

APPENDIX H

NEAR TERM WITH PROJECT SYNCHRO WORKSHEETS

(PHASE 1)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	2	378	385	310	507	8	393	5	153	1	1	4
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.98	0.98
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.98	0.98
Satd. Flow (prot)	1770	1863	1583	1770	1858		1775	1583		1750		1750
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.98	0.98
Satd. Flow (perm)	1770	1863	1583	1770	1858		1775	1583		1750		1750
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	420	428	344	563	9	437	6	170	1	1	1
RTOR Reduction (vph)	0	0	234	0	0	0	0	0	121	0	1	0
Lane Group Flow (vph)	2	420	194	344	572	0	0	443	49	0	2	0
Turn Type	Prot	Prot	Prot	Prot	Split	Split	Prot	Split	Prot	Split	Split	Split
Protected Phases	7	4	4	3	8		2	2	2	6		6
Permitted Phases												
Actuated Green, G (s)	0.8	25.7	25.7	19.6	44.5		25.3	25.3	25.3			1.1
Effective Green, g (s)	0.8	25.7	25.7	19.6	44.5		25.3	25.3	25.3			1.1
Actuated g/C Ratio	0.01	0.29	0.29	0.22	0.51		0.29	0.29	0.29			0.01
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)	16	546	464	396	943		512	457				22
v/s Ratio Prot	0.00	c0.23	0.12	c0.19	0.31		c0.25	0.03				c0.00
v/s Ratio Perm												
v/c Ratio	0.12	0.77	0.42	0.67	0.61		0.87	0.11				0.09
Uniform Delay, d1	43.1	28.3	25.0	32.8	15.4		29.6	22.9				42.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00				1.00
Incremental Delay, d2	3.5	6.5	0.6	17.9	1.1		14.2	0.1				1.8
Delay (s)	46.6	34.7	25.6	50.7	16.5		43.8	23.0				44.6
Level of Service	D	C	C	D	B		D	C				D
Approach Delay (s)		30.2			29.3		38.0					44.6
Approach LOS		C			C		D					D

Intersection Summary												
HCM Average Control Delay						31.9			HCM Level of Service			C
HCM Volume to Capacity ratio						0.82						
Actuated Cycle Length (s)						87.7			Sum of lost time (s)		16.0	
Intersection Capacity Utilization						75.8%			ICU Level of Service		D	
Analysis Period (min)						15						
c Critical Lane Group												

Baseline

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4
Volume (vph)	406	308	199	286	289	439	439
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95
Satd. Flow (prot)	3433	1583	1863	1583	1770	3539	3539
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	1863	1583	1770	3539	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	451	342	0	221	318	321	488
RTOR Reduction (vph)	0	255	0	0	244	0	0
Lane Group Flow (vph)	451	87	0	221	74	321	488
Turn Type	Perm	Prot	Perm	Prot	Perm	Prot	Prot
Protected Phases	1	3	8		7		6
Permitted Phases							
Actuated Green, G (s)	13.0	13.0	12.0	12.0	14.3	13.0	13.0
Effective Green, g (s)	13.0	13.0	12.0	12.0	14.3	13.0	13.0
Actuated g/C Ratio	0.25	0.25	0.23	0.23	0.28	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)	870	401	436	370	493	897	897
v/s Ratio Prot	0.13		c0.12		c0.18		c0.14
v/s Ratio Perm		0.05		0.20	0.65		0.54
v/c Ratio	0.52	0.22	0.51	0.20	0.65	0.54	0.54
Uniform Delay, d1	16.5	15.1	17.1	15.8	16.3	16.6	16.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3	0.9	0.3	3.1	0.7	0.7
Delay (s)	17.0	15.4	18.0	16.1	19.4	17.3	17.3
Level of Service	B	B	B	B	B	B	B
Approach Delay (s)		16.3		16.9		18.1	
Approach LOS		B		B		B	

Intersection Summary												
HCM Average Control Delay						17.1			HCM Level of Service			B
HCM Volume to Capacity ratio						0.57						
Actuated Cycle Length (s)						51.3			Sum of lost time (s)		12.0	
Intersection Capacity Utilization						48.1%			ICU Level of Service		A	
Analysis Period (min)						15						
c Critical Lane Group												

Baseline

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	EBL	EBT	EBR	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Volume (vph)	87	7	0	461	52	3	854	24	114	20	64	84	153	6	314	14	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.99	0.98	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Flt Protected	0.96	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)	3415	3485	3485	3485	3485	1770	3539	1770	1821	1770	1770	1682	1770	3516	1770	3469	1770
Flt Permitted	0.96	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3415	3485	3485	3485	3485	1770	3539	1770	1821	1770	1770	1682	1770	3516	1770	3469	1770
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	97	8	0	512	58	3	949	27	127	22	71	93	170	7	349	16	183
RTOR Reduction (vph)	7	0	0	13	0	0	0	0	11	0	0	113	0	0	6	0	17
Lane Group Flow (vph)	98	0	0	557	0	3	949	27	138	0	71	150	0	7	359	0	183
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	8	5	2	1	6												
Permitted Phases	3.2	15.1	0.6	19.7				0.7	10.7	2.3	12.3	0.7	14.0			6.4	19.7
Actuated Green, G (s)	3.2	15.1	0.6	19.7				0.7	10.7	2.3	12.3	0.7	14.0			6.4	19.7
Effective Green, g (s)	0.10	0.49	0.02	0.64				0.01	0.22	0.05	0.25	0.01	0.28			0.13	0.40
Actuated g/C Ratio	4.0	4.0	4.0	4.0				4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Clearance Time (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
Vehicle Extension (s)	354	1703	34	2256				25	394	82	419	25	996			229	1383
Lane Grp Cap (vph)	c0.03	0.16	0.00	c0.27				0.02	0.08	c0.04	c0.09	0.00	0.10			c0.10	c0.25
v/s Ratio Prot	0.28	0.33	0.09	0.42				1.08	0.35	0.87	0.36	0.28	0.36			0.80	0.64
Uniform Delay, d1	12.8	4.8	14.9	2.8				24.4	16.4	23.4	15.3	24.1	14.1			20.9	12.0
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	0.4	0.1	1.1	0.1				205.9	0.5	56.7	0.5	6.0	0.2			17.5	1.0
Delay (s)	13.2	4.9	16.0	2.9				230.3	16.9	80.1	15.8	30.1	14.4			38.3	12.9
Level of Service	B	A	B	A				F	B	F	B	C	B			D	B
Approach Delay (s)	13.2	4.9	2.9	2.9				49.7	29.5	29.5	14.6	14.6	17.2			17.2	17.2
Approach LOS	B	A	A	A				D	D	C	C	C	B			B	B
Intersection Summary																	
HCM Average Control Delay																	
HCM Volume to Capacity ratio																	
Actuated Cycle Length (s)																	
Intersection Capacity Utilization																	
Analysis Period (min)																	
c Critical Lane Group																	

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Baseline	Synchro 7 - Report Page 4
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HCM Signalized Intersection Capacity Analysis
5: Quarter Mile Road & El Camino Real

HCM Signalized Intersection Capacity Analysis
6: Del Mar Heights Road & Mango Drive

Near Term + Project (Phase 1) AM
3/2/2012

Near Term + Project (Phase 1) AM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SEB	SEB	SEB
Lane Configurations	5	85	72	95	141	37	41	333	55	42	788	7
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1805	1770	3464	1770	3464	1770	3534	3534
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1805	1770	3464	1770	3464	1770	3534	3534
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	94	80	106	157	41	46	370	81	47	876	8
RTOR Reduction (vph)	0	0	65	0	17	0	0	19	0	0	1	0
Lane Group Flow (vph)	6	94	15	106	181	0	46	412	0	47	883	0
Turn Type	Prot	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4	4	3	8	5	2	2	2	1	6	6
Permitted Phases	4											
Actuated Green, G (s)	0.6	8.7	8.7	3.5	11.6	1.3	18.1	1.3	18.1	1.3	18.1	18.1
Effective Green, g (s)	0.6	8.7	8.7	3.5	11.6	1.3	18.1	1.3	18.1	1.3	18.1	18.1
Actuated g/C Ratio	0.01	0.18	0.18	0.07	0.24	0.03	0.38	0.03	0.38	0.03	0.38	0.38
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)	22	341	289	130	440	48	1317	48	1344	48	1344	1344
v/s Ratio Prot	0.00	0.05	0.01	c0.06	c0.10	0.03	0.12	c0.03	c0.25	c0.03	c0.25	c0.25
v/s Ratio Perm												
v/c Ratio	0.27	0.28	0.05	0.82	0.41	0.96	0.31	0.98	0.66	0.98	0.66	0.66
Uniform Delay, d1	23.3	16.7	16.0	21.7	15.1	23.1	10.4	23.1	12.2	23.1	12.2	12.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	0.4	0.1	31.0	0.6	113.0	0.1	120.8	1.2	120.8	1.2	1.2
Delay (s)	29.9	17.2	16.1	52.7	15.8	136.1	10.5	144.0	13.4	144.0	13.4	13.4
Level of Service	C	B	B	D	B	F	B	F	B	F	B	B
Approach Delay (s)	17.1			28.7			22.6				19.9	
Approach LOS	B			C			C				B	
Intersection Summary												
HCM Average Control Delay			21.8				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			47.6				Sum of lost time (s)				16.0	
Intersection Capacity Utilization			47.3%				ICU Level of Service				A	
Analysis Period (min)			15									
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SEB	SEB	SEB
Lane Configurations	96	873	24	87	879	200	70	58	78	451	23	84
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5065	1770	3441	1770	3441	1813	1583	1681	1639	1639	1639
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5065	1770	3441	1770	3441	1813	1583	1681	1639	1639	1639
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	107	970	27	97	977	222	78	64	87	501	26	93
RTOR Reduction (vph)	0	3	0	0	21	0	0	0	75	0	17	0
Lane Group Flow (vph)	107	994	0	97	1178	0	0	142	12	316	287	0
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Split	Split	Prot	Split	Split	Split
Protected Phases	7	4	4	3	8	2	2	2	2	6	6	6
Permitted Phases												
Actuated Green, G (s)	6.6	30.9	7.7	7.7	32.0	11.8	11.8	11.8	11.8	18.1	18.1	18.1
Effective Green, g (s)	6.6	30.9	7.7	7.7	32.0	11.8	11.8	11.8	11.8	18.1	18.1	18.1
Actuated g/C Ratio	0.08	0.37	0.09	0.09	0.38	0.14	0.14	0.14	0.14	0.21	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	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)	138	1852	161	1303	1303	253	221	360	351	360	351	351
v/s Ratio Prot	c0.06	0.20	0.05	c0.34	c0.34	c0.08	0.01	c0.19	0.17	c0.19	0.17	0.17
v/s Ratio Perm												
v/c Ratio	0.78	0.54	0.60	0.90	0.90	0.56	0.05	0.88	0.82	0.88	0.82	0.82
Uniform Delay, d1	38.2	21.2	36.9	24.8	24.8	33.9	31.5	32.1	31.6	32.1	31.6	31.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.3	0.3	6.2	9.1	9.1	2.8	0.1	20.7	13.7	20.7	13.7	13.7
Delay (s)	61.6	21.5	43.2	33.9	33.9	36.8	31.6	52.8	45.3	52.8	45.3	45.3
Level of Service	E	C	D	C	C	D	C	D	D	D	D	D
Approach Delay (s)	25.3			34.6			34.8			49.1		
Approach LOS	C			C			C			D		
Intersection Summary												
HCM Average Control Delay			34.2				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			84.5				Sum of lost time (s)				12.0	
Intersection Capacity Utilization			68.3%				ICU Level of Service				C	
Analysis Period (min)			15									
c Critical Lane Group												

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Volume (veh/h)	1430	55	0	1382	0	133
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1589	61	0	1535	0	148
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	575			607		
pX, platoon unblocked			0.87		0.91	0.87
vC, conflicting volume			1650		2387	560
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1205		1430	0
IC, single (s)			4.1		5.8	6.9
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			100		100	84
cM capacity (veh/h)			487		114	938
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	636	636	379	768	768	148
Volume Left	0	0	0	0	0	0
Volume Right	0	0	61	0	0	148
cSH	1700	1700	1700	1700	1700	938
Volume to Capacity	0.37	0.37	0.22	0.45	0.45	0.16
Queue Length 95th (ft)	0	0	0	0	0	14
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.6
Lane LOS						A
Approach Delay (s)	0.0			0.0		9.6
Approach LOS						A
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			43.8%			ICU Level of Service
Analysis Period (min)			15			A

[illegible]

HCM Signalized Intersection Capacity Analysis
9: Del Mar Heights Road & I-15 NB Ramps

Near Term + Project (Phase 1) AM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3433	3539	3539	3433	3539	3539	3433	3539	3539	3433	3539	3539
Volume (vph)	231	1463	0	0	1506	930	384	59	1052	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.97	0.95	0.95	0.91	1.00	0.95	0.91	0.95	0.95	0.95	0.95	0.95
Flt	1.00	1.00	1.00	1.00	1.00	0.85	1.00	0.88	0.85	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539	3539	3433	3539	3539	3433	3539	3539	3433	3539	3539
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539	3539	3433	3539	3539	3433	3539	3539	3433	3539	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	257	1626	0	0	1673	1033	427	66	1169	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	455	0	7	0	0	0	0
Lane Group Flow (vph)	257	1626	0	0	1673	578	384	640	624	0	0	0
Turn Type	Prot	5	2	6	6	6	8	8	8	Prot	8	8
Protected Phases												
Permitted Phases												
Actuated Green, G (s)	9.8	59.0		45.2	45.2	45.2	53.0	53.0	53.0	53.0		
Effective Green, g (s)	9.8	59.0		45.2	45.2	45.2	53.0	53.0	53.0	53.0		
Actuated g/C Ratio	0.08	0.49		0.38	0.38	0.38	0.44	0.44	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		
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)	280	1740		1915	596	742	653	664				
v/s Ratio Prot	0.07	c0.46		0.33	0.37	0.23	c0.43	0.42				
v/s Ratio Perm												
v/c Ratio	0.92	0.93		0.87	0.97	0.52	0.98	0.94				
Uniform Delay, d1	54.7	28.7		34.7	36.7	24.2	33.0	32.0				
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00				
Incremental Delay, d2	32.6	10.8		5.9	30.1	0.6	30.2	21.4				
Delay (s)	87.4	39.5		40.6	66.9	24.9	63.2	53.4				
Level of Service	F	D		D	E	C	E	D				
Approach Delay (s)		46.0		50.6			50.6			0.0		
Approach LOS		D		D			D			A		
Intersection Summary												
HCM Average Control Delay				48.2						D		
HCM Volume to Capacity ratio				0.96								
Actuated Cycle Length (s)				120.0						8.0		
Intersection Capacity Utilization				97.1%						F		
Analysis Period (min)				15								
c Critical Lane Group												

Baseline

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis
10: Del Mar Heights Road & High Bluff Drive

Near Term + Project (Phase 1) AM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	3433	3539	3539	3433	3539	3539	3433	3539	3539	3433	3539	3539
Volume (vph)	111	1701	694	99	1913	65	201	10	36	104	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	0.91	0.97	0.95	1.00	0.95	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	1.00	0.88	1.00	0.85	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5085	1770	5085	1770	1583	1770	5085	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5085	1770	5085	1770	1583	1770	5085	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	123	1890	771	110	2126	72	223	11	40	116	66	347
RTOR Reduction (vph)	0	0	394	0	4	0	0	35	0	0	0	134
Lane Group Flow (vph)	123	1890	407	110	2184	0	223	16	0	116	66	213
Turn Type	Prot	7	4	4	3	8	5	2	2	1	6	6
Protected Phases												
Permitted Phases												
Actuated Green, G (s)	8.0	42.1	42.1	6.9	41.0	7.0	10.6	10.6	10.6	13.0	16.6	16.6
Effective Green, g (s)	8.0	42.1	42.1	6.9	41.0	7.0	10.6	10.6	10.6	13.0	16.6	16.6
Actuated g/C Ratio	0.09	0.48	0.48	0.08	0.46	0.08	0.12	0.12	0.12	0.15	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)	160	2416	752	138	2342	271	374	374	280	349	297	
v/s Ratio Prot	c0.07	0.37	0.26	0.06	c0.43	c0.06	0.01	0.01	0.07	0.04	c0.13	
v/s Ratio Perm												
v/c Ratio	0.77	0.78	0.54	0.80	0.94	0.82	0.04	0.04	0.45	0.19	0.72	
Uniform Delay, d1	39.4	19.4	16.4	40.2	22.6	40.2	34.5	34.5	34.5	30.3	33.8	
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	19.6	1.7	0.8	26.5	7.9	17.9	0.0	0.0	1.2	0.3	8.0	
Delay (s)	59.0	21.1	17.2	66.6	30.5	58.1	34.6	34.6	35.7	30.6	41.8	
Level of Service	E	C	B	E	C	E	C	C	D	C	D	
Approach Delay (s)		21.7			32.2		53.7			39.1		
Approach LOS		C			C		D			D		
Intersection Summary												
HCM Average Control Delay				28.9						C		
HCM Volume to Capacity ratio				0.96								
Actuated Cycle Length (s)				88.6						16.0		
Intersection Capacity Utilization				73.5%						D		
Analysis Period (min)				15								
c Critical Lane Group												

Baseline

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Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	AAA	A	AAA	AAA	AAA	A	
Volume (vph)	1843	192	115	2077	31	19	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00	
Fr	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)	5085	1583	1770	5085	3433	1583	
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	5085	1583	1770	5085	3433	1583	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	2048	213	128	2308	34	21	
RTOR Reduction (vph)	0	86	0	0	0	20	
Lane Group Flow (vph)	2048	127	128	2308	34	1	
Turn Type	Prot	Prot	Prot	Prot	Perm	Perm	
Protected Phases	4	4	3	8	2	2	
Permitted Phases							
Actuated Green, G (s)	30.6	30.6	5.3	39.9	3.4	3.4	
Effective Green, g (s)	30.6	30.6	5.3	39.9	3.4	3.4	
Actuated g/C Ratio	0.60	0.60	0.10	0.78	0.07	0.07	
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)	3033	944	183	3955	228	105	
v/s Ratio Prot	c0.40	0.08	0.07	c0.45	c0.01	0.00	
v/s Ratio Perm							
v/c Ratio	0.68	0.13	0.70	0.58	0.15	0.01	
Uniform Delay, d1	7.0	4.5	22.2	2.3	22.6	22.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.1	11.1	0.2	0.3	0.1	
Delay (s)	7.6	4.6	33.3	2.5	22.9	22.4	
Level of Service	A	A	C	A	C	C	
Approach Delay (s)	7.3			4.2	22.7		
Approach LOS	A			A	C		
Intersection Summary							
HCM Average Control Delay			5.9				
HCM Volume to Capacity ratio			0.64				
Actuated Cycle Length (s)			51.3				
Intersection Capacity Utilization			55.3%				
Analysis Period (min)			15				
c - Critical Lane Group							

Baseline

Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	AAA	A	AAA	AAA	AAA	A	
Volume (vph)	1708	154	77	2167	25	13	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	1.00	
Fr	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)	5085	1583	3433	5085	1770	1583	
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	5085	1583	3433	5085	1770	1583	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	1898	171	86	2408	28	14	
RTOR Reduction (vph)	0	61	0	0	0	13	
Lane Group Flow (vph)	1898	110	86	2408	28	1	
Turn Type	Prot	Prot	Prot	Prot	Perm	Perm	
Protected Phases	4	4	3	8	2	2	
Permitted Phases							
Actuated Green, G (s)	30.9	30.9	2.5	37.4	2.5	2.5	
Effective Green, g (s)	30.9	30.9	2.5	37.4	2.5	2.5	
Actuated g/C Ratio	0.65	0.65	0.05	0.78	0.05	0.05	
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)	3280	1021	179	3970	92	83	
v/s Ratio Prot	0.37	0.07	0.03	c0.47	c0.02	0.00	
v/s Ratio Perm							
v/c Ratio	0.58	0.11	0.48	0.61	0.30	0.01	
Uniform Delay, d1	4.8	3.2	22.1	2.2	21.9	21.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.0	2.0	0.3	1.9	0.0	
Delay (s)	5.1	3.3	24.1	2.5	23.7	21.6	
Level of Service	A	A	C	A	C	C	
Approach Delay (s)	4.9			3.2	23.0		
Approach LOS	A			A	C		
Intersection Summary							
HCM Average Control Delay			4.2				
HCM Volume to Capacity ratio			0.59				
Actuated Cycle Length (s)			47.9				
Intersection Capacity Utilization			51.9%				
Analysis Period (min)			15				
c - Critical Lane Group							

