.1	0.2
Delay (s)	33.5	5.1	18.4	10.1	29.3	27.3
Level of Service	C	A	B	B	C	C
Approach Delay (s)		8.4	17.6		28.2	
Approach LOS		A	B		C	

Intersection Summary				
HCM Average Control Delay	13.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

PM Horizon Year + Project
3: Pala Rd (SR-76) & Sage Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	20	1610	1610	20	20	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	1695	1695	21	21	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1716				2595	858
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1716				2595	858
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				0	93
cM capacity (veh/h)	365				19	300

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	21	847	847	1130	586	21
Volume Left	21	0	0	0	0	0
Volume Right	0	0	0	0	21	21
cSH	365	1700	1700	1700	1700	300
Volume to Capacity	0.06	0.50	0.50	0.66	0.34	0.07
Queue Length 95th (ft)	5	0	0	0	0	6
Control Delay (s)	15.5	0.0	0.0	0.0	0.0	17.9
Lane LOS	C					C
Approach Delay (s)	0.2			0.0		Err
Approach LOS						F

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		Err%	ICU Level of Service H
Analysis Period (min)		15	

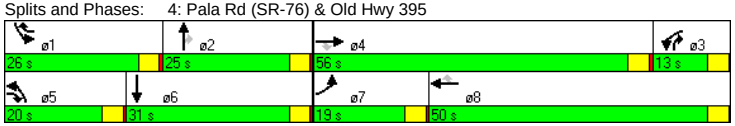
LOS Engineering

PM Horizon Year + Project
4: Pala Rd (SR-76) & Old Hwy 395 — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	140	1100	150	110	1090	380	230	300	150	350	220
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	3	1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	5	3	8	1	5	2	3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	19.0	56.0	20.0	13.0	50.0	26.0	20.0	25.0	13.0	26.0	31.0
Total Split (%)	15.8%	46.7%	16.7%	10.8%	41.7%	21.7%	16.7%	20.8%	10.8%	21.7%	25.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	Min	None	None	Min	Min	Min	None	Min	Min
Act Effct Green (s)	13.6	44.2	60.3	11.1	41.7	64.5	16.1	24.5	35.6	18.7	27.1
Actuated g/C Ratio	0.12	0.39	0.53	0.10	0.36	0.56	0.14	0.21	0.31	0.16	0.24
v/c Ratio	0.78	0.85	0.19	0.76	0.89	0.46	1.09	0.79	0.34	0.73	0.94
Control Delay	77.8	38.6	1.6	81.7	44.0	9.9	133.4	60.7	16.6	55.2	72.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.8	38.6	1.6	81.7	44.0	9.9	133.4	60.7	16.6	55.2	72.7
LOS	E	D	A	F	D	A	F	E	B	E	E
Approach Delay		38.6			38.4			75.6			64.4
Approach LOS		D			D			E			E

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 114.6		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.09		
Intersection Signal Delay: 48.6	Intersection LOS: D	
Intersection Capacity Utilization 88.3%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



LOS Engineering

PM Horizon Year + Project
4: Pala Rd (SR-76) & Old Hwy 395 Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	1		1	2		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.935	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1742	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1742	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			156			42		30	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	140	1100	150	110	1090	380	230	300	150	350	220	170
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	1158	158	116	1147	400	242	316	158	368	232	179
Lane Group Flow (vph)	147	1158	158	116	1147	400	242	316	158	368	411	0
v/c Ratio	0.78	0.85	0.19	0.76	0.89	0.46	1.09	0.79	0.34	0.73	0.94	
Control Delay	77.8	38.6	1.6	81.7	44.0	9.9	133.4	60.7	16.6	55.2	72.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	77.8	38.6	1.6	81.7	44.0	9.9	133.4	60.7	16.6	55.2	72.7	
Queue Length 50th (ft)	111	418	0	87	422	94	~218	240	43	139	298	
Queue Length 95th (ft)	#211	476	18	#214	515	159	#384	#427	90	190	#512	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	205	1508	820	153	1373	857	222	398	469	575	435	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.72	0.77	0.19	0.76	0.84	0.47	1.09	0.79	0.34	0.64	0.94	

Intersection Summary
Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year + Project
4: Pala Rd (SR-76) & Old Hwy 395 HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1741	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1741	
Volume (vph)	140	1100	150	110	1090	380	230	300	150	350	220	170
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	1158	158	116	1147	400	242	316	158	368	232	179
RTOR Reduction (vph)	0	0	75	0	0	74	0	0	29	0	23	0
Lane Group Flow (vph)	147	1158	83	116	1147	326	242	316	129	368	388	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pm+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	13.6	44.2	60.3	11.1	41.7	60.4	16.1	24.5	35.6	18.7	27.1	
Effective Green, g (s)	13.6	44.2	60.3	11.1	41.7	60.4	16.1	24.5	35.6	18.7	27.1	
Actuated g/C Ratio	0.12	0.39	0.53	0.10	0.36	0.53	0.14	0.21	0.31	0.16	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	188	1366	746	153	1289	797	223	399	441	502	412	
v/s Ratio Prot	0.09	c0.33	0.02	0.07	c0.32	0.07	c0.15	0.17	0.03	0.12	c0.22	
v/s Ratio Perm			0.04			0.16			0.06			
v/c Ratio	0.78	0.85	0.11	0.76	0.89	0.41	1.09	0.79	0.29	0.73	0.94	
Uniform Delay, d1	49.0	32.1	13.6	50.4	34.2	16.3	49.2	42.6	29.9	45.5	42.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.8	5.1	0.1	19.1	7.9	0.3	84.8	10.3	0.4	5.5	29.9	
Delay (s)	67.8	37.2	13.7	69.5	42.1	16.6	134.0	52.9	30.3	51.0	72.8	
Level of Service	E	D	B	E	D	B	F	D	C	D	E	
Approach Delay (s)		37.7			37.9			75.3			62.5	
Approach LOS		D			D			E			E	

Intersection Summary				
HCM Average Control Delay	47.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	114.5	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	88.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Horizon Year + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

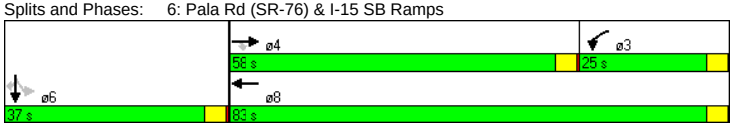
Timings

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	1300	300	400	1050	300	20	530
Turn Type		Perm	Prot		Perm		Perm
Protected Phases	4		3	8		6	
Permitted Phases		4			6		6
Detector Phases	4	4	3	8	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	58.0	58.0	25.0	83.0	37.0	37.0	37.0
Total Split (%)	48.3%	48.3%	20.8%	69.2%	30.8%	30.8%	30.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	52.3	52.3	19.4	75.7	36.3	36.3	36.3
Actuated g/C Ratio	0.44	0.44	0.16	0.63	0.30	0.30	0.30
v/c Ratio	0.89	0.41	0.85	0.50	0.56	0.65	0.59
Control Delay	39.1	5.9	69.0	16.0	42.7	31.6	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	5.9	69.0	16.0	42.7	31.6	27.4
LOS	D	A	E	B	D	C	C
Approach Delay	32.9			30.6		33.4	
Approach LOS	C			C		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 2: and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 32.2 Intersection LOS: C
Intersection Capacity Utilization 74.3% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



LOS Engineering

PM Horizon Year + Project
6: Pala Rd (SR-76) & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	2		0	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850								0.884	0.850
Flt Protected				0.950						0.950	0.992	
Satd. Flow (prot)	0	3539	1417	3072	3539	0	0	0	0	1504	1486	1346
Flt Permitted				0.950						0.950	0.992	
Satd. Flow (perm)	0	3539	1417	3072	3539	0	0	0	0	1504	1486	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			263								119	119
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	1300	300	400	1050	0	0	0	0	300	20	530
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1368	316	421	1105	0	0	0	0	316	21	558
Lane Group Flow (vph)	0	1368	316	421	1105	0	0	0	0	257	349	289
v/c Ratio		0.89	0.41	0.85	0.50					0.56	0.65	0.59
Control Delay		39.1	5.9	69.0	16.0					42.7	31.6	27.4
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		39.1	5.9	69.0	16.0					42.7	31.6	27.4
Queue Length 50th (ft)		464	22	170	422					192	187	127
Queue Length 95th (ft)		592	83	m201	m516					281	303	227
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		1618	790	542	2359					468	544	500
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.85	0.40	0.78	0.47					0.55	0.64	0.58

Intersection Summary

Area Type: Other
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Horizon Year + Project
6: Pala Rd (SR-76) & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.88	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		3539	1417	3072	3539					1504	1487	1346
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		3539	1417	3072	3539					1504	1487	1346
Volume (vph)	0	1300	300	400	1050	0	0	0	0	300	20	530
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1368	316	421	1105	0	0	0	0	316	21	558
RTOR Reduction (vph)	0	0	148	0	0	0	0	0	0	0	83	83
Lane Group Flow (vph)	0	1368	168	421	1105	0	0	0	0	257	266	206
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		52.3	52.3	19.4	75.7					36.3	36.3	36.3
Effective Green, g (s)		52.3	52.3	19.4	75.7					36.3	36.3	36.3
Actuated g/C Ratio		0.44	0.44	0.16	0.63					0.30	0.30	0.30
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1542	618	497	2233					455	450	407
v/s Ratio Prot		c0.39		c0.14	0.31							
v/s Ratio Perm			0.12							0.17	0.18	0.15
v/c Ratio		0.89	0.27	0.85	0.49					0.56	0.59	0.51
Uniform Delay, d1		31.1	21.7	48.9	11.9					35.2	35.5	34.5
Progression Factor		1.00	1.00	1.21	1.32					1.00	1.00	1.00
Incremental Delay, d2		6.6	0.2	7.7	0.1					5.0	5.6	4.4
Delay (s)		37.7	21.9	66.9	15.8					40.2	41.2	38.9
Level of Service		D	C	E	B					D	D	D
Approach Delay (s)		34.7			29.9			0.0			40.2	
Approach LOS		C			C			A			D	

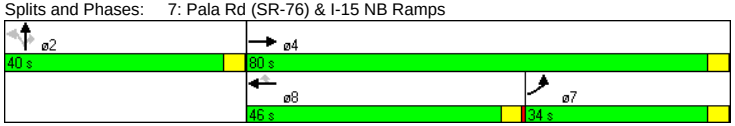
Intersection Summary				
HCM Average Control Delay	34.1	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	74.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

PM Horizon Year + Project
7: Pala Rd (SR-76) & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Volume (vph)	600	1000	1000	350	450	20	450
Turn Type	Prot			Perm	Perm		Perm
Protected Phases	7	4	8			2	
Permitted Phases				8	2		2
Detector Phases	7	4	8	8	2	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	34.0	80.0	46.0	46.0	40.0	40.0	40.0
Total Split (%)	28.3%	66.7%	38.3%	38.3%	33.3%	33.3%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	28.1	72.8	40.7	40.7	39.2	39.2	39.2
Actuated g/C Ratio	0.23	0.61	0.34	0.34	0.33	0.33	0.33
v/c Ratio	0.88	0.49	0.88	0.68	0.60	0.66	0.63
Control Delay	66.4	26.8	46.5	31.9	41.5	39.9	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.4	26.8	46.5	31.9	41.5	39.9	28.7
LOS	E	C	D	C	D	D	C
Approach Delay		41.6	42.7			36.6	
Approach LOS		D	D			D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green		
Natural Cycle: 75		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.88		
Intersection Signal Delay: 40.8	Intersection LOS: D	
Intersection Capacity Utilization 74.3%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



PM Horizon Year + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	2		0	0		1	1		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Frt						0.850		0.937	0.850			
Flt Protected	0.950						0.950	0.975				
Satd. Flow (prot)	3072	3539	0	0	3539	1417	1504	1549	1346	0	0	0
Flt Permitted	0.950						0.950	0.975				
Satd. Flow (perm)	3072	3539	0	0	3539	1417	1504	1549	1346	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						92		31	121			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	600	1000	0	0	1000	350	450	20	450	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	1053	0	0	1053	368	474	21	474	0	0	0
Lane Group Flow (vph)	632	1053	0	0	1053	368	294	346	329	0	0	0
v/c Ratio	0.88	0.49			0.88	0.68	0.60	0.66	0.63			
Control Delay	66.4	26.8			46.5	31.9	41.5	39.9	28.7			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	66.4	26.8			46.5	31.9	41.5	39.9	28.7			
Queue Length 50th (ft)	192	244			377	173	222	256	160			
Queue Length 95th (ft)	m262	m347			484	295	313	364	266			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	778	2271			1257	563	503	539	531			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.81	0.46			0.84	0.65	0.58	0.64	0.62			

Intersection Summary

Area Type: Other

m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Horizon Year + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.94	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (prot)	3072	3539			3539	1417	1504	1548	1346			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (perm)	3072	3539			3539	1417	1504	1548	1346			
Volume (vph)	600	1000	0	0	1000	350	450	20	450	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	1053	0	0	1053	368	474	21	474	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	61	0	21	81	0	0	0
Lane Group Flow (vph)	632	1053	0	0	1053	307	294	325	248	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	28.1	72.8			40.7	40.7	39.2	39.2	39.2			
Effective Green, g (s)	28.1	72.8			40.7	40.7	39.2	39.2	39.2			
Actuated g/C Ratio	0.23	0.61			0.34	0.34	0.33	0.33	0.33			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	719	2147			1200	481	491	506	440			
v/s Ratio Prot	c0.21	0.30			c0.30							
v/s Ratio Perm						0.22	0.20	0.21	0.18			
v/c Ratio	0.88	0.49			0.88	0.64	0.60	0.64	0.56			
Uniform Delay, d1	44.3	13.2			37.3	33.4	33.8	34.4	33.3			
Progression Factor	1.32	2.02			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	6.8	0.1			7.5	2.8	5.3	6.2	5.1			
Delay (s)	65.2	26.8			44.8	36.2	39.1	40.6	38.5			
Level of Service	E	C			D	D	D	D	D			
Approach Delay (s)		41.2			42.6			39.4			0.0	
Approach LOS		D			D			D			A	

Intersection Summary			
HCM Average Control Delay	41.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

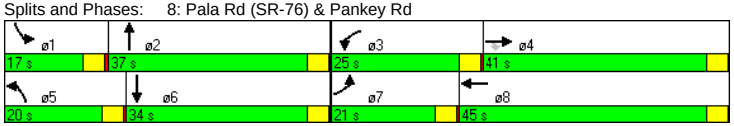
PM Horizon Year + Project
8: Pala Rd (SR-76) & Pankey Rd

Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	160	950	340	220	810	330	420	120	470
Turn Type	Prot		Perm	Prot		Prot		Prot	
Protected Phases	7	4		3	8	5	2	1	6
Permitted Phases			4						
Detector Phases	7	4	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	21.0	41.0	41.0	25.0	45.0	20.0	37.0	17.0	34.0
Total Split (%)	17.5%	34.2%	34.2%	20.8%	37.5%	16.7%	30.8%	14.2%	28.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	14.9	34.4	34.4	18.9	38.4	15.0	29.2	11.8	25.9
Actuated g/C Ratio	0.13	0.31	0.31	0.17	0.35	0.14	0.26	0.11	0.23
v/c Ratio	0.79	0.91	0.54	0.86	0.78	0.83	0.79	0.75	0.86
Control Delay	74.4	50.4	8.4	75.3	38.2	66.4	37.1	77.6	49.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.4	50.4	8.4	75.3	38.2	66.4	37.1	77.6	49.2
LOS	E	D	A	E	D	E	D	E	D
Approach Delay		43.2			45.5		46.1		53.5
Approach LOS		D			D		D		D

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 110.7		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.91		
Intersection Signal Delay: 46.3	Intersection LOS: D	
Intersection Capacity Utilization 83.4%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd



LOS Engineering

PM Horizon Year + Project
8: Pala Rd (SR-76) & Pankey Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.985			0.935			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3486	0	3072	3309	0	1583	3376	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3486	0	3072	3309	0	1583	3376	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			325		11			158			57	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2232			2833			991			1488	
Travel Time (s)		50.7			64.4			22.5			33.8	
Volume (vph)	160	950	340	220	810	90	330	420	320	120	470	210
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	1000	358	232	853	95	347	442	337	126	495	221
Lane Group Flow (vph)	168	1000	358	232	948	0	347	779	0	126	716	0
v/c Ratio	0.79	0.91	0.54	0.86	0.78		0.83	0.79		0.75	0.86	
Control Delay	74.4	50.4	8.4	75.3	38.2		66.4	37.1		77.6	49.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	74.4	50.4	8.4	75.3	38.2		66.4	37.1		77.6	49.2	
Queue Length 50th (ft)	126	390	18	175	341		136	236		96	255	
Queue Length 95th (ft)	#234	#518	100	#312	425		#215	311		#191	330	
Internal Link Dist (ft)		2152			2753			911			1408	
Turn Bay Length (ft)												
Base Capacity (vph)	243	1169	686	299	1285		449	1077		187	936	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.69	0.86	0.52	0.78	0.74		0.77	0.72		0.67	0.76	

Intersection Summary	
Area Type:	Other
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

LOS Engineering

PM Horizon Year + Project
8: Pala Rd (SR-76) & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3486		3072	3310		1583	3375	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3486		3072	3310		1583	3375	
Volume (vph)	160	950	340	220	810	90	330	420	320	120	470	210
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	168	1000	358	232	853	95	347	442	337	126	495	221
RTOR Reduction (vph)	0	0	223	0	7	0	0	116	0	0	44	0
Lane Group Flow (vph)	168	1000	135	232	941	0	347	663	0	126	672	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.9	34.5	34.5	18.9	38.5		15.0	29.2		11.8	26.0	
Effective Green, g (s)	14.9	34.5	34.5	18.9	38.5		15.0	29.2		11.8	26.0	
Actuated g/C Ratio	0.13	0.31	0.31	0.17	0.35		0.14	0.26		0.11	0.24	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	214	1106	443	271	1216		417	875		169	795	
v/s Ratio Prot	0.11	c0.28		c0.15	c0.27		c0.11	c0.20		0.08	c0.20	
v/s Ratio Perm			0.09									
v/c Ratio	0.79	0.90	0.30	0.86	0.77		0.83	0.76		0.75	0.85	
Uniform Delay, d1	46.2	36.4	28.8	44.4	32.1		46.5	37.3		47.8	40.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.0	10.4	0.4	22.3	3.1		13.3	3.8		16.3	8.3	
Delay (s)	63.2	46.8	29.2	66.8	35.2		59.7	41.1		64.1	48.5	
Level of Service	E	D	C	E	D		E	D		E	D	
Approach Delay (s)		44.5			41.4			46.9			50.9	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM Average Control Delay	45.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	110.4	Sum of lost time (s)	24.0	
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

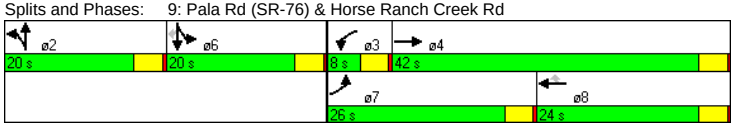
LOS Engineering

PM Horizon Year + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	700	750	740	130	90	0	380		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	26.0	42.0	24.0	24.0	20.0	20.0	20.0	20.0	8.0
Total Split (%)	28.9%	46.7%	26.7%	26.7%	22.2%	22.2%	22.2%	22%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	21.7	45.8	20.0	20.0	9.4	9.4	9.4		
Actuated g/C Ratio	0.30	0.63	0.27	0.27	0.13	0.13	0.13		
v/c Ratio	0.80	0.35	0.80	0.28	0.34	0.62	0.58		
Control Delay	32.6	7.5	33.0	6.3	33.3	15.0	11.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	32.6	7.5	33.0	6.3	33.3	15.0	11.8		
LOS	C	A	C	A	C	B	B		
Approach Delay		19.6	29.0			16.1			
Approach LOS		B	C			B			

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 72.8		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.80		
Intersection Signal Delay: 22.0	Intersection LOS: C	
Intersection Capacity Utilization 59.2%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



LOS Engineering

PM Horizon Year + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		250	0		0	150		150
Storage Lanes	2		0	1		1	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt						0.850					0.870	0.850
Flt Protected	0.950									0.950	0.994	
Satd. Flow (prot)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1466	1346
Flt Permitted	0.950									0.950	0.994	
Satd. Flow (perm)	3072	3539	0	1667	3539	1417	0	1863	0	1504	1466	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						137					193	207
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2833			5160			734			1509	
Travel Time (s)		64.4			117.3			16.7			34.3	
Volume (vph)	700	750	0	0	740	130	0	0	0	90	0	380
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	737	789	0	0	779	137	0	0	0	95	0	400
Lane Group Flow (vph)	737	789	0	0	779	137	0	0	0	66	222	207
v/c Ratio	0.80	0.35			0.80	0.28				0.34	0.62	0.58
Control Delay	32.6	7.5			33.0	6.3				33.3	15.0	11.8
Queue Delay	0.0	0.0			0.0	0.0				0.0	0.0	0.0
Total Delay	32.6	7.5			33.0	6.3				33.3	15.0	11.8
Queue Length 50th (ft)	152	74			167	0				29	13	0
Queue Length 95th (ft)	#274	137			#293	41				65	78	56
Internal Link Dist (ft)		2753			5080			654			1429	
Turn Bay Length (ft)	250					250				150		150
Base Capacity (vph)	927	2226			976	490				304	450	437
Starvation Cap Reductn	0	0			0	0				0	0	0
Spillback Cap Reductn	0	0			0	0				0	0	0
Storage Cap Reductn	0	0			0	0				0	0	0
Reduced v/c Ratio	0.80	0.35			0.80	0.28				0.22	0.49	0.47

Intersection Summary
Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year + Project
9: Pala Rd (SR-76) & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	0.97	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.87	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	0.99	1.00
Satd. Flow (prot)	3072	3539			3539	1417				1504	1464	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	0.99	1.00
Satd. Flow (perm)	3072	3539			3539	1417				1504	1464	1346
Volume (vph)	700	750	0	0	740	130	0	0	0	90	0	380
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	737	789	0	0	779	137	0	0	0	95	0	400
RTOR Reduction (vph)	0	0	0	0	0	99	0	0	0	0	168	180
Lane Group Flow (vph)	737	789	0	0	779	38	0	0	0	66	54	27
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	21.7	45.8			20.1	20.1				9.4	9.4	9.4
Effective Green, g (s)	21.7	45.8			20.1	20.1				9.4	9.4	9.4
Actuated g/C Ratio	0.30	0.63			0.28	0.28				0.13	0.13	0.13
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	917	2230			978	392				194	189	174
v/s Ratio Prot	c0.24	0.22			c0.22					c0.04	0.04	
v/s Ratio Perm						0.03						0.02
v/c Ratio	0.80	0.35			0.80	0.10				0.34	0.29	0.15
Uniform Delay, d1	23.5	6.4			24.4	19.6				28.8	28.6	28.1
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	5.2	0.1			4.6	0.1				1.0	0.8	0.4
Delay (s)	28.7	6.5			29.0	19.7				29.9	29.4	28.5
Level of Service	C	A			C	B				C	C	C
Approach Delay (s)		17.2			27.6			0.0			29.1	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM Average Control Delay	22.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	21.5	
Intersection Capacity Utilization	59.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

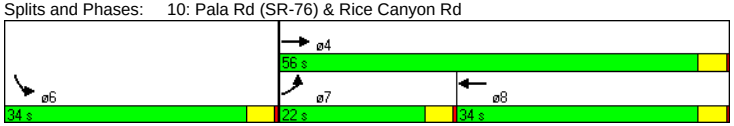
PM Horizon Year + Project
10: Pala Rd (SR-76) & Rice Canyon Rd — Timings

Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	60	1010	1230	60
Turn Type	Prot			
Protected Phases	7	4	8	6
Permitted Phases				
Detector Phases	7	4	8	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	22.0	56.0	34.0	34.0
Total Split (%)	24.4%	62.2%	37.8%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	None	None	Min
Act Effct Green (s)	7.7	37.9	30.9	8.4
Actuated g/C Ratio	0.13	0.70	0.57	0.15
v/c Ratio	0.30	0.43	0.67	0.49
Control Delay	27.7	4.5	13.2	18.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.7	4.5	13.2	18.1
LOS	C	A	B	B
Approach Delay		5.8	13.2	18.1
Approach LOS		A	B	B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 54.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 10.3 — Intersection LOS: B
Intersection Capacity Utilization 58.2% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 10: Pala Rd (SR-76) & Rice Canyon Rd



LOS Engineering

PM Horizon Year + Project
10: Pala Rd (SR-76) & Rice Canyon Rd — Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.995		0.923	
Flt Protected	0.950				0.979	
Satd. Flow (prot)	1583	3539	3522	0	1506	0
Flt Permitted	0.950				0.979	
Satd. Flow (perm)	1583	3539	3522	0	1506	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			4		80	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		5160	470		1120	
Travel Time (s)		117.3	10.7		25.5	
Volume (vph)	60	1010	1230	40	60	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	1063	1295	42	63	84
Lane Group Flow (vph)	63	1063	1337	0	147	0
v/c Ratio	0.30	0.43	0.67		0.49	
Control Delay	27.7	4.5	13.2		18.1	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	27.7	4.5	13.2		18.1	
Queue Length 50th (ft)	20	55	170		21	
Queue Length 95th (ft)	54	118	#333		69	
Internal Link Dist (ft)		5080	390		1040	
Turn Bay Length (ft)						
Base Capacity (vph)	416	2688	2001		648	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.15	0.40	0.67		0.23	

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year + Project
10: Pala Rd (SR-76) & Rice Canyon Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	0.95		1.00	
Frt	1.00	1.00	1.00		0.92	
Flt Protected	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1583	3539	3523		1506	
Flt Permitted	0.95	1.00	1.00		0.98	
Satd. Flow (perm)	1583	3539	3523		1506	
Volume (vph)	60	1010	1230	40	60	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	1063	1295	42	63	84
RTOR Reduction (vph)	0	0	2	0	68	0
Lane Group Flow (vph)	63	1063	1335	0	79	0
Turn Type	Prot					
Protected Phases	7	4	8		6	
Permitted Phases						
Actuated Green, G (s)	4.8	39.7	30.9		8.4	
Effective Green, g (s)	4.8	39.7	30.9		8.4	
Actuated g/C Ratio	0.09	0.71	0.55		0.15	
Clearance Time (s)	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	135	2504	1940		225	
v/s Ratio Prot	0.04	c0.30	c0.38		c0.05	
v/s Ratio Perm						
v/c Ratio	0.47	0.42	0.69		0.35	
Uniform Delay, d1	24.4	3.4	9.1		21.4	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	2.5	0.1	1.0		0.9	
Delay (s)	27.0	3.5	10.1		22.4	
Level of Service	C	A	B		C	
Approach Delay (s)		4.9	10.1		22.4	
Approach LOS		A	B		C	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	56.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

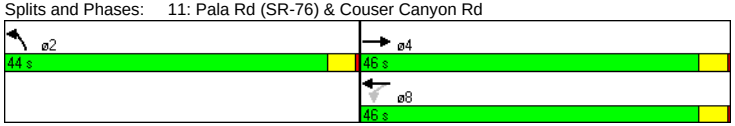
LOS Engineering

PM Horizon Year + Project
11: Pala Rd (SR-76) & Couser Canyon Rd — Timings

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	900	40	1160	70
Turn Type		Perm		
Protected Phases	4		8	2
Permitted Phases		8		
Detector Phases	4	8	8	2
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	46.0	46.0	46.0	44.0
Total Split (%)	51.1%	51.1%	51.1%	48.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	None	None	Min
Act Effct Green (s)	19.9	19.9	19.9	7.6
Actuated g/C Ratio	0.55	0.55	0.55	0.21
v/c Ratio	0.53	0.27	0.62	0.28
Control Delay	5.9	9.3	6.9	14.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	5.9	9.3	6.9	14.4
LOS	A	A	A	B
Approach Delay	5.9		7.0	14.4
Approach LOS	A		A	B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 36		
Natural Cycle: 45		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.62		
Intersection Signal Delay: 6.8		Intersection LOS: A
Intersection Capacity Utilization 46.5%		ICU Level of Service A
Analysis Period (min) 15		

Splits and Phases: 11: Pala Rd (SR-76) & Couser Canyon Rd



LOS Engineering

PM Horizon Year + Project
11: Pala Rd (SR-76) & Couser Canyon Rd — Queues

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50	
Trailing Detector (ft)	0		0	0	0	
Turning Speed (mph)		9	15		15	9
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.988				0.970	
Flt Protected			0.950		0.963	
Satd. Flow (prot)	3497	0	1583	3539	1557	0
Flt Permitted			0.167		0.963	
Satd. Flow (perm)	3497	0	278	3539	1557	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	14				20	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	470			11023	1081	
Travel Time (s)	10.7			250.5	24.6	
Volume (vph)	900	80	40	1160	70	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	947	84	42	1221	74	21
Lane Group Flow (vph)	1031	0	42	1221	95	0
v/c Ratio	0.53		0.27	0.62	0.28	
Control Delay	5.9		9.3	6.9	14.4	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	5.9		9.3	6.9	14.4	
Queue Length 50th (ft)	47		3	61	12	
Queue Length 95th (ft)	99		19	127	50	
Internal Link Dist (ft)	390			10943	1001	
Turn Bay Length (ft)						
Base Capacity (vph)	2559		203	2586	928	
Starvation Cap Reductn	15		0	0	0	
Spillback Cap Reductn	0		0	9	1	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.41		0.21	0.47	0.10	

Intersection Summary

Area Type: Other

LOS Engineering

PM Horizon Year + Project
11: Pala Rd (SR-76) & Couser Canyon Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.97	
Flt Protected	1.00		0.95	1.00	0.96	
Satd. Flow (prot)	3496		1583	3539	1556	
Flt Permitted	1.00		0.24	1.00	0.96	
Satd. Flow (perm)	3496		401	3539	1556	
Volume (vph)	900	80	40	1160	70	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	947	84	42	1221	74	21
RTOR Reduction (vph)	6	0	0	0	16	0
Lane Group Flow (vph)	1025	0	42	1221	79	0
Turn Type			Perm			
Protected Phases	4			8	2	
Permitted Phases			8			
Actuated Green, G (s)	19.9		19.9	19.9	7.5	
Effective Green, g (s)	19.9		19.9	19.9	7.5	
Actuated g/C Ratio	0.56		0.56	0.56	0.21	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1965		225	1989	330	
v/s Ratio Prot	0.29			c0.34	c0.05	
v/s Ratio Perm			0.10			
v/c Ratio	0.52		0.19	0.61	0.24	
Uniform Delay, d1	4.8		3.8	5.2	11.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		0.4	0.6	0.4	
Delay (s)	5.1		4.2	5.7	12.0	
Level of Service	A		A	A	B	
Approach Delay (s)	5.1			5.7	12.0	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	5.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	35.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

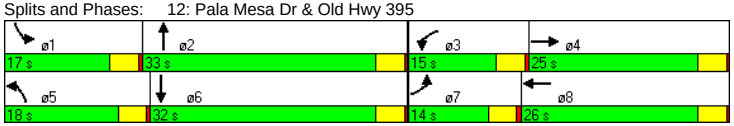
LOS Engineering

PM Horizon Year + Project
12: Pala Mesa Dr & Old Hwy 395 Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	150	160	180	190	120	820	210	490
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	14.0	25.0	15.0	26.0	18.0	33.0	17.0	32.0
Total Split (%)	15.6%	27.8%	16.7%	28.9%	20.0%	36.7%	18.9%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	10.0	21.0	11.0	22.0	11.5	28.9	13.0	30.4
Actuated g/C Ratio	0.11	0.23	0.12	0.24	0.13	0.32	0.14	0.34
v/c Ratio	0.90	0.84	0.98	0.97	0.62	0.95	0.97	0.52
Control Delay	87.2	45.8	101.5	64.9	50.4	47.3	91.8	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.2	45.8	101.5	64.9	50.4	47.3	91.8	25.3
LOS	F	D	F	E	D	D	F	C
Approach Delay		58.0		75.7		47.6		42.9
Approach LOS		E		E		D		D

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 89.9
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 53.7 Intersection LOS: D
Intersection Capacity Utilization 89.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395



LOS Engineering

PM Horizon Year + Project
12: Pala Mesa Dr & Old Hwy 395 Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	0		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.916			0.916			0.971			0.977	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1706	0	1583	1706	0	1583	3437	0	1583	3458	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1706	0	1583	1706	0	1583	3437	0	1583	3458	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		66			67			35			24	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3628			1500			4464			5461	
Travel Time (s)		82.5			34.1			101.5			124.1	
Volume (vph)	150	160	200	180	190	240	120	820	200	210	490	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	168	211	189	200	253	126	863	211	221	516	95
Lane Group Flow (vph)	158	379	0	189	453	0	126	1074	0	221	611	0
v/c Ratio	0.90	0.84		0.98	0.97		0.62	0.95		0.97	0.52	
Control Delay	87.2	45.8		101.5	64.9		50.4	47.3		91.8	25.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	87.2	45.8		101.5	64.9		50.4	47.3		91.8	25.3	
Queue Length 50th (ft)	90	173		109	223		68	303		127	140	
Queue Length 95th (ft)	#206	#329		#242	#418		124	#440		#267	199	
Internal Link Dist (ft)		3548			1420			4384			5381	
Turn Bay Length (ft)							150			200		
Base Capacity (vph)	176	449		193	468		240	1131		229	1186	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.90	0.84		0.98	0.97		0.53	0.95		0.97	0.52	

Intersection Summary
Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year + Project
12: Pala Mesa Dr & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.92		1.00	0.92		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1707		1583	1707		1583	3435		1583	3457	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1707		1583	1707		1583	3435		1583	3457	
Volume (vph)	150	160	200	180	190	240	120	820	200	210	490	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	168	211	189	200	253	126	863	211	221	516	95
RTOR Reduction (vph)	0	51	0	0	51	0	0	24	0	0	16	0
Lane Group Flow (vph)	158	328	0	189	402	0	126	1050	0	221	595	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	10.0	21.0		11.0	22.0		11.5	28.9		13.0	30.4	
Effective Green, g (s)	10.0	21.0		11.0	22.0		11.5	28.9		13.0	30.4	
Actuated g/C Ratio	0.11	0.23		0.12	0.24		0.13	0.32		0.14	0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	176	399		194	418		202	1104		229	1169	
v/s Ratio Prot	0.10	0.19		c0.12	c0.24		0.08	c0.31		c0.14	0.17	
v/s Ratio Perm												
v/c Ratio	0.90	0.82		0.97	0.96		0.62	0.95		0.97	0.51	
Uniform Delay, d1	39.4	32.7		39.3	33.5		37.1	29.8		38.2	23.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	39.7	12.9		56.7	34.2		5.9	16.7		49.2	0.4	
Delay (s)	79.2	45.6		96.0	67.8		43.0	46.5		87.4	24.1	
Level of Service	E	D		F	E		D	D		F	C	
Approach Delay (s)		55.4			76.1			46.1			40.9	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM Average Control Delay	52.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

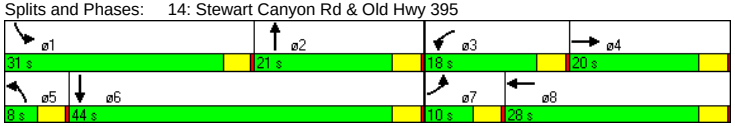
LOS Engineering

PM Horizon Year + Project
14: Stewart Canyon Rd & Old Hwy 395 — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	20	30	120	20	70	720	470	700
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	10.0	20.0	18.0	28.0	8.0	21.0	31.0	44.0
Total Split (%)	11.1%	22.2%	20.0%	31.1%	8.9%	23.3%	34.4%	48.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.8	7.3	10.8	15.9	4.1	17.2	27.4	40.5
Actuated g/C Ratio	0.07	0.10	0.14	0.21	0.05	0.23	0.36	0.53
v/c Ratio	0.19	0.37	0.58	0.63	0.88	0.99	0.87	0.45
Control Delay	41.1	23.7	43.0	9.2	112.6	62.8	44.0	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	23.7	43.0	9.2	112.6	62.8	44.0	13.1
LOS	D	C	D	A	F	E	D	B
Approach Delay		27.5		17.3		67.1		24.6
Approach LOS		C		B		E		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 76.3			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 36.4		Intersection LOS: D	
Intersection Capacity Utilization 83.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395



LOS Engineering

PM Horizon Year + Project
14: Stewart Canyon Rd & Old Hwy 395 — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	200		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.915			0.858			0.994			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1704	0	1583	1598	0	1583	3518	0	1583	3479	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1704	0	1583	1598	0	1583	3518	0	1583	3479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		42			379			4			20	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1302			7424			5461			3410	
Travel Time (s)		29.6			168.7			124.1			77.5	
Volume (vph)	20	30	40	120	20	360	70	720	30	470	700	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	32	42	126	21	379	74	758	32	495	737	95
Lane Group Flow (vph)	21	74	0	126	400	0	74	790	0	495	832	0
v/c Ratio	0.19	0.37		0.58	0.63		0.88	0.99		0.87	0.45	
Control Delay	41.1	23.7		43.0	9.2		112.6	62.8		44.0	13.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.1	23.7		43.0	9.2		112.6	62.8		44.0	13.1	
Queue Length 50th (ft)	10	15		58	7		37	~221		227	125	
Queue Length 95th (ft)	33	54		115	88		#125	#373		#457	201	
Internal Link Dist (ft)		1222			7344			5381			3330	
Turn Bay Length (ft)				200			100			100		
Base Capacity (vph)	116	357		273	729		84	797		567	1857	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.18	0.21		0.46	0.55		0.88	0.99		0.87	0.45	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year + Project
14: Stewart Canyon Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.86		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1704		1583	1598		1583	3518		1583	3479	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1704		1583	1598		1583	3518		1583	3479	
Volume (vph)	20	30	40	120	20	360	70	720	30	470	700	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	32	42	126	21	379	74	758	32	495	737	95
RTOR Reduction (vph)	0	37	0	0	302	0	0	3	0	0	10	0
Lane Group Flow (vph)	21	37	0	126	98	0	74	787	0	495	822	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	2.2	8.9		9.2	15.9		4.1	17.3		27.3	40.5	
Effective Green, g (s)	2.2	8.9		9.2	15.9		4.1	17.3		27.3	40.5	
Actuated g/C Ratio	0.03	0.11		0.12	0.20		0.05	0.22		0.35	0.51	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	44	193		185	323		82	773		549	1790	
v/s Ratio Prot	0.01	0.02		c0.08	c0.06		0.05	c0.22		c0.31	0.24	
v/s Ratio Perm												
v/c Ratio	0.48	0.19		0.68	0.30		0.90	1.02		0.90	0.46	
Uniform Delay, d1	37.7	31.6		33.3	26.7		37.1	30.7		24.4	12.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.9	0.5		9.9	0.5		67.3	36.9		18.0	0.2	
Delay (s)	45.6	32.1		43.2	27.2		104.4	67.6		42.4	12.3	
Level of Service	D	C		D	C		F	E		D	B	
Approach Delay (s)		35.1			31.0			70.8			23.5	
Approach LOS		D			C			E			C	

Intersection Summary

HCM Average Control Delay	39.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	78.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

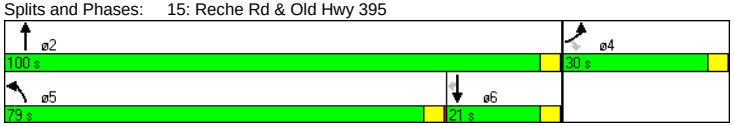
LOS Engineering

PM Horizon Year + Project
15: Reche Rd & Old Hwy 395 Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	300	260	880	340	220	400
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	30.0	30.0	79.0	100.0	21.0	21.0
Total Split (%)	23.1%	23.1%	60.8%	76.9%	16.2%	16.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	26.0	26.0	75.1	93.1	14.0	14.0
Actuated g/C Ratio	0.20	0.20	0.59	0.73	0.11	0.11
v/c Ratio	0.98	0.54	0.99	0.14	0.59	0.85
Control Delay	94.7	9.3	53.9	5.2	60.3	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.7	9.3	53.9	5.2	60.3	25.6
LOS	F	A	D	A	E	C
Approach Delay	55.0			40.3	38.0	
Approach LOS	E			D	D	

Intersection Summary			
Cycle Length: 130			
Actuated Cycle Length: 127.1			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 43.1		Intersection LOS: D	
Intersection Capacity Utilization 89.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 15: Reche Rd & Old Hwy 395



LOS Engineering

PM Horizon Year + Project
15: Reche Rd & Old Hwy 395 Queues

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Storage Length (ft)	0	0	150			0
Storage Lanes	1	1	1			1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		274				378
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	2635			3410	4960	
Travel Time (s)	59.9			77.5	112.7	
Volume (vph)	300	260	880	340	220	400
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	274	926	358	232	421
Lane Group Flow (vph)	316	274	926	358	232	421
v/c Ratio	0.98	0.54	0.99	0.14	0.59	0.85
Control Delay	94.7	9.3	53.9	5.2	60.3	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.7	9.3	53.9	5.2	60.3	25.6
Queue Length 50th (ft)	262	0	723	40	97	33
Queue Length 95th (ft)	#463	78	#1074	55	141	#198
Internal Link Dist (ft)	2555			3330	4880	
Turn Bay Length (ft)			150			
Base Capacity (vph)	324	508	935	2613	463	514
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.54	0.99	0.14	0.50	0.82

Intersection Summary	
Area Type:	Other
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

LOS Engineering

PM Horizon Year + Project
15: Reche Rd & Old Hwy 395 — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Volume (vph)	300	260	880	340	220	400
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	316	274	926	358	232	421
RTOR Reduction (vph)	0	218	0	0	0	336
Lane Group Flow (vph)	316	56	926	358	232	85
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	26.0	26.0	75.0	93.0	14.0	14.0
Effective Green, g (s)	26.0	26.0	75.0	93.0	14.0	14.0
Actuated g/C Ratio	0.20	0.20	0.59	0.73	0.11	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	324	290	935	2592	390	156
v/s Ratio Prot	c0.20		c0.58	0.10	c0.07	
v/s Ratio Perm		0.04				0.06
v/c Ratio	0.98	0.19	0.99	0.14	0.59	0.54
Uniform Delay, d1	50.2	41.8	25.6	5.1	53.8	53.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.9	0.3	27.0	0.0	2.4	3.8
Delay (s)	93.1	42.1	52.6	5.1	56.2	57.3
Level of Service	F	D	D	A	E	E
Approach Delay (s)	69.4			39.4	56.9	
Approach LOS	E			D	E	

Intersection Summary			
HCM Average Control Delay	50.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	127.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

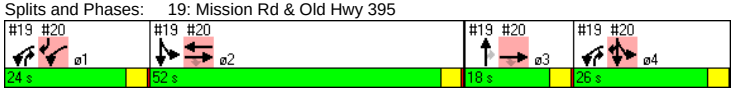
LOS Engineering

PM Horizon Year + Project
19: Mission Rd & Old Hwy 395 — Timings

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	390	850	130	320	1200	80		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	50.0	0.0	18.0	50.0	52.0	52.0	24.0	26.0
Total Split (%)	41.7%	0.0%	15.0%	41.7%	43.3%	43.3%	20%	22%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	46.0	119.7	13.7	63.7	48.0	48.0		
Actuated g/C Ratio	0.38	1.00	0.11	0.53	0.40	0.40		
v/c Ratio	0.68	0.63	0.64	0.45	1.03	0.11		
Control Delay	38.7	1.7	65.2	19.6	68.2	23.2		
Queue Delay	4.7	0.0	0.0	0.0	0.0	0.0		
Total Delay	43.4	1.7	65.2	19.6	68.2	23.2		
LOS	D	A	E	B	E	C		
Approach Delay	14.8		32.7			65.4		
Approach LOS	B		C			E		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 119.7		
Natural Cycle: 100		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.03		
Intersection Signal Delay: 39.3	Intersection LOS: D	
Intersection Capacity Utilization 79.3%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 19: Mission Rd & Old Hwy 395



LOS Engineering

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	390	850	130	320	1200	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	411	895	137	337	1263	84
Lane Group Flow (vph)	411	895	137	337	1263	84
v/c Ratio	0.68	0.63	0.64	0.45	1.03	0.11
Control Delay	38.7	1.7	65.2	19.6	68.2	23.2
Queue Delay	4.7	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	1.7	65.2	19.6	68.2	23.2
Queue Length 50th (ft)	252	23	103	154	~538	40
Queue Length 95th (ft)	m306	m0	#172	231	#673	75
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	608	1417	218	754	1232	747
Starvation Cap Reductn	132	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.63	0.63	0.45	1.03	0.11

Intersection Summary	
Area Type:	Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Volume (vph)	390	850	130	320	1200	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	411	895	137	337	1263	84
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	411	895	137	337	1263	84
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	46.0	119.7	13.7	59.7	48.0	48.0
Effective Green, g (s)	46.0	119.7	13.7	59.7	48.0	48.0
Actuated g/C Ratio	0.38	1.00	0.11	0.50	0.40	0.40
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	608	1417	213	754	1232	747
v/s Ratio Prot	c0.26		0.07	0.17	c0.41	0.05
v/s Ratio Perm		c0.63		0.07		
v/c Ratio	0.68	0.63	0.64	0.45	1.03	0.11
Uniform Delay, d1	30.7	0.0	50.7	19.4	35.9	22.5
Progression Factor	1.14	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	1.0	6.5	0.4	32.2	0.1
Delay (s)	36.3	1.0	57.2	19.8	68.1	22.6
Level of Service	D	A	E	B	E	C
Approach Delay (s)	12.1		30.6			65.2
Approach LOS	B		C			E

Intersection Summary				
HCM Average Control Delay	37.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	79.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

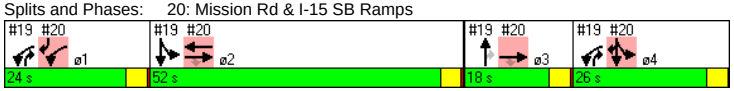
PM Horizon Year + Project
20: Mission Rd & I-15 SB Ramps

Timings

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR	ø3
Lane Configurations							
Volume (vph)	1270	250	90	510	20	730	
Turn Type		Perm	Prot			custom	
Protected Phases	2 3		1	2	4	1 4	3
Permitted Phases		2 3				4	
Detector Phases	2 3	2 3	1	2	4	1 4	
Minimum Initial (s)			4.0	4.0	4.0		4.0
Minimum Split (s)			8.0	20.0	20.0		20.0
Total Split (s)	70.0	70.0	24.0	52.0	26.0	50.0	18.0
Total Split (%)	58.3%	58.3%	20.0%	43.3%	21.7%	41.7%	15%
Yellow Time (s)			3.5	3.5	3.5		3.5
All-Red Time (s)			0.5	0.5	0.5		0.5
Lead/Lag			Lead	Lag	Lag		Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes
Recall Mode			None	Min	None		None
Act Effct Green (s)	65.7	65.7	20.0	48.0	22.0	46.0	
Actuated g/C Ratio	0.55	0.55	0.17	0.40	0.18	0.38	
v/c Ratio	0.69	0.29	0.36	0.72	0.13	0.98	
Control Delay	7.7	0.3	48.8	36.9	42.2	45.7	
Queue Delay	2.1	0.0	0.0	0.0	0.0	17.8	
Total Delay	9.7	0.3	48.8	36.9	42.2	63.4	
LOS	A	A	D	D	D	E	
Approach Delay	8.2			38.7	62.3		
Approach LOS	A			D	E		

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 119.7	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 28.9	Intersection LOS: C
Intersection Capacity Utilization 84.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



LOS Engineering

PM Horizon Year + Project
20: Mission Rd & I-15 SB Ramps

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.976	
Satd. Flow (prot)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Flt Permitted				0.950							0.976	
Satd. Flow (perm)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			263									392
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	1270	250	90	510	0	0	0	0	20	20	730
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1337	263	95	537	0	0	0	0	21	21	768
Lane Group Flow (vph)	0	1337	263	95	537	0	0	0	0	0	42	768
v/c Ratio		0.69	0.29	0.36	0.72						0.13	0.98
Control Delay		7.7	0.3	48.8	36.9						42.2	45.7
Queue Delay		2.1	0.0	0.0	0.0						0.0	17.8
Total Delay		9.7	0.3	48.8	36.9						42.2	63.4
Queue Length 50th (ft)		101	0	66	346						28	352
Queue Length 95th (ft)		m107	m0	120	481						61	#646
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1950	899	265	747						334	786
Starvation Cap Reductn		443	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	50
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.89	0.29	0.36	0.72						0.13	1.04

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

PM Horizon Year + Project
20: Mission Rd & I-15 SB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (prot)		3539	1417	1583	1863						1817	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (perm)		3539	1417	1583	1863						1817	1417
Volume (vph)	0	1270	250	90	510	0	0	0	0	20	20	730
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1337	263	95	537	0	0	0	0	21	21	768
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	0	0	0	241
Lane Group Flow (vph)	0	1337	144	95	537	0	0	0	0	0	42	527
Turn Type			Perm	Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases			2 3									4
Actuated Green, G (s)		65.7	65.7	20.0	48.0						22.0	46.0
Effective Green, g (s)		65.7	65.7	20.0	48.0						22.0	46.0
Actuated g/C Ratio		0.55	0.55	0.17	0.40						0.18	0.38
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1942	778	264	747						334	545
v/s Ratio Prot		c0.38		0.06	c0.29						0.02	c0.37
v/s Ratio Perm			0.10									
v/c Ratio		0.69	0.19	0.36	0.72						0.13	0.97
Uniform Delay, d1		19.6	13.6	44.2	30.2						40.8	36.1
Progression Factor		0.34	0.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.0	0.8	3.3						0.2	29.9
Delay (s)		7.2	0.0	45.0	33.5						41.0	66.0
Level of Service		A	A	D	C						D	E
Approach Delay (s)		6.0			35.2			0.0			64.7	
Approach LOS		A			D			A			E	

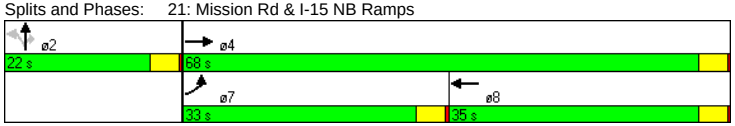
Intersection Summary				
HCM Average Control Delay	27.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	84.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

PM Horizon Year + Project
21: Mission Rd & I-15 NB Ramps — Timings

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	1000	290	230	20	180
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	33.0	68.0	35.0	22.0	22.0
Total Split (%)	36.7%	75.6%	38.9%	24.4%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	29.1	48.6	15.5	18.1	18.1
Actuated g/C Ratio	0.39	0.65	0.21	0.24	0.24
v/c Ratio	0.88	0.25	0.68	0.93	0.39
Control Delay	32.7	5.9	36.1	60.3	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	5.9	36.1	60.3	7.0
LOS	C	A	D	E	A
Approach Delay		26.7	36.1	43.2	
Approach LOS		C	D	D	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 74.7		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.93		
Intersection Signal Delay: 32.2	Intersection LOS: C	
Intersection Capacity Utilization 84.0%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



