

Appendix D

**Near Term
Near Term + Project (Phase 1&2)
Near Term + Project (Build-out)
Synchro Worksheets**

ONE PASEO – Updated Traffic Analysis for Revised Project

January 7, 2014

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Near Term AM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	855	24	84	876	197	70	58	60	433	23	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	0.95	0.95	
Flt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97	
Satd. Flow (prot)	1770	5064		1770	3442			1813	1583	1681	1637	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97	
Satd. Flow (perm)	1770	5064		1770	3442			1813	1583	1681	1637	
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	950	27	93	973	219	78	64	67	481	26	93
RTOR Reduction (vph)	0	2	0	0	12	0	0	0	57	0	12	0
Lane Group Flow (vph)	107	975	0	93	1180	0	0	142	10	303	285	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	11.2	59.5		11.3	59.4			20.3	20.3	29.2	29.2	
Effective Green, g (s)	11.2	59.5		11.3	59.4			20.3	20.3	29.2	29.2	
Actuated g/C Ratio	0.08	0.42		0.08	0.42			0.15	0.15	0.21	0.21	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	142	2152		143	1460			263	230	351	341	
v/s Ratio Prot	c0.06	0.19		0.05	c0.34			c0.08		c0.18	0.17	
v/s Ratio Perm									0.01			
v/c Ratio	0.75	0.45		0.65	0.81			0.54	0.04	0.86	0.84	
Uniform Delay, d1	63.0	28.7		62.4	35.3			55.5	51.5	53.5	53.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.0	0.7		7.8	3.5			1.1	0.0	19.2	16.1	
Delay (s)	81.1	29.4		70.2	38.8			56.6	51.5	72.6	69.2	
Level of Service	F	C		E	D			E	D	E	E	
Approach Delay (s)		34.5			41.1			55.0			70.9	
Approach LOS		C			D			D			E	
Intersection Summary												
HCM Average Control Delay		45.4					HCM Level of Service		D			
HCM Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		140.0					Sum of lost time (s)		19.9			
Intersection Capacity Utilization		70.1%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Near Term AM
7/16/2013

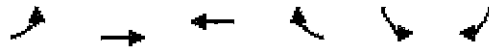


Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑↑↵			↑↑		↵			
Volume (veh/h)	1361	55	0	1367	0	110			
Sign Control	Free			Free	Stop				
Grade	0%			0%	0%				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90			
Hourly flow rate (vph)	1512	61	0	1519	0	122			
Pedestrians									
Lane Width (ft)									
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		0.89	0.87			
vC, conflicting volume			1573		2302	535			
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol			1134		1336	0			
tC, single (s)			4.1		6.8	6.9			
tC, 2 stage (s)									
tF (s)			2.2		3.5	3.3			
p0 queue free %			100		100	87			
cM capacity (veh/h)			532		129	943			
Direction Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1			
Volume Total	605	605	364	759	759	122			
Volume Left	0	0	0	0	0	0			
Volume Right	0	0	61	0	0	122			
cSH	1700	1700	1700	1700	1700	943			
Volume to Capacity	0.36	0.36	0.21	0.45	0.45	0.13			
Queue Length 95th (ft)	0	0	0	0	0	11			
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.4			
Lane LOS						A			
Approach Delay (s)	0.0				0.0	9.4			
Approach LOS						A			
Intersection Summary									
Average Delay	0.4								
Intersection Capacity Utilization	41.1%			ICU Level of Service		A			
Analysis Period (min)	15								

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Near Term AM
7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	685	1022	0	927	336
Ideal Flow (vphpl)	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
Frt		1.00	1.00		0.99	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		3429	1441
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		3429	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	761	1136	0	1030	373
RTOR Reduction (vph)	0	0	0	0	3	41
Lane Group Flow (vph)	0	761	1136	0	1064	295
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		41.8	41.8		25.9	25.9
Effective Green, g (s)		41.8	41.8		25.9	25.9
Actuated g/C Ratio		0.53	0.53		0.33	0.33
Clearance Time (s)					5.6	5.6
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)		1858	1858		1116	469
v/s Ratio Prot		0.22	c0.32		c0.31	
v/s Ratio Perm						0.20
v/c Ratio		0.41	0.61		0.95	0.63
Uniform Delay, d1		11.4	13.2		26.3	22.8
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.6		16.8	2.6
Delay (s)		11.6	13.8		43.0	25.4
Level of Service		B	B		D	C
Approach Delay (s)		11.6	13.8		38.8	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay			23.9		HCM Level of Service	C
HCM Volume to Capacity ratio			0.74			
Actuated Cycle Length (s)			79.6		Sum of lost time (s)	11.9
Intersection Capacity Utilization			114.8%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Near Term AM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	231	1302	0	0	1468	919	384	59	914	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1484	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1484	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	246	1385	0	0	1562	978	409	63	972	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	436	0	19	19	0	0	0
Lane Group Flow (vph)	246	1385	0	0	1562	542	368	522	516	0	0	0
Turn Type	Prot					Prot		Split		Prot		
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	10.1	63.5			48.2	48.2	44.6	44.6	44.6			
Effective Green, g (s)	10.1	63.5			48.2	48.2	44.6	44.6	44.6			
Actuated g/C Ratio	0.08	0.53			0.40	0.40	0.37	0.37	0.37			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	289	1873			2042	636	625	552	559			
v/s Ratio Prot	0.07	c0.39			0.31	c0.34	0.22	c0.35	0.34			
v/s Ratio Perm												
v/c Ratio	0.85	0.74			0.76	0.85	0.59	0.95	0.92			
Uniform Delay, d1	54.2	21.9			31.0	32.7	30.3	36.5	36.1			
Progression Factor	1.00	1.00			0.51	1.72	1.00	1.00	1.00			
Incremental Delay, d2	20.7	2.7			1.5	7.6	1.4	25.3	21.0			
Delay (s)	74.9	24.5			17.3	63.9	31.7	61.8	57.1			
Level of Service	E	C			B	E	C	E	E			
Approach Delay (s)	32.1				35.2				52.4		0.0	
Approach LOS	C				D				D		A	
Intersection Summary												
HCM Average Control Delay	38.7				HCM Level of Service				D			
HCM Volume to Capacity ratio	0.91											
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				18.2			
Intersection Capacity Utilization	99.3%				ICU Level of Service				F			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Near Term AM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1401	694	95	1864	61	201	10	13	81	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.92		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
Satd. Flow (prot)	1770	5085	1583	1770	5061		3433	3242		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5061		3433	3242		1770	1863	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	1557	771	106	2071	68	223	11	14	90	66	347
RTOR Reduction (vph)	0	0	297	0	2	0	0	12	0	0	0	27
Lane Group Flow (vph)	123	1557	474	106	2137	0	223	13	0	90	66	320
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.6	58.1	70.7	10.3	54.2		12.6	18.1		13.8	19.3	33.9
Effective Green, g (s)	14.6	58.1	70.7	10.3	54.2		12.6	18.1		13.8	19.3	33.9
Actuated g/C Ratio	0.12	0.48	0.59	0.09	0.45		0.10	0.15		0.12	0.16	0.28
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	215	2462	933	152	2286		360	489		204	300	447
v/s Ratio Prot	0.07	c0.31	0.05	0.06	c0.42		c0.06	0.00		0.05	0.04	c0.09
v/s Ratio Perm			0.25									0.12
v/c Ratio	0.57	0.63	0.51	0.70	0.93		0.62	0.03		0.44	0.22	0.72
Uniform Delay, d1	49.8	23.0	14.4	53.3	31.2		51.4	43.4		49.5	43.8	38.7
Progression Factor	1.06	0.86	0.62	1.02	0.95		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	0.7	0.1	9.6	7.9		2.2	0.0		0.6	0.1	4.5
Delay (s)	54.0	20.4	9.1	63.8	37.6		53.6	43.4		50.1	43.9	43.3
Level of Service	D	C	A	E	D		D	D		D	D	D
Approach Delay (s)	18.5			38.8			52.6			44.6		
Approach LOS	B			D			D			D		
Intersection Summary												
HCM Average Control Delay	30.9			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.83											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			20.4					
Intersection Capacity Utilization	74.4%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Near Term AM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  		 	  		 	  	
Volume (vph)	220	893	388	206	1380	95	233	104	79	164	312	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	4854		3433	5036		3433	5085	1583	3433	4649	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	4854		3433	5036		3433	5085	1583	3433	4649	
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)	244	992	431	229	1533	106	259	116	88	182	347	463
RTOR Reduction (vph)	0	57	0	0	6	0	0	0	67	0	140	0
Lane Group Flow (vph)	244	1366	0	229	1633	0	259	116	21	182	670	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	12.2	51.2		11.7	50.9		11.5	29.0	29.0	7.6	24.3	
Effective Green, g (s)	12.2	51.2		11.7	50.9		11.5	29.0	29.0	7.6	24.3	
Actuated g/C Ratio	0.10	0.43		0.10	0.42		0.10	0.24	0.24	0.06	0.20	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	349	2071		335	2136		329	1229	383	217	941	
v/s Ratio Prot	c0.07	0.28		0.07	c0.32		c0.08	c0.02		0.05	c0.14	
v/s Ratio Perm									0.01			
v/c Ratio	0.70	0.66		0.68	0.76		0.79	0.09	0.06	0.84	1.01dr	
Uniform Delay, d1	52.1	27.4		52.4	29.4		53.1	35.3	35.0	55.6	44.6	
Progression Factor	0.89	0.65		1.29	0.81		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.1	1.4		4.2	2.5		10.9	0.0	0.1	22.8	2.6	
Delay (s)	50.5	19.3		72.0	26.3		64.0	35.4	35.1	78.4	47.2	
Level of Service	D	B		E	C		E	D	D	E	D	
Approach Delay (s)		23.9			31.9			51.3			52.9	
Approach LOS		C			C			D			D	

Intersection Summary

HCM Average Control Delay	35.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
dr Defacto Right Lane Recode with 1 though lane as a right lane			
c Critical Lane Group			

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

Near Term AM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	TT	TTT		TT	TTT		TT	TTT		T	TT	
Volume (vph)	142	609	275	280	1141	174	346	188	111	146	185	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Flt	1.00	0.95		1.00	0.98		1.00	0.94		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4848		3433	4985		3433	4803		1770	3334	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4848		3433	4985		3433	4803		1770	3334	
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)	158	677	306	311	1268	193	384	209	123	162	206	130
RTOR Reduction (vph)	0	54	0	0	14	0	0	102	0	0	98	0
Lane Group Flow (vph)	158	929	0	311	1447	0	384	230	0	162	238	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	9.0	51.2		14.3	56.3		16.4	20.8		13.9	18.8	
Effective Green, g (s)	9.0	51.2		14.3	56.3		16.4	20.8		13.9	18.8	
Actuated g/C Ratio	0.08	0.43		0.12	0.47		0.14	0.17		0.12	0.16	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	257	2068		409	2339		469	833		205	522	
v/s Ratio Prot	0.05	0.19		0.09	0.29		0.11	0.05		0.09	0.07	
v/s Ratio Perm												
v/c Ratio	0.61	0.45		0.76	0.62		0.82	0.28		0.79	0.46	
Uniform Delay, d1	53.8	24.4		51.2	23.8		50.4	43.1		51.6	46.0	
Progression Factor	1.10	1.12		1.08	0.64		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	0.7		6.7	1.1		10.1	0.2		17.3	1.7	
Delay (s)	61.8	27.9		62.1	16.4		60.5	43.3		69.0	47.6	
Level of Service	E	C		E	B		E	D		E	D	
Approach Delay (s)		32.6			24.4			52.5			54.6	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay		35.2					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			13.7		
Intersection Capacity Utilization		65.0%					ICL Level of Service			C		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Del Mar Heights Road & Torrey Ridge Dr.

Near Term AM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	212	638	115	81	1023	216	79	156	11	56	62	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.99		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4969		1770	4952		1770	1845		1770	1674	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4969		1770	4952		1770	1845		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	709	128	90	1137	240	88	173	12	62	69	143
RTOR Reduction (vph)	0	17	0	0	22	0	0	2	0	0	67	0
Lane Group Flow (vph)	236	820	0	90	1355	0	88	183	0	62	145	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	19.4	64.7		10.1	54.7		10.3	20.7		5.8	16.2	
Effective Green, g (s)	19.4	64.7		10.1	54.7		10.3	20.7		5.8	16.2	
Actuated g/C Ratio	0.16	0.54		0.08	0.46		0.09	0.17		0.05	0.13	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	286	2679		149	2257		152	318		86	226	
v/s Ratio Prot	c0.13	0.17		0.05	c0.27		c0.05	c0.10		0.04	0.09	
v/s Ratio Perm												
v/c Ratio	0.83	0.31		0.60	0.60		0.58	0.57		0.72	0.64	
Uniform Delay, d1	48.7	15.3		53.0	24.5		52.8	45.6		56.3	49.1	
Progression Factor	0.85	1.47		1.01	0.81		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.5	0.3		4.0	1.0		3.3	1.6		22.1	4.3	
Delay (s)	56.9	22.8		57.4	20.9		56.1	47.2		78.4	53.5	
Level of Service	E	C		E	C		E	D		E	D	
Approach Delay (s)		30.3			23.2			50.0			59.1	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM Average Control Delay		31.2					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			14.5		
Intersection Capacity Utilization		68.1%					ICU Level of Service			C		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Del Mar Heights Road & Lansdale Drive

Near Term AM
7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	562	35	67	1100	36	44	26	55	49	60	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5040		1770	5061		1770	1673		1770	1627	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5040		1770	5061		1770	1673		1770	1627	
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)	166	624	39	74	1222	40	49	29	61	54	67	361
RTOR Reduction (vph)	0	4	0	0	2	0	0	50	0	0	189	0
Lane Group Flow (vph)	166	659	0	74	1260	0	49	40	0	54	239	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	15.0	64.5		7.8	57.3		6.6	21.4		7.2	21.8	
Effective Green, g (s)	15.0	64.5		7.8	57.3		6.6	21.4		7.2	21.8	
Actuated g/C Ratio	0.12	0.54		0.06	0.48		0.06	0.18		0.06	0.18	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	221	2709		115	2417		97	298		106	296	
v/s Ratio Prot	c0.09	0.13		0.04	c0.25		0.03	0.02		c0.03	c0.15	
v/s Ratio Perm												
v/c Ratio	0.75	0.24		0.64	0.52		0.51	0.13		0.51	0.81	
Uniform Delay, d1	50.7	14.8		54.7	21.8		55.1	41.5		54.7	47.1	
Progression Factor	1.41	0.32		0.86	1.16		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.6	0.2		8.7	0.8		1.5	0.1		1.4	14.0	
Delay (s)	82.9	4.9		55.5	26.1		56.6	41.6		56.1	61.1	
Level of Service	F	A		E	C		E	D		E	E	
Approach Delay (s)		20.5			27.7			46.9			60.6	
Approach LOS		C			C			D			E	

Intersection Summary

HCM Average Control Delay	32.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
17: Del Mar Heights Road & Carmel Canyon Road

Near Term AM
7/16/2013

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑↑	↑
Volume (vph)	559	123	397	996	256	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4947		1770	5085	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4947		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	621	137	441	1107	284	380
RTOR Reduction (vph)	23	0	0	0	0	38
Lane Group Flow (vph)	735	0	441	1107	284	342
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	53.0		33.3	91.4	17.7	51.0
Effective Green, g (s)	53.0		33.3	91.4	17.7	51.0
Actuated g/C Ratio	0.44		0.28	0.76	0.15	0.42
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	2185		491	3873	506	673
v/s Ratio Prot	c0.15		c0.25	0.22	c0.08	0.14
v/s Ratio Perm						0.07
v/c Ratio	0.34		0.90	0.29	0.56	0.51
Uniform Delay, d1	22.0		41.7	4.4	47.5	25.3
Progression Factor	1.46		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		18.5	0.2	0.9	0.2
Delay (s)	32.5		60.2	4.5	48.4	25.5
Level of Service	C		E	A	D	C
Approach Delay (s)	32.5			20.4	35.3	
Approach LOS	C			C	D	
Intersection Summary						
HCM Average Control Delay			26.8		HCM Level of Service	C
HCM Volume to Capacity ratio			0.55			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	16.0
Intersection Capacity Utilization			56.2%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Near Term PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	842	16	113	900	183	41	32	41	383	36	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	12	10	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	*0.91			1.00	1.00	*0.95	*0.95	
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (prot)	1652	5071		1652	3304			1812	1583	1681	1608	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (perm)	1652	5071		1652	3304			1812	1583	1681	1608	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	915	17	123	978	199	45	35	45	416	39	146
RTOR Reduction (vph)	0	1	0	0	12	0	0	0	40	0	32	0
Lane Group Flow (vph)	139	931	0	123	1165	0	0	80	5	308	261	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	21.8	41.9		19.2	39.1			12.2	12.2	27.0	27.0	
Effective Green, g (s)	21.8	41.9		19.2	39.1			12.2	12.2	27.0	27.0	
Actuated g/C Ratio	0.18	0.35		0.16	0.33			0.10	0.10	0.22	0.22	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	300	1771		264	1077			184	161	378	362	
v/s Ratio Prot	c0.08	c0.18		0.07	c0.35			c0.04		c0.18	0.16	
v/s Ratio Perm									0.00			
v/c Ratio	0.46	0.53		0.47	1.08			0.43	0.03	0.81	0.72	
Uniform Delay, d1	43.9	31.1		45.7	40.4			50.7	48.6	44.1	43.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	1.1		0.5	52.3			0.6	0.0	12.7	6.9	
Delay (s)	44.3	32.2		46.2	92.7			51.3	48.6	56.8	50.0	
Level of Service	D	C		D	F			D	D	E	D	
Approach Delay (s)		33.8			88.3			50.3			53.5	
Approach LOS		C			F			D			D	

Intersection Summary			
HCM Average Control Delay	61.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.4
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

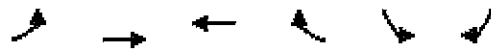
Near Term PM
7/16/2013

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Volume (veh/h)	1218	64	0	1443	0	78
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)	1353	71	0	1603	0	87
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			0.86		0.82	0.86
vC, conflicting volume			1424		2191	487
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			913		971	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			636		205	930
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	541	541	342	802	802	87
Volume Left	0	0	0	0	0	0
Volume Right	0	0	71	0	0	87
cSH	1700	1700	1700	1700	1700	930
Volume to Capacity	0.32	0.32	0.20	0.47	0.47	0.09
Queue Length 95th (ft)	0	0	0	0	0	8
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.3
Lane LOS						A
Approach Delay (s)	0.0			0.0		9.3
Approach LOS						A
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			43.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Near Term PM
7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	910	1198	0	901	299
Ideal Flow (vphpl)	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
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		3430	1441
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		3430	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1011	1331	0	1001	332
RTOR Reduction (vph)	0	0	0	0	3	24
Lane Group Flow (vph)	0	1011	1331	0	1031	275
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		42.2	42.2		25.5	25.5
Effective Green, g (s)		42.2	42.2		25.5	25.5
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)		1876	1876		1099	462
v/s Ratio Prot		0.29	c0.38		c0.30	
v/s Ratio Perm						0.19
v/c Ratio		0.54	0.71		0.94	0.59
Uniform Delay, d1		12.3	14.1		26.3	22.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.3	1.3		14.5	2.1
Delay (s)		12.6	15.3		40.8	24.8
Level of Service		B	B		D	C
Approach Delay (s)		12.6	15.3		37.2	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay		22.5		HCM Level of Service		C
HCM Volume to Capacity ratio		0.80				
Actuated Cycle Length (s)		79.6		Sum of lost time (s)		11.9
Intersection Capacity Utilization		105.6%		ICU Level of Service		G
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Near Term PM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			  			 				
Volume (vph)	242	1514	0	0	1188	890	649	24	802	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.90	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1503	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1503	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	1594	0	0	1251	937	683	25	844	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	496	0	10	10	0	0	0
Lane Group Flow (vph)	255	1594	0	0	1251	441	540	504	488	0	0	0
Turn Type	Prot						Prot	Split		Prot		
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	10.8	63.3			47.3	47.3	44.8	44.8	44.8			
Effective Green, g (s)	10.8	63.3			47.3	47.3	44.8	44.8	44.8			
Actuated g/C Ratio	0.09	0.53			0.39	0.39	0.37	0.37	0.37			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	309	1867			2004	624	628	561	561			
v/s Ratio Prot	0.07	c0.45			0.25	0.28	0.32	c0.34	0.32			
v/s Ratio Perm												
v/c Ratio	0.83	0.85			0.62	0.71	0.86	0.90	0.87			
Uniform Delay, d1	53.7	24.4			29.2	30.5	34.7	35.5	34.9			
Progression Factor	1.00	1.00			0.90	3.04	1.00	1.00	1.00			
Incremental Delay, d2	16.2	5.2			0.1	0.6	11.3	17.0	13.5			
Delay (s)	69.9	29.6			26.4	93.3	46.0	52.5	48.4			
Level of Service	E	C			C	F	D	D	D			
Approach Delay (s)		35.1			55.1			48.9			0.0	
Approach LOS		D			E			D			A	
Intersection Summary												
HCM Average Control Delay		46.8					HCM Level of Service		D			
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		11.9			
Intersection Capacity Utilization		103.0%					ICU Level of Service		G			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Near Term PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	1089	259	15	1353	29	637	67	138	28	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.90		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
Satd. Flow (prot)	1770	5085	1583	1770	5069		3433	3181		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5069		3433	3181		1770	1863	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	1210	288	17	1503	32	708	74	153	31	33	91
RTOR Reduction (vph)	0	0	92	0	2	0	0	118	0	0	0	1
Lane Group Flow (vph)	277	1210	196	17	1533	0	708	109	0	31	33	90
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases		2									4	
Actuated Green, G (s)	28.2	66.9	81.5	2.2	41.3		14.6	27.4		3.8	16.6	44.8
Effective Green, g (s)	28.2	66.9	81.5	2.2	41.3		14.6	27.4		3.8	16.6	44.8
Actuated g/C Ratio	0.24	0.56	0.68	0.02	0.34		0.12	0.23		0.03	0.14	0.37
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	416	2835	1075	32	1745		418	726		56	258	591
v/s Ratio Prot	c0.16	0.24	0.02	0.01	c0.30		c0.21	c0.03		0.02	0.02	0.04
v/s Ratio Perm			0.10									0.02
v/c Ratio	0.67	0.43	0.18	0.53	0.88		1.69	0.15		0.55	0.13	0.15
Uniform Delay, d1	41.6	15.4	7.0	58.4	37.0		52.7	37.0		57.3	45.4	25.0
Progression Factor	1.02	1.09	0.74	1.13	1.28		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.2	0.0	7.6	6.2		322.4	0.0		6.6	0.1	0.0
Delay (s)	44.0	17.0	5.2	73.4	53.6		375.1	37.0		63.8	45.4	25.0
Level of Service	D	B	A	E	D		F	D		E	D	C
Approach Delay (s)		19.3			53.8			293.0			37.1	
Approach LOS		B			D			F			D	
Intersection Summary												
HCM Average Control Delay	90.0			HCM Level of Service			F					
HCM Volume to Capacity ratio	0.78											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			14.4					
Intersection Capacity Utilization	77.8%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Near Term PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	452	1392	399	108	763	181	444	421	257	151	154	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	*0.95		0.97	*0.95		0.97	*0.95	1.00	0.97	*0.95	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5132		3433	5156		3433	5309	1583	3433	4862	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5132		3433	5156		3433	5309	1583	3433	4862	
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)	502	1547	443	120	848	201	493	468	286	168	171	219
RTOR Reduction (vph)	0	35	0	0	34	0	0	0	83	0	172	0
Lane Group Flow (vph)	502	1955	0	120	1015	0	493	468	203	168	218	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	26.5	61.3		7.9	42.9		13.6	23.9	23.9	6.4	15.9	
Effective Green, g (s)	26.5	61.3		7.9	42.9		13.6	23.9	23.9	6.4	15.9	
Actuated g/C Ratio	0.22	0.51		0.07	0.36		0.11	0.20	0.20	0.05	0.13	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	758	2622		226	1843		389	1057	315	183	644	
v/s Ratio Prot	c0.15	c0.38		0.03	0.20		c0.14	0.09		0.05	0.04	
v/s Ratio Perm									c0.13			
v/c Ratio	0.66	0.75		0.53	0.55		1.27	0.44	0.64	0.92	0.34	
Uniform Delay, d1	42.7	23.2		54.3	30.8		53.2	42.2	44.1	56.5	47.3	
Progression Factor	0.95	0.45		1.28	1.04		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	1.2		1.2	1.2		139.3	0.4	4.8	42.8	0.3	
Delay (s)	41.5	11.7		70.7	33.1		192.5	42.6	49.0	99.3	47.6	
Level of Service	D	B		E	C		F	D	D	F	D	
Approach Delay (s)		17.7			37.0			103.3			63.2	
Approach LOS		B			D			F			E	
Intersection Summary												
HCM Average Control Delay	46.0			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.78											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			14.9					
Intersection Capacity Utilization	77.0%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

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

Near Term PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  		 	  			 	
Volume (vph)	85	1101	458	82	545	74	323	172	149	80	128	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.93		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4861		3433	4994		3433	4731		1770	3305	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4861		3433	4994		3433	4731		1770	3305	
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)	94	1223	509	91	606	82	359	191	166	89	142	112
RTOR Reduction (vph)	0	50	0	0	11	0	0	137	0	0	96	0
Lane Group Flow (vph)	94	1682	0	91	677	0	359	220	0	89	158	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.6	62.2		6.8	61.2		14.9	21.2		10.0	16.8	
Effective Green, g (s)	7.6	62.2		6.8	61.2		14.9	21.2		10.0	16.8	
Actuated g/C Ratio	0.06	0.52		0.06	0.51		0.12	0.18		0.08	0.14	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	217	2520		195	2547		426	836		148	463	
v/s Ratio Prot	c0.03	c0.35		0.03	0.14		c0.10	0.05		0.05	c0.05	
v/s Ratio Perm												
v/c Ratio	0.43	0.67		0.47	0.27		0.84	0.26		0.60	0.34	
Uniform Delay, d1	54.1	21.3		54.8	16.7		51.4	42.7		53.1	46.6	
Progression Factor	1.09	0.92		1.25	0.50		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.0		0.6	0.3		13.5	0.2		4.6	1.2	
Delay (s)	59.1	20.6		69.1	8.6		64.9	42.9		57.7	47.8	
Level of Service	E	C		E	A		E	D		E	D	
Approach Delay (s)		22.5			15.7			53.9			50.4	
Approach LOS		C			B			D			D	
Intersection Summary												
HCM Average Control Delay	29.8			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			13.7					
Intersection Capacity Utilization	64.8%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

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

Near Term PM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	1180	108	8	619	23	37	14	32	28	8	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5021		1770	5058		1770	1669		1770	1642	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5021		1770	5058		1770	1669		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	1311	120	9	688	26	41	16	36	31	9	34
RTOR Reduction (vph)	0	6	0	0	2	0	0	31	0	0	30	0
Lane Group Flow (vph)	54	1425	0	9	712	0	41	21	0	31	13	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.2	78.5		1.1	71.7		6.1	17.3		4.4	15.6	
Effective Green, g (s)	7.2	78.5		1.1	71.7		6.1	17.3		4.4	15.6	
Actuated g/C Ratio	0.06	0.65		0.01	0.60		0.05	0.14		0.04	0.13	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	106	3285		16	3022		90	241		65	213	
v/s Ratio Prot	c0.03	c0.28		0.01	0.14		c0.02	c0.01		0.02	0.01	
v/s Ratio Perm												
v/c Ratio	0.51	0.43		0.56	0.24		0.46	0.09		0.48	0.06	
Uniform Delay, d1	54.7	10.0		59.2	11.3		55.3	44.5		56.7	45.8	
Progression Factor	0.83	1.51		1.07	0.61		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.3		23.7	0.2		1.3	0.1		2.0	0.0	
Delay (s)	46.5	15.5		86.8	7.0		56.7	44.6		58.7	45.8	
Level of Service	D	B		F	A		E	D		E	D	
Approach Delay (s)		16.6			8.0			49.9			51.2	
Approach LOS		B			A			D			D	
Intersection Summary												
HCM Average Control Delay		16.4		HCM Level of Service				B				
HCM Volume to Capacity ratio		0.36										
Actuated Cycle Length (s)		120.0		Sum of lost time (s)				8.4				
Intersection Capacity Utilization		49.5%		ICU Level of Service				A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Del Mar Heights Road & Lansdale Drive

Near Term PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑↑		↰	↑		↰	↑	
Volume (vph)	244	928	65	22	452	25	40	46	35	24	33	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.94		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5036		1770	5045		1770	1742		1770	1631	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5036		1770	5045		1770	1742		1770	1631	
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)	271	1031	72	24	502	28	44	51	39	27	37	182
RTOR Reduction (vph)	0	5	0	0	4	0	0	27	0	0	155	0
Lane Group Flow (vph)	271	1098	0	24	526	0	44	63	0	27	64	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	21.7	74.8		3.6	56.7		4.5	19.7		2.8	17.8	
Effective Green, g (s)	21.7	74.8		3.6	56.7		4.5	19.7		2.8	17.8	
Actuated g/C Ratio	0.18	0.62		0.03	0.47		0.04	0.16		0.02	0.15	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	320	3139		53	2384		66	286		41	242	
v/s Ratio Prot	c0.15	c0.22		0.01	0.10		c0.02	0.04		0.02	c0.04	
v/s Ratio Perm												
v/c Ratio	0.85	0.35		0.45	0.22		0.67	0.22		0.66	0.26	
Uniform Delay, d1	47.5	10.9		57.2	18.6		57.0	43.5		58.1	45.3	
Progression Factor	1.43	0.70		1.29	1.01		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.7	0.3		2.2	0.2		17.9	0.1		25.4	0.2	
Delay (s)	84.7	7.9		76.3	19.1		74.9	43.6		83.6	45.5	
Level of Service	F	A		E	B		E	D		F	D	
Approach Delay (s)		23.0			21.6			53.9			49.7	
Approach LOS		C			C			D			D	

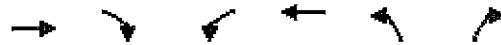
Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

17: Del Mar Heights Road & Carmel Canyon Road

Near Term PM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑↑	↑
Volume (vph)	811	160	92	411	104	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4959		1770	5085	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4959		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	901	178	102	457	116	283
RTOR Reduction (vph)	16	0	0	0	0	42
Lane Group Flow (vph)	1063	0	102	457	116	241
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	74.0		11.7	90.8	18.3	30.0
Effective Green, g (s)	74.0		11.7	90.8	18.3	30.0
Actuated g/C Ratio	0.62		0.10	0.76	0.15	0.25
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	3058		173	3848	524	396
v/s Ratio Prot	0.21		0.06	0.09	0.03	0.06
v/s Ratio Perm						0.09
v/c Ratio	0.35		0.59	0.12	0.22	0.61
Uniform Delay, d1	11.2		51.9	3.9	44.6	39.8
Progression Factor	1.86		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		3.3	0.1	0.1	1.8
Delay (s)	21.2		55.1	4.0	44.7	41.6
Level of Service	C		E	A	D	D
Approach Delay (s)	21.2			13.3	42.5	
Approach LOS	C			B	D	
Intersection Summary						
HCM Average Control Delay			23.2		HCM Level of Service	C
HCM Volume to Capacity ratio			0.42			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	15.1
Intersection Capacity Utilization			43.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Near Term + Project (Phase 1) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	873	24	88	880	201	70	58	78	451	23	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97	
Satd. Flow (prot)	1770	5065		1770	3441			1813	1583	1681	1639	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97	
Satd. Flow (perm)	1770	5065		1770	3441			1813	1583	1681	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	98	978	223	78	64	87	501	26	93
RTOR Reduction (vph)	0	2	0	0	12	0	0	0	74	0	12	0
Lane Group Flow (vph)	107	995	0	98	1189	0	0	142	13	316	292	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	11.2	58.4		11.7	58.7			20.3	20.3	29.9	29.9	
Effective Green, g (s)	11.2	58.4		11.7	58.7			20.3	20.3	29.9	29.9	
Actuated g/C Ratio	0.08	0.42		0.08	0.42			0.15	0.15	0.21	0.21	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	142	2113		148	1443			263	230	359	350	
v/s Ratio Prot	c0.06	0.20		0.06	c0.35			c0.08		c0.19	0.18	
v/s Ratio Perm									0.01			
v/c Ratio	0.75	0.47		0.66	0.82			0.54	0.05	0.88	0.83	
Uniform Delay, d1	63.0	29.6		62.2	36.1			55.5	51.6	53.3	52.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.0	0.8		8.3	4.1			1.1	0.0	21.3	15.6	
Delay (s)	81.1	30.4		70.6	40.2			56.6	51.6	74.6	68.3	
Level of Service	F	C		E	D			E	D	E	E	
Approach Delay (s)		35.3			42.5			54.7			71.5	
Approach LOS		D			D			D			E	
Intersection Summary												
HCM Average Control Delay		46.4					HCM Level of Service		D			
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		140.0					Sum of lost time (s)		14.4			
Intersection Capacity Utilization		70.9%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Near Term + Project (Phase 1) AM
7/16/2013