Baseline

HCM Signalized Intersection Capacity Analysis 13: Del Mar Heights Road & El Camino Real

Near Term + Project (Phase 1) AM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	224	921	388	298	1534	95	248	108	88	184	335	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.97	0.91	0.97	0.97	0.91	0.97	0.91	0.97	0.91	0.97	0.91	0.91
Flt	1.00	0.96	1.00	1.00	0.96	1.00	0.96	1.00	0.96	1.00	0.96	0.96
Flt Protected	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95
Satd. Flow (prot)	3433	4859	3433	3433	5041	3433	5085	1553	3433	4652	3433	4652
Satd. Flow (perm)	3433	4859	3433	3433	5041	3433	5085	1553	3433	4652	3433	4652
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	249	1023	431	331	1704	106	276	120	98	182	372	489
RTOR Reduction (vph)	0	93	0	0	9	0	0	0	0	75	0	155
Lane Group Flow (vph)	249	1361	0	331	1801	0	276	120	23	182	706	0
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Perm	Perm	Prot	Prot	Prot
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases	7.1	26.8	10.3	30.0	8.0	18.6	18.6	6.6	17.2			
Effective Green, G (s)	7.1	26.8	10.3	30.0	8.0	18.6	18.6	6.6	17.2			
Effective Green, g (s)	0.09	0.34	0.13	0.38	0.10	0.24	0.24	0.08	0.22			
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Vehicle Extension (s)	311	1653	452	1931	351	1208	376	289	1022			
Lane Grp Cap (vph)	0.07	0.28	c0.10	c0.36	c0.08	0.02	0.05	c0.15				
v/s Ratio Prot	0.80	0.82	0.73	0.93	0.79	0.10	0.06	0.63	0.97dr			
v/s Ratio Perm	34.9	23.5	32.7	23.2	34.3	23.3	23.1	34.7	28.1			
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Progression Factor	6.0	8.9	11.0	0.0	0.1	4.3	2.0					
Incremental Delay, d2	13.7	3.3	38.7	32.1	45.4	23.3	23.2	38.9	30.1			
Delay (s)	48.6	26.8	D	C	D	C	C	D	C			
Level of Service	D	C	D	C	D	C	C	D	C			
Approach Delay (s)	30.0		33.1		35.6		31.7					
Approach LOS	C		C		D		C					
Intersection Summary												
HCM Average Control Delay	32.1											
HCM Volume to Capacity ratio	0.84											
Actuated Cycle Length (s)	78.3											
Intersection Capacity Utilization	74.9%											
Analysis Period (min)	15											
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

Baseline

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis 14: Del Mar Heights Road & Carmel Country Rd.

Near Term + Project (Phase 1) AM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	147	625	288	280	1241	174	423	188	111	146	185	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.97	0.91	0.97	0.97	0.91	0.97	0.91	0.97	0.91	0.97	0.91	0.95
Flt	1.00	0.96	1.00	1.00	0.96	1.00	0.96	1.00	0.96	1.00	0.96	0.96
Flt Protected	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95
Satd. Flow (prot)	3433	4845	3433	3433	4992	3433	4803	1770	3304			
Satd. Flow (perm)	3433	4845	3433	3433	4992	3433	4803	1770	3304			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	163	694	320	311	1379	193	470	209	123	162	205	164
RTOR Reduction (vph)	0	106	0	0	23	0	0	101	0	0	138	0
Lane Group Flow (vph)	163	908	0	311	1549	0	470	231	0	162	232	0
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4	3	8	5	2	1	6				
Permitted Phases	5.0	20.0	9.2	24.2	9.2	24.2	11.8	12.1	9.6	9.9		
Effective Green, G (s)	5.0	20.0	9.2	24.2	9.2	24.2	11.8	12.1	9.6	9.9		
Effective Green, g (s)	0.07	0.30	0.14	0.36	0.14	0.36	0.18	0.18	0.14	0.15		
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Vehicle Extension (s)	257	1448	472	1806	306	869	254	489				
Lane Grp Cap (vph)	0.05	0.19	c0.09	c0.31	c0.14	0.05	0.09	c0.07				
v/s Ratio Prot	0.63	0.63	0.56	0.86	0.78	0.27	0.64	0.47				
v/s Ratio Perm	30.1	20.2	27.4	19.8	26.3	23.6	27.0	26.1				
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Progression Factor	5.0	0.9	3.3	4.3	6.2	0.2	5.2	0.7				
Incremental Delay, d2	35.1	21.1	30.7	24.0	32.5	23.7	32.2	26.8				
Delay (s)	D	C	C	C	C	C	C	C				
Level of Service	D	C	C	C	C	C	C	C				
Approach Delay (s)	23.0		25.1		28.9		28.5					
Approach LOS	C		C		C		C					
Intersection Summary												
HCM Average Control Delay	25.7											
HCM Volume to Capacity ratio	0.70											
Actuated Cycle Length (s)	66.9											
Intersection Capacity Utilization	67.3%											
Analysis Period (min)	15											
c Critical Lane Group												

Baseline

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis
 15: Del Mar Heights Road & Torrey Ridge Dr.

Near Term + Project (Phase 1) AM
 3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	212	649	120	81	1092	216	110	156	11	56	62	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.95	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	4966	1770	4959	1770	4959	1770	1845	1770	1674	1770	1674
Satd. Flow (perm)	1770	4966	1770	4959	1770	4959	1770	1845	1770	1674	1770	1674
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	236	721	133	90	1213	240	122	173	12	62	69	143
RTOR Reduction (vph)	0	29	0	0	34	0	0	3	0	0	102	0
Lane Group Flow (vph)	236	825	0	90	1419	0	122	182	0	62	110	0
Turn Type	Prot	4	Prot	3	8	Prot	5	2	Prot	1	6	Prot
Protected Phases	7	4	Prot	3	8	Prot	5	2	Prot	1	6	Prot
Permitted Phases	7	4	Prot	3	8	Prot	5	2	Prot	1	6	Prot
Actuated Green, G (s)	12.5	31.2	6.8	25.5	6.1	13.9	6.1	13.9	3.9	11.7	3.9	11.7
Effective Green, g (s)	12.5	31.2	6.8	25.5	6.1	13.9	6.1	13.9	3.9	11.7	3.9	11.7
Actuated g/C Ratio	0.17	0.43	0.09	0.36	0.08	0.19	0.08	0.19	0.05	0.16	0.05	0.16
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)	308	2158	168	1761	150	357	150	357	96	273	96	273
v/s Ratio Prot	c0.13	0.17	c0.07	c0.29	c0.07	c0.10	c0.07	c0.10	0.04	0.07	0.04	0.07
v/s Ratio Perm	0.77	0.38	0.54	0.81	0.81	0.51	0.81	0.51	0.65	0.40	0.65	0.40
Uniform Delay, d1	28.3	13.8	31.0	20.9	32.3	25.9	32.3	25.9	33.3	26.9	33.3	26.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.8	0.1	3.3	2.8	27.4	1.1	27.4	1.1	14.0	1.0	14.0	1.0
Delay (s)	39.1	13.9	34.3	23.7	59.7	27.0	59.7	27.0	47.2	27.9	47.2	27.9
Level of Service	D	B	C	C	E	C	E	C	D	C	D	C
Approach Delay (s)	19.3	19.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3	24.3
Approach LOS	B	B	C	C	C	C	C	C	D	C	D	C
Intersection Summary												
HCM Average Control Delay	24.8											
HCM Volume to Capacity ratio	0.70											
Actuated Cycle Length (s)	71.8											
Intersection Capacity Utilization	68.3%											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 16: Del Mar Heights Road & Lansdale Drive

Near Term + Project (Phase 1) AM
 3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	154	568	35	67	1138	36	44	26	55	49	60	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.87
Flt	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	0.87
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	5041	1770	5062	1770	5062	1770	1673	1770	1624	1770	1624
Satd. Flow (perm)	1770	5041	1770	5062	1770	5062	1770	1673	1770	1624	1770	1624
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	171	631	39	74	1264	40	49	29	61	54	67	396
RTOR Reduction (vph)	0	9	0	0	5	0	0	49	0	0	265	0
Lane Group Flow (vph)	171	661	0	74	1299	0	49	41	0	54	198	0
Turn Type	Prot	4	Prot	3	8	Prot	5	2	Prot	1	6	Prot
Protected Phases	7	4	Prot	3	8	Prot	5	2	Prot	1	6	Prot
Permitted Phases	7	4	Prot	3	8	Prot	5	2	Prot	1	6	Prot
Actuated Green, G (s)	8.1	24.8	3.7	20.4	3.7	20.4	2.4	11.2	2.4	11.2	2.4	11.2
Effective Green, g (s)	8.1	24.8	3.7	20.4	3.7	20.4	2.4	11.2	2.4	11.2	2.4	11.2
Actuated g/C Ratio	0.14	0.43	0.06	0.35	0.06	0.35	0.04	0.19	0.04	0.19	0.04	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)	247	2152	113	1777	113	1777	73	323	73	313	73	313
v/s Ratio Prot	c0.10	0.13	c0.04	c0.26	c0.04	c0.26	0.03	0.02	c0.03	c0.12	c0.03	c0.12
v/s Ratio Perm	0.69	0.31	0.65	0.73	0.65	0.73	0.67	0.13	0.74	0.63	0.74	0.63
Uniform Delay, d1	23.8	11.0	26.6	16.5	26.6	16.5	27.5	19.4	27.5	21.6	27.5	21.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.1	0.1	12.8	1.6	12.8	1.6	21.6	0.2	32.0	4.1	32.0	4.1
Delay (s)	31.9	11.1	39.4	18.0	39.4	18.0	49.1	19.6	59.6	25.7	59.6	25.7
Level of Service	C	B	D	B	D	B	D	B	E	C	E	C
Approach Delay (s)	15.3	15.3	19.2	19.2	19.2	19.2	30.0	30.0	30.0	29.2	30.0	29.2
Approach LOS	B	B	B	B	B	B	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	20.4											
HCM Volume to Capacity ratio	0.70											
Actuated Cycle Length (s)	58.1											
Intersection Capacity Utilization	73.1%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	←←←	←	←←←	←←←	←←←	←	
Volume (vph)	563	126	397	1019	271	342	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.91	1.00	0.91	0.97	1.00	1.00	
Fr	0.97	1.00	1.00	1.00	1.00	0.85	
Flt Protected	1.00	0.95	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	4946	1770	5085	3433	1583	1583	
Flt Permitted	1.00	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	4946	1770	5085	3433	1583	1583	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	626	140	441	1132	301	380	
RTOR Reduction (vph)	55	0	0	0	0	304	
Lane Group Flow (vph)	711	0	441	1132	301	76	
Turn Type	Prot	Prot	3	8	2	Perm	
Protected Phases	4					2	
Permitted Phases							
Actuated Green, G (s)	14.3	17.5	35.8	10.9	10.9	10.9	
Effective Green, g (s)	14.3	17.5	35.8	10.9	10.9	10.9	
Actuated g/C Ratio	0.26	0.32	0.65	0.20	0.20	0.20	
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)	1293	566	3328	684	315	315	
v/s Ratio Prot	c0.14	c0.25	0.22	c0.09	0.05	0.05	
v/s Ratio Perm	0.55	0.78	0.34	0.44	0.24	0.24	
Uniform Delay, d1	17.4	16.8	4.2	19.2	18.4	18.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	6.7	0.1	0.5	0.4	0.4	
Delay (s)	17.9	23.6	4.3	19.7	18.8	18.8	
Level of Service	B	C	A	B	B	B	
Approach Delay (s)	17.9		9.7	19.2			
Approach LOS	B		A	B			
Intersection Summary:							
HCM Average Control Delay		13.9			HCM Level of Service	B	
HCM Volume to Capacity ratio		0.62					
Actuated Cycle Length (s)		54.7			Sum of lost time (s)	12.0	
Intersection Capacity Utilization		53.4%			ICU Level of Service	A	
Analysis Period (min)		15					
c Critical Lane Group							

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗
Volume (vph)	13	4	4	97	23	110	92	340	101	165	882	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.95	0.95	0.95	1.00	1.00	1.00	0.97	0.91	0.97	0.91	0.97	0.91
Fr	1.00	0.95	0.95	1.00	0.85	1.00	0.97	1.00	0.97	1.00	0.99	0.99
Flt Protected	0.95	0.99	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1681	1651	1651	1791	1583	3433	4911	3433	3433	5054	3433	5054
Flt Permitted	0.95	0.99	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1681	1651	1651	1791	1583	3433	4911	3433	3433	5054	3433	5054
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	14	4	4	108	26	122	102	378	112	183	991	42
RTOR Reduction (vph)	0	4	0	0	0	105	0	50	0	0	4	0
Lane Group Flow (vph)	11	7	0	0	134	17	102	440	0	183	1029	0
Turn Type	Split	Split	2	6	6	Perm	3	8	7	7	4	
Protected Phases												
Permitted Phases												
Actuated Green, G (s)	2.0	2.0	2.0	7.0	7.0	7.0	5.2	19.0	6.1	18.9	6.1	18.9
Effective Green, g (s)	2.0	2.0	2.0	7.0	7.0	7.0	5.2	19.0	6.1	18.9	6.1	18.9
Actuated g/C Ratio	0.04	0.04	0.04	0.14	0.14	0.14	0.10	0.38	0.12	0.40	0.12	0.40
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)	67	66	66	250	221	356	1862	418	2007	418	2007	
v/s Ratio Prot	c0.01	0.00	0.00	c0.07	0.03	0.03	0.09	c0.05	c0.20	c0.05	c0.20	
v/s Ratio Perm	0.16	0.11	0.11	0.54	0.08	0.29	0.24	0.44	0.51	0.44	0.51	
Uniform Delay, d1	23.2	23.2	23.2	20.0	18.7	20.7	10.6	20.4	11.4	20.4	11.4	
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	1.2	0.7	0.7	2.2	0.1	0.4	0.1	0.7	0.2	0.7	0.2	
Delay (s)	24.4	23.9	23.9	22.2	18.9	21.2	10.7	21.1	11.7	21.1	11.7	
Level of Service	C	C	C	C	B	C	B	C	B	C	B	
Approach Delay (s)	24.2			20.6			12.5					
Approach LOS	C			C			B					
Intersection Summary:												
HCM Average Control Delay				14.0				HCM Level of Service	B			
HCM Volume to Capacity ratio				0.44								
Actuated Cycle Length (s)				50.1				Sum of lost time (s)	12.0			
Intersection Capacity Utilization				44.7%				ICU Level of Service	A			
Analysis Period (min)				15								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
19: Townsgate Drive & Carmel Country Road

HCM Signalized Intersection Capacity Analysis
20: Townsgate Drive & El Camino Real

Near Term + Project (Phase 1) AM
3/2/2012

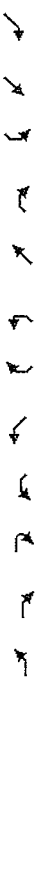
Near Term + Project (Phase 1) AM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↑	↔	↔	↑	↔	↔	↑	↔
Volume (vph)	170	85	116	46	185	153	114	436	7	103	456	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
FRT	1.00	1.00	0.85	1.00	0.93	1.00	1.00	1.00	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1740	1770	3531	3531	1770	3539	1583	1770
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1740	1770	3531	3531	1770	3539	1583	1770
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	189	94	129	51	217	170	127	484	8	114	507	189
RTOR Reduction (vph)	0	0	79	0	36	0	0	2	0	0	0	147
Lane Group Flow (vph)	189	94	50	51	351	0	127	490	0	114	507	42
Turn Type	Prot	Perm	Prot	Prot	Perm	Prot	Prot	Perm	Prot	Prot	Perm	Prot
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.2	26.7	26.7	3.5	18.0		7.1	16.3		6.1	15.3	15.3
Effective Green, g (s)	12.2	26.7	26.7	3.5	18.0		7.1	16.3		6.1	15.3	15.3
Actuated g/C Ratio	0.18	0.39	0.39	0.05	0.26		0.10	0.24		0.09	0.22	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
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)	315	725	616	90	457		183	839		157	769	353
v/s Ratio Prot	c0.11	0.05		0.03	c0.20		c0.07	0.14		0.06	c0.14	
v/s Ratio Perm			0.03									0.03
v/c Ratio	0.60	0.13	0.08	0.57	0.77		0.69	0.56		0.73	0.64	0.12
Uniform Delay, d1	26.0	13.5	13.2	31.8	23.4		29.7	23.2		30.4	24.2	21.3
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	3.2	0.1	0.1	7.9	7.6		10.8	1.0		15.4	1.8	0.2
Delay (s)	29.2	13.6	13.3	39.8	30.9		40.5	24.2		45.8	26.0	21.4
Level of Service	C	B	B	D	C		D	C		D	C	C
Approach Delay (s)		20.6			32.0			27.5			27.7	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM Average Control Delay					27.2							
HCM Volume to Capacity ratio					0.68							
Actuated Cycle Length (s)					68.6							
Intersection Capacity Utilization					61.3%							
Analysis Period (min)					15							
c Critical Lane Group												

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	↔	↑	↔	↔	↑	↔	↔	↑	↔	↔	↑	↔
Volume (vph)	63	70	6	233	52	138	104	311	54	149	555	193
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.91	1.00
FRT	1.00	0.99	1.00	1.00	1.00	0.85	1.00	0.98	1.00	1.00	0.96	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	1840	1770	1770	1863	1583	1770	4973	1770	4889	1770	4889
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	1840	1770	1770	1863	1583	1770	4973	1770	4889	1770	4889
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	70	78	7	259	58	153	116	346	60	166	617	214
RTOR Reduction (vph)	0	5	0	0	0	113	0	34	0	0	83	0
Lane Group Flow (vph)	70	80	0	259	58	40	116	372	0	166	748	0
Turn Type	Prot	Prot	Prot	Prot	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	1	6		5	2	2	7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	3.8	7.1		11.7	15.0	15.0	5.4	14.7		8.3	17.6	
Effective Green, g (s)	3.8	7.1		11.7	15.0	15.0	5.4	14.7		8.3	17.6	
Actuated g/C Ratio	0.07	0.12		0.20	0.26	0.26	0.09	0.25		0.14	0.30	
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	226		358	483	411	185	1285		254	1489	
v/s Ratio Prot	0.04	c0.04		c0.15	0.03		0.07	0.07		c0.09	c0.15	
v/s Ratio Perm						0.03						
v/c Ratio	0.60	0.35		0.72	0.12	0.10	0.70	0.29		0.65	0.50	
Uniform Delay, d1	26.3	23.2		21.5	16.4	16.3	28.4	17.4		23.4	16.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.6	1.0		7.1	0.1	0.1	12.7	0.1		5.9	0.3	
Delay (s)	34.8	24.2		28.6	16.5	16.4	38.2	17.5		29.3	16.8	
Level of Service	C	C		C	B	B	D	B		C	B	
Approach Delay (s)		29.0			23.1			22.1			18.9	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM Average Control Delay					21.3							
HCM Volume to Capacity ratio					0.58							
Actuated Cycle Length (s)					57.8							
Intersection Capacity Utilization					50.4%							
Analysis Period (min)					15							
c Critical Lane Group												