PM Horizon Year + Project
21: Mission Rd & I-15 NB Ramps — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.989				0.850			
Flt Protected	0.950							0.955				
Satd. Flow (prot)	3072	1863	0	0	1842	0	0	1779	1417	0	0	0
Flt Permitted	0.950							0.955				
Satd. Flow (perm)	3072	1863	0	0	1842	0	0	1779	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					5				189			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	1000	290	0	0	230	20	360	20	180	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	305	0	0	242	21	379	21	189	0	0	0
Lane Group Flow (vph)	1053	305	0	0	263	0	0	400	189	0	0	0
v/c Ratio	0.88	0.25			0.68			0.93	0.39			
Control Delay	32.7	5.9			36.1			60.3	7.0			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	32.7	5.9			36.1			60.3	7.0			
Queue Length 50th (ft)	226	51			111			181	0			
Queue Length 95th (ft)	#398	81			183			#388	50			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	1197	1325			638			430	486			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.88	0.23			0.41			0.93	0.39			

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Horizon Year + Project
21: Mission Rd & I-15 NB Ramps — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	0.97	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	3072	1863			1843			1778	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	3072	1863			1843			1778	1417			
Volume (vph)	1000	290	0	0	230	20	360	20	180	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	305	0	0	242	21	379	21	189	0	0	0
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	143	0	0	0
Lane Group Flow (vph)	1053	305	0	0	259	0	0	400	46	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	29.1	48.6			15.5			18.1	18.1			
Effective Green, g (s)	29.1	48.6			15.5			18.1	18.1			
Actuated g/C Ratio	0.39	0.65			0.21			0.24	0.24			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	1197	1212			382			431	343			
v/s Ratio Prot	c0.34	0.16			c0.14							
v/s Ratio Perm								0.22	0.03			
v/c Ratio	0.88	0.25			0.68			0.93	0.13			
Uniform Delay, d1	21.2	5.5			27.3			27.7	22.2			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	7.6	0.1			4.7			26.0	0.2			
Delay (s)	28.8	5.6			32.0			53.7	22.3			
Level of Service	C	A			C			D	C			
Approach Delay (s)		23.6			32.0			43.6			0.0	
Approach LOS		C			C			D			A	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	74.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

PM Horizon Year + Project
22: Stewart Canyon Rd & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	20	490	350	30	30	100
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	516	368	32	32	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	853	84	137			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	853	84	137			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	47	75			
cM capacity (veh/h)	246	975	1447			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	537	400	137
Volume Left	21	368	0
Volume Right	516	0	105
cSH	873	1447	1700
Volume to Capacity	0.61	0.25	0.08
Queue Length 95th (ft)	108	25	0
Control Delay (s)	15.5	7.8	0.0
Lane LOS	C	A	
Approach Delay (s)	15.5	7.8	0.0
Approach LOS	C		

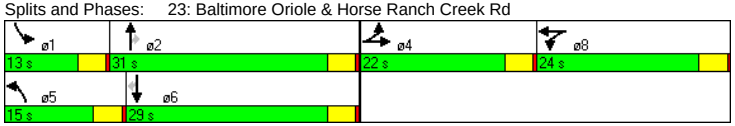
Intersection Summary			
Average Delay	10.7		
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

PM Horizon Year + Project
23: Baltimore Oriole & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	30	20	260	30	60	310	300	80	400	50
Turn Type	Split		Split		Prot		Perm	Prot		Perm
Protected Phases	4	4	8	8	5	2		1	6	
Permitted Phases							2			6
Detector Phases	4	4	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	22.0	22.0	24.0	24.0	15.0	31.0	31.0	13.0	29.0	29.0
Total Split (%)	24.4%	24.4%	26.7%	26.7%	16.7%	34.4%	34.4%	14.4%	32.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	7.4	7.4	13.1	13.1	8.3	30.1	30.1	8.2	29.9	29.9
Actuated g/C Ratio	0.11	0.11	0.20	0.20	0.12	0.48	0.48	0.12	0.47	0.47
v/c Ratio	0.18	0.20	0.56	0.54	0.32	0.37	0.38	0.44	0.48	0.08
Control Delay	32.9	22.8	30.0	26.2	33.2	18.0	4.1	36.5	20.3	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	22.8	30.0	26.2	33.2	18.0	4.1	36.5	20.3	6.7
LOS	C	C	C	C	C	B	A	D	C	A
Approach Delay		27.1		28.0		13.1			21.5	
Approach LOS		C		C		B			C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 63.2			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 19.6		Intersection LOS: B	
Intersection Capacity Utilization 50.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 23: Baltimore Oriole & Horse Ranch Creek Rd



PM Horizon Year + Project
23: Baltimore Oriole & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.925			0.958				0.850			0.850
Flt Protected	0.950			0.950	0.973		0.950			0.950		
Satd. Flow (prot)	1583	1723	0	1504	1650	0	1583	1863	1417	1583	1863	1417
Flt Permitted	0.950			0.950	0.973		0.950			0.950		
Satd. Flow (perm)	1583	1723	0	1504	1650	0	1583	1863	1417	1583	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			20				316			53
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1047			1324			958			2343	
Travel Time (s)		23.8			30.1			21.8			53.3	
Volume (vph)	30	20	20	260	30	50	60	310	300	80	400	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	21	21	274	32	53	63	326	316	84	421	53
Lane Group Flow (vph)	32	42	0	170	189	0	63	326	316	84	421	53
v/c Ratio	0.18	0.20		0.56	0.54		0.32	0.37	0.38	0.44	0.48	0.08
Control Delay	32.9	22.8		30.0	26.2		33.2	18.0	4.1	36.5	20.3	6.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	22.8		30.0	26.2		33.2	18.0	4.1	36.5	20.3	6.7
Queue Length 50th (ft)	11	7		62	61		22	103	0	30	139	0
Queue Length 95th (ft)	41	39		140	141		66	213	54	86	#303	25
Internal Link Dist (ft)		967			1244			878			2263	
Turn Bay Length (ft)												
Base Capacity (vph)	389	439		457	515		268	1011	914	227	983	773
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.10		0.37	0.37		0.24	0.32	0.35	0.37	0.43	0.07

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Horizon Year + Project
23: Baltimore Oriole & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	1723		1504	1650		1583	1863	1417	1583	1863	1417
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	1723		1504	1650		1583	1863	1417	1583	1863	1417
Volume (vph)	30	20	20	260	30	50	60	310	300	80	400	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	21	21	274	32	53	63	326	316	84	421	53
RTOR Reduction (vph)	0	20	0	0	16	0	0	0	175	0	0	30
Lane Group Flow (vph)	32	22	0	170	173	0	63	326	141	84	421	23
Turn Type	Split			Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	4.1	4.1		11.8	11.8		4.9	29.4	29.4	4.7	29.2	29.2
Effective Green, g (s)	4.1	4.1		11.8	11.8		4.9	29.4	29.4	4.7	29.2	29.2
Actuated g/C Ratio	0.06	0.06		0.18	0.18		0.07	0.45	0.45	0.07	0.44	0.44
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	98	107		269	295		118	830	631	113	824	627
v/s Ratio Prot	c0.02	0.01		c0.11	0.10		0.04	0.18		c0.05	c0.23	
v/s Ratio Perm									0.10			0.02
v/c Ratio	0.33	0.21		0.63	0.59		0.53	0.39	0.22	0.74	0.51	0.04
Uniform Delay, d1	29.6	29.4		25.1	24.9		29.4	12.3	11.3	30.1	13.3	10.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	1.0		4.8	2.9		4.6	0.3	0.2	22.9	0.5	0.0
Delay (s)	31.6	30.4		29.9	27.8		34.0	12.6	11.4	53.0	13.8	10.5
Level of Service	C	C		C	C		C	B	B	D	B	B
Approach Delay (s)		30.9			28.8			14.0			19.4	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	19.6	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	50.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

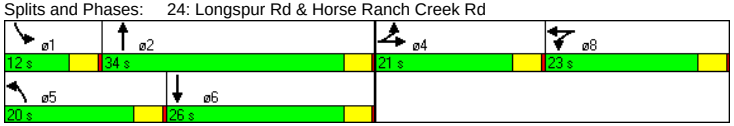
PM Horizon Year + Project
24: Longspur Rd & Horse Ranch Creek Rd

Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	20	50	310	50	140	600	60	560
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	21.0	21.0	23.0	23.0	20.0	34.0	12.0	26.0
Total Split (%)	23.3%	23.3%	25.6%	25.6%	22.2%	37.8%	13.3%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
Act Effct Green (s)	8.4	8.4	14.0	14.0	11.5	34.7	7.2	28.3
Actuated g/C Ratio	0.11	0.11	0.19	0.19	0.15	0.47	0.09	0.39
v/c Ratio	0.12	0.51	0.71	0.69	0.61	0.58	0.43	0.48
Control Delay	33.5	24.5	43.0	38.3	41.9	18.0	44.7	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	24.5	43.0	38.3	41.9	18.0	44.7	23.3
LOS	C	C	D	D	D	B	D	C
Approach Delay		25.8		40.5		21.2		25.2
Approach LOS		C		D		C		C

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 73.3		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.71		
Intersection Signal Delay: 26.2	Intersection LOS: C	
Intersection Capacity Utilization 58.0%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 24: Longspur Rd & Horse Ranch Creek Rd



LOS Engineering

PM Horizon Year + Project
24: Longspur Rd & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.913			0.965			0.950			0.986	
Flt Protected	0.950			0.950	0.974		0.950			0.950		
Satd. Flow (prot)	1583	1701	0	1504	1663	0	1583	3362	0	1583	3490	0
Flt Permitted	0.950			0.950	0.974		0.950			0.950		
Satd. Flow (perm)	1583	1701	0	1504	1663	0	1583	3362	0	1583	3490	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69			15			104			12	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1010			908			1206			958	
Travel Time (s)		23.0			20.6			27.4			21.8	
Volume (vph)	20	50	70	310	50	50	140	600	300	60	560	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	53	74	326	53	53	147	632	316	63	589	63
Lane Group Flow (vph)	21	127	0	204	228	0	147	948	0	63	652	0
v/c Ratio	0.12	0.51		0.71	0.69		0.61	0.58		0.43	0.48	
Control Delay	33.5	24.5		43.0	38.3		41.9	18.0		44.7	23.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.5	24.5		43.0	38.3		41.9	18.0		44.7	23.3	
Queue Length 50th (ft)	9	27		96	101		67	176		29	132	
Queue Length 95th (ft)	31	79		182	188		131	286		72	228	
Internal Link Dist (ft)		930			828			1126			878	
Turn Bay Length (ft)												
Base Capacity (vph)	324	402		370	420		320	1647		163	1354	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.06	0.32		0.55	0.54		0.46	0.58		0.39	0.48	

Intersection Summary	
Area Type:	Other

LOS Engineering

PM Horizon Year + Project
24: Longspur Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.97		1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1700		1504	1663		1583	3362		1583	3488	
Flt Permitted	0.95	1.00		0.95	0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1700		1504	1663		1583	3362		1583	3488	
Volume (vph)	20	50	70	310	50	50	140	600	300	60	560	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	53	74	326	53	53	147	632	316	63	589	63
RTOR Reduction (vph)	0	63	0	0	12	0	0	56	0	0	7	0
Lane Group Flow (vph)	21	64	0	204	216	0	147	892	0	63	645	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.9	6.9		14.0	14.0		9.8	34.7		4.3	29.2	
Effective Green, g (s)	6.9	6.9		14.0	14.0		9.8	34.7		4.3	29.2	
Actuated g/C Ratio	0.09	0.09		0.18	0.18		0.13	0.46		0.06	0.38	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	144	155		277	307		204	1537		90	1342	
v/s Ratio Prot	0.01	c0.04		c0.14	0.13		c0.09	c0.27		0.04	0.18	
v/s Ratio Perm												
v/c Ratio	0.15	0.41		0.74	0.70		0.72	0.58		0.70	0.48	
Uniform Delay, d1	31.8	32.6		29.2	29.0		31.7	15.2		35.2	17.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	1.8		9.8	7.1		11.8	1.6		21.1	1.2	
Delay (s)	32.3	34.4		39.0	36.1		43.6	16.8		56.3	18.9	
Level of Service	C	C		D	D		D	B		E	B	
Approach Delay (s)		34.1			37.5			20.4			22.2	
Approach LOS		C			D			C			C	

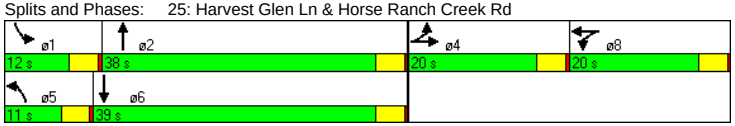
Intersection Summary			
HCM Average Control Delay	24.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

PM Horizon Year + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	40	330	40	50	920	140	780
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	11.0	38.0	12.0	39.0
Total Split (%)	22.2%	22.2%	22.2%	22.2%	12.2%	42.2%	13.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	7.5	7.5	14.9	14.9	6.7	34.3	8.1	40.2
Actuated g/C Ratio	0.09	0.09	0.19	0.19	0.08	0.44	0.10	0.51
v/c Ratio	0.07	0.34	0.81	0.79	0.42	0.89	0.91	0.46
Control Delay	34.4	30.4	54.5	46.1	47.0	29.6	89.8	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	30.4	54.5	46.1	47.0	29.6	89.8	16.0
LOS	C	C	D	D	D	C	F	B
Approach Delay		31.0		50.0		30.2		27.1
Approach LOS		C		D		C		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 78.7			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 32.5		Intersection LOS: C	
Intersection Capacity Utilization 75.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 25: Harvest Glen Ln & Horse Ranch Creek Rd



PM Horizon Year + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.950			0.940			0.958			0.998	
Flt Protected	0.950			0.950	0.978		0.950			0.950		
Satd. Flow (prot)	1583	1770	0	1504	1627	0	1583	3391	0	1583	3532	0
Flt Permitted	0.950			0.950	0.978		0.950			0.950		
Satd. Flow (perm)	1583	1770	0	1504	1627	0	1583	3391	0	1583	3532	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			32			74			2	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1058			1173			1033			1206	
Travel Time (s)		24.0			26.7			23.5			27.4	
Volume (vph)	10	40	20	330	40	100	50	920	360	140	780	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	42	21	347	42	105	53	968	379	147	821	11
Lane Group Flow (vph)	11	63	0	230	264	0	53	1347	0	147	832	0
v/c Ratio	0.07	0.34		0.81	0.79		0.42	0.89		0.91	0.46	
Control Delay	34.4	30.4		54.5	46.1		47.0	29.6		89.8	16.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	34.4	30.4		54.5	46.1		47.0	29.6		89.8	16.0	
Queue Length 50th (ft)	5	20		117	118		26	316		76	160	
Queue Length 95th (ft)	20	56		#249	#252		63	#496		#195	230	
Internal Link Dist (ft)		978			1093			953			1126	
Turn Bay Length (ft)												
Base Capacity (vph)	284	336		303	354		134	1521		162	1803	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.04	0.19		0.76	0.75		0.40	0.89		0.91	0.46	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

PM Horizon Year + Project
25: Harvest Glen Ln & Horse Ranch Creek Rd

HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.94		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1770		1504	1628		1583	3390		1583	3532	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1770		1504	1628		1583	3390		1583	3532	
Volume (vph)	10	40	20	330	40	100	50	920	360	140	780	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	42	21	347	42	105	53	968	379	147	821	11
RTOR Reduction (vph)	0	19	0	0	26	0	0	41	0	0	1	0
Lane Group Flow (vph)	11	44	0	230	238	0	53	1306	0	147	831	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.2	6.2		14.9	14.9		4.0	36.1		8.1	40.2	
Effective Green, g (s)	6.2	6.2		14.9	14.9		4.0	36.1		8.1	40.2	
Actuated g/C Ratio	0.08	0.08		0.18	0.18		0.05	0.44		0.10	0.49	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	121	135		276	298		78	1505		158	1746	
v/s Ratio Prot	0.01	c0.02		c0.15	0.15		0.03	c0.39		c0.09	0.24	
v/s Ratio Perm												
v/c Ratio	0.09	0.32		0.83	0.80		0.68	0.87		0.93	0.48	
Uniform Delay, d1	34.9	35.6		32.0	31.8		38.0	20.4		36.3	13.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.4		19.0	13.8		21.0	5.6		51.3	0.2	
Delay (s)	35.3	37.0		51.0	45.6		59.0	26.0		87.6	13.8	
Level of Service	D	D		D	D		E	C		F	B	
Approach Delay (s)		36.7			48.1			27.3			24.9	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	30.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	81.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

PM Horizon Year + Project
26: Pardee South Loop & Horse Ranch Creek Rd

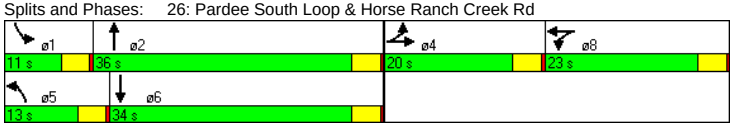
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	50	0	130	0	90	1200	160	890
Turn Type	Split		Split		Prot		Prot	
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phases	4	4	8	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	23.0	23.0	13.0	36.0	11.0	34.0
Total Split (%)	22.2%	22.2%	25.6%	25.6%	14.4%	40.0%	12.2%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	8.0	8.0	10.2	10.2	8.3	38.3	7.1	39.8
Actuated g/C Ratio	0.10	0.10	0.14	0.14	0.11	0.52	0.10	0.54
v/c Ratio	0.32	0.07	0.49	0.43	0.55	0.84	1.10	0.54
Control Delay	36.5	0.3	37.2	16.4	44.0	24.6	138.0	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	0.3	37.2	16.4	44.0	24.6	138.0	17.2
LOS	D	A	D	B	D	C	F	B
Approach Delay		22.9		25.8		25.8		34.1
Approach LOS		C		C		C		C

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 73.5
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 28.9 Intersection LOS: C
Intersection Capacity Utilization 73.4% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 26: Pardee South Loop & Horse Ranch Creek Rd



LOS Engineering

PM Horizon Year + Project
26: Pardee South Loop & Horse Ranch Creek Rd

Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.850			0.896			0.975			0.986	
Flt Protected	0.950			0.950	0.985		0.950			0.950		
Satd. Flow (prot)	1583	1583	0	1504	1562	0	1583	3451	0	1583	3490	0
Flt Permitted	0.950			0.950	0.985		0.950			0.950		
Satd. Flow (perm)	1583	1583	0	1504	1562	0	1583	3451	0	1583	3490	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		310			84			29			13	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		869			1419			1340			1033	
Travel Time (s)		19.8			32.3			30.5			23.5	
Volume (vph)	50	0	30	130	0	80	90	1200	240	160	890	90
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	0	32	137	0	84	95	1263	253	168	937	95
Lane Group Flow (vph)	53	32	0	100	121	0	95	1516	0	168	1032	0
v/c Ratio	0.32	0.07		0.49	0.43		0.55	0.84		1.10	0.54	
Control Delay	36.5	0.3		37.2	16.4		44.0	24.6		138.0	17.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	36.5	0.3		37.2	16.4		44.0	24.6		138.0	17.2	
Queue Length 50th (ft)	23	0		44	15		41	337		~88	194	
Queue Length 95th (ft)	58	0		94	64		#101	#599		#227	316	
Internal Link Dist (ft)		789			1339			1260			953	
Turn Bay Length (ft)												
Base Capacity (vph)	298	550		343	422		190	1814		153	1898	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.18	0.06		0.29	0.29		0.50	0.84		1.10	0.54	

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year + Project

26: Pardee South Loop & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.85		1.00	0.90		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1583		1504	1561		1583	3451		1583	3490	
Flt Permitted	0.95	1.00		0.95	0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1583		1504	1561		1583	3451		1583	3490	
Volume (vph)	50	0	30	130	0	80	90	1200	240	160	890	90
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	0	32	137	0	84	95	1263	253	168	937	95
RTOR Reduction (vph)	0	30	0	0	74	0	0	14	0	0	6	0
Lane Group Flow (vph)	53	2	0	100	47	0	95	1502	0	168	1026	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.4	5.4		9.0	9.0		7.1	39.1		7.1	39.1	
Effective Green, g (s)	5.4	5.4		9.0	9.0		7.1	39.1		7.1	39.1	
Actuated g/C Ratio	0.07	0.07		0.12	0.12		0.09	0.51		0.09	0.51	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	112	112		177	183		147	1762		147	1781	
v/s Ratio Prot	c0.03	0.00		c0.07	0.03		0.06	c0.44		c0.11	0.29	
v/s Ratio Perm												
v/c Ratio	0.47	0.02		0.56	0.26		0.65	0.85		1.14	0.58	
Uniform Delay, d1	34.2	33.1		31.9	30.8		33.5	16.2		34.8	13.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.1		4.1	0.7		9.4	4.2		117.8	0.5	
Delay (s)	37.4	33.2		36.0	31.5		42.9	20.5		152.5	13.5	
Level of Service	D	C		D	C		D	C		F	B	
Approach Delay (s)		35.8			33.6			21.8			32.9	
Approach LOS		D			C			C			C	

Intersection Summary				
HCM Average Control Delay	27.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	76.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Horizon Year + Project

27: School/Park Access & Horse Ranch Creek Rd — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	70	1440	50	0	1050
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	74	1516	53	0	1105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2095	784			1568	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2095	784			1568	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	78			100	
cM capacity (veh/h)	45	336			417	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	74	1011	558	553	553
Volume Left	0	0	0	0	0
Volume Right	74	0	53	0	0
cSH	336	1700	1700	1700	1700
Volume to Capacity	0.22	0.59	0.33	0.33	0.33
Queue Length 95th (ft)	21	0	0	0	0
Control Delay (s)	18.7	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	18.7	0.0		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	52.9%	ICU Level of Service	A	
Analysis Period (min)	15			

LOS Engineering

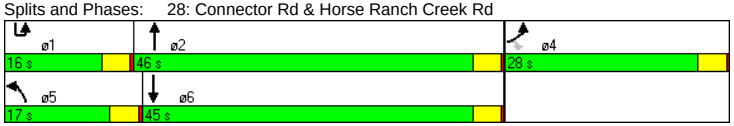
PM Horizon Year + Project
28: Connector Rd & Horse Ranch Creek Rd — Timings

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT
Lane Configurations						
Volume (vph)	670	20	20	810	50	520
Turn Type		Perm	Prot		Prot	
Protected Phases	4		5	2	1	6
Permitted Phases		4				
Detector Phases	4	4	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	28.0	28.0	17.0	46.0	16.0	45.0
Total Split (%)	31.1%	31.1%	18.9%	51.1%	17.8%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead	Lag	Lead	Lag
Lead-Lag Optimize?			Yes	Yes	Yes	Yes
Recall Mode	None	None	None	Min	None	Min
Act Effct Green (s)	18.2	18.2	7.0	19.9	7.8	24.3
Actuated g/C Ratio	0.34	0.34	0.11	0.37	0.14	0.45
v/c Ratio	0.68	0.04	0.12	0.65	0.25	0.65
Control Delay	21.8	9.0	34.3	18.1	30.9	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	9.0	34.3	18.1	30.9	9.6
LOS	C	A	C	B	C	A
Approach Delay	21.5			18.5		10.6
Approach LOS	C			B		B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 53.8
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 16.0 — Intersection LOS: B
Intersection Capacity Utilization 65.5% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 28: Connector Rd & Horse Ranch Creek Rd



LOS Engineering

PM Horizon Year + Project
28: Connector Rd & Horse Ranch Creek Rd — Queues

Lane Group	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9		9
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	0.95
Frt		0.850				0.926	
Flt Protected	0.950		0.950		0.950		
Satd. Flow (prot)	3072	1417	1583	3539	1583	3277	0
Flt Permitted	0.950		0.950		0.950		
Satd. Flow (perm)	3072	1417	1583	3539	1583	3277	0
Right Turn on Red		Yes					Yes
Satd. Flow (RTOR)		21				362	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30		30	
Link Distance (ft)	2875			1509		1400	
Travel Time (s)	65.3			34.3		31.8	
Volume (vph)	670	20	20	810	50	520	510
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	705	21	21	853	53	547	537
Lane Group Flow (vph)	705	21	21	853	53	1084	0
v/c Ratio	0.68	0.04	0.12	0.65	0.25	0.65	
Control Delay	21.8	9.0	34.3	18.1	30.9	9.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.8	9.0	34.3	18.1	30.9	9.6	
Queue Length 50th (ft)	112	0	7	138	18	76	
Queue Length 95th (ft)	225	16	31	226	57	206	
Internal Link Dist (ft)	2795			1429		1320	
Turn Bay Length (ft)							
Base Capacity (vph)	1314	618	328	2024	326	2119	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.54	0.03	0.06	0.42	0.16	0.51	

Intersection Summary

Area Type: Other

LOS Engineering

PM Horizon Year + Project
28: Connector Rd & Horse Ranch Creek Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Ideal Flow (vphpl)	1700	1700	1700	1900	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00	1.00	0.95	1.00	0.95	
Frt	1.00	0.85	1.00	1.00	1.00	0.93	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	3072	1417	1583	3539	1583	3276	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	3072	1417	1583	3539	1583	3276	
Volume (vph)	670	20	20	810	50	520	510
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	705	21	21	853	53	547	537
RTOR Reduction (vph)	0	14	0	0	0	204	0
Lane Group Flow (vph)	705	7	21	853	53	880	0
Turn Type		Perm	Prot		Prot		
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	18.2	18.2	1.1	21.2	4.2	24.3	
Effective Green, g (s)	18.2	18.2	1.1	21.2	4.2	24.3	
Actuated g/C Ratio	0.33	0.33	0.02	0.38	0.08	0.44	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1006	464	31	1349	120	1432	
v/s Ratio Prot	c0.23		0.01	0.24	c0.03	c0.27	
v/s Ratio Perm		0.00					
v/c Ratio	0.70	0.01	0.68	0.63	0.44	0.61	
Uniform Delay, d1	16.3	12.6	27.1	14.0	24.6	12.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	0.0	45.6	1.0	2.6	0.8	
Delay (s)	18.5	12.7	72.7	15.0	27.2	12.8	
Level of Service	B	B	E	B	C	B	
Approach Delay (s)	18.4			16.4		13.5	
Approach LOS	B			B		B	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	55.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

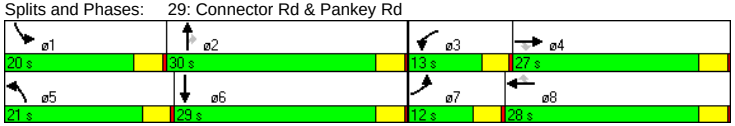
LOS Engineering

PM Horizon Year + Project
29: Connector Rd & Pankey Rd — Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	90	480	310	40	270	300	210	380	70	280	480
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot	
Protected Phases	7	4		3	8		5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	4	3	8	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	12.0	27.0	27.0	13.0	28.0	28.0	21.0	30.0	30.0	20.0	29.0
Total Split (%)	13.3%	30.0%	30.0%	14.4%	31.1%	31.1%	23.3%	33.3%	33.3%	22.2%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	7.6	24.0	24.0	7.5	21.7	21.7	14.8	23.9	23.9	16.2	25.3
Actuated g/C Ratio	0.09	0.29	0.29	0.09	0.26	0.26	0.18	0.29	0.29	0.19	0.30
v/c Ratio	0.67	0.99	0.53	0.31	0.58	0.52	0.79	0.75	0.16	0.96	0.93
Control Delay	62.8	71.3	6.8	44.2	33.7	6.8	54.4	37.7	7.2	79.6	56.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.8	71.3	6.8	44.2	33.7	6.8	54.4	37.7	7.2	79.6	56.2
LOS	E	E	A	D	C	A	D	D	A	E	E
Approach Delay		47.7			21.2			39.8			64.6
Approach LOS		D			C			D			E

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 83.1		
Natural Cycle: 90		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.99		
Intersection Signal Delay: 44.9	Intersection LOS: D	
Intersection Capacity Utilization 87.7%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 29: Connector Rd & Pankey Rd



LOS Engineering

PM Horizon Year + Project
29: Connector Rd & Pankey Rd — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1852	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1852	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			326			316			74		2	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1256			2875			1488			1443	
Travel Time (s)		28.5			65.3			33.8			32.8	
Volume (vph)	90	480	310	40	270	300	210	380	70	280	480	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	505	326	42	284	316	221	400	74	295	505	21
Lane Group Flow (vph)	95	505	326	42	284	316	221	400	74	295	526	0
v/c Ratio	0.67	0.99	0.53	0.31	0.58	0.52	0.79	0.75	0.16	0.96	0.93	
Control Delay	62.8	71.3	6.8	44.2	33.7	6.8	54.4	37.7	7.2	79.6	56.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.8	71.3	6.8	44.2	33.7	6.8	54.4	37.7	7.2	79.6	56.2	
Queue Length 50th (ft)	52	~341	0	23	140	0	117	201	0	~179	~296	
Queue Length 95th (ft)	#126	#552	71	54	221	63	#225	#319	31	#342	#519	
Internal Link Dist (ft)		1176			2795			1408			1363	
Turn Bay Length (ft)												
Base Capacity (vph)	149	510	620	161	528	628	317	571	485	308	564	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.64	0.99	0.53	0.26	0.54	0.50	0.70	0.70	0.15	0.96	0.93	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year + Project
29: Connector Rd & Pankey Rd — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1852	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1770	1346	1583	1863	1417	1583	1863	1417	1583	1852	
Volume (vph)	90	480	310	40	270	300	210	380	70	280	480	20
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	505	326	42	284	316	221	400	74	295	505	21
RTOR Reduction (vph)	0	0	234	0	0	232	0	0	53	0	1	0
Lane Group Flow (vph)	95	505	92	42	284	84	221	400	21	295	525	0
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	6.2	24.0	24.0	4.8	22.6	22.6	14.8	23.9	23.9	16.2	25.3	
Effective Green, g (s)	6.2	24.0	24.0	4.8	22.6	22.6	14.8	23.9	23.9	16.2	25.3	
Actuated g/C Ratio	0.07	0.28	0.28	0.06	0.27	0.27	0.17	0.28	0.28	0.19	0.30	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	116	500	380	89	496	377	276	524	399	302	552	
v/s Ratio Prot	c0.06	c0.29		0.03	0.15		0.14	0.21		c0.19	c0.28	
v/s Ratio Perm			0.07			0.06			0.01			
v/c Ratio	0.82	1.01	0.24	0.47	0.57	0.22	0.80	0.76	0.05	0.98	0.95	
Uniform Delay, d1	38.8	30.5	23.4	38.8	27.0	24.3	33.6	27.9	22.2	34.2	29.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	34.4	42.8	0.3	3.9	1.6	0.3	15.2	6.5	0.1	45.0	26.3	
Delay (s)	73.2	73.2	23.8	42.7	28.6	24.6	48.9	34.4	22.3	79.2	55.5	
Level of Service	E	E	C	D	C	C	D	C	C	E	E	
Approach Delay (s)		55.8			27.5			37.7			64.0	
Approach LOS		E			C			D			E	

Intersection Summary

HCM Average Control Delay	48.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	84.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

LOS Engineering

PM Horizon Year + Project
34: Pala Rd (SR-76) & S Mission Rd

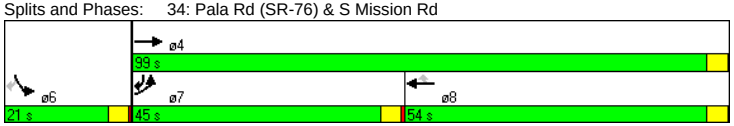
Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1000	1800	1400	250	300	550
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	45.0	99.0	54.0	54.0	21.0	45.0
Total Split (%)	37.5%	82.5%	45.0%	45.0%	17.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	41.0	95.0	50.0	50.0	17.0	62.0
Actuated g/C Ratio	0.34	0.79	0.42	0.42	0.14	0.52
v/c Ratio	1.00	0.47	1.00	0.36	0.73	0.45
Control Delay	68.2	4.6	58.6	6.0	59.9	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	4.6	58.6	6.0	59.9	19.7
LOS	E	A	E	A	E	B
Approach Delay		27.3	50.6		33.9	
Approach LOS		C	D		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 35.6 Intersection LOS: D
Intersection Capacity Utilization 90.1% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



LOS Engineering

PM Horizon Year + Project
34: Pala Rd (SR-76) & S Mission Rd

Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				227		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	1000	1800	1400	250	300	550
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1895	1474	263	316	579
Lane Group Flow (vph)	1053	1895	1474	263	316	579
v/c Ratio	1.00	0.47	1.00	0.36	0.73	0.45
Control Delay	68.2	4.6	58.6	6.0	59.9	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	4.6	58.6	6.0	59.9	19.7
Queue Length 50th (ft)	~421	146	591	16	122	154
Queue Length 95th (ft)	#570	167	#764	72	172	206
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	1050	4026	1475	723	435	1288
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.47	1.00	0.36	0.73	0.45

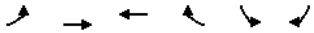
Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

LOS Engineering

PM Horizon Year + Project
34: Pala Rd (SR-76) & S Mission Rd

HCM Signalized Intersection Capacity Analysis



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Volume (vph)	1000	1800	1400	250	300	550
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1895	1474	263	316	579
RTOR Reduction (vph)	0	0	0	132	0	0
Lane Group Flow (vph)	1053	1895	1474	131	316	579
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	41.0	95.0	50.0	50.0	17.0	58.0
Effective Green, g (s)	41.0	95.0	50.0	50.0	17.0	58.0
Actuated g/C Ratio	0.34	0.79	0.42	0.42	0.14	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1050	4026	1475	590	435	1288
v/s Ratio Prot	c0.34	0.37	c0.42		c0.10	0.15
v/s Ratio Perm				0.09		0.08
v/c Ratio	1.00	0.47	1.00	0.22	0.73	0.45
Uniform Delay, d1	39.5	4.2	35.0	22.5	49.3	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.5	0.1	23.1	0.2	10.2	0.3
Delay (s)	68.0	4.2	58.1	22.7	59.4	20.7
Level of Service	E	A	E	C	E	C
Approach Delay (s)		27.0	52.7		34.4	
Approach LOS		C	D		C	

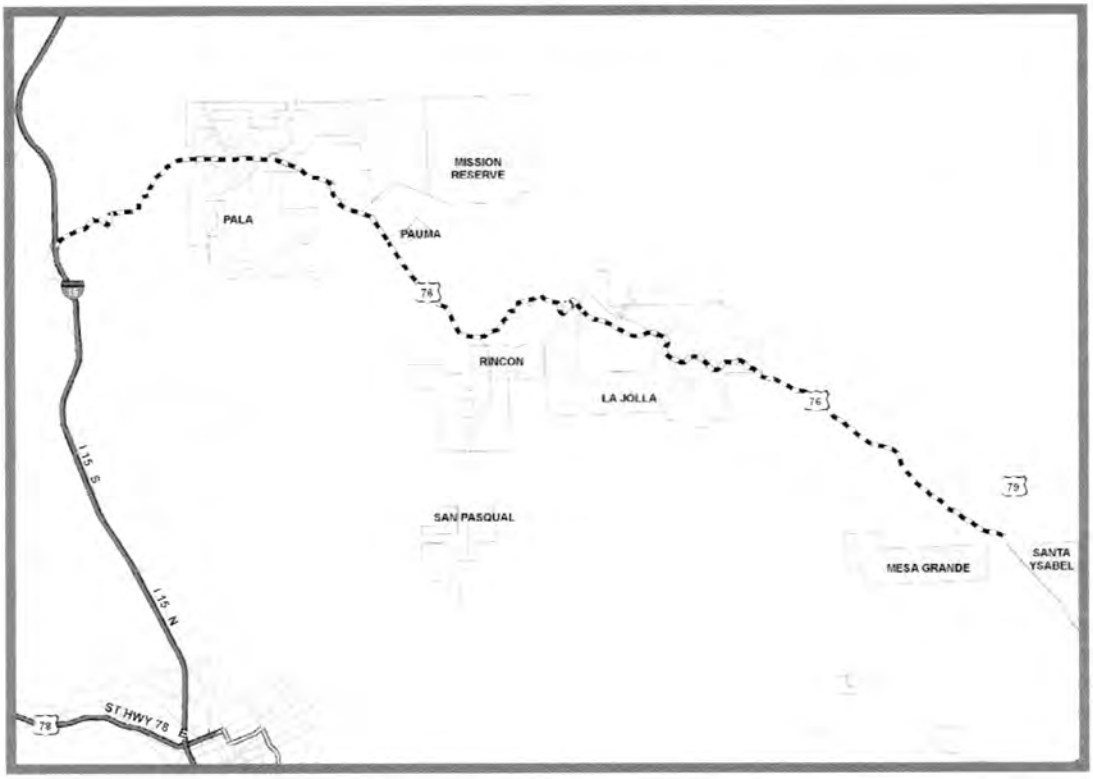
Intersection Summary			
HCM Average Control Delay	36.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

Appendix V

Reservation Transportation Authority *SR-76 East Corridor Study* - Excerpts

SR-76 EAST CORRIDOR STUDY



PREPARED BY:
RESERVATION TRANSPORTATION AUTHORITY

CONSULTANTS:
SPRINGER & ASSOCIATES, INC.
LINSCOTT, LAW & GREENSPAN

FUNDED BY:
CALIFORNIA DEPARTMENT OF TRANSPORTATION

March 2007

6.0 EVALUATION OF JANUARY 2006 SR-76 TRANSPORTATION CONCEPT SUMMARY REPORT

In early 2006, Caltrans prepared a Transportation Concept Summary for SR-76 as a beginning point for the evaluation of the corridor needs. This summary included the roadway segment from the I-5 freeway to the I-15 freeway, and the easterly segment from the I-15 freeway to SR-79. Information was provided in the summary on existing and future average weekday traffic volumes, general recommendations for future major road improvements, and potential operational improvements for the entire SR-76 Corridor from I-5 to SR-79. The complete summary report can be found in Appendix A.

The summary report noted that further study and analysis was required for many of the proposed operational improvements. As a result, Caltrans contracted with the Reservation Transportation Authority to develop the SR-76 East Corridor Study.

6.1 January 2006 Caltrans Proposed Operational Improvements

The summary report included the following potential key operational improvements:

- Curve corrections PM 18.80 to 19.00
- Left Turn Channelization Rice Canyon Road PM 19.39
- Westbound Sight Distance Improvement PM 20.50
- Curve Corrections PM 20.70 to 22.20
- Eastbound Passing Lane PM 26.1 to 26.6
- Curve Correction PM 26.86
- Left and Right Turn Channelization Pauma Reservation Road PM 28.99
- Left and Right Turn Channelization Cole Grade Road PM 29.87
- Eastbound Passing Lane PM 31.3 to 32.0
- Curve Corrections PM 31.50
- Intersection Improvements Poomacha Road PM 41.11
- Intersection Improvements Sengme Oaks Road PM 41.57
- Intersection Improvements La Jolla Campground Road PM 41.68

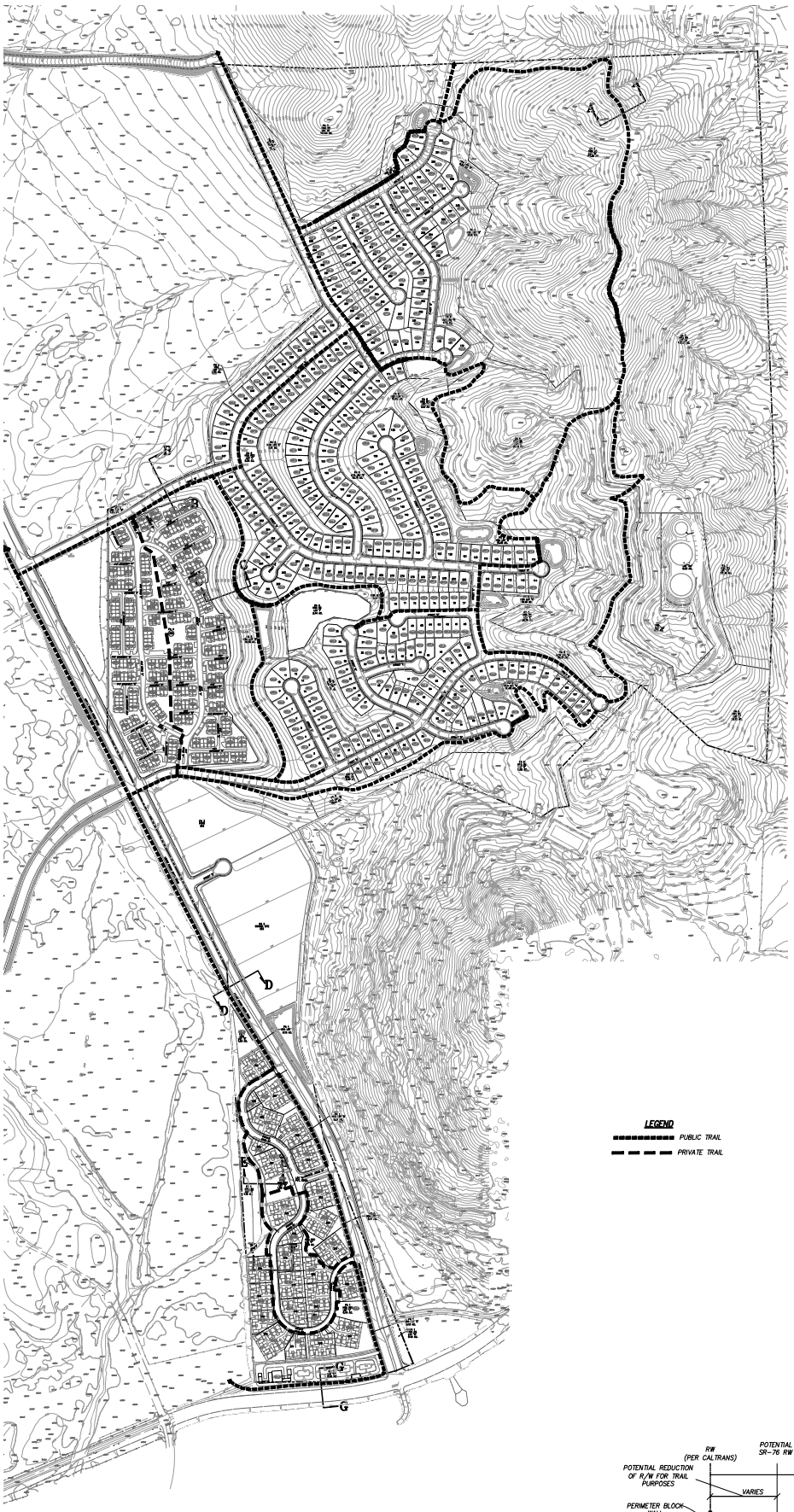
The above list of proposed operational improvements are shown on Figures 6.1-1 and 6.1-2.

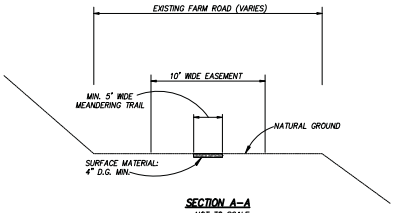
Appendix W

Trails Graphic

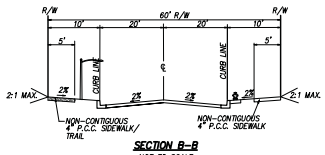
TRAIL EXHIBIT

MEADOWOOD

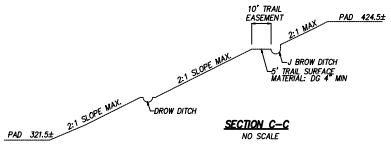




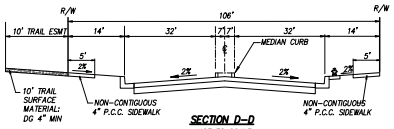
SECTION A–A
NOT TO SCALE
NOTE: ALL TRAILS MULTI–USE AND NON–MOTORIZED



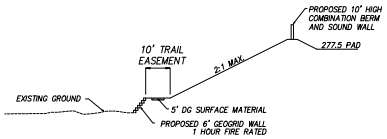
SECTION B–B
NOT TO SCALE



SECTION C–C
NO SCALE

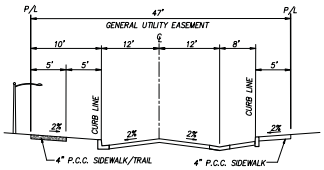


SECTION D–D
NOT TO SCALE



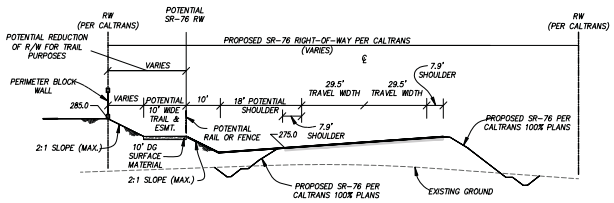
SECTION E–E
NOT TO SCALE

LEGEND
PUBLIC TRAIL
PRIVATE TRAIL



PARALLEL PARKING ONE SIDE (WHERE OCCURS)

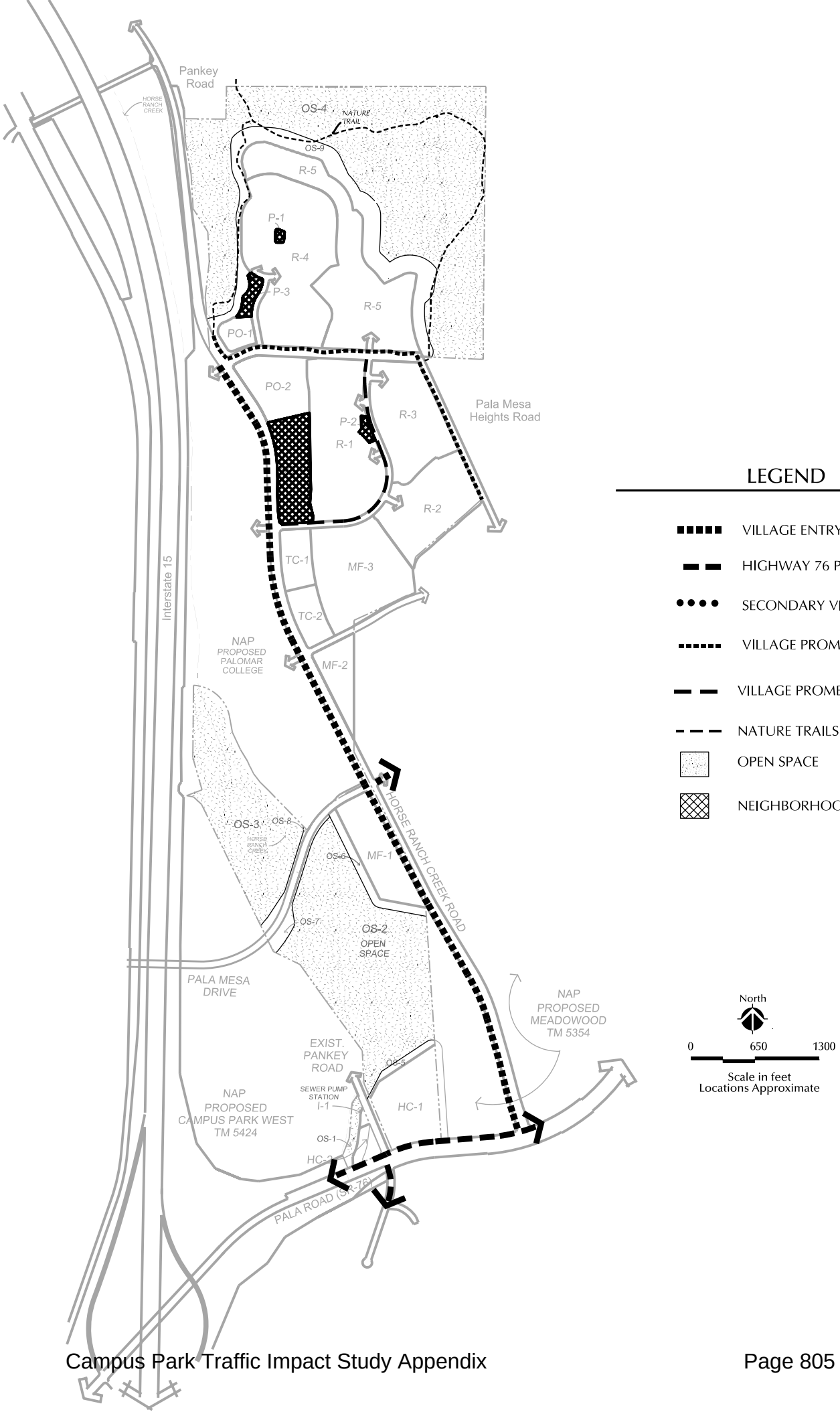
SECTION F–F
NOT TO SCALE



SECTION G–G
NOT TO SCALE

PREPARED BY:
Latitude 33
Planning and Engineering
4933 Paramount Drive, Suite C
San Diego, CA 92123
Tel 858–751–0633 Fax 858–751–0634

SCALE: 1" = 300'


Pankey Road
HORSE RANCH CREEK
OS-4
NATURE TRAIL
OS-8
R-5
P-1
R-4
P-3
R-5
PO-1
PO-2
P-2
R-3
R-1
Pala Mesa Heights Road
R-2
TC-1
MF-3
TC-2
Interstate 15
NAP PROPOSED PALOMAR COLLEGE
MF-2
OS-3
OS-8
HORSE RANCH CREEK
OS-6
MF-1
HORSE RANCH CREEK ROAD
OS-7
OS-2
OPEN SPACE
PALA MESA DRIVE
NAP PROPOSED MEADOWOOD TM 5354
EXIST. PANKEY ROAD
OS-5
SEWER PUMP STATION
I-1
HC-1
NAP PROPOSED CAMPUS PARK WEST TM 5424
OS-1
HC-2
PALA ROAD (SR-76)
LEGEND
VILLAGE ENTRY STREET
HIGHWAY 76 PATHWAY
SECONDARY VILLAGE ENTRY
VILLAGE PROMENADE ONE
VILLAGE PROMENADE TWO
NATURE TRAILS
OPEN SPACE
NEIGHBORHOOD PARK SITE
North
0
650
1300
Scale in feet
Locations Approximate

Appendix X

Modification to a Roadway Standard: Driveway Spacing

County of San Diego

DEPARTMENT OF PUBLIC WORKS

JOHN L. SNYDER
DIRECTOR

5201 RUFFIN ROAD, SUITE D
SAN DIEGO, CALIFORNIA 92123-4310
(858) 694-2055 FAX: (858) 694-8928
Web Site: sdcdpw.org

RICHARD E. CROMPTON
ASSISTANT DIRECTOR

October 14, 2008

Passerelle, LLC
Mark Brencick
402 West Broadway, Suite 1320
San Diego, CA 92101

REQUEST FOR MODIFICATION TO A ROAD STANDARD AND/OR MODIFICATION TO PROJECT CONDITIONS – TM 5338 CAMPUS PARK

Dear Mr. Brencick:

Department of Public Works (DPW) received your application for Modification to Road Standard dated September 10, 2008, submitted to DPLU on September 15, 2008. The request was for a waiver of the 200 feet minimum distance between driveways and between driveways and roads entering non-Circulation Element roads.

At this time, DPW is able to support your request for this modification to Public Road Standards. TM 5338 is zoned for 4,000 square foot lots and is designed with typical lot frontages of 50 to 90 feet. For such projects, modification of this standard is reasonable, and is supported, provided that in final plans, consideration should be given to separate the driveway from the intersection as far as lot lines will allow to avoid a driveway being hidden around a corner by landscaping. It has been determined your request for exception will not adversely affect the safety and flow of traffic. All other improvement conditions required by TM 5338 not otherwise waived shall be met.

If you have any questions or need additional information related to this request, please contact Nael Areigat, Project Manager at (858) 495-5747.