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↗
Volume (veh/h)	1431	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)	1590	61	0	1536	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			0.86		0.89	0.86
vC, conflicting volume			1651		2388	561
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1202		1387	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	84
cM capacity (veh/h)			498		119	937
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	937
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	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Near Term + Project (Phase 1) AM

7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	779	1041	0	997	336
Ideal Flow (vphpl)	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
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Sato. Flow (prot)		3539	3539		3430	1441
Flt Permitted		1.00	1.00		0.95	1.00
Sato. Flow (perm)		3539	3539		3430	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	866	1157	0	1108	373
RTOR Reduction (vph)	0	0	0	0	3	38
Lane Group Flow (vph)	0	866	1157	0	1142	298
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		42.1	42.1		26.0	26.0
Effective Green, g (s)		42.1	42.1		26.0	26.0
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)		1862	1862		1115	468
v/s Ratio Prot		0.24	0.33		0.33	
v/s Ratio Perm						0.21
v/c Ratio		0.47	0.62		1.02	0.64
Uniform Delay, d1		11.9	13.3		27.0	23.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	0.7		33.3	2.8
Delay (s)		12.1	14.0		60.3	25.8
Level of Service		B	B		E	C
Approach Delay (s)		12.1	14.0		52.5	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay		29.8		HCM Level of Service		C
HCM Volume to Capacity ratio		0.78				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		11.9
Intersection Capacity Utilization		121.2%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Near Term + Project (Phase 1) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	231	1466	0	0	1516	934	384	59	1055	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1479	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1479	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	246	1560	0	0	1613	994	409	63	1122	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	454	0	7	7	0	0	0
Lane Group Flow (vph)	246	1560	0	0	1613	540	368	613	599	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	9.4	56.7			42.1	42.1	51.4	51.4	51.4			
Effective Green, g (s)	9.4	56.7			42.1	42.1	51.4	51.4	51.4			
Actuated g/C Ratio	0.08	0.47			0.35	0.35	0.43	0.43	0.43			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	269	1672			1784	555	720	634	644			
v/s Ratio Prot	0.07	0.44			0.32	0.34	0.22	0.41	0.40			
v/s Ratio Perm												
v/c Ratio	0.91	0.93			0.90	0.97	0.51	0.97	0.93			
Uniform Delay, d1	54.9	29.9			37.0	38.4	25.1	33.5	32.6			
Progression Factor	1.00	1.00			0.75	1.58	1.00	1.00	1.00			
Incremental Delay, d2	33.0	11.0			4.2	20.6	0.6	27.4	20.2			
Delay (s)	87.9	40.8			32.0	81.2	25.7	60.9	52.8			
Level of Service	F	D			C	F	C	E	D			
Approach Delay (s)		47.3			50.7			49.7			0.0	
Approach LOS		D			D			D			A	
Intersection Summary												
HCM Average Control Delay		49.4					HCM Level of Service		D			
HCM Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		11.9			
Intersection Capacity Utilization		101.6%					ICU Level of Service		G			
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) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1706	694	100	1927	66	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)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.88		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
Satd. Flow (prot)	1770	5085	1583	1770	5060		3433	3123		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5060		3433	3123		1770	1863	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	1896	771	111	2141	73	223	11	40	116	66	347
RTOR Reduction (vph)	0	0	271	0	2	0	0	34	0	0	0	26
Lane Group Flow (vph)	123	1896	500	111	2212	0	223	17	0	116	66	321
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.3	58.6	71.2	10.7	55.4		12.6	18.5		12.5	18.4	32.7
Effective Green, g (s)	14.3	58.6	71.2	10.7	55.4		12.6	18.5		12.5	18.4	32.7
Actuated g/C Ratio	0.12	0.49	0.59	0.09	0.46		0.10	0.15		0.10	0.15	0.27
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	211	2483	939	158	2336		360	481		184	286	431
v/s Ratio Prot	0.07	c0.37	0.06	0.06	c0.44		0.06	0.01		c0.07	0.04	c0.09
v/s Ratio Perm			0.26									0.11
v/c Ratio	0.58	0.76	0.53	0.70	0.95		0.62	0.04		0.63	0.23	0.74
Uniform Delay, d1	50.0	25.0	14.5	53.1	30.9		51.4	43.2		51.5	44.6	39.8
Progression Factor	1.01	0.96	0.55	1.11	0.86		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.9	0.1	9.6	8.7		2.2	0.0		5.1	0.2	6.0
Delay (s)	51.8	25.0	8.1	68.7	35.2		53.6	43.2		56.6	44.7	45.8
Level of Service	D	C	A	E	D		D	D		E	D	D
Approach Delay (s)		21.5			36.8			51.7			48.1	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM Average Control Delay	31.3			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			24.8					
Intersection Capacity Utilization	75.8%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
11: Del Mar Heights Road & Third Ave.

Near Term + Project (Phase 1) AM
7/16/2013

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑	↑↑	↑
Volume (vph)	1846	196	117	2084	40	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2051	218	130	2316	44	27
RTOR Reduction (vph)	0	43	0	0	0	25
Lane Group Flow (vph)	2051	175	130	2316	44	2
Turn Type	Perm		Prot	Perm		
Protected Phases	2		1	6	3	
Permitted Phases	2				3	
Actuated Green, G (s)	84.3	84.3	14.1	101.4	9.6	9.6
Effective Green, g (s)	84.3	84.3	14.1	101.4	9.6	9.6
Actuated g/C Ratio	0.70	0.70	0.12	0.85	0.08	0.08
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3572	1112	208	4297	275	127
v/s Ratio Prot	c0.40		c0.07	0.46	c0.01	
v/s Ratio Perm	0.11					0.00
v/c Ratio	0.57	0.16	0.62	0.54	0.16	0.02
Uniform Delay, d1	8.9	6.0	50.4	2.6	51.4	50.9
Progression Factor	1.53	1.63	1.00	1.80	1.00	1.00
Incremental Delay, d2	0.5	0.2	4.3	0.4	0.3	0.1
Delay (s)	14.1	10.0	54.9	5.1	51.7	50.9
Level of Service	B	A	D	A	D	D
Approach Delay (s)	13.7			7.8	51.4	
Approach LOS	B			A	D	
Intersection Summary						
HCM Average Control Delay			11.2	HCM Level of Service		B
HCM Volume to Capacity ratio			0.54			
Actuated Cycle Length (s)			120.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization			55.5%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis 12: Del Mar Heights Road & First Ave.

Near Term + Project (Phase 1) AM
7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑↑	↑↑↑	↑	↑
Volume (vph)	1713	157	78	2169	32	16
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
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	1903	174	87	2410	36	18
RTOR Reduction (vph)	0	72	0	0	0	13
Lane Group Flow (vph)	1903	102	87	2410	36	5
Turn Type		Prot	Prot			Perm
Protected Phases	4	4	3	8	2	
Permitted Phases						2
Actuated Green, G (s)	69.1	69.1	7.5	80.6	31.4	31.4
Effective Green, g (s)	69.1	69.1	7.5	80.6	31.4	31.4
Actuated g/C Ratio	0.58	0.58	0.06	0.67	0.26	0.26
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2928	912	215	3415	463	414
v/s Ratio Prot	0.37	0.06	0.03	0.47	0.02	
v/s Ratio Perm						0.00
v/c Ratio	0.65	0.11	0.40	0.71	0.08	0.01
Uniform Delay, d1	17.3	11.5	54.1	12.3	33.4	32.8
Progression Factor	1.81	6.69	0.89	1.07	1.00	1.00
Incremental Delay, d2	0.4	0.0	0.7	0.4	0.3	0.1
Delay (s)	31.7	77.3	48.7	13.6	33.7	32.9
Level of Service	C	E	D	B	C	C
Approach Delay (s)	35.5			14.8	33.4	
Approach LOS	D			B	C	
Intersection Summary						
HCM Average Control Delay		24.3		HCM Level of Service		C
HCM Volume to Capacity ratio		0.53				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		51.9%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Near Term + Project (Phase 1) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	225	929	388	300	1537	95	249	109	90	164	335	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	4861		3433	5041		3433	5085	1583	3433	4652	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	4861		3433	5041		3433	5085	1583	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)	250	1032	431	333	1708	106	277	121	100	182	372	489
RTOR Reduction (vph)	0	61	0	0	5	0	0	0	73	0	137	0
Lane Group Flow (vph)	250	1402	0	333	1809	0	277	121	27	182	724	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	12.8	44.7		17.1	49.2		12.1	32.1	32.1	5.6	24.8	
Effective Green, g (s)	12.8	44.7		17.1	49.2		12.1	32.1	32.1	5.6	24.8	
Actuated g/C Ratio	0.11	0.37		0.14	0.41		0.10	0.27	0.27	0.05	0.21	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	366	1811		489	2067		346	1360	423	160	961	
v/s Ratio Prot	0.07	0.29		c0.10	c0.36		c0.08	0.02		c0.05	c0.16	
v/s Ratio Perm									0.02			
v/c Ratio	0.68	0.77		0.68	0.88		0.80	0.09	0.06	1.14	1.05dr	
Uniform Delay, d1	51.6	33.2		48.9	32.6		52.8	33.0	32.7	57.2	44.7	
Progression Factor	1.09	0.53		1.27	0.85		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.3	2.6		3.0	5.3		11.8	0.0	0.1	112.9	3.4	
Delay (s)	59.5	20.2		65.1	32.9		64.6	33.0	32.8	170.1	48.2	
Level of Service	E	C		E	C		E	C	C	F	D	
Approach Delay (s)		25.9			37.9			50.5			69.4	
Approach LOS		C			D			D			E	
Intersection Summary												
HCM Average Control Delay	41.3			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.83											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			21.1					
Intersection Capacity Utilization	79.3%			ICU Level of Service			D					
Analysis Period (min)	15											
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

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

Near Term + Project (Phase 1) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	630	291	280	1243	174	424	188	111	146	185	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	0.94		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4844		3433	4992		3433	4803		1770	3304	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4844		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)	164	700	323	311	1381	193	471	209	123	162	206	164
RTOR Reduction (vph)	0	58	0	0	13	0	0	100	0	0	109	0
Lane Group Flow (vph)	164	965	0	311	1561	0	471	232	0	162	261	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5		2	1		6	3		8	7		4
Permitted Phases												
Actuated Green, G (s)	9.3		48.8	14.3		53.6	18.2		22.3	14.8		19.4
Effective Green, g (s)	9.3		48.8	14.3		53.6	18.2		22.3	14.8		19.4
Actuated g/C Ratio	0.08		0.41	0.12		0.45	0.15		0.19	0.12		0.16
Clearance Time (s)	4.4		5.6	4.4		5.8	4.4		5.4	4.4		4.9
Vehicle Extension (s)	2.0		3.8	2.0		4.0	2.0		4.0	2.0		5.8
Lane Grp Cap (vph)	266		1970	409		2230	521		893	218		534
v/s Ratio Prot	0.05		0.20	c0.09		c0.31	c0.14		c0.05	0.09		c0.08
v/s Ratio Perm												
v/c Ratio	0.62		0.49	0.76		0.70	0.90		0.26	0.74		0.49
Uniform Delay, d1	53.6		26.4	51.2		26.7	50.0		41.8	50.8		45.8
Progression Factor	1.14		1.15	1.10		0.63	1.00		1.00	1.00		1.00
Incremental Delay, d2	2.8		0.8	6.5		1.6	18.6		0.2	11.3		1.9
Delay (s)	64.0		31.1	62.6		18.5	68.7		42.0	62.1		47.7
Level of Service	E		C	E		B	E		D	E		D
Approach Delay (s)			35.6			25.8			57.7			52.1
Approach LOS			D			C			E			D
Intersection Summary												
HCM Average Control Delay	37.4			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			19.1					
Intersection Capacity Utilization	70.3%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Del Mar Heights Road & Torrey Ridge Dr.

Near Term + Project (Phase 1) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	212	653	121	81	1093	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)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4966		1770	4959		1770	1845		1770	1674	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4966		1770	4959		1770	1845		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	726	134	90	1214	240	122	173	12	62	69	143
RTOR Reduction (vph)	0	17	0	0	21	0	0	2	0	0	68	0
Lane Group Flow (vph)	236	843	0	90	1433	0	122	183	0	62	144	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	19.4	63.3		10.1	53.3		12.2	22.1		5.8	15.7	
Effective Green, g (s)	19.4	63.3		10.1	53.3		12.2	22.1		5.8	15.7	
Actuated g/C Ratio	0.16	0.53		0.08	0.44		0.10	0.18		0.05	0.13	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	286	2620		149	2203		180	340		86	219	
v/s Ratio Prot	c0.13	0.17		0.05	c0.29		c0.07	0.10		0.04	c0.09	
v/s Ratio Perm												
v/c Ratio	0.83	0.32		0.60	0.65		0.68	0.54		0.72	0.66	
Uniform Delay, d1	48.7	16.1		53.0	26.1		52.0	44.3		56.3	49.6	
Progression Factor	0.85	1.58		1.00	0.86		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.4	0.3		3.9	1.2		7.7	0.8		22.1	5.4	
Delay (s)	56.9	25.8		56.9	23.6		59.7	45.1		78.4	55.0	
Level of Service	E	C		E	C		E	D		E	D	
Approach Delay (s)		32.5			25.5			50.9			60.3	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM Average Control Delay		33.3					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			19.4		
Intersection Capacity Utilization		71.1%					ICU Level of Service			C		
Analysis Period (min)		15										
o Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Del Mar Heights Road & Lansdale Drive

Near Term + Project (Phase 1) AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	570	35	67	1139	36	44	26	55	49	60	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5041		1770	5062		1770	1673		1770	1624	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5041		1770	5062		1770	1673		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)	172	633	39	74	1266	40	49	29	61	54	67	396
RTOR Reduction (vph)	0	4	0	0	2	0	0	49	0	0	202	0
Lane Group Flow (vph)	172	668	0	74	1304	0	49	41	0	54	261	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	15.3	64.2		7.8	56.7		5.8	23.0		5.9	22.9	
Effective Green, g (s)	15.3	64.2		7.8	56.7		5.8	23.0		5.9	22.9	
Actuated g/C Ratio	0.13	0.54		0.06	0.47		0.05	0.19		0.05	0.19	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	226	2697		115	2392		86	321		87	310	
v/s Ratio Prot	c0.10	0.13		0.04	c0.26		0.03	0.02		c0.03	c0.16	
v/s Ratio Perm												
v/c Ratio	0.76	0.25		0.64	0.55		0.57	0.13		0.62	0.84	
Uniform Delay, d1	50.6	15.0		54.7	22.5		55.9	40.2		56.0	46.8	
Progression Factor	1.44	0.30		0.86	1.23		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.3	0.2		8.6	0.9		5.1	0.1		9.5	17.6	
Delay (s)	85.2	4.7		55.5	28.5		61.0	40.2		65.4	64.4	
Level of Service	F	A		E	C		E	D		E	E	
Approach Delay (s)		21.1			29.9			47.5			64.5	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM Average Control Delay	34.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
17: Del Mar Heights Road & Carmel Canyon Road

Near Term + Project (Phase 1) AM
7/16/2013

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑↑	↑
Volume (vph)	564	126	397	1019	272	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Frt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4946		1770	5085	3433	1583
Frt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4946		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	627	140	441	1132	302	380
RTOR Reduction (vph)	24	0	0	0	0	37
Lane Group Flow (vph)	743	0	441	1132	302	343
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	52.5		33.3	90.9	18.2	51.5
Effective Green, g (s)	52.5		33.3	90.9	18.2	51.5
Actuated g/C Ratio	0.44		0.28	0.76	0.15	0.43
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	2164		491	3852	521	679
v/s Ratio Prot	c0.15		c0.25	0.22	c0.09	0.14
v/s Ratio Perm						0.08
v/c Ratio	0.34		0.90	0.29	0.58	0.51
Uniform Delay, d1	22.3		41.7	4.5	47.3	25.0
Progression Factor	1.48		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		18.5	0.2	1.0	0.2
Delay (s)	33.4		60.2	4.7	48.3	25.2
Level of Service	C		E	A	D	C
Approach Delay (s)	33.4			20.3	35.4	
Approach LOS	C			C	D	
Intersection Summary						
HCM Average Control Delay			27.0		HCM Level of Service	C
HCM Volume to Capacity ratio			0.56			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	16.0
Intersection Capacity Utilization			56.8%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Near Term + Project (Phase 1) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑			↑	↰	↰	↰	
Volume (vph)	128	856	16	137	924	207	41	32	55	397	36	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (prot)	1770	5072		1770	3442			1812	1583	1681	1610	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (perm)	1770	5072		1770	3442			1812	1583	1681	1610	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	930	17	149	1004	225	45	35	60	432	39	146
RTOR Reduction (vph)	0	1	0	0	15	0	0	0	53	0	29	0
Lane Group Flow (vph)	139	946	0	149	1214	0	0	80	7	315	273	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	20.3	38.0		21.7	39.2			13.3	13.3	27.3	27.3	
Effective Green, g (s)	20.3	38.0		21.7	39.2			13.3	13.3	27.3	27.3	
Actuated g/C Ratio	0.17	0.32		0.18	0.33			0.11	0.11	0.23	0.23	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	299	1606		320	1124			201	175	382	366	
v/s Ratio Prot	0.08	0.19		0.08	0.35			0.04		0.19	0.17	
v/s Ratio Perm									0.00			
v/c Ratio	0.46	0.59		0.47	1.08			0.40	0.04	0.82	0.74	
Uniform Delay, d1	45.0	34.4		44.0	40.4			49.6	47.6	44.1	43.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	1.6		0.4	51.3			0.5	0.0	13.5	8.0	
Delay (s)	45.4	36.0		44.4	91.7			50.1	47.7	57.5	51.1	
Level of Service	D	D		D	F			D	D	E	D	
Approach Delay (s)		37.2			86.6			49.1			54.4	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM Average Control Delay	62.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Near Term + Project (Phase 1) PM

7/16/2013



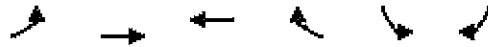
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Volume (veh/h)	1272	64	0	1548	0	96
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1413	71	0	1720	0	107
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	575			607		
pX, platoon unblocked			0.84		0.77	0.84
vC, conflicting volume			1484		2309	507
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			927		877	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	88
cM capacity (veh/h)			619		221	915
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	565	565	354	860	860	107
Volume Left	0	0	0	0	0	0
Volume Right	0	0	71	0	0	107
cSH	1700	1700	1700	1700	1700	915
Volume to Capacity	0.33	0.33	0.21	0.51	0.51	0.12
Queue Length 95th (ft)	0	0	0	0	0	10
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.5
Lane LOS						A
Approach Delay (s)	0.0			0.0		9.5
Approach LOS						A
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			46.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Near Term + Project (Phase 1) PM

7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑↑	↑
Volume (vph)	0	981	1325	0	955	299
Ideal Flow (vphpl)	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
Frt		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	0.90	0.90
Adj. Flow (vph)	0	1090	1472	0	1061	332
RTOR Reduction (vph)	0	0	0	0	3	17
Lane Group Flow (vph)	0	1090	1472	0	1091	282
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		42.2	42.2		25.9	25.9
Effective Green, g (s)		42.2	42.2		25.9	25.9
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)		1867	1867		1111	467
v/s Ratio Prot		0.31	0.42		0.32	
v/s Ratio Perm						0.20
v/c Ratio		0.58	0.79		0.98	0.60
Uniform Delay, d1		12.9	15.3		26.8	22.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.5	2.3		22.6	2.2
Delay (s)		13.4	17.6		49.5	24.9
Level of Service		B	B		D	C
Approach Delay (s)		13.4	17.6		44.2	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay		25.8		HCM Level of Service		C
HCM Volume to Capacity ratio		0.86				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		11.9
Intersection Capacity Utilization		120.9%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Near Term + Project (Phase 1) PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	242	1639	0	0	1505	985	649	24	909	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1486	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1486	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	1725	0	0	1584	1037	683	25	957	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	483	0	6	6	0	0	0
Lane Group Flow (vph)	255	1725	0	0	1584	554	581	542	530	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	8.5	61.4			47.7	47.7	46.7	46.7	46.7			
Effective Green, g (s)	8.5	61.4			47.7	47.7	46.7	46.7	46.7			
Actuated g/C Ratio	0.07	0.51			0.40	0.40	0.39	0.39	0.39			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	243	1811			2021	629	654	578	585			
v/s Ratio Prot	0.07	c0.49			0.31	0.35	0.35	c0.36	0.35			
v/s Ratio Perm												
v/c Ratio	1.05	0.95			0.78	0.88	0.89	0.94	0.91			
Uniform Delay, d1	55.8	27.9			31.6	33.5	34.2	35.2	34.6			
Progression Factor	1.00	1.00			0.72	1.92	1.00	1.00	1.00			
Incremental Delay, d2	71.3	12.6			0.3	1.8	13.9	22.9	17.6			
Delay (s)	127.0	40.5			23.2	66.1	48.1	58.1	52.1			
Level of Service	F	D			C	E	D	E	D			
Approach Delay (s)		51.6			40.2			52.7			0.0	
Approach LOS		D			D			D			A	
Intersection Summary												
HCM Average Control Delay		47.1					HCM Level of Service		D			
HCM Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		11.9			
Intersection Capacity Utilization		110.0%					ICU Level of Service		H			
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

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	2321	259	47	1765	61	637	67	156	46	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.89		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
Satd. Flow (prot)	1770	5085	1583	1770	5060		3433	3167		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5060		3433	3167		1770	1863	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	2579	288	52	1961	68	708	74	173	51	33	91
RTOR Reduction (vph)	0	0	70	0	3	0	0	125	0	0	0	0
Lane Group Flow (vph)	277	2579	218	52	2026	0	708	122	0	51	33	91
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases		2									4	
Actuated Green, G (s)	28.4	64.4	77.4	6.3	42.7		13.0	23.1		6.5	16.6	45.0
Effective Green, g (s)	28.4	64.4	77.4	6.3	42.7		13.0	23.1		6.5	16.6	45.0
Actuated g/C Ratio	0.24	0.54	0.64	0.05	0.36		0.11	0.19		0.05	0.14	0.38
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	419	2729	1021	93	1801		372	610		96	258	594
v/s Ratio Prot	c0.16	c0.51	0.02	0.03	c0.40		c0.21	c0.04		0.03	0.02	0.04
v/s Ratio Perm			0.11									0.02
v/c Ratio	0.66	0.95	0.21	0.56	1.12		1.90	0.20		0.53	0.13	0.15
Uniform Delay, d1	41.4	26.1	8.8	55.5	38.6		53.5	40.7		55.3	45.4	24.9
Progression Factor	0.99	1.03	0.85	1.08	1.27		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.7	5.3	0.0	3.6	63.3		416.4	0.1		2.8	0.1	0.0
Delay (s)	42.9	32.3	7.5	63.3	112.2		469.9	40.7		58.1	45.4	24.9
Level of Service	D	C	A	E	F		F	D		E	D	C
Approach Delay (s)		31.0			111.0			358.9			38.4	
Approach LOS		C			F			F			D	
Intersection Summary												
HCM Average Control Delay			106.7	HCM Level of Service		F						
HCM Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)		20.4						
Intersection Capacity Utilization			89.3%	ICU Level of Service		E						
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
11: Del Mar Heights Road & Third Ave.

Near Term + Project (Phase 1) PM

7/16/2013

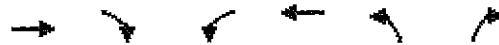
	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑	↑↑	↑
Volume (vph)	2420	149	89	1799	264	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2689	166	99	1999	293	177
RTOR Reduction (vph)	0	37	0	0	0	118
Lane Group Flow (vph)	2689	129	99	1999	293	59
Turn Type		Perm	Prot		Perm	
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	80.1	80.1	10.9	94.0	17.0	17.0
Effective Green, g (s)	80.1	80.1	10.9	94.0	17.0	17.0
Actuated g/C Ratio	0.67	0.67	0.09	0.78	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3394	1057	161	3983	486	224
v/s Ratio Prot	c0.53		c0.06	0.39	c0.09	
v/s Ratio Perm		0.08				0.04
v/c Ratio	0.79	0.12	0.61	0.50	0.60	0.26
Uniform Delay, d1	14.1	7.2	52.5	4.6	48.3	45.9
Progression Factor	0.64	0.09	1.10	0.19	1.00	1.00
Incremental Delay, d2	1.0	0.1	5.9	0.4	2.1	0.6
Delay (s)	10.1	0.7	63.9	1.3	50.4	46.5
Level of Service	B	A	E	A	D	D
Approach Delay (s)	9.5			4.2	49.0	
Approach LOS	A			A	D	
Intersection Summary						
HCM Average Control Delay			10.9	HCM Level of Service		B
HCM Volume to Capacity ratio			0.74			
Actuated Cycle Length (s)			120.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization			69.2%	ICU Level of Service		C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

12: Del Mar Heights Road & First Ave.

Near Term + Project (Phase 1) PM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑↑	↑↑↑	↑	↑
Volume (vph)	2460	119	60	1677	211	106
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
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2733	132	67	1863	234	118
RTOR Reduction (vph)	0	36	0	0	0	59
Lane Group Flow (vph)	2733	96	67	1863	234	59
Turn Type		Prot	Prot		Perm	
Protected Phases	4	4	3	8	2	
Permitted Phases						2
Actuated Green, G (s)	75.0	75.0	4.5	83.5	28.5	28.5
Effective Green, g (s)	75.0	75.0	4.5	83.5	28.5	28.5
Actuated g/C Ratio	0.62	0.62	0.04	0.70	0.24	0.24
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)	3178	989	129	3538	420	376
v/s Ratio Prot	c0.54	0.06	0.02	c0.37	c0.13	
v/s Ratio Perm						0.04
v/c Ratio	0.86	0.10	0.52	0.53	0.56	0.16
Uniform Delay, d1	18.2	9.0	56.7	8.8	40.2	36.2
Progression Factor	1.90	1.97	0.75	1.05	1.00	1.00
Incremental Delay, d2	1.6	0.0	2.1	0.1	5.3	0.9
Delay (s)	36.2	17.7	44.6	9.3	45.5	37.1
Level of Service	D	B	D	A	D	D
Approach Delay (s)	35.3			10.5	42.7	
Approach LOS	D			B	D	
Intersection Summary						
HCM Average Control Delay		26.5		HCM Level of Service		C
HCM Volume to Capacity ratio		0.77				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		12.0
Intersection Capacity Utilization		65.9%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Near Term + Project (Phase 1) PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	484	1625	399	179	882	181	456	453	331	151	172	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	*0.95		0.97	*0.95		0.97	*0.95	1.00	0.97	*0.95	
Flt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5152		3433	5173		3433	5309	1583	3433	4866	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5152		3433	5173		3433	5309	1583	3433	4866	
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)	538	1806	443	199	980	201	507	503	368	168	191	239
RTOR Reduction (vph)	0	34	0	0	28	0	0	0	89	0	118	0
Lane Group Flow (vph)	538	2215	0	199	1153	0	507	503	279	168	312	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	24.0	54.4		12.9	43.5		10.6	27.6	27.6	4.6	20.8	
Effective Green, g (s)	24.0	54.4		12.9	43.5		10.6	27.6	27.6	4.6	20.8	
Actuated g/C Ratio	0.20	0.45		0.11	0.36		0.09	0.23	0.23	0.04	0.17	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	687	2336		369	1875		303	1221	364	132	843	
v/s Ratio Prot	c0.16	c0.43		0.06	0.22		c0.15	0.09		0.05	0.06	
v/s Ratio Perm									c0.18			
v/c Ratio	0.78	0.95		0.54	0.61		1.67	0.41	0.77	1.27	0.37	
Uniform Delay, d1	45.5	31.5		50.7	31.4		54.7	39.3	43.2	57.7	43.8	
Progression Factor	1.07	0.50		1.02	1.12		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.9	5.9		0.7	1.5		317.1	0.3	9.8	169.0	0.3	
Delay (s)	51.4	21.4		52.3	36.6		371.8	39.6	53.0	226.7	44.1	
Level of Service	D	C		D	D		F	D	D	F	D	
Approach Delay (s)		27.2			38.8			165.4			95.4	
Approach LOS		C			D			F			F	
Intersection Summary												
HCM Average Control Delay		67.5		HCM Level of Service				E				
HCM Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		120.0		Sum of lost time (s)				14.9				
Intersection Capacity Utilization		84.3%		ICU Level of Service				E				
Analysis Period (min)		15										
c Critical Lane Group												

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

Near Term + Project (Phase 1) PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	1238	564	82	622	74	383	172	149	80	128	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	0.93		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4847		3433	5004		3433	4731		1770	3277	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4847		3433	5004		3433	4731		1770	3277	
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	1376	627	91	691	82	426	191	166	89	142	139
RTOR Reduction (vph)	0	55	0	0	10	0	0	132	0	0	120	0
Lane Group Flow (vph)	141	1948	0	91	763	0	426	225	0	89	161	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	8.8	61.6		6.8	59.4		15.6	21.8		10.0	16.7	
Effective Green, g (s)	8.8	61.6		6.8	59.4		15.6	21.8		10.0	16.7	
Actuated g/C Ratio	0.07	0.51		0.06	0.50		0.13	0.18		0.08	0.14	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	252	2488		195	2477		446	859		148	456	
v/s Ratio Prot	c0.04	c0.40		0.03	0.15		c0.12	0.05		0.05	c0.05	
v/s Ratio Perm												
v/c Ratio	0.56	0.78		0.47	0.31		0.96	0.26		0.60	0.35	
Uniform Delay, d1	53.7	23.8		54.8	18.1		51.9	42.2		53.1	46.8	
Progression Factor	1.07	0.99		1.31	0.44		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	2.0		0.6	0.3		30.9	0.2		4.6	1.3	
Delay (s)	58.5	25.6		72.5	8.3		82.8	42.4		57.7	48.0	
Level of Service	E	C		E	A		F	D		E	D	
Approach Delay (s)		27.7			15.1			64.4			50.4	
Approach LOS		C			B			E			D	
Intersection Summary												
HCM Average Control Delay		34.0		HCM Level of Service		C						
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		13.7						
Intersection Capacity Utilization		74.4%		ICU Level of Service		D						
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Del Mar Heights Road & Torrey Ridge Dr.