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	310	122	127	62	300	30	277	421	29	68	410	397
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	1.00	0.99	0.99	0.99	1.00	0.99	1.00	0.99	1.00	0.99
Fit	0.95	1.00	1.00	0.99	0.99	0.99	0.95	1.00	0.95	1.00	0.95	1.00
Fit Protected	1770	1863	1583	1829	1829	1829	1770	3505	1770	3278	3278	3278
Satd. Flow (prot)	0.95	1.00	1.00	0.99	0.99	0.99	0.95	1.00	0.95	1.00	0.95	1.00
Fit Permitted	1770	1863	1583	1829	1829	1829	1770	3505	1770	3278	3278	3278
Satd. Flow (perm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak-hour factor, PHF	344	136	28	0	432	0	308	495	0	76	724	0
Adj. Flow (vph)	0	0	113	0	3	0	0	5	0	0	173	0
RTOR Reduction (vph)	344	136	28	0	432	0	308	495	0	76	724	0
Lane Group Flow (vph)	344	136	28	0	432	0	308	495	0	76	724	0
Turn Type	Split	Perm	Split	Split	Split	Split	Prot	Split	Prot	Prot	Prot	Prot
Protected Phases	4	4	4	8	8	8	5	2	1	1	6	6
Permitted Phases	20.0	20.0	20.0	23.0	23.0	23.0	18.0	34.3	7.5	23.8	23.8	23.8
Actuated Green, G (s)	20.0	20.0	20.0	23.0	23.0	23.0	18.0	34.3	7.5	23.8	23.8	23.8
Effective Green, g (s)	0.20	0.20	0.20	0.23	0.23	0.23	0.18	0.34	0.07	0.24	0.24	0.24
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	351	370	314	417	417	417	316	1193	132	774	774	774
Lane Grp Cap (vph)	c0.19	0.07	0.02	c0.24	c0.24	c0.24	c0.17	0.14	0.04	c0.22	c0.22	c0.22
v/s Ratio Prot	0.98	0.37	0.09	1.04	1.04	1.04	0.97	0.42	0.58	0.93	0.93	0.93
v/s Ratio Perm	40.2	34.9	33.0	38.9	38.9	38.9	41.2	25.5	45.1	37.7	37.7	37.7
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	42.5	0.6	0.1	53.6	53.6	53.6	43.4	0.2	6.0	18.3	18.3	18.3
Incremental Delay, d2	82.7	35.6	33.1	92.5	92.5	92.5	84.6	25.8	51.1	56.0	56.0	56.0
Delay (s)	F	D	C	F	F	F	F	C	D	E	E	E
Level of Service	61.1	61.1	61.1	92.5	92.5	92.5	48.2	48.2	16.0	16.0	16.0	16.0
Approach Delay (s)	E	E	E	F	F	F	D	D	E	E	E	E
Approach LOS	E	E	E	F	F	F	D	D	E	E	E	E
Intersection Summary												
HCM Average Control Delay	60.4											
HCM Volume to Capacity ratio	0.98											
Actuated Cycle Length (s)	100.8											
Intersection Capacity Utilization	91.0%											
Analysis Period (min)	15											
c Critical Lane Group												



Movement	EBL	EBR	EBT	WBL	WBR	WBT	NBL	NBR	NBT	SBL	SBT	SBR
Lane Configurations	31	113	252	97	228	96	218	408	30	75	907	110
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	0.85	0.85	1.00	0.96	0.96	1.00	0.99	1.00	0.98	1.00	0.98
Fit	0.95	1.00	1.00	0.95	0.97	0.97	0.95	1.00	0.95	1.00	0.95	1.00
Fit Protected	1770	1583	1583	1770	3335	3335	1770	5033	1770	5033	1770	5033
Satd. Flow (prot)	0.95	1.00	1.00	0.95	0.97	0.97	0.95	1.00	0.95	1.00	0.95	1.00
Fit Permitted	1770	1583	1583	1770	3335	3335	1770	5033	1770	5033	1770	5033
Satd. Flow (perm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak-hour factor, PHF	34	126	280	108	253	107	242	453	33	83	1008	122
Adj. Flow (vph)	0	0	235	0	60	0	0	10	0	0	17	0
RTOR Reduction (vph)	34	126	280	108	253	107	242	453	33	83	1008	122
Lane Group Flow (vph)	34	126	280	108	253	107	242	453	33	83	1008	122
Turn Type	Split	Perm	Split	Split	Split	Split	Prot	Split	Prot	Prot	Prot	Prot
Protected Phases	2	2	2	6	6	6	3	8	7	4	4	4
Permitted Phases	10.7	10.7	10.7	9.6	9.6	9.6	10.0	24.0	6.6	20.6	20.6	20.6
Actuated Green, G (s)	10.7	10.7	10.7	9.6	9.6	9.6	10.0	24.0	6.6	20.6	20.6	20.6
Effective Green, g (s)	0.16	0.16	0.16	0.14	0.14	0.14	0.15	0.36	0.10	0.31	0.31	0.31
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	283	253	253	254	479	513	1806	c0.09	0.05	c0.22	c0.22	c0.22
Lane Grp Cap (vph)	0.02	0.02	0.02	0.06	c0.09	c0.07	c0.07	c0.09	0.05	c0.22	c0.22	c0.22
v/s Ratio Prot	0.12	0.50	0.18	0.43	0.63	0.47	0.26	0.26	0.47	0.72	0.72	0.72
v/s Ratio Perm	24.1	25.6	24.3	26.1	27.0	26.0	15.2	15.2	28.5	20.6	20.6	20.6
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.2	1.5	0.3	1.1	2.6	0.7	0.1	0.1	2.0	1.7	1.7	1.7
Incremental Delay, d2	24.3	27.2	24.6	27.3	29.5	26.7	15.3	15.3	30.5	22.3	22.3	22.3
Delay (s)	C	C	C	C	C	C	B	B	C	C	C	C
Level of Service	25.3	25.3	25.3	29.0	29.0	29.0	19.1	19.1	22.9	22.9	22.9	22.9
Approach Delay (s)	C	C	C	C	C	C	B	B	C	C	C	C
Approach LOS	C	C	C	C	C	C	B	B	C	C	C	C
Intersection Summary												
HCM Average Control Delay	23.3											
HCM Volume to Capacity ratio	0.65											
Actuated Cycle Length (s)	66.9											
Intersection Capacity Utilization	52.4%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	SEL	SET	SE2	SE1	NWL	NWT	NWL	NWT	NET	NET	NER	SWL	SWT	SWR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Volume (vph)	48	6	70	13	27	14	123	31	2	3	16	195		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	53	7	78	14	30	16	137	34	2	3	18	217		
Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1									
Volume Total (vph)	60	78	60	173	238									
Volume Left (vph)	53	0	14	137	3									
Volume Right (vph)	0	78	16	2	217									
Head (s)	0.48	-0.67	-0.07	0.18	-0.51									
Departure Headway (s)	6.0	4.8	5.1	4.9	4.1									
Degree Utilization, x	0.10	0.10	0.08	0.23	0.27									
Capacity (veh/h)	558	685	640	705	825									
Control Delay (s)	8.5	7.2	8.5	9.3	8.7									
Approach Delay (s)	7.8	8.5	9.3	8.7										
Approach LOS	A	A	A	A	A									
Intersection Summary														
Delay														
HCM Level of Service														
Intersection Capacity Utilization														
Analysis Period (min)														

Baseline

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	54	92	119	205	63	25	31	295	83	15	783	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit	1.00	0.85	0.99	1.00	0.99	1.00	0.95	1.00	0.97	1.00	0.95	1.00
Fit Protected	0.88	1.00	0.97	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1829	1583	1779	1779	1779	1779	1779	1779	1779	1779	1779	1779
Fit Permitted	0.88	1.00	0.97	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	1829	1583	1779	1779	1779	1779	1779	1779	1779	1779	1779	1779
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	60	102	132	228	70	28	34	328	92	17	870	160
RTOR Reduction (vph)	0	0	110	0	4	0	0	30	0	0	18	0
Lane Group Flow (vph)	0	162	22	0	322	0	34	390	0	17	1012	0
Turn Type	Split	Prot	Split	Prot	Split	Prot	Split	Prot	Split	Prot	Split	Prot
Protected Phases	4	4	4	8	8	5	2	1	6			
Permitted Phases												
Actuated Green, G (s)	11.5	11.5	15.9	15.9	15.9	1.6	26.2	0.8	25.4			
Effective Green, g (s)	11.5	11.5	15.9	15.9	15.9	1.6	26.2	0.8	25.4			
Actuated g/C Ratio	0.16	0.16	0.23	0.23	0.23	0.02	0.37	0.01	0.36			
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)	299	259	402	402	402	1274	20	1247	20	1247		
v/s Ratio Prot	c0.09	0.01	c0.18	c0.18	c0.18	c0.02	0.11	0.01	c0.29			
v/s Ratio Perm	0.54	0.08	0.80	0.80	0.80	0.85	0.31	0.85	0.81			
Uniform Delay, d1	27.0	25.0	25.8	25.8	25.8	34.3	15.7	34.7	20.3			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	2.0	0.1	10.9	10.9	10.9	85.5	0.1	131.5	4.1			
Delay (s)	29.0	25.1	36.7	36.7	36.7	119.8	15.8	166.2	24.5			
Level of Service	C	C	D	D	D	F	B	F	C			
Approach Delay (s)	27.3		36.7	36.7	36.7	23.6		26.8				
Approach LOS	C		D	D	D	C		C				
Intersection Summary												
HCM Average Control Delay												
HCM Volume to Capacity ratio												
Actuated Cycle Length (s)												
Intersection Capacity Utilization												
Analysis Period (min)												
c Critical Lane Group												

Baseline

HCM Signalized Intersection Capacity Analysis
25: Carmel Valley Road & I-5 SB Ramps

Near Term + Project (Phase 1) AM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	0	321	181	405	641	0	0	0	0	1081	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Flt	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3348	3433	3539	3433	3539	1681	1610	1504	1504	1681	1610	1504
Flt Permitted	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3348	3433	3539	3433	3539	1681	1610	1504	1504	1681	1610	1504
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	357	201	450	712	0	0	0	0	1201	3	164
RTOR Reduction (vph)	0	106	0	0	0	0	0	0	0	0	1	69
Lane Group Flow (vph)	0	452	0	450	712	0	0	0	0	613	606	79
Turn Type		4		3	8					6	6	6
Protected Phases												
Permitted Phases												
Actuated Green, G (s)		14.2		11.7	29.9					31.1	31.1	31.1
Effective Green, g (s)		14.2		11.7	29.9					31.1	31.1	31.1
Actuated g/C Ratio		0.21		0.17	0.43					0.45	0.45	0.45
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)		689		582	1534					768	726	678
v/s Ratio Prot		c0.14		c0.13	0.20					0.36	c0.38	0.05
v/s Ratio Perm												
v/c Ratio		0.68		0.77	0.46					0.81	0.63	0.12
Uniform Delay, d1		25.2		27.4	13.9					16.4	16.7	11.0
Progression Factor		1.00		1.00	1.00					1.00	1.00	1.00
Incremental Delay, d2		2.3		6.3	0.2					6.4	8.2	0.1
Delay (s)		27.4		33.7	14.1					22.7	24.9	11.1
Level of Service		C		C	B					C	C	B
Approach Delay (s)		27.4		21.7				0.0			22.4	
Approach LOS		C		C				A			C	
Intersection Summary												
HCM Average Control Delay				23.1						C		
HCM Volume to Capacity ratio				0.78								
Actuated Cycle Length (s)				69.0						12.0		
Intersection Capacity Utilization				115.0%						H		
Analysis Period (min)				15								
c Critical Lane Group												

Baseline

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis
26: Carmel Valley Road & I-5 NB Ramps

Near Term + Project (Phase 1) AM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	63	1267	0	974	879	109	2	570	2	570	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.97	0.95	0.95	0.95	1.00	0.85	1.00	0.85	0.85	0.85	0.95	0.95
Flt	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539		3539	1583	1681	1449	1504	1504	1681	1449	1504
Flt Permitted	0.95	1.00		1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539		3539	1583	1681	1449	1504	1504	1681	1449	1504
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	70	1408	0	0	1082	977	121	2	633	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	493	0	29	29	0	0	0
Lane Group Flow (vph)	70	1408	0	0	1082	484	109	295	294	0	0	0
Turn Type		7	4		8	2	2	2	2			
Protected Phases												
Permitted Phases												
Actuated Green, G (s)		2.4	32.2		25.8	25.8	14.9	14.9	14.9			
Effective Green, g (s)		2.4	32.2		25.8	25.8	14.9	14.9	14.9			
Actuated g/C Ratio		0.04	0.58		0.47	0.47	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)		150	2068		1657	741	455	392	407			
v/s Ratio Prot		0.02	c0.40		0.31	0.31	0.06	c0.20	0.20			
v/s Ratio Perm												
v/c Ratio		0.47	0.68		0.65	0.65	0.24	0.75	0.72			
Uniform Delay, d1		25.7	7.9		11.2	11.2	15.7	18.4	18.2			
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2		2.3	0.9		0.9	0.9	2.1	0.3	7.9			
Delay (s)		28.0	8.8		12.2	12.2	16.0	26.3	24.4			
Level of Service		C	A		B	B	B	C	C			
Approach Delay (s)			9.7		12.7			24.0				0.0
Approach LOS			A		B			C				A
Intersection Summary												
HCM Average Control Delay				13.7					B			
HCM Volume to Capacity ratio				0.70								
Actuated Cycle Length (s)				55.1					8.0			
Intersection Capacity Utilization				115.0%					H			
Analysis Period (min)				15								
c Critical Lane Group												

Baseline

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	36 13 44	725 19	160 90	1025 149	118 1108	28						
Volume (vph)	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900						
Ideal Flow (vphpl)	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0						
Total Lost time (s)	0.95 0.91 0.85	0.95 0.91 0.85	0.95 0.91 0.85	0.95 0.91 0.85	0.95 0.91 0.85	0.91						
Lane Util. Factor	1.00 0.93 0.85	1.00 0.99 0.85	1.00 0.99 0.85	1.00 0.99 0.85	1.00 0.99 0.85	1.00						
Flt	0.95 0.99 1.00	0.95 0.96 1.00	0.95 0.96 1.00	0.95 0.96 1.00	0.95 0.96 1.00	0.95						
Flt Protected	1681 1563 1504	1681 1611 1504	1681 1611 1504	1681 1611 1504	1681 1611 1504	1770						
Satd. Flow (prot)	1681 1563 1504	1681 1611 1504	1681 1611 1504	1681 1611 1504	1681 1611 1504	1770						
Satd. Flow (perm)	1681 1563 1504	1681 1611 1504	1681 1611 1504	1681 1611 1504	1681 1611 1504	1770						
Peak-hour factor, PHF	0.90 0.90 0.90	0.90 0.90 0.90	0.90 0.90 0.90	0.90 0.90 0.90	0.90 0.90 0.90	0.90						
Adj. Flow (vph)	40 14 49	806 21	178 100	1139 166	131 1231	31						
RTOR Reduction (vph)	0 16 30	0 1 109	0 20 0	0 0 0	0 0 0	0						
Lane Group Flow (vph)	36 19 2	419 425 51	100 1285 0	131 1259 0								
Turn Type	Split	Prot Split	Prot	Prot	Prot	Prot						
Protected Phases	4 4 4	8 8 8	5 5 21	61								
Actuated Green, G (s)	5.8 5.8 5.8	24.6 24.6 24.6	6.5 34.2	24.7 24.7	24.7 24.7	6						
Effective Green, g (s)	5.8 5.8 5.8	24.6 24.6 24.6	6.5 34.2	24.7 24.7	24.7 24.7	6						
Actuated g/C Ratio	0.07 0.07 0.07	0.32 0.32 0.32	0.08 0.44	0.32 0.32	0.32 0.32	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 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	3.0 3.0 3.0	3.0						
Lane Grp Cap (vph)	126 117 112	533 511	477 148	2198	563 1613							
v/s Ratio Prot	c0.02 0.01 0.00	0.25 0.26 0.03	0.06 c0.26	0.07								
v/s Ratio Perm	0.29 0.16 0.02	0.79 0.83 0.11	0.68 0.58	0.23 0.78								
Uniform Delay, d1	33.9 33.6 33.3	24.1 24.6 18.7	34.5 16.4	19.5 24.0								
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 0.7 0.1	7.5 11.0 0.1	11.6 0.4	0.2 2.5								
Delay (s)	35.2 34.3 33.3	31.6 35.6 18.8	46.1 16.8	19.7 26.5								
Level of Service	D C C	C C D	B D B	B C								
Approach Delay (s)	34.3	31.3	18.8	25.9								
Approach LOS	C	C	B	C								
Intersection Summary												
HCM Average Control Delay	25.0	HCM Level of Service				C						
HCM Volume to Capacity ratio	0.76											
Actuated Cycle Length (s)	77.6					17.0						
Intersection Capacity Utilization	69.4%					C						
Analysis Period (min)	15											
i Phase conflict between lane groups.												
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0 0 0	349 1043	261 165	912 0	0 0	619 674						
Ideal Flow (vphpl)	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900 1900 1900	1900						
Total Lost time (s)	0 0 0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0 4.0 4.0	4.0						
Lane Util. Factor	1.00 1.00 1.00	0.97 0.91 1.00	0.97 0.91 1.00	0.97 0.91 1.00	0.97 0.91 1.00	0.95						
Flt	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00 1.00 1.00	1.00						
Flt Protected	3433 3433 3433	3433 3433 3433	3433 3433 3433	3433 3433 3433	3433 3433 3433	4211						
Satd. Flow (prot)	3433 3433 3433	3433 3433 3433	3433 3433 3433	3433 3433 3433	3433 3433 3433	4211						
Satd. Flow (perm)	3433 3433 3433	3433 3433 3433	3433 3433 3433	3433 3433 3433	3433 3433 3433	4211						
Peak-hour factor, PHF	0.90 0.90 0.90	0.90 0.90 0.90	0.90 0.90 0.90	0.90 0.90 0.90	0.90 0.90 0.90	0.90						
Adj. Flow (vph)	0 0 0	388 1159	290 183	1013 0	0 0	688 749						
RTOR Reduction (vph)	0 0 0	0 0 0	67 0	0 0 0	0 0 0	10						
Lane Group Flow (vph)	0 0 0	388 1159	223 183	1013 0	0 0	1053 364						
Conf. Peds. (#/hr)												
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot						
Protected Phases	3 8	5 2	6									
Actuated Green, G (s)	16.6 16.6	16.6 16.6	16.6 16.6	16.6 16.6	16.6 16.6	21.2						
Effective Green, g (s)	16.6 16.6	16.6 16.6	16.6 16.6	16.6 16.6	16.6 16.6	21.2						
Actuated g/C Ratio	0.31 0.31	0.31 0.31	0.31 0.31	0.31 0.31	0.31 0.31	0.39						
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)	1048 1552	483 290	1939	1641	418							
v/s Ratio Prot	0.11 c0.23	0.05 c0.29	0.25									
v/s Ratio Perm	0.37 0.75	0.46 0.63	0.52									
Uniform Delay, d1	14.8 17.0	15.3 24.1	7.8									
Progression Factor	1.00 1.00	1.00 1.00	1.00									
Incremental Delay, d2	0.2 2.0	0.7 4.4	0.3									
Delay (s)	15.0 19.0	16.0 28.5	8.0									
Level of Service	B B	B C	A									
Approach Delay (s)	17.7	11.2	19.1									
Approach LOS	A	B	B									
Intersection Summary												
HCM Average Control Delay	16.4	HCM Level of Service				B						
HCM Volume to Capacity ratio	0.80											
Actuated Cycle Length (s)	54.4					12.0						
Intersection Capacity Utilization	101.8%					G						
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	651	943	317	0	0	0	0	406	227	147	748	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0	0.0
Lane Util. Factor	0.91	0.86	0.91	1.00	0.85	0.95	1.00	0.86	0.86	1.00	0.91	0.91
Flt	1.00	1.00	0.85	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.85
Satd. Flow (prot)	1610	3172	1441	1610	3172	1441	1610	3172	1441	1610	3172	1441
Flt Permitted	0.95	0.99	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.85
Satd. Flow (perm)	1610	3172	1441	1610	3172	1441	1610	3172	1441	1610	3172	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	723	1048	352	0	0	0	0	451	252	163	831	0
RTOR Reduction (vph)	0	3	50	0	0	0	0	59	0	0	0	0
Lane Group Flow (vph)	586	1217	267	0	0	0	0	644	0	163	831	0
Turn Type	Spill	Perm	Perm	Spill	Perm	Perm	Spill	Perm	Perm	Spill	Perm	Perm
Protected Phases	4	4	4	4	4	4	4	4	4	4	4	4
Permitted Phases	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1
Actuated Green, G (s)	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1
Effective Green, g (s)	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1	28.1
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
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)	740	1459	663	740	1459	663	740	1459	663	740	1459	663
v/s Ratio Prot	0.36	c0.38	0.19	0.36	c0.38	0.19	0.36	c0.38	0.19	0.36	c0.38	0.19
v/s Ratio Perm	0.79	0.83	0.40	0.79	0.83	0.40	0.79	0.83	0.40	0.79	0.83	0.40
Uniform Delay, d1	14.0	14.5	10.9	14.0	14.5	10.9	14.0	14.5	10.9	14.0	14.5	10.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.8	4.3	0.4	5.8	4.3	0.4	5.8	4.3	0.4	5.8	4.3	0.4
Delay (s)	19.8	18.7	11.3	19.8	18.7	11.3	19.8	18.7	11.3	19.8	18.7	11.3
Level of Service	B	B	B	B	B	B	B	B	B	B	B	B
Approach Delay (s)	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9	17.9
Approach LOS	B	B	B	B	B	B	B	B	B	B	B	B
Intersection Summary												
HCM Average Control Delay	18.2											
HCM Volume to Capacity ratio	0.72											
Actuated Cycle Length (s)	61.1											
Intersection Capacity Utilization	101.8%											
Analysis Period (min)	15											
c Critical Lane Group												