Sincerely,

RICHARD E. CROMPTON
Assistant Director

REC:NA:yl

cc: Dennis Campbell – DPLU planner

Appendix Y

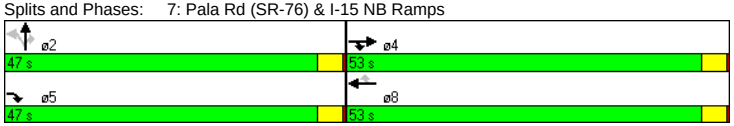
Intersection LOS Calculations With Mitigation

Lane Group	EBT	EBR	WBT	WBR	NBT	NBR	ø5
Lane Configurations							
Volume (vph)	277	405	324	112	0	234	
Turn Type		custom		Perm		Perm	
Protected Phases	4	4 5	8		2		5
Permitted Phases		4		8		2	
Detector Phases	4	4 5	8	8	2	2	
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0		20.0	20.0	20.0	20.0	8.0
Total Split (s)	53.0	100.0	53.0	53.0	47.0	47.0	47.0
Total Split (%)	53.0%	100.0%	53.0%	53.0%	47.0%	47.0%	47%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5		0.5	0.5	0.5	0.5	0.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None		None	None	C-Min	C-Min	None
Act Effct Green (s)	42.0	100.0	42.0	42.0	50.0	50.0	
Actuated g/C Ratio	0.42	1.00	0.42	0.42	0.50	0.50	
v/c Ratio	0.37	0.30	0.44	0.19	0.16	0.30	
Control Delay	9.6	0.4	20.8	6.4	17.9	3.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.6	0.4	20.8	6.4	17.9	3.6	
LOS	A	A	C	A	B	A	
Approach Delay	4.1		17.1		8.8		
Approach LOS	A		B		A		

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 56 (56%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.44
Intersection Signal Delay: 9.1 Intersection LOS: A
Intersection Capacity Utilization 37.4% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



Lane Group	EBT	EBR	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	292	426	341	118	141	246
v/c Ratio	0.37	0.30	0.44	0.19	0.16	0.30
Control Delay	9.6	0.4	20.8	6.4	17.9	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	0.4	20.8	6.4	17.9	3.6
Queue Length 50th (ft)	39	0	133	15	53	0
Queue Length 95th (ft)	m97	m0	185	42	100	47
Internal Link Dist (ft)	1191		2152		911	
Turn Bay Length (ft)				50		800
Base Capacity (vph)	936	1403	936	749	907	847
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.30	0.36	0.16	0.16	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	1.00			
Frt		1.00	0.85		1.00	0.85		1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00		0.95	1.00			
Satd. Flow (prot)		1863	1417		1863	1417		1770	1417			
Flt Permitted		1.00	1.00		1.00	1.00		0.95	1.00			
Satd. Flow (perm)		1863	1417		1863	1417		1770	1417			
Volume (vph)	0	277	405	0	324	112	134	0	234	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	292	426	0	341	118	141	0	246	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	42	0	0	123	0	0	0
Lane Group Flow (vph)	0	292	426	0	341	76	0	141	123	0	0	0
Turn Type			custom			Perm	Perm		Perm			
Protected Phases		4	4 5		8			2				
Permitted Phases			4			8	2		2			
Actuated Green, G (s)		42.0	100.0		42.0	42.0		50.0	50.0			
Effective Green, g (s)		42.0	100.0		42.0	42.0		50.0	50.0			
Actuated g/C Ratio		0.42	1.00		0.42	0.42		0.50	0.50			
Clearance Time (s)		4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		782	1417		782	595		885	709			
v/s Ratio Prot		0.16	c0.30		c0.18							
v/s Ratio Perm						0.05		0.08	0.09			
v/c Ratio		0.37	0.30		0.44	0.13		0.16	0.17			
Uniform Delay, d1		19.9	0.0		20.6	17.8		13.6	13.7			
Progression Factor		0.47	1.00		1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.2	0.1		0.4	0.1		0.4	0.5			
Delay (s)		9.6	0.1		21.0	17.9		14.0	14.2			
Level of Service		A	A		C	B		B	B			
Approach Delay (s)		3.9			20.2			14.1			0.0	
Approach LOS		A			C			B			A	

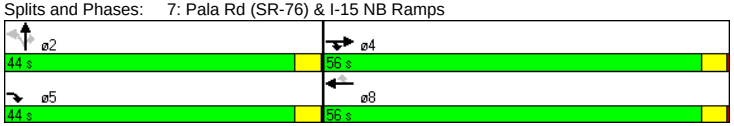
Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBT	WBR	NBT	NBR	ø5
Lane Configurations							
Volume (vph)	348	594	550	133	4	329	
Turn Type		custom		Perm		Perm	
Protected Phases	4	4 5	8		2		5
Permitted Phases				8		2	
Detector Phases	4	4 5	8	8	2	2	
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0		20.0	20.0	20.0	20.0	20.0
Total Split (s)	56.0	100.0	56.0	56.0	44.0	44.0	44.0
Total Split (%)	56.0%	100.0%	56.0%	56.0%	44.0%	44.0%	44%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5		0.5	0.5	0.5	0.5	0.5
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None		None	None	C-Min	C-Min	Min
Act Effct Green (s)	34.6	100.0	34.6	34.6	57.4	57.4	
Actuated g/C Ratio	0.35	1.00	0.35	0.35	0.57	0.57	
v/c Ratio	0.57	0.44	0.90	0.27	0.40	0.36	
Control Delay	36.6	0.5	47.7	13.6	15.1	2.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	36.6	0.5	47.7	13.6	15.1	2.8	
LOS	D	A	D	B	B	A	
Approach Delay	13.8		41.0		9.4		
Approach LOS	B		D		A		

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 20.4 Intersection LOS: C
Intersection Capacity Utilization 59.1% ICU Level of Service B
Analysis Period (min) 15

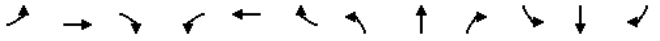
Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	0		1	0		1	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50	50	50	50	50			
Trailing Detector (ft)		0	0		0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			
Flt Protected								0.953				
Satd. Flow (prot)	0	1863	1417	0	1863	1417	0	1775	1417	0	0	0
Flt Permitted								0.953				
Satd. Flow (perm)	0	1863	1417	0	1863	1417	0	1775	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						54			346			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	0	348	594	0	550	133	380	4	329	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	366	625	0	579	140	400	4	346	0	0	0
Lane Group Flow (vph)	0	366	625	0	579	140	0	404	346	0	0	0
v/c Ratio		0.57	0.44		0.90	0.27		0.40	0.36			
Control Delay		36.6	0.5		47.7	13.6		15.1	2.8			
Queue Delay		0.0	0.0		0.0	0.0		0.0	0.0			
Total Delay		36.6	0.5		47.7	13.6		15.1	2.8			
Queue Length 50th (ft)		210	0		348	38		132	0			
Queue Length 95th (ft)		m0	m0		406	68		259	48			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)						50			800			
Base Capacity (vph)		969	1417		969	763		1018	960			
Starvation Cap Reductn		0	0		0	0		0	0			
Spillback Cap Reductn		0	0		0	0		0	0			
Storage Cap Reductn		0	0		0	0		0	0			
Reduced v/c Ratio		0.38	0.44		0.60	0.18		0.40	0.36			

Intersection Summary

Area Type: Other
m Volume for 95th percentile queue is metered by upstream signal.



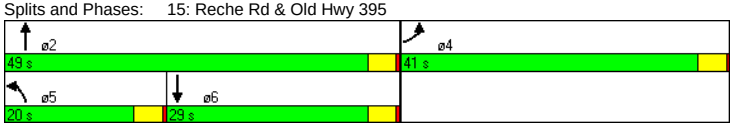
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00	1.00			
Frt		1.00	0.85		1.00	0.85		1.00	0.85			
Flt Protected		1.00	1.00		1.00	1.00		0.95	1.00			
Satd. Flow (prot)		1863	1417		1863	1417		1775	1417			
Flt Permitted		1.00	1.00		1.00	1.00		0.95	1.00			
Satd. Flow (perm)		1863	1417		1863	1417		1775	1417			
Volume (vph)	0	348	594	0	550	133	380	4	329	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	366	625	0	579	140	400	4	346	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	35	0	0	147	0	0	0
Lane Group Flow (vph)	0	366	625	0	579	105	0	404	199	0	0	0
Turn Type			custom			Perm	Perm		Perm			
Protected Phases		4	4 5		8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)		34.6	100.0		34.6	34.6		57.4	57.4			
Effective Green, g (s)		34.6	100.0		34.6	34.6		57.4	57.4			
Actuated g/C Ratio		0.35	1.00		0.35	0.35		0.57	0.57			
Clearance Time (s)		4.0			4.0	4.0		4.0	4.0			
Vehicle Extension (s)		3.0			3.0	3.0		3.0	3.0			
Lane Grp Cap (vph)		645	1417		645	490		1019	813			
v/s Ratio Prot		0.20	c0.44		c0.31							
v/s Ratio Perm						0.07		0.23	0.14			
v/c Ratio		0.57	0.44		0.90	0.21		0.40	0.24			
Uniform Delay, d1		26.6	0.0		31.0	23.1		11.7	10.6			
Progression Factor		1.36	1.00		1.00	1.00		1.00	1.00			
Incremental Delay, d2		0.6	0.1		15.2	0.2		1.2	0.7			
Delay (s)		36.9	0.1		46.2	23.3		12.9	11.3			
Level of Service		D	A		D	C		B	B			
Approach Delay (s)		13.7			41.7			12.1			0.0	
Approach LOS		B			D			B			A	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	189	144	171	149
Turn Type		Prot		
Protected Phases	4	5	2	6
Permitted Phases				
Detector Phases	4	5	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	41.0	20.0	49.0	29.0
Total Split (%)	45.6%	22.2%	54.4%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag		Lead		Lag
Lead-Lag Optimize?		Yes		Yes
Recall Mode	None	None	Min	Min
Act Effct Green (s)	18.8	10.5	26.8	15.3
Actuated g/C Ratio	0.34	0.18	0.49	0.28
v/c Ratio	0.77	0.52	0.20	0.54
Control Delay	24.1	32.6	10.1	22.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.1	32.6	10.1	22.8
LOS	C	C	B	C
Approach Delay	24.1		20.4	22.8
Approach LOS	C		C	C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 55.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 61.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 15: Reche Rd & Old Hwy 395



Lane Group	EBL	NBL	NBT	SBT
Lane Group Flow (vph)	435	152	180	282
v/c Ratio	0.77	0.52	0.20	0.54
Control Delay	24.1	32.6	10.1	22.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.1	32.6	10.1	22.8
Queue Length 50th (ft)	94	42	27	65
Queue Length 95th (ft)	262	141	92	194
Internal Link Dist (ft)	2555		3330	4880
Turn Bay Length (ft)		150		
Base Capacity (vph)	832	430	1174	746
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.52	0.35	0.15	0.38

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.93		1.00	1.00	0.94	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1510		1583	1863	1751	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1510		1583	1863	1751	
Volume (vph)	189	224	144	171	149	119
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	199	236	152	180	157	125
RTOR Reduction (vph)	53	0	0	0	32	0
Lane Group Flow (vph)	382	0	152	180	250	0
Turn Type			Prot			
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	18.8		8.4	27.7	15.3	
Effective Green, g (s)	18.8		8.4	27.7	15.3	
Actuated g/C Ratio	0.34		0.15	0.51	0.28	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	521		244	947	492	
v/s Ratio Prot	c0.25		c0.10	0.10	c0.14	
v/s Ratio Perm						
v/c Ratio	0.73		0.62	0.19	0.51	
Uniform Delay, d1	15.7		21.6	7.3	16.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	5.3		4.9	0.1	0.8	
Delay (s)	20.9		26.4	7.4	17.3	
Level of Service	C		C	A	B	
Approach Delay (s)	20.9			16.1	17.3	
Approach LOS	C			B	B	

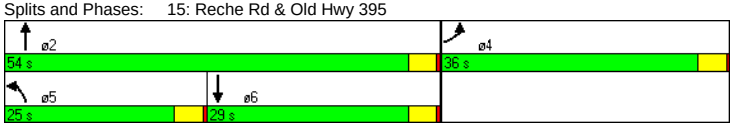
Intersection Summary			
HCM Average Control Delay	18.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	205	249	197	203
Turn Type		Prot		
Protected Phases	4	5	2	6
Permitted Phases				
Detector Phases	4	5	2	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	36.0	25.0	54.0	29.0
Total Split (%)	40.0%	27.8%	60.0%	32.2%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag		Lead		Lag
Lead-Lag Optimize?		Yes		Yes
Recall Mode	None	None	Min	Min
Act Effct Green (s)	22.0	15.5	37.5	17.5
Actuated g/C Ratio	0.32	0.23	0.55	0.26
v/c Ratio	0.85	0.73	0.20	0.78
Control Delay	35.8	41.5	9.6	35.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	35.8	41.5	9.6	35.9
LOS	D	D	A	D
Approach Delay	35.8		27.4	35.9
Approach LOS	D		C	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 68.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 32.8	Intersection LOS: C
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 15: Reche Rd & Old Hwy 395



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Storage Length (ft)	0	0	150			0
Storage Lanes	1	0	1			0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50	50	50	
Trailing Detector (ft)	0		0	0	0	
Turning Speed (mph)	15	9	15			9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.930				0.942	
Flt Protected	0.977		0.950			
Satd. Flow (prot)	1514	0	1583	1863	1755	0
Flt Permitted	0.977		0.950			
Satd. Flow (perm)	1514	0	1583	1863	1755	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	67				41	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	2635			3410	4960	
Travel Time (s)	59.9			77.5	112.7	
Volume (vph)	205	221	249	197	203	152
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	233	262	207	214	160
Lane Group Flow (vph)	449	0	262	207	374	0
v/c Ratio	0.85		0.73	0.20	0.78	
Control Delay	35.8		41.5	9.6	35.9	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	35.8		41.5	9.6	35.9	
Queue Length 50th (ft)	159		110	44	140	
Queue Length 95th (ft)	#346		#242	92	#276	
Internal Link Dist (ft)	2555			3330	4880	
Turn Bay Length (ft)			150			
Base Capacity (vph)	679		474	1168	632	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.66		0.55	0.18	0.59	

Intersection Summary	
Area Type:	Other
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frt	0.93		1.00	1.00	0.94	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1514		1583	1863	1755	
Flt Permitted	0.98		0.95	1.00	1.00	
Satd. Flow (perm)	1514		1583	1863	1755	
Volume (vph)	205	221	249	197	203	152
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	233	262	207	214	160
RTOR Reduction (vph)	45	0	0	0	30	0
Lane Group Flow (vph)	404	0	262	207	344	0
Turn Type			Prot			
Protected Phases	4		5	2	6	
Permitted Phases						
Actuated Green, G (s)	22.0		15.5	37.5	18.0	
Effective Green, g (s)	22.0		15.5	37.5	18.0	
Actuated g/C Ratio	0.33		0.23	0.56	0.27	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	493		364	1035	468	
v/s Ratio Prot	c0.27		c0.17	0.11	c0.20	
v/s Ratio Perm						
v/c Ratio	0.82		0.72	0.20	0.73	
Uniform Delay, d1	20.9		24.0	7.5	22.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	10.2		6.7	0.1	5.9	
Delay (s)	31.1		30.7	7.6	28.5	
Level of Service	C		C	A	C	
Approach Delay (s)	31.1			20.5	28.5	
Approach LOS	C			C	C	

Intersection Summary			
HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

CP

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

COUNT DATE E + P

DIST ____ CO ____ RTE ____ PM ____

CALC _____ DATE _____

CHK _____ DATE _____

Major St: OLD HIGHWAY 395

Minor St: RECHE RD

Critical Approach Speed _____ mph

Critical Approach Speed _____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☑

In built up area of isolated community of < 10,000 population..... ☐ } or **RURAL (R)**

☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓

CONDITION A - Minimum Vehicular Volume

Satisfied ✓ Not Satisfied _____

Minimum Requirements EADT

Number of lanes for moving traffic on each approach		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	1	8,000	5,600	2,400	1,680
(2) or More 8379	(1) 4109	9,600	6,720 ✓	2,400	1,680 ✓
2 or More	2 or More	9,600	6,720	3,200	2,240
1	2 or More	8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied _____ Not Satisfied ✓

Number of lanes for moving traffic on each approach		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	1	12,000	8,400	1,200	850
(2) or More 8379	(1) 4109	14,400	10,080 X	1,200	850 ✓
2 or More	2 or More	14,400	10,080	1,600	1,120
1	2 or More	12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied ✓ Not Satisfied _____

No one condition satisfied, but following conditions fulfilled 80% or more..... _____ A _____ B

2 CONDITIONS 80%	2 CONDITIONS 80%
= 8064 ∴ ✓	100% ✓

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

E=7735 OLD HWY 395

3868

RECHE RD

E 8218 4109 → ↑ 4512

E=9023

Appendix Z

TransNet Intersection Widening Configurations, Signal Warrants, and LOS Calcs

SR-76 at Melrose

SR-76 at East Vista Way

NORTH RIV
SR-76 at North River

SR-76 at Olive Hill

82-76 @ Mission

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE E+C+P

DIST ____ CO ____ RTE ____ PM ____

CALC ____ DATE ____

CHK ____ DATE ____

Major St: OLD HWY 395

Minor St: DULIN RD

Critical Approach Speed ____ mph

Critical Approach Speed ____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐
In built up area of isolated community of < 10,000 population..... ☑ } **RURAL (R)**
☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓	Minimum Requirements EADT	
CONDITION A - Minimum Vehicular Volume	Vehicles Per Day on Major Street (Total of Both Approaches)	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)
Satisfied ✓ Not Satisfied ____		
Number of lanes for moving traffic on each approach	Urban / Rural	Urban / Rural
Major Street / Minor Street		
1 / 1	8,000 / 5,600	2,400 / 1,680
2 or More / 1	9,600 / 6,720	2,400 / 1,680
2 or More / 2 or More	9,600 / 6,720	3,200 / 2,240
(1) 16,250 / (2) or More 3000	8,000 / 5,600 ✓	3,200 / 2,240 ✓
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)
Satisfied ✓ Not Satisfied ____		
Number of lanes for moving traffic on each approach	Urban / Rural	Urban / Rural
Major Street / Minor Street		
1 / 1	12,000 / 8,400	1,200 / 850
2 or More / 1	14,400 / 10,080	1,200 / 850
2 or More / 2 or More	14,400 / 10,080	1,600 / 1,120
(1) 16,250 / (2) or More 3,000	12,000 / 8,400 ✓	1,600 / 1,120 ✓
Combination of CONDITIONS A + B	2 CONDITIONS 80%	2 CONDITIONS 80%
Satisfied ✓ Not Satisfied ____		
No one condition satisfied, but following conditions fulfilled 80% or more..... A ____ B ____		

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

E 14,800
OLD HWY 395
7400
← 3000 DULIN RD
E = 6,000
8850

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE E+C+P

DIST ____ CO ____ RTE ____ PM ____

CALC ____ DATE ____

CHK ____ DATE ____

Major St: SR-76

Minor St: PANKEY RD

Critical Approach Speed ____ mph

Critical Approach Speed ____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☑
In built up area of isolated community of < 10,000 population..... ☑ } **RURAL (R)**
☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓

CONDITION A - Minimum Vehicular Volume

Satisfied ✓ Not Satisfied ____

Number of lanes for moving traffic on each approach

Major Street	Minor Street
1	1
(2) or More 31400	(1) 9350
2 or More	2 or More
1	2 or More

Minimum Requirements EADT

Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
8,000	5,600	2,400	1,680
9,600	6,720 ✓	2,400	1,680 ✓
9,600	6,720	3,200	2,240
8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied ✓ Not Satisfied ____

Number of lanes for moving traffic on each approach

Major Street	Minor Street
1	1
(2) or More 31400	(1) 9350
2 or More	2 or More
1	2 or More

Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
12,000	8,400	1,200	850
14,400	10,080 ✓	1,200	850 ✓
14,400	10,080	1,600	1,120
12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied ✓ Not Satisfied ____

No one condition satisfied, but following conditions fulfilled 80% or more..... ____ (A) ____ (B)

2 CONDITIONS 80%	2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

E=18700 PANKEY
9350
SR 76 ↓ ← 15150
E=32,500 16250 → ↑ E=30300
N

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

COUNT DATE E+C+P

CALC _____ DATE _____

CHK _____ DATE _____

DIST ____ CO ____ RTE ____ PM ____

Major St: SR-76

Minor St: RICE CANYON RD

Critical Approach Speed _____ mph

Critical Approach Speed _____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐ or

In built up area of isolated community of < 10,000 population..... ☑ } RURAL (R)

☐ URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓	Minimum Requirements EADT			
CONDITION A - Minimum Vehicular Volume Satisfied ✓ Not Satisfied _____	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach	Urban	Rural	Urban	Rural
Major Street 1 30,250 / Minor Street 1 6650	8,000	5,600 ✓	2,400	1,680 ✓
2 or More..... / 1.....	9,600	6,720	2,400	1,680
2 or More..... / 2 or More.....	9,600	6,720	3,200	2,240
1..... / 2 or More.....	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic Satisfied ✓ Not Satisfied _____	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach	Urban	Rural	Urban	Rural
Major Street 1 30250 / Minor Street 1 6650	12,000	8,400 ✓	1,200	850 ✓
2 or More..... / 1.....	14,400	10,080	1,200	850
2 or More..... / 2 or More.....	14,400	10,080	1,600	1,120
1..... / 2 or More.....	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B Satisfied ✓ Not Satisfied _____ No one condition satisfied, but following conditions fulfilled 80% or more..... ____ A ____ B	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

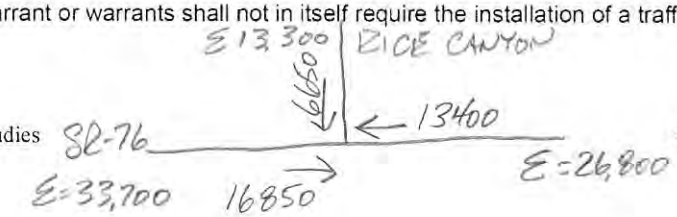


Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE E+C+P

DIST ____ CO ____ RTE ____ PM ____

CALC _____ DATE _____

CHK _____ DATE _____

Major St: SR-76

Minor St: COUSER CANYON RD

Critical Approach Speed _____ mph

Critical Approach Speed _____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐

In built up area of isolated community of < 10,000 population..... ☑ ✓ **RURAL (R)**

☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓

CONDITION A - Minimum Vehicular Volume

Satisfied ✓ Not Satisfied _____

Number of lanes for moving traffic on each approach

Major Street	Minor Street
(1) 30250	(1) 2950
2 or More	1
2 or More	2 or More
1	2 or More

Minimum Requirements EADT			
Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
8,000	5,600 ✓	2,400	1,680 ✓
9,600	6,720	2,400	1,680
9,600	6,720	3,200	2,240
8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied ✓ Not Satisfied _____

Number of lanes for moving traffic on each approach

Major Street	Minor Street
(1) 30250	(1) 2950
2 or More	1
2 or More	2 or More
1	2 or More

Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
12,000	8,400 ✓	1,200	850 ✓
14,400	10,080	1,200	850
14,400	10,080	1,600	1,120
12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied ✓ Not Satisfied _____

No one condition satisfied, but following conditions fulfilled 80% or more..... A _____ B _____

2 CONDITIONS 80%	2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

SR 76 E=33,700 ← 13400

16850 → ↑ 2950 E=26,800

E=5900

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE E+C+P

DIST ____ CO ____ RTE ____ PM ____

CALC ____ DATE ____

CHK ____ DATE ____

Major St: OLD HWY 395

Minor St: PALA MESA DR

Critical Approach Speed ____ mph

Critical Approach Speed ____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐
or
In built up area of isolated community of < 10,000 population..... ☑ **RURAL (R)**

☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓

CONDITION A - Minimum Vehicular Volume

Satisfied ✓ Not Satisfied ____

Number of lanes for moving traffic on each approach

Major Street	Minor Street
1	1
2 or More	1
(2) or More 19950	(2) or More 5750
1	2 or More

Minimum Requirements EADT			
Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
8,000	5,600	2,400	1,680
9,600	6,720	2,400	1,680
9,600	6,720 ✓	3,200	2,240 ✓
8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied ✓ Not Satisfied ____

Number of lanes for moving traffic on each approach

Major Street	Minor Street
1	1
2 or More	1
(2) or More 19950	(2) or More 5750
1	2 or More

Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
12,000	8,400	1,200	850
14,400	10,080	1,200	850
14,400	10,080 ✓	1,600	1,120 ✓
12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied ✓ Not Satisfied ____

No one condition satisfied, but following conditions fulfilled 80% or more..... ____ (A) ____ (B)

2 CONDITIONS 80%	2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

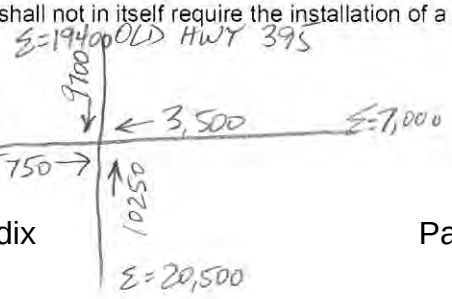


Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE E+C+P

DIST ____ CO ____ RTE ____ PM ____

CALC ____ DATE ____

CHK ____ DATE ____

Major St: OLD HWY 395

Minor St: STEWART CANYON

Critical Approach Speed ____ mph

Critical Approach Speed ____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐

or

In built up area of isolated community of < 10,000 population..... ☑ **RURAL (R)**

☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓	Minimum Requirements EADT	
CONDITION A - Minimum Vehicular Volume	Vehicles Per Day on Major Street (Total of Both Approaches)	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)
Satisfied ✓ Not Satisfied ____		
Number of lanes for moving traffic on each approach	Urban / Rural	Urban / Rural
Major Street / Minor Street		
1 / 1	8,000 / 5,600	2,400 / 1,680
2 or More / 1	9,600 / 6,720	2,400 / 1,680
(2) or More 20450 / (2) or More 4000	9,600 / 6,720 ✓	3,200 / 2,240 ✓
1 / 2 or More	8,000 / 5,600	3,200 / 2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)
Satisfied ✓ Not Satisfied ____		
Number of lanes for moving traffic on each approach	Urban / Rural	Urban / Rural
Major Street / Minor Street		
1 / 1	12,000 / 8,400	1,200 / 850
2 or More / 1	14,400 / 10,080	1,200 / 850
(2) or More 20450 / (2) or More 4000	14,400 / 10,080 ✓	1,600 / 1,120 ✓
1 / 2 or More	12,000 / 8,400	1,600 / 1,120
Combination of CONDITIONS A + B	2 CONDITIONS 80%	2 CONDITIONS 80%
Satisfied ✓ Not Satisfied ____		
No one condition satisfied, but following conditions fulfilled 80% or more..... ____ A ____ B		

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

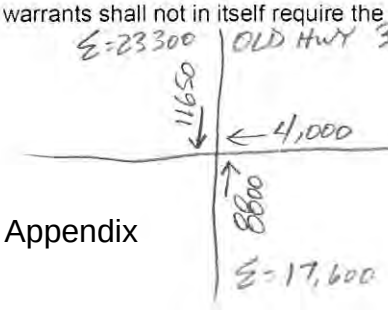


Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE E+C+P

DIST ____ CO ____ RTE ____ PM ____

CALC ____ DATE ____

CHK ____ DATE ____

Major St: OLD HWY 395

Minor St: RECHE RD

Critical Approach Speed ____ mph

Critical Approach Speed ____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☑
or
In built up area of isolated community of < 10,000 population..... ☐
} RURAL (R)

☐ URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓	Minimum Requirements EADT	
CONDITION A - Minimum Vehicular Volume Satisfied ✓ Not Satisfied ____	Vehicles Per Day on Major Street (Total of Both Approaches)	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)
Number of lanes for moving traffic on each approach	Urban / Rural	Urban / Rural
Major Street: 1 ..... Minor Street: 1	8,000 / 5,600	2,400 / 1,680
(2) or More.... 21600 ..... (1) 5300	9,600 / 6,720 ✓	2,400 / 1,680 ✓
2 or More ..... 2 or More	9,600 / 6,720	3,200 / 2,240
1 ..... 2 or More	8,000 / 5,600	3,200 / 2,240
CONDITION B - Interruption of Continuous Traffic Satisfied ✓ Not Satisfied ____	Vehicles Per Day on Major Street (Total of Both Approaches)	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)
Number of lanes for moving traffic on each approach	Urban / Rural	Urban / Rural
Major Street: 1 ..... Minor Street: 1	12,000 / 8,400	1,200 / 850
(2) or More.... 21600 ..... (1) 5300	14,400 / 10,080 ✓	1,200 / 850 ✓
2 or More ..... 2 or More	14,400 / 10,080	1,600 / 1,120
1 ..... 2 or More	12,000 / 8,400	1,600 / 1,120
Combination of CONDITIONS A + B Satisfied ✓ Not Satisfied ____	2 CONDITIONS 80%	2 CONDITIONS 80%
No one condition satisfied, but following conditions fulfilled 80% or more..... A ____ B ____		

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

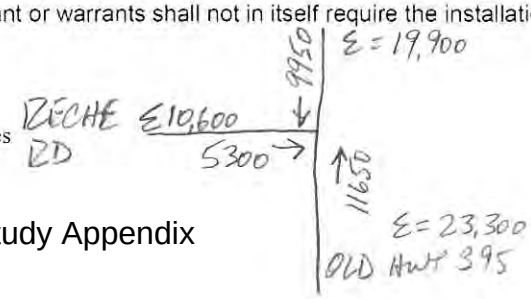


Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE E+C+P

DIST ____ CO ____ RTE ____ PM ____

CALC ____ DATE ____

CHK ____ DATE ____

Major St: RECHE RD

Critical Approach Speed 42 mph

Minor St: LIVE OAK PARK RD

Critical Approach Speed ____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☑ or
In built up area of isolated community of < 10,000 population..... ☐ } **RURAL (R)**

☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓

CONDITION A - Minimum Vehicular Volume

Satisfied ____ Not Satisfied ✓

Minimum Requirements EADT

Number of lanes for moving traffic on each approach		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	1	8,000	5,600	2,400	1,680
(2) or More 12,950	(1) 1,100	9,600	6,720 ✓	2,400	1,680 X
2 or More	2 or More	9,600	6,720	3,200	2,240
1	2 or More	8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied ✓ Not Satisfied ____

Number of lanes for moving traffic on each approach		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	1	12,000	8,400	1,200	850
(2) or More 12,950	(1) 1,100	14,400	10,080 ✓	1,200	850 ✓
2 or More	2 or More	14,400	10,080	1,600	1,120
1	2 or More	12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied ____ Not Satisfied ____

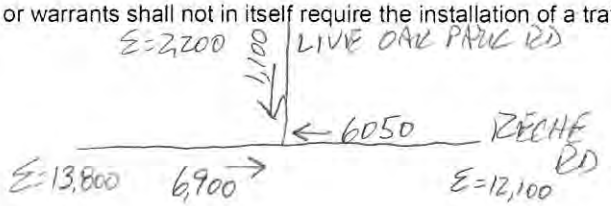
No one condition satisfied, but following conditions fulfilled 80% or more..... ____ A ____ B

2 CONDITIONS 80%

2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	9	1237	1969	44	0	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	1302	2073	46	0	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2119				2766	1059
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2119				2766	1059
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	62
cM capacity (veh/h)	254				15	220

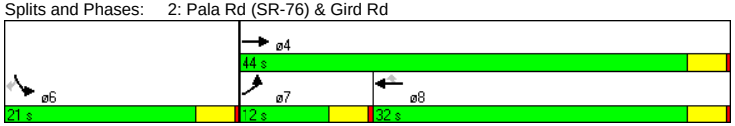
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	9	651	651	1382	737	84
Volume Left	9	0	0	0	0	0
Volume Right	0	0	0	0	46	84
cSH	254	1700	1700	1700	1700	220
Volume to Capacity	0.04	0.38	0.38	0.81	0.43	0.38
Queue Length 95th (ft)	3	0	0	0	0	42
Control Delay (s)	19.7	0.0	0.0	0.0	0.0	31.1
Lane LOS	C					D
Approach Delay (s)	0.1			0.0		31.1
Approach LOS						D

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	151	1185	1330	49	80	139
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	44.0	32.0	32.0	21.0	21.0
Total Split (%)	18.5%	67.7%	49.2%	49.2%	32.3%	32.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	7.9	38.2	26.3	26.3	8.3	8.3
Actuated g/C Ratio	0.14	0.70	0.48	0.48	0.15	0.15
v/c Ratio	0.70	0.50	0.82	0.08	0.35	0.43
Control Delay	43.5	4.9	17.9	7.2	25.6	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.5	4.9	17.9	7.2	25.6	9.0
LOS	D	A	B	A	C	A
Approach Delay		9.3	17.5		15.1	
Approach LOS		A	B		B	

Intersection Summary			
Cycle Length: 65			
Actuated Cycle Length: 54.6			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 13.6		Intersection LOS: B	
Intersection Capacity Utilization 61.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				12		146
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	151	1185	1330	49	80	139
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	1247	1400	52	84	146
Lane Group Flow (vph)	159	1247	1400	52	84	146
v/c Ratio	0.70	0.50	0.82	0.08	0.35	0.43
Control Delay	43.5	4.9	17.9	7.2	25.6	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.5	4.9	17.9	7.2	25.6	9.0
Queue Length 50th (ft)	52	72	188	6	26	0
Queue Length 95th (ft)	#141	134	#315	23	60	40
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	233	2513	1764	713	427	489
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.50	0.79	0.07	0.20	0.30

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Volume (vph)	151	1185	1330	49	80	139
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	159	1247	1400	52	84	146
RTOR Reduction (vph)	0	0	0	6	0	124
Lane Group Flow (vph)	159	1247	1400	46	84	22
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	7.9	38.2	26.3	26.3	8.3	8.3
Effective Green, g (s)	7.9	38.2	26.3	26.3	8.3	8.3
Actuated g/C Ratio	0.14	0.70	0.48	0.48	0.15	0.15
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	229	2481	1708	684	241	216
v/s Ratio Prot	c0.10	0.35	c0.40		c0.05	
v/s Ratio Perm				0.03		0.02
v/c Ratio	0.69	0.50	0.82	0.07	0.35	0.10
Uniform Delay, d1	22.2	3.8	12.1	7.5	20.7	19.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.8	0.2	3.2	0.0	0.9	0.2
Delay (s)	30.9	3.9	15.3	7.6	21.6	20.1
Level of Service	C	A	B	A	C	C
Approach Delay (s)		7.0	15.0		20.6	
Approach LOS		A	B		C	

Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	2	1056	1587	2	0	24
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2	1112	1671	2	0	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1673				2232	836
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1673				2232	836
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	92
cM capacity (veh/h)	380				36	310

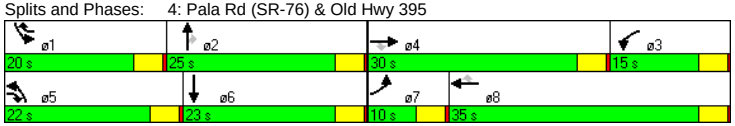
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	2	556	556	1114	559	25
Volume Left	2	0	0	0	0	0
Volume Right	0	0	0	0	2	25
cSH	380	1700	1700	1700	1700	310
Volume to Capacity	0.01	0.33	0.33	0.66	0.33	0.08
Queue Length 95th (ft)	0	0	0	0	0	7
Control Delay (s)	14.5	0.0	0.0	0.0	0.0	17.6
Lane LOS	B					C
Approach Delay (s)	0.0			0.0		17.6
Approach LOS						C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	94	700	145	82	1130	122	284	207	192	400	227
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot	
Protected Phases	7	4	5	3	8	1	5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	5	3	8	1	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	10.0	30.0	22.0	15.0	35.0	20.0	22.0	25.0	25.0	20.0	23.0
Total Split (%)	11.1%	33.3%	24.4%	16.7%	38.9%	22.2%	24.4%	27.8%	27.8%	22.2%	25.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	Min	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	6.0	28.0	46.8	11.2	31.0	50.3	18.0	21.6	21.6	15.3	18.9
Actuated g/C Ratio	0.07	0.31	0.52	0.12	0.34	0.56	0.20	0.24	0.24	0.17	0.21
v/c Ratio	0.93	0.67	0.19	0.45	0.97	0.15	0.94	0.49	0.41	0.80	0.94
Control Delay	116.3	31.6	1.7	44.5	50.6	2.2	75.5	34.1	7.1	48.7	67.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.3	31.6	1.7	44.5	50.6	2.2	75.5	34.1	7.1	48.7	67.4
LOS	F	C	A	D	D	A	E	C	A	D	E
Approach Delay		35.5			45.8			43.7			57.5
Approach LOS		D			D			D			E

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 89.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 45.2		Intersection LOS: D	
Intersection Capacity Utilization 87.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	1		1	2		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.947	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1764	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1764	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			153			128			202		28	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	94	700	145	82	1130	122	284	207	192	400	227	125
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	737	153	86	1189	128	299	218	202	421	239	132
Lane Group Flow (vph)	99	737	153	86	1189	128	299	218	202	421	371	0
v/c Ratio	0.93	0.67	0.19	0.45	0.97	0.15	0.94	0.49	0.41	0.80	0.94	
Control Delay	116.3	31.6	1.7	44.5	50.6	2.2	75.5	34.1	7.1	48.7	67.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	116.3	31.6	1.7	44.5	50.6	2.2	75.5	34.1	7.1	48.7	67.4	
Queue Length 50th (ft)	57	202	0	45	346	0	169	108	0	119	194	
Queue Length 95th (ft)	#156	262	16	93	#492	23	#326	179	54	#183	#368	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	106	1130	811	206	1220	831	317	448	494	543	394	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.93	0.65	0.19	0.42	0.97	0.15	0.94	0.49	0.41	0.78	0.94	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

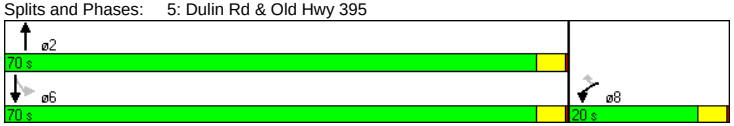
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1763	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1763	
Volume (vph)	94	700	145	82	1130	122	284	207	192	400	227	125
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	737	153	86	1189	128	299	218	202	421	239	132
RTOR Reduction (vph)	0	0	75	0	0	62	0	0	154	0	22	0
Lane Group Flow (vph)	99	737	78	86	1189	66	299	218	48	421	349	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	6.0	28.0	46.0	9.8	31.8	47.1	18.0	21.6	21.6	15.3	18.9	
Effective Green, g (s)	6.0	28.0	46.0	9.8	31.8	47.1	18.0	21.6	21.6	15.3	18.9	
Actuated g/C Ratio	0.07	0.31	0.51	0.11	0.35	0.52	0.20	0.24	0.24	0.17	0.21	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	105	1093	719	171	1241	798	314	444	337	518	367	
v/s Ratio Prot	c0.06	0.21	0.02	0.05	c0.34	0.01	c0.19	c0.12		0.14	c0.20	
v/s Ratio Perm			0.03			0.03			0.03			
v/c Ratio	0.94	0.67	0.11	0.50	0.96	0.08	0.95	0.49	0.14	0.81	0.95	
Uniform Delay, d1	42.2	27.4	11.7	38.2	28.8	11.0	35.9	29.8	27.2	36.3	35.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	69.2	1.7	0.1	2.3	16.3	0.0	38.0	0.9	0.2	9.4	34.2	
Delay (s)	111.4	29.0	11.7	40.5	45.1	11.0	73.9	30.7	27.4	45.8	69.6	
Level of Service	F	C	B	D	D	B	E	C	C	D	E	
Approach Delay (s)		34.6			41.7			47.7			56.9	
Approach LOS		C			D			D			E	

Intersection Summary				
HCM Average Control Delay	44.1	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	90.7	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	87.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	12	6	1046	9	442
Turn Type		Perm		Perm	
Protected Phases	8		2		6
Permitted Phases		8		6	
Detector Phases	8	8	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	70.0	70.0	70.0
Total Split (%)	22.2%	22.2%	77.8%	77.8%	77.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Min	Min	Min
Act Effct Green (s)	6.3	6.3	111.6		111.6
Actuated g/C Ratio	0.05	0.05	0.95		0.95
v/c Ratio	0.16	0.08	0.63		0.27
Control Delay	35.9	21.2	3.3		1.1
Queue Delay	0.0	0.0	0.0		0.0
Total Delay	35.9	21.2	3.3		1.1
LOS	D	C	A		A
Approach Delay	31.3		3.3		1.1
Approach LOS	C		A		A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 117.8	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 3.0	Intersection LOS: A
Intersection Capacity Utilization 65.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Dulin Rd & Old Hwy 395



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	320		0	0	
Storage Lanes	1	1		0	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.999			
Flt Protected	0.950					0.999
Satd. Flow (prot)	1583	1417	1861	0	0	1861
Flt Permitted	0.950					0.980
Satd. Flow (perm)	1583	1417	1861	0	0	1825
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		6		1		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	620		2135			899
Travel Time (s)	14.1		48.5			20.4
Volume (vph)	12	6	1046	10	9	442
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	6	1101	11	9	465
Lane Group Flow (vph)	13	6	1112	0	0	474
v/c Ratio	0.16	0.08	0.63			0.27
Control Delay	35.9	21.2	3.3			1.1
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	35.9	21.2	3.3			1.1
Queue Length 50th (ft)	10	0	0			0
Queue Length 95th (ft)	29	14	274			61
Internal Link Dist (ft)	540		2055			819
Turn Bay Length (ft)		320				
Base Capacity (vph)	191	176	1762			1728
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.07	0.03	0.63			0.27

Intersection Summary	
Area Type:	Other

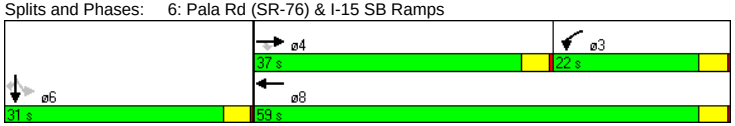
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1583	1417	1860			1861
Flt Permitted	0.95	1.00	1.00			0.98
Satd. Flow (perm)	1583	1417	1860			1824
Volume (vph)	12	6	1046	10	9	442
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	6	1101	11	9	465
RTOR Reduction (vph)	0	6	0	0	0	0
Lane Group Flow (vph)	13	0	1112	0	0	474
Turn Type		Perm			Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	2.9	2.9	109.2			109.2
Effective Green, g (s)	2.9	2.9	109.2			109.2
Actuated g/C Ratio	0.02	0.02	0.91			0.91
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	38	34	1691			1658
v/s Ratio Prot	c0.01		c0.60			
v/s Ratio Perm		0.00				0.26
v/c Ratio	0.34	0.00	0.66			0.29
Uniform Delay, d1	57.7	57.2	1.2			0.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	5.3	0.0	0.9			0.1
Delay (s)	63.0	57.2	2.2			0.8
Level of Service	E	E	A			A
Approach Delay (s)	61.2		2.2			0.8
Approach LOS	E		A			A

Intersection Summary			
HCM Average Control Delay	2.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	950	350	400	800	138	1	570
Turn Type		Perm	Prot		Perm		Perm
Protected Phases	4		3	8		6	
Permitted Phases		4			6		6
Detector Phases	4	4	3	8	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	37.0	22.0	59.0	31.0	31.0	31.0
Total Split (%)	41.1%	41.1%	24.4%	65.6%	34.4%	34.4%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	31.9	31.9	16.2	52.1	29.9	29.9	29.9
Actuated g/C Ratio	0.35	0.35	0.18	0.58	0.33	0.33	0.33
v/c Ratio	0.80	0.50	0.76	0.41	0.29	0.50	0.53
Control Delay	31.3	4.7	47.6	11.9	26.6	14.4	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	4.7	47.6	11.9	26.6	14.4	15.0
LOS	C	A	D	B	C	B	B
Approach Delay	24.1			23.8		17.0	
Approach LOS	C			C		B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2: and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 22.4		Intersection LOS: C	
Intersection Capacity Utilization 63.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	2		0	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850								0.850	0.850
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	3539	1417	3072	3539	0	0	0	0	1504	1441	1346
Flt Permitted				0.950						0.950		
Satd. Flow (perm)	0	3539	1417	3072	3539	0	0	0	0	1504	1441	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			368								179	179
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	950	350	400	800	0	0	0	0	138	1	570
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1000	368	421	842	0	0	0	0	145	1	600
Lane Group Flow (vph)	0	1000	368	421	842	0	0	0	0	145	301	300
v/c Ratio		0.80	0.50	0.76	0.41					0.29	0.50	0.53
Control Delay		31.3	4.7	47.6	11.9					26.6	14.4	15.0
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		31.3	4.7	47.6	11.9					26.6	14.4	15.0
Queue Length 50th (ft)		255	0	123	196					66	58	54
Queue Length 95th (ft)		336	56	m153	m303					121	147	144
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		1348	768	624	2218					523	618	585
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.74	0.48	0.67	0.38					0.28	0.49	0.51

Intersection Summary	
Area Type:	Other

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.85	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	1417	3072	3539					1504	1442	1346
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	1417	3072	3539					1504	1442	1346
Volume (vph)	0	950	350	400	800	0	0	0	0	138	1	570
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1000	368	421	842	0	0	0	0	145	1	600
RTOR Reduction (vph)	0	0	238	0	0	0	0	0	0	0	120	120
Lane Group Flow (vph)	0	1000	130	421	842	0	0	0	0	145	181	180
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		31.9	31.9	16.2	52.1					29.9	29.9	29.9
Effective Green, g (s)		31.9	31.9	16.2	52.1					29.9	29.9	29.9
Actuated g/C Ratio		0.35	0.35	0.18	0.58					0.33	0.33	0.33
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1254	502	553	2049					500	479	447
v/s Ratio Prot		c0.28		c0.14	0.24							
v/s Ratio Perm			0.09							0.10	0.13	c0.13
v/c Ratio		0.80	0.26	0.76	0.41					0.29	0.38	0.40
Uniform Delay, d1		26.1	20.7	35.1	10.5					22.2	23.0	23.2
Progression Factor		1.00	1.00	1.18	1.13					1.00	1.00	1.00
Incremental Delay, d2		3.6	0.3	4.1	0.1					1.5	2.3	2.7
Delay (s)		29.8	20.9	45.4	11.9					23.7	25.2	25.9
Level of Service		C	C	D	B					C	C	C
Approach Delay (s)		27.4			23.1			0.0			25.2	
Approach LOS		C			C			A			C	

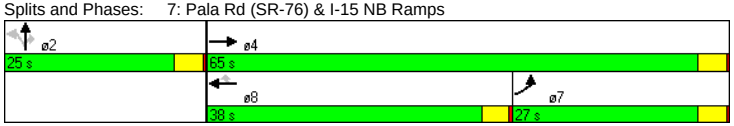
Intersection Summary					
HCM Average Control Delay	25.3	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.64				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	63.3%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Volume (vph)	500	600	950	139	277	0	340
Turn Type	Prot			Perm	Perm		Perm
Protected Phases	7	4	8			2	
Permitted Phases				8	2		2
Detector Phases	7	4	8	8	2	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	27.0	65.0	38.0	38.0	25.0	25.0	25.0
Total Split (%)	30.0%	72.2%	42.2%	42.2%	27.8%	27.8%	27.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	20.1	54.8	30.7	30.7	27.2	27.2	27.2
Actuated g/C Ratio	0.22	0.61	0.34	0.34	0.30	0.30	0.30
v/c Ratio	0.77	0.29	0.83	0.28	0.38	0.43	0.45
Control Delay	50.2	12.8	33.6	14.0	30.7	25.6	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.2	12.8	33.6	14.0	30.7	25.6	6.6
LOS	D	B	C	B	C	C	A
Approach Delay		29.8	31.1			19.3	
Approach LOS		C	C			B	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green		
Natural Cycle: 60		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.83		
Intersection Signal Delay: 28.0	Intersection LOS: C	
Intersection Capacity Utilization 63.3%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	2		0	0		1	1		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Frt						0.850		0.933	0.850			
Flt Protected	0.950						0.950	0.973				
Satd. Flow (prot)	3072	3539	0	0	3539	1417	1504	1539	1346	0	0	0
Flt Permitted	0.950						0.950	0.973				
Satd. Flow (perm)	3072	3539	0	0	3539	1417	1504	1539	1346	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						54		42	263			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	500	600	0	0	950	139	277	0	340	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	526	632	0	0	1000	146	292	0	358	0	0	0
Lane Group Flow (vph)	526	632	0	0	1000	146	175	212	263	0	0	0
v/c Ratio	0.77	0.29			0.83	0.28	0.38	0.43	0.45			
Control Delay	50.2	12.8			33.6	14.0	30.7	25.6	6.6			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	50.2	12.8			33.6	14.0	30.7	25.6	6.6			
Queue Length 50th (ft)	166	175			267	36	84	85	0			
Queue Length 95th (ft)	m201	m153			330	78	160	171	65			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	785	2415			1353	575	462	501	595			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.67	0.26			0.74	0.25	0.38	0.42	0.44			

Intersection Summary	
Area Type:	Other
m	Volume for 95th percentile queue is metered by upstream signal.