Near Term + Project (Phase 1) PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	1275	150	8	673	23	61	14	32	28	8	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5005		1770	5060		1770	1669		1770	1642	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5005		1770	5060		1770	1669		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	1417	167	9	748	26	68	16	36	31	9	34
RTOR Reduction (vph)	0	8	0	0	2	0	0	31	0	0	30	0
Lane Group Flow (vph)	54	1576	0	9	772	0	68	21	0	31	13	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.0	78.4		0.9	71.6		7.8	17.9		4.1	14.2	
Effective Green, g (s)	7.0	78.4		0.9	71.6		7.8	17.9		4.1	14.2	
Actuated g/C Ratio	0.06	0.65		0.01	0.60		0.06	0.15		0.03	0.12	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	103	3270		13	3019		115	249		60	194	
v/s Ratio Prot	c0.03	c0.31		0.01	0.15		c0.04	c0.01		0.02	0.01	
v/s Ratio Perm												
v/c Ratio	0.52	0.48		0.69	0.26		0.59	0.09		0.52	0.07	
Uniform Delay, d1	54.9	10.5		59.4	11.5		54.6	44.0		57.0	47.0	
Progression Factor	0.77	1.71		1.08	0.58		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.4		80.5	0.2		5.3	0.1		3.1	0.1	
Delay (s)	43.6	18.3		145.0	6.9		59.9	44.1		60.1	47.1	
Level of Service	D	B		F	A		E	D		E	D	
Approach Delay (s)		19.1			8.5			53.0			52.5	
Approach LOS		B			A			D			D	
Intersection Summary												
HCM Average Control Delay		18.5		HCM Level of Service				B				
HCM Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		120.0		Sum of lost time (s)				13.3				
Intersection Capacity Utilization		53.6%		ICU Level of Service				A				
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) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑↑		↰	↑		↰	↑	
Volume (vph)	286	981	65	22	482	25	40	46	35	24	33	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.94		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5038		1770	5047		1770	1742		1770	1625	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5038		1770	5047		1770	1742		1770	1625	
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)	318	1090	72	24	536	28	44	51	39	27	37	209
RTOR Reduction (vph)	0	4	0	0	4	0	0	28	0	0	178	0
Lane Group Flow (vph)	318	1158	0	24	560	0	44	62	0	27	68	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	24.2	75.1		3.6	54.5		4.2	19.7		2.5	17.8	
Effective Green, g (s)	24.2	75.1		3.6	54.5		4.2	19.7		2.5	17.8	
Actuated g/C Ratio	0.20	0.63		0.03	0.45		0.04	0.16		0.02	0.15	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	357	3153		53	2292		62	286		37	241	
v/s Ratio Prot	c0.18	c0.23		0.01	0.11		c0.02	0.04		0.02	c0.04	
v/s Ratio Perm												
v/c Ratio	0.89	0.37		0.45	0.24		0.71	0.22		0.73	0.28	
Uniform Delay, d1	46.6	10.9		57.2	20.1		57.3	43.5		58.4	45.4	
Progression Factor	1.34	0.84		1.27	1.03		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.2	0.3		2.2	0.3		26.0	0.1		45.8	0.2	
Delay (s)	83.4	9.5		74.8	20.9		83.3	43.6		104.2	45.7	
Level of Service	F	A		E	C		F	D		F	D	
Approach Delay (s)		25.3			23.1			56.7			51.4	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
17: Del Mar Heights Road & Carmel Canyon Road

Near Term + Project (Phase 1) PM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑↑	↑
Volume (vph)	843	181	92	429	116	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4951		1770	5085	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4951		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	937	201	102	477	129	283
RTOR Reduction (vph)	18	0	0	0	0	37
Lane Group Flow (vph)	1120	0	102	477	129	246
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	73.6		11.8	90.5	18.6	30.4
Effective Green, g (s)	73.6		11.8	90.5	18.6	30.4
Actuated g/C Ratio	0.61		0.10	0.75	0.16	0.25
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	3037		174	3835	532	401
v/s Ratio Prot	0.23		0.06	0.09	0.04	0.06
v/s Ratio Perm						0.10
v/c Ratio	0.37		0.59	0.12	0.24	0.61
Uniform Delay, d1	11.6		51.8	4.0	44.5	39.6
Progression Factor	1.94		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		3.2	0.1	0.1	2.0
Delay (s)	22.9		55.0	4.1	44.6	41.6
Level of Service	C		D	A	D	D
Approach Delay (s)	22.9			13.0	42.5	
Approach LOS	C			B	D	
Intersection Summary						
HCM Average Control Delay			24.0		HCM Level of Service	C
HCM Volume to Capacity ratio			0.44			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	15.1
Intersection Capacity Utilization			45.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Near Term + Project (Phase 1&2) AM

7/16/2013

																							
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR											
Lane Configurations																							
Volume (vph)	96	875	24	90	882	203	70	58	80	453	23	84											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900											
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9												
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	0.95	0.95												
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.95												
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97												
Satd. Flow (prot)	1770	5065		1770	3440			1813	1583	1681	1639												
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97												
Satd. Flow (perm)	1770	5065		1770	3440			1813	1583	1681	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	972	27	100	980	226	78	64	89	503	26	93											
RTOR Reduction (vph)	0	2	0	0	12	0	0	0	76	0	12	0											
Lane Group Flow (vph)	107	997	0	100	1194	0	0	142	13	317	293	0											
Turn Type	Prot			Prot			Split		Perm		Split												
Protected Phases	5		2	1		6	3		3		4	4											
Permitted Phases										3													
Actuated Green, G (s)	11.2		58.1	11.9		58.6	20.3		20.3	30.0	30.0												
Effective Green, g (s)	11.2		58.1	11.9		58.6	20.3		20.3	30.0	30.0												
Actuated g/C Ratio	0.08		0.42	0.08		0.42	0.15		0.15	0.21	0.21												
Clearance Time (s)	4.6		5.5	4.4		5.5	4.9		4.9	4.9	4.9												
Vehicle Extension (s)	2.0		3.7	2.0		3.7	2.0		2.0	3.0	3.0												
Lane Grp Cap (vph)	142		2102	150		1440	263		230	360	351												
v/s Ratio Prot	c0.06		0.20	0.06		c0.35	c0.08			c0.19	0.18												
v/s Ratio Perm									0.01														
v/c Ratio	0.75		0.47	0.67		0.83	0.54		0.06	0.88	0.84												
Uniform Delay, d1	63.0		29.8	62.1		36.2	55.5		51.6	53.3	52.6												
Progression Factor	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00												
Incremental Delay, d2	18.0		0.8	8.4		4.2	1.1		0.0	21.3	15.6												
Delay (s)	81.1		30.6	70.5		40.5	56.6		51.6	74.6	68.3												
Level of Service	F		C	E		D	E		D	E	E												
Approach Delay (s)			35.5			42.8			54.7		71.5												
Approach LOS			D			D			D		E												
Intersection Summary																							
HCM Average Control Delay	46.6			HCM Level of Service			D																
HCM Volume to Capacity ratio	0.75																						
Actuated Cycle Length (s)	140.0			Sum of lost time (s)			14.4																
Intersection Capacity Utilization	71.1%			ICU Level of Service			C																
Analysis Period (min)	15																						
c - Critical Lane Group																							

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Near Term + Project (Phase 1&2) AM

7/16/2013



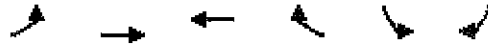
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Volume (veh/h)	1439	55	0	1400	0	136
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1599	61	0	1556	0	151
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	575			607		
pX, platoon unblocked			0.86		0.88	0.86
vC, conflicting volume			1660		2407	564
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1209		1393	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	84
cM capacity (veh/h)			494		117	936
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	640	640	381	778	778	151
Volume Left	0	0	0	0	0	0
Volume Right	0	0	61	0	0	151
cSH	1700	1700	1700	1700	1700	936
Volume to Capacity	0.38	0.38	0.22	0.46	0.46	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			44.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Near Term + Project (Phase 1&2) AM

7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	789	1054	0	1005	336
Ideal Flow (vphpl)	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
Frt		1.00	1.00		1.00	0.85
Frt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		3430	1441
Frt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		3430	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	877	1171	0	1117	373
RTOR Reduction (vph)	0	0	0	0	3	37
Lane Group Flow (vph)	0	877	1171	0	1151	299
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		42.1	42.1		26.0	26.0
Effective Green, g (s)		42.1	42.1		26.0	26.0
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)		1862	1862		1115	468
v/s Ratio Prot		0.25	c0.33		c0.34	
v/s Ratio Perm						0.21
v/c Ratio		0.47	0.63		1.03	0.64
Uniform Delay, d1		11.9	13.4		27.0	23.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	0.7		35.7	2.9
Delay (s)		12.1	14.1		62.7	25.9
Level of Service		B	B		E	C
Approach Delay (s)		12.1	14.1		54.4	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay			30.6		HCM Level of Service	C
HCM Volume to Capacity ratio			0.78			
Actuated Cycle Length (s)			80.0		Sum of lost time (s)	11.9
Intersection Capacity Utilization			122.8%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Near Term + Project (Phase 1&2) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	231	1484	0	0	1547	943	384	59	1070	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1478	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1478	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	246	1579	0	0	1646	1003	409	63	1138	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	449	0	6	6	0	0	0
Lane Group Flow (vph)	246	1579	0	0	1646	554	368	621	609	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	9.4	56.7			42.1	42.1	51.4	51.4	51.4			
Effective Green, g (s)	9.4	56.7			42.1	42.1	51.4	51.4	51.4			
Actuated g/C Ratio	0.08	0.47			0.35	0.35	0.43	0.43	0.43			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	269	1672			1784	555	720	633	644			
v/s Ratio Prot	0.07	c0.45			0.32	0.35	0.22	c0.42	0.40			
v/s Ratio Perm												
v/c Ratio	0.91	0.94			0.92	1.00	0.51	0.98	0.95			
Uniform Delay, d1	54.9	30.1			37.4	38.9	25.1	33.8	32.9			
Progression Factor	1.00	1.00			0.75	1.52	1.00	1.00	1.00			
Incremental Delay, d2	33.0	12.3			4.8	25.2	0.6	30.8	22.7			
Delay (s)	87.9	42.4			32.7	84.5	25.7	64.6	55.6			
Level of Service	F	D			C	F	C	E	E			
Approach Delay (s)		48.5			52.3			52.3			0.0	
Approach LOS		D			D			D			A	
Intersection Summary												
HCM Average Control Delay		51.2					HCM Level of Service		D			
HCM Volume to Capacity ratio		0.96										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		11.9			
Intersection Capacity Utilization		102.3%					ICU Level of Service		G			
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&2) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1740	694	103	1966	69	201	10	39	107	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.88		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
Satd. Flow (prot)	1770	5085	1583	1770	5059		3433	3116		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5059		3433	3116		1770	1863	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	1933	771	114	2184	77	223	11	43	119	66	347
RTOR Reduction (vph)	0	0	268	0	3	0	0	36	0	0	0	26
Lane Group Flow (vph)	123	1933	503	114	2258	0	223	18	0	119	66	321
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.3	58.3	70.9	11.0	55.4		12.6	18.4		12.6	18.4	32.7
Effective Green, g (s)	14.3	58.3	70.9	11.0	55.4		12.6	18.4		12.6	18.4	32.7
Actuated g/C Ratio	0.12	0.49	0.59	0.09	0.46		0.10	0.15		0.10	0.15	0.27
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	211	2470	935	162	2336		360	478		186	286	431
v/s Ratio Prot	0.07	c0.38	0.06	0.06	c0.45		0.06	0.01		c0.07	0.04	c0.09
v/s Ratio Perm			0.26									0.11
v/c Ratio	0.58	0.78	0.54	0.70	0.97		0.62	0.04		0.64	0.23	0.74
Uniform Delay, d1	50.0	25.6	14.7	52.9	31.4		51.4	43.3		51.5	44.6	39.8
Progression Factor	1.01	0.96	0.56	1.12	0.84		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	1.0	0.1	9.3	11.1		2.2	0.0		5.2	0.2	6.0
Delay (s)	51.8	25.6	8.3	68.6	37.6		53.6	43.3		56.8	44.7	45.8
Level of Service	D	C	A	E	D		D	D		E	D	D
Approach Delay (s)		22.0			39.1			51.6			48.1	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM Average Control Delay	32.4			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			24.8					
Intersection Capacity Utilization	76.6%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Del Mar Heights Road & Third Ave.

Near Term + Project (Phase 1&2) AM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑	↑↑	↑
Volume (vph)	1923	156	121	2123	47	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2137	173	134	2359	52	41
RTOR Reduction (vph)	0	33	0	0	0	38
Lane Group Flow (vph)	2137	140	134	2359	52	3
Turn Type		Perm	Prot		Perm	
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	84.0	84.0	14.3	101.3	9.7	9.7
Effective Green, g (s)	84.0	84.0	14.3	101.3	9.7	9.7
Actuated g/C Ratio	0.70	0.70	0.12	0.84	0.08	0.08
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3560	1108	211	4293	278	128
v/s Ratio Prot	c0.42		c0.08	0.46	c0.02	
v/s Ratio Perm		0.09				0.00
v/c Ratio	0.60	0.13	0.64	0.55	0.19	0.03
Uniform Delay, d1	9.3	5.9	50.4	2.7	51.5	50.8
Progression Factor	1.54	1.42	0.97	1.87	1.00	1.00
Incremental Delay, d2	0.6	0.2	4.5	0.4	0.3	0.1
Delay (s)	14.9	8.6	53.5	5.5	51.8	50.9
Level of Service	B	A	D	A	D	D
Approach Delay (s)	14.4			8.0	51.4	
Approach LOS	B			A	D	

Intersection Summary					
HCM Average Control Delay	11.9	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.57				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis

12: Del Mar Heights Road & First Ave.

Near Term + Project (Phase 1&2) AM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑↑	↑↑↑	↑	↑
Volume (vph)	1830	130	130	2204	39	39
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
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Frt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	1770	1583
Frt 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)	2033	144	144	2449	43	43
RTOR Reduction (vph)	0	56	0	0	0	32
Lane Group Flow (vph)	2033	88	144	2449	43	11
Turn Type		Prot	Prot		Perm	
Protected Phases	4	4	3	8	2	
Permitted Phases						2
Actuated Green, G (s)	68.3	68.3	7.9	80.2	31.8	31.8
Effective Green, g (s)	68.3	68.3	7.9	80.2	31.8	31.8
Actuated g/C Ratio	0.57	0.57	0.07	0.67	0.26	0.26
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2894	901	226	3398	469	419
v/s Ratio Prot	0.40	0.06	0.04	0.48	0.02	
v/s Ratio Perm						0.01
v/c Ratio	0.70	0.10	0.64	0.72	0.09	0.03
Uniform Delay, d1	18.6	11.8	54.7	12.7	33.2	32.6
Progression Factor	1.78	5.16	0.88	1.13	1.00	1.00
Incremental Delay, d2	0.6	0.0	3.0	0.4	0.4	0.1
Delay (s)	33.7	60.9	51.2	14.7	33.6	32.8
Level of Service	C	E	D	B	C	C
Approach Delay (s)	35.5			16.8	33.2	
Approach LOS	D			B	C	

Intersection Summary			
HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Near Term + Project (Phase 1&2) AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↓		↔↔	↑↑↓		↔↔	↑↑↑	↔	↔↔	↑↑↓	
Volume (vph)	231	959	492	258	1580	95	281	109	90	164	329	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	4827		3433	5042		3433	5085	1583	3433	4644	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	4827		3433	5042		3433	5085	1583	3433	4644	
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	1066	547	287	1756	106	312	121	100	182	366	502
RTOR Reduction (vph)	0	72	0	0	5	0	0	0	73	0	136	0
Lane Group Flow (vph)	257	1541	0	287	1857	0	312	121	27	182	732	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	13.3	47.3		14.1	48.3		12.4	32.5	32.5	5.6	24.9	
Effective Green, g (s)	13.3	47.3		14.1	48.3		12.4	32.5	32.5	5.6	24.9	
Actuated g/C Ratio	0.11	0.39		0.12	0.40		0.10	0.27	0.27	0.05	0.21	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	380	1903		403	2029		355	1377	429	160	964	
v/s Ratio Prot	0.07	0.32		c0.08	c0.37		c0.09	0.02		0.05	c0.16	
v/s Ratio Perm									0.02			
v/c Ratio	0.68	0.81		0.71	0.92		0.88	0.09	0.06	1.14	1.08dr	
Uniform Delay, d1	51.3	32.3		51.0	33.9		53.1	32.7	32.5	57.2	44.7	
Progression Factor	1.12	0.48		1.28	0.85		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.8	2.9		4.7	7.6		20.5	0.0	0.1	112.9	3.5	
Delay (s)	60.2	18.6		69.9	36.4		73.5	32.7	32.5	170.1	48.3	
Level of Service	E	B		E	D		E	C	C	F	D	
Approach Delay (s)		24.3			40.9			56.6			69.4	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM Average Control Delay	42.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
dr = Defacto Right Lane. Recode with 1 though lane as a right lane.			
c = Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

14: Del Mar Heights Road & Carmel Country Rd.

Near Term + Project (Phase 1&2) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  		 	  		 	 	
Volume (vph)	153	643	301	280	1254	174	433	188	111	146	185	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	0.94		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4842		3433	4992		3433	4803		1770	3300	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4842		3433	4992		3433	4803		1770	3300	
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)	170	714	334	311	1393	193	481	209	123	162	206	169
RTOR Reduction (vph)	0	59	0	0	13	0	0	100	0	0	109	0
Lane Group Flow (vph)	170	989	0	311	1573	0	481	232	0	162	266	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	9.6	48.5		14.3	53.0		18.3	22.6		14.8	19.6	
Effective Green, g (s)	9.6	48.5		14.3	53.0		18.3	22.6		14.8	19.6	
Actuated g/C Ratio	0.08	0.40		0.12	0.44		0.15	0.19		0.12	0.16	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	275	1957		409	2205		524	905		218	539	
v/s Ratio Prot	0.05	0.20		0.09	0.32		0.14	0.05		0.09	0.08	
v/s Ratio Perm												
v/c Ratio	0.62	0.51		0.76	0.71		0.92	0.26		0.74	0.49	
Uniform Delay, d1	53.4	26.8		51.2	27.3		50.1	41.5		50.8	45.7	
Progression Factor	1.14	1.07		1.10	0.63		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.7	0.9		6.5	1.8		20.7	0.2		11.3	1.9	
Delay (s)	63.9	29.7		62.7	19.0		70.8	41.7		62.1	47.6	
Level of Service	E	C		E	B		E	D		E	D	
Approach Delay (s)		34.4			26.2			58.9			52.0	
Approach LOS		C			C			E			D	
Intersection Summary												
HCM Average Control Delay		37.5		HCM Level of Service				D				
HCM Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		120.0		Sum of lost time (s)				19.1				
Intersection Capacity Utilization		71.1%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												

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

Near Term + Project (Phase 1&2) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	212	662	126	81	1101	216	114	156	11	56	62	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4963		1770	4960		1770	1845		1770	1874	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4963		1770	4960		1770	1845		1770	1874	
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	736	140	90	1223	240	127	173	12	62	69	143
RTOR Reduction (vph)	0	19	0	0	20	0	0	2	0	0	68	0
Lane Group Flow (vph)	236	857	0	90	1443	0	127	183	0	62	144	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	19.4	63.0		10.1	53.0		12.5	22.4		5.8	15.7	
Effective Green, g (s)	19.4	63.0		10.1	53.0		12.5	22.4		5.8	15.7	
Actuated g/C Ratio	0.16	0.52		0.08	0.44		0.10	0.19		0.05	0.13	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	286	2606		149	2191		184	344		86	219	
v/s Ratio Prot	c0.13	0.17		0.05	c0.29		c0.07	0.10		0.04	c0.09	
v/s Ratio Perm												
v/c Ratio	0.83	0.33		0.60	0.66		0.69	0.53		0.72	0.66	
Uniform Delay, d1	48.7	16.4		53.0	26.4		51.9	44.1		56.3	49.6	
Progression Factor	0.84	1.56		1.00	0.86		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.3	0.3		3.8	1.3		8.7	0.8		22.1	5.4	
Delay (s)	56.1	25.8		56.8	24.0		60.5	44.8		78.4	55.0	
Level of Service	E	C		E	C		E	D		E	D	
Approach Delay (s)	32.2			25.9			51.2			60.3		
Approach LOS	C			C			D			E		
Intersection Summary												
HCM Average Control Delay	33.4		HCM Level of Service		C							
HCM Volume to Capacity ratio	0.69											
Actuated Cycle Length (s)	120.0		Sum of lost time (s)		19.4							
Intersection Capacity Utilization	71.5%		ICU Level of Service		C							
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&2) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	575	35	67	1143	36	44	26	55	49	60	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5041		1770	5062		1770	1673		1770	1623	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5041		1770	5062		1770	1673		1770	1623	
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)	178	639	39	74	1270	40	49	29	61	54	67	400
RTOR Reduction (vph)	0	4	0	0	2	0	0	49	0	0	205	0
Lane Group Flow (vph)	178	674	0	74	1308	0	49	41	0	54	262	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	15.5	64.2		7.8	56.5		5.8	23.0		5.9	22.9	
Effective Green, g (s)	15.5	64.2		7.8	56.5		5.8	23.0		5.9	22.9	
Actuated g/C Ratio	0.13	0.54		0.06	0.47		0.05	0.19		0.05	0.19	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	229	2697		115	2383		86	321		87	310	
v/s Ratio Prot	c0.10	0.13		0.04	c0.26		0.03	0.02		c0.03	c0.16	
v/s Ratio Perm												
v/c Ratio	0.78	0.25		0.64	0.55		0.57	0.13		0.62	0.85	
Uniform Delay, d1	50.6	15.0		54.7	22.7		55.9	40.2		56.0	46.8	
Progression Factor	1.44	0.30		0.86	1.23		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.5	0.2		8.6	0.9		5.1	0.1		9.5	18.0	
Delay (s)	86.5	4.6		55.5	28.6		61.0	40.2		65.4	64.9	
Level of Service	F	A		E	C		E	D		E	E	
Approach Delay (s)		21.7			30.1			47.5			64.9	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM Average Control Delay	34.7			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.63											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			14.2					
Intersection Capacity Utilization	76.5%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: Del Mar Heights Road & Carmel Canyon Road

Near Term + Project (Phase 1&2) AM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑↑	↑
Volume (vph)	567	128	397	1022	273	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4945		1770	5085	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4945		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	630	142	441	1136	303	380
RTOR Reduction (vph)	24	0	0	0	0	36
Lane Group Flow (vph)	748	0	441	1136	303	344
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	52.5		33.3	90.9	18.2	51.5
Effective Green, g (s)	52.5		33.3	90.9	18.2	51.5
Actuated g/C Ratio	0.44		0.28	0.76	0.15	0.43
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	2163		491	3852	521	679
v/s Ratio Prot	0.15		0.25	0.22	0.09	0.14
v/s Ratio Perm						0.08
v/c Ratio	0.35		0.90	0.29	0.58	0.51
Uniform Delay, d1	22.4		41.7	4.5	47.4	25.0
Progression Factor	1.47		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		18.5	0.2	1.1	0.2
Delay (s)	33.3		60.2	4.7	48.4	25.2
Level of Service	C		E	A	D	C
Approach Delay (s)	33.3			20.2	35.5	
Approach LOS	C			C	D	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Near Term + Project (Phase 1&2) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	862	16	142	929	212	41	32	61	403	36	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.8	4.8	
Lane Util. Factor	1.00	*0.95		1.00	*0.96			1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (prot)	1770	5295		1770	3477			1812	1583	1681	1610	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (perm)	1770	5295		1770	3477			1812	1583	1681	1610	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	937	17	154	1010	230	45	35	66	438	39	146
RTOR Reduction (vph)	0	1	0	0	16	0	0	0	59	0	29	0
Lane Group Flow (vph)	139	953	0	154	1224	0	0	80	7	320	274	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	20.3	37.1		22.4	39.0			13.3	13.3	27.6	27.6	
Effective Green, g (s)	20.3	37.1		22.4	39.0			13.3	13.3	27.6	27.6	
Actuated g/C Ratio	0.17	0.31		0.19	0.32			0.11	0.11	0.23	0.23	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.8	4.8	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	299	1637		330	1130			201	175	387	370	
v/s Ratio Prot	0.08	0.18		c0.09	c0.35			c0.04		c0.19	0.17	
v/s Ratio Perm									0.00			
v/c Ratio	0.46	0.58		0.47	1.08			0.40	0.04	0.83	0.74	
Uniform Delay, d1	45.0	34.9		43.5	40.5			49.6	47.7	43.9	42.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	1.5		0.4	52.4			0.5	0.0	13.5	7.6	
Delay (s)	45.4	36.4		43.9	92.9			50.1	47.7	57.4	50.4	
Level of Service	D	D		D	F			D	D	E	D	
Approach Delay (s)		37.6			87.5			49.0			54.0	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM Average Control Delay	62.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.1
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Near Term + Project (Phase 1&2) PM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Volume (veh/h)	1294	64	0	1598	0	103
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)	1438	71	0	1776	0	114
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			0.84		0.76	0.84
vC, conflicting volume			1509		2361	515
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			938		881	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	87
cM capacity (veh/h)			610		216	911
Direction Lane #						
	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	575	575	359	888	888	114
Volume Left	0	0	0	0	0	0
Volume Right	0	0	71	0	0	114
cSH	1700	1700	1700	1700	1700	911
Volume to Capacity	0.34	0.34	0.21	0.52	0.52	0.13
Queue Length 95th (ft)	0	0	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.5
Lane LOS						A
Approach Delay (s)	0.0			0.0		9.5
Approach LOS						A
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			47.5%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Near Term + Project (Phase 1&2) PM

7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	1012	1352	0	977	299
Ideal Flow (vphpl)	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
Frt		1.00	1.00		1.00	0.85
Frt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		3431	1441
Frt 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	0.90	0.90
Adj. Flow (vph)	0	1124	1502	0	1086	332
RTOR Reduction (vph)	0	0	0	0	3	16
Lane Group Flow (vph)	0	1124	1502	0	1116	283
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		42.2	42.2		25.9	25.9
Effective Green, g (s)		42.2	42.2		25.9	25.9
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)		1867	1867		1111	467
v/s Ratio Prot		0.32	0.42		0.33	
v/s Ratio Perm						0.20
v/c Ratio		0.60	0.80		1.00	0.61
Uniform Delay, d1		13.1	15.5		27.1	22.8
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6	2.6		28.2	2.2
Delay (s)		13.6	18.1		55.2	25.0
Level of Service		B	B		E	C
Approach Delay (s)		13.6	18.1		48.8	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay		27.7		HCM Level of Service		C
HCM Volume to Capacity ratio		0.88				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		11.9
Intersection Capacity Utilization		124.9%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Near Term + Project (Phase 1&2) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←←	↑↑			↑↑↑	↑	←	↑	↑			
Volume (vph)	242	1692	0	0	1572	1005	649	24	955	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1480	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1480	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	1781	0	0	1655	1058	683	25	1005	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	471	0	5	5	0	0	0
Lane Group Flow (vph)	255	1781	0	0	1655	587	594	561	548	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	10.3	60.0			44.5	44.5	48.1	48.1	48.1			
Effective Green, g (s)	10.3	60.0			44.5	44.5	48.1	48.1	48.1			
Actuated g/C Ratio	0.09	0.50			0.37	0.37	0.40	0.40	0.40			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	295	1770			1886	587	674	593	603			
v/s Ratio Prot	0.07	c0.50			0.33	0.37	0.35	c0.38	0.36			
v/s Ratio Perm												
v/c Ratio	0.86	1.01			0.88	1.00	0.88	0.95	0.91			
Uniform Delay, d1	54.2	30.0			35.2	37.7	33.3	34.7	33.9			
Progression Factor	1.00	1.00			0.65	1.62	1.00	1.00	1.00			
Incremental Delay, d2	22.1	22.9			0.6	11.0	12.9	24.2	17.6			
Delay (s)	76.3	52.9			23.4	72.3	46.2	58.9	51.4			
Level of Service	E	D			C	E	D	E	D			
Approach Delay (s)		55.8			42.5			52.1			0.0	
Approach LOS		E			D			D			A	

Intersection Summary												
HCM Average Control Delay		49.2		HCM Level of Service				D				
HCM Volume to Capacity ratio		0.98										
Actuated Cycle Length (s)		120.0		Sum of lost time (s)				11.9				
Intersection Capacity Utilization		111.7%		ICU Level of Service				H				
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&2) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰	↑↑↑		↰	↑↑		↰	↑	↱
Volume (vph)	249	2420	259	53	1852	67	637	67	163	53	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.89		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
Satd. Flow (prot)	1770	5085	1583	1770	5059		3433	3162		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5059		3433	3162		1770	1863	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	2689	288	59	2058	74	708	74	181	59	33	91
RTOR Reduction (vph)	0	0	69	0	3	0	0	122	0	0	0	0
Lane Group Flow (vph)	277	2689	219	59	2129	0	708	133	0	59	33	91
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases		2									4	
Actuated Green, G (s)	28.4	63.5	76.5	7.2	42.7		13.0	22.7		6.9	16.6	45.0
Effective Green, g (s)	28.4	63.5	76.5	7.2	42.7		13.0	22.7		6.9	16.6	45.0
Actuated g/C Ratio	0.24	0.53	0.64	0.06	0.36		0.11	0.19		0.06	0.14	0.38
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	419	2691	1009	106	1800		372	598		102	258	594
v/s Ratio Prot	c0.16	c0.53	0.02	0.03	c0.42		c0.21	c0.04		0.03	0.02	0.04
v/s Ratio Perm			0.12									0.02
v/c Ratio	0.66	1.00	0.22	0.56	1.18		1.90	0.22		0.58	0.13	0.15
Uniform Delay, d1	41.4	28.2	9.2	54.8	38.6		53.5	41.2		55.1	45.4	24.9
Progression Factor	0.99	1.05	0.86	1.04	1.27		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	12.3	0.0	3.1	87.5		416.4	0.1		4.9	0.1	0.0
Delay (s)	42.6	42.0	7.9	60.2	136.5		469.9	41.2		60.0	45.4	24.9
Level of Service	D	D	A	E	F		F	D		E	D	C
Approach Delay (s)		39.0			134.5			356.4			39.9	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM Average Control Delay	117.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Del Mar Heights Road & Third Ave.

Near Term + Project (Phase 1&2) PM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑	↑↑	↑
Volume (vph)	2530	153	119	1934	230	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2811	170	132	2149	256	199
RTOR Reduction (vph)	0	38	0	0	0	120
Lane Group Flow (vph)	2811	132	132	2149	256	79
Turn Type		Perm	Prot		Perm	
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	78.3	78.3	13.7	95.0	16.0	16.0
Effective Green, g (s)	78.3	78.3	13.7	95.0	16.0	16.0
Actuated g/C Ratio	0.65	0.65	0.11	0.79	0.13	0.13
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3318	1033	202	4026	458	211
v/s Ratio Prot	c0.55		c0.07	0.42	c0.07	
v/s Ratio Perm		0.08				0.05
v/c Ratio	0.85	0.13	0.65	0.53	0.56	0.38
Uniform Delay, d1	16.2	7.9	50.9	4.5	48.7	47.4
Progression Factor	0.68	0.09	1.07	0.30	1.00	1.00
Incremental Delay, d2	1.2	0.1	6.1	0.4	1.5	1.1
Delay (s)	12.3	0.8	60.6	1.8	50.2	48.6
Level of Service	B	A	E	A	D	D
Approach Delay (s)	11.7			5.2	49.5	
Approach LOS	B			A	D	
Intersection Summary						
HCM Average Control Delay		12.1		HCM Level of Service		B
HCM Volume to Capacity ratio		0.78				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		12.0
Intersection Capacity Utilization		72.0%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
12: Del Mar Heights Road & First Ave.

Near Term + Project (Phase 1&2) PM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑↑	↑↑↑	↑	↑
Volume (vph)	2582	127	127	1860	192	192
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
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2869	141	141	2067	213	213
RTOR Reduction (vph)	0	36	0	0	0	59
Lane Group Flow (vph)	2869	105	141	2067	213	154
Turn Type		Prot	Prot			Perm
Protected Phases	4	4	3	8	2	
Permitted Phases						2
Actuated Green, G (s)	75.0	75.0	5.6	84.6	27.4	27.4
Effective Green, g (s)	75.0	75.0	5.6	84.6	27.4	27.4
Actuated g/C Ratio	0.62	0.62	0.05	0.70	0.23	0.23
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)	3178	989	160	3585	404	361
v/s Ratio Prot	c0.56	0.07	c0.04	0.41	c0.12	
v/s Ratio Perm						0.10
v/c Ratio	0.90	0.11	0.88	0.58	0.53	0.43
Uniform Delay, d1	19.4	9.0	56.9	8.8	40.6	39.6
Progression Factor	1.83	1.82	0.70	1.28	1.00	1.00
Incremental Delay, d2	2.3	0.0	5.5	0.0	4.9	3.6
Delay (s)	37.7	16.4	45.2	11.3	45.5	43.2
Level of Service	D	B	D	B	D	D
Approach Delay (s)	36.7			13.5	44.3	
Approach LOS	D			B	D	
Intersection Summary						
HCM Average Control Delay			28.2		HCM Level of Service	C
HCM Volume to Capacity ratio			0.81			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	12.0
Intersection Capacity Utilization			71.6%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Near Term + Project (Phase 1&2) PM

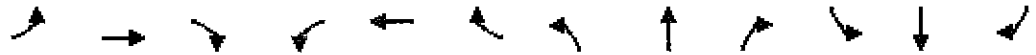
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	503	1712	501	159	958	181	614	446	308	151	171	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	*0.95		0.97	*0.95		0.97	*0.95	1.00	0.97	*0.95	
Flt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5128		3433	5182		3433	5309	1583	3433	4851	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5128		3433	5182		3433	5309	1583	3433	4851	
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)	559	1902	557	177	1064	201	682	496	342	168	190	257
RTOR Reduction (vph)	0	38	0	0	25	0	0	0	91	0	114	0
Lane Group Flow (vph)	559	2421	0	177	1240	0	682	496	251	168	333	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	26.3	56.2		11.4	41.5		11.6	26.3	26.3	5.6	19.5	
Effective Green, g (s)	26.3	56.2		11.4	41.5		11.6	26.3	26.3	5.6	19.5	
Actuated g/C Ratio	0.22	0.47		0.10	0.35		0.10	0.22	0.22	0.05	0.16	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	752	2402		326	1792		332	1164	347	160	788	
v/s Ratio Prot	c0.16	c0.47		0.05	0.24		c0.20	0.09		0.05	0.07	
v/s Ratio Perm									c0.16			
v/c Ratio	0.74	1.01		0.54	0.69		2.05	0.43	0.72	1.05	0.42	
Uniform Delay, d1	43.7	31.9		51.8	33.8		54.2	40.4	43.5	57.2	45.2	
Progression Factor	1.12	0.43		1.12	1.09		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	14.3		1.0	2.2		484.7	0.3	7.6	85.0	0.4	
Delay (s)	50.6	27.9		59.1	39.1		538.9	40.7	51.1	142.2	45.6	
Level of Service	D	C		E	D		F	D	D	F	D	
Approach Delay (s)		32.1			41.5			266.6			72.0	
Approach LOS		C			D			F			E	
Intersection Summary												
HCM Average Control Delay		91.9					HCM Level of Service		F			
HCM Volume to Capacity ratio		1.02										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)		14.9			
Intersection Capacity Utilization		92.6%					ICU Level of Service		F			
Analysis Period (min)		15										
c Critical Lane Group												

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

Near Term + Project (Phase 1&2) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑↓		↰↱	↑↑↓		↰	↑↓	
Volume (vph)	136	1267	586	82	655	74	408	172	149	80	128	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	0.93		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4844		3433	5008		3433	4731		1770	3267	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4844		3433	5008		3433	4731		1770	3267	
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)	151	1408	651	91	728	82	453	191	166	89	142	150
RTOR Reduction (vph)	0	56	0	0	9	0	0	131	0	0	123	0
Lane Group Flow (vph)	151	2003	0	91	801	0	453	226	0	89	169	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	9.0	61.4		6.8	59.0		15.6	22.0		10.0	16.9	
Effective Green, g (s)	9.0	61.4		6.8	59.0		15.6	22.0		10.0	16.9	
Actuated g/C Ratio	0.08	0.51		0.06	0.49		0.13	0.18		0.08	0.14	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	257	2479		195	2462		446	867		148	460	
v/s Ratio Prot	0.04	0.41		0.03	0.16		0.13	0.05		0.05	0.05	
v/s Ratio Perm												
v/c Ratio	0.59	0.81		0.47	0.33		1.02	0.26		0.60	0.37	
Uniform Delay, d1	53.7	24.4		54.8	18.5		52.2	42.0		53.1	46.7	
Progression Factor	1.07	0.96		1.29	0.45		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	2.4		0.6	0.3		46.6	0.2		4.6	1.3	
Delay (s)	59.3	25.7		71.3	8.7		98.8	42.2		57.7	48.0	
Level of Service	E	C		E	A		F	D		E	D	
Approach Delay (s)		28.0			15.0			73.9			50.3	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

15: Del Mar Heights Road & Torrey Ridge Dr.