Baseline

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	16	215	0	436	25	97	115	115	115	115	115	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.95	1.00	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Flt	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.85
Satd. Flow (prot)	1770	3539	3510	1770	3539	3510	1770	3539	3510	1770	3539	3510
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00	1.00	0.85
Satd. Flow (perm)	1770	3539	3510	1770	3539	3510	1770	3539	3510	1770	3539	3510
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	18	239	0	487	28	108	128	128	128	128	128	128
RTOR Reduction (vph)	0	0	0	8	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	18	239	0	507	0	108	28	28	28	28	28	28
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4	3	8	6	6	6	6	6	6	6	6
Permitted Phases	0.5	12.0	7.5	7.5	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Actuated Green, G (s)	0.5	12.0	7.5	7.5	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Effective Green, g (s)	0.5	12.0	7.5	7.5	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Actuated g/C Ratio	0.02	0.47	0.28	0.28	0.22	0.22	0.22	0.22	0.22	0.22	0.22	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	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)	35	1659	1028	35	387	346	346	346	346	346	346	346
v/s Ratio Prot	0.01	c0.07	c0.14	0.01	c0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.02
v/s Ratio Perm	0.51	0.14	0.49	0.51	0.28	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Uniform Delay, d1	12.4	3.9	7.5	12.4	8.3	8.0	8.0	8.0	8.0	8.0	8.0	8.0
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	12.2	0.0	0.4	12.2	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Delay (s)	24.6	3.9	7.9	24.6	8.7	8.1	8.1	8.1	8.1	8.1	8.1	8.1
Level of Service	C	A	A	C	A	A	A	A	A	A	A	A
Approach Delay (s)	5.4	5.4	7.9	5.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
Approach LOS	A	A	A	A	A	A	A	A	A	A	A	A
Intersection Summary												
HCM Average Control Delay	7.3											
HCM Volume to Capacity ratio	0.41											
Actuated Cycle Length (s)	25.6											
Intersection Capacity Utilization	26.7%											
Analysis Period (min)	15											
c Critical Lane Group												

Baseline

Movement	EBL	EBR	EBR2	WBL	WBR	NBL	NBT	NBR2	SBT	SBT2	SBT3	SBT4
Lane Configurations	EBL	EBR	EBR2	WBL	WBR	NBL	NBT	NBR2	SBT	SBT2	SBT3	SBT4
Volume (vph)	75	220	179	275	373	100	342	343	287	1102	224	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.88	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Fit	1.00	0.85	0.85	1.00	0.97	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	2787	1583	1770	1804	1770	3539	1583	3433	3539	1583	3539
Fit Permitted	0.46	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	864	2787	1583	1770	1804	1770	3539	1583	3433	3539	1583	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	83	244	199	306	414	111	380	381	319	1224	249	228
RTOR Reduction (vph)	0	0	170	0	10	0	0	0	269	0	0	172
Lane Group Flow (vph)	83	244	23	306	515	0	380	381	50	1224	249	56
Turn Type	custom	custom	custom	Prot	Prot	Prot	Perm	Perm	Prot	Prot	Perm	Perm
Protected Phases	4	4	4	3	8	5	2	2	1	1	6	6
Permitted Phases	13.8	13.8	13.8	17.0	34.8	25.5	15.0	15.0	34.1	23.6	23.6	23.6
Actuated Green, G (s)	13.8	13.8	13.8	17.0	34.8	25.5	15.0	15.0	34.1	23.6	23.6	23.6
Effective Green, g (s)	0.14	0.14	0.14	0.18	0.36	0.27	0.16	0.16	0.36	0.25	0.25	0.25
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	124	401	228	314	655	471	554	248	1221	871	390	390
Lane Grp Cap (vph)	0.10	0.09	0.02	0.17	c0.29	0.21	c0.11	0.03	0.36	0.07	0.04	0.04
vs Ratio Prot	0.67	0.61	0.13	0.97	0.79	0.81	0.69	0.20	1.00	0.29	0.14	0.14
vs Ratio Perm	38.9	38.5	39.2	39.2	27.2	32.9	38.2	35.2	30.9	29.3	28.3	28.3
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	12.9	2.6	0.2	43.5	6.2	9.8	3.5	0.4	25.3	0.2	0.2	0.2
Incremental Delay, d2	51.8	41.1	36.0	82.8	33.5	42.7	41.8	35.6	57.2	29.5	28.4	28.4
Delay (s)	D	D	D	F	C	D	D	D	E	C	C	C
Level of Service	D	D	D	F	C	D	D	D	E	C	C	C
Approach Delay (s)	51.6	40.3	40.3	51.6	40.3	40.3	40.3	40.3	40.3	40.3	40.3	40.3
Approach LOS	D	D	D	D	D	D	D	D	D	D	D	D
Intersection Summary												
HCM Average Control Delay	46.3											
HCM Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	95.9											
Intersection Capacity Utilization	84.1%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBL	EBT	EBT2	WBL	WBT	NBL	NBT	NBT2	SBT	SBT2	SBT3	SBT4
Lane Configurations	EBL	EBT	EBT2	WBL	WBT	NBL	NBT	NBT2	SBT	SBT2	SBT3	SBT4
Volume (vph)	450	0	330	0	0	0	527	129	188	459	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.95	0.95	1.00	0.95	0.95	0.95	0.95	0.95	0.97	1.00	0.95	0.95
Fit	1.00	1.00	1.00	0.85	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00
Fit Protected	0.95	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1681	1681	1583	1681	1681	1681	3435	1583	3433	3539	1583	3539
Fit Permitted	0.95	0.95	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1681	1681	1583	1681	1681	1681	3435	1583	3433	3539	1583	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	500	0	367	0	0	0	586	143	209	510	0	0
RTOR Reduction (vph)	0	0	207	0	0	0	43	0	0	0	0	0
Lane Group Flow (vph)	250	250	160	0	0	0	686	0	209	510	0	0
Turn Type	Split	Perm	Perm	Split	Perm	Perm	Perm	Perm	Prot	Prot	Perm	Perm
Protected Phases	4	4	4	4	4	4	2	2	1	1	6	6
Permitted Phases	13.1	13.1	13.1	13.1	13.1	13.1	14.1	14.1	3.6	21.7	3.6	21.7
Actuated Green, G (s)	13.1	13.1	13.1	13.1	13.1	13.1	14.1	14.1	3.6	21.7	3.6	21.7
Effective Green, g (s)	0.31	0.31	0.31	0.31	0.31	0.31	0.33	0.33	0.08	0.51	0.08	0.51
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	515	515	485	515	515	515	1132	289	1794	1794	289	1794
Lane Grp Cap (vph)	c0.15	0.15	0.10	c0.15	0.15	0.10	c0.20	c0.06	0.14	0.14	c0.06	0.14
vs Ratio Prot	0.49	0.49	0.33	0.49	0.49	0.33	0.61	0.72	0.28	0.28	0.72	0.28
vs Ratio Perm	12.1	12.1	11.5	12.1	12.1	11.5	12.0	19.1	6.1	6.1	19.1	6.1
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.7	0.7	0.4	0.7	0.7	0.4	0.9	8.6	0.1	0.1	8.6	0.1
Incremental Delay, d2	12.8	12.8	11.9	12.8	12.8	11.9	12.9	27.8	6.2	6.2	27.8	6.2
Delay (s)	B	B	B	B	B	B	B	C	A	A	C	A
Level of Service	B	B	B	B	B	B	B	C	A	A	C	A
Approach Delay (s)	12.4	12.9	12.9	12.4	12.9	12.9	12.9	12.4	12.4	12.4	12.4	12.4
Approach LOS	B	B	B	B	B	B	B	C	A	A	C	A
Intersection Summary												
HCM Average Control Delay	12.6											
HCM Volume to Capacity ratio	0.57											
Actuated Cycle Length (s)	42.8											
Intersection Capacity Utilization	48.5%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	SEL	SET	SER	NWL	NWT	NWR	NET	NER	SWL	SWT	SWR
Lane Configurations	89	506	35	145	466	345	57	66	243	642	143
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.0	5.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	5.0	5.0
Total Lost time (s)	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.92
Lane Util. Factor	1.00	0.99	1.00	0.94	1.00	0.98	1.00	0.88	1.00	0.92	1.00
Flt	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Flt Protected	1770	3305	1770	3314	1770	3314	1770	1643	3433	1706	1706
Satd. Flow (prot)	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Flt Permitted	1770	3305	1770	3314	1770	3314	1770	1643	3433	1706	1706
Satd. Flow (perm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak-hour factor, PHF	99	562	39	161	518	383	63	73	270	713	159
Adj. Flow (vph)	0	6	0	0	169	0	0	139	0	0	55
RTOR Reduction (vph)	99	595	0	161	732	0	63	204	0	713	307
Lane Group Flow (vph)	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Turn Type	1	6	5	2	7	4	3	8			
Protected Phases	5.0	17.7	9.0	20.7	4.0	14.4	17.6	28.0			
Permitted Phases	5.0	17.7	9.0	20.7	4.0	14.4	17.6	28.0			
Actuated Green, G (s)	0.07	0.23	0.12	0.27	0.06	0.19	0.23	0.37			
Effective Green, g (s)	5.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0			
Actuated g/C Ratio	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			
Clearance Time (s)	115	809	208	884	92	308	788	623			
Vehicle Extension (s)	0.06	0.17	c0.09	c0.22	0.04	c0.12	c0.21	0.18			
Lane Grp Cap (vph)	0.86	0.74	0.77	0.82	0.68	0.66	0.90	0.49			
vs Ratio Prot	35.5	27.3	32.9	26.2	35.7	28.9	28.7	18.8			
vs Ratio Perm	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Uniform Delay, d1	44.1	3.5	16.3	5.9	19.0	5.3	13.8	0.6			
Progression Factor	79.6	30.8	49.2	32.2	54.8	34.2	42.5	19.5			
Incremental Delay, d2	E	C	D	C	D	C	D	B			
Delay (s)	37.7	34.7	34.7	34.7	37.4	37.4	34.8	C			
Level of Service	D	D	C	C	D	D	D	C			
Approach Delay (s)											
Approach LOS											
Intersection Summary											
HCM Average Control Delay	35.7								D		
HCM Volume to Capacity ratio	0.82								18.0		
Actuated Cycle Length (s)	76.7								D		
Intersection Capacity Utilization	81.5%										
Analysis Period (min)	15										
c Critical Lane Group											

Baseline

Synchro 7 - Report
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Movement	WBL	WBR	SEL	SET	NWT	NWR	NWR2	SWL	SWR
Lane Configurations	0	0	777	597	764	0	315	137	230
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	0.97	0.95	0.95	0.95	1.00	0.85	1.00	0.97	1.00
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	0.85	1.00	0.85	1.00
Flt	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Flt Protected	3433	3539	3539	1583	3433	1583	3433	1583	1583
Satd. Flow (prot)	0.95	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Flt Permitted	3433	3539	3539	1583	3433	1583	3433	1583	1583
Satd. Flow (perm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak-hour factor, PHF	0	0	863	663	849	0	350	152	256
Adj. Flow (vph)	0	0	0	0	0	0	237	0	218
RTOR Reduction (vph)	0	0	863	663	849	0	113	152	38
Lane Group Flow (vph)	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Turn Type	5	2	6	6	4				
Protected Phases	17.4	38.3	17.9	17.9	8.2				
Permitted Phases	17.4	38.3	17.9	17.9	8.2				
Actuated Green, G (s)	0.31	0.69	0.32	0.32	0.15				
Effective Green, g (s)	4.0	5.0	4.0	4.0	4.0				
Actuated g/C Ratio	3.0	3.0	3.0	3.0	3.0				
Clearance Time (s)	1076	2442	1141	511	507				
Vehicle Extension (s)	c0.25	c0.19	c0.24	0.07	0.04				
Lane Grp Cap (vph)	0.80	0.27	0.74	0.22	0.30				
vs Ratio Prot	17.5	3.3	16.8	13.7	21.1				
vs Ratio Perm	1.00	1.00	1.00	1.00	1.00				
Uniform Delay, d1	4.4	0.1	2.7	0.2	0.3				
Progression Factor	21.9	3.3	19.4	13.9	21.4				
Incremental Delay, d2	C	A	B	B	C				
Delay (s)	C	A	B	B	C				
Level of Service	A	B	B	B	C				
Approach Delay (s)									
Approach LOS									
Intersection Summary									
HCM Average Control Delay	16.3					B			
HCM Volume to Capacity ratio	0.68					12.0			
Actuated Cycle Length (s)	55.5					B			
Intersection Capacity Utilization	57.2%								
Analysis Period (min)	15								
c Critical Lane Group									

Baseline

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis 35: SR-56 EB Ramps & Carmel Country Rd.

Near Term + Project (Phase 1) AM
3/2/2012

Movement	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR
Lane Configurations	EBL	EBR	SEL	SET	SER	NWL	NWT	NWR	SWL	SWR
Volume (vph)	309	2	166	350	381	0	0	745	220	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.95	0.95	1.00	0.97	0.95	0.95	1.00	0.85	1.00	1.00
Flt	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	0.95	1.00	0.95	1.00	1.00	1.00	0.85	1.00	1.00
Satd. Flow (prot)	1681	1681	1583	3433	3539	3539	3539	1583	3539	1583
Flt Permitted	0.95	0.95	1.00	0.95	1.00	1.00	1.00	0.85	1.00	1.00
Satd. Flow (perm)	1681	1681	1583	3433	3539	3539	3539	1583	3539	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	343	2	184	389	423	0	0	828	244	0
RTOR Reduction (vph)	0	0	145	0	0	0	0	158	0	0
Lane Group Flow (vph)	171	174	39	389	423	0	0	828	86	0
Turn Type	Split	Perm	Prot	Perm	Prot	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	1	6	2	2	2	2	2	2
Permitted Phases	10.8	10.8	10.1	32.1	18.0	18.0	18.0	18.0	18.0	18.0
Actuated Green, G (s)	10.8	10.8	10.1	32.1	18.0	18.0	18.0	18.0	18.0	18.0
Effective Green, g (s)	0.21	0.21	0.21	0.20	0.63	0.35	0.35	0.35	0.35	0.35
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	357	357	336	681	2232	1252	560	1252	560	1252
Lane Grp Cap (vph)	0.10	c0.10	c0.11	0.12	c0.23	c0.23	c0.23	c0.23	c0.23	c0.23
vs Ratio Prot	0.48	0.49	0.12	0.57	0.19	0.66	0.15	0.66	0.15	0.66
vs Ratio Perm	17.6	17.6	16.2	18.4	3.9	13.9	11.2	13.9	11.2	13.9
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	1.0	1.0	0.2	1.2	0.0	1.3	0.1	1.3	0.1	1.3
Incremental Delay, d2	18.6	18.7	16.3	19.6	4.0	45.2	11.4	45.2	11.4	45.2
Delay (s)	B	B	B	B	A	B	B	B	B	A
Level of Service	B	B	B	B	A	B	B	B	B	A
Approach Delay (s)	17.8	17.8	11.5	11.5	11.5	14.3	14.3	14.3	14.3	14.3
Approach LOS	B	B	B	B	B	B	B	B	B	A
Intersection Summary	Intersection Summary									
HCM Average Control Delay	14.1									
HCM Volume to Capacity ratio	0.59									
Actuated Cycle Length (s)	50.9									
Intersection Capacity Utilization	49.2%									
Analysis Period (min)	15									
c Critical Lane Group	15									

Baseline

Synchro 7 - Report
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ALL-WAY STOP CONTROL ANALYSIS										
General Information				Site Information						
Analyst	Jacob Swin	Intersection	Carmel Creek Rd/Del Mar Trail							
Agency/Co.	USAI	Jurisdiction	City of San Diego							
Date Performed	9/15/2010	Analysis Year	2010							
Analysis Time Period	38 NT+P AM (Phase 1)									
Project ID 002407 - San Diego Corporate Center Lots										
East/West Street: Del Mar Trail										
North/South Street: Carmel Creek Road										
Volume Adjustments and Site Characteristics										
Approach	Eastbound				Westbound				Southbound	
Movement	L	T	L	R	L	T	L	T	R	
Volume (veh/h)	10	10	10	10	206		2		26	
% Thrus Left Lane										
Approach	Northbound				Southbound				Southbound	
Movement	L	T	L	R	L	T	L	T	R	
Volume (veh/h)	3	267	103	15	956				3	
% Thrus Left Lane	50				50					
	Eastbound		Westbound		Northbound		Southbound		Southbound	
Configuration	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2
PHF	LTR	LTR	LTR	LTR	LT	TR	LT	TR	TR	TR
Flow Rate (veh/h)	33	258	258	150	0.90	0.90	0.90	0.90	0.90	0.90
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2
No. Lanes	1		1		2		2		2	
Geometry Group	2		2		5		5		5	
Duration, T	0.25									
Saturation Headway Adjustment Worksheet										
Prop. Left Turns	0.3		0.9		0.0		0.0		0.0	
Prop. Right Turns	0.3		0.1		0.0		0.4		0.0	
Prop. Heavy Vehicle	0.0		0.0		0.0		0.0		0.0	
HLT-adj	0.2		0.2		0.2		0.5		0.5	
hRT-adj	-0.6		-0.6		-0.6		-0.7		-0.7	
hRV-adj	1.7		1.7		1.7		1.7		1.7	
hadj, computed	-0.1		0.1		0.0		-0.3		0.0	
Departure Headway and Service Time										
hd, initial value (s)	3.20		3.20		3.20		3.20		3.20	
xi, initial	0.03		0.23		0.13		0.23		0.49	
hd, final value (s)	7.48		6.82		7.15		6.83		6.33	
xi, final value	0.07		0.49		0.30		0.50		0.96	
Move-up time, m (s)	2.0		2.0		2.3		2.3		2.3	
Service Time, ts (s)	5.5		4.8		4.9		4.5		4.0	
Capacity and Level of Service										
	Eastbound		Westbound		Northbound		Southbound		Southbound	
	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2
Capacity (veh/h)	283		508		400		512		569	
Delay (s/veh)	11.03		16.17		12.86		16.10		53.45	
LOS	B		C		B		C		F	
Approach Delay (s/veh)	11.03		16.17		14.92		50.83		50.83	
LOS	B		C		B		F		F	
Intersection Delay (s/veh)	36.79									
Intersection LOS	F									

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3/2/2012

HCM Signalized Intersection Capacity Analysis
1: Via De La Valle & El Camino Real