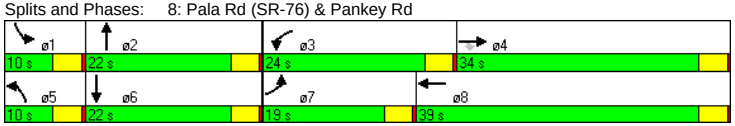
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.93	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (prot)	3072	3539			3539	1417	1504	1539	1346			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (perm)	3072	3539			3539	1417	1504	1539	1346			
Volume (vph)	500	600	0	0	950	139	277	0	340	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	526	632	0	0	1000	146	292	0	358	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	36	0	29	184	0	0	0
Lane Group Flow (vph)	526	632	0	0	1000	110	175	183	79	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	20.1	54.8			30.7	30.7	27.2	27.2	27.2			
Effective Green, g (s)	20.1	54.8			30.7	30.7	27.2	27.2	27.2			
Actuated g/C Ratio	0.22	0.61			0.34	0.34	0.30	0.30	0.30			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	686	2155			1207	483	455	465	407			
v/s Ratio Prot	c0.17	0.18			c0.28							
v/s Ratio Perm						0.08	0.12	0.12	0.06			
v/c Ratio	0.77	0.29			0.83	0.23	0.38	0.39	0.20			
Uniform Delay, d1	32.8	8.4			27.2	21.2	24.8	24.9	23.3			
Progression Factor	1.37	1.57			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	3.5	0.1			4.8	0.2	2.5	2.5	1.1			
Delay (s)	48.5	13.2			32.1	21.4	27.2	27.3	24.4			
Level of Service	D	B			C	C	C	C	C			
Approach Delay (s)		29.2			30.7			26.1			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	29.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	140	670	154	195	920	110	256	26	187
Turn Type	Prot		Perm	Prot		Prot		Prot	
Protected Phases	7	4		3	8	5	2	1	6
Permitted Phases			4						
Detector Phases	7	4	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	19.0	34.0	34.0	24.0	39.0	10.0	22.0	10.0	22.0
Total Split (%)	21.1%	37.8%	37.8%	26.7%	43.3%	11.1%	24.4%	11.1%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	11.2	24.1	24.1	13.7	26.3	6.6	15.8	6.6	11.8
Actuated g/C Ratio	0.16	0.36	0.36	0.20	0.39	0.10	0.24	0.09	0.18
v/c Ratio	0.57	0.55	0.26	0.65	0.76	0.39	0.49	0.19	0.41
Control Delay	40.9	21.7	5.1	39.4	23.5	40.7	19.6	41.7	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	21.7	5.1	39.4	23.5	40.7	19.6	41.7	26.4
LOS	D	C	A	D	C	D	B	D	C
Approach Delay		21.8			26.1		23.9		27.8
Approach LOS		C			C		C		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 66.9			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 24.5		Intersection LOS: C	
Intersection Capacity Utilization 65.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.988			0.940			0.964	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3497	0	3072	3327	0	1583	3412	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3497	0	3072	3327	0	1583	3412	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			162		11			153			43	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2232			2833			991			1488	
Travel Time (s)		50.7			64.4			22.5			33.8	
Volume (vph)	140	670	154	195	920	77	110	256	168	26	187	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	705	162	205	968	81	116	269	177	27	197	63
Lane Group Flow (vph)	147	705	162	205	1049	0	116	446	0	27	260	0
v/c Ratio	0.57	0.55	0.26	0.65	0.76		0.39	0.49		0.19	0.41	
Control Delay	40.9	21.7	5.1	39.4	23.5		40.7	19.6		41.7	26.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.9	21.7	5.1	39.4	23.5		40.7	19.6		41.7	26.4	
Queue Length 50th (ft)	61	130	0	84	204		25	54		11	47	
Queue Length 95th (ft)	140	232	42	178	344		#61	127		41	92	
Internal Link Dist (ft)		2152			2753			911			1408	
Turn Bay Length (ft)												
Base Capacity (vph)	352	1552	713	446	1702		304	1086		149	970	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.42	0.45	0.23	0.46	0.62		0.38	0.41		0.18	0.27	

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

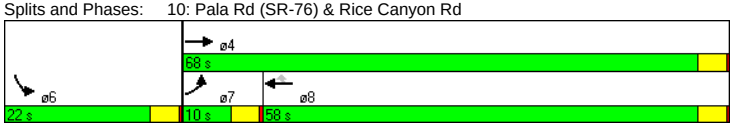
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3498		3072	3329		1583	3411	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3498		3072	3329		1583	3411	
Volume (vph)	140	670	154	195	920	77	110	256	168	26	187	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	705	162	205	968	81	116	269	177	27	197	63
RTOR Reduction (vph)	0	0	105	0	7	0	0	118	0	0	35	0
Lane Group Flow (vph)	147	705	57	205	1042	0	116	328	0	27	225	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	8.7	24.1	24.1	10.9	26.3		4.2	15.8		1.8	13.4	
Effective Green, g (s)	8.7	24.1	24.1	10.9	26.3		4.2	15.8		1.8	13.4	
Actuated g/C Ratio	0.13	0.35	0.35	0.16	0.38		0.06	0.23		0.03	0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	201	1243	498	252	1341		188	767		42	666	
v/s Ratio Prot	0.09	0.20		c0.13	c0.30		c0.04	c0.10		0.02	0.07	
v/s Ratio Perm			0.04									
v/c Ratio	0.73	0.57	0.11	0.81	0.78		0.62	0.43		0.64	0.34	
Uniform Delay, d1	28.8	18.0	15.0	27.9	18.6		31.4	22.5		33.1	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.8	0.6	0.1	17.9	2.9		5.9	0.4		29.0	0.3	
Delay (s)	41.7	18.6	15.1	45.7	21.5		37.3	22.9		62.1	24.1	
Level of Service	D	B	B	D	C		D	C		E	C	
Approach Delay (s)		21.4			25.4			25.9			27.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM Average Control Delay	24.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Configurations					
Volume (vph)	32	1071	552	33	80
Turn Type	Prot			Perm	
Protected Phases	7	4	8		6
Permitted Phases				8	
Detector Phases	7	4	8	8	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	10.0	68.0	58.0	58.0	22.0
Total Split (%)	11.1%	75.6%	64.4%	64.4%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	6.3	42.9	40.0	40.0	11.8
Actuated g/C Ratio	0.09	0.67	0.62	0.62	0.18
v/c Ratio	0.24	0.90	0.50	0.04	0.67
Control Delay	42.1	20.5	9.4	2.8	28.9
Queue Delay	0.0	0.5	0.4	0.0	0.1
Total Delay	42.1	21.0	9.9	2.8	29.0
LOS	D	C	A	A	C
Approach Delay		21.7	9.5		29.0
Approach LOS		C	A		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 64.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 77.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Pala Rd (SR-76) & Rice Canyon Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.914	
Flt Protected	0.950				0.982	
Satd. Flow (prot)	1583	1863	1863	1417	1496	0
Flt Permitted	0.950				0.982	
Satd. Flow (perm)	1583	1863	1863	1417	1496	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				35	88	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		5160	470		1120	
Travel Time (s)		117.3	10.7		25.5	
Volume (vph)	32	1071	552	33	80	140
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1127	581	35	84	147
Lane Group Flow (vph)	34	1127	581	35	231	0
v/c Ratio	0.24	0.90	0.50	0.04	0.67	
Control Delay	42.1	20.5	9.4	2.8	28.9	
Queue Delay	0.0	0.5	0.4	0.0	0.1	
Total Delay	42.1	21.0	9.9	2.8	29.0	
Queue Length 50th (ft)	13	275	81	0	52	
Queue Length 95th (ft)	49	#649	261	11	152	
Internal Link Dist (ft)		5080	390		1040	
Turn Bay Length (ft)						
Base Capacity (vph)	148	1424	1309	1006	479	
Starvation Cap Reductn	0	0	312	0	0	
Spillback Cap Reductn	0	73	0	0	14	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.23	0.83	0.58	0.03	0.50	

Intersection Summary	
Area Type:	Other
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

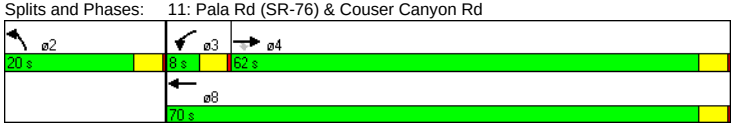
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.91	
Flt Protected	0.95	1.00	1.00	1.00	0.98	
Satd. Flow (prot)	1583	1863	1863	1417	1496	
Flt Permitted	0.95	1.00	1.00	1.00	0.98	
Satd. Flow (perm)	1583	1863	1863	1417	1496	
Volume (vph)	32	1071	552	33	80	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	34	1127	581	35	84	147
RTOR Reduction (vph)	0	0	0	14	72	0
Lane Group Flow (vph)	34	1127	581	21	159	0
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases				8		
Actuated Green, G (s)	1.7	45.7	40.0	40.0	11.8	
Effective Green, g (s)	1.7	45.7	40.0	40.0	11.8	
Actuated g/C Ratio	0.03	0.70	0.61	0.61	0.18	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	41	1300	1138	865	270	
v/s Ratio Prot	0.02	c0.61	0.31		c0.11	
v/s Ratio Perm				0.02		
v/c Ratio	0.83	0.87	0.51	0.02	0.59	
Uniform Delay, d1	31.8	7.6	7.2	5.0	24.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	76.2	6.3	0.4	0.0	3.3	
Delay (s)	108.0	13.9	7.6	5.1	27.9	
Level of Service	F	B	A	A	C	
Approach Delay (s)		16.7	7.5		27.9	
Approach LOS		B	A		C	

Intersection Summary				
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Volume (vph)	1010	37	6	520	65
Turn Type		Perm	Prot		
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phases	4	4	3	8	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0
Total Split (s)	62.0	62.0	8.0	70.0	20.0
Total Split (%)	68.9%	68.9%	8.9%	77.8%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	37.3	37.3	4.4	38.4	9.0
Actuated g/C Ratio	0.66	0.66	0.07	0.68	0.16
v/c Ratio	0.86	0.04	0.05	0.43	0.38
Control Delay	17.2	1.8	38.2	4.9	26.5
Queue Delay	0.8	0.0	0.0	0.0	0.0
Total Delay	18.0	1.8	38.2	4.9	26.5
LOS	B	A	D	A	C
Approach Delay	17.5			5.3	26.5
Approach LOS	B			A	C

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 56.5		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 14.1	Intersection LOS: B	
Intersection Capacity Utilization 65.9%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 11: Pala Rd (SR-76) & Couser Canyon Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	
Turning Speed (mph)		9	15		15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.957	
Flt Protected			0.950		0.967	
Satd. Flow (prot)	1863	1417	1583	1863	1542	0
Flt Permitted			0.950		0.967	
Satd. Flow (perm)	1863	1417	1583	1863	1542	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		39			23	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	470			11023	1081	
Travel Time (s)	10.7			250.5	24.6	
Volume (vph)	1010	37	6	520	65	30
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1063	39	6	547	68	32
Lane Group Flow (vph)	1063	39	6	547	100	0
v/c Ratio	0.86	0.04	0.05	0.43	0.38	
Control Delay	17.2	1.8	38.2	4.9	26.5	
Queue Delay	0.8	0.0	0.0	0.0	0.0	
Total Delay	18.0	1.8	38.2	4.9	26.5	
Queue Length 50th (ft)	172	0	2	54	22	
Queue Length 95th (ft)	#767	10	16	132	86	
Internal Link Dist (ft)	390			10943	1001	
Turn Bay Length (ft)						
Base Capacity (vph)	1420	1090	110	1485	435	
Starvation Cap Reductn	135	0	0	0	0	
Spillback Cap Reductn	0	0	0	3	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.83	0.04	0.05	0.37	0.23	

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	1863	1417	1583	1863	1542	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	1863	1417	1583	1863	1542	
Volume (vph)	1010	37	6	520	65	30
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1063	39	6	547	68	32
RTOR Reduction (vph)	0	14	0	0	19	0
Lane Group Flow (vph)	1063	25	6	547	81	0
Turn Type		Perm	Prot			
Protected Phases	4		3	8	2	
Permitted Phases		4				
Actuated Green, G (s)	37.3	37.3	0.5	41.8	9.0	
Effective Green, g (s)	37.3	37.3	0.5	41.8	9.0	
Actuated g/C Ratio	0.63	0.63	0.01	0.71	0.15	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1182	899	13	1324	236	
v/s Ratio Prot	c0.57		0.00	c0.29	c0.05	
v/s Ratio Perm		0.02				
v/c Ratio	0.90	0.03	0.46	0.41	0.34	
Uniform Delay, d1	9.2	4.0	29.0	3.5	22.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.3	0.0	23.8	0.2	0.9	
Delay (s)	18.5	4.0	52.8	3.7	23.1	
Level of Service	B	A	D	A	C	
Approach Delay (s)	17.9			4.2	23.1	
Approach LOS	B			A	C	

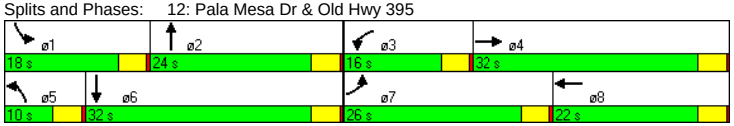
Intersection Summary				
HCM Average Control Delay	13.9	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	58.8	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	250	120	114	62	52	368	143	717
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	26.0	32.0	16.0	22.0	10.0	24.0	18.0	32.0
Total Split (%)	28.9%	35.6%	17.8%	24.4%	11.1%	26.7%	20.0%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	15.6	18.2	10.0	13.0	6.8	16.2	11.1	22.7
Actuated g/C Ratio	0.23	0.27	0.15	0.20	0.10	0.24	0.16	0.34
v/c Ratio	0.73	0.79	0.52	0.37	0.36	0.59	0.59	0.65
Control Delay	40.4	28.1	42.0	21.9	45.4	27.6	42.4	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	28.1	42.0	21.9	45.4	27.6	42.4	24.4
LOS	D	C	D	C	D	C	D	C
Approach Delay		32.7		31.0		29.3		27.3
Approach LOS		C		C		C		C

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66.4
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 29.7 Intersection LOS: C
Intersection Capacity Utilization 69.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	0		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.893			0.918			0.963			0.995	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1663	0	1583	1710	0	1583	3408	0	1583	3522	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1663	0	1583	1710	0	1583	3408	0	1583	3522	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		146			61			45			4	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3628			1500			4464			5461	
Travel Time (s)		82.5			34.1			101.5			124.1	
Volume (vph)	250	120	300	114	62	75	52	368	121	143	717	24
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	263	126	316	120	65	79	55	387	127	151	755	25
Lane Group Flow (vph)	263	442	0	120	144	0	55	514	0	151	780	0
v/c Ratio	0.73	0.79		0.52	0.37		0.36	0.59		0.59	0.65	
Control Delay	40.4	28.1		42.0	21.9		45.4	27.6		42.4	24.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	40.4	28.1		42.0	21.9		45.4	27.6		42.4	24.4	
Queue Length 50th (ft)	111	129		52	34		25	105		65	168	
Queue Length 95th (ft)	#224	263		122	94		#79	182		#148	270	
Internal Link Dist (ft)		3548			1420			4384			5381	
Turn Bay Length (ft)							150			200		
Base Capacity (vph)	494	748		298	532		156	1117		340	1483	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.53	0.59		0.40	0.27		0.35	0.46		0.44	0.53	

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

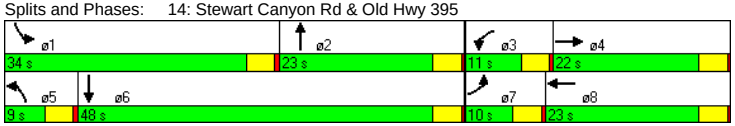
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.89		1.00	0.92		1.00	0.96		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1663		1583	1709		1583	3408		1583	3522	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1663		1583	1709		1583	3408		1583	3522	
Volume (vph)	250	120	300	114	62	75	52	368	121	143	717	24
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	263	126	316	120	65	79	55	387	127	151	755	25
RTOR Reduction (vph)	0	106	0	0	49	0	0	34	0	0	3	0
Lane Group Flow (vph)	263	336	0	120	95	0	55	480	0	151	777	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.5	18.2		7.4	13.1		2.9	17.1		8.5	22.7	
Effective Green, g (s)	12.5	18.2		7.4	13.1		2.9	17.1		8.5	22.7	
Actuated g/C Ratio	0.19	0.27		0.11	0.19		0.04	0.25		0.13	0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	294	450		174	333		68	867		200	1190	
v/s Ratio Prot	c0.17	c0.20		0.08	0.06		0.03	0.14		c0.10	c0.22	
v/s Ratio Perm												
v/c Ratio	0.89	0.75		0.69	0.28		0.81	0.55		0.76	0.65	
Uniform Delay, d1	26.7	22.4		28.8	23.1		31.9	21.7		28.3	18.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.2	6.6		10.8	0.5		48.6	0.8		14.9	1.3	
Delay (s)	53.9	29.0		39.6	23.5		80.5	22.5		43.2	20.2	
Level of Service	D	C		D	C		F	C		D	C	
Approach Delay (s)		38.3			30.8			28.1			23.9	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM Average Control Delay	29.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	67.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	21	19	23	5	8	404	302	1003
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	10.0	22.0	11.0	23.0	9.0	23.0	34.0	48.0
Total Split (%)	11.1%	24.4%	12.2%	25.6%	10.0%	25.6%	37.8%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	6.5	7.9	6.8	8.2	5.8	19.4	15.4	34.2
Actuated g/C Ratio	0.12	0.15	0.12	0.16	0.10	0.39	0.29	0.68
v/c Ratio	0.12	0.20	0.12	0.59	0.05	0.33	0.68	0.45
Control Delay	33.3	16.6	32.4	10.2	35.1	20.2	25.8	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	16.6	32.4	10.2	35.1	20.2	25.8	8.1
LOS	C	B	C	B	D	C	C	A
Approach Delay		21.3		11.9		20.5		12.1
Approach LOS		C		B		C		B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 50.2		
Natural Cycle: 65		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.68		
Intersection Signal Delay: 14.1	Intersection LOS: B	
Intersection Capacity Utilization 61.5%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	200		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.903			0.853			0.994			0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1682	0	1583	1589	0	1583	3518	0	1583	3525	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1682	0	1583	1589	0	1583	3518	0	1583	3525	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			287			4			4	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1302			7424			5461			3410	
Travel Time (s)		29.6			168.7			124.1			77.5	
Volume (vph)	21	19	35	23	5	273	8	404	16	302	1003	29
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	20	37	24	5	287	8	425	17	318	1056	31
Lane Group Flow (vph)	22	57	0	24	292	0	8	442	0	318	1087	0
v/c Ratio	0.12	0.20		0.12	0.59		0.05	0.33		0.68	0.45	
Control Delay	33.3	16.6		32.4	10.2		35.1	20.2		25.8	8.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	33.3	16.6		32.4	10.2		35.1	20.2		25.8	8.1	
Queue Length 50th (ft)	5	4		5	1		2	45		61	45	
Queue Length 95th (ft)	35	42		36	70		18	158		222	266	
Internal Link Dist (ft)		1222			7344			5381			3330	
Turn Bay Length (ft)				200			100			100		
Base Capacity (vph)	191	551		218	710		159	1603		742	2580	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.12	0.10		0.11	0.41		0.05	0.28		0.43	0.42	

Intersection Summary	
Area Type:	Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1681		1583	1588		1583	3519		1583	3524	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1681		1583	1588		1583	3519		1583	3524	
Volume (vph)	21	19	35	23	5	273	8	404	16	302	1003	29
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	20	37	24	5	287	8	425	17	318	1056	31
RTOR Reduction (vph)	0	33	0	0	256	0	0	3	0	0	2	0
Lane Group Flow (vph)	22	24	0	24	36	0	8	439	0	318	1085	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.6	5.8		1.9	6.1		0.6	20.1		12.7	32.2	
Effective Green, g (s)	1.6	5.8		1.9	6.1		0.6	20.1		12.7	32.2	
Actuated g/C Ratio	0.03	0.10		0.03	0.11		0.01	0.36		0.22	0.57	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	45	173		53	171		17	1252		356	2008	
v/s Ratio Prot	0.01	0.01		c0.02	c0.02		0.01	0.12		c0.20	c0.31	
v/s Ratio Perm												
v/c Ratio	0.49	0.14		0.45	0.21		0.47	0.35		0.89	0.54	
Uniform Delay, d1	27.0	23.1		26.8	23.0		27.8	13.4		21.2	7.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.1	0.4		6.0	0.6		19.2	0.2		23.4	0.3	
Delay (s)	35.2	23.4		32.8	23.6		47.0	13.6		44.7	7.9	
Level of Service	D	C		C	C		D	B		D	A	
Approach Delay (s)		26.7			24.3			14.2			16.2	
Approach LOS		C			C			B			B	

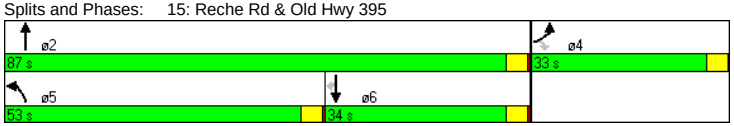
Intersection Summary				
HCM Average Control Delay	17.3	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	56.5	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	61.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	270	280	475	281	255	459
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	33.0	33.0	53.0	87.0	34.0	34.0
Total Split (%)	27.5%	27.5%	44.2%	72.5%	28.3%	28.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	17.9	17.9	26.9	44.6	13.0	13.0
Actuated g/C Ratio	0.25	0.25	0.37	0.62	0.18	0.18
v/c Ratio	0.72	0.51	0.85	0.13	0.42	0.74
Control Delay	40.3	7.6	36.5	6.0	32.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	7.6	36.5	6.0	32.0	11.4
LOS	D	A	D	A	C	B
Approach Delay	23.6			25.1	18.7	
Approach LOS	C			C	B	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 72
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 22.5 Intersection LOS: C
Intersection Capacity Utilization 67.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 15: Reche Rd & Old Hwy 395



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Storage Length (ft)	0	0	150			0
Storage Lanes	1	1	1			1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		295				483
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	2635			3410	4960	
Travel Time (s)	59.9			77.5	112.7	
Volume (vph)	270	280	475	281	255	459
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	295	500	296	268	483
Lane Group Flow (vph)	284	295	500	296	268	483
v/c Ratio	0.72	0.51	0.85	0.13	0.42	0.74
Control Delay	40.3	7.6	36.5	6.0	32.0	11.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	7.6	36.5	6.0	32.0	11.4
Queue Length 50th (ft)	104	0	176	23	52	0
Queue Length 95th (ft)	#301	72	456	52	128	101
Internal Link Dist (ft)	2555			3330	4880	
Turn Bay Length (ft)			150			
Base Capacity (vph)	590	714	857	2702	1278	820
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.41	0.58	0.11	0.21	0.59

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

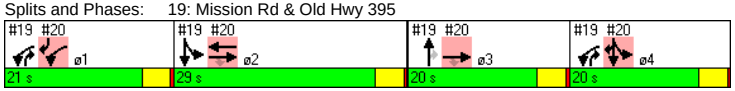
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Volume (vph)	270	280	475	281	255	459
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	284	295	500	296	268	483
RTOR Reduction (vph)	0	220	0	0	0	389
Lane Group Flow (vph)	284	75	500	296	268	94
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	17.9	17.9	26.9	44.6	13.7	13.7
Effective Green, g (s)	17.9	17.9	26.9	44.6	13.7	13.7
Actuated g/C Ratio	0.25	0.25	0.38	0.63	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	402	360	604	2239	688	275
v/s Ratio Prot	c0.18		c0.32	0.08	c0.08	
v/s Ratio Perm		0.05				0.07
v/c Ratio	0.71	0.21	0.83	0.13	0.39	0.34
Uniform Delay, d1	23.9	20.7	19.7	5.2	24.8	24.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	0.3	9.1	0.0	0.4	0.7
Delay (s)	29.5	21.0	28.8	5.2	25.1	25.3
Level of Service	C	C	C	A	C	C
Approach Delay (s)	25.2			20.1	25.2	
Approach LOS	C			C	C	

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	220	1000	81	250	843	60		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	41.0	0.0	20.0	41.0	29.0	29.0	21.0	20.0
Total Split (%)	45.6%	0.0%	22.2%	45.6%	32.2%	32.2%	23%	22%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	37.0	86.8	12.7	53.8	25.0	25.0		
Actuated g/C Ratio	0.43	1.00	0.15	0.62	0.29	0.29		
v/c Ratio	0.34	0.74	0.31	0.30	1.00	0.12		
Control Delay	21.0	3.1	35.9	8.7	63.5	24.7		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	21.0	3.1	35.9	8.7	63.5	24.7		
LOS	C	A	D	A	E	C		
Approach Delay	6.3		15.3			60.9		
Approach LOS	A		B			E		

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 86.8		
Natural Cycle: 100		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.00		
Intersection Signal Delay: 27.6	Intersection LOS: C	
Intersection Capacity Utilization 53.8%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 19: Mission Rd & Old Hwy 395



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	220	1000	81	250	843	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1053	85	263	887	63
Lane Group Flow (vph)	232	1053	85	263	887	63
v/c Ratio	0.34	0.74	0.31	0.30	1.00	0.12
Control Delay	21.0	3.1	35.9	8.7	63.5	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	3.1	35.9	8.7	63.5	24.7
Queue Length 50th (ft)	89	64	42	61	~261	26
Queue Length 95th (ft)	m102	m39	84	101	#400	58
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	676	1417	344	877	886	538
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.74	0.25	0.30	1.00	0.12

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Volume (vph)	220	1000	81	250	843	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1053	85	263	887	63
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	232	1053	85	263	887	63
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	37.0	86.7	12.7	49.7	25.0	25.0
Effective Green, g (s)	37.0	86.7	12.7	49.7	25.0	25.0
Actuated g/C Ratio	0.43	1.00	0.15	0.57	0.29	0.29
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	676	1417	273	878	886	537
v/s Ratio Prot	0.15		0.05	0.13	c0.29	0.03
v/s Ratio Perm		c0.74		0.06		
v/c Ratio	0.34	0.74	0.31	0.30	1.00	0.12
Uniform Delay, d1	16.7	0.0	33.1	9.5	30.9	22.7
Progression Factor	1.15	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.4	0.7	0.2	30.5	0.1
Delay (s)	19.2	1.4	33.7	9.7	61.4	22.8
Level of Service	B	A	C	A	E	C
Approach Delay (s)	4.6		15.6			58.8
Approach LOS	A		B			E

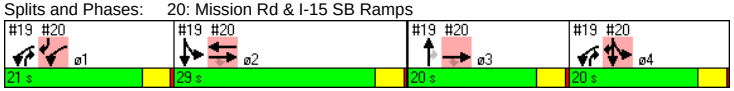
Intersection Summary				
HCM Average Control Delay	26.0	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	4.0	
Intersection Capacity Utilization	53.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBT	EBR	WBL	WBT	SBT	SBR	ø3
Lane Configurations							
Volume (vph)	800	270	117	370	8	865	
Turn Type		Perm	Prot			custom	
Protected Phases	2 3		1	2	4	1 4	3
Permitted Phases		2 3				4	
Detector Phases	2 3	2 3	1	2	4	1 4	
Minimum Initial (s)			4.0	4.0	4.0		4.0
Minimum Split (s)			8.0	20.0	20.0		20.0
Total Split (s)	49.0	49.0	21.0	29.0	20.0	41.0	20.0
Total Split (%)	54.4%	54.4%	23.3%	32.2%	22.2%	45.6%	22%
Yellow Time (s)			3.5	3.5	3.5		3.5
All-Red Time (s)			0.5	0.5	0.5		0.5
Lead/Lag			Lead	Lag	Lag		Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes
Recall Mode			None	Min	None		None
Act Effct Green (s)	41.7	41.7	17.0	25.0	16.0	37.0	
Actuated g/C Ratio	0.48	0.48	0.20	0.29	0.18	0.43	
v/c Ratio	0.49	0.34	0.40	0.72	0.05	1.00	
Control Delay	5.6	0.6	35.8	37.7	31.1	43.0	
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0	
Total Delay	5.9	0.6	35.8	37.7	31.1	43.0	
LOS	A	A	D	D	C	D	
Approach Delay	4.6			37.2	42.8		
Approach LOS	A			D	D		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 86.8
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 24.9 Intersection LOS: C
Intersection Capacity Utilization 86.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.974	
Satd. Flow (prot)	0	3539	1417	1583	1863	0	0	0	0	0	1814	1417
Flt Permitted				0.950							0.974	
Satd. Flow (perm)	0	3539	1417	1583	1863	0	0	0	0	0	1814	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			284									532
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	800	270	117	370	0	0	0	0	9	8	865
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	842	284	123	389	0	0	0	0	9	8	911
Lane Group Flow (vph)	0	842	284	123	389	0	0	0	0	0	17	911
v/c Ratio		0.49	0.34	0.40	0.72						0.05	1.00
Control Delay		5.6	0.6	35.8	37.7						31.1	43.0
Queue Delay		0.3	0.0	0.0	0.0						0.0	0.0
Total Delay		5.9	0.6	35.8	37.7						31.1	43.0
Queue Length 50th (ft)		40	0	60	195						8	~284
Queue Length 95th (ft)		m44	m0	115	#330						26	#593
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		1837	872	310	538						335	910
Starvation Cap Reductn		413	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.59	0.33	0.40	0.72						0.05	1.00

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

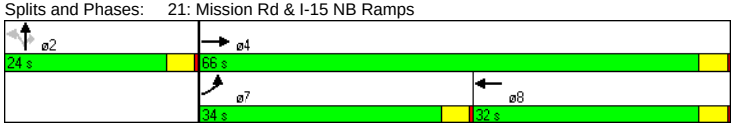
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.97	1.00
Satd. Flow (prot)		3539	1417	1583	1863						1815	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.97	1.00
Satd. Flow (perm)		3539	1417	1583	1863						1815	1417
Volume (vph)	0	800	270	117	370	0	0	0	0	9	8	865
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	842	284	123	389	0	0	0	0	9	8	911
RTOR Reduction (vph)	0	0	147	0	0	0	0	0	0	0	0	305
Lane Group Flow (vph)	0	842	137	123	389	0	0	0	0	0	17	606
Turn Type			Perm	Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases			2 3									4
Actuated Green, G (s)		41.7	41.7	17.0	25.0						16.0	37.0
Effective Green, g (s)		41.7	41.7	17.0	25.0						16.0	37.0
Actuated g/C Ratio		0.48	0.48	0.20	0.29						0.18	0.43
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1702	682	310	537						335	605
v/s Ratio Prot		c0.24		0.08	c0.21						0.01	c0.43
v/s Ratio Perm			0.10									
v/c Ratio		0.49	0.20	0.40	0.72						0.05	1.00
Uniform Delay, d1		15.3	12.9	30.4	27.8						29.1	24.9
Progression Factor		0.33	0.02	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.1	0.1	0.8	4.8						0.1	37.0
Delay (s)		5.2	0.3	31.2	32.6						29.2	61.9
Level of Service		A	A	C	C						C	E
Approach Delay (s)		4.0			32.2			0.0			61.3	
Approach LOS		A			C			A			E	

Intersection Summary				
HCM Average Control Delay	30.3	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	86.7	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	600	178	300	4	80
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	34.0	66.0	32.0	24.0	24.0
Total Split (%)	37.8%	73.3%	35.6%	26.7%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	17.6	37.5	15.5	12.2	12.2
Actuated g/C Ratio	0.30	0.64	0.26	0.21	0.21
v/c Ratio	0.69	0.16	0.67	0.58	0.23
Control Delay	23.7	4.7	28.6	31.2	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	4.7	28.6	31.2	8.6
LOS	C	A	C	C	A
Approach Delay		19.4	28.6	24.8	
Approach LOS		B	C	C	

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 58.7
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 22.6 — Intersection LOS: C
Intersection Capacity Utilization 86.0% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 21: Mission Rd & I-15 NB Ramps



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.995				0.850			
Flt Protected	0.950							0.953				
Satd. Flow (prot)	3072	1863	0	0	1853	0	0	1775	1417	0	0	0
Flt Permitted	0.950							0.953				
Satd. Flow (perm)	3072	1863	0	0	1853	0	0	1775	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					2				84			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	600	178	0	0	300	12	200	4	80	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	187	0	0	316	13	211	4	84	0	0	0
Lane Group Flow (vph)	632	187	0	0	329	0	0	215	84	0	0	0
v/c Ratio	0.69	0.16			0.67			0.58	0.23			
Control Delay	23.7	4.7			28.6			31.2	8.6			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	23.7	4.7			28.6			31.2	8.6			
Queue Length 50th (ft)	93	20			97			65	0			
Queue Length 95th (ft)	209	54			241			180	37			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	1343	1405			758			562	506			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.47	0.13			0.43			0.38	0.17			

Intersection Summary
Area Type: Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	0.97	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	3072	1863			1853			1776	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	3072	1863			1853			1776	1417			
Volume (vph)	600	178	0	0	300	12	200	4	80	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	187	0	0	316	13	211	4	84	0	0	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	66	0	0	0
Lane Group Flow (vph)	632	187	0	0	328	0	0	215	18	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	17.6	37.5			15.9			12.2	12.2			
Effective Green, g (s)	17.6	37.5			15.9			12.2	12.2			
Actuated g/C Ratio	0.31	0.65			0.28			0.21	0.21			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	937	1211			511			376	300			
v/s Ratio Prot	c0.21	0.10			c0.18							
v/s Ratio Perm								0.12	0.01			
v/c Ratio	0.67	0.15			0.64			0.57	0.06			
Uniform Delay, d1	17.5	3.9			18.4			20.4	18.2			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	1.9	0.1			2.7			2.1	0.1			
Delay (s)	19.5	4.0			21.1			22.5	18.3			
Level of Service	B	A			C			C	B			
Approach Delay (s)		15.9			21.1			21.3			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	57.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

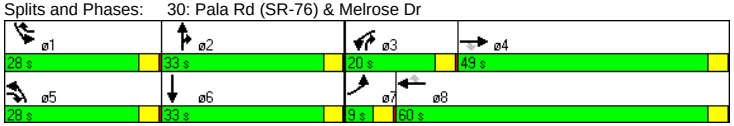
AM Existing + Cumulative + Project
30: Pala Rd (SR-76) & Melrose Dr

With Mitigation
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	16	1000	220	200	2150	50	450	8	210	157	157
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6
Permitted Phases			4			8					
Detector Phases	7	4	5	3	8	1	5	2	2 3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0		8.0	20.0
Total Split (s)	9.0	49.0	28.0	20.0	60.0	28.0	28.0	33.0	53.0	28.0	33.0
Total Split (%)	6.9%	37.7%	21.5%	15.4%	46.2%	21.5%	21.5%	25.4%	40.8%	21.5%	25.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	5.0	42.3	68.5	13.2	56.1	77.7	22.2	33.7	50.9	17.5	29.1
Actuated g/C Ratio	0.04	0.34	0.56	0.11	0.46	0.63	0.18	0.27	0.41	0.14	0.24
v/c Ratio	0.14	0.60	0.26	0.64	0.97	0.06	0.86	0.02	0.33	0.73	1.10
Control Delay	63.1	35.4	2.4	62.3	46.7	2.4	64.8	37.8	12.3	69.1	109.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.1	35.4	2.4	62.3	46.7	2.4	64.8	37.8	12.3	69.1	109.4
LOS	E	D	A	E	D	A	E	D	B	E	F
Approach Delay		29.9			47.1			48.0			99.4
Approach LOS		C			D			D			F

Intersection Summary		
Cycle Length: 130		
Actuated Cycle Length: 122.8		
Natural Cycle: 130		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 1.10		
Intersection Signal Delay: 49.5	Intersection LOS: D	
Intersection Capacity Utilization 100.1%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 30: Pala Rd (SR-76) & Melrose Dr



LOS Engineering

AM Existing + Cumulative + Project
30: Pala Rd (SR-76) & Melrose Dr

With Mitigation
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	500		500	500		500	400		400	200		0
Storage Lanes	2		1	2		1	2		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.900	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1417	3072	5085	1417	3072	1863	1417	1583	1676	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1417	3072	5085	1417	3072	1863	1417	1583	1676	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			232			53			130		72	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1330			646			1034			733	
Travel Time (s)		30.2			14.7			23.5			16.7	
Volume (vph)	16	1000	220	200	2150	50	450	8	210	157	157	314
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	1053	232	211	2263	53	474	8	221	165	165	331
Lane Group Flow (vph)	17	1053	232	211	2263	53	474	8	221	165	496	0
v/c Ratio	0.14	0.60	0.26	0.64	0.97	0.06	0.86	0.02	0.33	0.73	1.10	
Control Delay	63.1	35.4	2.4	62.3	46.7	2.4	64.8	37.8	12.3	69.1	109.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	63.1	35.4	2.4	62.3	46.7	2.4	64.8	37.8	12.3	69.1	109.4	
Queue Length 50th (ft)	6	258	0	82	612	0	182	4	42	125	~390	
Queue Length 95th (ft)	20	316	37	129	#841	15	#281	19	117	204	#664	
Internal Link Dist (ft)		1250			566			954			653	
Turn Bay Length (ft)	500		500	500		500	400		400	200		
Base Capacity (vph)	120	1827	885	392	2324	907	592	511	679	294	452	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.58	0.26	0.54	0.97	0.06	0.80	0.02	0.33	0.56	1.10	

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

LOS Engineering

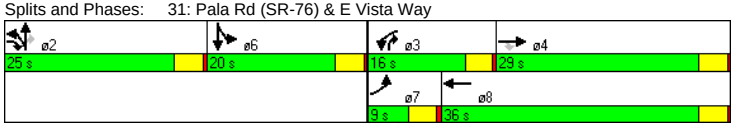
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3072	5085	1417	3072	5085	1417	3072	1863	1417	1583	1676	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3072	5085	1417	3072	5085	1417	3072	1863	1417	1583	1676	
Volume (vph)	16	1000	220	200	2150	50	450	8	210	157	157	314
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	1053	232	211	2263	53	474	8	221	165	165	331
RTOR Reduction (vph)	0	0	108	0	0	22	0	0	77	0	55	0
Lane Group Flow (vph)	17	1053	124	211	2263	31	474	8	144	165	441	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.9	44.8	67.0	13.2	56.1	73.6	22.2	33.8	51.0	17.5	29.1	
Effective Green, g (s)	1.9	44.8	67.0	13.2	56.1	73.6	22.2	33.8	51.0	17.5	29.1	
Actuated g/C Ratio	0.02	0.36	0.53	0.11	0.45	0.59	0.18	0.27	0.41	0.14	0.23	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	47	1818	803	324	2277	878	544	503	577	221	389	
v/s Ratio Prot	0.01	0.21	0.03	c0.07	c0.45	0.00	c0.15	0.00	0.10	0.10	c0.26	
v/s Ratio Perm			0.06			0.02						
v/c Ratio	0.36	0.58	0.15	0.65	0.99	0.04	0.87	0.02	0.25	0.75	1.13	
Uniform Delay, d1	61.1	32.6	14.8	53.8	34.4	10.9	50.2	33.6	24.5	51.8	48.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.7	0.5	0.1	4.6	17.3	0.0	14.2	0.1	0.2	12.9	87.0	
Delay (s)	65.8	33.1	14.9	58.5	51.7	10.9	64.4	33.6	24.7	64.6	135.1	
Level of Service	E	C	B	E	D	B	E	C	C	E	F	
Approach Delay (s)		30.3			51.5			51.6			117.5	
Approach LOS		C			D			D			F	

Intersection Summary			
HCM Average Control Delay	54.6	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	125.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations									
Volume (vph)	74	950	350	300	1680	300	47	286	200
Turn Type	Prot		pm+ov	Prot		Split		pm+ov	
Protected Phases	7	4	2	3	8	2	2	3	6
Permitted Phases			4					2	
Detector Phases	7	4	2	3	8	2	2	3	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	9.0	29.0	25.0	16.0	36.0	25.0	25.0	16.0	20.0
Total Split (%)	10.0%	32.2%	27.8%	17.8%	40.0%	27.8%	27.8%	17.8%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag		Lead	Lag			Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes	
Recall Mode	None	None	Max	None	None	Max	Max	None	Max
Act Effct Green (s)	5.0	25.3	50.3	11.7	32.0	21.0	21.0	32.7	16.0
Actuated g/C Ratio	0.06	0.28	0.56	0.13	0.36	0.23	0.23	0.36	0.18
v/c Ratio	0.89	0.70	0.42	0.79	0.99	0.86	0.11	0.43	0.65
Control Delay	114.2	32.2	7.6	53.2	48.8	56.5	28.1	3.2	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	114.2	32.2	7.6	53.2	48.8	56.5	28.1	3.2	26.3
LOS	F	C	A	D	D	E	C	A	C
Approach Delay		30.4			49.5		30.3		26.3
Approach LOS		C			D		C		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 38.5		Intersection LOS: D	
Intersection Capacity Utilization 82.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 31: Pala Rd (SR-76) & E Vista Way



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		150	450		0	0		200	0		0
Storage Lanes	1		1	2		0	1		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	0.91	1.00	1.00	1.00	0.95	0.95	0.95
Frt			0.850		0.998				0.850		0.919	
Flt Protected	0.950			0.950			0.950				0.999	
Satd. Flow (prot)	1583	5085	1417	3072	5075	0	1583	1863	1417	0	3249	0
Flt Permitted	0.950			0.950			0.950				0.999	
Satd. Flow (perm)	1583	5085	1417	3072	5075	0	1583	1863	1417	0	3249	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			170		2				301		173	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		710			526			797			552	
Travel Time (s)		16.1			12.0			18.1			12.5	
Volume (vph)	74	950	350	300	1680	20	300	47	286	6	200	241
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1000	368	316	1768	21	316	49	301	6	211	254
Lane Group Flow (vph)	78	1000	368	316	1789	0	316	49	301	0	471	0
v/c Ratio	0.89	0.70	0.42	0.79	0.99		0.86	0.11	0.43		0.65	
Control Delay	114.2	32.2	7.6	53.2	48.8		56.5	28.1	3.2		26.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	114.2	32.2	7.6	53.2	48.8		56.5	28.1	3.2		26.3	
Queue Length 50th (ft)	45	186	54	90	365		173	22	0		82	
Queue Length 95th (ft)	#130	234	115	#151	#484		#318	51	28		135	
Internal Link Dist (ft)		630			446			717			472	
Turn Bay Length (ft)	300		150	450					200			
Base Capacity (vph)	88	1428	867	409	1806		369	435	709		720	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.89	0.70	0.42	0.77	0.99		0.86	0.11	0.42		0.65	

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00		0.95	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1583	5085	1417	3072	5076		1583	1863	1417		3251	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (perm)	1583	5085	1417	3072	5076		1583	1863	1417		3251	
Volume (vph)	74	950	350	300	1680	20	300	47	286	6	200	241
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	1000	368	316	1768	21	316	49	301	6	211	254
RTOR Reduction (vph)	0	0	83	0	1	0	0	0	192	0	142	0
Lane Group Flow (vph)	78	1000	285	316	1788	0	316	49	109	0	329	0
Turn Type	Prot		pm+ov	Prot			Split		pm+ov	Split		
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases			4						2			
Actuated Green, G (s)	5.0	25.3	46.3	11.7	32.0		21.0	21.0	32.7		16.0	
Effective Green, g (s)	5.0	25.3	46.3	11.7	32.0		21.0	21.0	32.7		16.0	
Actuated g/C Ratio	0.06	0.28	0.51	0.13	0.36		0.23	0.23	0.36		0.18	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	88	1429	792	399	1805		369	435	515		578	
v/s Ratio Prot	0.05	0.20	0.08	c0.10	c0.35		c0.20	0.03	0.03		c0.10	
v/s Ratio Perm			0.12						0.05			
v/c Ratio	0.89	0.70	0.36	0.79	0.99		0.86	0.11	0.21		0.57	
Uniform Delay, d1	42.2	29.0	13.0	38.0	28.8		33.1	27.2	19.8		33.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	59.6	1.5	0.3	10.3	18.9		21.8	0.5	0.2		4.0	
Delay (s)	101.8	30.5	13.3	48.3	47.7		54.8	27.7	20.0		37.9	
Level of Service	F	C	B	D	D		D	C	B		D	
Approach Delay (s)		29.9			47.8			37.1			37.9	
Approach LOS		C			D			D			D	

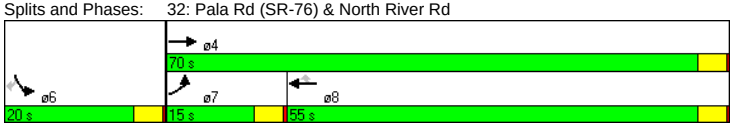
Intersection Summary				
HCM Average Control Delay	39.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	170	1150	1900	300	150	185
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	70.0	55.0	55.0	20.0	20.0
Total Split (%)	16.7%	77.8%	61.1%	61.1%	22.2%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Max	Max
Act Effct Green (s)	11.0	66.0	51.0	51.0	16.0	16.0
Actuated g/C Ratio	0.12	0.73	0.57	0.57	0.18	0.18
v/c Ratio	0.93	0.47	1.00	0.34	0.56	0.47
Control Delay	89.9	5.6	40.1	2.4	42.5	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.9	5.6	40.1	2.4	42.5	9.2
LOS	F	A	D	A	D	A
Approach Delay		16.4	34.9		24.1	
Approach LOS		B	C		C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 27.7 Intersection LOS: C
Intersection Capacity Utilization 82.3% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 32: Pala Rd (SR-76) & North River Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	150			0	50	0
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				305		195
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		1356	1400		1286	
Travel Time (s)		30.8	31.8		29.2	
Volume (vph)	170	1150	1900	300	150	185
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	1211	2000	316	158	195
Lane Group Flow (vph)	179	1211	2000	316	158	195
v/c Ratio	0.93	0.47	1.00	0.34	0.56	0.47
Control Delay	89.9	5.6	40.1	2.4	42.5	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.9	5.6	40.1	2.4	42.5	9.2
Queue Length 50th (ft)	102	121	555	3	83	0
Queue Length 95th (ft)	#226	155	#765	37	147	57
Internal Link Dist (ft)		1276	1320		1206	
Turn Bay Length (ft)	150				50	
Base Capacity (vph)	193	2595	2005	935	281	412
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.47	1.00	0.34	0.56	0.47

Intersection Summary

Area Type: Other
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

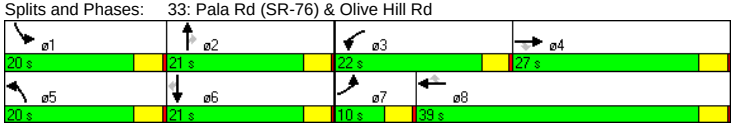
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Volume (vph)	170	1150	1900	300	150	185
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	1211	2000	316	158	195
RTOR Reduction (vph)	0	0	0	132	0	160
Lane Group Flow (vph)	179	1211	2000	184	158	35
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	11.0	66.0	51.0	51.0	16.0	16.0
Effective Green, g (s)	11.0	66.0	51.0	51.0	16.0	16.0
Actuated g/C Ratio	0.12	0.73	0.57	0.57	0.18	0.18
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	193	2595	2005	803	281	252
v/s Ratio Prot	c0.11	0.34	c0.57		c0.10	
v/s Ratio Perm				0.13		0.02
v/c Ratio	0.93	0.47	1.00	0.23	0.56	0.14
Uniform Delay, d1	39.1	4.9	19.4	9.7	33.8	31.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.2	0.1	19.4	0.1	7.9	1.1
Delay (s)	83.3	5.0	38.8	9.9	41.7	32.3
Level of Service	F	A	D	A	D	C
Approach Delay (s)		15.1	34.8		36.5	
Approach LOS		B	C		D	

Intersection Summary			
HCM Average Control Delay	28.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	1100	178	470	1900	200	110	153	250	150	300	193
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Detector Phases	7	4	4	3	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	10.0	27.0	27.0	22.0	39.0	39.0	20.0	21.0	21.0	20.0	21.0	21.0
Total Split (%)	11.1%	30.0%	30.0%	24.4%	43.3%	43.3%	22.2%	23.3%	23.3%	22.2%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	6.0	23.7	23.7	17.3	35.0	35.0	16.0	17.0	17.0	16.0	17.0	17.0
Actuated g/C Ratio	0.07	0.26	0.26	0.19	0.39	0.39	0.18	0.19	0.19	0.18	0.19	0.19
v/c Ratio	0.99	0.86	0.37	0.84	1.01	0.32	0.41	0.46	0.55	0.29	0.90	0.47
Control Delay	130.6	40.0	6.5	49.1	51.4	6.4	38.0	37.3	9.0	33.8	65.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.6	40.0	6.5	49.1	51.4	6.4	38.0	37.3	9.0	33.8	65.4	8.8
LOS	F	D	A	D	D	A	D	D	A	C	E	A
Approach Delay		42.2			47.5			23.7			41.1	
Approach LOS		D			D			C			D	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 42.9		Intersection LOS: D	
Intersection Capacity Utilization 78.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 33: Pala Rd (SR-76) & Olive Hill Rd



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		200	0		150	150		0
Storage Lanes	1		1	2		1	1		1	2		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	5085	1417	3072	5085	1417	1583	1863	1417	3072	1863	1417
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	5085	1417	3072	5085	1417	1583	1863	1417	3072	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			187			170			263			203
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		585			663			961			1186	
Travel Time (s)		13.3			15.1			21.8			27.0	
Volume (vph)	100	1100	178	470	1900	200	110	153	250	150	300	193
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	1158	187	495	2000	211	116	161	263	158	316	203
Lane Group Flow (vph)	105	1158	187	495	2000	211	116	161	263	158	316	203
v/c Ratio	0.99	0.86	0.37	0.84	1.01	0.32	0.41	0.46	0.55	0.29	0.90	0.47
Control Delay	130.6	40.0	6.5	49.1	51.4	6.4	38.0	37.3	9.0	33.8	65.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.6	40.0	6.5	49.1	51.4	6.4	38.0	37.3	9.0	33.8	65.4	8.8
Queue Length 50th (ft)	61	232	0	139	~419	14	59	82	0	40	177	0
Queue Length 95th (ft)	#165	#311	50	#212	#538	60	111	143	66	69	#329	57
Internal Link Dist (ft)		505			583			881			1106	
Turn Bay Length (ft)	250			250		200			150	150		
Base Capacity (vph)	106	1342	511	609	1978	655	281	352	481	546	352	432
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.86	0.37	0.81	1.01	0.32	0.41	0.46	0.55	0.29	0.90	0.47

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	5085	1417	3072	5085	1417	1583	1863	1417	3072	1863	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	5085	1417	3072	5085	1417	1583	1863	1417	3072	1863	1417
Volume (vph)	100	1100	178	470	1900	200	110	153	250	150	300	193
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	1158	187	495	2000	211	116	161	263	158	316	203
RTOR Reduction (vph)	0	0	138	0	0	104	0	0	213	0	0	165
Lane Group Flow (vph)	105	1158	49	495	2000	107	116	161	50	158	316	38
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	6.0	23.7	23.7	17.3	35.0	35.0	16.0	17.0	17.0	16.0	17.0	17.0
Effective Green, g (s)	6.0	23.7	23.7	17.3	35.0	35.0	16.0	17.0	17.0	16.0	17.0	17.0
Actuated g/C Ratio	0.07	0.26	0.26	0.19	0.39	0.39	0.18	0.19	0.19	0.18	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	106	1339	373	591	1978	551	281	352	268	546	352	268
v/s Ratio Prot	0.07	0.23		c0.16	c0.39		c0.07	0.09		0.05	c0.17	
v/s Ratio Perm			0.03			0.08			0.04			0.03
v/c Ratio	0.99	0.86	0.13	0.84	1.01	0.19	0.41	0.46	0.19	0.29	0.90	0.14
Uniform Delay, d1	42.0	31.6	25.3	35.0	27.5	18.2	32.8	32.4	30.7	32.1	35.7	30.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	84.2	6.1	0.2	10.1	23.0	0.2	4.4	4.2	1.5	1.3	27.9	1.1
Delay (s)	126.2	37.7	25.5	45.0	50.5	18.4	37.3	36.6	32.2	33.4	63.6	31.5
Level of Service	F	D	C	D	D	B	D	D	C	C	E	C
Approach Delay (s)		42.5			47.0			34.6			46.9	
Approach LOS		D			D			C			D	

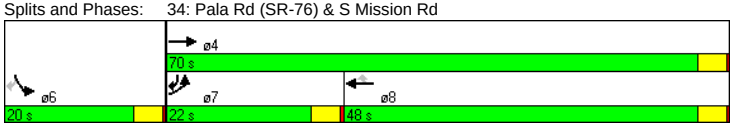
Intersection Summary				
HCM Average Control Delay	44.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	78.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	600	900	1700	202	239	900
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	22.0	70.0	48.0	48.0	20.0	22.0
Total Split (%)	24.4%	77.8%	53.3%	53.3%	22.2%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	18.0	66.0	44.0	44.0	16.0	38.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.42
v/c Ratio	1.03	0.25	1.03	0.27	0.46	0.90
Control Delay	81.0	4.1	55.2	2.8	36.3	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	4.1	55.2	2.8	36.3	37.4
LOS	F	A	E	A	D	D
Approach Delay		34.9	49.6		37.1	
Approach LOS		C	D		D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 41.6 Intersection LOS: D
Intersection Capacity Utilization 88.8% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				213		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	600	900	1700	202	239	900
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	947	1789	213	252	947
Lane Group Flow (vph)	632	947	1789	213	252	947
v/c Ratio	1.03	0.25	1.03	0.27	0.46	0.90
Control Delay	81.0	4.1	55.2	2.8	36.3	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.0	4.1	55.2	2.8	36.3	37.4
Queue Length 50th (ft)	~200	53	~581	0	67	277
Queue Length 95th (ft)	#306	67	#717	35	104	#417
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	614	3729	1730	802	546	1053
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.25	1.03	0.27	0.46	0.90