Near Term + Project (Phase 1&2) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑↑		↰	↑		↰	↑	
Volume (vph)	49	1295	159	8	695	23	71	14	32	28	8	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5002		1770	5060		1770	1669		1770	1642	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5002		1770	5060		1770	1669		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	1439	177	9	772	26	79	16	36	31	9	34
RTOR Reduction (vph)	0	8	0	0	2	0	0	31	0	0	30	0
Lane Group Flow (vph)	54	1608	0	9	796	0	79	21	0	31	13	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.0	77.6		0.9	70.8		8.6	18.2		4.6	14.2	
Effective Green, g (s)	7.0	77.6		0.9	70.8		8.6	18.2		4.6	14.2	
Actuated g/C Ratio	0.06	0.65		0.01	0.59		0.07	0.15		0.04	0.12	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	103	3235		13	2985		127	253		68	194	
v/s Ratio Prot	c0.03	c0.32		0.01	0.16		c0.04	c0.01		0.02	0.01	
v/s Ratio Perm												
v/c Ratio	0.52	0.50		0.69	0.27		0.62	0.08		0.46	0.07	
Uniform Delay, d1	54.9	11.0		59.4	12.0		54.1	43.7		56.5	47.0	
Progression Factor	0.78	1.72		1.09	0.59		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.4		80.4	0.2		6.6	0.1		1.8	0.1	
Delay (s)	44.1	19.3		145.3	7.2		60.8	43.8		58.2	47.1	
Level of Service	D	B		F	A		E	D		E	D	
Approach Delay (s)		20.1			8.8			54.0			51.7	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.3
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
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&2) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	295	992	65	22	494	25	40	46	35	24	33	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.94		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5039		1770	5048		1770	1742		1770	1624	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5039		1770	5048		1770	1742		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)	328	1102	72	24	549	28	44	51	39	27	37	220
RTOR Reduction (vph)	0	4	0	0	3	0	0	28	0	0	187	0
Lane Group Flow (vph)	328	1170	0	24	574	0	44	62	0	27	70	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	24.8	75.1		3.6	53.9		4.2	19.7		2.5	17.8	
Effective Green, g (s)	24.8	75.1		3.6	53.9		4.2	19.7		2.5	17.8	
Actuated g/C Ratio	0.21	0.63		0.03	0.45		0.04	0.16		0.02	0.15	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	366	3154		53	2267		62	286		37	241	
v/s Ratio Prot	c0.19	c0.23		0.01	0.11		c0.02	0.04		0.02	c0.04	
v/s Ratio Perm												
v/c Ratio	0.90	0.37		0.45	0.25		0.71	0.22		0.73	0.29	
Uniform Delay, d1	46.3	10.9		57.2	20.5		57.3	43.5		58.4	45.5	
Progression Factor	1.38	0.84		1.27	1.03		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.3	0.3		2.2	0.3		26.0	0.1		45.8	0.2	
Delay (s)	85.5	9.5		74.7	21.5		83.3	43.6		104.2	45.7	
Level of Service	F	A		E	C		F	D		F	D	
Approach Delay (s)		26.1			23.6			56.7			51.3	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.9
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
17: Del Mar Heights Road & Carmel Canyon Road

Near Term + Project (Phase 1&2) PM
7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑↑	↑
Volume (vph)	849	186	92	436	121	255
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4948		1770	5085	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4948		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	943	207	102	484	134	283
RTOR Reduction (vph)	19	0	0	0	0	36
Lane Group Flow (vph)	1131	0	102	484	134	247
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	73.5		11.8	90.4	18.7	30.5
Effective Green, g (s)	73.5		11.8	90.4	18.7	30.5
Actuated g/C Ratio	0.61		0.10	0.75	0.16	0.25
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	3031		174	3831	535	402
v/s Ratio Prot	0.23		0.06	0.10	0.04	0.06
v/s Ratio Perm						0.10
v/c Ratio	0.37		0.59	0.13	0.25	0.61
Uniform Delay, d1	11.7		51.8	4.0	44.5	39.6
Progression Factor	1.94		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3		3.2	0.1	0.1	2.0
Delay (s)	23.0		55.0	4.1	44.6	41.5
Level of Service	C		D	A	D	D
Approach Delay (s)	23.0			13.0	42.5	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

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

Near Term + Project (Buildout) AM

7/16/2013

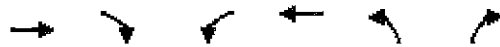


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	877	24	94	886	207	70	58	82	455	23	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97	
Satd. Flow (prot)	1770	5065		1770	3439			1813	1583	1681	1639	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97	
Satd. Flow (perm)	1770	5065		1770	3439			1813	1583	1681	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	974	27	104	984	230	78	64	91	506	26	93
RTOR Reduction (vph)	0	2	0	0	13	0	0	0	78	0	12	0
Lane Group Flow (vph)	107	999	0	104	1201	0	0	142	13	319	294	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	11.2	57.8		12.1	58.5			20.3	20.3	30.1	30.1	
Effective Green, g (s)	11.2	57.8		12.1	58.5			20.3	20.3	30.1	30.1	
Actuated g/C Ratio	0.08	0.41		0.09	0.42			0.15	0.15	0.22	0.22	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	142	2091		153	1437			263	230	361	352	
v/s Ratio Prot	c0.06	0.20		0.06	c0.35			c0.08		c0.19	0.18	
v/s Ratio Perm									0.01			
v/c Ratio	0.75	0.48		0.68	0.84			0.54	0.06	0.88	0.84	
Uniform Delay, d1	63.0	30.1		62.1	36.5			55.5	51.6	53.3	52.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.0	0.8		9.1	4.5			1.1	0.0	21.6	15.6	
Delay (s)	81.1	30.8		71.1	41.0			56.6	51.6	74.9	68.2	
Level of Service	F	C		E	D			E	D	E	E	
Approach Delay (s)		35.7			43.4			54.7			71.6	
Approach LOS		D			D			D			E	
Intersection Summary												
HCM Average Control Delay		47.0					HCM Level of Service		D			
HCM Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		140.0					Sum of lost time (s)		14.4			
Intersection Capacity Utilization		71.3%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Near Term + Project (Buildout) AM
7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Volume (veh/h)	1446	55	0	1424	0	138
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)	1607	61	0	1582	0	153
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			0.86		0.87	0.86
vC, conflicting volume			1668		2428	566
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1214		1393	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	84
cM capacity (veh/h)			491		116	935
Direction Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	643	643	382	791	791	153
Volume Left	0	0	0	0	0	0
Volume Right	0	0	61	0	0	153
cSH	1700	1700	1700	1700	1700	935
Volume to Capacity	0.38	0.38	0.22	0.47	0.47	0.16
Queue Length 95th (ft)	0	0	0	0	0	15
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			44.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Near Term + Project (Buildout) AM

7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	798	1074	0	1012	336
Ideal Flow (vphpl)	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
Frt		1.00	1.00		1.00	0.85
Frt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		3430	1441
Frt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		3430	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	887	1193	0	1124	373
RTOR Reduction (vph)	0	0	0	0	3	34
Lane Group Flow (vph)	0	887	1193	0	1158	302
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		41.7	41.7		26.4	26.4
Effective Green, g (s)		41.7	41.7		26.4	26.4
Actuated g/C Ratio		0.52	0.52		0.33	0.33
Clearance Time (s)					5.6	5.6
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)		1845	1845		1132	476
v/s Ratio Prot		0.25	0.34		0.34	
v/s Ratio Perm						0.21
v/c Ratio		0.48	0.65		1.02	0.63
Uniform Delay, d1		12.2	13.8		26.8	22.7
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.2	0.8		32.8	2.8
Delay (s)		12.4	14.6		59.6	25.5
Level of Service		B	B		E	C
Approach Delay (s)		12.4	14.6		51.9	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay		29.7		HCM Level of Service		C
HCM Volume to Capacity ratio		0.79				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		11.9
Intersection Capacity Utilization		125.2%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Near Term + Project (Buildout) AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↱↱↱	↱	↰	↱↱	↱			
Volume (vph)	231	1500	0	0	1598	958	384	59	1084	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1478	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1478	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	246	1596	0	0	1700	1019	409	63	1153	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	441	0	6	6	0	0	0
Lane Group Flow (vph)	246	1596	0	0	1700	578	368	628	617	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	9.4	56.7			42.1	42.1	51.4	51.4	51.4			
Effective Green, g (s)	9.4	56.7			42.1	42.1	51.4	51.4	51.4			
Actuated g/C Ratio	0.08	0.47			0.35	0.35	0.43	0.43	0.43			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	269	1672			1784	555	720	633	644			
v/s Ratio Prot	0.07	c0.45			0.33	c0.36	0.22	c0.42	0.41			
v/s Ratio Perm												
v/c Ratio	0.91	0.95			0.95	1.04	0.51	0.99	0.96			
Uniform Delay, d1	54.9	30.4			38.0	39.0	25.1	34.1	33.2			
Progression Factor	1.00	1.00			0.72	1.43	1.00	1.00	1.00			
Incremental Delay, d2	33.0	13.6			6.3	35.5	0.6	33.5	25.1			
Delay (s)	87.9	44.0			33.9	91.2	25.7	67.6	58.3			
Level of Service	F	D			C	F	C	E	E			
Approach Delay (s)		49.9			55.3			54.6			0.0	
Approach LOS		D			E			D			A	

Intersection Summary			
HCM Average Control Delay	53.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Near Term + Project (Buildout) AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1769	694	108	2033	74	201	10	41	109	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.88		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
Satd. Flow (prot)	1770	5085	1583	1770	5059		3433	3111		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5059		3433	3111		1770	1863	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	1966	771	120	2259	82	223	11	46	121	66	347
RTOR Reduction (vph)	0	0	268	0	3	0	0	39	0	0	0	26
Lane Group Flow (vph)	123	1966	503	120	2338	0	223	18	0	121	66	321
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.3	57.5	70.1	11.8	55.4		12.6	18.2		12.8	18.4	32.7
Effective Green, g (s)	14.3	57.5	70.1	11.8	55.4		12.6	18.2		12.8	18.4	32.7
Actuated g/C Ratio	0.12	0.48	0.58	0.10	0.46		0.10	0.15		0.11	0.15	0.27
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	211	2437	925	174	2336		360	472		189	286	431
v/s Ratio Prot	0.07	0.39	0.06	0.07	0.46		0.06	0.01		0.07	0.04	0.09
v/s Ratio Perm			0.26									0.11
v/c Ratio	0.58	0.81	0.54	0.69	1.00		0.62	0.04		0.64	0.23	0.74
Uniform Delay, d1	50.0	26.5	15.2	52.3	32.3		51.4	43.4		51.4	44.6	39.8
Progression Factor	1.01	0.96	0.56	1.11	0.85		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	1.1	0.1	7.4	17.3		2.2	0.0		5.4	0.2	6.0
Delay (s)	51.7	26.7	8.6	65.3	44.8		53.6	43.4		56.8	44.7	45.8
Level of Service	D	C	A	E	D		D	D		E	D	D
Approach Delay (s)		22.9			45.8			51.6			48.2	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	35.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

11: Del Mar Heights Road & Third Ave.

Near Term + Project (Buildout) AM
7/16/2013

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑	↑↑	↑
Volume (vph)	1944	170	132	2169	78	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2160	189	147	2410	87	68
RTOR Reduction (vph)	0	39	0	0	0	61
Lane Group Flow (vph)	2160	150	147	2410	87	7
Turn Type		Perm	Prot		Perm	
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	81.1	81.1	15.2	99.3	11.7	11.7
Effective Green, g (s)	81.1	81.1	15.2	99.3	11.7	11.7
Actuated g/C Ratio	0.68	0.68	0.13	0.83	0.10	0.10
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3437	1070	224	4208	335	154
v/s Ratio Prot	c0.42		c0.08	0.47	c0.03	
v/s Ratio Perm		0.10				0.00
v/c Ratio	0.63	0.14	0.66	0.57	0.26	0.04
Uniform Delay, d1	11.0	7.0	49.9	3.4	50.1	49.1
Progression Factor	1.51	1.48	1.02	1.80	1.00	1.00
Incremental Delay, d2	0.6	0.2	4.9	0.4	0.4	0.1
Delay (s)	17.2	10.5	56.0	6.5	50.6	49.2
Level of Service	B	B	E	A	D	D
Approach Delay (s)	16.6			9.4	50.0	
Approach LOS	B			A	D	
Intersection Summary						
HCM Average Control Delay		14.0		HCM Level of Service		B
HCM Volume to Capacity ratio		0.59				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		12.0
Intersection Capacity Utilization		58.2%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

12: Del Mar Heights Road & First Ave.

Near Term + Project (Buildout) AM
7/16/2013

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑↑	↑↑↑	↑	↑
Volume (vph)	1863	141	142	2236	65	65
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
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2070	157	158	2484	72	72
RTOR Reduction (vph)	0	60	0	0	0	53
Lane Group Flow (vph)	2070	97	158	2484	72	19
Turn Type		Prot	Prot		Perm	
Protected Phases	4	4	3	8	2	
Permitted Phases						2
Actuated Green, G (s)	68.7	68.7	8.0	80.7	31.3	31.3
Effective Green, g (s)	68.7	68.7	8.0	80.7	31.3	31.3
Actuated g/C Ratio	0.57	0.57	0.07	0.67	0.26	0.26
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2911	906	229	3420	462	413
v/s Ratio Prot	0.41	0.06	0.05	c0.49	c0.04	
v/s Ratio Perm						0.01
v/c Ratio	0.71	0.11	0.69	0.73	0.16	0.05
Uniform Delay, d1	18.5	11.7	54.8	12.6	34.2	33.2
Progression Factor	1.79	5.15	0.87	1.15	1.00	1.00
Incremental Delay, d2	0.7	0.0	4.1	0.4	0.7	0.2
Delay (s)	33.8	60.2	52.0	14.8	34.9	33.4
Level of Service	C	E	D	B	C	C
Approach Delay (s)	35.7			17.0	34.1	
Approach LOS	D			B	C	
Intersection Summary						
HCM Average Control Delay			25.8		HCM Level of Service	C
HCM Volume to Capacity ratio			0.57			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	8.0
Intersection Capacity Utilization			53.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Near Term + Project (Buildout) AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑		↔↔	↑↑↑		↔↔	↑↑↑	↔	↔↔	↑↑↑	
Volume (vph)	237	1001	501	263	1597	95	304	112	96	164	331	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	4831		3433	5042		3433	5085	1583	3433	4644	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	4831		3433	5042		3433	5085	1583	3433	4644	
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)	263	1112	557	292	1774	106	338	124	107	182	368	506
RTOR Reduction (vph)	0	71	0	0	5	0	0	0	78	0	141	0
Lane Group Flow (vph)	263	1598	0	292	1875	0	338	124	29	182	733	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	13.3	46.0		14.8	47.7		12.8	32.0	32.0	6.7	25.1	
Effective Green, g (s)	13.3	46.0		14.8	47.7		12.8	32.0	32.0	6.7	25.1	
Actuated g/C Ratio	0.11	0.38		0.12	0.40		0.11	0.27	0.27	0.06	0.21	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	380	1852		423	2004		366	1356	422	192	971	
v/s Ratio Prot	0.08	0.33		c0.09	c0.37		c0.10	0.02		0.05	c0.16	
v/s Ratio Perm									0.02			
v/c Ratio	0.69	0.86		0.69	0.94		0.92	0.09	0.07	0.95	1.07dr	
Uniform Delay, d1	51.4	34.1		50.4	34.7		53.1	33.1	32.9	56.5	44.6	
Progression Factor	1.13	0.51		1.28	0.84		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.3	4.3		3.7	9.4		28.0	0.0	0.1	49.1	3.4	
Delay (s)	61.5	21.7		68.0	38.7		81.1	33.1	32.9	105.6	48.0	
Level of Service	E	C		E	D		F	C	C	F	D	
Approach Delay (s)		27.1			42.6			61.6			57.9	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM Average Control Delay	42.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		
dr = Defacto Right Lane Recode with 1 though lane as a right lane.			
c = Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

14: Del Mar Heights Road & Carmel Country Rd.

Near Term + Project (Buildout) AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱↰		↰↱	↰↱↰		↰↱	↰↱↰		↰	↰↱	
Volume (vph)	159	665	318	280	1264	174	440	188	111	146	185	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.95		1.00	0.98		1.00	0.94		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4839		3433	4993		3433	4803		1770	3298	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4839		3433	4993		3433	4803		1770	3298	
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)	177	739	353	311	1404	193	489	209	123	162	206	172
RTOR Reduction (vph)	0	60	0	0	12	0	0	100	0	0	108	0
Lane Group Flow (vph)	177	1032	0	311	1585	0	489	232	0	162	270	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	9.9	48.3		14.3	52.5		18.4	22.8		14.8	19.7	
Effective Green, g (s)	9.9	48.3		14.3	52.5		18.4	22.8		14.8	19.7	
Actuated g/C Ratio	0.08	0.40		0.12	0.44		0.15	0.19		0.12	0.16	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	283	1948		409	2184		526	913		218	541	
v/s Ratio Prot	0.05	0.21		0.09	0.32		0.14	0.05		0.09	0.08	
v/s Ratio Perm												
v/c Ratio	0.63	0.53		0.76	0.73		0.93	0.25		0.74	0.50	
Uniform Delay, d1	53.3	27.2		51.2	27.8		50.2	41.4		50.8	45.7	
Progression Factor	1.15	1.06		1.10	0.63		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	1.0		6.5	1.9		22.6	0.2		11.3	1.9	
Delay (s)	64.2	30.0		62.6	19.5		72.8	41.6		62.1	47.6	
Level of Service	E	C		E	B		E	D		E	D	
Approach Delay (s)		34.8			26.5			60.1			51.9	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.9
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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

Near Term + Project (Buildout) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	212	677	132	81	1108	216	117	156	11	56	62	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4961		1770	4961		1770	1845		1770	1674	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4961		1770	4961		1770	1845		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	752	147	90	1231	240	130	173	12	62	69	143
RTOR Reduction (vph)	0	19	0	0	20	0	0	2	0	0	68	0
Lane Group Flow (vph)	236	880	0	90	1451	0	130	183	0	62	144	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	19.4	62.9		10.1	52.9		12.6	22.5		5.8	15.7	
Effective Green, g (s)	19.4	62.9		10.1	52.9		12.6	22.5		5.8	15.7	
Actuated g/C Ratio	0.16	0.52		0.08	0.44		0.10	0.19		0.05	0.13	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	286	2600		149	2187		186	346		86	219	
v/s Ratio Prot	c0.13	0.18		0.05	c0.29		c0.07	0.10		0.04	c0.09	
v/s Ratio Perm												
v/c Ratio	0.83	0.34		0.60	0.66		0.70	0.53		0.72	0.66	
Uniform Delay, d1	48.7	16.5		53.0	26.5		51.9	44.0		56.3	49.6	
Progression Factor	0.83	1.59		1.00	0.87		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.2	0.3		3.8	1.3		8.9	0.7		22.1	5.4	
Delay (s)	55.6	26.6		56.6	24.4		60.8	44.6		78.4	55.0	
Level of Service	E	C		E	C		E	D		E	D	
Approach Delay (s)		32.6			26.3			51.3			60.3	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM Average Control Delay		33.7					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.70										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			19.4		
Intersection Capacity Utilization		71.8%					ICU Level of Service			C		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Del Mar Heights Road & Lansdale Drive

Near Term + Project (Buildout) AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SEB
Lane Configurations												
Volume (vph)	166	584	35	67	1147	36	44	26	55	49	60	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Flt	1.00	0.99		1.00	1.00		1.00	0.90		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5042		1770	5062		1770	1673		1770	1623	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5042		1770	5062		1770	1673		1770	1623	
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)	184	649	39	74	1274	40	49	29	61	54	67	403
RTOR Reduction (vph)	0	4	0	0	2	0	0	49	0	0	205	0
Lane Group Flow (vph)	184	684	0	74	1312	0	49	41	0	54	265	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	15.9	64.0		7.8	55.9		5.8	23.2		5.9	23.1	
Effective Green, g (s)	15.9	64.0		7.8	55.9		5.8	23.2		5.9	23.1	
Actuated g/C Ratio	0.13	0.53		0.06	0.47		0.05	0.19		0.05	0.19	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	235	2689		115	2358		86	323		87	312	
v/s Ratio Prot	c0.10	0.14		0.04	c0.26		0.03	0.02		c0.03	c0.16	
v/s Ratio Perm												
v/c Ratio	0.78	0.25		0.64	0.56		0.57	0.13		0.62	0.85	
Uniform Delay, d1	50.4	15.1		54.7	23.1		55.9	40.0		56.0	46.8	
Progression Factor	1.45	0.29		0.86	1.23		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.9	0.2		8.6	0.9		5.1	0.1		9.5	18.2	
Delay (s)	87.1	4.6		55.5	29.2		61.0	40.1		65.4	65.0	
Level of Service	F	A		E	C		E	D		E	E	
Approach Delay (s)		22.0			30.6			47.4			65.0	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM Average Control Delay		35.0					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			14.2		
Intersection Capacity Utilization		77.1%					ICU Level of Service			D		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: Del Mar Heights Road & Carmel Canyon Road

Near Term + Project (Buildout) AM
7/16/2013

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑↑	↑
Volume (vph)	572	132	397	1024	275	342
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Frt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4942		1770	5085	3433	1583
Frt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4942		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	636	147	441	1138	306	380
RTOR Reduction (vph)	25	0	0	0	0	35
Lane Group Flow (vph)	758	0	441	1138	306	345
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	52.4		33.3	90.8	18.3	51.6
Effective Green, g (s)	52.4		33.3	90.8	18.3	51.6
Actuated g/C Ratio	0.44		0.28	0.76	0.15	0.43
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	2158		491	3848	524	681
v/s Ratio Prot	c0.15		c0.25	0.22	c0.09	0.14
v/s Ratio Perm						0.08
v/c Ratio	0.35		0.90	0.30	0.58	0.51
Uniform Delay, d1	22.5		41.7	4.6	47.3	24.9
Progression Factor	1.46		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		18.5	0.2	1.1	0.2
Delay (s)	33.3		60.2	4.8	48.4	25.1
Level of Service	C		E	A	D	C
Approach Delay (s)	33.3			20.3	35.5	
Approach LOS	C			C	D	
Intersection Summary						
HCM Average Control Delay			27.0		HCM Level of Service	C
HCM Volume to Capacity ratio			0.57			
Actuated Cycle Length (s)			120.0		Sum of lost time (s)	16.0
Intersection Capacity Utilization			57.2%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Near Term + Project (Buildout) PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	868	16	146	933	216	41	32	67	409	36	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	*0.91		1.00	*0.98			1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	0.97			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (prot)	1770	5072		1770	3548			1812	1583	1681	1611	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (perm)	1770	5072		1770	3548			1812	1583	1681	1611	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	943	17	159	1014	235	45	35	73	445	39	146
RTOR Reduction (vph)	0	1	0	0	16	0	0	0	65	0	29	0
Lane Group Flow (vph)	139	959	0	159	1233	0	0	80	8	325	276	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	20.3	36.0		23.1	38.6			13.3	13.3	27.9	27.9	
Effective Green, g (s)	20.3	36.0		23.1	38.6			13.3	13.3	27.9	27.9	
Actuated g/C Ratio	0.17	0.30		0.19	0.32			0.11	0.11	0.23	0.23	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	299	1522		341	1141			201	175	391	375	
v/s Ratio Prot	0.08	0.19		c0.09	c0.35			c0.04		c0.19	0.17	
v/s Ratio Perm									0.01			
v/c Ratio	0.46	0.63		0.47	1.08			0.40	0.05	0.83	0.74	
Uniform Delay, d1	45.0	36.2		43.0	40.7			49.6	47.7	43.8	42.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	2.0		0.4	51.2			0.5	0.0	13.9	7.3	
Delay (s)	45.4	38.2		43.3	91.9			50.1	47.7	57.8	50.0	
Level of Service	D	D		D	F			D	D	E	D	
Approach Delay (s)		39.1			86.4			49.0			54.0	
Approach LOS		D			F			D			D	
Intersection Summary												
HCM Average Control Delay		62.7				HCM Level of Service		E				
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		120.0				Sum of lost time (s)		19.7				
Intersection Capacity Utilization		76.7%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Near Term + Project (Buildout) PM

7/16/2013



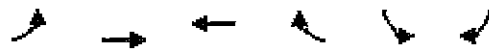
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Volume (veh/h)	1318	64	0	1647	0	111
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1464	71	0	1830	0	123
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	575			607		
pX, platoon unblocked			0.84		0.75	0.84
vC, conflicting volume			1536		2415	524
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			958		905	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	86
cM capacity (veh/h)			597		206	908
Direction Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	586	586	364	915	915	123
Volume Left	0	0	0	0	0	0
Volume Right	0	0	71	0	0	123
cSH	1700	1700	1700	1700	1700	908
Volume to Capacity	0.34	0.34	0.21	0.54	0.54	0.14
Queue Length 95th (ft)	0	0	0	0	0	12
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			0.3			
Intersection Capacity Utilization			48.9%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Near Term + Project (Buildout) PM

7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	1043	1373	0	1001	299
Ideal Flow (vphpl)	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
Frt		1.00	1.00		1.00	0.85
Frt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		3431	1441
Frt 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	0.90	0.90
Adj. Flow (vph)	0	1159	1526	0	1112	332
RTOR Reduction (vph)	0	0	0	0	3	14
Lane Group Flow (vph)	0	1159	1526	0	1142	285
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		42.2	42.2		25.9	25.9
Effective Green, g (s)		42.2	42.2		25.9	25.9
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)		1867	1867		1111	467
v/s Ratio Prot		0.33	0.43		0.33	
v/s Ratio Perm						0.20
v/o Ratio		0.62	0.82		1.03	0.61
Uniform Delay, d1		13.3	15.7		27.1	22.8
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.6	2.9		34.4	2.3
Delay (s)		13.9	18.6		61.5	25.1
Level of Service		B	B		E	C
Approach Delay (s)		13.9	18.6		53.9	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay		29.6		HCM Level of Service		C
HCM Volume to Capacity ratio		0.90				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		11.9
Intersection Capacity Utilization		128.4%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Near Term + Project (Buildout) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗			↖↗↖↗	↖↗	↖	↖↗	↖↗			
Volume (vph)	242	1747	0	0	1625	1021	649	24	1002	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Flt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1473	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1473	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	1839	0	0	1711	1075	683	25	1055	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	463	0	4	4	0	0	0
Lane Group Flow (vph)	255	1839	0	0	1711	612	615	574	566	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	10.0	59.7			44.5	44.5	48.4	48.4	48.4			
Effective Green, g (s)	10.0	59.7			44.5	44.5	48.4	48.4	48.4			
Actuated g/C Ratio	0.08	0.50			0.37	0.37	0.40	0.40	0.40			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	286	1761			1886	587	678	594	607			
v/s Ratio Prot	0.07	0.52			0.34	0.39	0.37	0.39	0.38			
v/s Ratio Perm												
v/c Ratio	0.89	1.04			0.91	1.04	0.91	0.97	0.93			
Uniform Delay, d1	54.5	30.2			35.8	37.8	33.7	35.0	34.2			
Progression Factor	1.00	1.00			0.64	1.58	1.00	1.00	1.00			
Incremental Delay, d2	27.3	34.0			0.8	24.4	15.8	28.3	21.3			
Delay (s)	81.8	64.2			23.7	84.1	49.5	63.3	55.5			
Level of Service	F	E			C	F	D	E	E			
Approach Delay (s)		66.3			47.0			56.0			0.0	
Approach LOS		E			D			E			A	

Intersection Summary			
HCM Average Control Delay	55.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	113.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Near Term + Project (Buildout) PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	2522	259	59	1921	73	637	67	171	61	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.89		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
Satd. Flow (prot)	1770	5085	1583	1770	5057		3433	3157		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5057		3433	3157		1770	1863	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	2802	288	66	2134	81	708	74	190	68	33	91
RTOR Reduction (vph)	0	0	67	0	3	0	0	121	0	0	0	0
Lane Group Flow (vph)	277	2802	221	66	2212	0	708	143	0	68	33	91
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	28.4	62.5	75.7	8.0	42.5		13.2	22.4		7.4	16.6	45.0
Effective Green, g (s)	28.4	62.5	75.7	8.0	42.5		13.2	22.4		7.4	16.6	45.0
Actuated g/C Ratio	0.24	0.52	0.63	0.07	0.35		0.11	0.19		0.06	0.14	0.38
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	419	2648	999	118	1791		378	589		109	258	594
v/s Ratio Prot	c0.16	c0.55	0.02	0.04	c0.44		c0.21	c0.05		0.04	0.02	0.04
v/s Ratio Perm			0.12									0.02
v/c Ratio	0.66	1.06	0.22	0.56	1.23		1.87	0.24		0.62	0.13	0.15
Uniform Delay, d1	41.4	28.7	9.5	54.3	38.7		53.4	41.6		54.9	45.4	24.9
Progression Factor	0.99	1.05	0.87	1.02	1.24		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	31.1	0.0	2.8	110.1		402.8	0.1		7.8	0.1	0.0
Delay (s)	42.3	61.4	8.2	58.3	158.1		456.2	41.7		62.7	45.4	24.9
Level of Service	D	E	A	E	F		F	D		E	D	C
Approach Delay (s)	55.2			155.2			343.6			41.8		
Approach LOS	E			F			F			D		
Intersection Summary												
HCM Average Control Delay	129.5			HCM Level of Service			F					
HCM Volume to Capacity ratio	1.08											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			20.4					
Intersection Capacity Utilization	92.6%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
11: Del Mar Heights Road & Third Ave.

Near Term + Project (Buildout) PM

7/16/2013

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑	↑↑	↑
Volume (vph)	2601	200	155	1981	262	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2890	222	172	2201	291	227
RTOR Reduction (vph)	0	56	0	0	0	118
Lane Group Flow (vph)	2890	166	172	2201	291	109
Turn Type		Perm	Prot		Perm	
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	72.0	72.0	19.0	94.0	17.0	17.0
Effective Green, g (s)	72.0	72.0	19.0	94.0	17.0	17.0
Actuated g/C Ratio	0.60	0.60	0.16	0.78	0.14	0.14
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3051	950	280	3983	486	224
v/s Ratio Prot	c0.57		c0.10	0.43	c0.08	
v/s Ratio Perm		0.11				0.07
v/c Ratio	0.95	0.18	0.61	0.55	0.60	0.49
Uniform Delay, d1	22.2	10.7	47.1	5.0	48.3	47.5
Progression Factor	0.73	0.20	0.98	0.38	1.00	1.00
Incremental Delay, d2	3.1	0.1	3.2	0.4	2.0	1.7
Delay (s)	19.4	2.3	49.3	2.3	50.3	49.2
Level of Service	B	A	D	A	D	D
Approach Delay (s)	18.2			5.8	49.8	
Approach LOS	B			A	D	
Intersection Summary						
HCM Average Control Delay		16.0		HCM Level of Service		B
HCM Volume to Capacity ratio		0.83				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		12.0
Intersection Capacity Utilization		76.3%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
12: Del Mar Heights Road & First Ave.