Near Term + Project (Phase 1) PM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	6	478	528	175	425	3	557	2	430	0	2	1
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Util. Factor	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85	1.00	0.96	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1861	1774	1583	1774	1583	1779	1779	1779
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1861	1774	1583	1774	1583	1779	1779	1779
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	531	587	194	472	3	619	2	478	0	2	1
RTOR Reduction (vph)	0	0	197	0	0	0	0	0	262	0	1	0
Lane Group Flow (vph)	7	531	390	194	475	0	621	216	0	2	0	0
Turn Type	Prot	Perm	Prot	Perm	Prot	Spill	Spill	Perm	Spill			
Protected Phases	7	4	4	3	8	2	2	2	6	6	6	6
Permitted Phases												
Actuated Green, G (s)	0.8	40.3	40.3	14.5	54.0			45.8	45.8	1.2	1.2	1.2
Effective Green, g (s)	0.8	40.3	40.3	14.5	54.0			45.8	45.8	1.2	1.2	1.2
Actuated g/C Ratio	0.01	0.34	0.34	0.12	0.46			0.39	0.39	0.01	0.01	0.01
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)	12	637	542	218	853			690	615	18	18	18
v/s Ratio Prot	0.00	c0.29		c0.11	0.26			c0.35		c0.00	c0.00	c0.00
v/c Ratio	0.58	0.83	0.72	0.89	0.56			0.90	0.35	0.14	0.11	0.11
Uniform Delay, d1	58.3	35.7	33.8	50.9	23.2			33.8	25.5	57.8	57.8	57.8
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	56.2	9.2	4.5	32.5	0.8			14.8	0.3	2.7	2.7	2.7
Delay (s)	114.6	44.8	38.3	83.4	24.0			48.7	25.8	60.5	60.5	60.5
Level of Service	F	D	D	F	C			D	C	E	E	E
Approach Delay (s)		41.9		41.2				38.7		60.5		60.5
Approach LOS		D		D				D		E		E

Intersection Summary			D
HCM Average Control Delay	40.6	HCM Level of Service	
HCM Volume to Capacity ratio	0.86		D
Actuated Cycle Length (s)	117.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Baseline

Synchro 7 - Report
Page 1

HCM Signalized Intersection Capacity Analysis
2: San Diegouito Road & El Camino Real

Near Term + Project (Phase 1) PM
3/2/2012

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	W	W	A	A	A	W	W
Volume (vph)	210	264	0	563	374	342	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	5.0	5.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95
Flt Protected	1.00	0.85	1.00	0.85	1.00	1.00	1.00
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	1863	1583	1770	3539	3539
Flt Permitted	0.95	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	1863	1583	1770	3539	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	233	293	0	626	416	380	321
RTOR Reduction (vph)	0	244	0	0	253	0	0
Lane Group Flow (vph)	233	49	0	626	163	380	321
Turn Type	Perm	Prot	Prot	Perm	Prot	Prot	
Protected Phases	1	1	3	8	7	7	6
Permitted Phases							
Actuated Green, G (s)	12.1	12.1	28.3	28.3	18.7	12.1	12.1
Effective Green, g (s)	12.1	12.1	28.3	28.3	18.7	12.1	12.1
Actuated g/C Ratio	0.17	0.17	0.39	0.39	0.26	0.17	0.17
Clearance Time (s)	4.0	4.0	5.0	5.0	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)	576	266	731	621	459	594	594
v/s Ratio Prot	0.07		c0.34		c0.21	c0.09	c0.09
v/c Ratio	0.40	0.18	0.86	0.26	0.83	0.54	0.54
Uniform Delay, d1	26.8	25.8	20.0	14.8	25.2	27.5	27.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3	9.7	0.2	11.7	1.0	1.0
Delay (s)	27.2	26.1	29.7	15.1	36.9	28.5	28.5
Level of Service	C	C	C	B	D	C	C
Approach Delay (s)	26.6		23.9		33.0		33.0
Approach LOS	C		C		C		C

Intersection Summary		
HCM Average Control Delay	27.3	HCM Level of Service
HCM Volume to Capacity ratio	0.78	C
Actuated Cycle Length (s)	72.1	Sum of lost time (s)
Intersection Capacity Utilization	65.4%	13.0
Analysis Period (min)	15	C
c Critical Lane Group		

Baseline

Synchro 7 - Report
Page 2

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	W	W	A	A	A	W	W
Volume (vph)	65	6	0	896	111	8	497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.99	0.98	0.95	0.95	1.00	0.95
Flt	0.99	0.99	0.98	1.00	1.00	1.00	1.00
Flt Protected	0.96	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3410	3410	3481	1770	3539	1770	3539
Flt Permitted	0.96	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3410	3410	3481	1770	3539	1770	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	72	7	0	996	123	9	552
RTOR Reduction (vph)	6	0	0	13	0	0	0
Lane Group Flow (vph)	73	0	0	1106	0	9	552
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	8	5	2	1	6		
Permitted Phases							
Actuated Green, G (s)	3.2	19.6	0.6	24.2	0.6	24.2	
Effective Green, g (s)	3.2	19.6	0.6	24.2	0.6	24.2	
Actuated g/C Ratio	0.09	0.55	0.02	0.68	0.02	0.68	
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)	308	1927	30	2419	30	2419	
v/s Ratio Prot	c0.02	c0.32	0.01	c0.16	0.01	c0.16	
v/s Ratio Perm							
v/c Ratio	0.24	0.57	0.30	0.23	0.30	0.23	
Uniform Delay, d1	15.0	5.2	17.2	2.1	17.2	2.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.4	5.6	0.0	5.6	0.0	
Delay (s)	15.4	5.6	22.8	2.1	22.8	2.1	
Level of Service	B	A	C	A	C	A	
Approach Delay (s)	15.4	5.6	2.5				
Approach LOS	B	A	A				
Intersection Summary							
HCM Average Control Delay	5.0						A
HCM Volume to Capacity ratio	0.53						
Actuated Cycle Length (s)	35.4						12.0
Intersection Capacity Utilization	38.3%						A
Analysis Period (min)	15						
c Critical Lane Group							

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SEB
Lane Configurations	W	W	W	W	W	W	W	W	W	W	W	W
Volume (vph)	23	22	14	17	21	155	26	812	58	89	441	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	1.00	1.00	1.00	0.87	1.00	0.95	1.00	0.95	1.00	0.95
Flt	1.00	0.94	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	1751	1770	1770	1616	1770	1770	3504	1770	1770	3508	1770
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	1770	1751	1770	1770	1616	1770	1770	3504	1770	1770	3508	1770
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	26	24	16	19	23	172	29	902	64	99	490	31
RTOR Reduction (vph)	0	14	0	0	152	0	0	7	0	0	5	0
Lane Group Flow (vph)	26	26	0	19	43	0	29	959	0	99	516	0
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	1.3	6.7		0.7	6.1		1.6	23.0		5.0	26.4	
Effective Green, g (s)	1.3	6.7		0.7	6.1		1.6	23.0		5.0	26.4	
Actuated g/C Ratio	0.03	0.13		0.01	0.12		0.03	0.45		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)	45	228		24	192		55	1558		172	1802	
v/s Ratio Prot	c0.01	0.01		0.01	c0.03		0.02	c0.27		c0.06	c0.15	
v/s Ratio Perm												
v/c Ratio	0.58	0.11		0.79	0.23		0.53	0.61		0.58	0.29	
Uniform Delay, d1	24.8	19.7		25.3	20.5		24.5	10.8		22.2	7.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.7	0.2		94.5	0.6		8.8	0.7		4.6	0.1	
Delay (s)	41.5	20.0		119.8	21.1		33.4	11.5		26.8	7.2	
Level of Service	D	B		F	C		C	B		C	A	
Approach Delay (s)	28.4			29.9			12.2			10.3		
Approach LOS	C			C			B			B		
Intersection Summary												
HCM Average Control Delay	14.1											B
HCM Volume to Capacity ratio	0.58											
Actuated Cycle Length (s)	51.4									20.0		
Intersection Capacity Utilization	56.6%									B		
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
5: Quarter Mile Road & El Camino Real

HCM Signalized Intersection Capacity Analysis
6: Del Mar Heights Road & Mango Drive

Near Term + Project (Phase 1) PM
3/2/2012

Near Term + Project (Phase 1) PM
3/2/2012

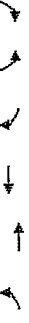
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↘	↔	↑	↘	↔	↑	↘	↔	↑	↘
Volume (vph)	7	42	33	44	30	20	48	957	126	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95
Flt	1.00	1.00	0.95	1.00	0.94	1.00	0.98	1.00	1.00	1.00	1.00	0.95
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (prot)	1770	1853	1583	1770	1751	1770	3477	1770	3477	1770	3528	1770
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Satd. Flow (perm)	1770	1853	1583	1770	1751	1770	3477	1770	3477	1770	3528	1770
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	47	37	49	33	22	53	1063	140	26	518	11
RTOR Reduction (vph)	0	0	34	0	20	0	0	12	0	0	2	0
Lane Group Flow (vph)	8	47	3	49	35	0	53	1191	0	26	527	0
Turn Type	Prot	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4	4	3	8	5	2	1	6			
Permitted Phases												
Actuated Green, G (s)	0.8	4.3	4.3	1.7	5.2	1.8	24.2	0.6	23.0			
Effective Green, g (s)	0.8	4.3	4.3	1.7	5.2	1.8	24.2	0.6	23.0			
Actuated g/C Ratio	0.02	0.09	0.09	0.04	0.11	0.04	0.52	0.01	0.49			
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)	30	171	145	64	195	68	1798	23	1734			
v/s Ratio Prot	0.00	c0.03	0.00	c0.03	0.02	c0.03	c0.34	0.01	0.15			
v/s Ratio Perm												
v/c Ratio	0.27	0.27	0.02	0.77	0.18	0.78	0.66	1.13	0.30			
Uniform Delay, d1	22.7	19.8	19.3	22.4	18.9	22.3	8.3	23.1	7.1			
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.7	0.9	0.1	41.2	0.5	41.9	0.9	231.0	0.1			
Delay (s)	27.4	20.7	19.4	63.6	19.3	64.2	9.2	254.1	7.2			
Level of Service	C	C	B	E	B	E	A	F	A			
Approach Delay (s)		20.8			40.2		11.6		18.8			
Approach LOS		C			D		B		B			
Intersection Summary												
HCM Average Control Delay	15.5											
HCM Volume to Capacity ratio	0.57											
Actuated Cycle Length (s)	46.8											
Intersection Capacity Utilization	52.9%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	128	849	16	133	920	203	41	32	48	390	36	134
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	0.91	1.00	1.00	0.95	1.00	0.95	1.00	0.85	1.00	0.95	0.95
Lane Util. Factor	1.00	1.00	1.00	1.00	0.97	1.00	0.97	1.00	0.85	1.00	0.93	0.93
Flt	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.97	1.00	0.95	0.98	0.98
Flt Protected	1770	5071	1770	3443	3443	1770	3443	1812	1583	1681	1609	1609
Satd. Flow (prot)	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.97	1.00	0.95	0.98	0.98
Flt Permitted	1770	5071	1770	3443	3443	1770	3443	1812	1583	1681	1609	1609
Satd. Flow (perm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak-hour factor, PHF	142	943	18	148	1022	226	46	36	53	433	40	149
Adj. Flow (vph)	0	2	0	0	20	0	0	0	48	0	38	0
RTOR Reduction (vph)	142	959	0	148	1228	0	0	82	5	320	264	0
Lane Group Flow (vph)	Prot	Perm	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Turn Type	7	4	4	3	8	2	2	2	2	6	6	6
Protected Phases												
Permitted Phases												
Actuated Green, G (s)	8.2	27.9	11.6	31.3	31.3	7.6	7.6	7.6	7.6	17.8	17.8	17.8
Effective Green, g (s)	8.2	27.9	11.6	31.3	31.3	7.6	7.6	7.6	7.6	17.8	17.8	17.8
Actuated g/C Ratio	0.10	0.34	0.14	0.39	0.39	0.09	0.09	0.09	0.09	0.22	0.22	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	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)	179	1749	254	1332	1332	170	149	370	354			
vs Ratio Prot	c0.08	0.19	0.08	c0.36	c0.36	c0.05	0.00	c0.19	0.16			
vs Ratio Perm												
Uniform Delay, d1	0.79	0.55	0.58	0.92	0.92	0.48	0.03	0.86	0.75			
Progression Factor	35.5	21.4	32.4	23.6	23.6	34.8	33.3	30.4	29.4			
Incremental Delay, d2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Delay (s)	21.0	0.4	3.4	10.7	10.7	2.2	0.1	18.5	8.3			
Level of Service	56.5	21.8	35.8	34.3	34.3	36.9	33.4	48.9	37.7			
Approach Delay (s)	E	C	D	C	C	D	C	D	D			
Approach LOS		26.2		34.5	34.5		35.5		43.5			
		C		C	C		D		D			
Intersection Summary												
HCM Average Control Delay	33.5											
HCM Volume to Capacity ratio	0.84											
Actuated Cycle Length (s)	80.9											
Intersection Capacity Utilization	72.1%											
Analysis Period (min)	15											
c Critical Lane Group												



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	←←←	←←	←←	←←	←	←
Volume (veh/h)	1246	64	0	1548	0	87
Sign Control	Free	Free	Free	Free	Stop	Stop
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1384	71	0	1720	0	97
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	575		0.87	607	0.78	0.87
VC1, stage 1 conf vol					2280	497
VC2, stage 2 conf vol						
VCU, unblocked vol			992		1056	0
IC, single (s)			4.1		6.8	6.9
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			100		100	90
cM capacity (veh/h)			601		172	941
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 1
Volume Total	554	554	348	860	860	97
Volume Left	0	0	0	0	0	0
Volume Right	0	0	71	0	0	97
cSH	1700	1700	1700	1700	1700	941
Volume to Capacity	0.33	0.33	0.20	0.51	0.51	0.10
Queue Length 95th (ft)	0	0	0	0	0	9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.3
Lane LOS	A	A	A	A	A	A
Approach Delay (s)	0.0		0.0		9.3	
Approach LOS	A		A		A	
Intersection Summary						
Average Delay	0.3			9.3		
Intersection Capacity Utilization	46.1%			ICU Level of Service		
Analysis Period (min)	15			A		

Baseline



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR
Lane Configurations	←	←	←	←	←	←	←	←
Volume (veh)	0	948	1303	0	929	299	0	0
Ideal Flow (vphpl)	1800	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3		5.6	5.6		
Lane Util. Factor		0.95	0.95		0.97	0.91		
Flt		1.00	1.00		1.00	0.85		
Flt Protected		1.00	1.00		0.95	1.00		
Satd. Flow (prot)		3539	3539		3431	1441		
Flt Permitted		1.00	1.00		0.95	1.00		
Satd. Flow (perm)		3539	3539		3431	1441		
Peak-hour factor, PHF		0.90	0.90		0.90	0.90		
Adj. Flow (vph)		1053	1448		1032	332		
RTOR Reduction (vph)		0	0		0	0		
Lane Group Flow (vph)		1053	1448		1032	332		
Turn Type		Prot	Prot		Prot	Prot		
Protected Phases		2.6	6.2		4	4		
Permitted Phases								
Actuated Green, G (s)		42.5	42.5		25.6	25.6		
Effective Green, g (s)		42.5	42.5		25.6	25.6		
Actuated g/C Ratio		0.53	0.53		0.32	0.32		
Clearance Time (s)					5.6	5.6		
Vehicle Extension (s)					3.0	3.0		
Lane Grp Cap (vph)		1880	1880		1088	461		
v/s Ratio Prot		0.30	c0.41		c0.31	0.19		
v/s Ratio Perm								
v/s Ratio		0.56	0.77		0.97	0.61		
Uniform Delay, d1		12.5	14.9		26.8	23.0		
Progression Factor		1.00	1.00		1.00	1.00		
Incremental Delay, d2		0.4	2.0		19.5	2.3		
Delay (s)		12.9	16.9		46.3	25.2		
Level of Service		B	B		D	C		
Approach Delay (s)		12.9	16.9		41.7			
Approach LOS		B	B		D			
Intersection Summary								
HCM Average Control Delay	24.6			HCM Level of Service			C	
HCM Volume to Capacity ratio	0.84			Sum of lost time (s)			119	
Actuated Cycle Length (s)	80.0			ICU Level of Service			H	
Intersection Capacity Utilization	117.3%			Analysis Period (min)			15	
Analysis Period (min)	15			c. Critical Lane Group				

Baseline

HCM Signalized Intersection Capacity Analysis
9. Del Mar Heights Road & L-15 NB Ramps

Near Term + Project (Phase 1) PM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	GBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	242	1580	0	0	1451	969	649	24	858	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	0	4.0	4.0	4.0	4.0	0	4.0	0	0	0
Lane Util. Factor	0.97	0.95	0	0.91	0.91	0.95	0.91	0.91	0.95	0	0	0
Flt	1.00	1.00	0	1.00	1.00	0.95	1.00	0.89	0.85	0	0	0
Flt Protected	0.95	1.00	0	1.00	1.00	0.95	1.00	0.99	1.00	0	0	0
Satd. Flow (prot)	3433	3539	0	5085	5085	1583	1681	1494	1504	0	0	0
Flt Permitted	0.95	1.00	0	1.00	1.00	0.95	1.00	0.99	1.00	0	0	0
Satd. Flow (perm)	3433	3539	0	5085	5085	1583	1681	1494	1504	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	269	1756	0	0	1612	1077	721	27	953	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	475	0	8	0	0	0	0
Lane Group Flow (vph)	269	1756	0	0	1612	602	591	559	535	0	0	0
Turn Type	Prot	2	2	Prot	6	6	8	8	8	Prot	8	8
Protected Phases	5	2	2	6	6	6	8	8	8	8	8	8
Permitted Phases	5	2	2	6	6	6	8	8	8	8	8	8
Actuated Green, G (s)	10.6	65.0	65.0	50.4	50.4	50.4	47.0	47.0	47.0	47.0	47.0	47.0
Effective Green, g (s)	10.6	65.0	65.0	50.4	50.4	50.4	47.0	47.0	47.0	47.0	47.0	47.0
Actuated g/C Ratio	0.09	0.54	0.54	0.42	0.42	0.42	0.39	0.39	0.39	0.39	0.39	0.39
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)	303	1917	2136	665	658	585	589	589	589	589	589	589
v/s Ratio Prot	0.08	c0.50	0.32	0.38	0.35	c0.37	0.36	0.36	0.36	0.36	0.36	0.36
v/s Ratio Perm	0.89	0.92	0.75	0.91	0.90	0.96	0.91	0.91	0.91	0.91	0.91	0.91
Uniform Delay, d1	54.1	25.0	29.6	32.6	34.3	35.5	34.5	34.5	34.5	34.5	34.5	34.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.3	8.4	2.5	18.1	15.0	26.3	17.8	17.8	17.8	17.8	17.8	17.8
Delay (s)	79.4	33.4	32.1	50.7	49.2	61.8	52.3	52.3	52.3	52.3	52.3	52.3
Level of Service	E	C	C	D	D	D	E	D	D	D	D	D
Approach Delay (s)	39.5	39.5	39.5	39.5	39.5	39.5	54.4	54.4	54.4	0.0	0.0	0.0
Approach LOS	D	D	D	D	D	D	D	D	D	A	A	A
Intersection Summary												
HCM Average Control Delay	43.5											
HCM Volume to Capacity ratio	0.93											
Actuated Cycle Length (s)	120.0											
Intersection Capacity Utilization	104.2%											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
10. Del Mar Heights Road & High Bluff Drive