Intersection Summary

Area Type: Other
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

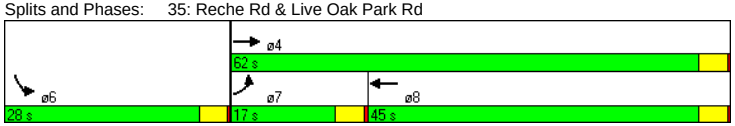
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Volume (vph)	600	900	1700	202	239	900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	947	1789	213	252	947
RTOR Reduction (vph)	0	0	0	109	0	0
Lane Group Flow (vph)	632	947	1789	104	252	947
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	18.0	66.0	44.0	44.0	16.0	34.0
Effective Green, g (s)	18.0	66.0	44.0	44.0	16.0	34.0
Actuated g/C Ratio	0.20	0.73	0.49	0.49	0.18	0.38
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	614	3729	1730	693	546	1053
v/s Ratio Prot	c0.21	0.19	c0.51		0.08	c0.18
v/s Ratio Perm				0.07		0.20
v/c Ratio	1.03	0.25	1.03	0.15	0.46	0.90
Uniform Delay, d1	36.0	3.9	23.0	12.7	33.1	26.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	44.0	0.0	31.0	0.1	2.8	10.3
Delay (s)	80.0	4.0	54.0	12.8	35.9	36.6
Level of Service	F	A	D	B	D	D
Approach Delay (s)		34.4	49.6		36.5	
Approach LOS		C	D		D	

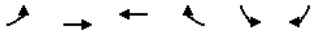
Intersection Summary			
HCM Average Control Delay	41.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	79	496	446	87
Turn Type	Prot			
Protected Phases	7	4	8	6
Permitted Phases				
Detector Phases	7	4	8	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	17.0	62.0	45.0	28.0
Total Split (%)	18.9%	68.9%	50.0%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	None	None	Min
Act Effct Green (s)	8.7	26.9	20.4	12.5
Actuated g/C Ratio	0.16	0.54	0.41	0.25
v/c Ratio	0.32	0.52	0.71	0.59
Control Delay	30.0	8.5	19.9	19.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.0	8.5	19.9	19.5
LOS	C	A	B	B
Approach Delay		11.5	19.9	19.5
Approach LOS		B	B	B

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 50		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.71		
Intersection Signal Delay: 16.2		Intersection LOS: B
Intersection Capacity Utilization 58.8%		ICU Level of Service B
Analysis Period (min) 15		

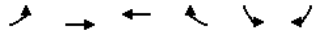
Splits and Phases: 35: Reche Rd & Live Oak Park Rd





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.983		0.912	
Flt Protected	0.950				0.983	
Satd. Flow (prot)	1583	1863	1831	0	1494	0
Flt Permitted	0.950				0.983	
Satd. Flow (perm)	1583	1863	1831	0	1494	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			11		101	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		4892	6958		2036	
Travel Time (s)		111.2	158.1		46.3	
Volume (vph)	79	496	446	65	87	162
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	83	522	469	68	92	171
Lane Group Flow (vph)	83	522	537	0	263	0
v/c Ratio	0.32	0.52	0.71		0.59	
Control Delay	30.0	8.5	19.9		19.5	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	30.0	8.5	19.9		19.5	
Queue Length 50th (ft)	22	65	129		42	
Queue Length 95th (ft)	86	192	331		154	
Internal Link Dist (ft)		4812	6878		1956	
Turn Bay Length (ft)	75					
Base Capacity (vph)	386	1386	1116		698	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.22	0.38	0.48		0.38	

Intersection Summary	
Area Type:	Other



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.98		0.91	
Flt Protected	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1583	1863	1831		1494	
Flt Permitted	0.95	1.00	1.00		0.98	
Satd. Flow (perm)	1583	1863	1831		1494	
Volume (vph)	79	496	446	65	87	162
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	83	522	469	68	92	171
RTOR Reduction (vph)	0	0	6	0	75	0
Lane Group Flow (vph)	83	522	531	0	188	0
Turn Type	Prot					
Protected Phases	7	4	8		6	
Permitted Phases						
Actuated Green, G (s)	4.6	29.0	20.4		12.5	
Effective Green, g (s)	4.6	29.0	20.4		12.5	
Actuated g/C Ratio	0.09	0.59	0.41		0.25	
Clearance Time (s)	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	147	1091	755		377	
v/s Ratio Prot	0.05	c0.28	c0.29		c0.13	
v/s Ratio Perm						
v/c Ratio	0.56	0.48	0.70		0.50	
Uniform Delay, d1	21.5	5.9	12.0		15.8	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	4.9	0.3	3.0		1.0	
Delay (s)	26.4	6.2	15.0		16.8	
Level of Service	C	A	B		B	
Approach Delay (s)		9.0	15.0		16.8	
Approach LOS		A	B		B	

Intersection Summary			
HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	49.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	50	2120	1600	110	0	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	2232	1684	116	0	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1800				2963	900
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1800				2963	900
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	84				100	74
cM capacity (veh/h)	339				10	282

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	53	1116	1116	1123	677	74
Volume Left	53	0	0	0	0	0
Volume Right	0	0	0	0	116	74
cSH	339	1700	1700	1700	1700	282
Volume to Capacity	0.16	0.66	0.66	0.66	0.40	0.26
Queue Length 95th (ft)	14	0	0	0	0	26
Control Delay (s)	17.6	0.0	0.0	0.0	0.0	22.3
Lane LOS	C					C
Approach Delay (s)	0.4			0.0		22.3
Approach LOS						C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	220	1760	1340	120	60	80
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	12.0	44.0	32.0	32.0	21.0	21.0
Total Split (%)	18.5%	67.7%	49.2%	49.2%	32.3%	32.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Min	Min
Act Effct Green (s)	8.0	38.5	26.4	26.4	7.6	7.6
Actuated g/C Ratio	0.15	0.71	0.49	0.49	0.14	0.14
v/c Ratio	0.99	0.74	0.82	0.18	0.28	0.31
Control Delay	86.9	7.3	17.3	7.3	24.7	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.9	7.3	17.3	7.3	24.7	9.3
LOS	F	A	B	A	C	A
Approach Delay		16.2	16.5		15.9	
Approach LOS		B	B		B	

Intersection Summary			
Cycle Length: 65			
Actuated Cycle Length: 54.2			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 16.3		Intersection LOS: B	
Intersection Capacity Utilization 64.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Pala Rd (SR-76) & Gird Rd

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	450			20	0	180
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				30		84
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		3191	8309		1271	
Travel Time (s)		72.5	188.8		28.9	
Volume (vph)	220	1760	1340	120	60	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1853	1411	126	63	84
Lane Group Flow (vph)	232	1853	1411	126	63	84
v/c Ratio	0.99	0.74	0.82	0.18	0.28	0.31
Control Delay	86.9	7.3	17.3	7.3	24.7	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.9	7.3	17.3	7.3	24.7	9.3
Queue Length 50th (ft)	~80	135	184	15	19	0
Queue Length 95th (ft)	#210	256	#299	43	48	31
Internal Link Dist (ft)		3111	8229		1191	
Turn Bay Length (ft)	450			20		180
Base Capacity (vph)	235	2543	1780	728	425	442
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.73	0.79	0.17	0.15	0.19

Intersection Summary	
Area Type:	Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Volume (vph)	220	1760	1340	120	60	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	1853	1411	126	63	84
RTOR Reduction (vph)	0	0	0	15	0	72
Lane Group Flow (vph)	232	1853	1411	111	63	12
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	8.1	38.6	26.5	26.5	7.6	7.6
Effective Green, g (s)	8.1	38.6	26.5	26.5	7.6	7.6
Actuated g/C Ratio	0.15	0.71	0.49	0.49	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	237	2520	1730	693	222	199
v/s Ratio Prot	c0.15	0.52	c0.40		c0.04	
v/s Ratio Perm				0.08		0.01
v/c Ratio	0.98	0.74	0.82	0.16	0.28	0.06
Uniform Delay, d1	23.0	4.7	11.8	7.7	20.9	20.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	51.9	1.1	3.1	0.1	0.7	0.1
Delay (s)	74.9	5.9	14.9	7.8	21.6	20.3
Level of Service	E	A	B	A	C	C
Approach Delay (s)		13.5	14.3		20.9	
Approach LOS		B	B		C	

Intersection Summary				
HCM Average Control Delay	14.1	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	54.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	1600	1600	10	0	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	1684	1684	11	0	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1695				2553	847
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1695				2553	847
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	93
cM capacity (veh/h)	372				21	305

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	11	842	842	1123	572	21
Volume Left	11	0	0	0	0	0
Volume Right	0	0	0	0	11	21
cSH	372	1700	1700	1700	1700	305
Volume to Capacity	0.03	0.50	0.50	0.66	0.34	0.07
Queue Length 95th (ft)	2	0	0	0	0	6
Control Delay (s)	15.0	0.0	0.0	0.0	0.0	17.7
Lane LOS	B					C
Approach Delay (s)	0.1			0.0		17.7
Approach LOS						C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	130	1000	140	100	960	290	220	290	140	340	210
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot	
Protected Phases	7	4	5	3	8	1	5	2		1	6
Permitted Phases			4			8			2		
Detector Phases	7	4	5	3	8	1	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	10.0	30.0	22.0	15.0	35.0	20.0	22.0	25.0	25.0	20.0	23.0
Total Split (%)	11.1%	33.3%	24.4%	16.7%	38.9%	22.2%	24.4%	27.8%	27.8%	22.2%	25.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	Min	None	None	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	6.0	27.3	44.0	9.6	28.4	46.5	15.7	20.7	20.7	14.1	19.1
Actuated g/C Ratio	0.07	0.32	0.52	0.11	0.33	0.54	0.18	0.24	0.24	0.17	0.22
v/c Ratio	1.22	0.93	0.18	0.61	0.86	0.36	0.79	0.67	0.32	0.71	0.93
Control Delay	193.8	45.8	1.7	52.8	35.5	5.9	54.6	39.1	7.3	42.5	61.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	193.8	45.8	1.7	52.8	35.5	5.9	54.6	39.1	7.3	42.5	61.4
LOS	F	D	A	D	D	A	D	D	A	D	E
Approach Delay		56.1			30.4			37.5			52.3
Approach LOS		E			C			D			D

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 85.4			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.22			
Intersection Signal Delay: 43.7		Intersection LOS: D	
Intersection Capacity Utilization 82.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	330		0	150		150	0		0	0		0
Storage Lanes	1		0	1		1	1		1	2		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.935	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1742	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1742	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			147			167			147		39	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		652			462			899			4464	
Travel Time (s)		14.8			10.5			20.4			101.5	
Volume (vph)	130	1000	140	100	960	290	220	290	140	340	210	160
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	1053	147	105	1011	305	232	305	147	358	221	168
Lane Group Flow (vph)	137	1053	147	105	1011	305	232	305	147	358	389	0
v/c Ratio	1.22	0.93	0.18	0.61	0.86	0.36	0.79	0.67	0.32	0.71	0.93	
Control Delay	193.8	45.8	1.7	52.8	35.5	5.9	54.6	39.1	7.3	42.5	61.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	193.8	45.8	1.7	52.8	35.5	5.9	54.6	39.1	7.3	42.5	61.4	
Queue Length 50th (ft)	~101	~341	0	57	274	35	125	160	0	98	201	
Queue Length 95th (ft)	#215	#465	16	110	355	80	#230	#253	47	145	#386	
Internal Link Dist (ft)		572			382			819			4384	
Turn Bay Length (ft)	330			150		150						
Base Capacity (vph)	112	1132	802	196	1250	838	326	459	460	565	421	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.22	0.93	0.18	0.54	0.81	0.36	0.71	0.66	0.32	0.63	0.92	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1742	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3539	1417	1583	1863	1417	3072	1742	
Volume (vph)	130	1000	140	100	960	290	220	290	140	340	210	160
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	1053	147	105	1011	305	232	305	147	358	221	168
RTOR Reduction (vph)	0	0	74	0	0	83	0	0	112	0	30	0
Lane Group Flow (vph)	137	1053	73	105	1011	222	232	305	35	358	359	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases	7	4	5	3	8	1	5	2		1	6	
Permitted Phases			4			8			2			
Actuated Green, G (s)	6.0	27.3	43.0	8.1	29.4	43.5	15.7	20.7	20.7	14.1	19.1	
Effective Green, g (s)	6.0	27.3	43.0	8.1	29.4	43.5	15.7	20.7	20.7	14.1	19.1	
Actuated g/C Ratio	0.07	0.32	0.50	0.09	0.34	0.50	0.18	0.24	0.24	0.16	0.22	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	110	1121	707	149	1207	781	288	447	340	502	386	
v/s Ratio Prot	c0.09	c0.30	0.02	0.07	c0.29	0.05	c0.15	0.16		0.12	c0.21	
v/s Ratio Perm			0.03			0.11			0.02			
v/c Ratio	1.25	0.94	0.10	0.70	0.84	0.28	0.81	0.68	0.10	0.71	0.93	
Uniform Delay, d1	40.1	28.6	11.4	37.9	26.2	12.3	33.8	29.8	25.5	34.1	32.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	165.8	14.4	0.1	14.1	5.2	0.2	15.0	4.3	0.1	4.8	28.3	
Delay (s)	205.9	43.1	11.5	52.0	31.4	12.6	48.8	34.0	25.7	38.9	61.1	
Level of Service	F	D	B	D	C	B	D	C	C	D	E	
Approach Delay (s)		56.3			28.9			37.2			50.5	
Approach LOS		E			C			D			D	

Intersection Summary				
HCM Average Control Delay	42.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	86.2	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	20	10	1250	10	530
Turn Type		Perm		Perm	
Protected Phases	8		2		6
Permitted Phases		8		6	
Detector Phases	8	8	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	70.0	70.0	70.0
Total Split (%)	22.2%	22.2%	77.8%	77.8%	77.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	Min	Min	Min
Act Effct Green (s)	6.8	6.8	108.0		108.0
Actuated g/C Ratio	0.06	0.06	0.94		0.94
v/c Ratio	0.23	0.12	0.76		0.51
Control Delay	40.5	19.9	6.7		3.2
Queue Delay	0.0	0.0	0.0		0.0
Total Delay	40.5	19.9	6.7		3.2
LOS	D	B	A		A
Approach Delay	33.4		6.7		3.2
Approach LOS	C		A		A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 114.8	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 77.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: Dulin Rd & Old Hwy 395

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	320		0	0	
Storage Lanes	1	1		0	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.998			
Flt Protected	0.950					0.999
Satd. Flow (prot)	1583	1417	1859	0	0	1861
Flt Permitted	0.950					0.632
Satd. Flow (perm)	1583	1417	1859	0	0	1177
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		11	2			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	620		2135			899
Travel Time (s)	14.1		48.5			20.4
Volume (vph)	20	10	1250	20	10	530
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	11	1316	21	11	558
Lane Group Flow (vph)	21	11	1337	0	0	569
v/c Ratio	0.23	0.12	0.76			0.51
Control Delay	40.5	19.9	6.7			3.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	40.5	19.9	6.7			3.2
Queue Length 50th (ft)	16	0	0			0
Queue Length 95th (ft)	36	17	627			137
Internal Link Dist (ft)	540		2055			819
Turn Bay Length (ft)		320				
Base Capacity (vph)	197	186	1748			1107
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.11	0.06	0.76			0.51

Intersection Summary	
Area Type:	Other

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0			4.0
Lane Util. Factor	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1583	1417	1859			1861
Flt Permitted	0.95	1.00	1.00			0.97
Satd. Flow (perm)	1583	1417	1859			1807
Volume (vph)	20	10	1250	20	10	530
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	11	1316	21	11	558
RTOR Reduction (vph)	0	11	0	0	0	0
Lane Group Flow (vph)	21	0	1337	0	0	569
Turn Type		Perm			Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	3.4	3.4	105.7			105.7
Effective Green, g (s)	3.4	3.4	105.7			105.7
Actuated g/C Ratio	0.03	0.03	0.90			0.90
Clearance Time (s)	4.0	4.0	4.0			4.0
Vehicle Extension (s)	3.0	3.0	3.0			3.0
Lane Grp Cap (vph)	46	41	1678			1631
v/s Ratio Prot	c0.01		c0.72			
v/s Ratio Perm		0.00				0.31
v/c Ratio	0.46	0.01	0.80			0.35
Uniform Delay, d1	55.9	55.2	2.0			0.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	7.0	0.1	2.7			0.1
Delay (s)	63.0	55.3	4.7			0.9
Level of Service	E	E	A			A
Approach Delay (s)	60.3		4.7			0.9
Approach LOS	E		A			A

Intersection Summary			
HCM Average Control Delay	4.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	117.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	1150	300	400	860	240	10	520
Turn Type		Perm	Prot		Perm		Perm
Protected Phases	4		3	8		6	
Permitted Phases		4			6		6
Detector Phases	4	4	3	8	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0	20.0
Total Split (s)	37.0	37.0	22.0	59.0	31.0	31.0	31.0
Total Split (%)	41.1%	41.1%	24.4%	65.6%	34.4%	34.4%	34.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes				
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	36.7	36.7	16.7	57.4	24.6	24.6	24.6
Actuated g/C Ratio	0.41	0.41	0.19	0.64	0.27	0.27	0.27
v/c Ratio	0.84	0.41	0.74	0.40	0.55	0.60	0.57
Control Delay	31.0	4.1	48.4	12.2	34.4	19.6	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	4.1	48.4	12.2	34.4	19.6	17.5
LOS	C	A	D	B	C	B	B
Approach Delay	25.5			23.7		23.1	
Approach LOS	C			C		C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2: and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 24.3		Intersection LOS: C	
Intersection Capacity Utilization 69.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	500		0	0		0	0		900
Storage Lanes	0		1	2		0	0		0	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	1.00	1.00	1.00	1.00	0.95	0.91	0.95
Frt			0.850								0.868	0.850
Flt Protected				0.950						0.950	0.996	
Satd. Flow (prot)	0	3539	1417	3072	3539	0	0	0	0	1504	1465	1346
Flt Permitted				0.950						0.950	0.996	
Satd. Flow (perm)	0	3539	1417	3072	3539	0	0	0	0	1504	1465	1346
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			316								156	156
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		654			1271			961			1209	
Travel Time (s)		14.9			28.9			21.8			27.5	
Volume (vph)	0	1150	300	400	860	0	0	0	0	240	10	520
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1211	316	421	905	0	0	0	0	253	11	547
Lane Group Flow (vph)	0	1211	316	421	905	0	0	0	0	227	310	274
v/c Ratio		0.84	0.41	0.74	0.40					0.55	0.60	0.57
Control Delay		31.0	4.1	48.4	12.2					34.4	19.6	17.5
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	0.0
Total Delay		31.0	4.1	48.4	12.2					34.4	19.6	17.5
Queue Length 50th (ft)		288	0	114	211					124	85	60
Queue Length 95th (ft)		#482	53	m155	322					187	169	135
Internal Link Dist (ft)		574			1191			881			1129	
Turn Bay Length (ft)				500								900
Base Capacity (vph)		1449	767	614	2296					468	564	526
Starvation Cap Reductn		0	0	0	0					0	0	0
Spillback Cap Reductn		0	0	0	0					0	0	0
Storage Cap Reductn		0	0	0	0					0	0	0
Reduced v/c Ratio		0.84	0.41	0.69	0.39					0.49	0.55	0.52

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

LOS Engineering

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lane Util. Factor		0.95	1.00	0.97	0.95					0.95	0.91	0.95
Frt		1.00	0.85	1.00	1.00					1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		3539	1417	3072	3539					1504	1465	1346
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		3539	1417	3072	3539					1504	1465	1346
Volume (vph)	0	1150	300	400	860	0	0	0	0	240	10	520
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1211	316	421	905	0	0	0	0	253	11	547
RTOR Reduction (vph)	0	0	187	0	0	0	0	0	0	0	113	113
Lane Group Flow (vph)	0	1211	129	421	905	0	0	0	0	227	197	161
Turn Type			Perm	Prot						Perm		Perm
Protected Phases		4		3	8						6	
Permitted Phases			4							6		6
Actuated Green, G (s)		36.7	36.7	16.7	57.4					24.6	24.6	24.6
Effective Green, g (s)		36.7	36.7	16.7	57.4					24.6	24.6	24.6
Actuated g/C Ratio		0.41	0.41	0.19	0.64					0.27	0.27	0.27
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1443	578	570	2257					411	400	368
v/s Ratio Prot		c0.34		c0.14	0.26							
v/s Ratio Perm			0.09							c0.15	0.13	0.12
v/c Ratio		0.84	0.22	0.74	0.40					0.55	0.49	0.44
Uniform Delay, d1		24.0	17.4	34.6	7.9					28.0	27.5	27.0
Progression Factor		1.00	1.00	1.23	1.48					1.00	1.00	1.00
Incremental Delay, d2		4.5	0.2	3.4	0.1					5.3	4.3	3.7
Delay (s)		28.5	17.6	45.9	11.8					33.3	31.7	30.7
Level of Service		C	B	D	B					C	C	C
Approach Delay (s)		26.2			22.6			0.0			31.8	
Approach LOS		C			C			A			C	

Intersection Summary					
HCM Average Control Delay	26.1	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	69.1%	ICU Level of Service	C		
Analysis Period (min)	15				

c Critical Lane Group

LOS Engineering

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Configurations							
Volume (vph)	600	820	900	270	400	10	370
Turn Type	Prot			Perm	Perm		Perm
Protected Phases	7	4	8			2	
Permitted Phases				8	2		2
Detector Phases	7	4	8	8	2	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	27.0	65.0	38.0	38.0	25.0	25.0	25.0
Total Split (%)	30.0%	72.2%	42.2%	42.2%	27.8%	27.8%	27.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag		Lead	Lead			
Lead-Lag Optimize?	Yes		Yes	Yes			
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	22.3	56.3	30.0	30.0	25.7	25.7	25.7
Actuated g/C Ratio	0.25	0.63	0.33	0.33	0.29	0.29	0.29
v/c Ratio	0.83	0.39	0.80	0.52	0.53	0.59	0.60
Control Delay	47.8	12.6	32.8	17.3	34.7	34.2	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	12.6	32.8	17.3	34.7	34.2	16.5
LOS	D	B	C	B	C	C	B
Approach Delay		27.5	29.2			27.5	
Approach LOS		C	C			C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 28.1		Intersection LOS: C	
Intersection Capacity Utilization 69.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	450		0	0		50	0		800	0		0
Storage Lanes	2		0	0		1	1		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50	50	50			
Trailing Detector (ft)	0	0			0	0	0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	0.95	0.91	0.95	1.00	1.00	1.00
Frt						0.850		0.961	0.850			
Flt Protected	0.950						0.950	0.966				
Satd. Flow (prot)	3072	3539	0	0	3539	1417	1504	1574	1346	0	0	0
Flt Permitted	0.950						0.950	0.966				
Satd. Flow (perm)	3072	3539	0	0	3539	1417	1504	1574	1346	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						110		18	206			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1271			2232			991			1241	
Travel Time (s)		28.9			50.7			22.5			28.2	
Volume (vph)	600	820	0	0	900	270	400	10	370	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	863	0	0	947	284	421	11	389	0	0	0
Lane Group Flow (vph)	632	863	0	0	947	284	229	274	318	0	0	0
v/c Ratio	0.83	0.39			0.80	0.52	0.53	0.59	0.60			
Control Delay	47.8	12.6			32.8	17.3	34.7	34.2	16.5			
Queue Delay	0.0	0.0			0.0	0.0	0.0	0.0	0.0			
Total Delay	47.8	12.6			32.8	17.3	34.7	34.2	16.5			
Queue Length 50th (ft)	176	217			251	75	122	145	54			
Queue Length 95th (ft)	m229	m253			307	142	207	#267	158			
Internal Link Dist (ft)		1191			2152			911			1161	
Turn Bay Length (ft)	450					50			800			
Base Capacity (vph)	798	2399			1337	604	429	462	531			
Starvation Cap Reductn	0	0			0	0	0	0	0			
Spillback Cap Reductn	0	0			0	0	0	0	0			
Storage Cap Reductn	0	0			0	0	0	0	0			
Reduced v/c Ratio	0.79	0.36			0.71	0.47	0.53	0.59	0.60			

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

PM Existing + Cumulative + Project
7: Pala Rd (SR-76) & I-15 NB Ramps

With Mitigation
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Lane Util. Factor	0.97	0.95			0.95	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.96	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (prot)	3072	3539			3539	1417	1504	1574	1346			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97	1.00			
Satd. Flow (perm)	3072	3539			3539	1417	1504	1574	1346			
Volume (vph)	600	820	0	0	900	270	400	10	370	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	632	863	0	0	947	284	421	11	389	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	73	0	13	147	0	0	0
Lane Group Flow (vph)	632	863	0	0	947	211	229	261	171	0	0	0
Turn Type	Prot					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases						8	2		2			
Actuated Green, G (s)	22.3	56.3			30.0	30.0	25.7	25.7	25.7			
Effective Green, g (s)	22.3	56.3			30.0	30.0	25.7	25.7	25.7			
Actuated g/C Ratio	0.25	0.63			0.33	0.33	0.29	0.29	0.29			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	761	2214			1180	472	429	449	384			
v/s Ratio Prot	c0.21	0.24			c0.27							
v/s Ratio Perm						0.15	0.15	0.17	0.13			
v/c Ratio	0.83	0.39			0.80	0.45	0.53	0.58	0.44			
Uniform Delay, d1	32.1	8.3			27.3	23.5	27.1	27.5	26.3			
Progression Factor	1.29	1.53			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	4.8	0.1			4.0	0.7	4.7	5.4	3.7			
Delay (s)	46.0	12.8			31.3	24.2	31.8	33.0	30.0			
Level of Service	D	B			C	C	C	C	C			
Approach Delay (s)		26.9			29.7			31.5			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

PM Existing + Cumulative + Project
8: Pala Rd (SR-76) & Pankey Rd

With Mitigation
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	152	750	328	200	600	315	408	106	459
Turn Type	Prot		Perm	Prot		Prot		Prot	
Protected Phases	7	4		3	8	5	2	1	6
Permitted Phases			4						
Detector Phases	7	4	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	19.0	34.0	34.0	24.0	39.0	10.0	22.0	10.0	22.0
Total Split (%)	21.1%	37.8%	37.8%	26.7%	43.3%	11.1%	24.4%	11.1%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	11.9	23.6	23.6	14.8	29.4	6.2	17.4	6.2	17.4
Actuated g/C Ratio	0.15	0.30	0.30	0.19	0.38	0.08	0.22	0.08	0.22
v/c Ratio	0.68	0.74	0.54	0.71	0.55	1.38	0.85	0.90	0.86
Control Delay	49.1	29.6	7.5	44.6	21.6	225.9	34.1	101.3	41.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	29.6	7.5	44.6	21.6	225.9	34.1	101.3	41.1
LOS	D	C	A	D	C	F	C	F	D
Approach Delay		26.1			26.8		93.0		49.5
Approach LOS		C			C		F		D

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 78.4			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.38			
Intersection Signal Delay: 48.5		Intersection LOS: D	
Intersection Capacity Utilization 75.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	0.97	0.95	0.95	1.00	0.95	0.95
Frt			0.850		0.982			0.936			0.954	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	3539	1417	1583	3476	0	3072	3313	0	1583	3376	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	3539	1417	1583	3476	0	3072	3313	0	1583	3376	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			310		20			189			69	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2232			2833			991			1488	
Travel Time (s)		50.7			64.4			22.5			33.8	
Volume (vph)	152	750	328	200	600	83	315	408	305	106	459	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	160	789	345	211	632	87	332	429	321	112	483	211
Lane Group Flow (vph)	160	789	345	211	719	0	332	750	0	112	694	0
v/c Ratio	0.68	0.74	0.54	0.71	0.55		1.38	0.85		0.90	0.86	
Control Delay	49.1	29.6	7.5	44.6	21.6		225.9	34.1		101.3	41.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	49.1	29.6	7.5	44.6	21.6		225.9	34.1		101.3	41.1	
Queue Length 50th (ft)	76	185	12	100	152		~120	146		58	162	
Queue Length 95th (ft)	151	264	79	183	211		#226	#282		#176	#302	
Internal Link Dist (ft)		2152			2753			911			1408	
Turn Bay Length (ft)												
Base Capacity (vph)	286	1265	706	383	1474		241	913		124	835	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.56	0.62	0.49	0.55	0.49		1.38	0.82		0.90	0.83	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3539	1417	1583	3475		3072	3312		1583	3378	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3539	1417	1583	3475		3072	3312		1583	3378	
Volume (vph)	152	750	328	200	600	83	315	408	305	106	459	200
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	160	789	345	211	632	87	332	429	321	112	483	211
RTOR Reduction (vph)	0	0	213	0	13	0	0	147	0	0	54	0
Lane Group Flow (vph)	160	789	132	211	706	0	332	603	0	112	640	0
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.1	24.7	24.7	14.8	29.4		6.2	17.4		6.2	17.4	
Effective Green, g (s)	10.1	24.7	24.7	14.8	29.4		6.2	17.4		6.2	17.4	
Actuated g/C Ratio	0.13	0.31	0.31	0.19	0.37		0.08	0.22		0.08	0.22	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	202	1105	442	296	1292		241	729		124	743	
v/s Ratio Prot	0.10	c0.22		c0.13	0.20		c0.11	0.18		0.07	c0.19	
v/s Ratio Perm			0.09									
v/c Ratio	0.79	0.71	0.30	0.71	0.55		1.38	0.83		0.90	0.86	
Uniform Delay, d1	33.5	24.1	20.6	30.2	19.6		36.4	29.4		36.2	29.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.8	2.2	0.4	7.9	0.5		193.8	7.6		51.9	10.1	
Delay (s)	52.3	26.3	21.0	38.0	20.1		230.3	37.0		88.1	39.8	
Level of Service	D	C	C	D	C		F	D		F	D	
Approach Delay (s)		28.1			24.1			96.3			46.5	
Approach LOS		C			C			F			D	

Intersection Summary				
HCM Average Control Delay	48.8	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	79.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	75.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

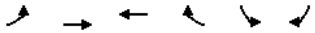
Lane Group	EBL	EBT	WBT	WBR	SBL
Lane Configurations					
Volume (vph)	50	1000	1220	30	50
Turn Type	Prot			Perm	
Protected Phases	7	4	8		6
Permitted Phases				8	
Detector Phases	7	4	8	8	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	10.0	68.0	58.0	58.0	22.0
Total Split (%)	11.1%	75.6%	64.4%	64.4%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes		Yes	Yes	
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	5.9	60.1	54.6	54.6	8.8
Actuated g/C Ratio	0.07	0.78	0.71	0.71	0.11
v/c Ratio	0.46	0.72	0.97	0.03	0.54
Control Delay	50.6	8.6	34.5	2.8	25.9
Queue Delay	0.0	0.1	38.8	0.0	0.0
Total Delay	50.6	8.7	73.3	2.8	25.9
LOS	D	A	E	A	C
Approach Delay		10.7	71.6		25.9
Approach LOS		B	E		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 77			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 42.9		Intersection LOS: D	
Intersection Capacity Utilization 78.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 10: Pala Rd (SR-76) & Rice Canyon Rd

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.921	
Flt Protected	0.950				0.980	
Satd. Flow (prot)	1583	1863	1863	1417	1504	0
Flt Permitted	0.950				0.980	
Satd. Flow (perm)	1583	1863	1863	1417	1504	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				27	70	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		5160	470		1120	
Travel Time (s)		117.3	10.7		25.5	
Volume (vph)	50	1000	1220	30	50	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	1053	1284	32	53	74
Lane Group Flow (vph)	53	1053	1284	32	127	0
v/c Ratio	0.46	0.72	0.97	0.03	0.54	
Control Delay	50.6	8.6	34.5	2.8	25.9	
Queue Delay	0.0	0.1	38.8	0.0	0.0	
Total Delay	50.6	8.7	73.3	2.8	25.9	
Queue Length 50th (ft)	26	177	~701	1	27	
Queue Length 95th (ft)	#71	437	#1046	11	78	
Internal Link Dist (ft)		5080	390		1040	
Turn Bay Length (ft)						
Base Capacity (vph)	118	1474	1320	1012	371	
Starvation Cap Reductn	0	0	147	0	0	
Spillback Cap Reductn	0	35	0	0	8	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.45	0.73	1.09	0.03	0.35	

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	1.00	0.85	0.92	
Flt Protected	0.95	1.00	1.00	1.00	0.98	
Satd. Flow (prot)	1583	1863	1863	1417	1504	
Flt Permitted	0.95	1.00	1.00	1.00	0.98	
Satd. Flow (perm)	1583	1863	1863	1417	1504	
Volume (vph)	50	1000	1220	30	50	70
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	1053	1284	32	53	74
RTOR Reduction (vph)	0	0	0	8	62	0
Lane Group Flow (vph)	53	1053	1284	24	65	0
Turn Type	Prot			Perm		
Protected Phases	7	4	8		6	
Permitted Phases				8		
Actuated Green, G (s)	3.3	61.9	54.6	54.6	8.8	
Effective Green, g (s)	3.3	61.9	54.6	54.6	8.8	
Actuated g/C Ratio	0.04	0.79	0.69	0.69	0.11	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	66	1465	1293	983	168	
v/s Ratio Prot	0.03	c0.57	c0.69		c0.04	
v/s Ratio Perm				0.02		
v/c Ratio	0.80	0.72	0.99	0.02	0.39	
Uniform Delay, d1	37.4	4.1	11.9	3.8	32.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	48.8	1.7	23.2	0.0	1.5	
Delay (s)	86.1	5.8	35.1	3.8	33.9	
Level of Service	F	A	D	A	C	
Approach Delay (s)		9.7	34.3		33.9	
Approach LOS		A	C		C	

Intersection Summary				
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	78.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations					
Volume (vph)	890	70	30	1150	60
Turn Type		Perm	Prot		
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phases	4	4	3	8	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0
Total Split (s)	62.0	62.0	8.0	70.0	20.0
Total Split (%)	68.9%	68.9%	8.9%	77.8%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	43.7	43.7	4.3	46.0	8.7
Actuated g/C Ratio	0.68	0.68	0.06	0.72	0.14
v/c Ratio	0.73	0.07	0.32	0.90	0.33
Control Delay	11.4	1.5	47.6	17.5	32.8
Queue Delay	1.5	0.0	0.0	2.0	0.1
Total Delay	12.8	1.5	47.6	19.4	32.8
LOS	B	A	D	B	C
Approach Delay	12.0			20.2	32.8
Approach LOS	B			C	C

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 63.8		
Natural Cycle: 80		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.90		
Intersection Signal Delay: 17.0	Intersection LOS: B	
Intersection Capacity Utilization 71.6%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 11: Pala Rd (SR-76) & Couser Canyon Rd

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	
Turning Speed (mph)		9	15		15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.980	
Flt Protected			0.950		0.959	
Satd. Flow (prot)	1863	1417	1583	1863	1566	0
Flt Permitted			0.950		0.959	
Satd. Flow (perm)	1863	1417	1583	1863	1566	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		74			8	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	470			11023	1081	
Travel Time (s)	10.7			250.5	24.6	
Volume (vph)	890	70	30	1150	60	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	937	74	32	1211	63	11
Lane Group Flow (vph)	937	74	32	1211	74	0
v/c Ratio	0.73	0.07	0.32	0.90	0.33	
Control Delay	11.4	1.5	47.6	17.5	32.8	
Queue Delay	1.5	0.0	0.0	2.0	0.1	
Total Delay	12.8	1.5	47.6	19.4	32.8	
Queue Length 50th (ft)	132	0	13	244	25	
Queue Length 95th (ft)	462	13	#54	#631	73	
Internal Link Dist (ft)	390			10943	1001	
Turn Bay Length (ft)						
Base Capacity (vph)	1398	1082	99	1490	384	
Starvation Cap Reductn	267	0	0	0	0	
Spillback Cap Reductn	0	0	0	150	33	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.83	0.07	0.32	0.90	0.21	

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1700	1700	1900	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1863	1417	1583	1863	1567	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1863	1417	1583	1863	1567	
Volume (vph)	890	70	30	1150	60	10
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	937	74	32	1211	63	11
RTOR Reduction (vph)	0	25	0	0	7	0
Lane Group Flow (vph)	937	49	32	1211	67	0
Turn Type		Perm	Prot			
Protected Phases	4		3	8	2	
Permitted Phases		4				
Actuated Green, G (s)	43.7	43.7	1.2	48.9	8.7	
Effective Green, g (s)	43.7	43.7	1.2	48.9	8.7	
Actuated g/C Ratio	0.67	0.67	0.02	0.75	0.13	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1241	944	29	1389	208	
v/s Ratio Prot	0.50		0.02	c0.65	c0.04	
v/s Ratio Perm		0.03				
v/c Ratio	0.76	0.05	1.10	0.87	0.32	
Uniform Delay, d1	7.4	3.8	32.2	6.1	25.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	0.0	200.4	6.3	0.9	
Delay (s)	10.0	3.8	232.6	12.4	26.7	
Level of Service	B	A	F	B	C	
Approach Delay (s)	9.6			18.0	26.7	
Approach LOS	A			B	C	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	65.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	150	145	174	176	110	810	199	480
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	13.0	21.0	14.0	22.0	17.0	30.0	15.0	28.0
Total Split (%)	16.3%	26.3%	17.5%	27.5%	21.3%	37.5%	18.8%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	9.0	17.0	10.0	18.0	10.6	25.6	11.0	28.3
Actuated g/C Ratio	0.11	0.21	0.13	0.23	0.13	0.32	0.14	0.36
v/c Ratio	0.88	0.85	0.92	0.96	0.57	0.93	0.95	0.47
Control Delay	80.7	44.7	83.8	62.4	43.2	40.8	87.8	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.7	44.7	83.8	62.4	43.2	40.8	87.8	21.9
LOS	F	D	F	E	D	D	F	C
Approach Delay		55.6		68.8		41.0		39.2
Approach LOS		E		E		D		D

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 79.6			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 48.5		Intersection LOS: D	
Intersection Capacity Utilization 86.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	0		0	150		0	200		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.913			0.915			0.972			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1701	0	1583	1704	0	1583	3440	0	1583	3465	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1701	0	1583	1704	0	1583	3440	0	1583	3465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		79			77			37			24	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		3628			1500			4464			5461	
Travel Time (s)		82.5			34.1			101.5			124.1	
Volume (vph)	150	145	200	174	176	232	110	810	189	199	480	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	153	211	183	185	244	116	853	199	209	505	84
Lane Group Flow (vph)	158	364	0	183	429	0	116	1052	0	209	589	0
v/c Ratio	0.88	0.85		0.92	0.96		0.57	0.93		0.95	0.47	
Control Delay	80.7	44.7		83.8	62.4		43.2	40.8		87.8	21.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	80.7	44.7		83.8	62.4		43.2	40.8		87.8	21.9	
Queue Length 50th (ft)	79	140		92	179		55	255		105	118	
Queue Length 95th (ft)	#188	#291		#211	#362		104	#382		#236	175	
Internal Link Dist (ft)		3548			1420			4384			5381	
Turn Bay Length (ft)							150			200		
Base Capacity (vph)	179	426		199	445		245	1143		219	1247	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.88	0.85		0.92	0.96		0.47	0.92		0.95	0.47	

Intersection Summary	
Area Type:	Other
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

PM Existing + Cumulative + Project
12: Pala Mesa Dr & Old Hwy 395

With Mitigation
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.91		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1701		1583	1704		1583	3439		1583	3464	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1701		1583	1704		1583	3439		1583	3464	
Volume (vph)	150	145	200	174	176	232	110	810	189	199	480	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	153	211	183	185	244	116	853	199	209	505	84
RTOR Reduction (vph)	0	62	0	0	60	0	0	25	0	0	16	0
Lane Group Flow (vph)	158	302	0	183	369	0	116	1027	0	209	573	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.0	17.0		10.0	18.0		9.1	26.4		11.0	28.3	
Effective Green, g (s)	9.0	17.0		10.0	18.0		9.1	26.4		11.0	28.3	
Actuated g/C Ratio	0.11	0.21		0.12	0.22		0.11	0.33		0.14	0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	360		197	381		179	1129		217	1219	
v/s Ratio Prot	0.10	0.18		c0.12	c0.22		0.07	c0.30		c0.13	0.17	
v/s Ratio Perm												
v/c Ratio	0.89	0.84		0.93	0.97		0.65	0.91		0.96	0.47	
Uniform Delay, d1	35.2	30.4		34.8	30.9		34.1	25.9		34.5	20.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	38.7	15.5		43.9	37.5		7.8	10.7		50.3	0.3	
Delay (s)	73.9	45.9		78.7	68.4		42.0	36.6		84.8	20.5	
Level of Service	E	D		E	E		D	D		F	C	
Approach Delay (s)		54.4			71.5			37.1			37.4	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	46.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

LOS Engineering

PM Existing + Cumulative + Project
14: Stewart Canyon Rd & Old Hwy 395

With Mitigation
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	10	21	26	13	60	710	464	690
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	10.0	22.0	11.0	23.0	9.0	23.0	34.0	48.0
Total Split (%)	11.1%	24.4%	12.2%	25.6%	10.0%	25.6%	37.8%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	5.9	8.0	6.4	10.1	5.1	19.6	25.8	42.6
Actuated g/C Ratio	0.08	0.12	0.08	0.15	0.07	0.28	0.37	0.61
v/c Ratio	0.09	0.24	0.20	0.70	0.56	0.78	0.83	0.38
Control Delay	39.9	19.9	39.3	11.8	56.7	32.7	35.6	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	19.9	39.3	11.8	56.7	32.7	35.6	9.2
LOS	D	B	D	B	E	C	D	A
Approach Delay		23.3		13.6		34.5		19.2
Approach LOS		C		B		C		B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 69.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 23.3		Intersection LOS: C	
Intersection Capacity Utilization 81.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395

LOS Engineering

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	200		0	100		0	100		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.911			0.855			0.995			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	1697	0	1583	1593	0	1583	3522	0	1583	3483	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	1697	0	1583	1593	0	1583	3522	0	1583	3483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		32			368			4			19	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1302			7424			5461			3410	
Travel Time (s)		29.6			168.7			124.1			77.5	
Volume (vph)	10	21	30	26	13	350	60	710	26	464	690	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	22	32	27	14	368	63	747	27	488	726	84
Lane Group Flow (vph)	11	54	0	27	382	0	63	774	0	488	810	0
v/c Ratio	0.09	0.24		0.20	0.70		0.56	0.78		0.83	0.38	
Control Delay	39.9	19.9		39.3	11.8		56.7	32.7		35.6	9.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	39.9	19.9		39.3	11.8		56.7	32.7		35.6	9.2	
Queue Length 50th (ft)	4	8		10	5		25	144		153	64	
Queue Length 95th (ft)	22	42		40	85		#102	#360		#447	192	
Internal Link Dist (ft)		1222			7344			5381			3330	
Turn Bay Length (ft)				200			100			100		
Base Capacity (vph)	124	416		147	670		113	998		653	2187	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.13		0.18	0.57		0.56	0.78		0.75	0.37	

Intersection Summary	
Area Type:	Other

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91		1.00	0.86		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	1697		1583	1594		1583	3521		1583	3484	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	1697		1583	1594		1583	3521		1583	3484	
Volume (vph)	10	21	30	26	13	350	60	710	26	464	690	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	22	32	27	14	368	63	747	27	488	726	84
RTOR Reduction (vph)	0	28	0	0	317	0	0	3	0	0	8	0
Lane Group Flow (vph)	11	26	0	27	65	0	63	771	0	488	802	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.9	8.7		2.3	10.1		3.9	20.6		25.9	42.6	
Effective Green, g (s)	0.9	8.7		2.3	10.1		3.9	20.6		25.9	42.6	
Actuated g/C Ratio	0.01	0.12		0.03	0.14		0.05	0.28		0.35	0.58	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	19	201		50	219		84	987		558	2019	
v/s Ratio Prot	0.01	0.02		c0.02	c0.04		0.04	c0.22		c0.31	0.23	
v/s Ratio Perm												
v/c Ratio	0.58	0.13		0.54	0.29		0.75	0.78		0.87	0.40	
Uniform Delay, d1	36.1	29.0		35.1	28.5		34.3	24.4		22.3	8.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.3	0.3		11.4	0.8		30.8	4.1		14.2	0.1	
Delay (s)	72.4	29.3		46.5	29.3		65.1	28.5		36.5	8.6	
Level of Service	E	C		D	C		E	C		D	A	
Approach Delay (s)		36.6			30.4			31.2			19.1	
Approach LOS		D			C			C			B	

Intersection Summary					
HCM Average Control Delay	25.2	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	81.5%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	290	250	870	330	210	350
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Detector Phases	4	4	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	27.0	27.0	72.0	93.0	21.0	21.0
Total Split (%)	22.5%	22.5%	60.0%	77.5%	17.5%	17.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag
Lead-Lag Optimize?			Yes		Yes	Yes
Recall Mode	None	None	None	Min	Min	Min
Act Effct Green (s)	23.0	23.0	68.1	84.9	12.8	12.8
Actuated g/C Ratio	0.20	0.20	0.59	0.73	0.11	0.11
v/c Ratio	0.97	0.53	0.99	0.13	0.57	0.76
Control Delay	91.0	9.3	51.1	4.7	54.6	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.0	9.3	51.1	4.7	54.6	15.9
LOS	F	A	D	A	D	B
Approach Delay	53.2			38.3	30.4	
Approach LOS	D			D	C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 115.9			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 39.9		Intersection LOS: D	
Intersection Capacity Utilization 87.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 15: Reche Rd & Old Hwy 395

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Storage Length (ft)	0	0	150			0
Storage Lanes	1	1	1			1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9	15			9
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		263				368
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30			30	30	
Link Distance (ft)	2635			3410	4960	
Travel Time (s)	59.9			77.5	112.7	
Volume (vph)	290	250	870	330	210	350
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	263	916	347	221	368
Lane Group Flow (vph)	305	263	916	347	221	368
v/c Ratio	0.97	0.53	0.99	0.13	0.57	0.76
Control Delay	91.0	9.3	51.1	4.7	54.6	15.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.0	9.3	51.1	4.7	54.6	15.9
Queue Length 50th (ft)	227	0	628	35	83	0
Queue Length 95th (ft)	#426	75	#1002	48	124	99
Internal Link Dist (ft)	2555			3330	4880	
Turn Bay Length (ft)			150			
Base Capacity (vph)	314	492	929	2625	501	517
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.53	0.99	0.13	0.44	0.71

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1700	1900	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1583	1417	1583	3539	3539	1417
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1583	1417	1583	3539	3539	1417
Volume (vph)	290	250	870	330	210	350
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	305	263	916	347	221	368
RTOR Reduction (vph)	0	211	0	0	0	327
Lane Group Flow (vph)	305	52	916	347	221	41
Turn Type		Perm	Prot			Perm
Protected Phases	4		5	2	6	
Permitted Phases		4				6
Actuated Green, G (s)	23.0	23.0	68.0	84.9	12.9	12.9
Effective Green, g (s)	23.0	23.0	68.0	84.9	12.9	12.9
Actuated g/C Ratio	0.20	0.20	0.59	0.73	0.11	0.11
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	314	281	929	2592	394	158
v/s Ratio Prot	c0.19		c0.58	0.10	c0.06	
v/s Ratio Perm		0.04				0.03
v/c Ratio	0.97	0.19	0.99	0.13	0.56	0.26
Uniform Delay, d1	46.1	38.7	23.5	4.6	48.8	47.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.8	0.3	25.9	0.0	1.8	0.9
Delay (s)	88.9	39.0	49.4	4.6	50.6	48.0
Level of Service	F	D	D	A	D	D
Approach Delay (s)	65.8			37.1	49.0	
Approach LOS	E			D	D	

Intersection Summary			
HCM Average Control Delay	46.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	115.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø1	ø4
Lane Configurations								
Volume (vph)	380	840	120	320	1050	70		
Turn Type		Free		pm+ov	Split			
Protected Phases	1 4		3	1 4	2	2	1	4
Permitted Phases		Free		3				
Detector Phases	1 4		3	1 4	2	2		
Minimum Initial (s)			4.0		4.0	4.0	4.0	4.0
Minimum Split (s)			20.0		20.0	20.0	8.0	20.0
Total Split (s)	35.0	0.0	20.0	35.0	35.0	35.0	15.0	20.0
Total Split (%)	38.9%	0.0%	22.2%	38.9%	38.9%	38.9%	17%	22%
Yellow Time (s)			3.5		3.5	3.5	3.5	3.5
All-Red Time (s)			0.5		0.5	0.5	0.5	0.5
Lead/Lag			Lead		Lag	Lag	Lead	Lag
Lead-Lag Optimize?			Yes		Yes	Yes	Yes	Yes
Recall Mode			None		Min	Min	None	None
Act Effct Green (s)	31.0	88.5	14.4	49.5	31.0	31.0		
Actuated g/C Ratio	0.35	1.00	0.16	0.56	0.35	0.35		
v/c Ratio	0.72	0.62	0.42	0.43	1.03	0.11		
Control Delay	33.9	2.0	37.6	13.3	64.4	20.7		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	33.9	2.0	37.6	13.3	64.4	20.7		
LOS	C	A	D	B	E	C		
Approach Delay	11.9		19.9			61.7		
Approach LOS	B		B			E		

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 88.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 33.2		Intersection LOS: C	
Intersection Capacity Utilization 70.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 19: Mission Rd & Old Hwy 395

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Storage Length (ft)	0	130		210	100	
Storage Lanes	1	1		1	2	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Right Turn on Red		No		No		
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	434		4960			1035
Travel Time (s)	9.9		112.7			23.5
Volume (vph)	380	840	120	320	1050	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	884	126	337	1105	74
Lane Group Flow (vph)	400	884	126	337	1105	74
v/c Ratio	0.72	0.62	0.42	0.43	1.03	0.11
Control Delay	33.9	2.0	37.6	13.3	64.4	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.9	2.0	37.6	13.3	64.4	20.7
Queue Length 50th (ft)	189	26	64	101	~354	28
Queue Length 95th (ft)	m230	m20	117	164	#478	59
Internal Link Dist (ft)	354		4880			955
Turn Bay Length (ft)		130		210	100	
Base Capacity (vph)	555	1417	337	792	1077	654
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.62	0.37	0.43	1.03	0.11

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

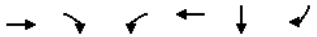
m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1700	1700	1900	1700	1700	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	1417	1863	1417	3072	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	1417	1863	1417	3072	1863
Volume (vph)	380	840	120	320	1050	70
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	884	126	337	1105	74
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	400	884	126	337	1105	74
Turn Type		Free		pm+ov	Split	
Protected Phases	1 4		3	1 4	2	2
Permitted Phases		Free		3		
Actuated Green, G (s)	31.0	88.4	14.4	45.4	31.0	31.0
Effective Green, g (s)	31.0	88.4	14.4	45.4	31.0	31.0
Actuated g/C Ratio	0.35	1.00	0.16	0.51	0.35	0.35
Clearance Time (s)			4.0		4.0	4.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)	555	1417	303	792	1077	653
v/s Ratio Prot	c0.25		0.07	0.15	c0.36	0.04
v/s Ratio Perm		c0.62		0.09		
v/c Ratio	0.72	0.62	0.42	0.43	1.03	0.11
Uniform Delay, d1	24.9	0.0	33.2	13.4	28.7	19.4
Progression Factor	1.15	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.9	0.9	0.4	34.2	0.1
Delay (s)	30.8	0.9	34.2	13.8	62.9	19.5
Level of Service	C	A	C	B	E	B
Approach Delay (s)	10.2		19.3			60.2
Approach LOS	B		B			E