Near Term + Project (Buildout) PM
7/16/2013

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑↑	↑↑↑	↑	↑
Volume (vph)	2638	166	166	1918	218	218
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
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2931	184	184	2131	242	242
RTOR Reduction (vph)	0	46	0	0	0	84
Lane Group Flow (vph)	2931	138	184	2131	242	158
Turn Type		Prot	Prot			Perm
Protected Phases	4	4	3	8	2	
Permitted Phases						2
Actuated Green, G (s)	72.0	72.0	8.0	84.0	28.0	28.0
Effective Green, g (s)	72.0	72.0	8.0	84.0	28.0	28.0
Actuated g/C Ratio	0.60	0.60	0.07	0.70	0.23	0.23
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)	3051	950	229	3560	413	369
v/s Ratio Prot	c0.58	0.09	c0.05	0.42	c0.14	
v/s Ratio Perm						0.10
v/c Ratio	0.96	0.14	0.80	0.60	0.59	0.43
Uniform Delay, d1	22.7	10.5	55.2	9.3	40.9	39.2
Progression Factor	1.57	1.63	0.69	1.32	1.00	1.00
Incremental Delay, d2	4.2	0.0	1.9	0.0	6.0	3.6
Delay (s)	39.8	17.2	39.9	12.3	46.8	42.8
Level of Service	D	B	D	B	D	D
Approach Delay (s)	38.5			14.5	44.8	
Approach LOS	D			B	D	
Intersection Summary						
HCM Average Control Delay		29.6		HCM Level of Service		C
HCM Volume to Capacity ratio		0.85				
Actuated Cycle Length (s)		120.0		Sum of lost time (s)		12.0
Intersection Capacity Utilization		77.8%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Near Term + Project (Buildout) PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	510	1756	532	175	1018	181	641	450	315	151	176	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	*0.95		0.97	*0.95		0.97	*0.95	1.00	0.97	*0.95	
Frt	1.00	0.97		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5124		3433	5189		3433	5309	1583	3433	4849	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5124		3433	5189		3433	5309	1583	3433	4849	
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)	567	1951	591	194	1131	201	712	500	350	168	196	268
RTOR Reduction (vph)	0	41	0	0	23	0	0	0	90	0	101	0
Lane Group Flow (vph)	567	2501	0	194	1309	0	712	500	260	168	363	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	24.7	54.3		12.7	42.5		11.6	26.9	26.9	5.6	20.1	
Effective Green, g (s)	24.7	54.3		12.7	42.5		11.6	26.9	26.9	5.6	20.1	
Actuated g/C Ratio	0.21	0.45		0.11	0.35		0.10	0.22	0.22	0.05	0.17	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	707	2319		363	1838		332	1190	355	160	812	
v/s Ratio Prot	c0.17	c0.49		0.06	0.25		c0.21	0.09		0.05	0.07	
v/s Ratio Perm									c0.16			
v/c Ratio	0.80	1.08		0.53	0.71		2.14	0.42	0.73	1.05	0.45	
Uniform Delay, d1	45.3	32.9		50.8	33.5		54.2	39.9	43.2	57.2	45.0	
Progression Factor	1.17	0.38		1.05	1.10		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.3	38.9		0.7	2.3		525.0	0.3	8.0	85.0	0.4	
Delay (s)	55.3	51.3		54.2	39.2		579.2	40.2	51.2	142.2	45.4	
Level of Service	E	D		D	D		F	D	D	F	D	
Approach Delay (s)		52.1			41.1			288.4			71.1	
Approach LOS		D			D			F			E	
Intersection Summary												
HCM Average Control Delay			105.4			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.07									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			14.9			
Intersection Capacity Utilization			95.7%			ICL Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: Del Mar Heights Road & Carmel Country Rd.

Near Term + Project (Buildout) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	👤👤	👤👤👤		👤👤	👤👤👤		👤👤	👤👤👤		👤	👤👤	
Volume (vph)	143	1290	604	82	689	74	434	172	149	80	128	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.93		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4842		3433	5012		3433	4731		1770	3257	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4842		3433	5012		3433	4731		1770	3257	
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)	159	1433	671	91	766	82	482	191	166	89	142	161
RTOR Reduction (vph)	0	57	0	0	8	0	0	130	0	0	116	0
Lane Group Flow (vph)	159	2047	0	91	840	0	482	227	0	89	187	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	9.3	60.8		6.8	58.1		15.6	22.6		10.0	17.5	
Effective Green, g (s)	9.3	60.8		6.8	58.1		15.6	22.6		10.0	17.5	
Actuated g/C Ratio	0.08	0.51		0.06	0.48		0.13	0.19		0.08	0.15	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	266	2453		195	2427		446	891		148	475	
v/s Ratio Prot	0.05	0.42		0.03	0.17		0.14	0.05		0.05	0.06	
v/s Ratio Perm												
v/c Ratio	0.60	0.83		0.47	0.35		1.08	0.25		0.60	0.39	
Uniform Delay, d1	53.5	25.3		54.8	19.2		52.2	41.5		53.1	46.4	
Progression Factor	1.08	0.94		1.19	0.55		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	2.9		0.6	0.4		66.0	0.2		4.6	1.4	
Delay (s)	59.7	26.6		65.7	11.0		118.2	41.7		57.7	47.9	
Level of Service	E	C		E	B		F	D		E	D	
Approach Delay (s)		28.9			16.3			85.7			50.1	
Approach LOS		C			B			F			D	

Intersection Summary			
HCM Average Control Delay	38.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

15: Del Mar Heights Road & Torrey Ridge Dr.

Near Term + Project (Buildout) PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NET	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	1311	166	8	719	23	81	14	32	28	8	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.90		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5000		1770	5061		1770	1669		1770	1642	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5000		1770	5061		1770	1669		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	1457	184	9	799	26	90	16	36	31	9	34
RTOR Reduction (vph)	0	8	0	0	2	0	0	31	0	0	31	0
Lane Group Flow (vph)	54	1633	0	9	823	0	90	21	0	31	12	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.0	80.7		0.9	73.9		10.3	15.1		4.6	9.4	
Effective Green, g (s)	7.0	80.7		0.9	73.9		10.3	15.1		4.6	9.4	
Actuated g/C Ratio	0.06	0.67		0.01	0.62		0.09	0.13		0.04	0.08	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	103	3363		13	3117		152	210		68	129	
v/s Ratio Prot	c0.03	c0.33		0.01	0.16		c0.05	c0.01		0.02	0.01	
v/s Ratio Perm												
v/c Ratio	0.52	0.49		0.69	0.26		0.59	0.10		0.46	0.09	
Uniform Delay, d1	54.9	9.6		59.4	10.6		52.8	46.4		56.5	51.3	
Progression Factor	0.78	1.81		0.99	0.61		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.3		80.2	0.2		4.1	0.1		1.8	0.1	
Delay (s)	44.3	17.6		139.3	6.6		56.9	46.5		58.2	51.4	
Level of Service	D	B		F	A		E	D		E	D	
Approach Delay (s)		18.4			8.0			53.1			54.3	
Approach LOS		B			A			D			D	

Intersection Summary

HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

16: Del Mar Heights Road & Lansdale Drive

Near Term + Project (Buildout) PM

7/16/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	302	1001	65	22	508	25	40	46	35	24	33	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.94		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5039		1770	5049		1770	1742		1770	1622	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5039		1770	5049		1770	1742		1770	1622	
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)	336	1112	72	24	564	28	44	51	39	27	37	231
RTOR Reduction (vph)	0	4	0	0	3	0	0	28	0	0	197	0
Lane Group Flow (vph)	336	1180	0	24	589	0	44	62	0	27	71	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	25.3	75.1		3.6	53.4		4.2	19.7		2.5	17.8	
Effective Green, g (s)	25.3	75.1		3.6	53.4		4.2	19.7		2.5	17.8	
Actuated g/C Ratio	0.21	0.63		0.03	0.44		0.04	0.16		0.02	0.15	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	373	3154		53	2247		62	286		37	241	
v/s Ratio Prot	c0.19	c0.23		0.01	0.12		c0.02	0.04		0.02	c0.04	
v/s Ratio Perm												
v/c Ratio	0.90	0.37		0.45	0.26		0.71	0.22		0.73	0.30	
Uniform Delay, d1	46.1	11.0		57.2	20.9		57.3	43.5		58.4	45.5	
Progression Factor	1.27	0.75		1.24	1.03		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.9	0.3		2.2	0.3		26.0	0.1		45.8	0.3	
Delay (s)	80.5	8.6		73.3	21.9		83.3	43.6		104.2	45.8	
Level of Service	F	A		E	C		F	D		F	D	
Approach Delay (s)		24.5			23.9			56.7			51.1	
Approach LOS		C			C			E			D	
Intersection Summary												
HCM Average Control Delay			29.1			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			13.9			
Intersection Capacity Utilization			61.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Appendix E

**Year 2030
Year 2030 + Project (Build-out)
Synchro Worksheets**

ONE PASEO – Updated Traffic Analysis for Revised Project

January 7, 2014

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Year 2030 AM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	970	40	90	1150	230	80	60	140	460	40	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	0.95	0.95	
Frt	1.00	0.99		1.00	0.98			1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (prot)	1770	5055		1770	3451			1811	1583	1681	1631	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (perm)	1770	5055		1770	3451			1811	1583	1681	1631	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	1021	42	95	1211	242	84	63	147	484	42	116
RTOR Reduction (vph)	0	2	0	0	11	0	0	0	126	0	15	0
Lane Group Flow (vph)	137	1061	0	95	1442	0	0	147	21	329	298	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	16.2	59.1		11.8	54.5			20.8	20.8	33.6	33.6	
Effective Green, g (s)	16.2	59.1		11.8	54.5			20.8	20.8	33.6	33.6	
Actuated g/C Ratio	0.11	0.41		0.08	0.38			0.14	0.14	0.23	0.23	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	198	2060		144	1297			260	227	390	378	
v/s Ratio Prot	c0.08	c0.21		0.05	c0.42			c0.08		c0.20	0.18	
v/s Ratio Perm									0.01			
v/c Ratio	0.69	0.51		0.66	1.11			0.57	0.09	0.84	0.79	
Uniform Delay, d1	62.0	32.2		64.7	45.2			57.9	53.9	53.2	52.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.1	0.9		8.1	61.7			1.7	0.1	15.2	10.5	
Delay (s)	70.1	33.1		72.7	107.0			59.6	54.0	68.4	62.9	
Level of Service	E	C		E	F			E	D	E	E	
Approach Delay (s)		37.4			104.8			56.8			65.7	
Approach LOS		D			F			E			E	
Intersection Summary												
HCM Average Control Delay		72.2		HCM Level of Service				E				
HCM Volume to Capacity ratio		0.93										
Actuated Cycle Length (s)		145.0		Sum of lost time (s)				25.4				
Intersection Capacity Utilization		87.6%		ICU Level of Service				E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Year 2030 AM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↗
Volume (veh/h)	1450	60	0	1550	0	170
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)	1611	67	0	1722	0	189
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			0.85		0.91	0.85
vC, conflicting volume			1678		2506	570
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1177		1621	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	79
cM capacity (veh/h)			500		85	921
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	644	644	389	861	861	189
Volume Left	0	0	0	0	0	0
Volume Right	0	0	67	0	0	189
cSH	1700	1700	1700	1700	1700	921
Volume to Capacity	0.38	0.38	0.23	0.51	0.51	0.21
Queue Length 95th (ft)	0	0	0	0	0	19
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.9
Lane LOS						A
Approach Delay (s)	0.0		0.0		9.9	
Approach LOS						A
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			46.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Year 2030 AM
7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	960	1000	0	880	550
Ideal Flow (vphpl)	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
Frt		1.00	1.00		0.98	0.85
Flt Protected		1.00	1.00		0.96	1.00
Satd. Flow (prot)		3539	3539		3404	1441
Flt Permitted		1.00	1.00		0.96	1.00
Satd. Flow (perm)		3539	3539		3404	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1067	1111	0	978	611
RTOR Reduction (vph)	0	0	0	0	11	44
Lane Group Flow (vph)	0	1067	1111	0	1083	451
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		42.1	42.1		26.0	26.0
Effective Green, g (s)		42.1	42.1		26.0	26.0
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)		1862	1862		1106	468
v/s Ratio Prot		0.30	0.31		0.32	
v/s Ratio Perm						0.31
v/c Ratio		0.57	0.60		0.98	0.96
Uniform Delay, d1		12.9	13.1		26.7	26.5
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.4	0.5		21.8	32.2
Delay (s)		13.3	13.6		48.5	58.8
Level of Service		B	B		D	E
Approach Delay (s)		13.3	13.6		51.7	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay		29.6		HCM Level of Service		C
HCM Volume to Capacity ratio		0.74				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		11.9
Intersection Capacity Utilization		146.8%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Year 2030 AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱			↰↱↰↱	↰↱	↰↱	↰↱	↰↱			
Volume (vph)	370	1580	0	0	1850	800	400	60	1110	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1478	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1478	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	394	1681	0	0	1968	851	426	64	1181	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	264	0	9	9	0	0	0
Lane Group Flow (vph)	394	1681	0	0	1968	588	383	641	629	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	16.4	76.7			55.1	55.1	56.4	56.4	56.4			
Effective Green, g (s)	16.4	76.7			55.1	55.1	56.4	56.4	56.4			
Actuated g/C Ratio	0.11	0.53			0.38	0.38	0.39	0.39	0.39			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	388	1872			1932	602	654	575	585			
v/s Ratio Prot	0.11	0.47			0.39	0.37	0.23	0.43	0.42			
v/s Ratio Perm												
v/c Ratio	1.02	0.90			1.02	0.98	0.59	1.12	1.08			
Uniform Delay, d1	64.3	30.6			45.0	44.3	35.1	44.3	44.3			
Progression Factor	1.00	1.00			0.74	0.45	1.00	1.00	1.00			
Incremental Delay, d2	49.7	7.3			19.5	20.9	1.3	73.4	59.3			
Delay (s)	114.0	37.9			52.9	40.7	36.4	117.7	103.6			
Level of Service	F	D			D	D	D	F	F			
Approach Delay (s)		52.4			49.2			93.7			0.0	
Approach LOS		D			D			F			A	
Intersection Summary												
HCM Average Control Delay		61.5			HCM Level of Service			E				
HCM Volume to Capacity ratio		1.07										
Actuated Cycle Length (s)		145.0			Sum of lost time (s)			18.2				
Intersection Capacity Utilization		99.4%			ICU Level of Service			F				
Analysis Period (min)		15										
Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Year 2030 AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1489	840	210	1763	110	290	30	30	120	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		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
Satd. Flow (prot)	1770	5085	1583	1770	5041		3433	3274		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5041		3433	3274		1770	1863	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)	133	1654	933	233	1959	122	322	33	33	133	78	444
RTOR Reduction (vph)	0	0	249	0	4	0	0	28	0	0	0	6
Lane Group Flow (vph)	133	1654	684	233	2077	0	322	38	0	133	78	438
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	22.1	64.3	81.2	22.7	65.3		16.9	20.8		17.5	21.4	43.5
Effective Green, g (s)	22.1	64.3	81.2	22.7	65.3		16.9	20.8		17.5	21.4	43.5
Actuated g/C Ratio	0.15	0.44	0.56	0.16	0.45		0.12	0.14		0.12	0.15	0.30
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	270	2255	886	277	2270		400	470		214	275	475
v/s Ratio Prot	0.08	0.33	0.09	0.13	0.41		0.09	0.01		0.08	0.04	0.14
v/s Ratio Perm			0.34									0.14
v/c Ratio	0.49	0.73	0.77	0.84	0.91		0.80	0.08		0.62	0.28	0.92
Uniform Delay, d1	56.3	33.3	24.7	59.4	37.2		62.4	53.8		60.6	55.0	49.1
Progression Factor	1.01	0.86	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6	1.1	19.3	7.2		10.6	0.0		4.0	0.2	23.0
Delay (s)	56.9	29.2	25.8	78.7	44.4		73.1	53.8		64.6	55.2	72.1
Level of Service	E	C	C	E	D		E	D		E	E	E
Approach Delay (s)	29.4				47.9			69.8			68.6	
Approach LOS	C				D			E			E	

Intersection Summary			
HCM Average Control Delay	43.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Year 2030 AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔↔		↔↔	↔↔↔		↔↔	↔↔↔	↔	↔↔	↔↔↔	
Volume (vph)	241	976	458	243	1540	150	220	150	83	170	510	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd Flow (prot)	3433	4842		3433	5017		3433	5085	1583	3433	4732	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd Flow (perm)	3433	4842		3433	5017		3433	5085	1583	3433	4732	
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)	268	1084	509	270	1711	167	244	167	92	189	567	489
RTOR Reduction (vph)	0	55	0	0	7	0	0	0	69	0	112	0
Lane Group Flow (vph)	268	1538	0	270	1871	0	244	167	23	189	945	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	14.1	62.9		14.4	63.4		12.9	36.9	36.9	10.3	33.5	
Effective Green, g (s)	14.1	62.9		14.4	63.4		12.9	36.9	36.9	10.3	33.5	
Actuated g/C Ratio	0.10	0.43		0.10	0.44		0.09	0.25	0.25	0.07	0.23	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	334	2100		341	2194		305	1294	403	244	1093	
v/s Ratio Prot	0.08	0.32		c0.08	c0.37		c0.07	c0.03		0.06	c0.20	
v/s Ratio Perm									0.01			
v/c Ratio	0.80	0.73		0.79	0.85		0.80	0.13	0.06	0.77	1.03dr	
Uniform Delay, d1	64.1	34.1		63.8	36.6		64.8	41.7	40.9	66.2	53.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.3	2.3		11.1	4.4		13.2	0.1	0.1	13.0	7.4	
Delay (s)	76.4	36.4		75.0	41.1		78.0	41.7	41.0	79.2	60.9	
Level of Service	E	D		E	D		E	D	D	E	E	
Approach Delay (s)		42.1			45.3			59.2			63.7	
Approach LOS		D			D			E			E	

Intersection Summary												
HCM Average Control Delay		49.5	HCM Level of Service		D							
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		145.0	Sum of lost time (s)		20.8							
Intersection Capacity Utilization		83.6%	ICU Level of Service		E							
Analysis Period (min)		15										
dr Defacto Right Lane Recode with 1 though lane as a right lane												
c Critical Lane Group												

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

Year 2030 AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱↰		↰↱	↰↱↰		↰↱	↰↱↰		↰	↰↱	
Volume (vph)	190	849	284	289	1392	170	360	200	240	200	310	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.92		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4894		3433	5002		3433	4669		1770	3307	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4894		3433	5002		3433	4669		1770	3307	
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)	211	943	316	321	1547	189	400	222	267	222	344	267
RTOR Reduction (vph)	0	37	0	0	10	0	0	158	0	0	103	0
Lane Group Flow (vph)	211	1222	0	321	1726	0	400	331	0	222	508	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	12.4	59.0		17.5	63.9		19.6	27.6		21.1	29.6	
Effective Green, g (s)	12.4	59.0		17.5	63.9		19.6	27.6		21.1	29.6	
Actuated g/C Ratio	0.09	0.41		0.12	0.44		0.14	0.19		0.15	0.20	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	294	1991		414	2204		464	889		258	675	
v/s Ratio Prot	0.06	0.25		0.09	0.35		0.12	0.07		0.13	0.15	
v/s Ratio Perm												
v/c Ratio	0.72	0.61		0.78	0.78		0.86	0.37		0.86	0.75	
Uniform Delay, d1	64.6	34.0		61.8	34.6		61.4	51.2		60.5	54.2	
Progression Factor	1.00	1.00		1.14	0.99		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.8	1.4		5.8	2.0		14.7	0.4		23.4	6.1	
Delay (s)	71.4	35.4		76.3	36.3		76.0	51.5		83.9	60.3	
Level of Service	E	D		E	D		E	D		F	E	
Approach Delay (s)		40.6			42.5			62.6			66.6	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM Average Control Delay		49.2		HCM Level of Service				D				
HCM Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		145.0		Sum of lost time (s)				8.8				
Intersection Capacity Utilization		78.9%		ICU Level of Service				D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Del Mar Heights Road & Torrey Ridge Dr.

Year 2030 AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	212	889	115	81	1426	216	111	156	16	78	62	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4998		1770	4985		1770	1836		1770	1655	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4998		1770	4985		1770	1836		1770	1655	
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	988	128	90	1584	240	123	173	18	87	69	200
RTOR Reduction (vph)	0	9	0	0	12	0	0	2	0	0	77	0
Lane Group Flow (vph)	236	1107	0	90	1812	0	123	189	0	87	192	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	22.3	80.4		11.4	68.8		12.8	24.6		9.9	21.7	
Effective Green, g (s)	22.3	80.4		11.4	68.8		12.8	24.6		9.9	21.7	
Actuated g/C Ratio	0.15	0.55		0.08	0.47		0.09	0.17		0.07	0.15	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	272	2771		139	2365		156	311		121	248	
v/s Ratio Prot	c0.13	0.22		0.05	c0.36		c0.07	c0.10		0.05	c0.12	
v/s Ratio Perm												
v/c Ratio	0.87	0.40		0.65	0.77		0.79	0.61		0.72	0.77	
Uniform Delay, d1	59.9	18.5		64.8	31.5		64.8	55.7		66.2	59.3	
Progression Factor	1.16	0.76		1.01	0.75		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.6	0.3		4.3	1.4		21.1	2.3		15.6	12.7	
Delay (s)	88.8	14.3		69.5	24.9		85.9	58.0		81.8	72.0	
Level of Service	F	B		E	C		F	E		F	E	
Approach Delay (s)		27.3			27.0			68.9			74.4	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM Average Control Delay		34.8					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		145.0					Sum of lost time (s)		24.3			
Intersection Capacity Utilization		80.8%					ICU Level of Service		D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Del Mar Heights Road & Lansdale Drive

Year 2030 AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	149	784	35	67	1534	36	62	26	76	69	60	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5053		1770	5068		1770	1655		1770	1616	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5053		1770	5068		1770	1655		1770	1616	
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)	166	871	39	74	1704	40	69	29	84	77	67	504
RTOR Reduction (vph)	0	3	0	0	2	0	0	63	0	0	169	0
Lane Group Flow (vph)	166	907	0	74	1742	0	69	50	0	77	402	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	16.5	69.0		10.0	62.5		8.3	36.7		10.2	38.4	
Effective Green, g (s)	16.5	69.0		10.0	62.5		8.3	36.7		10.2	38.4	
Actuated g/C Ratio	0.11	0.48		0.07	0.43		0.06	0.25		0.07	0.26	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	201	2405		122	2184		101	419		125	428	
v/s Ratio Prot	0.09	0.18		0.04	0.34		0.04	0.03		0.04	0.25	
v/s Ratio Perm												
v/c Ratio	0.83	0.38		0.61	0.80		0.68	0.12		0.62	0.94	
Uniform Delay, d1	62.8	24.3		65.6	35.8		67.1	41.7		65.5	52.2	
Progression Factor	1.34	0.83		0.88	1.06		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.9	0.4		5.3	2.9		14.1	0.0		6.2	28.0	
Delay (s)	104.9	20.5		63.3	40.9		81.2	41.8		71.7	80.2	
Level of Service	F	C		E	D		F	D		E	F	
Approach Delay (s)		33.5			41.8			56.7			79.2	
Approach LOS		C			D			E			E	
Intersection Summary												
HCM Average Control Delay		46.7					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		145.0					Sum of lost time (s)		14.2			
Intersection Capacity Utilization		89.4%					ICU Level of Service		E			
Analysis Period (min)		15										
Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
17: Del Mar Heights Road & Carmel Canyon Road

Year 2030 AM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑↑	↑
Volume (vph)	897	204	661	1389	358	548
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4944		1770	5085	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4944		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	997	227	734	1543	398	609
RTOR Reduction (vph)	25	0	0	0	0	2
Lane Group Flow (vph)	1199	0	734	1543	398	607
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	39.0		64.7	108.8	25.3	90.0
Effective Green, g (s)	39.0		64.7	108.8	25.3	90.0
Actuated g/C Ratio	0.27		0.45	0.75	0.17	0.62
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	1330		790	3816	599	983
v/s Ratio Prot	c0.24		c0.41	0.30	c0.12	0.28
v/s Ratio Perm						0.11
v/c Ratio	0.90		0.93	0.40	0.66	0.62
Uniform Delay, d1	51.1		38.0	6.5	55.9	16.9
Progression Factor	1.14		1.00	1.00	1.00	1.00
Incremental Delay, d2	9.8		16.8	0.3	2.2	0.8
Delay (s)	68.2		54.7	6.8	58.0	17.7
Level of Service	E		D	A	E	B
Approach Delay (s)	68.2			22.3	33.7	
Approach LOS	E			C	C	
Intersection Summary						
HCM Average Control Delay			37.3		HCM Level of Service	D
HCM Volume to Capacity ratio			0.87			
Actuated Cycle Length (s)			145.0		Sum of lost time (s)	16.0
Intersection Capacity Utilization			82.0%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Year 2030 PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1130	50	130	900	230	90	50	70	450	40	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	0.95	0.95	
Frt	1.00	0.99		1.00	0.97			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (prot)	1770	5053		1770	3431			1805	1583	1681	1615	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (perm)	1770	5053		1770	3431			1805	1583	1681	1615	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	1189	53	137	947	242	95	53	74	474	42	147
RTOR Reduction (vph)	0	3	0	0	14	0	0	0	63	0	20	0
Lane Group Flow (vph)	158	1239	0	137	1175	0	0	148	11	341	302	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	17.1	53.3		14.7	50.7			20.9	20.9	36.4	36.4	
Effective Green, g (s)	17.1	53.3		14.7	50.7			20.9	20.9	36.4	36.4	
Actuated g/C Ratio	0.12	0.37		0.10	0.35			0.14	0.14	0.25	0.25	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	209	1857		179	1200			260	228	422	405	
v/s Ratio Prot	c0.09	c0.25		0.08	c0.34			c0.08		c0.20	0.19	
v/s Ratio Perm									0.01			
v/c Ratio	0.76	0.67		0.77	0.98			0.57	0.05	0.81	0.75	
Uniform Delay, d1	61.9	38.4		63.5	46.6			57.9	53.5	51.0	50.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.9	1.9		16.0	21.4			1.7	0.0	10.8	7.3	
Delay (s)	74.8	40.3		79.4	68.0			59.6	53.5	61.9	57.3	
Level of Service	E	D		E	E			E	D	E	E	
Approach Delay (s)		44.2			69.2			57.5			59.7	
Approach LOS		D			E			E			E	
Intersection Summary												
HCM Average Control Delay		57.0					HCM Level of Service		E			
HCM Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		145.0					Sum of lost time (s)		25.4			
Intersection Capacity Utilization		82.5%					ICU Level of Service		E			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Year 2030 PM
7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↓			↑↑		↗
Volume (veh/h)	1770	80	0	1540	0	90
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)	1967	89	0	1711	0	100
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			0.80		0.89	0.80
vC, conflicting volume			2056		2867	700
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1445		1509	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	88
cM capacity (veh/h)			372		99	868
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	787	787	482	856	856	100
Volume Left	0	0	0	0	0	0
Volume Right	0	0	89	0	0	100
cSH	1700	1700	1700	1700	1700	868
Volume to Capacity	0.46	0.46	0.28	0.50	0.50	0.12
Queue Length 95th (ft)	0	0	0	0	0	10
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.7
Lane LOS						A
Approach Delay (s)	0.0			0.0		9.7
Approach LOS						A
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			48.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Year 2030 PM

7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	1280	1140	0	820	400
Ideal Flow (vphpl)	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
Frt		1.00	1.00		0.99	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		3425	1441
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		3425	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1422	1267	0	911	444
RTOR Reduction (vph)	0	0	0	0	5	30
Lane Group Flow (vph)	0	1422	1267	0	950	370
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		42.2	42.2		24.7	24.7
Effective Green, g (s)		42.2	42.2		24.7	24.7
Actuated g/C Ratio		0.54	0.54		0.31	0.31
Clearance Time (s)					5.6	5.6
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)		1895	1895		1074	452
v/s Ratio Prot		0.40	0.36		0.28	
v/s Ratio Perm						0.26
v/c Ratio		0.75	0.67		0.88	0.82
Uniform Delay, d1		14.2	13.2		25.7	25.0
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		1.7	0.9		8.9	11.1
Delay (s)		15.9	14.1		34.6	36.1
Level of Service		B	B		C	D
Approach Delay (s)		15.9	14.1		35.0	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay		21.8		HCM Level of Service		C
HCM Volume to Capacity ratio		0.80				
Actuated Cycle Length (s)		78.8		Sum of lost time (s)		11.9
Intersection Capacity Utilization		125.7%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Year 2030 PM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NET	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	750	1633	0	0	1340	600	630	30	850	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.89	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1494	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1494	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	789	1719	0	0	1411	632	663	32	895	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	273	0	11	11	0	0	0
Lane Group Flow (vph)	789	1719	0	0	1411	359	550	519	499	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	34.4	81.7			42.1	42.1	51.4	51.4	51.4			
Effective Green, g (s)	34.4	81.7			42.1	42.1	51.4	51.4	51.4			
Actuated g/C Ratio	0.24	0.56			0.29	0.29	0.35	0.35	0.35			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	814	1994			1476	460	596	530	533			
v/s Ratio Prot	c0.23	0.49			c0.28	0.23	0.33	c0.35	0.33			
v/s Ratio Perm												
v/c Ratio	0.97	0.86			0.96	0.78	0.92	0.98	0.94			
Uniform Delay, d1	54.8	26.9			50.5	47.2	44.9	46.3	45.2			
Progression Factor	1.00	1.00			0.95	1.09	1.00	1.00	1.00			
Incremental Delay, d2	23.9	5.2			6.3	4.2	20.0	33.4	24.0			
Delay (s)	78.7	32.1			54.5	55.6	64.9	79.6	69.2			
Level of Service	E	C			D	E	E	E	E			
Approach Delay (s)		46.7			54.8			71.2			0.0	
Approach LOS		D			D			E			A	
Intersection Summary												
HCM Average Control Delay		55.8					HCM Level of Service		E			
HCM Volume to Capacity ratio		0.97										
Actuated Cycle Length (s)		145.0					Sum of lost time (s)		17.1			
Intersection Capacity Utilization		99.7%					ICU Level of Service		F			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Year 2030 PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2220	300	20	1280	150	680	70	150	40	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.90		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
Satd. Flow (prot)	1770	5085	1583	1770	5005		3433	3177		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5005		3433	3177		1770	1863	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)	278	2467	333	22	1422	167	756	78	167	44	44	222
RTOR Reduction (vph)	0	0	67	0	10	0	0	95	0	0	0	1
Lane Group Flow (vph)	278	2467	266	22	1579	0	756	150	0	44	44	221
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases		2									4	
Actuated Green, G (s)	30.6	79.6	104.2	2.9	52.3		24.6	36.2		6.6	18.2	48.8
Effective Green, g (s)	30.6	79.6	104.2	2.9	52.3		24.6	36.2		6.6	18.2	48.8
Actuated g/C Ratio	0.21	0.55	0.72	0.02	0.36		0.17	0.25		0.05	0.13	0.34
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	374	2791	1138	35	1805		582	793		81	234	533
v/s Ratio Prot	c0.16	c0.49	0.04	0.01	0.32		c0.22	0.05		0.02	0.02	c0.09
v/s Ratio Perm			0.13									0.05
V/c Ratio	0.74	0.88	0.23	0.63	0.88		1.30	0.19		0.54	0.19	0.41
Uniform Delay, d1	53.5	28.7	6.9	70.5	43.3		60.2	42.8		67.7	56.8	37.1
Progression Factor	1.12	0.80	0.83	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	2.9	0.0	22.7	6.3		146.8	0.0		3.9	0.1	0.2
Delay (s)	64.2	25.9	5.7	93.2	49.6		207.0	42.9		71.7	56.9	37.3
Level of Service	E	C	A	F	D		F	D		E	E	D
Approach Delay (s)		27.2			50.2			166.9			44.9	
Approach LOS		C			D			F			D	

Intersection Summary		
HCM Average Control Delay	57.6	HCM Level of Service E
HCM Volume to Capacity ratio	0.90	
Actuated Cycle Length (s)	145.0	Sum of lost time (s) 19.2
Intersection Capacity Utilization	87.9%	ICU Level of Service E
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Year 2030 PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	495	1522	471	127	930	190	420	750	270	190	220	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	*0.95		0.97	*0.95		0.97	*0.95	1.00	0.97	*0.95	
Frt	1.00	0.96		1.00	0.97		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5121		3433	5174		3433	5309	1583	3433	4863	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5121		3433	5174		3433	5309	1583	3433	4863	
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)	550	1691	523	141	1033	211	467	833	300	211	244	311
RTOR Reduction (vph)	0	35	0	0	21	0	0	0	85	0	175	0
Lane Group Flow (vph)	550	2179	0	141	1223	0	467	833	215	211	380	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	26.0	71.4		8.6	54.2		20.9	33.1	33.1	11.4	22.8	
Effective Green, g (s)	26.0	71.4		8.6	54.2		20.9	33.1	33.1	11.4	22.8	
Actuated g/C Ratio	0.18	0.49		0.06	0.37		0.14	0.23	0.23	0.08	0.16	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	616	2522		204	1934		495	1212	361	270	765	
v/s Ratio Prot	c0.16	c0.43		0.04	0.24		c0.14	c0.16		0.06	0.08	
v/s Ratio Perm									0.14			
v/c Ratio	0.89	0.86		0.69	0.63		0.94	0.69	0.60	0.78	0.50	
Uniform Delay, d1	58.1	32.5		66.9	37.2		61.5	51.2	50.0	65.6	55.9	
Progression Factor	1.00	1.00		1.13	1.01		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.9	4.2		7.7	1.5		26.5	1.7	3.0	12.7	0.6	
Delay (s)	73.1	36.8		83.4	39.1		88.0	53.0	52.9	78.2	56.4	
Level of Service	E	D		F	D		F	D	D	E	E	
Approach Delay (s)		44.0			43.6			63.2			62.4	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM Average Control Delay			50.8			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			145.0			Sum of lost time (s)			8.8			
Intersection Capacity Utilization			83.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: Del Mar Heights Road & Carmel Country Rd.