Near Term + Project (Phase 1) PM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	GBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	249	2211	259	41	1695	55	637	67	147	37	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	0.91	0.97	0.95	0.95	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	1.00	0.90	0.90	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5081	3433	3174	3433	1770	1683	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5061	3433	3174	3433	1770	1683	1583	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	277	2457	288	46	1883	61	708	74	163	41	33	91
RTOR Reduction (vph)	0	0	80	0	2	0	0	84	0	0	0	85
Lane Group Flow (vph)	277	2457	208	46	1942	0	708	153	0	41	33	91
Turn Type	Prot	4	4	3	8	5	2	2	1	6	6	6
Protected Phases	7	4	4	3	8	5	2	2	1	6	6	6
Permitted Phases	7	4	4	3	8	5	2	2	1	6	6	6
Actuated Green, G (s)	21.0	66.2	66.2	3.6	48.8	27.0	29.8	29.8	5.7	8.5	8.5	8.5
Effective Green, g (s)	21.0	66.2	66.2	3.6	48.8	27.0	29.8	29.8	5.7	8.5	8.5	8.5
Actuated g/C Ratio	0.17	0.55	0.55	0.03	0.40	0.22	0.25	0.25	0.05	0.07	0.07	0.07
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)	306	2775	864	53	2036	764	780	780	83	131	111	111
v/s Ratio Prot	c0.16	0.48	0.13	0.03	c0.38	c0.21	c0.05	c0.05	0.02	0.02	0.00	0.00
v/s Ratio Perm	0.91	0.89	0.24	0.87	0.95	0.93	0.20	0.20	0.49	0.25	0.06	0.06
Uniform Delay, d1	49.2	24.2	14.4	58.6	35.2	46.2	36.3	36.3	56.4	53.4	52.7	52.7
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	28.4	3.8	0.1	76.0	11.0	17.1	0.1	0.1	4.6	1.0	0.2	0.2
Delay (s)	77.5	28.0	14.5	134.6	46.1	63.3	36.4	36.4	61.0	54.4	52.9	52.9
Level of Service	E	C	B	F	D	E	D	D	E	D	D	D
Approach Delay (s)	31.2	31.2	31.2	46.2	46.2	56.5	56.5	56.5	55.2	55.2	55.2	55.2
Approach LOS	C	C	C	D	D	E	E	E	E	E	E	E
Intersection Summary												
HCM Average Control Delay	41.3											
HCM Volume to Capacity ratio	0.85											
Actuated Cycle Length (s)	121.3											
Intersection Capacity Utilization	82.6%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	AAA	A	A	AAA	A	A
Volume (vph)	2364	76	47	1763	219	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Fit	1.00	0.85	1.00	1.00	1.00	0.85
Fit Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	1770	5085	3433	1583
Fit Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2627	87	52	1959	243	146
RTOR Reduction (vph)	0	32	0	0	0	91
Lane Group Flow (vph)	2627	55	52	1959	243	55
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	4	4	3	8	2	2
Permitted Phases						
Actuated Green, G (s)	42.4	42.4	2.5	48.9	9.9	9.9
Effective Green, g (s)	42.4	42.4	2.5	48.9	9.9	9.9
Actuated g/C Ratio	0.63	0.63	0.04	0.73	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)	3228	1005	66	3722	509	235
v/s Ratio Prot	c0.52	0.03	0.03	c0.39	c0.07	0.03
v/s Ratio Perm						
v/c Ratio	0.81	0.05	0.79	0.53	0.48	0.23
Uniform Delay, d1	9.2	4.6	31.9	3.9	26.1	25.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.0	44.9	0.1	0.7	0.5
Delay (s)	10.9	4.6	76.8	4.0	26.8	25.6
Level of Service	B	A	E	A	C	C
Approach Delay (s)	10.7		5.9	26.3		
Approach LOS	B		A	C		
Intersection Summary						
HCM Average Control Delay			10.0			A
HCM Volume to Capacity ratio			0.75			
Actuated Cycle Length (s)			66.8			12.0
Intersection Capacity Utilization			60.5%			B
Analysis Period (min)			15			
c Critical Lane Group						

Baseline

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	AAA	A	A	AAA	A	A
Volume (vph)	2432	63	31	1635	175	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	1.00
Fit	1.00	0.85	1.00	1.00	1.00	0.85
Fit Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	1583
Fit Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	1770	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2702	70	34	1817	194	98
RTOR Reduction (vph)	0	26	0	0	0	81
Lane Group Flow (vph)	2702	44	34	1817	194	17
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	4	4	3	8	2	2
Permitted Phases						
Actuated Green, G (s)	42.5	42.5	1.6	48.1	12.1	12.1
Effective Green, g (s)	42.5	42.5	1.6	48.1	12.1	12.1
Actuated g/C Ratio	0.62	0.62	0.02	0.71	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)	3169	966	81	3566	314	281
v/s Ratio Prot	c0.53	0.03	0.01	c0.36	c0.11	0.01
v/s Ratio Perm						
v/c Ratio	0.85	0.04	0.42	0.51	0.62	0.06
Uniform Delay, d1	10.3	5.0	32.8	4.6	25.9	23.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.0	3.5	0.1	3.6	0.1
Delay (s)	12.7	5.0	36.3	4.7	29.5	23.4
Level of Service	B	A	D	A	C	C
Approach Delay (s)	12.5		5.3	27.5		
Approach LOS	B		A	C		
Intersection Summary						
HCM Average Control Delay			10.7			B
HCM Volume to Capacity ratio			0.81			
Actuated Cycle Length (s)			68.2			12.0
Intersection Capacity Utilization			63.4%			B
Analysis Period (min)			15			
c Critical Lane Group						

Baseline

HCM Signalized Intersection Capacity Analysis
 13: Del Mar Heights Road & El Camino Real

HCM Signalized Intersection Capacity Analysis
 14: Del Mar Heights Road & Carmel Country Rd.

Near Term + Project (Phase 1) PM
 3/2/2012

Near Term + Project (Phase 1) PM
 3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	W	W	W	W	W	W	W	W	W	W	W	W
Volume (vph)	478	1565	399	145	826	181	450	447	318	151	163	206
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.97	0.91	0.97	0.97	0.91	0.97	0.91	0.97	0.91	0.97	0.91	0.97
Flt Protected	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.97	1.00
Satd. Flow (prot)	3433	4932	3433	3433	4948	3433	5085	1883	3433	4659	3433	4659
Satd. Flow (perm)	3433	4932	3433	3433	4948	3433	5085	1883	3433	4659	3433	4659
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	531	1761	443	161	918	201	500	497	353	168	181	229
RTOR Reduction (vph)	0	47	0	0	37	0	0	0	104	0	196	0
Lane Group Flow (vph)	531	2157	0	161	1082	0	500	497	249	168	214	0
Turn Type	Prot	4	Prot	Prot	3	8	5	2	2	1	6	
Permitted Phases	7	4	Prot	Prot	3	8	5	2	2	1	6	
Actuated Green, G (s)	16.3	37.8		5.2	26.7		14.0	19.4	19.4	6.8	12.2	
Effective Green, g (s)	16.3	37.8		5.2	26.7		14.0	19.4	19.4	6.8	12.2	
Actuated g/C Ratio	0.19	0.44		0.06	0.31		0.16	0.23	0.23	0.08	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)	657	2188		210	1551		564	1158	360	274	657	
v/s Ratio Prot	c0.15	c0.44		0.05	0.22		c0.15	0.10	c0.16	0.05	0.05	
v/s Ratio Perm												
v/c Ratio	0.81	0.99		0.77	0.70		0.89	0.43	0.69	0.61	0.32	
Uniform Delay, d1	33.0	23.4		39.4	25.7		34.8	28.2	30.2	37.9	32.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.2	15.9		15.3	1.4		15.5	0.3	5.6	4.0	0.3	
Delay (s)	40.2	39.3		54.7	27.1		50.3	28.4	35.8	42.0	33.1	
Level of Service	D	D		D	C		D	C	D	D	C	
Approach Delay (s)		39.5			30.6						35.6	
Approach LOS		D			C						D	
Intersection Summary												
HCM Average Control Delay				37.0								
HCM Volume to Capacity ratio				0.89								
Actuated Cycle Length (s)				85.2						12.0		
Intersection Capacity Utilization				77.6%						D		
Analysis Period (min)				15								
c - Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	W	W	W	W	W	W	W	W	W	W	W	W
Volume (vph)	120	1215	546	92	586	74	354	172	149	80	128	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.97	0.91	0.97	0.97	0.91	0.97	0.91	0.97	0.91	0.97	0.91	0.97
Flt Protected	1.00	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)	3433	4849	3433	3433	5000	3433	4731	3433	4731	3433	4731	3433
Satd. Flow (perm)	3433	4849	3433	3433	5000	3433	4731	3433	4731	3433	4731	3433
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	1350	607	91	651	82	393	191	166	89	142	127
RTOR Reduction (vph)	0	93	0	0	18	0	0	135	0	0	110	0
Lane Group Flow (vph)	133	1884	0	91	715	0	393	222	0	89	169	0
Turn Type	Prot	7	4	Prot	3	8	5	2	2	1	6	
Permitted Phases	7	4	Prot	Prot	3	8	5	2	2	1	6	
Actuated Green, G (s)	5.4	31.7		3.5	29.8		10.5	13.1		6.9	9.5	
Effective Green, g (s)	5.4	31.7		3.5	29.8		10.5	13.1		6.9	9.5	
Actuated g/C Ratio	0.08	0.46		0.05	0.42		0.15	0.18		0.10	0.13	
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)	260	2159		169	2093		506	870		172	439	
v/s Ratio Prot	c0.04	c0.38		0.03	0.14		c0.11	c0.05		0.05	c0.05	
v/s Ratio Perm												
v/c Ratio	0.51	0.86		0.54	0.34		0.78	0.25		0.52	0.36	
Uniform Delay, d1	31.6	17.8		33.1	14.0		29.2	24.9		30.6	28.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	3.9		3.3	0.1		7.4	0.2		2.6	0.5	
Delay (s)	33.3	21.7		36.3	14.1		36.6	25.0		33.2	28.6	
Level of Service	C	C		D	B		D	C		C	C	
Approach Delay (s)		22.4			16.6			31.1			29.7	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM Average Control Delay				23.5								
HCM Volume to Capacity ratio				0.73								
Actuated Cycle Length (s)				71.2						16.0		
Intersection Capacity Utilization				69.6%						C		
Analysis Period (min)				15								
c - Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 15: Del Mar Heights Road & Torrey Ridge Drive

HCM Signalized Intersection Capacity Analysis
 16: Del Mar Heights Road & Lansdale Drive

Near Term + Project (Phase 1) PM
 3/2/2012

Near Term + Project (Phase 1) PM
 3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SSR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	49	1259	143	8	647	23	50	14	32	28	8	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.88	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.88	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	5007	1770	5059	1770	5059	1770	1669	1770	1642	1770	1642
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	5007	1770	5059	1770	5059	1770	1669	1770	1642	1770	1642
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	54	1399	159	9	719	26	56	16	36	31	9	34
RTOR Reduction (vph)	0	16	0	0	5	0	0	33	0	0	32	0
Lane Group Flow (vph)	54	1542	0	9	741	0	56	19	0	31	11	0
Turn Type	Prot	4	Prot	3	8	Prot	5	2	Prot	1	Prot	6
Protected Phases	7	4	7	4	7	4	7	4	7	4	7	4
Permitted Phases	1.4	22.0	0.6	21.2	1.3	3.2	1.3	3.2	0.6	2.5	0.6	2.5
Actuated Green, G (s)	1.4	22.0	0.6	21.2	1.3	3.2	1.3	3.2	0.6	2.5	0.6	2.5
Effective Green, g (s)	0.03	0.52	0.01	0.50	0.03	0.08	0.03	0.08	0.01	0.06	0.03	0.06
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	58	2598	25	2530	54	126	54	126	25	97	25	97
Lane Grp Cap (vph)	c0.03	c0.31	0.01	0.15	c0.03	c0.01	0.01	0.15	c0.03	c0.01	0.01	0.15
v/s Ratio Prot	0.93	0.59	0.36	0.29	1.04	0.15	1.04	0.15	0.36	0.29	1.04	0.15
v/s Ratio Perm	20.5	7.1	20.7	6.2	20.5	18.3	20.5	18.3	20.9	18.9	20.5	18.9
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	93.1	0.4	8.7	0.1	133.3	0.5	261.6	0.5	261.6	0.5	261.6	0.5
Incremental Delay, d2	113.5	7.5	29.4	6.3	153.9	18.9	282.5	19.4	282.5	19.4	282.5	19.4
Delay (s)	F	A	C	A	F	B	F	B	F	B	F	B
Level of Service	11.0	11.0	6.5	6.5	88.9	88.9	88.9	88.9	88.9	88.9	88.9	88.9
Approach Delay (s)	B	B	A	A	F	F	F	F	F	F	F	F
Approach LOS	B	B	A	A	F	F	F	F	F	F	F	F
Intersection Summary												
HCM Average Control Delay	16.4											
HCM Volume to Capacity ratio	0.47											
Actuated Cycle Length (s)	42.4											
Intersection Capacity Utilization	50.3%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SSR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	279	972	65	22	468	25	40	46	35	24	33	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.94	1.00	1.00	0.87	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	5038	1770	5046	1770	5046	1770	1742	1770	1742	1770	1628
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	5038	1770	5046	1770	5046	1770	1742	1770	1742	1770	1628
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	310	1080	72	24	520	28	44	51	39	27	37	197
RTOR Reduction (vph)	0	9	0	0	9	0	0	33	0	0	167	0
Lane Group Flow (vph)	310	1143	0	24	539	0	44	57	0	27	67	0
Turn Type	Prot	7	4	Prot	3	8	Prot	5	2	Prot	1	6
Protected Phases	7	4	7	4	7	4	7	4	7	4	7	4
Permitted Phases	11.7	25.9	0.7	14.9	1.4	7.8	1.4	7.8	0.7	14.9	1.4	7.8
Actuated Green, G (s)	11.7	25.9	0.7	14.9	1.4	7.8	1.4	7.8	0.7	14.9	1.4	7.8
Effective Green, g (s)	0.23	0.50	0.01	0.29	0.03	0.15	0.03	0.15	0.23	0.50	0.01	0.29
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	400	2819	24	1451	48	262	48	262	24	1451	48	262
Lane Grp Cap (vph)	c0.18	c0.23	0.01	0.11	c0.02	0.03	0.01	0.11	c0.02	0.03	0.01	0.11
v/s Ratio Prot	0.78	0.45	1.00	0.37	0.92	0.22	0.92	0.22	0.78	0.45	1.00	0.37
v/s Ratio Perm	18.8	8.4	25.6	14.7	25.1	19.3	25.1	19.3	18.8	8.4	25.6	14.7
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	9.1	0.1	183.7	0.2	97.8	0.4	97.8	0.4	9.1	0.1	183.7	0.2
Incremental Delay, d2	27.9	8.5	209.3	14.9	123.0	19.7	123.0	19.7	27.9	8.5	209.3	14.9
Delay (s)	C	A	F	B	F	B	F	B	C	A	F	B
Level of Service	12.6	12.6	23.0	23.0	53.6	53.6	53.6	53.6	12.6	12.6	23.0	23.0
Approach Delay (s)	B	B	C	C	D	D	D	D	B	B	C	C
Approach LOS	B	B	C	C	D	D	D	D	B	B	C	C
Intersection Summary												
HCM Average Control Delay	18.3											
HCM Volume to Capacity ratio	0.51											
Actuated Cycle Length (s)	51.8											
Intersection Capacity Utilization	54.4%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	←←←	←←←	←←←	←←←	←←←	←
Volume (vph)	837	178	92	420	110	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.91	0.97	1.00	0.85
Flt	0.97	1.00	1.00	1.00	1.00	0.85
Flt Protected	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	4951	1770	5085	3433	1583	1583
Flt Permitted	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	4951	1770	5085	3433	1583	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	930	198	102	467	122	283
RTOR Reduction (vph)	55	0	0	0	0	230
Lane Group Flow (vph)	1073	0	102	467	122	53
Turn Type	Prot					
Protected Phases	4	3	8	2	2	2
Permitted Phases	Prot					
Actuated Green, G (s)	16.4	2.4	22.8	5.7	5.7	5.7
Effective Green, g (s)	16.4	2.4	22.8	5.7	5.7	5.7
Actuated g/C Ratio	0.45	0.07	0.62	0.16	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)	2225	116	3176	536	247	247
v/s Ratio Prot	c0.22	c0.06	0.09	c0.04	0.03	0.03
v/s Ratio Perm	v/s Ratio Perm					
v/c Ratio	0.48	0.88	0.15	0.23	0.22	0.22
Uniform Delay, d1	7.1	16.9	2.8	13.5	13.4	13.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	47.7	0.0	0.2	0.4	0.4
Delay (s)	7.2	64.6	2.9	13.7	13.9	13.9
Level of Service	A	E	A	B	B	B
Approach Delay (s)	7.2	13.9	13.8			
Approach LOS	A	B	B			
Intersection Summary						
HCM Average Control Delay	10.3			HCM Level of Service		
HCM Volume to Capacity ratio	0.46			B		
Actuated Cycle Length (s)	36.5			Sum of lost time (s)		
Intersection Capacity Utilization	42.6%			12.0		
Analysis Period (min)	15			A		
Critical Lane Group						

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SWL	SWT	SWR
Lane Configurations	↵	↵	↵	↵	↵	↵	↵↶	↵↶	↵↶	↵↶	↵↶	↵↶
Volume (vph)	88	26	26	194	9	255	38	850	168	295	411	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.95	0.95	0.95	1.00	1.00	0.97	0.91	0.91	0.97	0.97	0.91	0.91
Flt	1.00	0.94	1.00	0.85	1.00	0.85	1.00	0.98	1.00	0.98	1.00	0.99
Flt Protected	0.95	0.99	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1681	1649	1778	1583	3433	3433	4959	3433	4959	3433	5058	5058
Flt Permitted	0.95	0.99	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1681	1649	1778	1583	3433	3433	4959	3433	4959	3433	5058	5058
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	98	29	29	216	10	283	42	944	187	328	457	17
RTOR Reduction (vph)	0	26	0	0	0	226	0	33	0	0	4	0
Lane Group Flow (vph)	79	51	0	0	226	57	42	1098	0	328	470	0
Turn Type	Split	Split	Split	Split	Split	Split	Split	Split	Split	Split	Split	Split
Protected Phases	2	2	2	6	6	6	3	8	7	4	4	4
Permitted Phases	7.0	7.0	7.0	13.6	13.6	13.6	2.4	21.5	9.8	28.9	28.9	28.9
Actuated Green, G (s)	7.0	7.0	7.0	13.6	13.6	13.6	2.4	21.5	9.8	28.9	28.9	28.9
Effective Green, g (s)	0.10	0.10	0.10	0.20	0.20	0.20	0.04	0.32	0.14	0.43	0.43	0.43
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	173	170	356	317	121	1570	495	2153	495	2153	495	2153
Lane Grp Cap (vph)	c0.05	0.03	c0.13	c0.13	0.01	c0.22	c0.22	c0.10	c0.10	0.09	0.09	0.09
v/s Ratio Prot	0.46	0.30	0.63	0.63	0.18	0.35	0.70	0.66	0.66	0.22	0.22	0.22
v/s Ratio Perm	28.7	28.2	24.9	24.9	22.5	32.0	20.4	27.5	27.5	12.3	12.3	12.3
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	1.9	1.0	3.7	3.7	0.3	1.7	1.4	3.3	3.3	0.1	0.1	0.1
Incremental Delay, d2	30.6	29.2	28.6	28.6	22.8	33.7	21.7	30.8	30.8	12.4	12.4	12.4
Delay (s)	C	C	C	C	C	C	C	C	C	C	C	C
Level of Service	C	C	C	C	C	C	C	C	C	C	C	C
Approach Delay (s)	29.9	25.3	25.3	25.3								
Approach LOS	C	C	C	C								
Intersection Summary												
HCM Average Control Delay	22.6			HCM Level of Service								
HCM Volume to Capacity ratio	0.64			C								
Actuated Cycle Length (s)	67.9			Sum of lost time (s)								
Intersection Capacity Utilization	56.5%			16.0								
Analysis Period (min)	15			B								
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
19: Townsgate Drive & Camel Country Road

Near Term + Project (Phase 1) PM

3/2/2012

HCM Signalized Intersection Capacity Analysis
20: Townsgate Drive & El Camino Real