Intersection Summary

HCM Average Control Delay	31.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

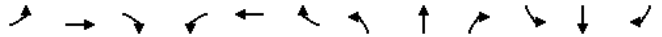
c Critical Lane Group



Lane Group	EBT	EBR	WBL	WBT	SBT	SBR	ø3
Lane Configurations							
Volume (vph)	1260	90	80	500	10	720	
Turn Type		Perm	Prot			custom	
Protected Phases	2 3		1	2	4	1 4	3
Permitted Phases		2 3				4	
Detector Phases	2 3	2 3	1	2	4	1 4	
Minimum Initial (s)			4.0	4.0	4.0		4.0
Minimum Split (s)			8.0	20.0	20.0		20.0
Total Split (s)	55.0	55.0	15.0	35.0	20.0	35.0	20.0
Total Split (%)	61.1%	61.1%	16.7%	38.9%	22.2%	38.9%	22%
Yellow Time (s)			3.5	3.5	3.5		3.5
All-Red Time (s)			0.5	0.5	0.5		0.5
Lead/Lag			Lead	Lag	Lag		Lead
Lead-Lag Optimize?			Yes	Yes	Yes		Yes
Recall Mode			None	Min	None		None
Act Effct Green (s)	49.5	49.5	11.0	31.0	16.0	31.0	
Actuated g/C Ratio	0.56	0.56	0.12	0.35	0.18	0.35	
v/c Ratio	0.67	0.11	0.43	0.80	0.07	0.95	
Control Delay	5.7	0.2	43.9	37.7	31.5	33.7	
Queue Delay	1.0	0.0	0.0	0.0	0.0	1.6	
Total Delay	6.8	0.2	43.9	37.7	31.5	35.3	
LOS	A	A	D	D	C	D	
Approach Delay	6.3			38.6	35.2		
Approach LOS	A			D	D		

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 88.5			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.03			
Intersection Signal Delay: 21.3		Intersection LOS: C	
Intersection Capacity Utilization 82.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 20: Mission Rd & I-15 SB Ramps



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	0		0	285		0	0		0	0		200
Storage Lanes	0		1	1		0	0		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50					50	50	50
Trailing Detector (ft)		0	0	0	0					0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.976	
Satd. Flow (prot)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Flt Permitted				0.950							0.976	
Satd. Flow (perm)	0	3539	1417	1583	1863	0	0	0	0	0	1818	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95									468
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		434			744			972			897	
Travel Time (s)		9.9			16.9			22.1			20.4	
Volume (vph)	0	1260	90	80	500	0	0	0	0	10	10	720
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1326	95	84	526	0	0	0	0	11	11	758
Lane Group Flow (vph)	0	1326	95	84	526	0	0	0	0	0	22	758
v/c Ratio		0.67	0.11	0.43	0.80						0.07	0.95
Control Delay		5.7	0.2	43.9	37.7						31.5	33.7
Queue Delay		1.0	0.0	0.0	0.0						0.0	1.6
Total Delay		6.8	0.2	43.9	37.7						31.5	35.3
Queue Length 50th (ft)		65	0	45	270						11	188
Queue Length 95th (ft)		m76	m0	91	#440						31	#461
Internal Link Dist (ft)		354			664			892			817	
Turn Bay Length (ft)				285								200
Base Capacity (vph)		2041	858	197	654						329	801
Starvation Cap Reductn		428	0	0	0						0	0
Spillback Cap Reductn		0	0	0	0						0	11
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.82	0.11	0.43	0.80						0.07	0.96

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0	4.0	4.0						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (prot)		3539	1417	1583	1863						1817	1417
Flt Permitted		1.00	1.00	0.95	1.00						0.98	1.00
Satd. Flow (perm)		3539	1417	1583	1863						1817	1417
Volume (vph)	0	1260	90	80	500	0	0	0	0	10	10	720
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1326	95	84	526	0	0	0	0	11	11	758
RTOR Reduction (vph)	0	0	42	0	0	0	0	0	0	0	0	304
Lane Group Flow (vph)	0	1326	53	84	526	0	0	0	0	0	22	454
Turn Type			Perm	Prot						Split		custom
Protected Phases		2 3		1	2					4	4	1 4
Permitted Phases			2 3									4
Actuated Green, G (s)		49.4	49.4	11.0	31.0						16.0	31.0
Effective Green, g (s)		49.4	49.4	11.0	31.0						16.0	31.0
Actuated g/C Ratio		0.56	0.56	0.12	0.35						0.18	0.35
Clearance Time (s)				4.0	4.0						4.0	
Vehicle Extension (s)				3.0	3.0						3.0	
Lane Grp Cap (vph)		1978	792	197	653						329	497
v/s Ratio Prot		c0.37		0.05	c0.28						0.01	c0.32
v/s Ratio Perm			0.04									
v/c Ratio		0.67	0.07	0.43	0.81						0.07	0.91
Uniform Delay, d1		13.8	8.9	35.8	26.0						30.0	27.4
Progression Factor		0.35	0.05	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.0	1.5	7.2						0.1	21.2
Delay (s)		5.2	0.4	37.3	33.1						30.1	48.6
Level of Service		A	A	D	C						C	D
Approach Delay (s)		4.9			33.7			0.0			48.1	
Approach LOS		A			C			A			D	

Intersection Summary				
HCM Average Control Delay	23.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	82.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	NBT	NBR
Lane Configurations					
Volume (vph)	1000	290	230	10	170
Turn Type	Prot				Perm
Protected Phases	7	4	8	2	
Permitted Phases					2
Detector Phases	7	4	8	2	2
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0
Total Split (s)	34.0	66.0	32.0	24.0	24.0
Total Split (%)	37.8%	73.3%	35.6%	26.7%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	30.1	49.5	15.4	19.6	19.6
Actuated g/C Ratio	0.39	0.64	0.20	0.25	0.25
v/c Ratio	0.88	0.25	0.68	0.84	0.36
Control Delay	33.2	6.5	37.9	47.1	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	6.5	37.9	47.1	6.7
LOS	C	A	D	D	A
Approach Delay		27.2	37.9	34.2	
Approach LOS		C	D	C	

Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 77.1		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.88		
Intersection Signal Delay: 30.2	Intersection LOS: C	
Intersection Capacity Utilization 82.8%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 21: Mission Rd & I-15 NB Ramps

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		0	0		0	0		200	0		0
Storage Lanes	2		0	0		0	0		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50			
Trailing Detector (ft)	0	0			0		0	0	0			
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.994				0.850			
Flt Protected	0.950							0.954				
Satd. Flow (prot)	3072	1863	0	0	1852	0	0	1777	1417	0	0	0
Flt Permitted	0.950							0.954				
Satd. Flow (perm)	3072	1863	0	0	1852	0	0	1777	1417	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					3				179			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		744			1271			1082			1005	
Travel Time (s)		16.9			28.9			24.6			22.8	
Volume (vph)	1000	290	0	0	230	10	350	10	170	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	305	0	0	242	11	368	11	179	0	0	0
Lane Group Flow (vph)	1053	305	0	0	253	0	0	379	179	0	0	0
v/c Ratio	0.88	0.25			0.68			0.84	0.36			
Control Delay	33.2	6.5			37.9			47.1	6.7			
Queue Delay	0.0	0.0			0.0			0.0	0.0			
Total Delay	33.2	6.5			37.9			47.1	6.7			
Queue Length 50th (ft)	238	56			112			172	0			
Queue Length 95th (ft)	#411	89			186			#355	49			
Internal Link Dist (ft)		664			1191			1002			925	
Turn Bay Length (ft)	300								200			
Base Capacity (vph)	1200	1290			581			460	499			
Starvation Cap Reductn	0	0			0			0	0			
Spillback Cap Reductn	0	0			0			0	0			
Storage Cap Reductn	0	0			0			0	0			
Reduced v/c Ratio	0.88	0.24			0.44			0.82	0.36			

Intersection Summary

Area Type: Other

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0			4.0	4.0			
Lane Util. Factor	0.97	1.00			1.00			1.00	1.00			
Frt	1.00	1.00			0.99			1.00	0.85			
Flt Protected	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (prot)	3072	1863			1852			1776	1417			
Flt Permitted	0.95	1.00			1.00			0.95	1.00			
Satd. Flow (perm)	3072	1863			1852			1776	1417			
Volume (vph)	1000	290	0	0	230	10	350	10	170	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	305	0	0	242	11	368	11	179	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	133	0	0	0
Lane Group Flow (vph)	1053	305	0	0	251	0	0	379	46	0	0	0
Turn Type	Prot						Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases							2		2			
Actuated Green, G (s)	30.1	49.5			15.4			19.6	19.6			
Effective Green, g (s)	30.1	49.5			15.4			19.6	19.6			
Actuated g/C Ratio	0.39	0.64			0.20			0.25	0.25			
Clearance Time (s)	4.0	4.0			4.0			4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0			3.0	3.0			
Lane Grp Cap (vph)	1199	1196			370			451	360			
v/s Ratio Prot	c0.34	0.16			c0.14							
v/s Ratio Perm								0.21	0.03			
v/c Ratio	0.88	0.26			0.68			0.84	0.13			
Uniform Delay, d1	21.8	5.9			28.6			27.3	22.2			
Progression Factor	1.00	1.00			1.00			1.00	1.00			
Incremental Delay, d2	7.5	0.1			4.9			13.2	0.2			
Delay (s)	29.3	6.0			33.4			40.5	22.3			
Level of Service	C	A			C			D	C			
Approach Delay (s)		24.1			33.4			34.6			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM Average Control Delay	27.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	77.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Volume (vph)	200	2200	360	100	1620	10	300	200	360	100	200
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot	
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6
Permitted Phases			4			8					
Detector Phases	7	4	5	3	8	1	5	2	2 3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	8.0	20.0	8.0	8.0	20.0		8.0	20.0
Total Split (s)	12.0	46.0	14.0	8.0	42.0	11.0	14.0	25.0	33.0	11.0	22.0
Total Split (%)	13.3%	51.1%	15.6%	8.9%	46.7%	12.2%	15.6%	27.8%	36.7%	12.2%	24.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Max		None	Max
Act Effct Green (s)	8.0	42.0	56.0	4.0	38.0	49.0	10.0	21.0	29.0	7.0	18.0
Actuated g/C Ratio	0.09	0.47	0.62	0.04	0.42	0.54	0.11	0.23	0.32	0.08	0.20
v/c Ratio	0.77	0.98	0.39	0.77	0.79	0.01	0.93	0.49	0.79	0.85	0.71
Control Delay	60.2	38.0	4.3	77.3	26.0	5.1	74.6	34.3	39.7	92.9	43.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.2	38.0	4.3	77.3	26.0	5.1	74.6	34.3	39.7	92.9	43.8
LOS	E	D	A	E	C	A	E	C	D	F	D
Approach Delay		35.2			28.9			50.6			57.7
Approach LOS		D			C			D			E

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 37.0		Intersection LOS: D	
Intersection Capacity Utilization 83.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 30: Pala Rd (SR-76) & Melrose Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	500		500	500		500	400		400	200		0
Storage Lanes	2		1	2		1	2		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.970	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3072	5085	1417	3072	5085	1417	3072	1863	1417	1583	1807	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3072	5085	1417	3072	5085	1417	3072	1863	1417	1583	1807	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			234			11			30		13	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1330			646			1034			733	
Travel Time (s)		30.2			14.7			23.5			16.7	
Volume (vph)	200	2200	360	100	1620	10	300	200	360	100	200	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2316	379	105	1705	11	316	211	379	105	211	53
Lane Group Flow (vph)	211	2316	379	105	1705	11	316	211	379	105	264	0
v/c Ratio	0.77	0.98	0.39	0.77	0.79	0.01	0.93	0.49	0.79	0.85	0.71	
Control Delay	60.2	38.0	4.3	77.3	26.0	5.1	74.6	34.3	39.7	92.9	43.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	60.2	38.0	4.3	77.3	26.0	5.1	74.6	34.3	39.7	92.9	43.8	
Queue Length 50th (ft)	61	454	32	30	300	0	93	104	180	60	134	
Queue Length 95th (ft)	#116	#590	75	#75	361	8	#172	173	#330	#155	#238	
Internal Link Dist (ft)		1250			566			954			653	
Turn Bay Length (ft)	500		500	500		500	400		400	200		
Base Capacity (vph)	273	2373	970	137	2147	776	341	435	477	123	372	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.77	0.98	0.39	0.77	0.79	0.01	0.93	0.49	0.79	0.85	0.71	

Intersection Summary	
Area Type:	Other
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

PM Existing + Cumulative + Project
30: Pala Rd (SR-76) & Melrose Dr

With Mitigation
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3072	5085	1417	3072	5085	1417	3072	1863	1417	1583	1807	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3072	5085	1417	3072	5085	1417	3072	1863	1417	1583	1807	
Volume (vph)	200	2200	360	100	1620	10	300	200	360	100	200	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2316	379	105	1705	11	316	211	379	105	211	53
RTOR Reduction (vph)	0	0	99	0	0	6	0	0	20	0	10	0
Lane Group Flow (vph)	211	2316	280	105	1705	6	316	211	359	105	254	0
Turn Type	Prot		pm+ov	Prot		pm+ov	Prot		pt+ov	Prot		
Protected Phases	7	4	5	3	8	1	5	2	2 3	1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.0	42.0	52.0	4.0	38.0	45.0	10.0	21.0	29.0	7.0	18.0	
Effective Green, g (s)	8.0	42.0	52.0	4.0	38.0	45.0	10.0	21.0	29.0	7.0	18.0	
Actuated g/C Ratio	0.09	0.47	0.58	0.04	0.42	0.50	0.11	0.23	0.32	0.08	0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	273	2373	882	137	2147	771	341	435	457	123	361	
v/s Ratio Prot	0.07	c0.46	0.04	0.03	0.34	0.00	c0.10	0.11	c0.25	0.07	0.14	
v/s Ratio Perm			0.16			0.00						
v/c Ratio	0.77	0.98	0.32	0.77	0.79	0.01	0.93	0.49	0.78	0.85	0.70	
Uniform Delay, d1	40.1	23.5	9.8	42.5	22.6	11.3	39.6	29.8	27.7	41.0	33.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.7	13.2	0.2	22.2	2.1	0.0	30.3	3.8	8.6	40.3	10.9	
Delay (s)	52.8	36.7	10.0	64.7	24.7	11.3	70.0	33.7	36.3	81.3	44.4	
Level of Service	D	D	B	E	C	B	E	C	D	F	D	
Approach Delay (s)		34.4			26.9			47.4			54.9	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	35.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	83.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

LOS Engineering

PM Existing + Cumulative + Project
31: Pala Rd (SR-76) & E Vista Way

With Mitigation
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBT
Lane Configurations									
Volume (vph)	100	2050	400	400	1200	300	70	370	80
Turn Type	Prot		pm+ov	Prot		Split		pm+ov	
Protected Phases	7	4	2	3	8	2	2	3	6
Permitted Phases			4					2	
Detector Phases	7	4	2	3	8	2	2	3	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	58.0	31.0	21.0	59.0	31.0	31.0	21.0	20.0
Total Split (%)	15.4%	44.6%	23.8%	16.2%	45.4%	23.8%	23.8%	16.2%	15.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag		Lead	Lag			Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes	
Recall Mode	None	None	Max	None	None	Max	Max	None	Max
Act Effct Green (s)	13.2	54.0	85.0	17.0	57.8	27.0	27.0	44.0	16.0
Actuated g/C Ratio	0.10	0.42	0.65	0.13	0.44	0.21	0.21	0.34	0.12
v/c Ratio	0.66	1.02	0.42	1.05	0.57	0.96	0.19	0.62	0.36
Control Delay	74.9	62.9	5.6	111.7	28.5	91.7	44.1	13.5	31.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.9	62.9	5.6	111.7	28.5	91.7	44.1	13.5	31.4
LOS	E	E	A	F	C	F	D	B	C
Approach Delay		54.4			48.9		48.1		31.4
Approach LOS		D			D		D		C

Intersection Summary			
Cycle Length: 130			
Actuated Cycle Length: 130			
Natural Cycle: 130			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.05			
Intersection Signal Delay: 51.0		Intersection LOS: D	
Intersection Capacity Utilization 89.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 31: Pala Rd (SR-76) & E Vista Way

LOS Engineering

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	300		150	450		0	0		200	0		0
Storage Lanes	1		1	2		0	1		1	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	0.91	1.00	1.00	1.00	0.95	0.95	0.95
Frt			0.850		0.996				0.850		0.934	
Flt Protected	0.950			0.950			0.950				0.997	
Satd. Flow (prot)	1583	5085	1417	3072	5065	0	1583	1863	1417	0	3296	0
Flt Permitted	0.950			0.950			0.950				0.997	
Satd. Flow (perm)	1583	5085	1417	3072	5065	0	1583	1863	1417	0	3296	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			233		3				223		74	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		710			526			797			552	
Travel Time (s)		16.1			12.0			18.1			12.5	
Volume (vph)	100	2050	400	400	1200	30	300	70	370	10	80	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	2158	421	421	1263	32	316	74	389	11	84	74
Lane Group Flow (vph)	105	2158	421	421	1295	0	316	74	389	0	169	0
v/c Ratio	0.66	1.02	0.42	1.05	0.57		0.96	0.19	0.62		0.36	
Control Delay	74.9	62.9	5.6	111.7	28.5		91.7	44.1	13.5		31.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay	74.9	62.9	5.6	111.7	28.5		91.7	44.1	13.5		31.4	
Queue Length 50th (ft)	86	~706	59	~198	295		266	52	76		38	
Queue Length 95th (ft)	148	#800	118	#305	354		#453	97	155		75	
Internal Link Dist (ft)		630			446			717			472	
Turn Bay Length (ft)	300		150	450					200			
Base Capacity (vph)	191	2112	1007	402	2255		329	387	627		471	
Starvation Cap Reductn	0	0	0	0	0		0	0	0		0	
Spillback Cap Reductn	0	0	0	0	0		0	0	0		0	
Storage Cap Reductn	0	0	0	0	0		0	0	0		0	
Reduced v/c Ratio	0.55	1.02	0.42	1.05	0.57		0.96	0.19	0.62		0.36	

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

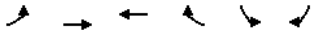
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00		0.95	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (prot)	1583	5085	1417	3072	5066		1583	1863	1417		3296	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		1.00	
Satd. Flow (perm)	1583	5085	1417	3072	5066		1583	1863	1417		3296	
Volume (vph)	100	2050	400	400	1200	30	300	70	370	10	80	70
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	105	2158	421	421	1263	32	316	74	389	11	84	74
RTOR Reduction (vph)	0	0	88	0	2	0	0	0	148	0	65	0
Lane Group Flow (vph)	105	2158	333	421	1293	0	316	74	241	0	104	0
Turn Type	Prot		pm+ov	Prot			Split		pm+ov	Split		
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases			4						2			
Actuated Green, G (s)	13.2	54.0	81.0	17.0	57.8		27.0	27.0	44.0		16.0	
Effective Green, g (s)	13.2	54.0	81.0	17.0	57.8		27.0	27.0	44.0		16.0	
Actuated g/C Ratio	0.10	0.42	0.62	0.13	0.44		0.21	0.21	0.34		0.12	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	161	2112	927	402	2252		329	387	480		406	
v/s Ratio Prot	0.07	c0.42	0.07	c0.14	c0.26		c0.20	0.04	0.07		c0.03	
v/s Ratio Perm			0.16						0.10			
v/c Ratio	0.65	1.02	0.36	1.05	0.57		0.96	0.19	0.50		0.26	
Uniform Delay, d1	56.2	38.0	11.9	56.5	26.9		51.0	42.5	34.3		51.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	9.1	25.3	0.2	57.8	0.4		40.5	1.1	0.8		1.5	
Delay (s)	65.3	63.3	12.1	114.3	27.3		91.5	43.6	35.1		53.1	
Level of Service	E	E	B	F	C		F	D	D		D	
Approach Delay (s)		55.3			48.6			58.8			53.1	
Approach LOS		E			D			E			D	

Intersection Summary				
HCM Average Control Delay	53.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	89.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

PM Existing + Cumulative + Project
32: Pala Rd (SR-76) & North River Rd

With Mitigation
Timings



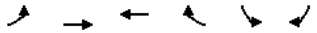
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	200	2350	1500	150	250	200
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	15.0	70.0	55.0	55.0	20.0	20.0
Total Split (%)	16.7%	77.8%	61.1%	61.1%	22.2%	22.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	None	None	None	Max	Max
Act Effct Green (s)	11.0	65.2	50.2	50.2	16.0	16.0
Actuated g/C Ratio	0.12	0.73	0.56	0.56	0.18	0.18
v/c Ratio	1.08	0.96	0.79	0.18	0.93	0.49
Control Delay	128.3	21.9	19.1	2.1	76.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	128.3	21.9	19.1	2.1	76.2	9.3
LOS	F	C	B	A	E	A
Approach Delay		30.2	17.6		46.4	
Approach LOS		C	B		D	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 89.2			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 27.3		Intersection LOS: C	
Intersection Capacity Utilization 87.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 32: Pala Rd (SR-76) & North River Rd

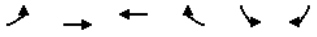
PM Existing + Cumulative + Project
32: Pala Rd (SR-76) & North River Rd

With Mitigation
Queues



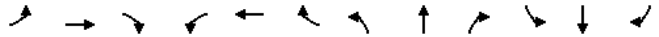
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	150			0	50	0
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				158		211
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		1356	1400		1286	
Travel Time (s)		30.8	31.8		29.2	
Volume (vph)	200	2350	1500	150	250	200
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2474	1579	158	263	211
Lane Group Flow (vph)	211	2474	1579	158	263	211
v/c Ratio	1.08	0.96	0.79	0.18	0.93	0.49
Control Delay	128.3	21.9	19.1	2.1	76.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	128.3	21.9	19.1	2.1	76.2	9.3
Queue Length 50th (ft)	~137	542	344	0	149	0
Queue Length 95th (ft)	#274	#877	438	25	#297	59
Internal Link Dist (ft)		1276	1320		1206	
Turn Bay Length (ft)	150				50	
Base Capacity (vph)	195	2595	2005	871	284	427
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.08	0.95	0.79	0.18	0.93	0.49

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1583	3539	3539	1417	1583	1417
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1583	3539	3539	1417	1583	1417
Volume (vph)	200	2350	1500	150	250	200
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	211	2474	1579	158	263	211
RTOR Reduction (vph)	0	0	0	69	0	173
Lane Group Flow (vph)	211	2474	1579	89	263	38
Turn Type	Prot			Perm		Perm
Protected Phases	7	4	8		6	
Permitted Phases				8		6
Actuated Green, G (s)	11.0	65.2	50.2	50.2	16.0	16.0
Effective Green, g (s)	11.0	65.2	50.2	50.2	16.0	16.0
Actuated g/C Ratio	0.12	0.73	0.56	0.56	0.18	0.18
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	195	2587	1992	797	284	254
v/s Ratio Prot	0.13	c0.70	0.45		c0.17	
v/s Ratio Perm				0.06		0.03
v/c Ratio	1.08	0.96	0.79	0.11	0.93	0.15
Uniform Delay, d1	39.1	10.7	15.4	9.1	36.0	30.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	88.0	9.5	2.2	0.1	37.4	1.2
Delay (s)	127.1	20.2	17.6	9.2	73.4	32.1
Level of Service	F	C	B	A	E	C
Approach Delay (s)		28.6	16.9		55.0	
Approach LOS		C	B		E	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	2250	200	250	1550	150	100	200	350	150	200	80
Turn Type	Prot		pm+ov	Prot		Perm	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Detector Phases	7	4	5	3	8	8	5	2	3	1	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	8.0	20.0	20.0	20.0	20.0	8.0	20.0	20.0	20.0
Total Split (s)	17.0	47.0	20.0	12.0	42.0	42.0	20.0	21.0	12.0	20.0	21.0	21.0
Total Split (%)	17.0%	47.0%	20.0%	12.0%	42.0%	42.0%	20.0%	21.0%	12.0%	20.0%	21.0%	21.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	Max	None	None	None	Max	Max	None	Max	Max	Max
Act Effct Green (s)	12.4	43.0	63.0	8.0	38.6	38.6	16.0	17.0	29.0	16.0	17.0	17.0
Actuated g/C Ratio	0.12	0.43	0.63	0.08	0.39	0.39	0.16	0.17	0.29	0.16	0.17	0.17
v/c Ratio	0.80	1.08	0.22	1.07	0.83	0.25	0.42	0.67	0.78	0.32	0.67	0.27
Control Delay	71.9	74.7	3.1	121.9	32.5	6.1	43.5	50.2	37.5	39.3	50.2	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	74.7	3.1	121.9	32.5	6.1	43.5	50.2	37.5	39.3	50.2	10.6
LOS	E	E	A	F	C	A	D	D	D	D	D	B
Approach Delay		69.0			42.0			42.3			39.0	
Approach LOS		E			D			D			D	

Intersection Summary			
Cycle Length: 100			
Actuated Cycle Length: 100			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.08			
Intersection Signal Delay: 54.3		Intersection LOS: D	
Intersection Capacity Utilization 82.5%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 33: Pala Rd (SR-76) & Olive Hill Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Storage Length (ft)	250		0	250		200	0		150	150		0
Storage Lanes	1		1	2		1	1		1	2		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1583	5085	1417	3072	5085	1417	1583	1863	1417	3072	1863	1417
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1583	5085	1417	3072	5085	1417	1583	1863	1417	3072	1863	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			151			138			88			84
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		585			663			961			1186	
Travel Time (s)		13.3			15.1			21.8			27.0	
Volume (vph)	150	2250	200	250	1550	150	100	200	350	150	200	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	2368	211	263	1632	158	105	211	368	158	211	84
Lane Group Flow (vph)	158	2368	211	263	1632	158	105	211	368	158	211	84
v/c Ratio	0.80	1.08	0.22	1.07	0.83	0.25	0.42	0.67	0.78	0.32	0.67	0.27
Control Delay	71.9	74.7	3.1	121.9	32.5	6.1	43.5	50.2	37.5	39.3	50.2	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	74.7	3.1	121.9	32.5	6.1	43.5	50.2	37.5	39.3	50.2	10.6
Queue Length 50th (ft)	99	~623	14	~96	342	8	61	127	166	46	127	0
Queue Length 95th (ft)	#202	#718	41	#177	406	49	114	#208	#310	77	#208	41
Internal Link Dist (ft)		505			583			881			1106	
Turn Bay Length (ft)	250			250		200			150	150		
Base Capacity (vph)	205	2187	949	246	1962	631	253	317	473	492	317	311
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	1.08	0.22	1.07	0.83	0.25	0.42	0.67	0.78	0.32	0.67	0.27

Intersection Summary

Area Type: Other

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1583	5085	1417	3072	5085	1417	1583	1863	1417	3072	1863	1417
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1583	5085	1417	3072	5085	1417	1583	1863	1417	3072	1863	1417
Volume (vph)	150	2250	200	250	1550	150	100	200	350	150	200	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	2368	211	263	1632	158	105	211	368	158	211	84
RTOR Reduction (vph)	0	0	62	0	0	85	0	0	66	0	0	70
Lane Group Flow (vph)	158	2368	149	263	1632	73	105	211	302	158	211	14
Turn Type	Prot		pm+ov	Prot		Perm	Prot		pm+ov	Prot		Perm
Protected Phases	7	4	5	3	8		5	2	3	1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.4	43.0	59.0	8.0	38.6	38.6	16.0	17.0	25.0	16.0	17.0	17.0
Effective Green, g (s)	12.4	43.0	59.0	8.0	38.6	38.6	16.0	17.0	25.0	16.0	17.0	17.0
Actuated g/C Ratio	0.12	0.43	0.59	0.08	0.39	0.39	0.16	0.17	0.25	0.16	0.17	0.17
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	2187	893	246	1963	547	253	317	411	492	317	241
v/s Ratio Prot	c0.10	c0.47	0.03	c0.09	0.32		c0.07	0.11	c0.06	0.05	0.11	
v/s Ratio Perm			0.08			0.05			0.15			0.01
v/c Ratio	0.81	1.08	0.17	1.07	0.83	0.13	0.42	0.67	0.73	0.32	0.67	0.06
Uniform Delay, d1	42.6	28.5	9.3	46.0	27.8	19.9	37.8	38.8	34.5	37.2	38.8	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.9	46.0	0.1	76.9	3.2	0.1	5.0	10.6	6.7	1.7	10.6	0.5
Delay (s)	63.6	74.5	9.4	122.9	30.9	20.0	42.7	49.4	41.1	38.9	49.4	35.3
Level of Service	E	E	A	F	C	B	D	D	D	D	D	D
Approach Delay (s)		68.8			41.9			43.9			43.1	
Approach LOS		E			D			D			D	

Intersection Summary				
HCM Average Control Delay	54.6	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

PM Existing + Cumulative + Project
34: Pala Rd (SR-76) & S Mission Rd

With Mitigation
Timings

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	1000	1800	1400	240	300	550
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Detector Phases	7	4	8	8	6	7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	45.0	99.0	54.0	54.0	21.0	45.0
Total Split (%)	37.5%	82.5%	45.0%	45.0%	17.5%	37.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	Lag		Lead
Lead-Lag Optimize?	Yes		Yes	Yes		Yes
Recall Mode	None	None	None	None	Max	None
Act Effct Green (s)	41.0	95.0	50.0	50.0	17.0	62.0
Actuated g/C Ratio	0.34	0.79	0.42	0.42	0.14	0.52
v/c Ratio	1.00	0.47	1.00	0.35	0.73	0.45
Control Delay	68.2	4.6	58.6	6.0	59.9	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	4.6	58.6	6.0	59.9	19.7
LOS	E	A	E	A	E	B
Approach Delay		27.3	50.9		33.9	
Approach LOS		C	D		C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 35.7		Intersection LOS: D	
Intersection Capacity Utilization 90.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 34: Pala Rd (SR-76) & S Mission Rd

PM Existing + Cumulative + Project
34: Pala Rd (SR-76) & S Mission Rd

With Mitigation
Queues

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	500			300	500	0
Storage Lanes	2			1	2	2
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Right Turn on Red				Yes		No
Satd. Flow (RTOR)				218		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		565	451		1333	
Travel Time (s)		12.8	10.3		30.3	
Volume (vph)	1000	1800	1400	240	300	550
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1895	1474	253	316	579
Lane Group Flow (vph)	1053	1895	1474	253	316	579
v/c Ratio	1.00	0.47	1.00	0.35	0.73	0.45
Control Delay	68.2	4.6	58.6	6.0	59.9	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	4.6	58.6	6.0	59.9	19.7
Queue Length 50th (ft)	~421	146	591	16	122	154
Queue Length 95th (ft)	#570	167	#764	70	172	206
Internal Link Dist (ft)		485	371		1253	
Turn Bay Length (ft)	500			300	500	
Base Capacity (vph)	1050	4026	1475	718	435	1288
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.47	1.00	0.35	0.73	0.45

Intersection Summary	
Area Type:	Other
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.

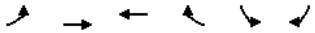
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	0.95	1.00	0.97	0.88
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3072	5085	3539	1417	3072	2493
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3072	5085	3539	1417	3072	2493
Volume (vph)	1000	1800	1400	240	300	550
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1053	1895	1474	253	316	579
RTOR Reduction (vph)	0	0	0	127	0	0
Lane Group Flow (vph)	1053	1895	1474	126	316	579
Turn Type	Prot			Perm		pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases				8		6
Actuated Green, G (s)	41.0	95.0	50.0	50.0	17.0	58.0
Effective Green, g (s)	41.0	95.0	50.0	50.0	17.0	58.0
Actuated g/C Ratio	0.34	0.79	0.42	0.42	0.14	0.48
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1050	4026	1475	590	435	1288
v/s Ratio Prot	c0.34	0.37	c0.42		c0.10	0.15
v/s Ratio Perm				0.09		0.08
v/c Ratio	1.00	0.47	1.00	0.21	0.73	0.45
Uniform Delay, d1	39.5	4.2	35.0	22.4	49.3	20.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.5	0.1	23.1	0.2	10.2	0.3
Delay (s)	68.0	4.2	58.1	22.6	59.4	20.7
Level of Service	E	A	E	C	E	C
Approach Delay (s)		27.0	52.9		34.4	
Approach LOS		C	D		C	

Intersection Summary			
HCM Average Control Delay	36.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	SBL
Lane Configurations				
Volume (vph)	50	500	540	50
Turn Type	Prot			
Protected Phases	7	4	8	6
Permitted Phases				
Detector Phases	7	4	8	6
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0
Total Split (s)	15.0	66.0	51.0	24.0
Total Split (%)	16.7%	73.3%	56.7%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lead		Lag	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	None	None	Min
Act Effct Green (s)	7.5	23.1	19.7	8.5
Actuated g/C Ratio	0.16	0.56	0.47	0.20
v/c Ratio	0.21	0.51	0.71	0.30
Control Delay	25.0	6.3	14.5	15.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.0	6.3	14.5	15.7
LOS	C	A	B	B
Approach Delay		8.0	14.5	15.7
Approach LOS		A	B	B

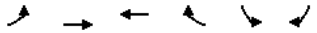
Intersection Summary		
Cycle Length: 90		
Actuated Cycle Length: 41.6		
Natural Cycle: 60		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.71		
Intersection Signal Delay: 11.7		Intersection LOS: B
Intersection Capacity Utilization 51.3%		ICU Level of Service A
Analysis Period (min) 15		

Splits and Phases: 35: Reche Rd & Live Oak Park Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Storage Length (ft)	75			0	0	0
Storage Lanes	1			0	1	0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	
Trailing Detector (ft)	0	0	0		0	
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.988		0.932	
Flt Protected	0.950				0.976	
Satd. Flow (prot)	1583	1863	1840	0	1516	0
Flt Permitted	0.950				0.976	
Satd. Flow (perm)	1583	1863	1840	0	1516	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			8		51	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		4892	6958		2036	
Travel Time (s)		111.2	158.1		46.3	
Volume (vph)	50	500	540	50	50	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	526	568	53	53	53
Lane Group Flow (vph)	53	526	621	0	106	0
v/c Ratio	0.21	0.51	0.71		0.30	
Control Delay	25.0	6.3	14.5		15.7	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	25.0	6.3	14.5		15.7	
Queue Length 50th (ft)	7	44	54		7	
Queue Length 95th (ft)	53	116	296		65	
Internal Link Dist (ft)		4812	6878		1956	
Turn Bay Length (ft)	75					
Base Capacity (vph)	365	1486	1292		654	
Starvation Cap Reductn	0	0	0		0	
Spillback Cap Reductn	0	0	0		0	
Storage Cap Reductn	0	0	0		0	
Reduced v/c Ratio	0.15	0.35	0.48		0.16	

Intersection Summary	
Area Type:	Other



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1700	1900	1900	1700	1700	1700
Total Lost time (s)	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.99		0.93	
Flt Protected	0.95	1.00	1.00		0.98	
Satd. Flow (prot)	1583	1863	1841		1516	
Flt Permitted	0.95	1.00	1.00		0.98	
Satd. Flow (perm)	1583	1863	1841		1516	
Volume (vph)	50	500	540	50	50	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	526	568	53	53	53
RTOR Reduction (vph)	0	0	4	0	41	0
Lane Group Flow (vph)	53	526	617	0	65	0
Turn Type	Prot					
Protected Phases	7	4	8		6	
Permitted Phases						
Actuated Green, G (s)	2.4	26.1	19.7		8.5	
Effective Green, g (s)	2.4	26.1	19.7		8.5	
Actuated g/C Ratio	0.06	0.61	0.46		0.20	
Clearance Time (s)	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	89	1141	851		302	
v/s Ratio Prot	0.03	c0.28	c0.33		c0.04	
v/s Ratio Perm						
v/c Ratio	0.60	0.46	0.72		0.22	
Uniform Delay, d1	19.6	4.5	9.3		14.3	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	10.3	0.3	3.1		0.4	
Delay (s)	29.9	4.7	12.3		14.6	
Level of Service	C	A	B		B	
Approach Delay (s)		7.1	12.3		14.6	
Approach LOS		A	B		B	

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	42.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix AA

San Diego County TIF Email

Campus Park TIF Determination

From: **Campbell, Dennis** (Dennis.Campbell@sdcounty.ca.gov)
Sent: Wed 4/22/09 9:14 AM
To: David Davis (winwood-davis@msn.com)
Cc: Justin Rasas (justin@losengineering.com); Areigat, Nael (Nael.Areigat@sdcounty.ca.gov); Ortiz, Francisco "Nick" (Francisco.Ortiz@sdcounty.ca.gov); Chris Brown (alchemycb@cox.net)
Attachments:
image001.jpg (26.9 KB), image002.jpg (23.6 KB)

Hello Dave,

Please find below the County staff's determination on the TIF and handling of potential impacts to TIF facilities in Fallbrook. If you have any questions, please contact me. Thank you, Dennis

Based on information contained in the Fallbrook TIF report (attached), it is determined that cumulative impacts occurring to roadway segments and intersections located within the Fallbrook community can be fully mitigated by payment into the County's TIF program.

The traffic analysis contained in the TIF report adequately demonstrates that with the construction of all TIF roadway and intersection improvement projects that all County Circulation Element roads will operate at an acceptable LOS (LOS D or better) within the Fallbrook community. The Existing plus CIP network map (Fig.3-1) shows that without the TIF improvement projects, several roadway segments are projected to operate at LOS E/F, in the future Year 2030 conditions. However, the TIF Network map (Fig.3-2) shows that with the addition of all TIF projects all Fallbrook roadway segments are projected to operate at LOS D or better, in the future Year 2030 conditions. The conclusion is that the Fallbrook TIF program mitigates cumulative traffic impacts due to new development within the Fallbrook community.

WITHOUT TIF IMPROVEMENTS (FIG.3-1)



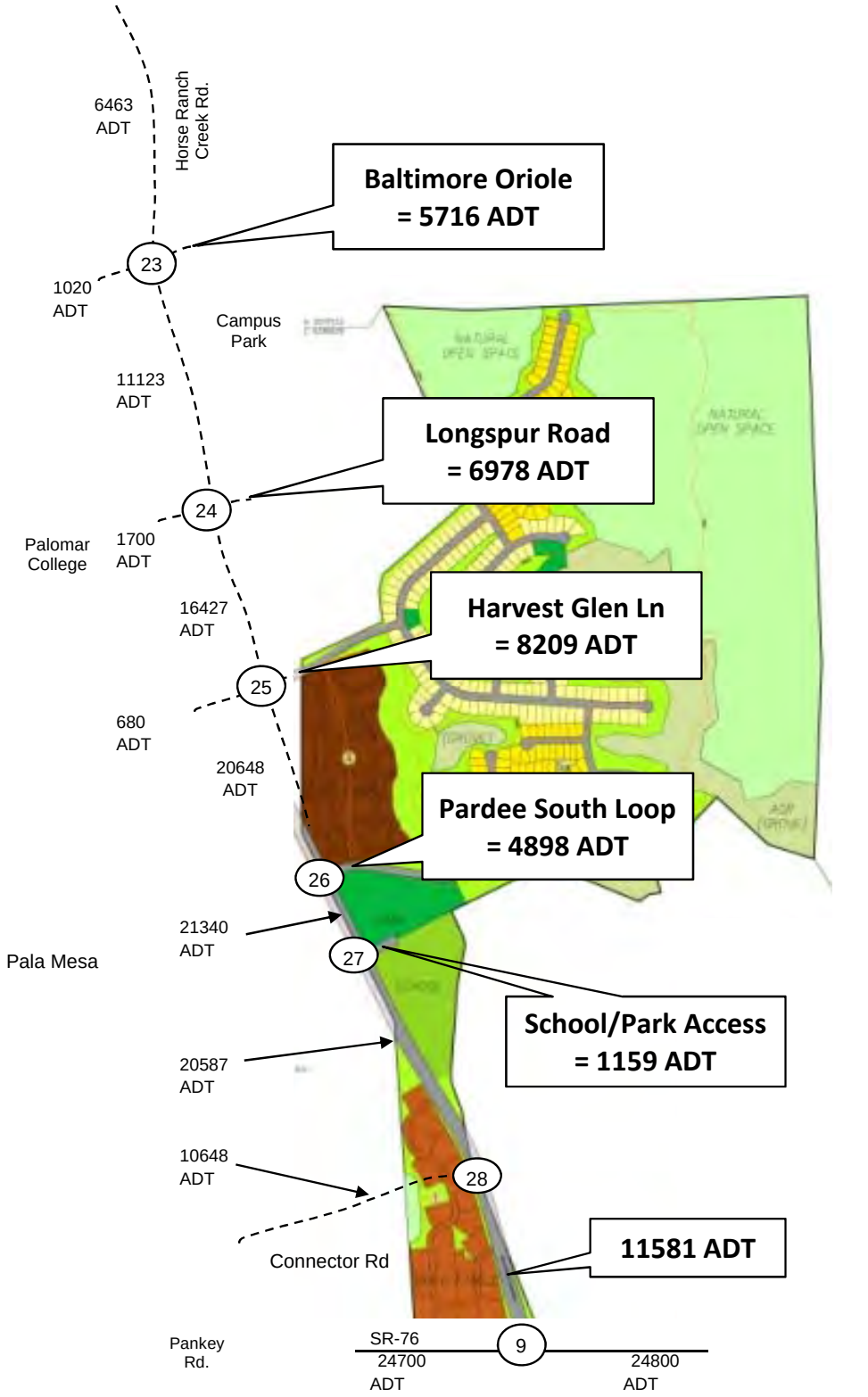
WITH TIF IMPROVEMENTS (FIG.3-2)



Appendix BB

On-Site MUTCD Signal Warrant Calculations

Build-Out Volumes for MUTCD Warrant Calculations
LOS Engineering (2/19/08)



LEGEND

XX	AM peak hour volumes at intersections	———	Existing Roadways
(YY)	PM peak hour volumes at intersections	- - - -	Future Roadways
Z,ZZZ	ADT volumes shown along segments		
(#)	Intersection Reference Number to LOS Tables		

N

No Scale

INT. (9)

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

COUNT DATE BUILD-OUT
CALC JR DATE 2/19/08
CHK _____ DATE _____

DIST	CO	RTE	PM
		76	

Major St: SR-76 (PALA RD)
Minor St: HOUSE RANCH CREEK RD

Critical Approach Speed 85%ile EB 65MPH WB58 mph
Critical Approach Speed — mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☑ or
In built up area of isolated community of < 10,000 population..... ☐ } RURAL (R)
☐ URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓	Minimum Requirements EADT			
CONDITION A - Minimum Vehicular Volume Satisfied ✓ Not Satisfied _____	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach Major Street 24750 Minor Street 5791	Urban	Rural	Urban	Rural
1..... 1.....	8,000	5,600	2,400	1,680
2 or More..... 1.....	9,600	6,720	2,400	1,680
(2) or More..... (2) or More.....	9,600	6,720 ✓	3,200	2,240 ✓
1..... 2 or More.....	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic Satisfied ✓ Not Satisfied _____	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach Major Street 24750 Minor Street 5791	Urban	Rural	Urban	Rural
1..... 1.....	12,000	8,400	1,200	850
2 or More..... 1.....	14,400	10,080	1,200	850
(2) or More..... (2) or More.....	14,400	10,080 ✓	1,600	1,120 ✓
1..... 2 or More.....	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B Satisfied ✓ Not Satisfied _____ No one condition satisfied, but following conditions fulfilled 80% or more..... _____ A _____ B	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE BUILD-OUT

____ ____ ____ ____
DIST CO RTE PM

CALC JD DATE 2/19/08

CHK _____ DATE _____

Major St: HORSE RANCH CREEK ROAD
Minor St: BALTIMORE ORIOLE

Critical Approach Speed — mph
Critical Approach Speed — mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐
or
In built up area of isolated community of < 10,000 population..... ☑ **RURAL (R)**

☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓

CONDITION A - Minimum Vehicular Volume

Satisfied ✓ Not Satisfied _____

Number of lanes for moving traffic on each approach

Major Street 6793	Minor Street 2858
1	1
2 or More	1
(2) or More	(2) or More
1	2 or More

Minimum Requirements EADT			
Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
8,000	5,600	2,400	1,680
9,600	6,720	2,400	1,680
9,600	6,720 ✓	3,200	2,240 ✓
8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied _____ Not Satisfied ✓

Number of lanes for moving traffic on each approach

Major Street 6793	Minor Street 2858
1	1
2 or More	1
(2) or More	(2) or More
1	2 or More

Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural 80%	Urban	Rural
12,000	8,400	1,200	850
14,400	10,080	1,200	850
14,400	×10,080 BOTH ✓	1,600	1,120 ✓
12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B AT 80%

Satisfied ✓ Not Satisfied _____

No one condition satisfied, but following conditions fulfilled 80% or more..... ____ (A) ____ (B)

2 CONDITIONS 80%	2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

INT. (24)

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

COUNT DATE BUILD-OUT
CALC JR DATE 2/19/08
CHK _____ DATE _____

DIST ____ CO ____ RTE ____ PM ____

Major St: HORSE RANCH CREEK RD
Minor St: LONGSPUR RD

Critical Approach Speed — mph
Critical Approach Speed — mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐ or
In built up area of isolated community of < 10,000 population..... ☑ } **RURAL (R)**
☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL ✓	Minimum Requirements EADT			
CONDITION A - Minimum Vehicular Volume Satisfied ✓ Not Satisfied ____	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach Major Street 13775 Minor Street 3489	Urban	Rural	Urban	Rural
1..... 1.....	8,000	5,600	2,400	1,680
2 or More..... 1.....	9,600	6,720	2,400	1,680
(2) or More..... (2) or More.....	9,600	6,720 ✓	3,200	2,240 ✓
1..... 2 or More.....	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic Satisfied ✓ Not Satisfied ____	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Number of lanes for moving traffic on each approach Major Street 13775 Minor Street 3489	Urban	Rural	Urban	Rural
1..... 1.....	12,000	8,400	1,200	850
2 or More..... 1.....	14,400	10,080	1,200	850
(2) or More..... (2) or More.....	14,400	10,080 ✓	1,600	1,120 ✓
1..... 2 or More.....	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B Satisfied ✓ Not Satisfied ____ No one condition satisfied, but following conditions fulfilled 80% or more..... ____ A ____ B	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE BUILD-OUT

DIST ____ CO ____ RTE ____ PM ____

CALC JR DATE 2/19/08

CHK ____ DATE ____

Major St: HORSE RANCH CREEK RD

Minor St: HARVEST GLEN LN

Critical Approach Speed — mph

Critical Approach Speed — mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐

In built up area of isolated community of < 10,000 population..... ☑ } **RURAL (R)**

☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓

CONDITION A - Minimum Vehicular Volume

Satisfied ✓ Not Satisfied ____

Number of lanes for moving traffic on each approach

Major Street 18538 Minor Street 4105

Major Street	Minor Street	Minimum Requirements EADT: Vehicles Per Day on Major Street (Total of Both Approaches) Urban	Rural	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) Urban	Rural
1	1	8,000	5,600	2,400	1,680
2 or More	1	9,600	6,720	2,400	1,680
(2) or More	(2) or More	9,600	6,720 ✓	3,200	2,240 ✓
1	2 or More	8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied ✓ Not Satisfied ____

Number of lanes for moving traffic on each approach

Major Street 18538 Minor Street 4105

Major Street	Minor Street	Vehicles Per Day on Major Street (Total of Both Approaches) Urban	Rural	Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) Urban	Rural
1	1	12,000	8,400	1,200	850
2 or More	1	14,400	10,080	1,200	850
(2) or More	(2) or More	14,400	10,080 ✓	1,600	1,120 ✓
1	2 or More	12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied ✓ Not Satisfied ____

No one condition satisfied, but following conditions fulfilled 80% or more..... ____ A ____ B

2 CONDITIONS 80%

2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

COUNT DATE BUILD-OUT

CALC JR DATE 2/19/08

CHK _____ DATE _____

DIST _____ CO _____ RTE _____ PM _____

Major St: HORSE RANCH CREEK RD

Minor St: PARDEE SOUTH LOOP

Critical Approach Speed — mph

Critical Approach Speed — mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐ or ☑ **RURAL (R)**

In built up area of isolated community of < 10,000 population..... ☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓

CONDITION A - Minimum Vehicular Volume

Satisfied ✓ Not Satisfied _____

Number of lanes for moving traffic on each approach

Major Street 20994 Minor Street 2449

1 / 1
2 or More / 1
(2) or More / (2) or More
1 / 2 or More

Minimum Requirements EADT			
Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
8,000	5,600	2,400	1,680
9,600	6,720	2,400	1,680
9,600	6,720 ✓	3,200	2,240 ✓
8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied ✓ Not Satisfied _____

Number of lanes for moving traffic on each approach

Major Street 20994 Minor Street 2449

1 / 1
2 or More / 1
(2) or More / (2) or More
1 / 2 or More

Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
12,000	8,400	1,200	850
14,400	10,080	1,200	850
14,400	10,080 ✓	1,600	1,120 ✓
12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied ✓ Not Satisfied _____

No one condition satisfied, but following conditions fulfilled 80% or more..... A _____ B _____

2 CONDITIONS 80%

2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE BUILD-OUT

CALC JR DATE 2/19/08

CHK _____ DATE _____

DIST CO RTE PM

Major St: HORSE RANCH CREEK RD

Minor St: SCHOOL & PARK ACCESS

Critical Approach Speed _____ mph

Critical Approach Speed _____ mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐

In built up area of isolated community of < 10,000 population..... ☑ } **RURAL (R)**

☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL.....	Minimum Requirements EADT			
CONDITION A - Minimum Vehicular Volume	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied _____ Not Satisfied ✓				
Number of lanes for moving traffic on each approach	Urban	Rural	Urban	Rural
Major Street 20,994 Minor Street 580				
1..... 1.....	8,000	5,600	2,400	1,680
(2) or More..... 1.....	9,600	6,720	2,400	1,680
2 or More..... 2 or More.....	9,600	6,720	3,200	2,240
1..... 2 or More.....	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic	Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied _____ Not Satisfied ✓				
Number of lanes for moving traffic on each approach	Urban	Rural	Urban	Rural
Major Street 20,994 Minor Street 580				
1..... 1.....	12,000	8,400	1,200	850
(2) or More..... (1).....	14,400	10,080	1,200	850
2 or More..... 2 or More.....	14,400	10,080	1,600	1,120
1..... 2 or More.....	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B	2 CONDITIONS 80%		2 CONDITIONS 80%	
Satisfied _____ Not Satisfied ✓				
No one condition satisfied, but following conditions fulfilled 80% or more..... A _____ B _____				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

COUNT DATE BUILD-OUT

DIST ____ CO ____ RTE ____ PM ____

CALC JR DATE 2/19/08

CHK ____ DATE ____

Major St: HORSE RANCH CREEK RD

Minor St: CONNECTOR RD

Critical Approach Speed — mph

Critical Approach Speed — mph

Speed limit or critical speed on major street traffic > 64 km/h (40 mph)..... ☐

In built up area of isolated community of < 10,000 population..... ☑ **RURAL (R)**

☐ **URBAN (U)**

(Based on Estimated Average Daily Traffic - See Note)

URBAN..... RURAL..... ✓

CONDITION A - Minimum Vehicular Volume

Satisfied ✓ Not Satisfied ____

Number of lanes for moving traffic on each approach

Major Street 16 084 Minor Street 5324

1..... 1.....
2 or More..... 1.....
(2) or More..... (2) or More.....
1..... 2 or More.....