Year 2030 PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑		↔↔	↑↑↑		↔↔	↑↑↑		↔	↑↑	
Volume (vph)	140	1535	473	85	665	120	400	300	175	200	250	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4906		3433	4969		3433	4804		1770	3348	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4906		3433	4969		3433	4804		1770	3348	
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)	156	1706	526	94	739	133	444	333	194	222	278	156
RTOR Reduction (vph)	0	35	0	0	16	0	0	77	0	0	57	0
Lane Group Flow (vph)	156	2197	0	94	856	0	444	450	0	222	377	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.4	73.8		6.7	69.9		18.9	26.4		18.3	26.3	
Effective Green, g (s)	10.4	73.8		6.7	69.9		18.9	26.4		18.3	26.3	
Actuated g/C Ratio	0.07	0.51		0.05	0.48		0.13	0.18		0.13	0.18	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	246	2497		159	2395		447	875		223	607	
v/s Ratio Prot	0.05	0.45		0.03	0.17		0.13	0.09		0.13	0.11	
v/s Ratio Perm												
V/c Ratio	0.63	0.88		0.59	0.36		0.99	0.51		1.00	0.62	
Uniform Delay, d1	65.4	31.7		67.8	23.5		63.0	53.5		63.3	54.7	
Progression Factor	0.68	1.51		0.68	1.54		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	4.3		3.8	0.4		40.6	0.7		58.6	3.2	
Delay (s)	48.0	52.2		49.8	36.7		103.5	54.2		121.9	58.0	
Level of Service	D	D		D	D		F	D		F	E	
Approach Delay (s)		52.0			38.0			76.8			79.6	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM Average Control Delay		57.7					HCM Level of Service			E		
HCM Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		145.0					Sum of lost time (s)		19.3			
Intersection Capacity Utilization		82.4%					ICU Level of Service		E			
Analysis Period (min)		15										
c Critical Lane Group												

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

Year 2030 PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	1646	108	8	863	23	52	14	45	39	8	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5038		1770	5065		1770	1651		1770	1627	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5038		1770	5065		1770	1651		1770	1627	
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	1829	120	9	959	26	58	16	50	43	9	48
RTOR Reduction (vph)	0	2	0	0	1	0	0	45	0	0	43	0
Lane Group Flow (vph)	54	1947	0	9	984	0	58	21	0	43	14	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.8	102.4		1.3	95.2		8.1	15.6		7.0	14.5	
Effective Green, g (s)	7.8	102.4		1.3	95.2		8.1	15.6		7.0	14.5	
Actuated g/C Ratio	0.05	0.71		0.01	0.66		0.06	0.11		0.05	0.10	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	95	3558		16	3325		99	178		85	163	
v/s Ratio Prot	0.03	0.39		0.01	0.19		0.03	0.01		0.02	0.01	
v/s Ratio Perm												
v/c Ratio	0.57	0.55		0.56	0.30		0.59	0.12		0.51	0.08	
Uniform Delay, d1	67.0	10.2		71.6	10.6		66.8	58.5		67.3	59.2	
Progression Factor	1.14	0.65		1.04	0.59		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.3		23.2	0.2		5.6	0.1		1.7	0.1	
Delay (s)	78.3	6.9		97.5	6.4		72.4	58.6		69.0	59.3	
Level of Service	E	A		F	A		E	E		E	E	
Approach Delay (s)		8.8			7.3			65.1			63.5	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

16: Del Mar Heights Road & Lansdale Drive

Year 2030 PM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	244	1294	65	22	631	25	56	46	49	33	33	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.92		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5049		1770	5056		1770	1719		1770	1619	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5049		1770	5056		1770	1719		1770	1619	
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)	271	1438	72	24	701	28	62	51	54	37	37	253
RTOR Reduction (vph)	0	2	0	0	2	0	0	31	0	0	200	0
Lane Group Flow (vph)	271	1508	0	24	727	0	62	74	0	37	90	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	26.6	95.3		4.5	73.2		8.0	20.0		6.1	17.9	
Effective Green, g (s)	26.6	95.3		4.5	73.2		8.0	20.0		6.1	17.9	
Actuated g/C Ratio	0.18	0.66		0.03	0.50		0.06	0.14		0.04	0.12	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	325	3318		55	2552		98	237		74	200	
v/s Ratio Prot	c0.15	c0.30		0.01	0.14		c0.04	0.04		0.02	c0.06	
v/s Ratio Perm												
v/c Ratio	0.83	0.45		0.44	0.28		0.63	0.31		0.50	0.45	
Uniform Delay, d1	57.1	12.1		69.0	20.8		67.1	56.3		68.0	59.0	
Progression Factor	1.24	1.16		1.03	0.82		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.2	0.4		2.0	0.3		9.4	0.3		1.9	0.6	
Delay (s)	85.3	14.4		72.8	17.3		76.5	56.6		69.9	59.6	
Level of Service	F	B		E	B		E	E		E	E	
Approach Delay (s)		25.2			19.1			64.0			60.7	
Approach LOS		C			B			E			E	
Intersection Summary												
HCM Average Control Delay	29.7			HCM Level of Service			C					
HCM Volume to Capacity ratio	0.53											
Actuated Cycle Length (s)	145.0			Sum of lost time (s)			13.9					
Intersection Capacity Utilization	65.0%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
17: Del Mar Heights Road & Carmel Canyon Road

Year 2030 PM
7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↰	↑↑↑	↰	↰
Volume (vph)	1300	266	153	573	145	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4956		1770	5085	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4956		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1444	296	170	637	161	456
RTOR Reduction (vph)	16	0	0	0	0	7
Lane Group Flow (vph)	1724	0	170	637	161	449
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	82.2		27.0	114.3	19.8	46.8
Effective Green, g (s)	82.2		27.0	114.3	19.8	46.8
Actuated g/C Ratio	0.57		0.19	0.79	0.14	0.32
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	2810		330	4008	469	511
v/s Ratio Prot	0.35		0.10	0.13	0.05	0.16
v/s Ratio Perm						0.12
v/c Ratio	0.61		0.52	0.16	0.34	0.88
Uniform Delay, d1	20.8		53.1	3.7	56.7	46.4
Progression Factor	0.54		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0		0.6	0.1	0.2	15.2
Delay (s)	12.2		53.7	3.8	56.9	61.6
Level of Service	B		D	A	E	E
Approach Delay (s)	12.2			14.3	60.4	
Approach LOS	B			B	E	
Intersection Summary						
HCM Average Control Delay			22.2		HCM Level of Service	C
HCM Volume to Capacity ratio			0.70			
Actuated Cycle Length (s)			145.0		Sum of lost time (s)	15.1
Intersection Capacity Utilization			65.4%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Year 2030+Project AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	992	40	100	1160	240	80	60	162	482	40	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	0.95	0.95	
Frt	1.00	0.99		1.00	0.97			1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97	
Satd. Flow (prot)	1770	5056		1770	3448			1811	1583	1681	1633	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.97	
Satd. Flow (perm)	1770	5056		1770	3448			1811	1583	1681	1633	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	1044	42	105	1221	253	84	63	171	507	42	116
RTOR Reduction (vph)	0	2	0	0	12	0	0	0	141	0	14	0
Lane Group Flow (vph)	137	1084	0	105	1462	0	0	147	30	340	311	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	16.1	59.2		12.5	55.4			20.8	20.8	32.8	32.8	
Effective Green, g (s)	16.1	59.2		12.5	55.4			20.8	20.8	32.8	32.8	
Actuated g/C Ratio	0.11	0.41		0.09	0.38			0.14	0.14	0.23	0.23	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	197	2064		153	1317			260	227	380	369	
v/s Ratio Prot	c0.08	c0.21		0.06	c0.42			c0.08		c0.20	0.19	
v/s Ratio Perm									0.02			
v/c Ratio	0.70	0.53		0.69	1.11			0.57	0.13	0.89	0.84	
Uniform Delay, d1	62.1	32.3		64.3	44.8			57.9	54.2	54.4	53.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.3	1.0		9.7	60.9			1.7	0.1	22.5	15.9	
Delay (s)	70.4	33.3		74.1	105.7			59.6	54.3	76.9	69.5	
Level of Service	E	C		E	F			E	D	E	E	
Approach Delay (s)		37.4			103.6			56.7			73.3	
Approach LOS		D			F			E			E	
Intersection Summary												
HCM Average Control Delay		72.9					HCM Level of Service		E			
HCM Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		145.0					Sum of lost time (s)		25.4			
Intersection Capacity Utilization		88.8%					ICU Level of Service		E			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Year 2030+Project AM
7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	1073	1052	0	965	550
Ideal Flow (vphpl)	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
Frt		1.00	1.00		0.99	0.85
Flt Protected		1.00	1.00		0.96	1.00
Satd. Flow (prot)		3539	3539		3414	1441
Flt Permitted		1.00	1.00		0.96	1.00
Satd. Flow (perm)		3539	3539		3414	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1192	1169	0	1072	611
RTOR Reduction (vph)	0	0	0	0	8	36
Lane Group Flow (vph)	0	1192	1169	0	1156	483
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		41.7	41.7		26.4	26.4
Effective Green, g (s)		41.7	41.7		26.4	26.4
Actuated g/C Ratio		0.52	0.52		0.33	0.33
Clearance Time (s)					5.6	5.6
Vehicle Extension (s)					3.0	3.0
Lane Grp Cap (vph)		1845	1845		1127	476
v/s Ratio Prot		0.34	0.33		0.34	
v/s Ratio Perm						0.34
v/c Ratio		0.65	0.63		1.03	1.01
Uniform Delay, d1		13.8	13.7		26.8	26.8
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		0.8	0.7		33.5	44.9
Delay (s)		14.6	14.4		60.3	71.7
Level of Service		B	B		E	E
Approach Delay (s)		14.6	14.4		63.8	
Approach LOS		B	B		E	
Intersection Summary						
HCM Average Control Delay		35.0		HCM Level of Service		D
HCM Volume to Capacity ratio		0.79				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		11.9
Intersection Capacity Utilization		157.2%		ICU Level of Service		H
Analysis Period (min)		15				
Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Year 2030+Project AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			  			 				
Volume (vph)	370	1778	0	0	1980	839	400	60	1280	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Flt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1473	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1473	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	394	1891	0	0	2106	893	426	64	1362	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	259	0	4	4	0	0	0
Lane Group Flow (vph)	394	1891	0	0	2106	634	383	743	718	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	13.8	72.7			53.7	53.7	60.4	60.4	60.4			
Effective Green, g (s)	13.8	72.7			53.7	53.7	60.4	60.4	60.4			
Actuated g/C Ratio	0.10	0.50			0.37	0.37	0.42	0.42	0.42			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	327	1774			1883	586	700	614	626			
v/s Ratio Prot	0.11	0.53			0.41	0.40	0.23	0.50	0.48			
v/s Ratio Perm												
v/c Ratio	1.20	1.07			1.12	1.08	0.55	1.21	1.15			
Uniform Delay, d1	65.6	36.2			45.6	45.6	32.0	42.3	42.3			
Progression Factor	1.00	1.00			0.77	0.56	1.00	1.00	1.00			
Incremental Delay, d2	117.6	41.4			56.6	48.9	0.9	109.5	84.1			
Delay (s)	183.2	77.6			91.7	74.5	32.8	151.8	126.4			
Level of Service	F	E			F	E	C	F	F			
Approach Delay (s)		95.8			86.6			117.3			0.0	
Approach LOS		F			F			F			A	
Intersection Summary												
HCM Average Control Delay			97.5		HCM Level of Service				F			
HCM Volume to Capacity ratio			1.19									
Actuated Cycle Length (s)			145.0		Sum of lost time (s)				18.2			
Intersection Capacity Utilization			111.9%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Year 2030+Project AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1857	840	223	1932	123	290	30	58	148	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		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
Satd. Flow (prot)	1770	5085	1583	1770	5040		3433	3189		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5040		3433	3189		1770	1863	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)	133	2063	933	248	2147	137	322	33	64	164	78	444
RTOR Reduction (vph)	0	0	252	0	4	0	0	55	0	0	0	8
Lane Group Flow (vph)	133	2063	681	248	2280	0	322	42	0	164	78	436
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	22.1	62.2	79.4	25.5	66.0		17.2	20.4		17.2	20.4	42.5
Effective Green, g (s)	22.1	62.2	79.4	25.5	66.0		17.2	20.4		17.2	20.4	42.5
Actuated g/C Ratio	0.15	0.43	0.55	0.18	0.46		0.12	0.14		0.12	0.14	0.29
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	270	2181	867	311	2294		407	449		210	262	464
v/s Ratio Prot	0.08	0.41	0.09	0.14	0.45		0.09	0.01		0.09	0.04	0.14
v/s Ratio Perm			0.34									0.13
v/c Ratio	0.49	0.95	0.79	0.80	0.99		0.79	0.09		0.78	0.30	0.94
Uniform Delay, d1	56.3	39.8	26.0	57.3	39.3		62.2	54.2		62.1	55.9	50.0
Progression Factor	1.00	0.92	0.93	1.29	0.66		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.0	1.2	0.4	10.7	15.9		9.4	0.0		15.8	0.2	27.1
Delay (s)	56.6	37.9	24.5	84.7	41.7		71.6	54.3		77.9	56.1	77.1
Level of Service	E	D	C	F	D		E	D		E	E	E
Approach Delay (s)	34.7				45.9			67.6			74.9	
Approach LOS	C				D			E			E	

Intersection Summary			
HCM Average Control Delay	45.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Del Mar Heights Road & Third Ave.

Year 2030+Project AM
7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑	↑↑	↑
Volume (vph)	1944	170	132	2169	78	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2160	189	147	2410	87	68
RTOR Reduction (vph)	0	54	0	0	0	50
Lane Group Flow (vph)	2160	135	147	2410	87	18
Turn Type	Perm		Prot	Perm		
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	75.8	75.8	19.4	98.2	37.8	37.8
Effective Green, g (s)	75.8	75.8	19.4	98.2	37.8	37.8
Actuated g/C Ratio	0.52	0.52	0.13	0.68	0.26	0.26
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2658	828	237	3444	895	413
v/s Ratio Prot	c0.42		0.08	c0.47	c0.03	
v/s Ratio Perm		0.09				0.01
v/c Ratio	0.81	0.16	0.62	0.70	0.10	0.04
Uniform Delay, d1	28.7	18.0	59.3	14.4	40.7	40.1
Progression Factor	0.27	0.01	1.05	0.55	1.00	1.00
Incremental Delay, d2	0.9	0.0	4.1	0.5	0.2	0.2
Delay (s)	8.6	0.2	66.6	8.4	40.9	40.3
Level of Service	A	A	E	A	D	D
Approach Delay (s)	8.0			11.7	40.6	
Approach LOS	A			B	D	

Intersection Summary					
HCM Average Control Delay	10.9	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.61				
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	13.0		
Intersection Capacity Utilization	58.2%	ICU Level of Service	B		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
12: Del Mar Heights Road & First Ave.

Year 2030+Project AM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑↑	↑↑↑	↑	↑
Volume (vph)	1863	141	142	2236	65	65
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
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2070	157	158	2484	72	72
RTOR Reduction (vph)	0	47	0	0	0	52
Lane Group Flow (vph)	2070	110	158	2484	72	20
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	74.9	74.9	17.1	96.0	41.0	41.0
Effective Green, g (s)	74.9	74.9	17.1	96.0	41.0	41.0
Actuated g/C Ratio	0.52	0.52	0.12	0.66	0.28	0.28
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)	2627	818	405	3367	500	448
v/s Ratio Prot	c0.41		0.05	c0.49	c0.04	
v/s Ratio Perm		0.07				0.01
v/c Ratio	0.79	0.13	0.39	0.74	0.14	0.05
Uniform Delay, d1	28.6	18.2	59.1	16.2	38.9	37.8
Progression Factor	0.19	0.09	0.83	1.21	1.00	1.00
Incremental Delay, d2	1.0	0.0	0.2	0.3	0.6	0.2
Delay (s)	6.5	1.6	49.3	19.9	39.5	38.0
Level of Service	A	A	D	B	D	D
Approach Delay (s)	6.2			21.7	38.7	
Approach LOS	A			C	D	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Year 2030+Project AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	👤👤	👤👤👤		👤👤	👤👤👤		👤👤	👤👤👤	👤	👤👤	👤👤👤	
Volume (vph)	258	1084	571	300	1757	150	291	158	100	170	529	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	4822		3433	5025		3433	5085	1583	3433	4723	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	4822		3433	5025		3433	5085	1583	3433	4723	
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)	287	1204	634	333	1952	167	323	176	111	189	588	531
RTOR Reduction (vph)	0	65	0	0	7	0	0	0	80	0	114	0
Lane Group Flow (vph)	287	1773	0	333	2112	0	323	176	31	189	1005	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	13.2	59.9		15.5	62.4		14.9	40.1	40.1	9.0	33.4	
Effective Green, g (s)	13.2	59.9		15.5	62.4		14.9	40.1	40.1	9.0	33.4	
Actuated g/C Ratio	0.09	0.41		0.11	0.43		0.10	0.28	0.28	0.06	0.23	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	313	1992		367	2162		353	1406	438	213	1088	
v/s Ratio Prot	0.08	0.37		0.10	0.42		0.09	0.03		0.06	0.21	
v/s Ratio Perm									0.02			
v/c Ratio	0.92	0.89		0.91	0.98		0.92	0.13	0.07	0.89	1.11	dr
Uniform Delay, d1	65.4	39.5		64.0	40.6		64.4	39.3	38.7	67.5	54.6	
Progression Factor	0.66	1.43		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	26.3	5.6		24.7	14.6		27.0	0.1	0.1	32.0	12.9	
Delay (s)	69.5	62.1		88.8	55.2		91.4	39.4	38.8	99.5	67.4	
Level of Service	E	E		F	E		F	D	D	F	E	
Approach Delay (s)		63.1			59.8			66.8			72.0	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM Average Control Delay	64.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	91.5%	ICU Level of Service	F
Analysis Period (min)	15		
dr Defacto Right Lane Recode with 1 though lane as a right lane			
c Critical Lane Group			

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

Year 2030+Project AM
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	207	905	327	289	1515	170	454	200	240	200	310	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.92		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4883		3433	5008		3433	4669		1770	3288	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4883		3433	5008		3433	4669		1770	3288	
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)	230	1006	363	321	1683	189	504	222	267	222	344	309
RTOR Reduction (vph)	0	43	0	0	9	0	0	154	0	0	116	0
Lane Group Flow (vph)	230	1326	0	321	1863	0	504	335	0	222	537	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	12.3	56.5		16.5	60.5		22.6	31.4		20.8	30.1	
Effective Green, g (s)	12.3	56.5		16.5	60.5		22.6	31.4		20.8	30.1	
Actuated g/C Ratio	0.08	0.39		0.11	0.42		0.16	0.22		0.14	0.21	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	291	1903		391	2090		535	1011		254	683	
v/s Ratio Prot	0.07	0.27		0.09	0.37		0.15	0.07		0.13	0.16	
v/s Ratio Perm												
v/c Ratio	0.79	0.70		0.82	0.89		0.94	0.33		0.87	0.79	
Uniform Delay, d1	65.1	37.1		62.8	39.2		60.6	47.9		60.8	54.4	
Progression Factor	1.00	1.00		1.13	1.01		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.7	2.1		8.2	4.1		24.9	0.3		25.9	7.3	
Delay (s)	77.8	39.2		79.3	43.7		85.5	48.2		86.7	61.7	
Level of Service	E	D		E	D		F	D		F	E	
Approach Delay (s)		44.8			48.9			67.1			68.0	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM Average Control Delay	53.9			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.88											
Actuated Cycle Length (s)	145.0			Sum of lost time (s)			19.5					
Intersection Capacity Utilization	85.7%			ICU Level of Service			E					
Analysis Period (min)	15											
o Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Del Mar Heights Road & Torrey Ridge Dr.

Year 2030+Project AM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑↑		↰	↑		↰	↑	
Volume (vph)	212	928	132	81	1511	216	149	156	16	78	62	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4990		1770	4990		1770	1836		1770	1655	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4990		1770	4990		1770	1836		1770	1655	
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	1031	147	90	1679	240	166	173	18	87	69	200
RTOR Reduction (vph)	0	11	0	0	12	0	0	2	0	0	75	0
Lane Group Flow (vph)	236	1167	0	90	1907	0	166	189	0	87	194	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	21.9	79.0		11.3	67.7		15.8	27.3		8.7	20.2	
Effective Green, g (s)	21.9	79.0		11.3	67.7		15.8	27.3		8.7	20.2	
Actuated g/C Ratio	0.15	0.54		0.08	0.47		0.11	0.19		0.06	0.14	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	267	2719		138	2330		193	346		106	231	
v/s Ratio Prot	c0.13	0.23		0.05	c0.38		c0.09	0.10		0.05	c0.12	
v/s Ratio Perm												
v/c Ratio	0.88	0.43		0.65	0.82		0.86	0.54		0.82	0.84	
Uniform Delay, d1	60.3	19.6		64.9	33.4		63.5	53.2		67.4	60.8	
Progression Factor	1.15	0.71		1.00	0.71		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.2	0.4		3.6	1.5		29.3	0.9		36.3	22.3	
Delay (s)	90.7	14.3		68.6	25.2		92.8	54.2		103.6	83.1	
Level of Service	F	B		E	C		F	D		F	F	
Approach Delay (s)		27.1			27.2			72.1			88.1	
Approach LOS		C			C			E			F	

Intersection Summary			
HCM Average Control Delay	36.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

16: Del Mar Heights Road & Lansdale Drive

Year 2030+Project AM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	166	806	35	67	1581	36	62	26	76	69	60	492
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5053		1770	5068		1770	1655		1770	1614	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5053		1770	5068		1770	1655		1770	1614	
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)	184	896	39	74	1757	40	69	29	84	77	67	547
RTOR Reduction (vph)	0	3	0	0	2	0	0	61	0	0	146	0
Lane Group Flow (vph)	184	932	0	74	1795	0	69	52	0	77	468	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	16.9	65.5		10.0	58.6		7.4	40.2		10.2	42.8	
Effective Green, g (s)	16.9	65.5		10.0	58.6		7.4	40.2		10.2	42.8	
Actuated g/C Ratio	0.12	0.45		0.07	0.40		0.05	0.28		0.07	0.30	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	206	2283		122	2048		90	459		125	476	
v/s Ratio Prot	c0.10	0.18		0.04	c0.35		0.04	0.03		c0.04	c0.29	
v/s Ratio Perm												
v/c Ratio	0.89	0.41		0.61	0.88		0.77	0.11		0.62	0.98	
Uniform Delay, d1	63.2	26.7		65.6	39.9		67.9	39.1		65.5	50.7	
Progression Factor	1.31	0.94		0.88	1.08		1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.8	0.5		5.3	5.2		28.9	0.0		6.2	36.6	
Delay (s)	114.6	25.5		63.2	48.3		96.8	39.1		71.7	87.4	
Level of Service	F	C		E	D		F	D		E	F	
Approach Delay (s)		40.1			48.9			61.0			85.6	
Approach LOS		D			D			E			F	
Intersection Summary												
HCM Average Control Delay	53.5			HCM Level of Service			D					
HCM Volume to Capacity ratio	0.91											
Actuated Cycle Length (s)	145.0			Sum of lost time (s)			19.3					
Intersection Capacity Utilization	93.6%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
17: Del Mar Heights Road & Carmel Canyon Road

Year 2030+Project AM
7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↑	↑↑↑	↑↑	↑
Volume (vph)	910	213	661	1417	377	548
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4940		1770	5085	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4940		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1011	237	734	1574	419	609
RTOR Reduction (vph)	26	0	0	0	0	1
Lane Group Flow (vph)	1222	0	734	1574	419	608
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	38.4		64.9	108.4	25.7	90.6
Effective Green, g (s)	38.4		64.9	108.4	25.7	90.6
Actuated g/C Ratio	0.26		0.45	0.75	0.18	0.62
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	1308		792	3801	608	989
v/s Ratio Prot	c0.25		c0.41	0.31	c0.12	0.28
v/s Ratio Perm						0.11
v/c Ratio	0.93		0.93	0.41	0.69	0.61
Uniform Delay, d1	52.1		37.8	6.7	55.9	16.6
Progression Factor	1.20		1.00	1.00	1.00	1.00
Incremental Delay, d2	13.0		16.4	0.3	2.6	0.8
Delay (s)	75.6		54.2	7.0	58.5	17.4
Level of Service	E		D	A	E	B
Approach Delay (s)	75.6			22.0	34.1	
Approach LOS	E			C	C	
Intersection Summary						
HCM Average Control Delay			39.3		HCM Level of Service	D
HCM Volume to Capacity ratio			0.88			
Actuated Cycle Length (s)			145.0		Sum of lost time (s)	16.0
Intersection Capacity Utilization			83.0%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

6: Del Mar Heights Road & Mango Drive

Year 2030 + Project PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	1156	50	163	933	263	90	50	96	476	40	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.95			1.00	1.00	0.95	0.95	
Frt	1.00	0.99		1.00	0.97			1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (prot)	1770	5053		1770	3422			1805	1583	1681	1619	
Flt Permitted	0.95	1.00		0.95	1.00			0.97	1.00	0.95	0.98	
Satd. Flow (perm)	1770	5053		1770	3422			1805	1583	1681	1619	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	1217	53	172	982	277	95	53	101	501	42	147
RTOR Reduction (vph)	0	3	0	0	17	0	0	0	87	0	18	0
Lane Group Flow (vph)	158	1267	0	172	1242	0	0	148	14	351	321	0
Turn Type	Prot			Prot			Split			Perm	Split	
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			
Actuated Green, G (s)	16.4	53.9		16.8	54.1			20.8	20.8	33.8	33.8	
Effective Green, g (s)	16.4	53.9		16.8	54.1			20.8	20.8	33.8	33.8	
Actuated g/C Ratio	0.11	0.37		0.12	0.37			0.14	0.14	0.23	0.23	
Clearance Time (s)	4.6	5.5		4.4	5.5			4.9	4.9	4.9	4.9	
Vehicle Extension (s)	2.0	3.7		2.0	3.7			2.0	2.0	3.0	3.0	
Lane Grp Cap (vph)	200	1878		205	1277			259	227	392	377	
v/s Ratio Prot	0.09	0.25		0.10	0.36			0.08		0.21	0.20	
v/s Ratio Perm									0.01			
v/c Ratio	0.79	0.67		0.84	0.97			0.57	0.06	0.90	0.85	
Uniform Delay, d1	62.6	38.2		62.8	44.7			57.9	53.7	53.9	53.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.7	2.0		23.9	18.9			1.9	0.0	22.1	16.6	
Delay (s)	80.3	40.2		86.7	63.6			59.8	53.7	75.9	69.7	
Level of Service	F	D		F	E			E	D	E	E	
Approach Delay (s)		44.6			66.4			57.4			72.9	
Approach LOS		D			E			E			E	

Intersection Summary

HCM Average Control Delay	58.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

7: Del Mar Heights Road & Portofino Drive

Year 2030 + Project PM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑		↑
Volume (veh/h)	1870	80	0	1744	0	123
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)	2078	89	0	1938	0	137
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			0.80		0.81	0.80
vC, conflicting volume			2167		3091	737
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1566		1596	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	84
cM capacity (veh/h)			332		79	862
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	831	831	504	969	969	137
Volume Left	0	0	0	0	0	0
Volume Right	0	0	89	0	0	137
cSH	1700	1700	1700	1700	1700	862
Volume to Capacity	0.49	0.49	0.30	0.57	0.57	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	10.0
Lane LOS						A
Approach Delay (s)	0.0			0.0		10.0
Approach LOS						A
Intersection Summary						
Average Delay	0.3					
Intersection Capacity Utilization	52.2%					
ICU Level of Service	A					
Analysis Period (min)	15					

HCM Signalized Intersection Capacity Analysis

8: Del Mar Heights Road & I-5 SB Ramps

Year 2030 + Project PM

7/16/2013



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	↑
Volume (vph)	0	1413	1315	0	920	400
Ideal Flow (vphpl)	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
Frt		1.00	1.00		0.99	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		3427	1441
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		3427	1441
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1570	1461	0	1022	444
RTOR Reduction (vph)	0	0	0	0	4	18
Lane Group Flow (vph)	0	1570	1461	0	1062	382
Turn Type					Perm	
Protected Phases		2.6	6.2		4	
Permitted Phases						4
Actuated Green, G (s)		42.2	42.2		25.9	25.9
Effective Green, g (s)		42.2	42.2		25.9	25.9
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)		1867	1867		1109	467
v/s Ratio Prot		0.44	0.41		0.31	
v/s Ratio Perm						0.27
v/c Ratio		0.84	0.78		0.96	0.82
Uniform Delay, d1		16.0	15.2		26.5	24.9
Progression Factor		1.00	1.00		1.00	1.00
Incremental Delay, d2		3.6	2.2		17.6	10.7
Delay (s)		19.7	17.4		44.1	35.6
Level of Service		B	B		D	D
Approach Delay (s)		19.7	17.4		41.8	
Approach LOS		B	B		D	
Intersection Summary						
HCM Average Control Delay		26.1		HCM Level of Service		C
HCM Volume to Capacity ratio		0.89				
Actuated Cycle Length (s)		80.0		Sum of lost time (s)		11.9
Intersection Capacity Utilization		148.5%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Year 2030 + Project PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	750	1866	0	0	1777	731	630	30	1050	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1474	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1474	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	789	1964	0	0	1871	769	663	32	1105	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	251	0	6	6	0	0	0
Lane Group Flow (vph)	789	1964	0	0	1871	518	597	600	591	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	28.8	81.7			47.7	47.7	51.4	51.4	51.4			
Effective Green, g (s)	28.8	81.7			47.7	47.7	51.4	51.4	51.4			
Actuated g/C Ratio	0.20	0.56			0.33	0.33	0.35	0.35	0.35			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	682	1994			1673	521	596	523	533			
v/s Ratio Prot	c0.23	0.55			c0.37	0.33	0.36	c0.41	0.39			
v/s Ratio Perm												
v/c Ratio	1.16	0.98			1.12	0.99	1.00	1.15	1.11			
Uniform Delay, d1	58.1	31.0			48.6	48.5	46.8	46.8	46.8			
Progression Factor	1.00	1.00			1.07	1.17	1.00	1.00	1.00			
Incremental Delay, d2	86.5	16.9			54.2	10.6	37.3	86.9	72.4			
Delay (s)	144.6	47.9			106.1	67.6	84.1	133.7	119.2			
Level of Service	F	D			F	E	F	F	F			
Approach Delay (s)		75.6			94.9			112.4			0.0	
Approach LOS		E			F			F			A	
Intersection Summary												
HCM Average Control Delay		91.9				HCM Level of Service		F				
HCM Volume to Capacity ratio		1.14										
Actuated Cycle Length (s)		145.0				Sum of lost time (s)		17.1				
Intersection Capacity Utilization		109.8%				ICU Level of Service		H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Year 2030 + Project PM

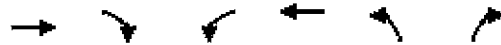
7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2653	300	64	1848	194	680	70	183	73	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.89		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
Satd. Flow (prot)	1770	5085	1583	1770	5013		3433	3156		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5013		3433	3156		1770	1863	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)	278	2948	333	71	2053	216	756	78	203	81	44	222
RTOR Reduction (vph)	0	0	65	0	9	0	0	101	0	0	0	0
Lane Group Flow (vph)	278	2948	268	71	2260	0	756	180	0	81	44	222
Turn Type	Prot	pm+ov		Prot			Prot			Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	32.7	77.3	96.9	10.2	55.2		19.6	27.3		10.5	18.2	50.9
Effective Green, g (s)	32.7	77.3	96.9	10.2	55.2		19.6	27.3		10.5	18.2	50.9
Actuated g/C Ratio	0.23	0.53	0.67	0.07	0.38		0.14	0.19		0.07	0.13	0.35
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	399	2711	1058	125	1908		464	594		128	234	556
v/s Ratio Prot	c0.16	c0.58	0.03	0.04	c0.45		c0.22	0.06		0.05	0.02	c0.09
v/s Ratio Perm			0.13									0.05
v/c Ratio	0.70	1.09	0.25	0.57	1.18		1.63	0.30		0.63	0.19	0.40
Uniform Delay, d1	51.6	33.8	9.6	65.3	44.9		62.7	50.7		65.4	56.8	35.5
Progression Factor	1.08	0.85	0.95	1.01	0.97		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	42.6	0.0	3.1	88.1		292.9	0.1		7.3	0.1	0.2
Delay (s)	57.7	71.2	9.2	68.7	131.8		355.6	50.8		72.7	56.9	35.7
Level of Service	E	E	A	E	F		F	D		E	E	D
Approach Delay (s)	64.3			129.8			273.0			47.0		
Approach LOS	E			F			F			D		
Intersection Summary												
HCM Average Control Delay	114.3			HCM Level of Service			F					
HCM Volume to Capacity ratio	1.12											
Actuated Cycle Length (s)	145.0			Sum of lost time (s)			24.8					
Intersection Capacity Utilization	96.5%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
11: Del Mar Heights Road & Third Ave.