Near Term + Project (Phase 1) PM

3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	118	108	178	14	56	118	116	491	10	187	578	88
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.85
Lane Util. Factor	1.00	1.00	0.85	1.00	0.90	1.00	1.00	1.00	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1673	1770	1770	3529	1770	3539	1583	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1673	1770	1770	3529	1770	3539	1583	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	132	120	198	16	62	131	129	546	11	208	642	98
RTOR Reduction (vph)	0	0	134	0	106	0	0	2	0	0	0	72
Lane Group Flow (vph)	132	120	64	16	87	0	129	555	0	208	642	26
Turn Type	Prot	4	Perm	Prot	3	8	Prot	5	2	Prot	1	6
Protected Phases	7	4	4	3	4	4	5	2	2	1	6	6
Permitted Phases	7.6	17.6	17.6	0.6	10.6	6.3	6.3	14.3	6.3	14.3	14.3	14.3
Actuated Green, G (s)	7.6	17.6	17.6	0.6	10.6	6.3	6.3	14.3	6.3	14.3	14.3	14.3
Effective Green, g (s)	0.14	0.32	0.32	0.01	0.19	0.11	0.11	0.26	0.11	0.26	0.26	0.26
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	245	598	508	19	324	203	921	203	923	413	0.02	0.02
Lane Grp Cap (vph)	c0.07	0.06	0.04	0.01	c0.05	0.07	0.16	0.07	0.16	c0.12	c0.18	0.06
v/s Ratio Prot	0.54	0.20	0.13	0.84	0.27	0.64	0.60	0.64	0.60	1.02	0.70	0.06
v/s Ratio Perm	22.0	13.5	13.2	27.1	18.8	23.2	17.8	23.2	17.8	24.2	18.3	15.2
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	2.3	0.2	0.1	131.7	0.5	6.4	1.1	69.7	2.3	0.1	2.3	0.1
Incremental Delay, d2	24.2	13.7	13.3	189.8	19.3	29.5	18.9	29.5	18.9	94.0	20.6	15.3
Delay (s)	C	B	B	F	B	C	B	C	B	F	C	B
Level of Service	C	B	B	F	B	C	B	C	B	F	C	B
Approach Delay (s)	16.6	16.6	16.6	29.9	29.9	20.9	20.9	20.9	20.9	36.1	36.1	36.1
Approach LOS	B	B	B	C	C	C	C	C	C	D	D	D
Intersection Summary												
HCM Average Control Delay	27.2											
HCM Volume to Capacity ratio	0.60											
Actuated Cycle Length (s)	54.8											
Intersection Capacity Utilization	54.4%											
Analysis Period (min)	15											
c Critical Lane Group												

Baseline

Synchro 7 - Report
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Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations	217	12	10	144	2	93	23	730	206	132	516	32
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.91	1.00	0.91
Lane Util. Factor	1.00	0.83	1.00	0.95	1.00	0.85	1.00	0.97	1.00	0.95	1.00	0.99
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1735	1770	1863	1863	1863	1770	4917	1770	1770	5040	5040
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	1735	1770	1863	1863	1863	1770	4917	1770	1770	5040	5040
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	241	13	11	160	2	103	32	811	229	147	573	36
RTOR Reduction (vph)	0	11	0	0	0	0	91	0	66	0	8	0
Lane Group Flow (vph)	241	13	0	160	2	12	32	974	0	147	601	0
Turn Type	Prot	1	6	Prot	5	2	2	7	4	Prot	3	8
Protected Phases	11.8	2.3	16.6	7.1	7.1	7.1	2.7	18.1	6.1	21.5	6.1	21.5
Actuated Green, G (s)	11.8	2.3	16.6	7.1	7.1	7.1	2.7	18.1	6.1	21.5	6.1	21.5
Effective Green, g (s)	0.20	0.04	0.28	0.12	0.12	0.12	0.05	0.31	0.10	0.36	0.10	0.36
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	353	68	497	224	190	81	1506	183	1834	c0.08	c0.12	c0.12
Lane Grp Cap (vph)	c0.14	c0.01	c0.09	0.00	0.01	0.02	0.02	c0.20	c0.08	c0.12	c0.12	c0.12
v/s Ratio Prot	0.68	0.20	0.32	0.01	0.07	0.40	0.65	0.80	0.33	0.33	0.33	0.33
v/s Ratio Perm	21.9	27.5	16.8	22.9	23.1	27.4	17.7	25.9	13.6	13.6	13.6	13.6
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	5.4	1.4	0.4	0.0	0.1	3.2	1.0	21.9	0.1	21.9	0.1	0.1
Incremental Delay, d2	27.3	28.9	17.2	22.9	23.2	30.6	18.7	47.8	13.7	47.8	13.7	13.7
Delay (s)	C	C	B	C	C	C	C	B	D	D	B	B
Level of Service	C	C	B	C	C	C	C	B	D	D	B	B
Approach Delay (s)	27.4	27.4	19.6	19.6	19.6	19.6	19.1	20.3	20.3	20.3	20.3	20.3
Approach LOS	C	C	B	B	B	B	B	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	20.5											
HCM Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	59.1											
Intersection Capacity Utilization	54.7%											
Analysis Period (min)	15											
c Critical Lane Group												

Baseline

Synchro 7 - Report
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HCM Signalized Intersection Capacity Analysis
 21: Carmel Creek Road & Carmel Country Road

HCM Signalized Intersection Capacity Analysis
 22: High Bluff Drive & El Camino Real

Near Term + Project (Phase 1) PM
 3/2/2012

Near Term + Project (Phase 1) PM
 3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	302	244	127	33	102	18	97	370	40	26	436
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00
Lane Util. Factor	1.00	1.00	0.85	1.00	0.98	1.00	0.99	1.00	0.99	1.00	0.94
Flt	0.95	1.00	1.00	0.99	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Protected	1770	1863	1583	1813	1770	1770	3488	1770	3344	1770	3344
Satd. Flow (prot)	0.95	1.00	1.00	0.99	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Permitted	1770	1863	1583	1813	1770	1770	3488	1770	3344	1770	3344
Satd. Flow (perm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak-hour factor, PHF	336	271	141	37	113	20	108	411	44	29	484
Adj. Flow (vph)	0	0	109	0	8	0	0	10	0	0	113
RTOR Reduction (vph)	336	271	32	0	162	0	108	445	0	29	653
Lane Group Flow (vph)	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Split
Turn Type	4	4	4	8	8	8	5	2	1	6	6
Protected Phases	15.1	15.1	15.1	10.9	10.9	5.1	21.8	1.9	18.6	1.9	18.6
Permitted Phases	15.1	15.1	15.1	10.9	10.9	5.1	21.8	1.9	18.6	1.9	18.6
Actuated Green, G (s)	0.23	0.23	0.23	0.17	0.17	0.08	0.33	0.03	0.28	0.03	0.28
Effective Green, g (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actuated g/C Ratio	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Clearance Time (s)	407	428	364	301	301	137	1157	51	947	51	947
Vehicle Extension (s)	c0.19	0.15	c0.09	c0.06	c0.13	c0.06	c0.13	0.02	c0.20	0.02	c0.20
Lane Grp Cap (vph)	0.83	0.63	0.09	0.54	0.54	0.79	0.38	0.57	0.69	0.57	0.69
vis Ratio Prot	24.0	22.8	19.9	25.1	25.1	29.8	16.8	31.5	21.0	31.5	21.0
vis Ratio Perm	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay, d1	12.8	3.1	0.1	1.9	1.9	25.2	0.2	13.7	2.1	45.2	23.1
Progression Factor	36.9	25.9	20.0	27.0	27.0	55.0	17.0	46.2	23.1	45.2	23.1
Incremental Delay, d2	D	C	B	C	C	D	B	D	C	D	C
Delay (s)	29.7	29.7	29.7	27.0	27.0	27.0	24.3	24.3	23.9	23.9	23.9
Level of Service	C	C	B	C	C	D	B	D	C	D	C
Approach Delay (s)	C	C	C	C	C	C	C	C	C	C	C
Approach LOS	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary											
HCM Average Control Delay	26.1										
HCM Volume to Capacity ratio	0.75										
Actuated Cycle Length (s)	85.7										
Intersection Capacity Utilization	63.9%										
Analysis Period (min)	15										
c Critical Lane Group											

Movement	EBL	EBT	EBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	74	279	324	99	173	108	266	1023
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	1.00	1.00	1.00	0.97	0.97	1.00	0.91
Lane Util. Factor	1.00	0.85	0.85	1.00	0.94	1.00	0.99	1.00
Flt	0.95	1.00	1.00	0.95	0.97	0.95	1.00	0.95
Flt Protected	1770	1583	1583	1770	3304	3433	5020	1770
Satd. Flow (prot)	0.95	1.00	1.00	0.95	0.97	0.95	1.00	0.95
Flt Permitted	1770	1583	1583	1770	3304	3433	5020	1770
Satd. Flow (perm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak-hour factor, PHF	82	310	360	110	192	120	286	1137
Adj. Flow (vph)	0	0	254	0	109	0	17	0
RTOR Reduction (vph)	82	310	106	110	203	0	296	1226
Lane Group Flow (vph)	Split	Perm	Split	Perm	Split	Perm	Split	Perm
Turn Type	2	2	2	6	6	3	8	7
Protected Phases	15.8	15.8	15.8	6.0	6.0	7.9	17.0	8.0
Permitted Phases	15.8	15.8	15.8	6.0	6.0	7.9	17.0	8.0
Actuated Green, G (s)	0.25	0.25	0.25	0.10	0.10	0.13	0.27	0.13
Effective Green, g (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Actuated g/C Ratio	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Clearance Time (s)	445	398	398	169	316	432	1359	225
Vehicle Extension (s)	0.05	0.05	0.05	c0.06	0.06	0.09	c0.24	c0.09
Lane Grp Cap (vph)	0.18	0.78	0.27	0.65	0.64	0.89	0.90	0.75
vis Ratio Prot	18.4	21.9	18.9	27.4	27.4	26.3	22.1	26.4
vis Ratio Perm	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay, d1	0.2	9.3	0.4	8.7	4.4	4.5	8.6	12.6
Progression Factor	18.6	31.2	19.2	36.0	31.8	30.7	30.7	39.1
Incremental Delay, d2	B	C	B	D	C	C	C	D
Delay (s)	24.1	24.1	24.1	32.9	32.9	32.9	30.7	23.4
Level of Service	C	C	B	D	C	C	C	D
Approach Delay (s)	C	C	C	C	C	C	C	C
Approach LOS	C	C	C	C	C	C	C	C
Intersection Summary								
HCM Average Control Delay	27.7							
HCM Volume to Capacity ratio	0.80							
Actuated Cycle Length (s)	62.8							
Intersection Capacity Utilization	57.5%							
Analysis Period (min)	15							
c Critical Lane Group								

[illegible]

Movement													
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SSR		
Lane Configurations													
119	52	72	57	27	9	111	751	138	6	357	84		
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Ideal Flow (vphpl)													
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	1.00		
FFt													
	1.00	0.85		0.99		1.00	0.98		1.00	0.97	1.00		
FFt Protected													
	0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)													
1800	1583	1784		1770		3457	3438		1770	3438	3438		
FFt Permitted													
	0.97	1.00		0.97		0.95	1.00		0.95	1.00	1.00		
Satd. Flow (perm)													
1800	1583	1784		1770		3457	3438		1770	3438	3438		
Peak-hour factor, PHF													
0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90		
132	58	80	63	30	10	123	834	153	7	397	93		
Adj. Flow (vph)													
0	0	68	0	6	0	0	15	0	0	22	0		
RTOR Reduction (vph)													
0	190	12	0	97	0	123	972	0	7	468	0		
Lane Group Flow (vph)													
Split	Perm	Split	Perm	Split	Perm	Split	Perm	Split	Perm	Split	Perm		
4	4		8		5	2	1	6					
Protected Phases													
Permitted Phases													
	8.8	8.8		6.7		5.9	26.2		0.7	21.0			
Actuated Green, G (s)													
	8.8	8.8		6.7		5.9	26.2		0.7	21.0			
Effective Green, g (s)													
	0.15	0.15		0.11		0.10	0.45		0.01	0.36			
Actuated g/C Ratio													
	4.0	4.0		3.0		4.0	4.0		4.0	4.0			
Clearance Time (s)													
	3.0	3.0		3.0		3.0	3.0		3.0	3.0			
Vehicle Extension (s)													
	271	239		205		179	1551		21	1236			
Lane Grp Cap (vph)													
c0.11			c0.05		c0.07	c0.28			0.00	0.14			
v/s Ratio Prot													
	0.01												
v/s Ratio Perm													
	0.70	0.05		0.47		0.89	0.63		0.33	0.38			
v/s Ratio													
	23.6	21.2		24.2		25.4	12.3		28.6	13.9			
Uniform Delay, d1													
	1.00	1.00		1.00		1.00	1.00		1.00	1.00			
Progression Factor													
	7.9	0.1		1.7		10.4	0.8		9.1	0.2			
Incremental Delay, d2													
	31.5	21.3		25.9		35.8	13.1		37.8	14.1			
Delay (s)													
	C	C		C		D	B		D	B			
Level of Service													
	28.5			25.9		15.7			14.4				
Approach Delay (s)													
	C			C		B			B				
Approach LOS													
Intersection Summary													
HCN Average Control Delay													
	17.6												B
HCN Volume to Capacity ratio													
	0.61												
Actuated Cycle Length (s)													
	58.4												
Sum of lost time (s)													
	12.0												A
Intersection Capacity Utilization													
	50.3%												
ICU Level of Service													
	15												
Analysis Period (min)													
Critical Lane Group													

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	127	1449	0	0	1043	872	452	7	700	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.97	0.95	0.95	0.95	1.00	0.95	0.95	0.91	0.95	0.95	0.95	0.95
Fit	1.00	1.00	1.00	1.00	0.85	1.00	0.87	0.85	0.85	0.85	0.85	0.85
Fit Protected	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.99	1.00	1.00	1.00	1.00
Satd. Flow (prot)	3433	3539	3539	3539	3539	3539	3539	3539	3539	3539	3539	3539
Fit Permitted	0.95	1.00	1.00	1.00	1.00	1.00	0.95	0.99	1.00	1.00	1.00	1.00
Satd. Flow (perm)	3433	3539	3539	3539	3539	3539	3539	3539	3539	3539	3539	3539
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	141	1610	0	0	1159	969	502	8	778	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	524	0	11	0	0	0
Lane Group Flow (vph)	141	1610	0	0	1159	445	447	410	409	0	0	0
Turn Type	Prot	4	4	8	8	8	2	2	2	Perm	Perm	Perm
Protected Phases	7	4	4	8	8	8	2	2	2	2	2	2
Permitted Phases	3.5	31.5	31.5	24.0	24.0	24.0	19.4	19.4	19.4	19.4	19.4	19.4
Actuated Green, G (s)	3.5	31.5	31.5	24.0	24.0	24.0	19.4	19.4	19.4	19.4	19.4	19.4
Effective Green, g (s)	3.5	31.5	31.5	24.0	24.0	24.0	19.4	19.4	19.4	19.4	19.4	19.4
Actuated g/C Ratio	0.08	0.59	0.59	0.41	0.41	0.41	0.33	0.33	0.33	0.33	0.33	0.33
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)	204	1893	1893	1442	645	554	484	495	495	495	495	495
v/s Ratio Prot	0.04	0.45	0.45	0.33	0.28	0.27	0.28	0.27	0.27	0.27	0.27	0.27
v/s Ratio Perm	0.69	0.85	0.85	0.80	0.69	0.81	0.85	0.83	0.83	0.83	0.83	0.83
Uniform Delay, d1	27.2	11.7	11.7	15.4	14.4	18.0	18.4	18.2	18.2	18.2	18.2	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.7	3.9	3.9	3.3	3.1	8.4	12.8	10.8	10.8	10.8	10.8	10.8
Delay (s)	36.8	15.6	15.6	18.7	17.5	26.5	31.2	29.0	29.0	29.0	29.0	29.0
Level of Service	D	B	B	B	B	C	C	C	C	C	C	C
Approach Delay (s)	17.3	17.3	17.3	16.1	16.1	28.8	28.8	28.8	28.8	28.8	28.8	28.8
Approach LOS	B	B	B	B	B	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	20.5											
HCM Volume to Capacity ratio	0.85											
Actuated Cycle Length (s)	58.9											
Intersection Capacity Utilization	87.5%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Volume (vph)	0	646	141	631	908	0	0	0	0	906	1	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.95	0.97	0.95	0.97	0.95	0.95	0.95	0.91	0.95	0.95	0.95	0.95
Fit	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85
Fit Protected	1.00	0.95	1.00	0.95	1.00	0.95	0.95	0.95	1.00	0.95	0.95	1.00
Satd. Flow (prot)	3444	3433	3539	3444	3539	3444	3433	3539	3444	3433	3539	3444
Fit Permitted	1.00	0.95	1.00	0.95	1.00	0.95	0.95	0.95	1.00	0.95	0.95	1.00
Satd. Flow (perm)	3444	3433	3539	3444	3539	3444	3433	3539	3444	3433	3539	3444
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	718	157	701	1009	0	0	0	0	1007	1	83
RTOR Reduction (vph)	0	27	0	0	0	0	0	0	0	0	1	49
Lane Group Flow (vph)	0	848	0	701	1009	0	0	0	0	503	512	26
Turn Type	Prot	4	4	3	8	8	6	6	6	6	6	6
Protected Phases	18.2	18.2	18.2	15.4	37.6	37.6	23.8	23.8	23.8	23.8	23.8	23.8
Permitted Phases	18.2	18.2	18.2	15.4	37.6	37.6	23.8	23.8	23.8	23.8	23.8	23.8
Actuated Green, G (s)	18.2	18.2	18.2	15.4	37.6	37.6	23.8	23.8	23.8	23.8	23.8	23.8
Effective Green, g (s)	18.2	18.2	18.2	15.4	37.6	37.6	23.8	23.8	23.8	23.8	23.8	23.8
Actuated g/C Ratio	0.26	0.26	0.26	0.22	0.54	0.54	0.34	0.34	0.34	0.34	0.34	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	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)	903	762	1917	762	1917	1917	576	553	516	576	553	516
v/s Ratio Prot	0.25	0.25	0.25	0.20	0.29	0.29	0.30	0.32	0.32	0.30	0.32	0.32
v/s Ratio Perm	0.94	0.94	0.94	0.92	0.53	0.53	0.87	0.93	0.93	0.87	0.93	0.93
Uniform Delay, d1	25.1	25.1	25.1	26.4	10.2	10.2	21.4	22.0	15.2	21.4	22.0	15.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	17.0	17.0	17.0	16.1	0.3	0.3	13.7	21.6	0.0	13.7	21.6	0.0
Delay (s)	42.0	42.0	42.0	42.5	10.5	10.5	35.1	43.6	15.3	35.1	43.6	15.3
Level of Service	D	D	D	D	B	B	D	D	B	D	D	B
Approach Delay (s)	42.0	42.0	42.0	23.6	23.6	23.6	0.0	0.0	0.0	37.7	37.7	0.0
Approach LOS	D	D	D	C	C	C	A	A	A	D	D	D
Intersection Summary												
HCM Average Control Delay	32.2											
HCM Volume to Capacity ratio	0.93											
Actuated Cycle Length (s)	69.4											
Intersection Capacity Utilization	87.5%											
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
27: Valley Centre Drive & El Camino Real