Minimum Requirements EADT

Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
8,000	5,600	2,400	1,680
9,600	6,720	2,400	1,680
9,600	6,720 ✓	3,200	2,240 ✓
8,000	5,600	3,200	2,240

CONDITION B - Interruption of Continuous Traffic

Satisfied ✓ Not Satisfied ____

Number of lanes for moving traffic on each approach

Major Street 16084 Minor Street 5324

1..... 1.....
2 or More..... 1.....
(2) or More..... 2 or More.....
1..... 2 or More.....

Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Urban	Rural	Urban	Rural
12,000	8,400	1,200	850
14,400	10,080	1,200	850
14,400	10,080 ✓	1,600	1,120 ✓
12,000	8,400	1,600	1,120

Combination of CONDITIONS A + B

Satisfied ✓ Not Satisfied ____

No one condition satisfied, but following conditions fulfilled 80% or more..... ____ A ____ B

2 CONDITIONS 80%	2 CONDITIONS 80%

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Appendix CC

Off-Site Improvement Plans and Phasing LOS Calculations

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	205	186	214	96	92	152
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	216	196	225	101	97	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	728	177	257			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	728	177	257			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	33	77	83			
cM capacity (veh/h)	323	866	1308			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	412	225	101	257
Volume Left	216	225	0	0
Volume Right	196	0	0	160
cSH	460	1308	1700	1700
Volume to Capacity	0.89	0.17	0.06	0.15
Queue Length 95th (ft)	244	16	0	0
Control Delay (s)	49.9	8.3	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	49.9	5.7		0.0
Approach LOS	E			

Intersection Summary			
Average Delay	22.5		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

LOS Engineering

Campus Park

State Route 76 Study Limits	Lanes in each dir	AM (Eastbound) Vol	Dir	Cap	v/c	LOS	Project Vol	E+P	v/c	LOS	Change In v/c	Sig
S Mission Rd to Via Monserate	1	745	EB	950	0.78	D	47	792	0.83	D	0.05	No
Via Monserate to Gird Rd	1	808	EB	950	0.85	D	14	822	0.87	**E**	0.01	**No**
Gird Rd to Sage Rd	1	740	EB	950	0.78	D	49	789	0.83	D	0.05	No
Sage Rd to Old Hwy 395	1	760	EB	950	0.80	D	49	809	0.85	D	0.05	No
Old Hwy 395 to I-15 SB Ramps	2	1507	EB	2050	0.74	D	24	1531	0.75	D	0.01	No
I-15 SB Ramps to I-15 NB Ramps	1	844	EB	950	0.89	**E**	14	858	0.90	**E**	0.01	**No**
I-15 NB Ramps to Pankey Rd	2	559	EB	3100	0.18	A	201	760	0.25	A	0.06	No
Pankey Rd to Horse Ranch Creek Rd	2	589	EB	1806	0.33	B	220	809	0.45	B	0.12	No
Horse Ranch Creek Rd to Rice Cyn	1	588	EB	950	0.62	C	40	628	0.66	C	0.04	No
Rice Cyn to Couser Cyn	1	589	EB	950	0.62	C	38	627	0.66	C	0.04	No

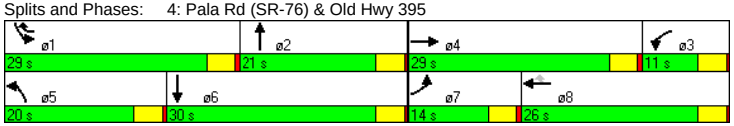
											EB IN	WB OUT
Dus												
170	MF DU	**2,030**	8%	0.3	0.7	**0**	**0**	10%	0.7	0.3	**14**	10%

The following pages show the LOS with project improvements for existing + project conditions and for existing + project + cumulative conditions.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	75	557	51	562	76	96	84	255	91
Turn Type	Prot		Prot		pm+ov	Prot		Prot	
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	1	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	14.0	29.0	11.0	26.0	29.0	20.0	21.0	29.0	30.0
Total Split (%)	15.6%	32.2%	12.2%	28.9%	32.2%	22.2%	23.3%	32.2%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	8.2	17.1	7.0	16.1	36.3	10.0	10.3	15.5	15.8
Actuated g/C Ratio	0.12	0.27	0.11	0.26	0.58	0.16	0.17	0.25	0.25
v/c Ratio	0.40	0.69	0.32	0.65	0.09	0.40	0.49	0.68	0.37
Control Delay	39.2	26.2	40.1	27.2	2.5	34.7	28.6	34.0	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	26.2	40.1	27.2	2.5	34.7	28.6	34.0	19.4
LOS	D	C	D	C	A	C	C	C	B
Approach Delay		27.5		25.5			31.0		28.2
Approach LOS		C		C			C		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 62.4			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 27.4		Intersection LOS: C	
Intersection Capacity Utilization 58.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



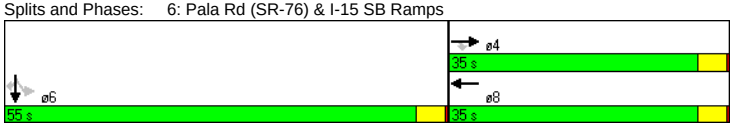
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.93		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3475		1583	3539	1417	1583	1741		1583	1737	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3475		1583	3539	1417	1583	1741		1583	1737	
Volume (vph)	75	557	77	51	562	76	96	84	65	255	91	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	79	586	81	54	592	80	101	88	68	268	96	79
RTOR Reduction (vph)	0	12	0	0	0	39	0	32	0	0	34	0
Lane Group Flow (vph)	79	655	0	54	592	41	101	124	0	268	141	0
Turn Type	Prot			Prot		pm+ov	Prot			Prot		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	4.5	17.1		3.5	16.1	31.6	10.0	10.3		15.5	15.8	
Effective Green, g (s)	4.5	17.1		3.5	16.1	31.6	10.0	10.3		15.5	15.8	
Actuated g/C Ratio	0.07	0.27		0.06	0.26	0.51	0.16	0.17		0.25	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	114	952		89	913	808	254	287		393	440	
v/s Ratio Prot	0.05	c0.19		0.03	c0.17	0.01	0.06	c0.07		c0.17	0.08	
v/s Ratio Perm						0.02						
v/c Ratio	0.69	0.69		0.61	0.65	0.05	0.40	0.43		0.68	0.32	
Uniform Delay, d1	28.3	20.3		28.8	20.6	7.8	23.5	23.4		21.2	18.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.7	2.1		11.2	1.6	0.0	1.0	1.0		4.8	0.4	
Delay (s)	44.9	22.3		39.9	22.2	7.8	24.5	24.5		26.0	19.4	
Level of Service	D	C		D	C	A	C	C		C	B	
Approach Delay (s)		24.7			22.0			24.5			23.4	
Approach LOS		C			C			C			C	

Intersection Summary					
HCM Average Control Delay	23.5	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.61				
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	EBR	WBT	WBR	SBT	SBR
Lane Configurations						
Volume (vph)	502	297	260	193	1	551
Turn Type		Perm		Free		Perm
Protected Phases	4		8		6	
Permitted Phases		4		Free		6
Detector Phases	4	4	8		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	35.0	35.0	35.0	0.0	55.0	55.0
Total Split (%)	38.9%	38.9%	38.9%	0.0%	61.1%	61.1%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		C-Min	C-Min
Act Effct Green (s)	19.0	19.0	19.0	90.0	63.0	63.0
Actuated g/C Ratio	0.21	0.21	0.21	1.00	0.70	0.70
v/c Ratio	0.71	0.57	0.37	0.14	0.09	0.52
Control Delay	37.9	7.8	23.6	0.5	5.4	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.9	7.8	23.6	0.5	5.4	4.1
LOS	D	A	C	A	A	A
Approach Delay	26.7		13.8		4.3	
Approach LOS	C		B		A	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2: and 6:SBTL, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 15.9		Intersection LOS: B	
Intersection Capacity Utilization 52.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



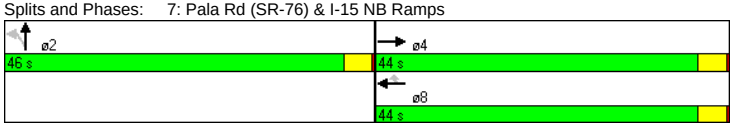
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0					4.0	4.0
Lane Util. Factor		0.95	1.00		0.95	1.00					1.00	1.00
Frt		1.00	0.85		1.00	0.85					1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00					0.95	1.00
Satd. Flow (prot)		3539	1417		3539	1417					1775	1417
Flt Permitted		1.00	1.00		1.00	1.00					0.95	1.00
Satd. Flow (perm)		3539	1417		3539	1417					1775	1417
Volume (vph)	0	502	297	0	260	193	0	0	0	107	1	551
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	528	313	0	274	203	0	0	0	113	1	580
RTOR Reduction (vph)	0	0	247	0	0	0	0	0	0	0	0	117
Lane Group Flow (vph)	0	528	66	0	274	203	0	0	0	0	114	463
Turn Type			Perm			Free				Perm		Perm
Protected Phases		4			8						6	
Permitted Phases			4			Free				6		6
Actuated Green, G (s)		19.0	19.0		19.0	90.0					63.0	63.0
Effective Green, g (s)		19.0	19.0		19.0	90.0					63.0	63.0
Actuated g/C Ratio		0.21	0.21		0.21	1.00					0.70	0.70
Clearance Time (s)		4.0	4.0		4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		747	299		747	1417					1243	992
v/s Ratio Prot		c0.15			0.08							
v/s Ratio Perm			0.05			0.14					0.06	c0.33
v/c Ratio		0.71	0.22		0.37	0.14					0.09	0.47
Uniform Delay, d1		32.9	29.4		30.4	0.0					4.3	6.0
Progression Factor		1.00	1.00		0.76	1.00					1.00	1.00
Incremental Delay, d2		3.1	0.4		0.3	0.2					0.1	1.6
Delay (s)		36.0	29.8		23.3	0.2					4.5	7.6
Level of Service		D	C		C	A					A	A
Approach Delay (s)		33.7			13.5			0.0			7.1	
Approach LOS		C			B			A			A	

Intersection Summary					
HCM Average Control Delay	19.7	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.52				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	52.0%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT
Lane Configurations						
Volume (vph)	277	405	324	112	134	0
Turn Type		Free		Perm	Perm	
Protected Phases	4		8			2
Permitted Phases		Free		8	2	
Detector Phases	4		8	8	2	2
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	20.0		20.0	20.0	20.0	20.0
Total Split (s)	44.0	0.0	44.0	44.0	46.0	46.0
Total Split (%)	48.9%	0.0%	48.9%	48.9%	51.1%	51.1%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5		0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	C-Min	C-Min
Act Effct Green (s)	12.8	90.0	12.8	12.8	69.2	69.2
Actuated g/C Ratio	0.14	1.00	0.14	0.14	0.77	0.77
v/c Ratio	0.58	0.30	0.68	0.39	0.12	0.19
Control Delay	21.8	3.2	43.4	10.5	3.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	3.2	43.4	10.5	3.3	0.3
LOS	C	A	D	B	A	A
Approach Delay	10.8		34.9			1.4
Approach LOS	B		C			A

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 26.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



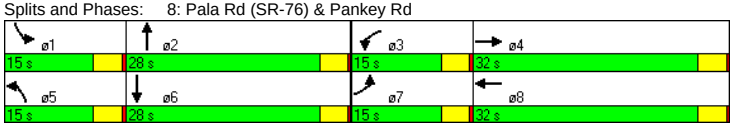
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0				
Lane Util. Factor		0.95	1.00		0.95	1.00	0.95	0.95				
Frt		1.00	0.85		1.00	0.85	1.00	0.85				
Flt Protected		1.00	1.00		1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539	1417		3539	1417	1504	1504				
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539	1417		3539	1417	1504	1504				
Volume (vph)	0	277	405	0	324	112	134	0	234	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	292	426	0	341	118	141	0	246	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	101	0	57	0	0	0	0
Lane Group Flow (vph)	0	292	426	0	341	17	141	189	0	0	0	0
Turn Type			Free			Perm	Perm					
Protected Phases		4			8			2				
Permitted Phases			Free			8	2					
Actuated Green, G (s)		12.8	90.0		12.8	12.8	69.2	69.2				
Effective Green, g (s)		12.8	90.0		12.8	12.8	69.2	69.2				
Actuated g/C Ratio		0.14	1.00		0.14	0.14	0.77	0.77				
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)		503	1417		503	202	1156	1156				
v/s Ratio Prot		0.08			c0.10							
v/s Ratio Perm			c0.30			0.01	0.09	0.13				
v/c Ratio		0.58	0.30		0.68	0.08	0.12	0.16				
Uniform Delay, d1		36.1	0.0		36.6	33.5	2.7	2.7				
Progression Factor		0.50	1.00		1.00	1.00	1.00	1.00				
Incremental Delay, d2		1.5	0.5		3.6	0.2	0.2	0.3				
Delay (s)		19.4	0.5		40.3	33.7	2.9	3.1				
Level of Service		B	A		D	C	A	A				
Approach Delay (s)		8.2			38.6			3.0			0.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	ø1
Lane Configurations								
Volume (vph)	9	514	14	489	14	2	6	
Turn Type	Prot		Prot		Prot			
Protected Phases	7	4	3	8	5	2	6	1
Permitted Phases								
Detector Phases	7	4	3	8	5	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	20.0	8.0
Total Split (s)	15.0	32.0	15.0	32.0	15.0	28.0	28.0	15.0
Total Split (%)	16.7%	35.6%	16.7%	35.6%	16.7%	31.1%	31.1%	17%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None
Act Effct Green (s)	6.1	10.5	6.2	10.6	6.2	7.8	6.7	
Actuated g/C Ratio	0.17	0.36	0.17	0.37	0.17	0.27	0.23	
v/c Ratio	0.03	0.43	0.06	0.40	0.06	0.08	0.08	
Control Delay	17.7	9.3	17.5	9.0	17.5	5.5	9.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	17.7	9.3	17.5	9.0	17.5	5.5	9.6	
LOS	B	A	B	A	B	A	A	
Approach Delay		9.4		9.3		9.1	9.6	
Approach LOS		A		A		A	A	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 28.8			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 9.3		Intersection LOS: A	
Intersection Capacity Utilization 28.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd



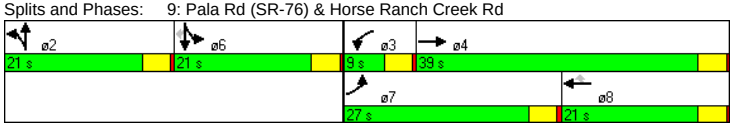
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.86			0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1583	3531		1583	3536		1583	1599			1639	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)	1583	3531		1583	3536		1583	1599			1639	
Volume (vph)	9	514	9	14	489	3	14	2	32	0	6	23
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	9	541	9	15	515	3	15	2	34	0	6	24
RTOR Reduction (vph)	0	1	0	0	1	0	0	23	0	0	19	0
Lane Group Flow (vph)	9	549	0	15	517	0	15	13	0	0	11	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.7	10.6		0.7	10.6		0.7	11.4			6.7	
Effective Green, g (s)	0.7	10.6		0.7	10.6		0.7	11.4			6.7	
Actuated g/C Ratio	0.02	0.31		0.02	0.31		0.02	0.33			0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	32	1079		32	1080		32	525			316	
v/s Ratio Prot	0.01	c0.16		c0.01	0.15		c0.01	c0.01			0.01	
v/s Ratio Perm												
v/c Ratio	0.28	0.51		0.47	0.48		0.47	0.03			0.03	
Uniform Delay, d1	16.8	9.9		16.8	9.8		16.8	7.9			11.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	4.8	0.4		10.5	0.3		10.5	0.0			0.0	
Delay (s)	21.5	10.3		27.3	10.1		27.3	7.9			11.4	
Level of Service	C	B		C	B		C	A			B	
Approach Delay (s)		10.5			10.6			13.6			11.4	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	10.7	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.28				
Actuated Cycle Length (s)	34.7	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	220	326	287	45	40	0	219		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	27.0	39.0	21.0	21.0	21.0	21.0	21.0	21.0	9.0
Total Split (%)	30.0%	43.3%	23.3%	23.3%	23.3%	23.3%	23.3%	23%	10%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	12.4	23.1	9.8	9.8	7.3	7.3	7.3		
Actuated g/C Ratio	0.24	0.47	0.20	0.20	0.15	0.15	0.15		
v/c Ratio	0.61	0.21	0.43	0.15	0.16	0.38	0.40		
Control Delay	25.1	7.1	21.5	8.8	24.1	10.7	10.2		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	25.1	7.1	21.5	8.8	24.1	10.7	10.2		
LOS	C	A	C	A	C	B	B		
Approach Delay		14.4	19.8			12.2			
Approach LOS		B	B			B			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 49.3			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 34.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



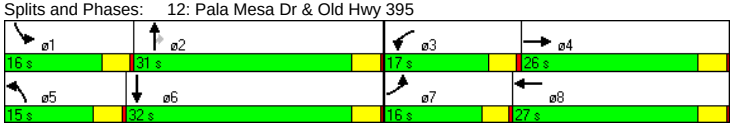
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.86	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1583	3539			3539	1417				1504	1452	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1583	3539			3539	1417				1504	1452	1346
Volume (vph)	220	326	0	0	287	45	0	0	0	40	0	219
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	343	0	0	302	47	0	0	0	42	0	231
RTOR Reduction (vph)	0	0	0	0	0	38	0	0	0	0	94	103
Lane Group Flow (vph)	232	343	0	0	302	9	0	0	0	35	23	18
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	10.4	24.2			9.8	9.8				7.3	7.3	7.3
Effective Green, g (s)	10.4	24.2			9.8	9.8				7.3	7.3	7.3
Actuated g/C Ratio	0.21	0.49			0.20	0.20				0.15	0.15	0.15
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	333	1734			702	281				222	215	199
v/s Ratio Prot	c0.15	0.10			c0.09					c0.02	0.02	
v/s Ratio Perm						0.01						0.01
v/c Ratio	0.70	0.20			0.43	0.03				0.16	0.11	0.09
Uniform Delay, d1	18.0	7.1			17.4	16.0				18.4	18.2	18.2
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	6.2	0.1			0.4	0.0				0.3	0.2	0.2
Delay (s)	24.3	7.2			17.8	16.0				18.7	18.5	18.4
Level of Service	C	A			B	B				B	B	B
Approach Delay (s)		14.1			17.5			0.0			18.5	
Approach LOS		B			B			A			B	

Intersection Summary					
HCM Average Control Delay	16.1	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.46				
Actuated Cycle Length (s)	49.4	Sum of lost time (s)	21.9		
Intersection Capacity Utilization	34.9%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	25	34	55	21	21	149	46	36	244
Turn Type	Prot		Prot		Prot		Perm	Prot	
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phases	7	4	3	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	16.0	26.0	17.0	27.0	15.0	31.0	31.0	16.0	32.0
Total Split (%)	17.8%	28.9%	18.9%	30.0%	16.7%	34.4%	34.4%	17.8%	35.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	8.2	8.7	9.2	12.2	8.1	40.8	40.8	8.6	43.6
Actuated g/C Ratio	0.12	0.14	0.14	0.19	0.12	0.70	0.70	0.13	0.75
v/c Ratio	0.13	0.28	0.25	0.12	0.11	0.13	0.05	0.18	0.19
Control Delay	22.7	13.9	19.9	11.6	22.9	11.3	6.5	20.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	13.9	19.9	11.6	22.9	11.3	6.5	20.4	8.8
LOS	C	B	B	B	C	B	A	C	A
Approach Delay		16.2		16.5		11.4			10.2
Approach LOS		B		B		B			B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 58.1			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.28			
Intersection Signal Delay: 12.3		Intersection LOS: B	
Intersection Capacity Utilization 36.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395



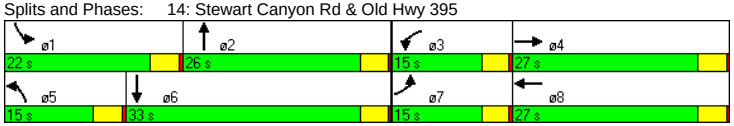
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	0.95	1.00	1.00	
Frt	1.00	0.92		1.00	0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1717		1583	1733		1583	1770	1346	1583	1854	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1717		1583	1733		1583	1770	1346	1583	1854	
Volume (vph)	25	34	37	55	21	18	21	149	46	36	244	8
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	36	39	58	22	19	22	157	48	38	257	8
RTOR Reduction (vph)	0	36	0	0	17	0	0	0	20	0	1	0
Lane Group Flow (vph)	26	39	0	58	24	0	22	157	28	38	264	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	1.5	4.4		3.8	6.7		1.5	37.1	37.1	3.4	39.0	
Effective Green, g (s)	1.5	4.4		3.8	6.7		1.5	37.1	37.1	3.4	39.0	
Actuated g/C Ratio	0.02	0.07		0.06	0.10		0.02	0.57	0.57	0.05	0.60	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	37	117		93	179		37	1015	772	83	1118	
v/s Ratio Prot	0.02	c0.02		c0.04	0.01		0.01	0.09		c0.02	c0.14	
v/s Ratio Perm									0.02			
v/c Ratio	0.70	0.33		0.62	0.13		0.59	0.15	0.04	0.46	0.24	
Uniform Delay, d1	31.4	28.7		29.8	26.4		31.3	6.5	6.0	29.8	6.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	46.2	1.7		12.3	0.3		23.1	0.1	0.0	4.0	0.1	
Delay (s)	77.5	30.4		42.1	26.7		54.4	6.5	6.0	33.7	6.1	
Level of Service	E	C		D	C		D	A	A	C	A	
Approach Delay (s)		42.5			35.7			11.1			9.5	
Approach LOS		D			D			B			A	

Intersection Summary					
HCM Average Control Delay	18.1	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.26				
Actuated Cycle Length (s)	64.7	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø7
Lane Configurations								
Volume (vph)	6	16	2	3	156	93	273	
Turn Type		Prot		Prot		Prot		
Protected Phases	4	3	8	5	2	1	6	7
Permitted Phases								
Detector Phases	4	3	8	5	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	8.0	20.0	8.0	20.0	8.0
Total Split (s)	27.0	15.0	27.0	15.0	26.0	22.0	33.0	15.0
Total Split (%)	30.0%	16.7%	30.0%	16.7%	28.9%	24.4%	36.7%	17%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min	None
Act Effct Green (s)	0.0	7.5	20.9	6.9	34.1	10.2	41.5	
Actuated g/C Ratio	0.00	0.10	0.30	0.09	0.52	0.15	0.63	
v/c Ratio	1.88	0.11	0.25	0.02	0.19	0.42	0.25	
Control Delay	536.9	30.6	3.5	30.0	18.4	26.8	12.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	536.9	30.6	3.5	30.0	18.4	26.8	12.6	
LOS	F	C	A	C	B	C	B	
Approach Delay	536.9		6.3		18.5		16.1	
Approach LOS	F		A		B		B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 65.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.88			
Intersection Signal Delay: 44.7		Intersection LOS: D	
Intersection Capacity Utilization 43.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected		0.98		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1700		1583	1587		1583	1841		1583	1856	
Flt Permitted		0.90		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1555		1583	1587		1583	1841		1583	1856	
Volume (vph)	14	6	23	16	2	136	3	156	13	93	273	7
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	15	6	24	17	2	143	3	164	14	98	287	7
RTOR Reduction (vph)	0	19	0	0	103	0	0	3	0	0	0	0
Lane Group Flow (vph)	0	26	0	17	42	0	3	175	0	98	294	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		14.9		1.3	20.2		1.1	33.2		6.7	38.8	
Effective Green, g (s)		14.9		1.3	20.2		1.1	33.2		6.7	38.8	
Actuated g/C Ratio		0.21		0.02	0.28		0.02	0.46		0.09	0.54	
Clearance Time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		321		29	445		24	848		147	999	
v/s Ratio Prot				c0.01	c0.03		0.00	0.10		c0.06	c0.16	
v/s Ratio Perm		0.02										
v/c Ratio		0.08		0.59	0.09		0.12	0.21		0.67	0.29	
Uniform Delay, d1		23.1		35.1	19.2		35.0	11.6		31.6	9.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1		26.8	0.1		2.3	0.1		10.9	0.2	
Delay (s)		23.2		61.9	19.3		37.4	11.7		42.5	9.3	
Level of Service		C		E	B		D	B		D	A	
Approach Delay (s)		23.2			23.8			12.1			17.6	
Approach LOS		C			C			B			B	

Intersection Summary					
HCM Average Control Delay	17.9	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.27				
Actuated Cycle Length (s)	72.1	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	43.2%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	118	812	60	632	236	73	122	181	89
Turn Type	Prot		Prot		pm+ov	Prot		Prot	
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	1	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	18.0	34.0	12.0	28.0	22.0	20.0	22.0	22.0	24.0
Total Split (%)	20.0%	37.8%	13.3%	31.1%	24.4%	22.2%	24.4%	24.4%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	10.4	24.8	7.4	19.4	37.0	9.4	11.9	13.1	15.6
Actuated g/C Ratio	0.15	0.36	0.10	0.28	0.53	0.14	0.17	0.19	0.22
v/c Ratio	0.54	0.74	0.39	0.67	0.28	0.36	0.59	0.64	0.44
Control Delay	41.7	25.7	44.3	28.6	2.6	38.2	34.7	40.7	23.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.7	25.7	44.3	28.6	2.6	38.2	34.7	40.7	23.1
LOS	D	C	D	C	A	D	C	D	C
Approach Delay		27.6		23.0			35.7		32.0
Approach LOS		C		C			D		C

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 69.4			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 27.3		Intersection LOS: C	
Intersection Capacity Utilization 63.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395

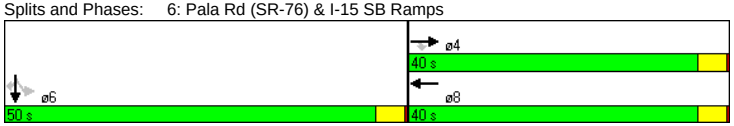
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3494		1583	3539	1417	1583	1771		1583	1723	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3494		1583	3539	1417	1583	1771		1583	1723	
Volume (vph)	118	812	75	60	632	236	73	122	60	181	89	89
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	124	855	79	63	665	248	77	128	63	191	94	94
RTOR Reduction (vph)	0	7	0	0	0	129	0	21	0	0	40	0
Lane Group Flow (vph)	124	927	0	63	665	119	77	170	0	191	148	0
Turn Type	Prot			Prot		pm+ov	Prot			Prot		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	8.4	24.8		3.9	20.3	33.4	9.4	11.9		13.1	15.6	
Effective Green, g (s)	8.4	24.8		3.9	20.3	33.4	9.4	11.9		13.1	15.6	
Actuated g/C Ratio	0.12	0.36		0.06	0.29	0.48	0.13	0.17		0.19	0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	1243		89	1031	760	213	302		298	386	
v/s Ratio Prot	0.08	c0.27		0.04	c0.19	0.03	0.05	c0.10		c0.12	c0.09	
v/s Ratio Perm						0.05						
v/c Ratio	0.65	0.75		0.71	0.65	0.16	0.36	0.56		0.64	0.38	
Uniform Delay, d1	29.2	19.7		32.3	21.6	10.2	27.4	26.5		26.1	23.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.4	2.5		22.6	1.4	0.1	1.0	2.4		4.7	0.6	
Delay (s)	36.6	22.2		54.9	23.0	10.3	28.5	28.9		30.8	23.6	
Level of Service	D	C		D	C	B	C	C		C	C	
Approach Delay (s)		23.9			21.8			28.8			27.2	
Approach LOS		C			C			C			C	

Intersection Summary					
HCM Average Control Delay	24.1	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	69.7	Sum of lost time (s)	16.0		
Intersection Capacity Utilization	63.2%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	EBR	WBT	WBR	SBT	SBR
Lane Configurations						
Volume (vph)	749	273	589	291	5	433
Turn Type		Perm		Free		Perm
Protected Phases	4		8		6	
Permitted Phases		4		Free		6
Detector Phases	4	4	8		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	40.0	40.0	40.0	0.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	0.0%	55.6%	55.6%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		C-Min	C-Min
Act Effct Green (s)	26.4	26.4	26.4	90.0	55.6	55.6
Actuated g/C Ratio	0.29	0.29	0.29	1.00	0.62	0.62
v/c Ratio	0.76	0.46	0.60	0.22	0.17	0.49
Control Delay	33.5	5.2	18.9	0.3	9.0	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	5.2	18.9	0.3	9.0	9.3
LOS	C	A	B	A	A	A
Approach Delay	26.0		12.7		9.2	
Approach LOS	C		B		A	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2: and 6:SBTL, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 17.3		Intersection LOS: B	
Intersection Capacity Utilization 52.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



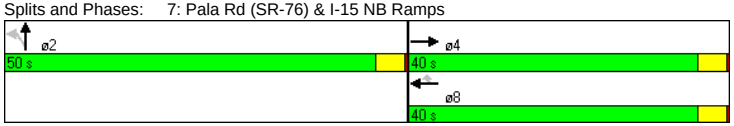
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0					4.0	4.0
Lane Util. Factor		0.95	1.00		0.95	1.00					1.00	1.00
Frt		1.00	0.85		1.00	0.85					1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00					0.95	1.00
Satd. Flow (prot)		3539	1417		3539	1417					1776	1417
Flt Permitted		1.00	1.00		1.00	1.00					0.95	1.00
Satd. Flow (perm)		3539	1417		3539	1417					1776	1417
Volume (vph)	0	749	273	0	589	291	0	0	0	174	5	433
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	788	287	0	620	306	0	0	0	183	5	456
RTOR Reduction (vph)	0	0	203	0	0	0	0	0	0	0	0	54
Lane Group Flow (vph)	0	788	84	0	620	306	0	0	0	0	188	402
Turn Type			Perm			Free				Perm		Perm
Protected Phases		4			8						6	
Permitted Phases			4			Free				6		6
Actuated Green, G (s)		26.4	26.4		26.4	90.0					55.6	55.6
Effective Green, g (s)		26.4	26.4		26.4	90.0					55.6	55.6
Actuated g/C Ratio		0.29	0.29		0.29	1.00					0.62	0.62
Clearance Time (s)		4.0	4.0		4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		1038	416		1038	1417					1097	875
v/s Ratio Prot		c0.22			0.18							
v/s Ratio Perm			0.06			0.22					0.11	c0.28
v/c Ratio		0.76	0.20		0.60	0.22					0.17	0.46
Uniform Delay, d1		28.9	23.9		27.2	0.0					7.4	9.2
Progression Factor		1.00	1.00		0.63	1.00					1.00	1.00
Incremental Delay, d2		3.2	0.2		0.8	0.3					0.3	1.7
Delay (s)		32.1	24.1		18.0	0.3					7.7	10.9
Level of Service		C	C		B	A					A	B
Approach Delay (s)		30.0			12.2			0.0			10.0	
Approach LOS		C			B			A			A	

Intersection Summary					
HCM Average Control Delay	18.9	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.56				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	52.9%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT
Lane Configurations						
Volume (vph)	348	594	550	133	380	4
Turn Type		Free		Perm	Perm	
Protected Phases	4		8			2
Permitted Phases		Free		8	2	
Detector Phases	4		8	8	2	2
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	20.0		20.0	20.0	20.0	20.0
Total Split (s)	40.0	0.0	40.0	40.0	50.0	50.0
Total Split (%)	44.4%	0.0%	44.4%	44.4%	55.6%	55.6%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5		0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	C-Min	C-Min
Act Effct Green (s)	19.4	90.0	19.4	19.4	62.6	62.6
Actuated g/C Ratio	0.22	1.00	0.22	0.22	0.70	0.70
v/c Ratio	0.48	0.44	0.76	0.37	0.32	0.35
Control Delay	18.4	5.6	39.6	13.9	7.1	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	5.6	39.6	13.9	7.1	2.3
LOS	B	A	D	B	A	A
Approach Delay	10.4		34.6			4.5
Approach LOS	B		C			A

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 42.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



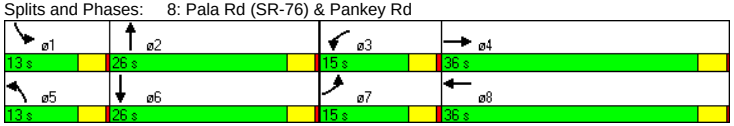
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0				
Lane Util. Factor		0.95	1.00		0.95	1.00	0.95	0.95				
Frt		1.00	0.85		1.00	0.85	1.00	0.87				
Flt Protected		1.00	1.00		1.00	1.00	0.95	0.99				
Satd. Flow (prot)		3539	1417		3539	1417	1504	1535				
Flt Permitted		1.00	1.00		1.00	1.00	0.95	0.99				
Satd. Flow (perm)		3539	1417		3539	1417	1504	1535				
Volume (vph)	0	348	594	0	550	133	380	4	329	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	366	625	0	579	140	400	4	346	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	72	0	101	0	0	0	0
Lane Group Flow (vph)	0	366	625	0	579	68	339	310	0	0	0	0
Turn Type			Free			Perm	Perm					
Protected Phases		4			8			2				
Permitted Phases			Free			8	2					
Actuated Green, G (s)		19.4	90.0		19.4	19.4	62.6	62.6				
Effective Green, g (s)		19.4	90.0		19.4	19.4	62.6	62.6				
Actuated g/C Ratio		0.22	1.00		0.22	0.22	0.70	0.70				
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)		763	1417		763	305	1046	1068				
v/s Ratio Prot		0.10			c0.16							
v/s Ratio Perm			c0.44			0.05	0.23	0.20				
v/c Ratio		0.48	0.44		0.76	0.22	0.32	0.29				
Uniform Delay, d1		30.9	0.0		33.1	29.1	5.4	5.2				
Progression Factor		0.55	1.00		1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.4	0.8		4.4	0.4	0.8	0.7				
Delay (s)		17.5	0.8		37.5	29.5	6.2	5.9				
Level of Service		B	A		D	C	A	A				
Approach Delay (s)		6.9			35.9			6.0			0.0	
Approach LOS		A			D			A			A	

Intersection Summary					
HCM Average Control Delay	15.1	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.51				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	4.0		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT	ø1
Lane Configurations								
Volume (vph)	27	665	38	704	14	6	3	
Turn Type	Prot		Prot		Prot			
Protected Phases	7	4	3	8	5	2	6	1
Permitted Phases								
Detector Phases	7	4	3	8	5	2	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	20.0	8.0
Total Split (s)	15.0	36.0	15.0	36.0	13.0	26.0	26.0	13.0
Total Split (%)	16.7%	40.0%	16.7%	40.0%	14.4%	28.9%	28.9%	14%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None
Act Effct Green (s)	6.7	13.9	6.9	15.9	6.4	8.1	6.9	
Actuated g/C Ratio	0.16	0.40	0.17	0.46	0.15	0.23	0.20	
v/c Ratio	0.11	0.52	0.15	0.46	0.06	0.10	0.05	
Control Delay	22.3	10.8	20.0	8.6	22.5	8.5	13.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	22.3	10.8	20.0	8.6	22.5	8.5	13.9	
LOS	C	B	C	A	C	A	B	
Approach Delay		11.2		9.2		12.4	13.9	
Approach LOS		B		A		B	B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 34.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 10.3		Intersection LOS: B	
Intersection Capacity Utilization 40.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd



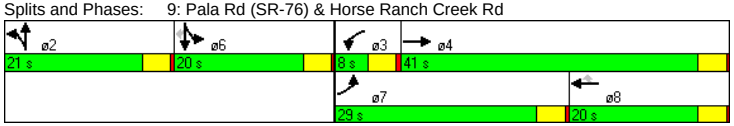
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.87			0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1583	3519		1583	3534		1583	1626			1636	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (perm)	1583	3519		1583	3534		1583	1626			1636	
Volume (vph)	27	665	27	38	704	7	14	6	31	0	3	12
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	28	700	28	40	741	7	15	6	33	0	3	13
RTOR Reduction (vph)	0	3	0	0	1	0	0	23	0	0	11	0
Lane Group Flow (vph)	28	725	0	40	747	0	15	16	0	0	5	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	0.9	14.6		2.2	15.9		0.8	11.7			6.9	
Effective Green, g (s)	0.9	14.6		2.2	15.9		0.8	11.7			6.9	
Actuated g/C Ratio	0.02	0.36		0.05	0.39		0.02	0.29			0.17	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	35	1269		86	1387		31	470			279	
v/s Ratio Prot	0.02	0.21		c0.03	c0.21		c0.01	c0.01			0.00	
v/s Ratio Perm												
v/c Ratio	0.80	0.57		0.47	0.54		0.48	0.03			0.02	
Uniform Delay, d1	19.7	10.4		18.6	9.5		19.6	10.3			14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	75.9	0.6		3.9	0.4		11.4	0.0			0.0	
Delay (s)	95.6	11.1		22.5	9.9		31.1	10.4			14.0	
Level of Service	F	B		C	A		C	B			B	
Approach Delay (s)		14.2			10.5			16.1			14.0	
Approach LOS		B			B			B			B	

Intersection Summary					
HCM Average Control Delay	12.5	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.32				
Actuated Cycle Length (s)	40.5	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	346	350	442	66	61	0	307		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	29.0	41.0	20.0	20.0	20.0	20.0	20.0	21.0	8.0
Total Split (%)	32.2%	45.6%	22.2%	22.2%	22.2%	22.2%	22.2%	23%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	19.0	36.0	12.8	12.8	8.1	8.1	8.1		
Actuated g/C Ratio	0.31	0.58	0.21	0.21	0.13	0.13	0.13		
v/c Ratio	0.75	0.18	0.64	0.20	0.24	0.53	0.51		
Control Delay	31.1	6.4	28.3	8.6	30.0	13.3	11.7		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	31.1	6.4	28.3	8.6	30.0	13.3	11.7		
LOS	C	A	C	A	C	B	B		
Approach Delay		18.7	25.7			14.7			
Approach LOS		B	C			B			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 62.2			
Natural Cycle: 80			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 20.0		Intersection LOS: C	
Intersection Capacity Utilization 48.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



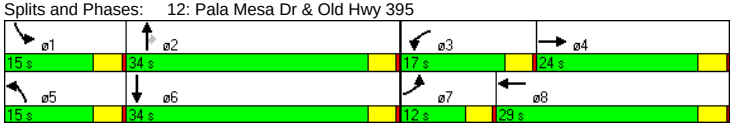
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.86	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1583	3539			3539	1417				1504	1457	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1583	3539			3539	1417				1504	1457	1346
Volume (vph)	346	350	0	0	442	66	0	0	0	61	0	307
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	364	368	0	0	465	69	0	0	0	64	0	323
RTOR Reduction (vph)	0	0	0	0	0	54	0	0	0	0	138	143
Lane Group Flow (vph)	364	368	0	0	465	15	0	0	0	48	37	21
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	19.0	36.0			13.0	13.0				8.1	8.1	8.1
Effective Green, g (s)	19.0	36.0			13.0	13.0				8.1	8.1	8.1
Actuated g/C Ratio	0.31	0.58			0.21	0.21				0.13	0.13	0.13
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	487	2062			744	298				197	191	176
v/s Ratio Prot	c0.23	0.10			c0.13					c0.03	0.03	
v/s Ratio Perm						0.01						0.02
v/c Ratio	0.75	0.18			0.62	0.05				0.24	0.19	0.12
Uniform Delay, d1	19.2	6.0			22.2	19.5				24.1	23.9	23.7
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	6.2	0.0			1.6	0.1				0.6	0.5	0.3
Delay (s)	25.4	6.1			23.8	19.5				24.7	24.4	24.0
Level of Service	C	A			C	B				C	C	C
Approach Delay (s)		15.7			23.3			0.0			24.3	
Approach LOS		B			C			A			C	

Intersection Summary					
HCM Average Control Delay	20.2	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.61				
Actuated Cycle Length (s)	61.8	Sum of lost time (s)	21.7		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	13	40	64	47	46	329	81	39	165
Turn Type	Prot		Prot		Prot		Perm	Prot	
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phases	7	4	3	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	12.0	24.0	17.0	29.0	15.0	34.0	34.0	15.0	34.0
Total Split (%)	13.3%	26.7%	18.9%	32.2%	16.7%	37.8%	37.8%	16.7%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	8.5	9.3	10.0	12.8	9.4	43.3	43.3	9.2	43.1
Actuated g/C Ratio	0.13	0.14	0.15	0.20	0.15	0.74	0.74	0.14	0.73
v/c Ratio	0.07	0.25	0.27	0.26	0.21	0.27	0.08	0.18	0.15
Control Delay	27.3	18.0	23.1	11.7	23.8	11.2	4.5	24.2	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	18.0	23.1	11.7	23.8	11.2	4.5	24.2	10.1
LOS	C	B	C	B	C	B	A	C	B
Approach Delay		19.6		16.2		11.3			12.5
Approach LOS		B		B		B			B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 58.8			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.27			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 42.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395



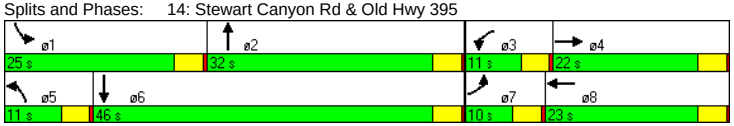
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	0.95	1.00	1.00	
Frt	1.00	0.94		1.00	0.92		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1758		1583	1719		1583	1770	1346	1583	1824	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1758		1583	1719		1583	1770	1346	1583	1824	
Volume (vph)	13	40	24	64	47	49	46	329	81	39	165	27
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	14	42	25	67	49	52	48	346	85	41	174	28
RTOR Reduction (vph)	0	23	0	0	47	0	0	0	35	0	4	0
Lane Group Flow (vph)	14	44	0	67	54	0	48	346	50	41	198	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	1.2	4.0		3.6	6.4		3.3	37.6	37.6	3.1	37.4	
Effective Green, g (s)	1.2	4.0		3.6	6.4		3.3	37.6	37.6	3.1	37.4	
Actuated g/C Ratio	0.02	0.06		0.06	0.10		0.05	0.58	0.58	0.05	0.58	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	30	109		89	171		81	1035	787	76	1061	
v/s Ratio Prot	0.01	0.02		c0.04	c0.03		c0.03	c0.20		0.03	0.11	
v/s Ratio Perm									0.04			
v/c Ratio	0.47	0.40		0.75	0.32		0.59	0.33	0.06	0.54	0.19	
Uniform Delay, d1	31.2	29.0		29.9	26.9		29.8	6.9	5.8	29.9	6.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.0	2.4		29.7	1.1		11.1	0.2	0.0	7.2	0.1	
Delay (s)	42.3	31.4		59.6	28.0		40.9	7.1	5.8	37.1	6.4	
Level of Service	D	C		E	C		D	A	A	D	A	
Approach Delay (s)		33.3			40.6			10.2			11.6	
Approach LOS		C			D			B			B	

Intersection Summary					
HCM Average Control Delay	17.7	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.33				
Actuated Cycle Length (s)	64.3	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	42.9%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø7
Lane Configurations								
Volume (vph)	8	22	8	21	300	180	195	
Turn Type		Prot		Prot		Prot		
Protected Phases	4	3	8	5	2	1	6	7
Permitted Phases								
Detector Phases	4	3	8	5	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	8.0	20.0	8.0	20.0	8.0
Total Split (s)	22.0	11.0	23.0	11.0	32.0	25.0	46.0	10.0
Total Split (%)	24.4%	12.2%	25.6%	12.2%	35.6%	27.8%	51.1%	11%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min	None
Act Effct Green (s)	0.0	6.5	16.8	6.5	27.5	12.7	39.0	
Actuated g/C Ratio	0.00	0.09	0.25	0.09	0.42	0.19	0.60	
v/c Ratio	1.84	0.16	0.31	0.15	0.43	0.63	0.20	
Control Delay	548.9	37.4	5.9	37.2	22.1	33.9	11.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	548.9	37.4	5.9	37.2	22.1	33.9	11.6	
LOS	F	D	A	D	C	C	B	
Approach Delay	548.9		9.9		23.0		21.7	
Approach LOS	F		A		C		C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 65.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.84			
Intersection Signal Delay: 38.7		Intersection LOS: D	
Intersection Capacity Utilization 47.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395



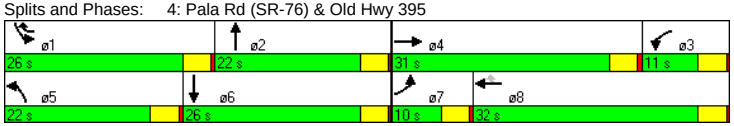
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.86		1.00	0.99		1.00	0.99	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1707		1583	1597		1583	1846		1583	1838	
Flt Permitted		0.93		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1602		1583	1597		1583	1846		1583	1838	
Volume (vph)	8	8	18	22	8	144	21	300	19	180	195	19
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	8	19	23	8	152	22	316	20	189	205	20
RTOR Reduction (vph)	0	16	0	0	113	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	19	0	23	47	0	22	334	0	189	222	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		11.9		2.2	18.1		2.2	29.1		11.3	38.2	
Effective Green, g (s)		11.9		2.2	18.1		2.2	29.1		11.3	38.2	
Actuated g/C Ratio		0.17		0.03	0.26		0.03	0.41		0.16	0.54	
Clearance Time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		270		49	410		49	762		254	996	
v/s Ratio Prot				c0.01	c0.03		0.01	c0.18		c0.12	0.12	
v/s Ratio Perm		0.01										
v/c Ratio		0.07		0.47	0.11		0.45	0.44		0.74	0.22	
Uniform Delay, d1		24.7		33.6	20.1		33.6	14.8		28.2	8.4	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1		6.9	0.1		6.4	0.4		11.2	0.1	
Delay (s)		24.8		40.5	20.2		40.0	15.2		39.4	8.5	
Level of Service		C		D	C		D	B		D	A	
Approach Delay (s)		24.8			22.7			16.8			22.6	
Approach LOS		C			C			B			C	

Intersection Summary					
HCM Average Control Delay	20.6	HCM Level of Service	C		
HCM Volume to Capacity ratio	0.41				
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	94	700	82	1130	122	284	207	400	227
Turn Type	Prot		Prot		pm+ov	Prot		Prot	
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	1	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	10.0	31.0	11.0	32.0	26.0	22.0	22.0	26.0	26.0
Total Split (%)	11.1%	34.4%	12.2%	35.6%	28.9%	24.4%	24.4%	28.9%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	6.0	29.0	7.1	28.0	54.0	18.0	18.0	22.0	22.0
Actuated g/C Ratio	0.07	0.32	0.08	0.31	0.60	0.20	0.20	0.24	0.24
v/c Ratio	0.93	0.79	0.70	1.08	0.14	0.94	1.10	1.09	0.82
Control Delay	116.3	33.7	71.4	82.7	1.9	75.7	107.0	106.0	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.3	33.7	71.4	82.7	1.9	75.7	107.0	106.0	46.0
LOS	F	C	E	F	A	E	F	F	D
Approach Delay		42.0		74.6			94.0		77.9
Approach LOS		D		E			F		E

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 70.6		Intersection LOS: E	
Intersection Capacity Utilization 97.8%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



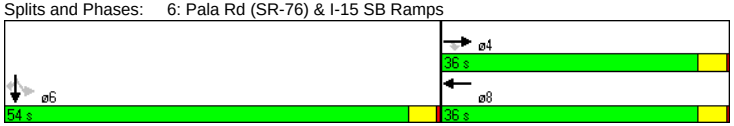
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.93		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3448		1583	3539	1417	1583	1728		1583	1763	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3448		1583	3539	1417	1583	1728		1583	1763	
Volume (vph)	94	700	145	82	1130	122	284	207	192	400	227	125
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	737	153	86	1189	128	299	218	202	421	239	132
RTOR Reduction (vph)	0	19	0	0	0	56	0	37	0	0	22	0
Lane Group Flow (vph)	99	871	0	86	1189	72	299	383	0	421	349	0
Turn Type	Prot			Prot		pm+ov	Prot			Prot		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	6.0	29.0		5.8	28.8	50.8	18.0	18.0		22.0	22.0	
Effective Green, g (s)	6.0	29.0		5.8	28.8	50.8	18.0	18.0		22.0	22.0	
Actuated g/C Ratio	0.07	0.32		0.06	0.32	0.56	0.20	0.20		0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	105	1101		101	1123	855	314	343		384	427	
v/s Ratio Prot	0.06	c0.25		0.05	c0.34	0.02	0.19	c0.22		c0.27	c0.20	
v/s Ratio Perm						0.03						
v/c Ratio	0.94	0.79		0.85	1.06	0.08	0.95	1.12		1.10	0.82	
Uniform Delay, d1	42.2	28.1		42.1	31.0	9.2	36.0	36.4		34.4	32.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	69.2	4.0		46.0	43.9	0.0	38.0	84.0		74.4	11.5	
Delay (s)	111.5	32.1		88.1	74.9	9.3	74.0	120.4		108.8	44.0	
Level of Service	F	C		F	E	A	E	F		F	D	
Approach Delay (s)		40.0			69.7			101.1			78.5	
Approach LOS		D			E			F			E	

Intersection Summary					
HCM Average Control Delay	69.7	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.12				
Actuated Cycle Length (s)	90.8	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	97.8%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	EBR	WBT	WBR	SBT	SBR
Lane Configurations						
Volume (vph)	950	350	800	400	1	570
Turn Type		Perm		Free		Perm
Protected Phases	4		8		6	
Permitted Phases		4		Free		6
Detector Phases	4	4	8		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	36.0	36.0	36.0	0.0	54.0	54.0
Total Split (%)	40.0%	40.0%	40.0%	0.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		C-Min	C-Min
Act Effct Green (s)	31.2	31.2	31.2	90.0	50.8	50.8
Actuated g/C Ratio	0.35	0.35	0.35	1.00	0.56	0.56
v/c Ratio	0.81	0.50	0.69	0.30	0.15	0.73
Control Delay	32.7	4.9	26.0	0.4	10.5	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	4.9	26.0	0.4	10.5	20.8
LOS	C	A	C	A	B	C
Approach Delay	25.2		17.5		18.8	
Approach LOS	C		B		B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2: and 6:SBTL, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 20.9		Intersection LOS: C	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



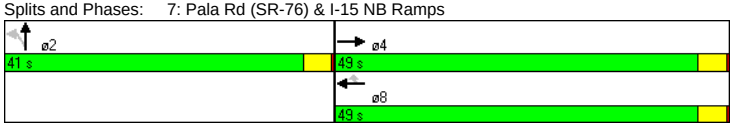
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0					4.0	4.0
Lane Util. Factor		0.95	1.00		0.95	1.00					1.00	1.00
Frt		1.00	0.85		1.00	0.85					1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00					0.95	1.00
Satd. Flow (prot)		3539	1417		3539	1417					1775	1417
Flt Permitted		1.00	1.00		1.00	1.00					0.95	1.00
Satd. Flow (perm)		3539	1417		3539	1417					1775	1417
Volume (vph)	0	950	350	0	800	400	0	0	0	138	1	570
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1000	368	0	842	421	0	0	0	145	1	600
RTOR Reduction (vph)	0	0	240	0	0	0	0	0	0	0	0	20
Lane Group Flow (vph)	0	1000	128	0	842	421	0	0	0	0	146	580
Turn Type			Perm			Free				Perm		Perm
Protected Phases		4			8						6	
Permitted Phases			4			Free				6		6
Actuated Green, G (s)		31.2	31.2		31.2	90.0					50.8	50.8
Effective Green, g (s)		31.2	31.2		31.2	90.0					50.8	50.8
Actuated g/C Ratio		0.35	0.35		0.35	1.00					0.56	0.56
Clearance Time (s)		4.0	4.0		4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		1227	491		1227	1417					1002	800
v/s Ratio Prot		c0.28			0.24							
v/s Ratio Perm			0.09			0.30					0.08	c0.41
v/c Ratio		0.81	0.26		0.69	0.30					0.15	0.73
Uniform Delay, d1		26.8	21.1		25.2	0.0					9.3	14.5
Progression Factor		1.00	1.00		0.95	1.00					1.00	1.00
Incremental Delay, d2		4.3	0.3		1.1	0.4					0.3	5.7
Delay (s)		31.1	21.4		25.1	0.4					9.6	20.1
Level of Service		C	C		C	A					A	C
Approach Delay (s)		28.5			16.9			0.0			18.1	
Approach LOS		C			B			A			B	