Year 2030 + Project PM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑↑	↑↑	↑
Volume (vph)	2601	200	155	1981	262	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2738	211	163	2085	276	215
RTOR Reduction (vph)	0	42	0	0	0	175
Lane Group Flow (vph)	2738	169	163	2085	276	40
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	85.9	85.9	20.1	109.0	27.0	27.0
Effective Green, g (s)	85.9	85.9	20.1	109.0	27.0	27.0
Actuated g/C Ratio	0.59	0.59	0.14	0.75	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3012	938	245	3823	639	295
v/s Ratio Prot	c0.54		c0.09	0.41	c0.08	
v/s Ratio Perm		0.11				0.03
v/c Ratio	0.91	0.18	0.67	0.55	0.43	0.14
Uniform Delay, d1	26.1	13.5	59.3	7.6	52.2	49.3
Progression Factor	0.35	0.04	1.04	1.33	1.00	1.00
Incremental Delay, d2	0.4	0.0	5.6	0.1	2.1	1.0
Delay (s)	9.5	0.5	67.0	10.2	54.3	50.2
Level of Service	A	A	E	B	D	D
Approach Delay (s)	8.8			14.3	52.5	
Approach LOS	A			B	D	

Intersection Summary					
HCM Average Control Delay	14.8	HCM Level of Service	B		
HCM Volume to Capacity ratio	0.78				
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	76.3%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis

12: Del Mar Heights Road & First Ave.

Year 2030 + Project PM

7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑↑	↑↑↑	↑	↑
Volume (vph)	2638	166	166	1918	218	218
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
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	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)	2931	184	184	2131	242	242
RTOR Reduction (vph)	0	33	0	0	0	190
Lane Group Flow (vph)	2931	151	184	2131	242	52
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	84.4	84.4	17.6	106.0	31.0	31.0
Effective Green, g (s)	84.4	84.4	17.6	106.0	31.0	31.0
Actuated g/C Ratio	0.58	0.58	0.12	0.73	0.21	0.21
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2960	921	417	3717	378	338
v/s Ratio Prot	c0.58		0.05	c0.42	c0.14	
v/s Ratio Perm		0.10				0.03
v/c Ratio	0.99	0.16	0.44	0.57	0.64	0.15
Uniform Delay, d1	29.9	14.0	59.1	9.0	51.9	46.3
Progression Factor	0.51	0.82	0.96	1.57	1.00	1.00
Incremental Delay, d2	9.9	0.0	0.2	0.1	8.1	1.0
Delay (s)	25.2	11.6	56.9	14.2	60.0	47.3
Level of Service	C	B	E	B	E	D
Approach Delay (s)	24.4			17.6	53.6	
Approach LOS	C			B	D	
Intersection Summary						
HCM Average Control Delay		24.1		HCM Level of Service		C
HCM Volume to Capacity ratio		0.86				
Actuated Cycle Length (s)		145.0		Sum of lost time (s)		12.0
Intersection Capacity Utilization		77.8%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Year 2030 + Project PM

7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  		 	  		 	  	
Volume (vph)	553	1886	604	194	1185	190	617	779	328	190	242	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	*0.95		0.97	*0.95		0.97	*0.95	1.00	0.97	*0.95	
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5116		3433	5199		3433	5309	1583	3433	4853	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5116		3433	5199		3433	5309	1583	3433	4853	
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)	614	2096	671	216	1317	211	686	866	364	211	269	360
RTOR Reduction (vph)	0	39	0	0	16	0	0	0	74	0	182	0
Lane Group Flow (vph)	614	2728	0	216	1512	0	686	866	290	211	447	0
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	30.4	65.5		14.4	49.7		19.6	33.8	33.8	10.8	24.2	
Effective Green, g (s)	30.4	65.5		14.4	49.7		19.6	33.8	33.8	10.8	24.2	
Actuated g/C Ratio	0.21	0.45		0.10	0.34		0.14	0.23	0.23	0.07	0.17	
Clearance Time (s)	4.4	6.1		4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8		2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	720	2311		341	1782		464	1238	369	256	810	
v/s Ratio Prot	c0.18	c0.53		0.06	0.29		c0.20	0.16		0.06	0.09	
v/s Ratio Perm									c0.18			
v/c Ratio	0.85	1.18		0.63	0.85		1.48	0.70	0.78	0.82	0.55	
Uniform Delay, d1	55.1	39.8		62.8	44.2		62.7	50.9	52.2	66.2	55.4	
Progression Factor	1.22	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.8	84.0		2.8	5.3		226.7	1.9	10.9	18.1	0.9	
Delay (s)	72.8	123.3		65.6	49.4		289.4	52.8	63.1	84.3	56.3	
Level of Service	E	F		E	D		F	D	E	F	E	
Approach Delay (s)		114.1			51.4			139.5			63.3	
Approach LOS		F			D			F			E	
Intersection Summary												
HCM Average Control Delay		101.0		HCM Level of Service				F				
HCM Volume to Capacity ratio		1.09										
Actuated Cycle Length (s)		145.0		Sum of lost time (s)				14.9				
Intersection Capacity Utilization		102.8%		ICU Level of Service				G				
Analysis Period (min)		15										
c Critical Lane Group												

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

Year 2030 + Project PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱↰		↰↱	↰↱↰		↰↱	↰↱↰		↰	↰↱	
Volume (vph)	198	1724	619	85	809	120	511	300	175	200	250	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.94		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	4884		3433	4987		3433	4805		1770	3314	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	4884		3433	4987		3433	4805		1770	3314	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	208	1815	652	89	852	126	538	316	184	211	263	194
RTOR Reduction (vph)	0	41	0	0	12	0	0	76	0	0	99	0
Lane Group Flow (vph)	208	2426	0	89	966	0	538	424	0	211	358	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	12.7	71.3		6.4	64.8		22.2	27.4		20.1	25.8	
Effective Green, g (s)	12.7	71.3		6.4	64.8		22.2	27.4		20.1	25.8	
Actuated g/C Ratio	0.09	0.49		0.04	0.45		0.15	0.19		0.14	0.18	
Clearance Time (s)	4.4	5.6		4.4	5.8		4.4	5.4		4.4	4.9	
Vehicle Extension (s)	2.0	3.8		2.0	4.0		2.0	4.0		2.0	5.8	
Lane Grp Cap (vph)	301	2402		152	2229		526	908		245	590	
v/s Ratio Prot	0.06	0.50		0.03	0.19		0.16	0.09		0.12	0.11	
v/s Ratio Perm												
v/c Ratio	0.69	1.01		0.59	0.43		1.02	0.47		0.86	0.61	
Uniform Delay, d1	64.2	36.8		68.0	27.5		61.4	52.3		61.1	54.9	
Progression Factor	1.00	1.00		1.01	1.11		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	20.8		3.5	0.6		45.2	0.5		24.5	3.0	
Delay (s)	69.7	57.7		72.4	31.0		106.6	52.8		85.6	57.9	
Level of Service	E	E		E	C		F	D		F	E	
Approach Delay (s)		58.6			34.4			80.7			66.7	
Approach LOS		E			C			F			E	

Intersection Summary			
HCM Average Control Delay	59.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

15: Del Mar Heights Road & Torrey Ridge Dr.

Year 2030 + Project PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	1777	166	8	963	23	96	14	45	39	8	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5020		1770	5067		1770	1651		1770	1627	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5020		1770	5067		1770	1651		1770	1627	
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	1974	184	9	1070	26	107	16	50	43	9	48
RTOR Reduction (vph)	0	5	0	0	1	0	0	44	0	0	44	0
Lane Group Flow (vph)	54	2153	0	9	1095	0	107	22	0	43	13	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.5	100.1		0.9	92.8		12.8	18.5		6.8	12.5	
Effective Green, g (s)	7.5	100.1		0.9	92.8		12.8	18.5		6.8	12.5	
Actuated g/C Ratio	0.05	0.69		0.01	0.64		0.09	0.13		0.05	0.09	
Clearance Time (s)	4.4	5.4		4.4	6.1		4.0	4.9		4.0	4.9	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	92	3466		11	3243		156	211		83	140	
v/s Ratio Prot	c0.03	c0.43		0.01	0.22		c0.06	c0.01		0.02	0.01	
v/s Ratio Perm												
v/c Ratio	0.59	0.62		0.82	0.34		0.69	0.11		0.52	0.09	
Uniform Delay, d1	67.2	12.2		72.0	12.0		64.1	55.9		67.5	61.0	
Progression Factor	1.28	0.42		1.49	0.56		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.3		156.0	0.3		9.5	0.1		2.3	0.1	
Delay (s)	88.1	5.4		263.3	6.9		73.7	56.0		69.8	61.1	
Level of Service	F	A		F	A		E	E		E	E	
Approach Delay (s)		7.4			9.0			66.9			64.8	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	8.4
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

16: Del Mar Heights Road & Lansdale Drive

Year 2030 + Project PM

7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑↑		↰	↑		↰	↑	
Volume (vph)	302	1367	65	22	687	25	56	46	49	33	33	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.92		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5051		1770	5058		1770	1719		1770	1614	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	5051		1770	5058		1770	1719		1770	1614	
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)	336	1519	72	24	763	28	62	51	54	37	37	302
RTOR Reduction (vph)	0	2	0	0	2	0	0	31	0	0	238	0
Lane Group Flow (vph)	336	1589	0	24	789	0	62	74	0	37	101	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	31.7	95.0		4.5	67.8		8.0	20.3		6.1	18.2	
Effective Green, g (s)	31.7	95.0		4.5	67.8		8.0	20.3		6.1	18.2	
Actuated g/C Ratio	0.22	0.66		0.03	0.47		0.06	0.14		0.04	0.13	
Clearance Time (s)	4.4	5.4		4.4	5.4		4.4	4.9		4.4	5.1	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	387	3309		55	2365		98	241		74	203	
v/s Ratio Prot	c0.19	c0.31		0.01	0.16		c0.04	0.04		0.02	c0.06	
v/s Ratio Perm												
v/c Ratio	0.87	0.48		0.44	0.33		0.63	0.31		0.50	0.50	
Uniform Delay, d1	54.6	12.6		69.0	24.3		67.1	56.0		68.0	59.1	
Progression Factor	0.80	2.01		1.07	0.84		1.00	1.00		1.00	1.00	
Incremental Delay, d2	15.0	0.4		2.0	0.4		9.4	0.3		1.9	0.7	
Delay (s)	58.5	25.7		75.8	20.8		76.5	56.3		69.9	59.8	
Level of Service	E	C		E	C		E	E		E	E	
Approach Delay (s)		31.4			22.4			63.8			60.8	
Approach LOS		C			C			E			E	
Intersection Summary												
HCM Average Control Delay		34.2					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		145.0					Sum of lost time (s)			13.9		
Intersection Capacity Utilization		69.1%					ICU Level of Service			C		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
17: Del Mar Heights Road & Carmel Canyon Road

Year 2030 + Project PM
7/16/2013



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↱	↑↑↑	↱↱	↱
Volume (vph)	1344	295	153	606	167	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		4.4	5.6	5.3	4.4
Lane Util. Factor	0.91		1.00	0.91	0.97	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	4948		1770	5085	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	4948		1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1493	328	170	673	186	456
RTOR Reduction (vph)	19	0	0	0	0	7
Lane Group Flow (vph)	1802	0	170	673	186	449
Turn Type			Prot		pm+ov	
Protected Phases	2		1	6	8	1
Permitted Phases						8
Actuated Green, G (s)	82.2		26.5	113.8	20.3	46.8
Effective Green, g (s)	82.2		26.5	113.8	20.3	46.8
Actuated g/C Ratio	0.57		0.18	0.78	0.14	0.32
Clearance Time (s)	6.3		4.4	5.6	5.3	4.4
Vehicle Extension (s)	3.5		2.0	3.3	2.0	2.0
Lane Grp Cap (vph)	2805		323	3991	481	511
v/s Ratio Prot	0.36		0.10	0.13	0.05	0.16
v/s Ratio Perm						0.12
v/c Ratio	0.64		0.53	0.17	0.39	0.88
Uniform Delay, d1	21.4		53.6	3.9	56.7	46.4
Progression Factor	0.65		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1		0.7	0.1	0.2	15.3
Delay (s)	14.9		54.3	4.0	56.9	61.7
Level of Service	B		D	A	E	E
Approach Delay (s)	14.9			14.1	60.3	
Approach LOS	B			B	E	
Intersection Summary						
HCM Average Control Delay			23.5		HCM Level of Service	C
HCM Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			145.0		Sum of lost time (s)	15.1
Intersection Capacity Utilization			66.9%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

Appendix F

**Year 2030 + Project (Build-out) With Mitigation
Synchro Worksheets**

ONE PASEO – Updated Traffic Analysis for Revised Project

January 7, 2014

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Year 2030+Project AM
WITH MITIGATION 7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	1778	0	0	1980	839	400	60	1280	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.95	0.86	0.91			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	5085			5085	1583	1681	1407	2882			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	5085			5085	1583	1681	1407	2882			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	394	1891	0	0	2106	893	426	64	1362	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	410	0	6	10	0	0	0
Lane Group Flow (vph)	394	1891	0	0	2106	483	383	496	957	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	17.0	78.7			56.5	56.5	54.4	54.4	54.4			
Effective Green, g (s)	17.0	78.7			56.5	56.5	54.4	54.4	54.4			
Actuated g/C Ratio	0.12	0.54			0.39	0.39	0.38	0.38	0.38			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	402	2760			1981	617	631	528	1081			
v/s Ratio Prot	0.11	0.37			0.41	0.31	0.23	0.35	0.33			
v/s Ratio Perm												
v/c Ratio	0.98	0.69			1.06	0.78	0.61	0.94	0.89			
Uniform Delay, d1	63.8	24.1			44.2	38.9	36.7	43.7	42.4			
Progression Factor	1.00	1.00			0.89	0.86	1.00	1.00	1.00			
Incremental Delay, d2	39.5	1.4			36.0	6.2	1.7	25.1	8.9			
Delay (s)	103.3	25.5			75.4	39.6	38.3	68.8	51.2			
Level of Service	F	C			E	D	D	E	D			
Approach Delay (s)			38.9		64.7				53.3	0.0		
Approach LOS			D		E				D	A		
Intersection Summary												
HCM Average Control Delay			53.5		HCM Level of Service				D			
HCM Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			145.0		Sum of lost time (s)				17.1			
Intersection Capacity Utilization			97.2%		ICU Level of Service				F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Year 2030+Project AM
WITH MITIGATION 7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱↰	↰	↰↱	↰↱↰		↰↱	↰	↰	↰	↰	↰
Volume (vph)	120	1857	840	223	1932	123	290	30	58	148	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5040		4990	1863	1583	1770	1863	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
Satd. Flow (perm)	3433	5085	1583	3433	5040		4990	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	1955	884	235	2034	129	305	32	61	156	74	421
RTOR Reduction (vph)	0	0	228	0	4	0	0	0	54	0	0	7
Lane Group Flow (vph)	126	1955	656	235	2159	0	305	32	7	156	74	414
Turn Type	Prot	pm+ov		Prot			Prot	Perm		Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	20.0	76.6	90.7	13.2	70.2		14.1	17.5	17.5	18.0	21.4	41.4
Effective Green, g (s)	20.0	76.6	90.7	13.2	70.2		14.1	17.5	17.5	18.0	21.4	41.4
Actuated g/C Ratio	0.14	0.53	0.63	0.09	0.48		0.10	0.12	0.12	0.12	0.15	0.29
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	474	2686	990	313	2440		485	225	191	220	275	452
v/s Ratio Prot	0.04	0.38	0.06	0.07	0.43		0.06	0.02		0.09	0.04	0.13
v/s Ratio Perm			0.35						0.00			0.14
v/c Ratio	0.27	0.73	0.66	0.75	0.88		0.63	0.14	0.04	0.71	0.27	0.92
Uniform Delay, d1	55.9	26.2	17.4	64.3	33.8		62.9	57.0	56.3	61.0	54.9	50.1
Progression Factor	1.05	0.87	1.75	1.09	0.85		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.1	0.8	6.9	4.1		1.8	0.1	0.0	8.3	0.2	22.7
Delay (s)	59.0	23.8	31.3	77.1	32.9		64.8	57.1	56.3	69.2	55.1	72.8
Level of Service	E	C	C	E	C		E	E	E	E	E	E
Approach Delay (s)		27.5			37.2			62.9			69.9	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM Average Control Delay	37.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Year 2030+Project AM
WITH MITIGATION 7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NET	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱↰	↰	↰↱	↰↱↰		↰↱	↰↱↰	↰	↰↱	↰↱↰	
Volume (vph)	258	1084	571	300	1757	150	291	158	100	170	529	478
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	12	12	13	12	12	13	12	12	13
Total Lost time (s)	4.4	6.1	6.1	4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	*0.98	1.00	0.97	*0.98		0.97	*0.98	1.00	0.97	*0.98	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5476	1636	3433	5412		3433	5476	1636	3433	5087	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5476	1636	3433	5412		3433	5476	1636	3433	5087	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	272	1141	601	316	1849	158	306	166	105	179	557	503
RTOR Reduction (vph)	0	0	208	0	6	0	0	0	77	0	115	0
Lane Group Flow (vph)	272	1141	393	316	2001	0	306	166	28	179	945	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	14.9	57.4	57.4	16.8	59.5		17.3	38.4	38.4	11.9	32.2	
Effective Green, g (s)	14.9	57.4	57.4	16.8	59.5		17.3	38.4	38.4	11.9	32.2	
Actuated g/C Ratio	0.10	0.40	0.40	0.12	0.41		0.12	0.26	0.26	0.08	0.22	
Clearance Time (s)	4.4	6.1	6.1	4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	353	2168	648	398	2221		410	1450	433	282	1130	
v/s Ratio Prot	0.08	0.21		c0.09	c0.37		c0.09	0.03		0.05	c0.19	
v/s Ratio Perm			0.24						0.02			
v/c Ratio	0.77	0.53	0.61	0.79	0.90		0.75	0.11	0.06	0.63	1.09dr	
Uniform Delay, d1	63.4	33.4	34.8	62.4	40.0		61.7	40.4	39.9	64.4	53.9	
Progression Factor	1.48	0.39	0.28	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.0	0.6	2.7	9.8	6.4		6.4	0.0	0.1	3.4	5.6	
Delay (s)	99.5	13.5	12.5	72.2	46.4		68.1	40.5	39.9	67.9	59.5	
Level of Service	F	B	B	E	D		E	D	D	E	E	
Approach Delay (s)		24.8			49.9			55.0			60.7	
Approach LOS		C			D			E			E	

Intersection Summary		
HCM Average Control Delay	44.3	HCM Level of Service D
HCM Volume to Capacity ratio	0.82	
Actuated Cycle Length (s)	145.0	Sum of lost time (s) 15.2
Intersection Capacity Utilization	91.5%	ICU Level of Service F
Analysis Period (min)	15	

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

9: Del Mar Heights Road & I-5 NB Ramps

Year 2030 + Project PM
WITH MITIGATION 7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↑			↑↑↑	↰	↰	↕	↰↱			
Volume (vph)	750	1866	0	0	1777	731	630	30	1050	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	13	12	12	13	12	12	12
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.95	0.95	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.92	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (prot)	3433	5085			5085	1636	1681	1601	3109			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.98	1.00			
Satd. Flow (perm)	3433	5085			5085	1636	1681	1601	3109			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	789	1964	0	0	1871	769	663	32	1105	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	361	0	9	18	0	0	0
Lane Group Flow (vph)	789	1964	0	0	1871	408	471	447	855	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	29.9	88.8			53.7	53.7	44.3	44.3	44.3			
Effective Green, g (s)	29.9	88.8			53.7	53.7	44.3	44.3	44.3			
Actuated g/C Ratio	0.21	0.61			0.37	0.37	0.31	0.31	0.31			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	708	3114			1883	606	514	489	950			
v/s Ratio Prot	c0.23	0.39			c0.37	0.25	c0.28	0.28	0.28			
v/s Ratio Perm												
v/c Ratio	1.11	0.63			0.99	0.67	0.92	0.91	0.90			
Uniform Delay, d1	57.6	17.7			45.5	38.3	48.6	48.5	48.2			
Progression Factor	1.00	1.00			0.96	0.99	1.00	1.00	1.00			
Incremental Delay, d2	69.8	1.0			13.9	3.2	21.1	21.5	11.2			
Delay (s)	127.3	18.7			57.5	41.3	69.6	70.0	59.5			
Level of Service	F	B			E	D	E	E	E			
Approach Delay (s)		49.8			52.8			64.8			0.0	
Approach LOS		D			D			E			A	

Intersection Summary			
HCM Average Control Delay	54.7	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

10: Del Mar Heights Road & High Bluff Drive

Year 2030 + Project PM
WITH MITIGATION 7/16/2013



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱↰	↰	↰↱	↰↱↰		↰↱	↰	↰	↰	↰	↰
Volume (vph)	250	2653	300	64	1848	194	680	70	183	73	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	12	12	12	12	12	13	12	12	13
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	0.97	*0.95	1.00	0.97	*0.95		*0.95	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5309	1636	3433	5233		5043	1863	1636	1770	1863	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5309	1636	3433	5233		5043	1863	1636	1770	1863	1636
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	263	2793	316	67	1945	204	716	74	193	77	42	211
RTOR Reduction (vph)	0	0	62	0	8	0	0	0	149	0	0	1
Lane Group Flow (vph)	263	2793	254	67	2141	0	716	74	44	77	42	210
Turn Type	Prot	pm+ov		Prot			Prot	Perm		Prot	pm+ov	
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	14.4	79.0	101.7	5.5	70.5		22.7	30.1	30.1	10.7	18.1	32.5
Effective Green, g (s)	14.4	79.0	101.7	5.5	70.5		22.7	30.1	30.1	10.7	18.1	32.5
Actuated g/C Ratio	0.10	0.54	0.70	0.04	0.49		0.16	0.21	0.21	0.07	0.12	0.22
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	341	2892	1147	130	2544		789	387	340	131	233	367
v/s Ratio Prot	c0.08	c0.53	0.03	0.02	0.41		c0.14	0.04		0.04	0.02	c0.06
v/s Ratio Perm			0.12						0.03			0.07
v/c Ratio	0.77	0.97	0.22	0.52	0.84		0.91	0.19	0.13	0.59	0.18	0.57
Uniform Delay, d1	63.7	31.7	7.7	68.4	32.4		60.1	47.4	46.8	65.0	56.8	50.1
Progression Factor	1.00	0.97	1.45	1.03	1.03		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	8.4	0.0	1.2	3.1		13.8	0.1	0.1	4.3	0.1	1.3
Delay (s)	71.0	39.0	11.1	71.5	36.6		73.9	47.5	46.8	69.3	56.9	51.4
Level of Service	E	D	B	E	D		E	D	D	E	E	D
Approach Delay (s)		38.9			37.6			66.6			56.3	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM Average Control Delay	43.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.2
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

13: Del Mar Heights Road & El Camino Real

Year 2030 + Project PM
WITH MITIGATION 7/16/2013

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	553	1886	604	194	1185	190	617	779	328	190	242	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	13	12	12	12	12	12	13	12	12	12
Total Lost time (s)	4.4	6.1	6.1	4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Lane Util. Factor	0.97	*0.95	1.00	0.97	*0.95		0.97	*0.95	1.00	0.97	*0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5309	1636	3433	5199		3433	5309	1636	3433	4853	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5309	1636	3433	5199		3433	5309	1636	3433	4853	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	582	1985	636	204	1247	200	649	820	345	200	255	341
RTOR Reduction (vph)	0	0	291	0	15	0	0	0	112	0	182	0
Lane Group Flow (vph)	582	1985	345	204	1432	0	649	820	233	200	414	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	28.1	62.7	62.7	11.4	46.2		27.2	38.0	38.0	12.4	22.4	
Effective Green, g (s)	28.1	62.7	62.7	11.4	46.2		27.2	38.0	38.0	12.4	22.4	
Actuated g/C Ratio	0.19	0.43	0.43	0.08	0.32		0.19	0.26	0.26	0.09	0.15	
Clearance Time (s)	4.4	6.1	6.1	4.4	5.9		4.4	5.6	5.6	4.4	6.4	
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.8		2.0	3.8	3.8	2.0	3.3	
Lane Grp Cap (vph)	665	2296	707	270	1657		644	1391	429	294	750	
v/s Ratio Prot	c0.17	c0.37		0.06	0.28		c0.19	c0.15		0.06	0.09	
v/s Ratio Perm			0.21						0.14			
v/c Ratio	0.88	0.86	0.49	0.76	0.86		1.01	0.59	0.54	0.68	0.55	
Uniform Delay, d1	56.7	37.3	29.6	65.4	46.5		58.9	46.7	46.0	64.4	56.7	
Progression Factor	1.17	0.30	0.59	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.6	1.7	0.8	10.2	6.3		37.4	0.7	1.7	5.1	0.9	
Delay (s)	71.2	12.7	18.4	75.6	52.7		96.3	47.4	47.7	69.5	57.6	
Level of Service	E	B	B	E	D		F	D	D	E	E	
Approach Delay (s)		24.5			55.6			65.0			60.6	
Approach LOS		C			E			E			E	
Intersection Summary												
HCM Average Control Delay			45.0			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			145.0			Sum of lost time (s)			8.8			
Intersection Capacity Utilization			90.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Appendix G

**Existing + Project (Build-out)
Near Term + Project (Build-out)
Year 2030 + Project (Build-out)
Arterial Level of Service Worksheets**

ONE PASEO – Updated Traffic Analysis for Revised Project

January 7, 2014

Arterial Level of Service: EB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
I-5 NB Ramps	III	35	22.6	17.1	39.7	0.19	17.1	D
High Bluff Drive	III	35	25.1	20.5	45.6	0.21	16.5	D
Third Ave.	III	35	16.2	19.1	35.3	0.12	12.3	E
First Ave.	III	35	14.1	29.9	44.0	0.10	8.6	F
El Camino Real	III	35	16.1	16.9	33.0	0.12	13.0	E
Shopping Center Drwy	III	35	16.7	20.8	37.5	0.12	11.9	E
Carmel Country Road	III	35	20.2	35.9	56.1	0.16	10.1	E
Torrey Ridge Drive	III	35	28.2	24.3	52.5	0.23	16.1	D
Lansdale Drive	III	35	33.6	9.6	43.2	0.28	23.4	C
Carmel Canyon Road	III	35	51.2	25.6	76.8	0.43	20.0	C
Total	III		244.0	219.7	463.7	1.97	15.3	D

Arterial Level of Service: WB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Carmel Canyon Road	III	35	45.3	5.6	50.9	0.38	26.7	B
Lansdale Drive	III	35	51.2	28.7	79.9	0.43	19.2	C
Torrey Ridge Dr.	III	35	33.6	29.4	63.0	0.28	16.0	D
Carmel Country Rd.	III	35	28.2	18.3	46.5	0.23	18.2	C
Signature Point	III	35	20.2	11.0	31.2	0.16	18.2	C
El Camino Real	III	35	16.7	34.4	51.1	0.12	8.7	F
First Ave.	III	35	16.1	14.6	30.7	0.12	14.0	E
Third Ave.	III	35	14.1	9.6	23.7	0.10	15.9	D
High Bluff Drive	III	35	16.2	36.8	53.0	0.12	8.2	F
I-5 NB Ramps	III	35	25.1	18.1	43.2	0.21	17.5	D
Total	III		266.7	206.5	473.2	2.15	16.4	D

Arterial Level of Service: EB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
I-5 NB Ramps	III	36	22.6	20.0	42.6	0.19	15.9	D
High Bluff Drive	III	35	25.1	25.9	51.0	0.21	14.8	D
Third Ave.	III	35	16.2	16.0	32.2	0.12	13.4	E
First Ave.	III	35	14.1	37.2	51.3	0.10	7.3	F
El Camino Real	III	35	16.1	13.6	29.7	0.12	14.4	D
Shopping Center Drwy	III	35	16.7	27.2	43.9	0.12	10.2	E
Carmel Country Road	III	35	20.2	26.9	47.1	0.16	12.1	E
Torrey Ridge Drive	III	35	28.2	17.7	45.9	0.23	18.4	C
Lansdale Drive	III	35	33.6	11.7	45.3	0.28	22.3	C
Carmel Canyon Road	III	35	51.2	29.1	80.3	0.43	19.1	C
Total	III		244.0	225.3	469.3	1.97	15.1	D

Arterial Level of Service: WB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Carmel Canyon Road	III	35	45.3	5.8	51.1	0.38	26.6	B
Lansdale Drive	III	35	51.2	22.0	73.2	0.43	21.0	C
Torrey Ridge Dr	III	35	33.6	7.9	41.5	0.28	24.3	B
Carmel Country Rd.	III	35	28.2	11.0	39.2	0.23	21.6	C
Signature Point	III	35	20.2	15.8	36.0	0.16	15.8	D
El Camino Real	III	35	16.7	39.6	56.3	0.12	7.9	F
First Ave.	III	35	16.1	11.4	27.5	0.12	15.6	D
Third Ave.	III	35	14.1	1.4	15.5	0.10	24.3	B
High Bluff Drive	III	35	16.2	35.4	51.6	0.12	8.4	F
I-5 NB Ramps	III	35	25.1	25.4	50.5	0.21	14.9	D
Total	III		266.7	175.7	442.4	2.15	17.5	D

Arterial Level of Service: EB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
I-5 NB Ramps	III	35	22.6	17.5	40.1	0.19	16.9	D
High Bluff Drive	III	35	25.1	20.4	45.5	0.21	16.6	D
Third Ave.	III	35	16.2	4.4	20.6	0.12	21.0	C
First Ave.	III	35	14.1	1.0	15.1	0.10	25.0	B
El Camino Real	III	35	16.1	32.2	48.3	0.12	8.9	F
Carmel Country Road	III	35	20.2	31.8	52.0	0.16	10.9	E
Torrey Ridge Drive	III	35	28.2	15.4	43.6	0.23	19.4	C
Lansdale Drive	III	35	33.6	23.9	57.5	0.28	17.5	D
Carmel Canyon Road	III	35	51.2	36.3	87.5	0.43	17.5	D
Total	III		227.3	182.9	410.2	1.84	16.2	D

Arterial Level of Service: WB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Carmel Canyon Road	III	35	41.3	18.2	51.5	0.36	26.4	B
Lansdale Drive	III	35	51.2	23.2	80.4	0.43	19.1	C
Torrey Ridge Dr	III	35	33.6	21.7	55.3	0.28	18.2	C
Carmel Country Rd.	III	35	28.2	36.7	64.9	0.23	13.0	E
El Camino Real	III	35	16.7	39.9	56.6	0.12	7.9	F
First Ave.	III	35	16.1	2.9	19.0	0.12	22.6	C
Third Ave.	III	35	14.1	3.6	17.7	0.10	21.3	C
High Bluff Drive	III	35	16.2	26.6	42.8	0.12	10.1	E
I-5 NB Ramps	III	35	25.1	23.2	48.3	0.21	15.6	D
Total	III		246.5	190.0	436.5	2.00	16.5	D