Near Term + Project (Phase 1) PM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SSR
Lane Configurations	50	37	50	490	31	104	109	563	220	184	1485
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	0.95	0.91	0.95	0.95	0.91	0.95	1.00	0.91	1.00	0.91	1.00
Lane Util. Factor	1.00	0.98	0.85	1.00	0.99	0.85	1.00	0.97	1.00	1.00	1.00
Friction	0.95	0.99	1.00	0.95	0.96	1.00	0.95	1.00	0.95	1.00	1.00
FL Protected	1681	1649	1504	1681	1617	1504	1770	4944	1770	5064	1770
Satd. Flow (prot)	0.95	0.99	1.00	0.95	0.96	1.00	0.95	1.00	0.95	1.00	1.00
FL Permitted	1681	1649	1504	1681	1617	1504	1770	4944	1770	5064	1770
Satd. Flow (perm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak-hour factor, PHF	56	41	56	544	34	116	121	1070	244	204	1661
Adj. Flow (vph)	0	7	44	0	2	81	0	39	0	0	3
RTOR Reduction (vph)	50	48	4	294	294	23	121	1275	0	204	1705
Lane Group Flow (vph)	Split	4	4	4	8	8	5	2	Prot	Prot	1
Turn Type	Protected Phases	6.4	6.4	16.2	16.2	16.2	6.8	23.1	13.1	29.4	6
Permitted Phases	Actuated Green, G (s)	6.4	6.4	16.2	16.2	16.2	6.8	23.1	13.1	29.4	6
Effective Green, G (s)	0.09	0.09	0.09	0.22	0.22	0.22	0.09	0.31	0.18	0.39	0.18
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	144	141	129	364	350	326	161	1527	310	1990	c0.34
Lane Grp Cap (vph)	c0.03	0.03	0.00	0.17	c0.18	0.01	0.07	0.26	c0.12	c0.12	c0.34
v/s Ratio Prot	0.35	0.34	0.03	0.81	0.84	0.07	0.75	0.83	0.66	0.86	0.86
v/s Ratio Perm	32.2	32.2	31.4	27.8	28.1	23.3	33.2	24.1	28.8	20.8	20.8
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	1.5	1.4	0.1	12.4	16.5	0.1	17.8	4.1	5.0	3.9	3.9
Incremental Delay, d2	33.7	33.6	31.5	40.2	44.5	23.4	51.0	28.2	33.7	24.7	24.7
Delay (s)	C	C	C	C	C	C	C	C	C	C	C
Level of Service	C	C	C	C	C	C	C	C	C	C	C
Approach Delay (s)	33.0	C	C	39.5	D	D	30.1	C	C	25.6	C
Approach LOS	C	C	C	D	D	D	C	C	C	C	C
Intersection Summary	HCM Level of Service										
HCM Average Control Delay	29.7										
HCM Volume to Capacity ratio	0.79										
Actuated Cycle Length (s)	74.8										
Intersection Capacity Utilization	68.0%										
Analysis Period (min)	15										
c Critical Lane Group	C										

HCM Signalized Intersection Capacity Analysis
28: Carmel Valley Road & El Camino Real

Near Term + Project (Phase 1) PM
3/2/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SSR
Lane Configurations	0	0	0	223	860	220	405	1081	0	735	829
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	0.97	0.91	0.95	0.97	0.91	0.95	1.00	0.95	1.00	0.95	1.00
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
Friction	0.95	0.99	1.00	0.95	0.96	1.00	0.95	1.00	0.95	1.00	1.00
FL Protected	3433	3433	3433	5085	1583	1583	3433	3539	3433	4140	1362
Satd. Flow (prot)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
FL Permitted	3433	3433	3433	5085	1583	1583	3433	3539	3433	4140	1362
Satd. Flow (perm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Peak-hour factor, PHF	0	0	0	248	956	244	450	1201	0	817	921
Adj. Flow (vph)	0	0	0	0	0	0	63	0	0	0	7
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	7
Lane Group Flow (vph)	0	0	0	248	956	181	450	1201	0	1271	453
Confl. Peds. (#/hr)	200	200	200	200	200	200	200	200	200	200	200
Turn Type	Protected Phases	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Permitted Phases	Actuated Green, G (s)	16.2	16.2	16.2	16.2	16.2	10.0	39.9	25.9	25.9	25.9
Effective Green, G (s)	0.25	0.25	0.25	0.25	0.25	0.25	0.16	0.62	0.40	0.40	0.40
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	868	1285	400	536	2203	1673	550	1673	550	1673	550
Lane Grp Cap (vph)	0.07	c0.19	0.11	c0.13	0.34	0.31	c0.33	0.31	c0.33	0.31	c0.33
v/s Ratio Prot	0.29	0.74	0.45	0.84	0.55	0.76	0.82	0.76	0.82	0.76	0.82
v/s Ratio Perm	19.3	22.0	20.2	26.3	6.9	16.4	17.1	16.4	17.1	16.4	17.1
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	0.2	2.4	0.8	11.1	0.3	2.0	9.7	2.0	9.7	2.0	9.7
Incremental Delay, d2	19.5	24.4	21.0	37.4	7.2	18.5	26.8	18.5	26.8	18.5	26.8
Delay (s)	B	C	C	D	A	B	C	B	C	B	C
Level of Service	B	C	C	D	A	B	C	B	C	B	C
Approach Delay (s)	23.0	C	C	C	C	20.7	C	20.7	C	20.7	C
Approach LOS	A	C	C	C	C	C	C	C	C	C	C
Intersection Summary	HCM Level of Service										
HCM Average Control Delay	19.6										
HCM Volume to Capacity ratio	0.80										
Actuated Cycle Length (s)	64.1										
Intersection Capacity Utilization	113.6%										
Analysis Period (min)	15										
c Critical Lane Group	C										

Movement	EBL	EBT	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	537	1031	133	0	0	0	0	0	905	442	278	638
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.91	0.86	0.91	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.91	0.91
Fit	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Fit Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1610	3190	1441	6093	6093	6093	6093	6093	6093	1770	5085	5085
Fit Permitted	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3190	1441	6093	6093	6093	6093	6093	6093	1770	5085	5085
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	597	1146	148	0	0	0	0	1006	491	309	709	709
RTOR Reduction (vph)	0	1	80	0	0	0	0	41	0	0	0	0
Lane Group Flow (vph)	537	1220	53	0	0	0	0	1456	0	309	709	0
Turn Type	Spill	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	4	4	4	4	4	4	2	1	6	1	6	6
Permitted Phases	32.0	32.0	32.0	20.8	20.8	20.8	15.2	40.0	15.2	40.0	15.2	40.0
Effective Green, g (s)	32.0	32.0	32.0	20.8	20.8	20.8	15.2	40.0	15.2	40.0	15.2	40.0
Effective Green, g (s)	0.40	0.40	0.40	0.26	0.26	0.26	0.19	0.50	0.19	0.50	0.19	0.50
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	644	1276	576	1584	1584	1584	336	2543	336	2543	336	2543
Lane Grp Cap (vph)	0.33	c0.38	0.04	c0.24	c0.24	c0.24	c0.17	0.14	c0.17	0.14	c0.17	0.14
vs Ratio Prot	0.83	0.96	0.09	1.07dr	1.07dr	1.07dr	0.82	0.28	0.82	0.28	0.82	0.28
vs Ratio Perm	21.6	23.3	15.0	28.8	28.8	28.8	31.8	11.6	31.8	11.6	31.8	11.6
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	9.1	15.7	0.1	8.9	8.9	8.9	29.1	0.1	29.1	0.1	29.1	0.1
Incremental Delay, d2	30.7	39.0	15.0	37.5	37.5	37.5	60.9	11.7	60.9	11.7	60.9	11.7
Delay (s)	C	D	B	D	D	D	E	B	E	B	E	B
Level of Service	C	D	B	D	D	D	E	B	E	B	E	B
Approach Delay (s)	35.0	C	C	0.0	0.0	0.0	37.6	D	37.6	D	37.6	D
Approach LOS	C	C	C	A	A	A	D	D	D	D	D	D
Intersection Summary												
HCM Average Control Delay	34.0											
HCM Volume to Capacity ratio	0.94											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	113.6%											
Analysis Period (min)	15											
dr Defect Right Lane. Record with 1 through lane as a right lane.												
c Critical Lane Group												

Baseline	Synchro 7 - Report Page 29
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Movement	EBL	EBT	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	68	383	0	366	0	366	0	366	0	97	31	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	0.95	1.00	0.95	0.95	0.95	1.00	0.95	1.00	1.00	0.85	1.00
Fit	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.97	1.00	1.00	0.85	1.00
Fit Protected	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3428	3428	3428	3428	1770	3539	3428	1770	1583	1583
Fit Permitted	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	3428	3428	3428	3428	1770	3539	3428	1770	1583	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	437	0	407	0	407	108	34	52	0	46	6
RTOR Reduction (vph)	0	0	0	47	0	47	0	0	46	0	0	6
Lane Group Flow (vph)	76	437	0	468	0	468	0	34	6	0	0	6
Turn Type	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	7	4	3	8	6	6	6	6	6	6	6	6
Permitted Phases	1.3	13.5	8.2	8.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Actuated Green, G (s)	1.3	13.5	8.2	8.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Effective Green, g (s)	0.05	0.55	0.33	0.33	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	94	1960	1147	c0.14	c0.14	c0.14	c0.02	0.00	c0.02	0.00	c0.02	0.00
Lane Grp Cap (vph)	0.81	0.22	0.41	0.41	0.16	0.03	0.16	0.03	0.16	0.03	0.16	0.03
vs Ratio Prot	11.5	2.8	6.3	6.3	9.6	9.5	9.6	9.5	9.6	9.5	9.6	9.5
vs Ratio Perm	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay, d1	38.1	0.1	0.2	0.2	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1
Progression Factor	49.6	2.9	6.5	6.5	10.0	9.5	10.0	9.5	10.0	9.5	10.0	9.5
Incremental Delay, d2	D	A	A	A	A	A	A	A	A	A	A	A
Delay (s)	D	A	A	A	A	A	A	A	A	A	A	A
Level of Service	D	A	A	A	A	A	A	A	A	A	A	A
Approach Delay (s)	9.8	6.5	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
Approach LOS	A	A	A	A	A	A	A	A	A	A	A	A
Intersection Summary												
HCM Average Control Delay	8.3											
HCM Volume to Capacity ratio	0.39											
Actuated Cycle Length (s)	24.5											
Intersection Capacity Utilization	30.3%											
Analysis Period (min)	15											
c Critical Lane Group												

Baseline	Synchro 7 - Report Page 30
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Movement	EBL	EBR	EBR2	WBL	WBR	NBL	NBT	NBR2	SBL	SBT	SBT2	SBT3
Lane Configurations	113	293	331	126	162	99	370	831	332	272	158	140
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	0.85	0.85	1.00	1.00	1.00	0.95	1.00	0.85	1.00	0.95	1.00
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Protected	1770	2787	1583	1770	1757	1770	3539	1583	3433	3539	1583	1583
Satd. Flow (prot)	1085	2787	1583	1770	1757	1770	3539	1583	3433	3539	1583	1583
Flt Permitted	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Satd. Flow (perm)	126	325	368	140	180	110	411	923	369	302	176	156
Peak-hour factor, PHF	0	0	289	0	28	0	0	0	212	0	0	122
Adj. Flow (vph)	126	325	368	140	180	110	411	923	369	302	176	156
RTOR Reduction (vph)	0	0	289	0	28	0	0	0	212	0	0	122
Lane Group Flow (vph)	126	325	368	140	180	110	411	923	369	302	176	156
Turn Type	custom	custom	custom	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	4	4	4	3	8	5	2	2	1	6	6	6
Permitted Phases	13.8	13.8	13.8	8.0	25.8	20.1	26.7	26.7	9.5	16.1	16.1	16.1
Actuated Green, G (s)	13.8	13.8	13.8	8.0	25.8	20.1	26.7	26.7	9.5	16.1	16.1	16.1
Effective Green, g (s)	0.19	0.19	0.19	0.11	0.35	0.27	0.36	0.36	0.13	0.22	0.22	0.22
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	202	520	295	191	613	481	1277	571	441	770	344	344
Lane Grp Cap (vph)	0.12	c0.12	0.04	0.62	c0.08	0.15	c0.23	c0.26	0.09	0.05	0.02	0.02
v/s Ratio Prot	0.62	0.63	0.23	0.73	0.43	0.85	0.72	0.27	0.68	0.23	0.10	0.10
v/s Ratio Perm	27.7	27.7	25.6	32.0	18.4	25.6	20.4	16.8	30.8	23.8	23.1	23.1
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	5.9	2.4	0.4	13.5	0.5	13.8	2.1	0.3	4.4	0.2	0.1	0.1
Incremental Delay, d2	33.6	30.1	26.0	45.5	18.9	39.4	22.5	17.0	35.2	24.0	23.3	23.3
Delay (s)	C	C	C	D	B	D	C	B	D	C	C	C
Level of Service	C	C	C	D	B	D	C	B	D	C	C	C
Approach Delay (s)	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6
Approach LOS	C	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	27.1											
HCM Volume to Capacity ratio	0.73											
Actuated Cycle Length (s)	74.0											
Intersection Capacity Utilization	64.9%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	EBL	EBR	EBR2	WBL	WBR	NBL	NBT	NBR2	SBL	SBT	SBT2	SBT3
Lane Configurations	113	293	331	126	162	99	370	831	332	272	158	140
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Total Lost time (s)	1.00	0.85	0.85	1.00	1.00	1.00	0.95	1.00	0.85	1.00	0.95	1.00
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Protected	1770	2787	1583	1770	1757	1770	3539	1583	3433	3539	1583	1583
Satd. Flow (prot)	1085	2787	1583	1770	1757	1770	3539	1583	3433	3539	1583	1583
Flt Permitted	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Satd. Flow (perm)	126	325	368	140	180	110	411	923	369	302	176	156
Peak-hour factor, PHF	0	0	289	0	28	0	0	0	212	0	0	122
Adj. Flow (vph)	126	325	368	140	180	110	411	923	369	302	176	156
RTOR Reduction (vph)	0	0	289	0	28	0	0	0	212	0	0	122
Lane Group Flow (vph)	126	325	368	140	180	110	411	923	369	302	176	156
Turn Type	custom	custom	custom	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot	Prot
Protected Phases	4	4	4	3	8	5	2	2	1	6	6	6
Permitted Phases	13.8	13.8	13.8	8.0	25.8	20.1	26.7	26.7	9.5	16.1	16.1	16.1
Actuated Green, G (s)	13.8	13.8	13.8	8.0	25.8	20.1	26.7	26.7	9.5	16.1	16.1	16.1
Effective Green, g (s)	0.19	0.19	0.19	0.11	0.35	0.27	0.36	0.36	0.13	0.22	0.22	0.22
Actuated g/C Ratio	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Clearance Time (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
Vehicle Extension (s)	202	520	295	191	613	481	1277	571	441	770	344	344
Lane Grp Cap (vph)	0.12	c0.12	0.04	0.62	c0.08	0.15	c0.23	c0.26	0.09	0.05	0.02	0.02
v/s Ratio Prot	0.62	0.63	0.23	0.73	0.43	0.85	0.72	0.27	0.68	0.23	0.10	0.10
v/s Ratio Perm	27.7	27.7	25.6	32.0	18.4	25.6	20.4	16.8	30.8	23.8	23.1	23.1
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	5.9	2.4	0.4	13.5	0.5	13.8	2.1	0.3	4.4	0.2	0.1	0.1
Incremental Delay, d2	33.6	30.1	26.0	45.5	18.9	39.4	22.5	17.0	35.2	24.0	23.3	23.3
Delay (s)	C	C	C	D	B	D	C	B	D	C	C	C
Level of Service	C	C	C	D	B	D	C	B	D	C	C	C
Approach Delay (s)	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6	27.6
Approach LOS	C	C	C	C	C	C	C	C	C	C	C	C
Intersection Summary												
HCM Average Control Delay	27.1											
HCM Volume to Capacity ratio	0.73											
Actuated Cycle Length (s)	74.0											
Intersection Capacity Utilization	64.9%											
Analysis Period (min)	15											
c Critical Lane Group												

Movement	SEL	SET	SEL	SET	SEL	SET	SEL	SET	SEL	SET	SEL	SET	SEL	SET	SEL	SET
Volume (vph)	131	454	40	94	400	412	48	132	107	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
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	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Fit	1.00	0.99	1.00	0.92	1.00	0.92	1.00	0.93	1.00	0.93	1.00	0.92	1.00	0.95	1.00	0.92
Fit Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3497	1770	3497	1770	3497	1770	3497	1770	3497	1770	3497	1770	3497	1770	3497
Fit Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1770	3497	1770	3497	1770	3497	1770	3497	1770	3497	1770	3497	1770	3497	1770	3497
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	146	504	44	104	444	458	53	147	119	263	60	74	211	163	277	227
RTOR Reduction (vph)	0	10	0	0	313	0	0	51	0	0	0	53	0	136	0	277
Lane Group Flow (vph)	146	538	0	104	589	0	53	215	0	263	81	0	289	549	690	50
Turn Type	Prot	1	6	5	2	7	4	3	8	Prot	5	2	6	6	4	4
Protected Phases	5.7	17.6	3.4	15.3	2.5	13.2	2.5	13.2	5.4	16.1	9.5	28.8	16.3	16.3	8.3	8.3
Permitted Phases	5.7	17.6	3.4	15.3	2.5	13.2	2.5	13.2	5.4	16.1	9.5	28.8	16.3	16.3	8.3	8.3
Actuated Green, G (s)	0.10	0.32	0.06	0.28	0.04	0.24	0.04	0.24	0.10	0.29	0.21	0.62	0.35	0.35	0.18	0.18
Effective Green, g (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	4.0	4.0	4.0	4.0
Clearance Time (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	3.0	3.0	3.0	3.0
Vehicle Extension (s)	181	1107	108	900	80	413	333	495	c0.08	c0.05	707	2211	1251	560	618	285
Lane Grp Cap (vph)	c0.08	0.15	0.06	c0.18	0.03	c0.12	c0.08	c0.05	0.42	0.25	0.55	0.13	0.26	0.17	0.03	0.03
v/s Ratio Prot	0.81	0.49	0.96	0.85	0.66	0.52	0.79	0.16	15.9	3.8	12.0	10.1	16.3	16.0	16.0	16.0
v/s Ratio Perm	24.4	15.3	26.0	17.8	26.1	18.4	24.5	14.7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.4	0.1	0.5	0.1	0.2	0.3	0.3	0.3
Progression Factor	22.4	0.3	74.3	1.7	18.7	1.2	11.8	0.2	16.3	3.9	12.5	10.2	16.5	16.3	16.3	16.3
Incremental Delay, d2	46.8	15.7	100.3	19.5	44.9	19.6	36.3	14.9	Level of Service	A	B	A	B	B	B	B
Delay (s)	D	B	F	B	D	B	D	B	Approach Delay (s)	0.0	8.3	12.0	16.4	16.4	16.4	16.4
Level of Service	D	B	F	B	D	B	D	B	Approach LOS	A	A	A	B	B	B	B
Approach Delay (s)	22.2	C	27.9	C	23.8	C	29.1	C	Intersection Summary	11.4	HCM Level of Service	0.45	HCM Level of Service	0.45	HCM Level of Service	0.45
Approach LOS	C	C	C	C	C	C	C	C	HCM Average Control Delay	11.4	HCM Level of Service	0.45	HCM Level of Service	0.45	HCM Level of Service	0.45
Intersection Summary	25.9	HCM Level of Service	25.9	HCM Level of Service	25.9	HCM Level of Service	25.9	HCM Level of Service	HCM Volume to Capacity ratio	0.45	HCM Level of Service	0.45	HCM Level of Service	0.45	HCM Level of Service	0.45
HCM Average Control Delay	0.68	HCM Level of Service	0.68	HCM Level of Service	0.68	HCM Level of Service	0.68	HCM Level of Service	Actuated Cycle Length (s)	46.1	Sum of lost time (s)	46.1	Sum of lost time (s)	46.1	Sum of lost time (s)	46.1
HCM Volume to Capacity ratio	65.1%	Sum of lost time (s)	65.1%	Sum of lost time (s)	65.1%	Sum of lost time (s)	65.1%	Sum of lost time (s)	Intersection Capacity Utilization	39.3%	ICU Level of Service	15	ICU Level of Service	15	ICU Level of Service	15
Actuated Cycle Length (s)	15	ICU Level of Service	15	ICU Level of Service	15	ICU Level of Service	15	ICU Level of Service	Analysis Period (min)	15	Analysis Period (min)	15	Analysis Period (min)	15	Analysis Period (min)	15
Intersection Capacity Utilization	65.1%	Analysis Period (min)	65.1%	Analysis Period (min)	65.1%	Analysis Period (min)	65.1%	Analysis Period (min)	c Critical Lane Group		c Critical Lane Group		c Critical Lane Group		c Critical Lane Group	
Analysis Period (min)	15	c Critical Lane Group	15	c Critical Lane Group	15	c Critical Lane Group	15	c Critical Lane Group								
c Critical Lane Group																

HCM Signalized Intersection Capacity Analysis
35: SR-56 EB Ramps & Carmel Country Road
Near Term + Project (Phase 1) PM
3/2/2012

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