Intersection Summary					
HCM Average Control Delay	21.8	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.76				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	68.2%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT
Lane Configurations						
Volume (vph)	600	500	950	139	277	0
Turn Type		Free		Perm	Perm	
Protected Phases	4		8			2
Permitted Phases		Free		8	2	
Detector Phases	4		8	8	2	2
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	20.0		20.0	20.0	20.0	20.0
Total Split (s)	49.0	0.0	49.0	49.0	41.0	41.0
Total Split (%)	54.4%	0.0%	54.4%	54.4%	45.6%	45.6%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5		0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	C-Min	C-Min
Act Effct Green (s)	30.9	90.0	30.9	30.9	51.1	51.1
Actuated g/C Ratio	0.34	1.00	0.34	0.34	0.57	0.57
v/c Ratio	0.52	0.37	0.82	0.28	0.34	0.38
Control Delay	6.8	2.2	32.9	11.8	13.4	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	2.2	32.9	11.8	13.4	6.5
LOS	A	A	C	B	B	A
Approach Delay	4.7		30.2			9.6
Approach LOS	A		C			A

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 51.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



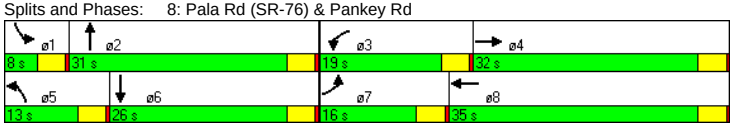
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0				
Lane Util. Factor		0.95	1.00		0.95	1.00	0.95	0.95				
Frt		1.00	0.85		1.00	0.85	1.00	0.85				
Flt Protected		1.00	1.00		1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539	1417		3539	1417	1504	1504				
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539	1417		3539	1417	1504	1504				
Volume (vph)	0	600	500	0	950	139	277	0	340	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	632	526	0	1000	146	292	0	358	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	44	0	90	0	0	0	0
Lane Group Flow (vph)	0	632	526	0	1000	102	292	268	0	0	0	0
Turn Type			Free			Perm	Perm					
Protected Phases		4			8			2				
Permitted Phases			Free			8	2					
Actuated Green, G (s)		30.9	90.0		30.9	30.9	51.1	51.1				
Effective Green, g (s)		30.9	90.0		30.9	30.9	51.1	51.1				
Actuated g/C Ratio		0.34	1.00		0.34	0.34	0.57	0.57				
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)		1215	1417		1215	487	854	854				
v/s Ratio Prot		0.18			c0.28							
v/s Ratio Perm			c0.37			0.07	0.19	0.18				
v/c Ratio		0.52	0.37		0.82	0.21	0.34	0.31				
Uniform Delay, d1		23.6	0.0		27.0	20.9	10.4	10.2				
Progression Factor		0.25	1.00		1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.3	0.5		4.6	0.2	1.1	1.0				
Delay (s)		6.2	0.5		31.7	21.1	11.5	11.2				
Level of Service		A	A		C	C	B	B				
Approach Delay (s)		3.6			30.3			11.3			0.0	
Approach LOS		A			C			B			A	

Intersection Summary					
HCM Average Control Delay	15.7	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.53				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		4.0	
Intersection Capacity Utilization	51.0%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	140	670	195	920	110	256	26	187
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	16.0	32.0	19.0	35.0	13.0	31.0	8.0	26.0
Total Split (%)	17.8%	35.6%	21.1%	38.9%	14.4%	34.4%	8.9%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	10.6	24.8	13.1	26.8	8.8	24.0	4.5	17.5
Actuated g/C Ratio	0.14	0.34	0.17	0.36	0.12	0.32	0.06	0.24
v/c Ratio	0.66	0.74	0.75	0.82	0.63	0.75	0.30	0.59
Control Delay	52.0	28.2	52.6	30.3	55.2	32.9	50.7	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	28.2	52.6	30.3	55.2	32.9	50.7	34.0
LOS	D	C	D	C	E	C	D	C
Approach Delay		31.7		33.9		37.5		35.5
Approach LOS		C		C		D		D

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 73.9			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 34.0		Intersection LOS: C	
Intersection Capacity Utilization 76.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd



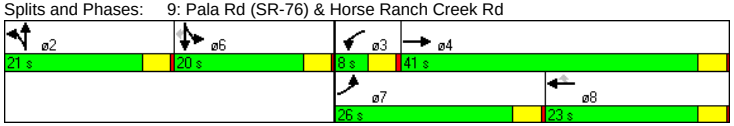
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3440		1583	3498		1583	1752		1583	1795	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3440		1583	3498		1583	1752		1583	1795	
Volume (vph)	140	670	154	195	920	77	110	256	168	26	187	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	705	162	205	968	81	116	269	177	27	197	63
RTOR Reduction (vph)	0	22	0	0	6	0	0	26	0	0	13	0
Lane Group Flow (vph)	147	845	0	205	1043	0	116	420	0	27	247	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.1	24.8		10.2	26.9		6.3	24.0		1.3	19.0	
Effective Green, g (s)	8.1	24.8		10.2	26.9		6.3	24.0		1.3	19.0	
Actuated g/C Ratio	0.11	0.33		0.13	0.35		0.08	0.31		0.02	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	168	1118		212	1233		131	551		27	447	
v/s Ratio Prot	0.09	0.25		c0.13	c0.30		c0.07	c0.24		0.02	0.14	
v/s Ratio Perm												
v/c Ratio	0.88	0.76		0.97	0.85		0.89	0.76		1.00	0.55	
Uniform Delay, d1	33.6	23.0		32.9	22.8		34.6	23.6		37.5	25.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.2	3.0		51.8	5.5		45.6	6.2		173.2	1.5	
Delay (s)	69.8	26.0		84.7	28.3		80.2	29.8		210.7	26.4	
Level of Service	E	C		F	C		F	C		F	C	
Approach Delay (s)		32.4			37.5			40.2			43.8	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM Average Control Delay	36.9	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	76.3	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	76.9%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	452	440	800	80	70	0	390		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	26.0	41.0	23.0	23.0	20.0	20.0	20.0	21.0	8.0
Total Split (%)	28.9%	45.6%	25.6%	25.6%	22.2%	22.2%	22.2%	23%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	22.0	45.1	19.0	19.0	9.1	9.1	9.1		
Actuated g/C Ratio	0.31	0.63	0.26	0.26	0.13	0.13	0.13		
v/c Ratio	0.98	0.21	0.90	0.19	0.33	0.60	0.59		
Control Delay	64.1	6.4	40.4	7.2	32.7	12.9	12.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.1	6.4	40.4	7.2	32.7	12.9	12.1		
LOS	E	A	D	A	C	B	B		
Approach Delay		35.7	37.4			15.1			
Approach LOS		D	D			B			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 71.7			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 66.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



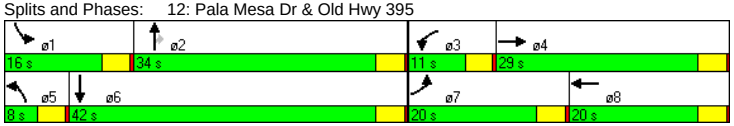
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.86	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1583	3539			3539	1417				1504	1451	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1583	3539			3539	1417				1504	1451	1346
Volume (vph)	452	440	0	0	800	80	0	0	0	70	0	390
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	476	463	0	0	842	84	0	0	0	74	0	411
RTOR Reduction (vph)	0	0	0	0	0	62	0	0	0	0	179	180
Lane Group Flow (vph)	476	463	0	0	842	22	0	0	0	62	38	26
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	22.0	45.1			19.1	19.1				9.1	9.1	9.1
Effective Green, g (s)	22.0	45.1			19.1	19.1				9.1	9.1	9.1
Actuated g/C Ratio	0.31	0.63			0.27	0.27				0.13	0.13	0.13
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	486	2226			943	377				191	184	171
v/s Ratio Prot	c0.30	0.13			c0.24					c0.04	0.03	
v/s Ratio Perm						0.02						0.02
v/c Ratio	0.98	0.21			0.89	0.06				0.32	0.21	0.15
Uniform Delay, d1	24.6	5.7			25.3	19.6				28.5	28.1	27.9
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	35.1	0.0			10.7	0.1				1.0	0.6	0.4
Delay (s)	59.7	5.7			36.0	19.7				29.5	28.6	28.3
Level of Service	E	A			D	B				C	C	C
Approach Delay (s)		33.1			34.6			0.0			28.6	
Approach LOS		C			C			A			C	

Intersection Summary					
HCM Average Control Delay	32.7	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.83				
Actuated Cycle Length (s)	71.7	Sum of lost time (s)		21.5	
Intersection Capacity Utilization	66.0%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	250	124	114	65	52	368	121	139	717
Turn Type	Prot		Prot		Prot		Perm	Prot	
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phases	7	4	3	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	29.0	11.0	20.0	8.0	34.0	34.0	16.0	42.0
Total Split (%)	22.2%	32.2%	12.2%	22.2%	8.9%	37.8%	37.8%	17.8%	46.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	17.8	20.2	7.2	12.2	4.0	31.3	31.3	10.8	37.1
Actuated g/C Ratio	0.21	0.24	0.09	0.14	0.05	0.38	0.38	0.13	0.45
v/c Ratio	0.77	0.88	0.88	0.49	0.72	0.58	0.22	0.73	0.94
Control Delay	52.2	41.2	93.4	27.4	91.8	27.7	5.3	58.6	44.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	41.2	93.4	27.4	91.8	27.7	5.3	58.6	44.5
LOS	D	D	F	C	F	C	A	E	D
Approach Delay		45.2		57.4		28.9			46.8
Approach LOS		D		E		C			D

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 82.8			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 43.3		Intersection LOS: D	
Intersection Capacity Utilization 87.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395



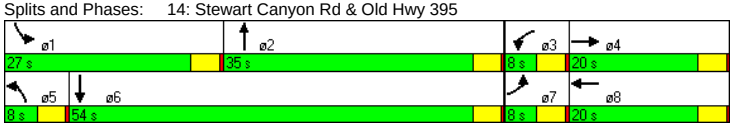
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	0.95	1.00	1.00	
Frt	1.00	0.89		1.00	0.92		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1665		1583	1715		1583	1770	1346	1583	1854	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1665		1583	1715		1583	1770	1346	1583	1854	
Volume (vph)	250	124	300	114	65	72	52	368	121	139	717	24
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	263	131	316	120	68	76	55	387	127	146	755	25
RTOR Reduction (vph)	0	100	0	0	47	0	0	0	80	0	1	0
Lane Group Flow (vph)	263	347	0	120	97	0	55	387	47	146	779	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	17.8	21.2		7.2	10.6		3.0	31.3	31.3	8.9	37.2	
Effective Green, g (s)	17.8	21.2		7.2	10.6		3.0	31.3	31.3	8.9	37.2	
Actuated g/C Ratio	0.21	0.25		0.09	0.13		0.04	0.37	0.37	0.11	0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	333	417		135	215		56	655	498	167	815	
v/s Ratio Prot	c0.17	c0.21		0.08	0.06		0.03	0.22		c0.09	c0.42	
v/s Ratio Perm									0.03			
v/c Ratio	0.79	0.83		0.89	0.45		0.98	0.59	0.09	0.87	0.96	
Uniform Delay, d1	31.6	30.0		38.3	34.3		40.8	21.5	17.4	37.3	22.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.8	13.2		45.2	1.5		113.3	1.4	0.1	36.2	21.2	
Delay (s)	43.4	43.2		83.5	35.8		154.1	22.9	17.5	73.5	44.1	
Level of Service	D	D		F	D		F	C	B	E	D	
Approach Delay (s)		43.3			57.5			34.4			48.8	
Approach LOS		D			E			C			D	

Intersection Summary					
HCM Average Control Delay	44.8	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.85				
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	87.9%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø7
Lane Configurations								
Volume (vph)	14	23	3	8	404	307	1003	
Turn Type		Prot		Prot		Prot		
Protected Phases	4	3	8	5	2	1	6	7
Permitted Phases								
Detector Phases	4	3	8	5	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	8.0	20.0	8.0	20.0	8.0
Total Split (s)	20.0	8.0	20.0	8.0	35.0	27.0	54.0	8.0
Total Split (%)	22.2%	8.9%	22.2%	8.9%	38.9%	30.0%	60.0%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min	None
Act Effct Green (s)	0.0	4.0	19.0	4.0	29.4	19.5	51.5	
Actuated g/C Ratio	0.00	0.05	0.24	0.05	0.37	0.24	0.64	
v/c Ratio	2.00	0.32	0.49	0.11	0.65	0.84	0.91	
Control Delay	550.1	52.1	6.6	45.0	27.8	49.5	27.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	550.1	52.1	6.6	45.0	27.8	49.5	27.2	
LOS	F	D	A	D	C	D	C	
Approach Delay	550.1		10.0		28.2		32.3	
Approach LOS	F		B		C		C	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 80			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 2.00			
Intersection Signal Delay: 45.4		Intersection LOS: D	
Intersection Capacity Utilization 90.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395



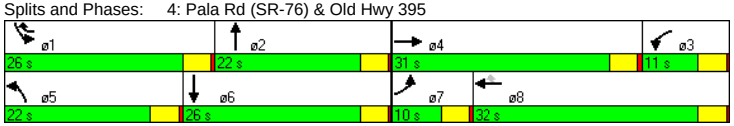
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1712		1583	1586		1583	1852		1583	1855	
Flt Permitted		0.86		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1494		1583	1586		1583	1852		1583	1855	
Volume (vph)	21	14	35	23	3	275	8	404	16	307	1003	29
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	15	37	24	3	289	8	425	17	323	1056	31
RTOR Reduction (vph)	0	30	0	0	216	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	44	0	24	76	0	8	441	0	323	1086	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		16.1		1.4	21.5		0.7	32.7		19.5	51.5	
Effective Green, g (s)		16.1		1.4	21.5		0.7	32.7		19.5	51.5	
Actuated g/C Ratio		0.19		0.02	0.25		0.01	0.38		0.23	0.60	
Clearance Time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		281		26	398		13	707		360	1115	
v/s Ratio Prot				c0.02	c0.05		0.01	0.24		c0.20	c0.59	
v/s Ratio Perm		0.03										
v/c Ratio		0.16		0.92	0.19		0.62	0.62		0.90	0.97	
Uniform Delay, d1		29.1		42.1	25.2		42.4	21.5		32.1	16.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3		142.0	0.2		64.0	1.7		23.8	20.7	
Delay (s)		29.4		184.1	25.5		106.4	23.2		55.9	37.2	
Level of Service		C		F	C		F	C		E	D	
Approach Delay (s)		29.4			37.5			24.7			41.5	
Approach LOS		C			D			C			D	

Intersection Summary					
HCM Average Control Delay	37.2	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.77				
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	90.7%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	94	700	82	1130	122	284	207	400	227
Turn Type	Prot		Prot		pm+ov	Prot		Prot	
Protected Phases	7	4	3	8	1	5	2	1	6
Permitted Phases					8				
Detector Phases	7	4	3	8	1	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Split (s)	10.0	31.0	11.0	32.0	26.0	22.0	22.0	26.0	26.0
Total Split (%)	11.1%	34.4%	12.2%	35.6%	28.9%	24.4%	24.4%	28.9%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	Min
Act Effct Green (s)	6.0	29.0	7.1	28.0	54.0	18.0	18.0	22.0	22.0
Actuated g/C Ratio	0.07	0.32	0.08	0.31	0.60	0.20	0.20	0.24	0.24
v/c Ratio	0.93	0.79	0.70	1.08	0.14	0.94	1.10	1.09	0.82
Control Delay	116.3	33.7	71.4	82.7	1.9	75.7	107.0	106.0	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.3	33.7	71.4	82.7	1.9	75.7	107.0	106.0	46.0
LOS	F	C	E	F	A	E	F	F	D
Approach Delay		42.0		74.6			94.0		77.9
Approach LOS		D		E			F		E

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 70.6		Intersection LOS: E	
Intersection Capacity Utilization 97.8%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 4: Pala Rd (SR-76) & Old Hwy 395



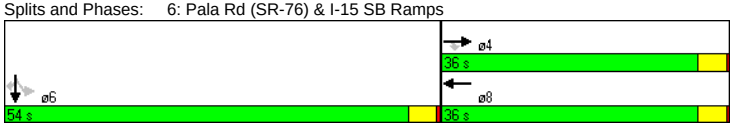
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.93		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3448		1583	3539	1417	1583	1728		1583	1763	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3448		1583	3539	1417	1583	1728		1583	1763	
Volume (vph)	94	700	145	82	1130	122	284	207	192	400	227	125
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	99	737	153	86	1189	128	299	218	202	421	239	132
RTOR Reduction (vph)	0	19	0	0	0	56	0	37	0	0	22	0
Lane Group Flow (vph)	99	871	0	86	1189	72	299	383	0	421	349	0
Turn Type	Prot			Prot		pm+ov	Prot			Prot		
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	6.0	29.0		5.8	28.8	50.8	18.0	18.0		22.0	22.0	
Effective Green, g (s)	6.0	29.0		5.8	28.8	50.8	18.0	18.0		22.0	22.0	
Actuated g/C Ratio	0.07	0.32		0.06	0.32	0.56	0.20	0.20		0.24	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	105	1101		101	1123	855	314	343		384	427	
v/s Ratio Prot	0.06	c0.25		0.05	c0.34	0.02	0.19	c0.22		c0.27	c0.20	
v/s Ratio Perm						0.03						
v/c Ratio	0.94	0.79		0.85	1.06	0.08	0.95	1.12		1.10	0.82	
Uniform Delay, d1	42.2	28.1		42.1	31.0	9.2	36.0	36.4		34.4	32.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	69.2	4.0		46.0	43.9	0.0	38.0	84.0		74.4	11.5	
Delay (s)	111.5	32.1		88.1	74.9	9.3	74.0	120.4		108.8	44.0	
Level of Service	F	C		F	E	A	E	F		F	D	
Approach Delay (s)		40.0			69.7			101.1			78.5	
Approach LOS		D			E			F			E	

Intersection Summary					
HCM Average Control Delay	69.7	HCM Level of Service		E	
HCM Volume to Capacity ratio	1.12				
Actuated Cycle Length (s)	90.8	Sum of lost time (s)		20.0	
Intersection Capacity Utilization	97.8%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	EBR	WBT	WBR	SBT	SBR
Lane Configurations						
Volume (vph)	950	350	800	400	1	570
Turn Type		Perm		Free		Perm
Protected Phases	4		8		6	
Permitted Phases		4		Free		6
Detector Phases	4	4	8		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	36.0	36.0	36.0	0.0	54.0	54.0
Total Split (%)	40.0%	40.0%	40.0%	0.0%	60.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		C-Min	C-Min
Act Effct Green (s)	31.2	31.2	31.2	90.0	50.8	50.8
Actuated g/C Ratio	0.35	0.35	0.35	1.00	0.56	0.56
v/c Ratio	0.81	0.50	0.69	0.30	0.15	0.73
Control Delay	32.7	4.9	26.0	0.4	10.5	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.7	4.9	26.0	0.4	10.5	20.8
LOS	C	A	C	A	B	C
Approach Delay	25.2		17.5		18.8	
Approach LOS	C		B		B	

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 40 (44%), Referenced to phase 2: and 6:SBTL, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 20.9		Intersection LOS: C	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Pala Rd (SR-76) & I-15 SB Ramps



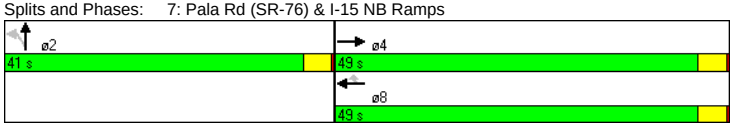
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0					4.0	4.0
Lane Util. Factor		0.95	1.00		0.95	1.00					1.00	1.00
Frt		1.00	0.85		1.00	0.85					1.00	0.85
Flt Protected		1.00	1.00		1.00	1.00					0.95	1.00
Satd. Flow (prot)		3539	1417		3539	1417					1775	1417
Flt Permitted		1.00	1.00		1.00	1.00					0.95	1.00
Satd. Flow (perm)		3539	1417		3539	1417					1775	1417
Volume (vph)	0	950	350	0	800	400	0	0	0	138	1	570
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1000	368	0	842	421	0	0	0	145	1	600
RTOR Reduction (vph)	0	0	240	0	0	0	0	0	0	0	0	20
Lane Group Flow (vph)	0	1000	128	0	842	421	0	0	0	0	146	580
Turn Type			Perm			Free				Perm		Perm
Protected Phases		4			8						6	
Permitted Phases			4			Free				6		6
Actuated Green, G (s)		31.2	31.2		31.2	90.0					50.8	50.8
Effective Green, g (s)		31.2	31.2		31.2	90.0					50.8	50.8
Actuated g/C Ratio		0.35	0.35		0.35	1.00					0.56	0.56
Clearance Time (s)		4.0	4.0		4.0						4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0						3.0	3.0
Lane Grp Cap (vph)		1227	491		1227	1417					1002	800
v/s Ratio Prot		c0.28			0.24							
v/s Ratio Perm			0.09			0.30					0.08	c0.41
v/c Ratio		0.81	0.26		0.69	0.30					0.15	0.73
Uniform Delay, d1		26.8	21.1		25.2	0.0					9.3	14.5
Progression Factor		1.00	1.00		0.95	1.00					1.00	1.00
Incremental Delay, d2		4.3	0.3		1.1	0.4					0.3	5.7
Delay (s)		31.1	21.4		25.1	0.4					9.6	20.1
Level of Service		C	C		C	A					A	C
Approach Delay (s)		28.5			16.9			0.0			18.1	
Approach LOS		C			B			A			B	

Intersection Summary					
HCM Average Control Delay	21.8	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.76				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	68.2%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT
Lane Configurations						
Volume (vph)	600	500	950	139	277	0
Turn Type		Free		Perm	Perm	
Protected Phases	4		8			2
Permitted Phases		Free		8	2	
Detector Phases	4		8	8	2	2
Minimum Initial (s)	4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	20.0		20.0	20.0	20.0	20.0
Total Split (s)	49.0	0.0	49.0	49.0	41.0	41.0
Total Split (%)	54.4%	0.0%	54.4%	54.4%	45.6%	45.6%
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5		0.5	0.5	0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		None	None	C-Min	C-Min
Act Effct Green (s)	30.9	90.0	30.9	30.9	51.1	51.1
Actuated g/C Ratio	0.34	1.00	0.34	0.34	0.57	0.57
v/c Ratio	0.52	0.37	0.82	0.28	0.34	0.38
Control Delay	6.8	2.2	32.9	11.8	13.4	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	2.2	32.9	11.8	13.4	6.5
LOS	A	A	C	B	B	A
Approach Delay	4.7		30.2			9.6
Approach LOS	A		C			A

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 51.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Pala Rd (SR-76) & I-15 NB Ramps



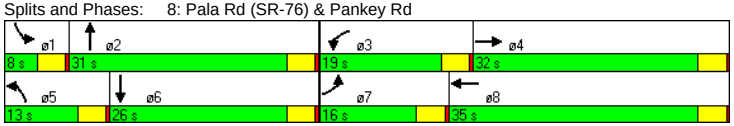
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0	4.0				
Lane Util. Factor		0.95	1.00		0.95	1.00	0.95	0.95				
Frt		1.00	0.85		1.00	0.85	1.00	0.85				
Flt Protected		1.00	1.00		1.00	1.00	0.95	1.00				
Satd. Flow (prot)		3539	1417		3539	1417	1504	1504				
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00				
Satd. Flow (perm)		3539	1417		3539	1417	1504	1504				
Volume (vph)	0	600	500	0	950	139	277	0	340	0	0	0
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	632	526	0	1000	146	292	0	358	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	44	0	90	0	0	0	0
Lane Group Flow (vph)	0	632	526	0	1000	102	292	268	0	0	0	0
Turn Type			Free			Perm	Perm					
Protected Phases		4			8			2				
Permitted Phases			Free			8	2					
Actuated Green, G (s)		30.9	90.0		30.9	30.9	51.1	51.1				
Effective Green, g (s)		30.9	90.0		30.9	30.9	51.1	51.1				
Actuated g/C Ratio		0.34	1.00		0.34	0.34	0.57	0.57				
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)		1215	1417		1215	487	854	854				
v/s Ratio Prot		0.18			c0.28							
v/s Ratio Perm			c0.37			0.07	0.19	0.18				
v/c Ratio		0.52	0.37		0.82	0.21	0.34	0.31				
Uniform Delay, d1		23.6	0.0		27.0	20.9	10.4	10.2				
Progression Factor		0.25	1.00		1.00	1.00	1.00	1.00				
Incremental Delay, d2		0.3	0.5		4.6	0.2	1.1	1.0				
Delay (s)		6.2	0.5		31.7	21.1	11.5	11.2				
Level of Service		A	A		C	C	B	B				
Approach Delay (s)		3.6			30.3			11.3			0.0	
Approach LOS		A			C			B			A	

Intersection Summary					
HCM Average Control Delay	15.7	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.53				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		4.0	
Intersection Capacity Utilization	51.0%	ICU Level of Service		A	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	140	670	195	920	110	256	26	187
Turn Type	Prot		Prot		Prot		Prot	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases								
Detector Phases	7	4	3	8	5	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	16.0	32.0	19.0	35.0	13.0	31.0	8.0	26.0
Total Split (%)	17.8%	35.6%	21.1%	38.9%	14.4%	34.4%	8.9%	28.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	None	Min
Act Effct Green (s)	10.6	24.8	13.1	26.8	8.8	24.0	4.5	17.5
Actuated g/C Ratio	0.14	0.34	0.17	0.36	0.12	0.32	0.06	0.24
v/c Ratio	0.66	0.74	0.75	0.82	0.63	0.75	0.30	0.59
Control Delay	52.0	28.2	52.6	30.3	55.2	32.9	50.7	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	28.2	52.6	30.3	55.2	32.9	50.7	34.0
LOS	D	C	D	C	E	C	D	C
Approach Delay		31.7		33.9		37.5		35.5
Approach LOS		C		C		D		D

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 73.9			
Natural Cycle: 75			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 34.0		Intersection LOS: C	
Intersection Capacity Utilization 76.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 8: Pala Rd (SR-76) & Pankey Rd



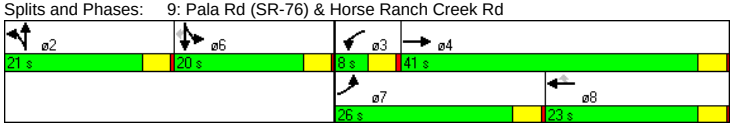
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1583	3440		1583	3498		1583	1752		1583	1795	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1583	3440		1583	3498		1583	1752		1583	1795	
Volume (vph)	140	670	154	195	920	77	110	256	168	26	187	60
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	705	162	205	968	81	116	269	177	27	197	63
RTOR Reduction (vph)	0	22	0	0	6	0	0	26	0	0	13	0
Lane Group Flow (vph)	147	845	0	205	1043	0	116	420	0	27	247	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.1	24.8		10.2	26.9		6.3	24.0		1.3	19.0	
Effective Green, g (s)	8.1	24.8		10.2	26.9		6.3	24.0		1.3	19.0	
Actuated g/C Ratio	0.11	0.33		0.13	0.35		0.08	0.31		0.02	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	168	1118		212	1233		131	551		27	447	
v/s Ratio Prot	0.09	0.25		c0.13	c0.30		c0.07	c0.24		0.02	0.14	
v/s Ratio Perm												
v/c Ratio	0.88	0.76		0.97	0.85		0.89	0.76		1.00	0.55	
Uniform Delay, d1	33.6	23.0		32.9	22.8		34.6	23.6		37.5	25.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.2	3.0		51.8	5.5		45.6	6.2		173.2	1.5	
Delay (s)	69.8	26.0		84.7	28.3		80.2	29.8		210.7	26.4	
Level of Service	E	C		F	C		F	C		F	C	
Approach Delay (s)		32.4			37.5			40.2			43.8	
Approach LOS		C			D			D			D	

Intersection Summary					
HCM Average Control Delay	36.9	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	76.3	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	76.9%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBT	WBR	SBL	SBT	SBR	ø2	ø3
Lane Configurations									
Volume (vph)	452	440	800	80	70	0	390		
Turn Type	Prot			Perm	Split		Perm		
Protected Phases	7	4	8		6	6		2	3
Permitted Phases				8			6		
Detector Phases	7	4	8	8	6	6	6		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	8.0
Total Split (s)	26.0	41.0	23.0	23.0	20.0	20.0	20.0	21.0	8.0
Total Split (%)	28.9%	45.6%	25.6%	25.6%	22.2%	22.2%	22.2%	23%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lag	Lag					Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					Yes
Recall Mode	None	None	None	None	Min	Min	Min	Min	None
Act Effct Green (s)	22.0	45.1	19.0	19.0	9.1	9.1	9.1		
Actuated g/C Ratio	0.31	0.63	0.26	0.26	0.13	0.13	0.13		
v/c Ratio	0.98	0.21	0.90	0.19	0.33	0.60	0.59		
Control Delay	64.1	6.4	40.4	7.2	32.7	12.9	12.1		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.1	6.4	40.4	7.2	32.7	12.9	12.1		
LOS	E	A	D	A	C	B	B		
Approach Delay		35.7	37.4			15.1			
Approach LOS		D	D			B			

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 71.7			
Natural Cycle: 100			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 32.1		Intersection LOS: C	
Intersection Capacity Utilization 66.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 9: Pala Rd (SR-76) & Horse Ranch Creek Rd



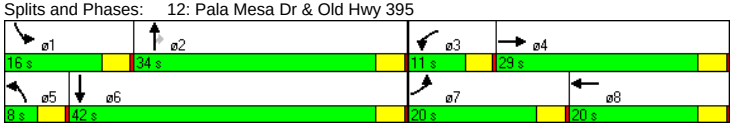
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.95	0.91	0.95
Frt	1.00	1.00			1.00	0.85				1.00	0.86	0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	1583	3539			3539	1417				1504	1451	1346
Flt Permitted	0.95	1.00			1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	1583	3539			3539	1417				1504	1451	1346
Volume (vph)	452	440	0	0	800	80	0	0	0	70	0	390
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	476	463	0	0	842	84	0	0	0	74	0	411
RTOR Reduction (vph)	0	0	0	0	0	62	0	0	0	0	179	180
Lane Group Flow (vph)	476	463	0	0	842	22	0	0	0	62	38	26
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases						8						6
Actuated Green, G (s)	22.0	45.1			19.1	19.1				9.1	9.1	9.1
Effective Green, g (s)	22.0	45.1			19.1	19.1				9.1	9.1	9.1
Actuated g/C Ratio	0.31	0.63			0.27	0.27				0.13	0.13	0.13
Clearance Time (s)	4.0	4.0			4.0	4.0				4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0				3.0	3.0	3.0
Lane Grp Cap (vph)	486	2226			943	377				191	184	171
v/s Ratio Prot	c0.30	0.13			c0.24					c0.04	0.03	
v/s Ratio Perm						0.02						0.02
v/c Ratio	0.98	0.21			0.89	0.06				0.32	0.21	0.15
Uniform Delay, d1	24.6	5.7			25.3	19.6				28.5	28.1	27.9
Progression Factor	1.00	1.00			1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	35.1	0.0			10.7	0.1				1.0	0.6	0.4
Delay (s)	59.7	5.7			36.0	19.7				29.5	28.6	28.3
Level of Service	E	A			D	B				C	C	C
Approach Delay (s)		33.1			34.6			0.0			28.6	
Approach LOS		C			C			A			C	

Intersection Summary					
HCM Average Control Delay	32.7	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.83				
Actuated Cycle Length (s)	71.7	Sum of lost time (s)		21.5	
Intersection Capacity Utilization	66.0%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	250	124	114	65	52	368	121	139	717
Turn Type	Prot		Prot		Prot		Perm	Prot	
Protected Phases	7	4	3	8	5	2		1	6
Permitted Phases							2		
Detector Phases	7	4	3	8	5	2	2	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0	8.0	20.0	8.0	20.0	20.0	8.0	20.0
Total Split (s)	20.0	29.0	11.0	20.0	8.0	34.0	34.0	16.0	42.0
Total Split (%)	22.2%	32.2%	12.2%	22.2%	8.9%	37.8%	37.8%	17.8%	46.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	17.8	20.2	7.2	12.2	4.0	31.3	31.3	10.8	37.1
Actuated g/C Ratio	0.21	0.24	0.09	0.14	0.05	0.38	0.38	0.13	0.45
v/c Ratio	0.77	0.88	0.88	0.49	0.72	0.58	0.22	0.73	0.94
Control Delay	52.2	41.2	93.4	27.4	91.8	27.7	5.3	58.6	44.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	41.2	93.4	27.4	91.8	27.7	5.3	58.6	44.5
LOS	D	D	F	C	F	C	A	E	D
Approach Delay		45.2		57.4		28.9			46.8
Approach LOS		D		E		C			D

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 82.8			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 43.3		Intersection LOS: D	
Intersection Capacity Utilization 87.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 12: Pala Mesa Dr & Old Hwy 395



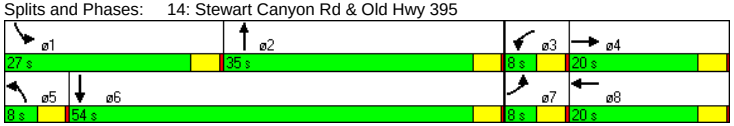
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	0.95	1.00	1.00	
Frt	1.00	0.89		1.00	0.92		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1665		1583	1715		1583	1770	1346	1583	1854	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1665		1583	1715		1583	1770	1346	1583	1854	
Volume (vph)	250	124	300	114	65	72	52	368	121	139	717	24
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	263	131	316	120	68	76	55	387	127	146	755	25
RTOR Reduction (vph)	0	100	0	0	47	0	0	0	80	0	1	0
Lane Group Flow (vph)	263	347	0	120	97	0	55	387	47	146	779	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	17.8	21.2		7.2	10.6		3.0	31.3	31.3	8.9	37.2	
Effective Green, g (s)	17.8	21.2		7.2	10.6		3.0	31.3	31.3	8.9	37.2	
Actuated g/C Ratio	0.21	0.25		0.09	0.13		0.04	0.37	0.37	0.11	0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	333	417		135	215		56	655	498	167	815	
v/s Ratio Prot	c0.17	c0.21		0.08	0.06		0.03	0.22		c0.09	c0.42	
v/s Ratio Perm									0.03			
v/c Ratio	0.79	0.83		0.89	0.45		0.98	0.59	0.09	0.87	0.96	
Uniform Delay, d1	31.6	30.0		38.3	34.3		40.8	21.5	17.4	37.3	22.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.8	13.2		45.2	1.5		113.3	1.4	0.1	36.2	21.2	
Delay (s)	43.4	43.2		83.5	35.8		154.1	22.9	17.5	73.5	44.1	
Level of Service	D	D		F	D		F	C	B	E	D	
Approach Delay (s)		43.3			57.5			34.4			48.8	
Approach LOS		D			E			C			D	

Intersection Summary					
HCM Average Control Delay	44.8	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.85				
Actuated Cycle Length (s)	84.6	Sum of lost time (s)	8.0		
Intersection Capacity Utilization	87.9%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø7
Lane Configurations								
Volume (vph)	14	23	3	8	404	307	1003	
Turn Type		Prot		Prot		Prot		
Protected Phases	4	3	8	5	2	1	6	7
Permitted Phases								
Detector Phases	4	3	8	5	2	1	6	
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	8.0	20.0	8.0	20.0	8.0
Total Split (s)	20.0	8.0	20.0	8.0	35.0	27.0	54.0	8.0
Total Split (%)	22.2%	8.9%	22.2%	8.9%	38.9%	30.0%	60.0%	9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	Min	None	Min	None
Act Effct Green (s)	0.0	4.0	19.0	4.0	29.4	19.5	51.5	
Actuated g/C Ratio	0.00	0.05	0.24	0.05	0.37	0.24	0.64	
v/c Ratio	2.00	0.32	0.49	0.11	0.65	0.84	0.91	
Control Delay	550.1	52.1	6.6	45.0	27.8	49.5	27.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	550.1	52.1	6.6	45.0	27.8	49.5	27.2	
LOS	F	D	A	D	C	D	C	
Approach Delay	550.1		10.0		28.2		32.3	
Approach LOS	F		B		C		C	

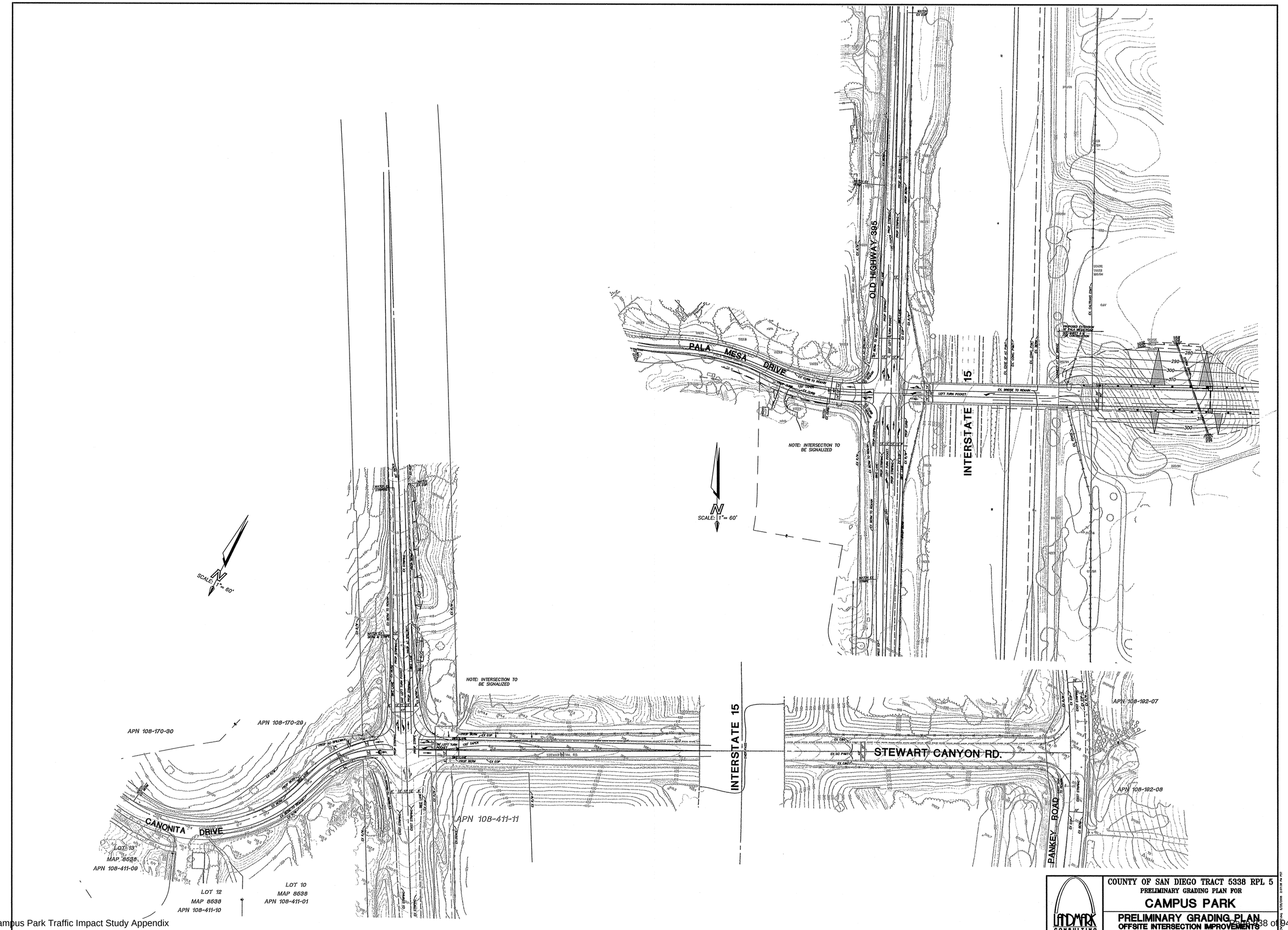
Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 80			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 2.00			
Intersection Signal Delay: 45.4		Intersection LOS: D	
Intersection Capacity Utilization 90.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 14: Stewart Canyon Rd & Old Hwy 395



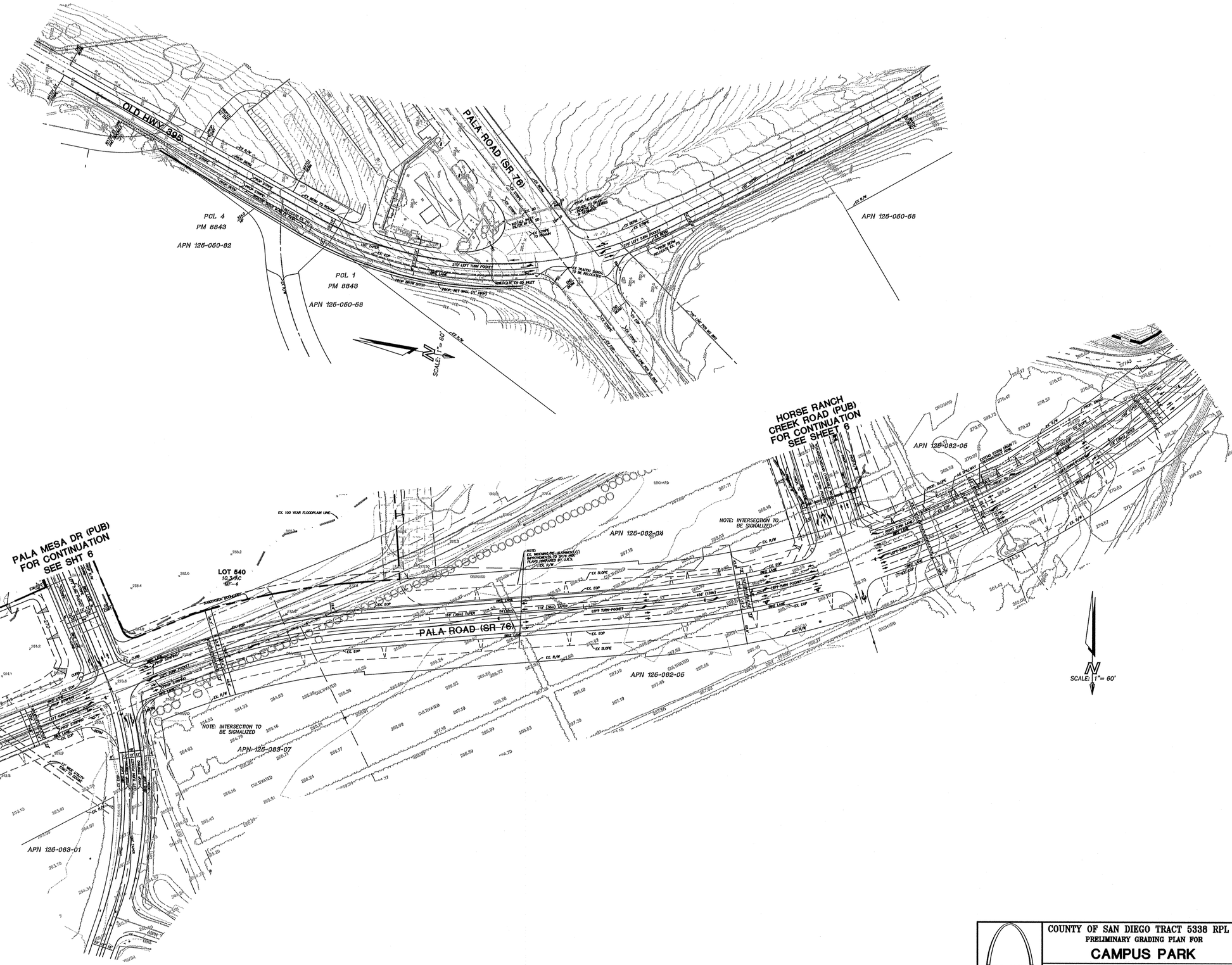
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1700	1900	1700	1700	1900	1700	1700	1900	1700	1700	1900	1700
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	1.00	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1712		1583	1586		1583	1852		1583	1855	
Flt Permitted		0.86		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1494		1583	1586		1583	1852		1583	1855	
Volume (vph)	21	14	35	23	3	275	8	404	16	307	1003	29
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	15	37	24	3	289	8	425	17	323	1056	31
RTOR Reduction (vph)	0	30	0	0	216	0	0	1	0	0	1	0
Lane Group Flow (vph)	0	44	0	24	76	0	8	441	0	323	1086	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		16.1		1.4	21.5		0.7	32.7		19.5	51.5	
Effective Green, g (s)		16.1		1.4	21.5		0.7	32.7		19.5	51.5	
Actuated g/C Ratio		0.19		0.02	0.25		0.01	0.38		0.23	0.60	
Clearance Time (s)		4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		281		26	398		13	707		360	1115	
v/s Ratio Prot				c0.02	c0.05		0.01	0.24		c0.20	c0.59	
v/s Ratio Perm		0.03										
v/c Ratio		0.16		0.92	0.19		0.62	0.62		0.90	0.97	
Uniform Delay, d1		29.1		42.1	25.2		42.4	21.5		32.1	16.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3		142.0	0.2		64.0	1.7		23.8	20.7	
Delay (s)		29.4		184.1	25.5		106.4	23.2		55.9	37.2	
Level of Service		C		F	C		F	C		E	D	
Approach Delay (s)		29.4			37.5			24.7			41.5	
Approach LOS		C			D			C			D	

Intersection Summary					
HCM Average Control Delay	37.2	HCM Level of Service	D		
HCM Volume to Capacity ratio	0.77				
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	90.7%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					



COUNTY OF SAN DIEGO TRACT 5338 RPL 5
PRELIMINARY GRADING PLAN FOR
CAMPUS PARK
PRELIMINARY GRADING PLAN
OFFSITE INTERSECTION IMPROVEMENTS
SHEET NO. 7 OF 12 SHEETS

LANDMARK CONSULTING
PLANNING • ENGINEERING • SURVEYING
9335 GENESEE AVE., SUITE 200
SAN DIEGO, CA 92121, (858)587-9270



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PRELIMINARY GRADING PLAN FOR
CAMPUS PARK
PRELIMINARY GRADING PLAN
OFFSITE INTERSECTION IMPROVEMENTS
SHEET NO. 8 OF 12 SHEETS

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PLANNING/ENGINEERING/SURVEYING
9325 SKYPARK AVE., SUITE 200
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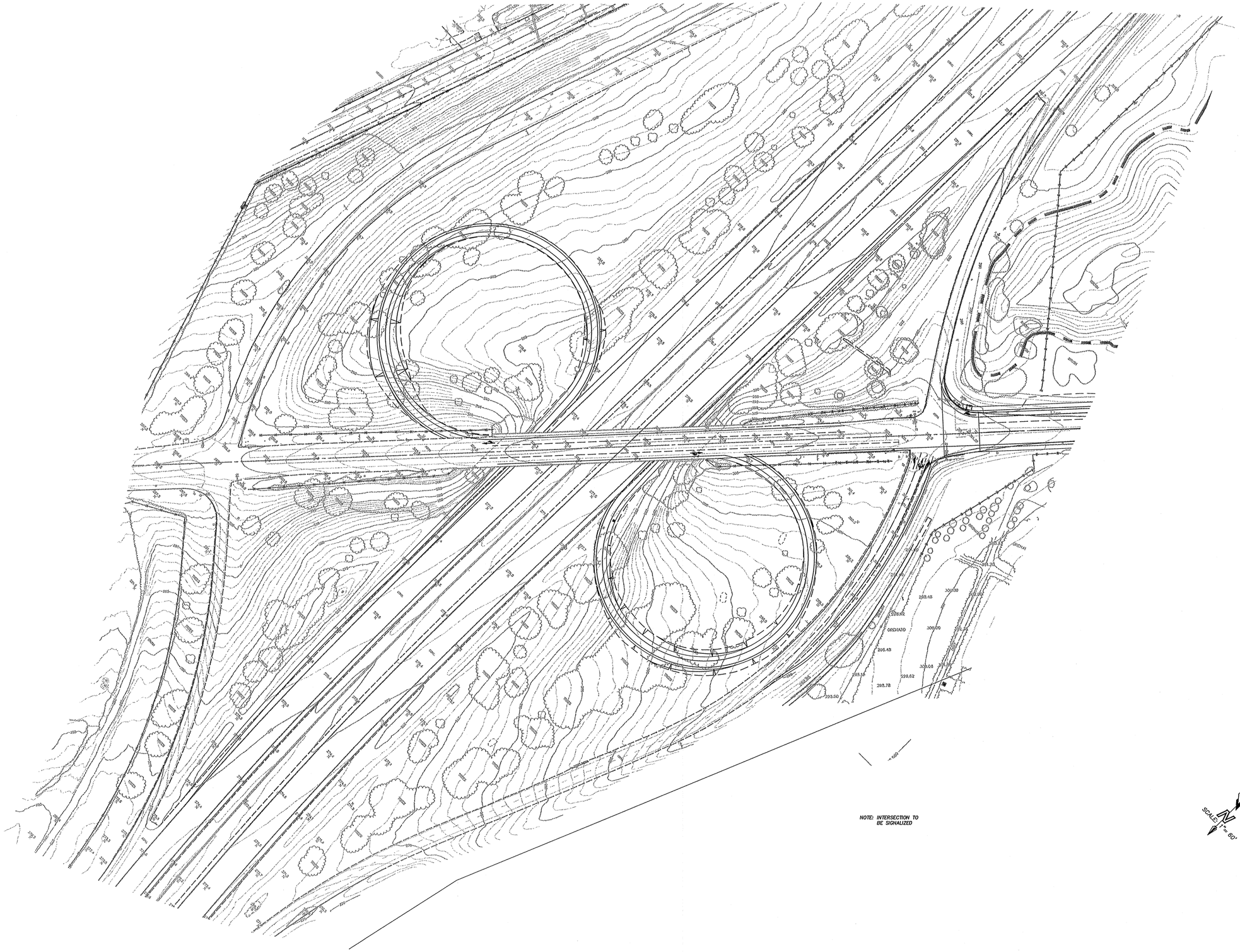

COUNTY OF SAN DIEGO TRACT 5338 RPL 5
PRELIMINARY GRADING PLAN FOR
CAMPUS PARK

PRELIMINARY GRADING PLAN
OFFSITE INTERSECTION IMPROVEMENTS

SHEET NO. 12 OF 12 SHEETS

LANDMARK CONSULTING
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