Arterial Level of Service: EB Del Mar Heights Road

I-5 NB Ramps	II	35	22.5	19.9	42.5	0.19	15.9	D
High Bluff Drive	II	35	25.1	23.6	48.7	0.21	15.5	D
Third Ave.	III	35	16.2	14.2	30.4	0.12	14.2	D
First Ave.	III	35	14.1	3.9	18.0	0.10	20.9	C
El Camino Real	III	35	16.1	48.1	64.2	0.12	6.7	F
Carmel Country Road	III	35	20.2	31.8	52.0	0.16	10.9	E
Torrey Ridge Drive	III	35	28.2	9.1	37.3	0.23	22.6	C
Lansdale Drive	III	35	33.6	20.5	54.1	0.28	18.7	C
Carmel Canyon Road	III	35	51.2	9.6	60.8	0.43	25.3	B
Total	III		227.3	180.7	408.0	1.84	16.2	D

Arterial Level of Service: WB Del Mar Heights Road

Carmel Canyon Road	II	35	45.3	4.8	51.1	0.39	21.2	D
Lansdale Drive	III	35	51.2	21.4	72.6	0.43	21.1	C
Torrey Ridge Dr.	III	35	33.6	7.9	41.5	0.28	24.3	B
Carmel Country Rd.	III	35	28.2	22.2	50.4	0.23	16.8	D
El Camino Real	III	35	16.7	44.7	61.4	0.12	7.3	F
First Ave.	III	35	16.1	1.9	18.0	0.12	23.8	C
Third Ave.	III	35	14.1	4.3	18.4	0.10	20.5	C
High Bluff Drive	III	35	16.2	29.4	45.6	0.12	9.5	F
I-5 NB Ramps	III	35	25.1	27.6	52.7	0.21	14.3	D
Total	III		246.5	164.2	410.7	2.00	17.5	D

Arterial Level of Service: EB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
I-5 NB Ramps	III	30	16.9	20.2	37.1	0.13	12.2	E
High Bluff Drive	III	35	25.1	33.0	58.1	0.21	13.0	E
Third Ave.	III	35	16.2	4.0	20.2	0.12	21.4	C
First Ave.	III	35	14.1	2.2	16.3	0.10	23.1	C
El Camino Real	III	35	16.1	33.5	49.6	0.12	8.6	F
Carmel Country Road	III	35	16.2	47.0	63.2	0.12	6.9	F
Torrey Ridge Drive	III	35	32.6	7.7	40.3	0.27	24.3	B
Lansdale Drive	III	35	33.6	29.5	63.1	0.28	16.0	D
Carmel Canyon Road	III	35	51.2	55.1	106.3	0.43	14.4	D
Total	III		222.0	232.2	454.2	1.78	14.1	D

Arterial Level of Service: WB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Carmel Canyon Road	III	35	51.2	55.1	106.3	0.43	14.4	D
Lansdale Drive	III	35	33.6	29.5	63.1	0.28	16.0	D
Torrey Ridge Dr.	III	35	32.6	7.7	40.3	0.27	24.3	B
Carmel Country Rd.	III	35	16.2	47.0	63.2	0.12	6.9	F
El Camino Real	III	35	16.1	33.5	49.6	0.12	8.6	F
First Ave.	III	35	14.1	2.2	16.3	0.10	23.1	C
Third Ave.	III	35	16.2	4.0	20.2	0.12	21.4	C
High Bluff Drive	III	35	25.1	33.0	58.1	0.21	13.0	E
I-5 NB Ramps	III	30	16.9	20.2	37.1	0.13	12.2	E
Total	III		232.9	211.0	443.9	1.85	15.0	D

Arterial Level of Service: EB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
I-5 NB Ramps	III	35	16.1	16.2	32.3	0.13	14.0	D
High Bluff Drive	III	35	25.1	63.5	88.6	0.21	8.5	F
Third Ave.	III	35	16.2	11.4	27.6	0.12	15.7	D
First Ave.	III	35	14.1	4.0	18.1	0.10	20.8	C
El Camino Real	III	35	16.1	27.9	44.0	0.12	9.7	F
Carmel Country Road	III	35	16.5	44.7	61.2	0.12	7.2	F
Torrey Ridge Drive	III	35	32.6	13.1	45.7	0.27	21.4	C
Lansdale Drive	III	35	33.6	14.8	48.4	0.28	20.8	C
Carmel Canyon Road	III	35	51.2	20.6	71.8	0.43	21.4	C
Total	III		221.5	216.2	437.7	1.78	14.6	D

Arterial Level of Service: WB Del Mar Heights Road

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Carmel Canyon Road	III	35	10.4	5.1	15.5	0.08	17.7	D
Lansdale Drive	III	35	51.2	10.6	61.8	0.43	16.9	C
Torrey Ridge Dr.	III	35	33.6	14.2	47.8	0.28	21.1	C
Carmel Country Rd.	III	35	32.6	26.1	58.7	0.27	16.7	D
El Camino Real	III	35	16.7	59.6	76.3	0.12	5.8	F
First Ave.	III	35	16.1	3.3	19.4	0.12	22.1	C
Third Ave.	III	35	14.1	2.0	16.1	0.10	23.4	C
High Bluff Drive	III	35	16.2	39.5	55.7	0.12	7.8	F
I-5 NB Ramps	III	35	25.1	28.0	53.1	0.21	14.2	D
	III	35	16.1	0.3	16.4	0.13	27.6	B
Total	III		232.1	208.2	440.3	1.86	15.2	D

Appendix H

**Year 2030 + Project (Build-out)
AM & PM Queuing Worksheets**

ONE PASEO – Updated Traffic Analysis for Revised Project

January 7, 2014



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	389	1872	2084	883	379	496	956
v/c Ratio	0.92	0.63	0.94	0.84	0.63	0.97	0.91
Control Delay	88.3	20.2	27.3	6.9	43.1	75.9	55.7
Queue Delay	0.0	0.4	7.4	1.0	0.3	10.4	0.0
Total Delay	88.3	20.6	34.7	7.9	43.3	86.2	55.7
Queue Length 50th (ft)	183	391	419	13	300	504	446
Queue Length 95th (ft)	#280	439	#645	m100	421	#780	#584
Internal Link Dist (ft)		584	1026			911	
Turn Bay Length (ft)	450			850			
Base Capacity (vph)	422	2978	2208	1057	600	512	1045
Starvation Cap Reductn	0	527	0	47	0	0	0
Spillback Cap Reductn	0	0	126	0	26	23	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.76	1.00	0.87	0.66	1.01	0.91

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

Year 2030 + Project (Buildout) AM

10: Del Mar Heights Road & High Bluff Drive

With Mitigation 7/17/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	126	1955	884	235	2163	305	32	61	156	74	421
v/c Ratio	0.67	0.85	0.82	0.75	0.87	0.93	0.07	0.13	0.82	0.14	0.76
Control Delay	67.1	30.8	9.5	62.9	24.2	99.2	40.7	10.2	92.6	37.5	43.2
Queue Delay	0.0	0.0	0.3	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	30.8	9.7	62.9	25.0	99.2	40.7	10.2	92.6	37.5	43.2
Queue Length 50th (ft)	60	471	54	109	367	100	22	0	141	50	268
Queue Length 95th (ft)	m79	m530	m227	#163	493	#162	51	37	#263	91	403
Internal Link Dist (ft)		1026			555		3060			1111	
Turn Bay Length (ft)	250		250	225		300			150		
Base Capacity (vph)	187	2313	1077	319	2500	328	469	457	190	546	555
Starvation Cap Reductn	0	0	18	0	128	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.85	0.83	0.74	0.91	0.93	0.07	0.13	0.82	0.14	0.76

Intersection Summary

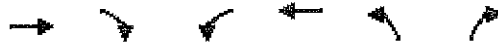
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Queues

Year 2030 + Project (Buildout) AM

11: Del Mar Heights Road & Third Ave.

With Mitigation 7/17/2013



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2160	189	147	2410	87	68
v/c Ratio	0.78	0.21	0.70	0.69	0.10	0.15
Control Delay	4.1	0.3	61.6	2.4	42.7	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	0.3	61.6	2.4	42.7	10.7
Queue Length 50th (ft)	34	1	131	24	31	0
Queue Length 95th (ft)	45	m1	m195	25	58	42
Internal Link Dist (ft)	555			473	388	
Turn Bay Length (ft)		200	250			
Base Capacity (vph)	2797	926	278	3741	871	452
Starvation Cap Reductn	27	0	0	147	0	0
Spillback Cap Reductn	0	0	0	143	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.20	0.53	0.67	0.10	0.15

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2070	157	158	2484	72	72
v/c Ratio	0.71	0.16	0.56	0.71	0.16	0.16
Control Delay	2.2	0.2	69.2	14.4	43.7	10.2
Queue Delay	0.1	0.0	0.0	1.7	0.0	0.0
Total Delay	2.3	0.2	69.2	16.1	43.7	10.2
Queue Length 50th (ft)	11	0	72	459	52	0
Queue Length 95th (ft)	15	0	109	450	99	42
Internal Link Dist (ft)	473			549	209	
Turn Bay Length (ft)		200	150			
Base Capacity (vph)	3021	989	343	3668	451	457
Starvation Cap Reductn	141	0	0	952	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.16	0.46	0.91	0.16	0.16

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

Year 2030 + Project (Buildout) AM

13: Del Mar Heights Road & El Camino Real

With Mitigation 7/17/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	272	1141	601	316	2007	306	166	105	179	1060
v/c Ratio	0.75	0.51	0.67	0.84	0.86	0.78	0.11	0.20	0.72	1.04dr
Control Delay	72.5	30.0	18.5	79.4	40.0	72.5	35.5	7.0	77.7	46.3
Queue Delay	0.0	0.0	0.6	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Total Delay	72.5	30.0	19.1	79.4	40.9	72.5	35.5	7.0	77.7	46.3
Queue Length 50th (ft)	121	262	206	139	540	134	36	0	80	264
Queue Length 95th (ft)	#178	305	348	#227	608	#201	55	43	#128	309
Internal Link Dist (ft)		549			631		823			805
Turn Bay Length (ft)	250		365	275		300		250	300	
Base Capacity (vph)	361	2246	898	375	2347	404	1612	570	254	1421
Starvation Cap Reductn	0	0	77	0	134	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.51	0.73	0.84	0.91	0.76	0.10	0.18	0.70	0.75

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Queues

Year 2030+Project PM

9: Del Mar Heights Road & I-15 NB Ramps

With Mitigation 7/17/2013



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	789	1964	1871	769	471	456	873
v/c Ratio	0.87	0.59	1.04	0.90	1.06	1.15	1.11
Control Delay	62.3	15.1	77.2	32.9	109.2	137.4	113.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	15.1	77.2	32.9	109.2	137.4	113.0
Queue Length 50th (ft)	368	360	~702	339	~512	~573	~503
Queue Length 95th (ft)	426	401	#862	#651	#745	#831	#646
Internal Link Dist (ft)		584	1026			911	
Turn Bay Length (ft)	450			850			
Base Capacity (vph)	1037	3321	1801	854	445	397	787
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.59	1.04	0.90	1.06	1.15	1.11

Intersection Summary							
~ Volume exceeds capacity, queue is theoretically infinite.							
Queue shown is maximum after two cycles.							
# 95th percentile volume exceeds capacity, queue may be longer.							
Queue shown is maximum after two cycles.							

Queues
10: Del Mar Heights Road & High Bluff Drive

Year 2030+Project PM
With Mitigation 7/17/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	263	2793	316	67	2149	716	74	193	77	42	211
v/c Ratio	0.87	0.98	0.25	0.34	0.83	0.94	0.21	0.42	0.49	0.20	0.81
Control Delay	82.9	38.8	1.1	67.8	17.5	71.0	43.8	9.0	62.2	48.8	51.6
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.9	38.8	1.1	67.8	17.7	71.0	43.8	9.0	62.2	48.8	51.6
Queue Length 50th (ft)	~108	~856	0	24	396	192	49	0	58	30	89
Queue Length 95th (ft)	#222	#961	25	m47	349	#268	96	64	105	64	#179
Internal Link Dist (ft)		1026			509		3060			1111	
Turn Bay Length (ft)	250		250	225		300			150		
Base Capacity (vph)	301	2864	1262	204	2601	764	357	459	251	264	304
Starvation Cap Reductn	0	0	0	0	85	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.98	0.25	0.33	0.85	0.94	0.21	0.42	0.31	0.16	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2827	217	168	2153	285	222
V/c Ratio	0.87	0.20	0.74	0.53	0.67	0.58
Control Delay	10.6	1.8	75.7	3.3	57.9	14.2
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	1.8	75.7	3.3	57.9	14.2
Queue Length 50th (ft)	155	6	136	110	109	8
Queue Length 95th (ft)	m197	m7	m#206	102	152	81
Internal Link Dist (ft)	509			519	388	
Turn Bay Length (ft)		200	250			
Base Capacity (vph)	3250	1063	254	4071	515	416
Starvation Cap Reductn	65	0	0	238	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.20	0.66	0.56	0.55	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
12: Del Mar Heights Road & First Ave.

Year 2030+Project PM
With Mitigation 7/17/2013



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2867	180	180	2085	237	237
v/c Ratio	0.89	0.17	0.60	0.54	0.79	0.61
Control Delay	12.9	3.7	58.6	5.8	66.4	24.3
Queue Delay	0.5	0.0	0.0	0.2	0.0	0.0
Total Delay	13.4	3.7	58.6	6.0	66.4	24.4
Queue Length 50th (ft)	220	15	76	156	176	62
Queue Length 95th (ft)	230	m17	m88	184	261	145
Internal Link Dist (ft)	519			549	209	
Turn Bay Length (ft)		200	150			
Base Capacity (vph)	3231	1048	318	3843	354	433
Starvation Cap Reductn	31	0	0	656	0	0
Spillback Cap Reductn	103	0	0	0	0	3
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.17	0.57	0.65	0.67	0.55

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
13: Del Mar Heights Road & El Camino Real

Year 2030+Project PM
With Mitigation 7/17/2013



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	582	1985	636	204	1447	649	820	345	200	596
v/c Ratio	0.88	0.83	0.64	0.73	0.86	0.92	0.65	0.67	0.72	0.85dr
Control Delay	59.0	17.9	6.4	69.3	43.8	66.6	42.8	28.1	69.5	37.4
Queue Delay	0.0	2.7	1.1	0.0	0.0	2.1	0.0	0.0	0.0	0.4
Total Delay	59.0	20.7	7.5	69.3	43.8	68.7	42.8	28.1	69.5	37.8
Queue Length 50th (ft)	221	399	115	80	391	255	205	128	79	99
Queue Length 95th (ft)	m243	503	m208	#139	#485	#360	250	233	#127	142
Internal Link Dist (ft)		549			574		830			805
Turn Bay Length (ft)	250		365	275		300		250	300	
Base Capacity (vph)	683	2405	991	281	1678	715	1356	539	280	851
Starvation Cap Reductn	0	302	157	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	1	20	0	0	0	44
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.94	0.76	0.73	0.86	0.93	0.60	0.64	0.71	0.74

Both percent v/c and red defacto capacity queues are shown.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Appendix I

Caltrans Advanced Planning Study

ONE PASEO – Updated Traffic Analysis for Revised Project

January 7, 2014

Consultant Prepared Advance Planning Study (APS) Checklist

Sheet 1 of 2

Date: 9/23/10	Consultant Firm (for structures): Dokken Engineering	Phone No: (916) 858-0642
Designed by: Charles Tornaci, P.E.		Phone No: (916) 858-0642
EA: 11-177900	County: San Diego	Rte: I-5
Project Description: Del Mar Heights OC Replacement at Interstate 5		KP(PM) 52.6-56.0
Bridge No(s): 57-0487	Bridge Name(s): Del Mar Heights OC	
Total number of bridges in project: 4		APS Alternative Letter or Number (if more than one): 1-5
Purpose of this APS: Initial APS Cost & Feasibility ☒ Revised scope ☐ Update cost ☐		

Part A Items to collect and considerations prior to beginning the APS

All items listed in Part A are to be made available and submitted if requested by the Liaison Engineer.
(Mark N/A if not applicable)

- ☒ Preliminary profile grade of proposed structure.
- ☒ Typical section of the proposed structure. (Including barrier type, sidewalks, cross slope %, etc.)
- ☒ Grades or spot elevations of roadway below the structure.
- ☒ Typical section of roadway below the structure. (Including shoulders, gutters, embankment slope.)
- ☒ Site map: including horizontal alignment of new structure and the roadway below, topo, contours, etc.
- ☒ Stage construction or detour plan for traffic on the structure.
(number of lanes to remain open, Temp Railing, etc.)
- ☒ Stage construction or detour plan for the roadway below the structure.
(falsework openings for each stage and any restrictions.)
- ☒ "As Built" plans for existing structures.
- ☒ Future widening plans of upper and lower roadway (verify with Route Concept Report).
- ☒ Site aerial photograph (at the proposed structure).
- ☐ Environmental and/or permit requirements (areas of potential impact, construction windows, etc.)
- ☒ Overhead and underground utility plans
- ☐ Any other information that you feel is necessary to complete the study. (Other concerns that may affect the APS: local agency requirements such as aesthetics, improvements in vicinity of structure, airspace usage, other obstructions, etc.)

Consultant Prepared Advance Planning Study (APS) Checklist

Sheet 2 of 2

Part B Considerations during the APS design and cost estimate preparation

1.	Has this project been discussed with:	the OSFP Liaison Engineer?	Yes	☐	No	☒	
		the Caltrans District Project Manager?	Yes	☒	No	☐	
		the roadway consultant?	Yes	☒	No	☐	
2.	Have the Caltrans Structures Maintenance records been reviewed?		Yes	☐	No	☒	
	If the records recommend any work for the structure, is it included in the APS?		Yes	☐	No	☒	
3.	Are there special aesthetic considerations?		Yes	☐	No	☒	
4.	(Widenings and Modifications)						
	Has this project been reviewed for seismic retrofit requirements?		N/A	Yes	☐	No	☐
	Are seismic retrofit requirements included in the APS?			Yes	☐	No	☐
5.	Any special Railroad requirements?		Yes	☐	No	☒	
	Shoofly required?		Yes	☐	No	☒	
	Cost of shoofly included as a separate item in the project cost estimate?		Yes	☐	No	☒	
6.	Any special foundation requirements, including scour critical work, special excavation such as Type A, Type D, and/or hazardous or contaminated material?		Yes	☐	No	☒	
7.	Any special construction requirements, including limited site accessibility or seasonal work?						
	Stage Construction will be required		Yes	☒	No	☐	
8.	Other items to be included in the cost such as slope paving, approach slabs, and/or adjacent retaining walls?		Yes	☒	No	☐	
9.	Remove existing bridge?		Yes	☒	No	☐	
	Total Deck Area: 2916.5 M2						
10.	Any other unusual or special requirements?		Yes	☐	No	☒	
11.	Provide and attach a consultant prepared Design Memo to summarize and document any important assumptions, discussions, decisions, unusual items, local agency requirements such as aesthetics, improvements in vicinity of the structure, airspace usage, other obstructions, or any items noted above.		Summary attached?	Yes	☒	No	☐

Designer: (Printed Name) Charles Tornaci, P.E.	Designer's Signature:	Date: 9/23/10
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Advance Planning Study (APS) Design Memorandum

Date: September 23, 2010	Consultant Firm (for structures): Dokken Engineering	Phone No: (916) 858-0642
Project Manager: Gerard Lumabas, P.E.	Project Engineer: John S. Bishop, P.E.	Phone No: (916) 858-0642
Designed by: Charles Tornaci, P.E.	County: San Diego	Rte: I-5 -- Del Mar Heights Rd
Project Description: Del Mar Heights Rd OC Replacement at I-5		

Introduction

The purpose of this memorandum is to describe and discuss the proposed structure work for the Del Mar Heights Road Interchange at Interstate 5. The interchange improvements include: addition of Auxiliary Lanes on I-5; realigning existing ramps; and replacement of the existing overcrossing structure.

Description:

The existing Del Mar Heights Road Overcrossing (Bridge No. 57-0487), constructed in 1988, is a 2 span, single frame cast-in-place prestressed/post-tensioned reinforced concrete box girder structure. The 32.92 m wide structure carries a total of seven traffic lanes, and has 1.5 m (5'-0") sidewalks on both edges of the bridge. The structure is supported by short seat type abutments founded on driven precast concrete piles, and a three column pier founded on a shallow foundation (spread footing.) The overcrossing spans 88.6 m and is oriented at a 16° skew to Interstate 5.

As part of the proposed interchange improvements, the horizontal alignment of Del Mar Heights Road will remain the same, with the width of the bridge increasing 10.0 m to the North to maintain 5 lanes of open traffic during all phases of construction. The proposed work consists of removing the existing structure, and replacing it with a 2 span cast-in-place prestressed concrete box girder structure. The profile of Del Mar Heights Road will be raised approximately 1.0 m at the western end of the bridge, to 2.0 m at the eastern end in order to maintain temporary minimum vertical clearance requirements (4.57m minimum) over I-5. Once the existing concrete median is removed, traffic will be shifted south to allow for the removal of 11.0 m of the northern edge of the existing structure. The proposed new structure will be built in two stages, with the shifted Del Mar Heights Road traffic running on the remaining existing structure during the first stage of construction (northern half). Once the first stage of construction is complete, traffic will be shifted onto the new structure during demolition of the rest of the existing bridge, and the remainder of the new structure will be completed. The finished structure will be 145.0 m long, and 43.0 m wide, and will be designed in accordance with the current Caltrans Bridge Design Specifications, and the Caltrans Seismic Design Criteria.

Structure Type:

The bridge structure type will be a cast-in-place post-tensioned box girder, which will span over I-5, including all proposed ramp improvements, bypass lanes and the ultimate lane configuration of I-5. The existing two span bridge will be replaced with a new two span structure, which will be more than twice as long. The lone mid-span support will be located at the existing centerline of I-5.

The 2-span structure will be 3.35 m deep, with a minimum depth to span ratio of 0.04. Temporary vertical clearance is the controlling profile issue, and the profile of Del Mar Heights Road will be raised, maintaining temporary and permanent vertical clearances of 5.2m and 6.4m respectively, maintaining the minimum temporary vertical clearance of 4.57 m (15'-0") required by Caltrans over freeways and expressways. A minimum falsework depth 1.2 m can be used to maintain the existing traffic flow of I-5 during bridge construction.

Structure Foundation:

Based on the Structures Preliminary Geotechnical Report (SPGR), and the As-Built plans and log of test borings for the existing Del Mar Heights Overcrossing, we believe that the abutments may be founded on precast class 625 (70-ton) concrete piles, while the bent footings may be founded on shallow foundations (spread footings).

Seismic Considerations:

Based on the general area of the site and the SPGR, the Newport-Inglewood – Rose Canyon Fault Zone will have the greatest potential impact on the project area, which is considered a high seismic zone.

Liquefaction studies indicate there is a low chance of liquefaction occurring at the project site. This assumption is due to a lack of groundwater in the upper 15m (50 ft), the overall density of the site granular soils, and hard consistency of the sandy clays, which typically are not susceptible to liquefaction.

Based on the information given in the Preliminary Geotechnical Report, anticipated seismic design parameter are as follows:

Max Credible EQ Magnitude	=	7.0 +/-0.25
Soil Profile Type:	=	Type D
Peak Bedrock Acceleration:	=	0.6g

Construction Costs:

A detailed cost estimate for the structure is attached. Anticipated bid items are broken down by unit, quantity, and cost.

Revised - December 3, 2007

RCVD BY:

IN EST:

OUT EST:

BRIDGE: DEL MAR HEIGHTS OC (REPLACE)

BR. No.: 57-0487

DISTRICT: 11

TYPE: CAST-IN-PLACE PRESTRESSED CONCRETE BOX

RTE:	5
------	---

CU:

CO: SD

EA: 11-177900

KP: 52.6-56.0

LENGTH: 145.00 m WIDTH: 43.00 m AREA (SM)= 6,235

DESIGN SECTION: Dokken

OF STRUCTURES IN PROJECT :

EST. NO. 1

PRICES BY: C, Tomaci

COST INDEX: 317

PRICES CHECKED BY : J. Bishop

DATE: 9/23/2010

QUANTITIES BY: C. Tomaci

DATE: 9/23/2010

[illegible]

ROUTING

1. DES SECTION
2. OFFICE OF BRIDGE DESIGN - NORTH
3. OFFICE OF BRIDGE DESIGN - CENTRAL
4. OFFICE OF BRIDGE DESIGN - SOUTH
5. OFFICE OF BRIDGE DESIGN - WEST
6. OFFICE OF BRIDGE DESIGN SOUTHERN CALIFORNIA

NOTES: Prestressing Cast-in-Place Concrete: 500,000 LB
Bridge Removal Area: 30,810 SF

SUBTOTAL	\$9,180,000
TIME RELATED OVERHEAD	\$918,000
MOBILIZATION (@ 10 %)	\$1,122,000
SUBTOTAL BRIDGE ITEMS	\$11,220,000
CONTINGENCIES (@ 25%)	\$2,805,000
BRIDGE TOTAL COST	\$14,025,000
COST PER SQ. FOOT	\$2,249.40
BRIDGE REMOVAL (CONTINGENCIES INCL.)	\$1,000,000
WORK BY RAILROAD OR UTILITY FORCES	
GRAND TOTAL	\$15,025,000
BUDGET ESTIMATE AS OF	\$15,025,000

Escalated Budget Estimate to Midpoint of Construction *

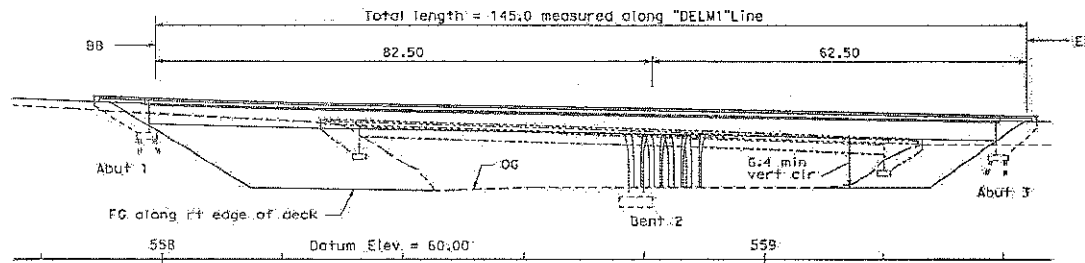
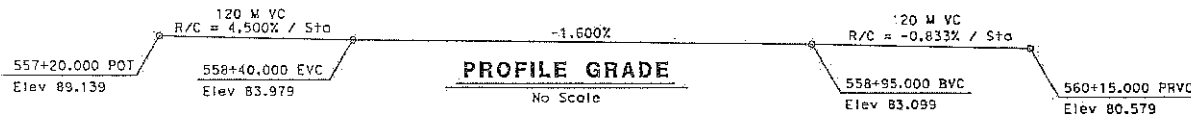
Escalation Rate per Year

3.5%

Years Beyond Midpoint	Escalated Budget Est.
1	\$15,551,000
2	\$16,095,000
3	\$16,658,000

Years Beyond Midpoint	Escalated Budget Est.
4	\$17,241,000
5	\$17,844,000

* Escalated budget estimate is provided for information only, actual construction costs may vary. Escalated budget estimates provided do not replace Departmental policy to update cost estimates annually.



ELEVATION
1:400
(Assume driven conc piles at abutments, spread footings at bent)

Date of estimate	= 9-23-10
Structure depth	= 3.35
Length	= 145.00
Width	= 43.00
Area	= 6235.00
Cost/□m including 10% time related overhead 10% mobilization & 25% contingency	= \$2,250
Bridge Cost	= \$14,025,000
Bridge Removal	= \$1,000,000
Total Cost	= \$15,025,000

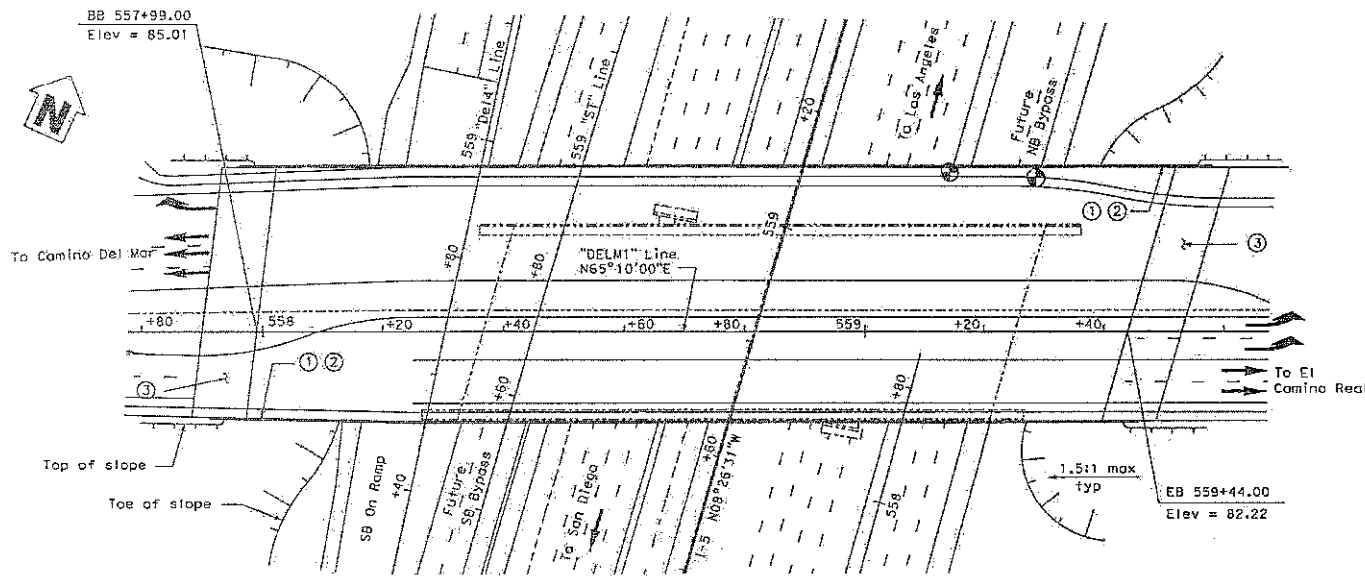
Vehicular Traffic

1. New alignment. No traffic at the site.
2. Traffic will be detoured away from the site.
3. ☒ Traffic will be carried on the structure. Stage construction will be required.
4. ☒ Traffic will pass under the structure on 1-5

- A. No falsework allowed over traffic.
- B. ☒ Falsework opening(s) required.

	Temporary Vertical Clearance	Width of Traffic Opening
N Bnd	5.2	25.9
S Bnd	5.8	25.9
Two-way		

- C. Temporary traffic lane reduction needed for footing excavation,



PLAN
1:400

ALTERNATIVES 1-5

DESIGNED BY C. Tornaci	DATE 9-23-10
DRAWN BY C. Houghton	DATE 9-23-10
CHECKED BY J. Bishop	DATE 9-23-10
APPROVED X	DATE X

J. Bishop
PROJECT ENGINEER

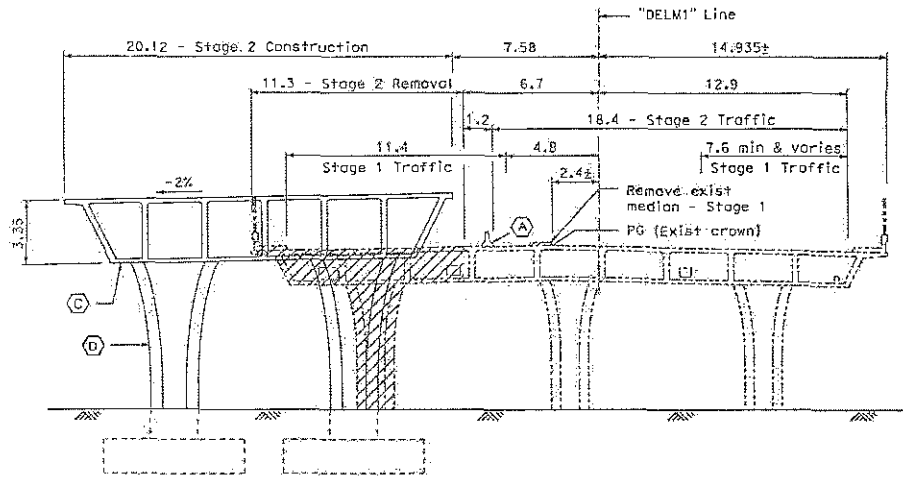
PLANNING STUDY	
DEL MAR HEIGHTS OC (REPLACE)	
BRIDGE NO. 57-487	CV 1:1
SCALE: As Noted	EA 197700

LEGEND

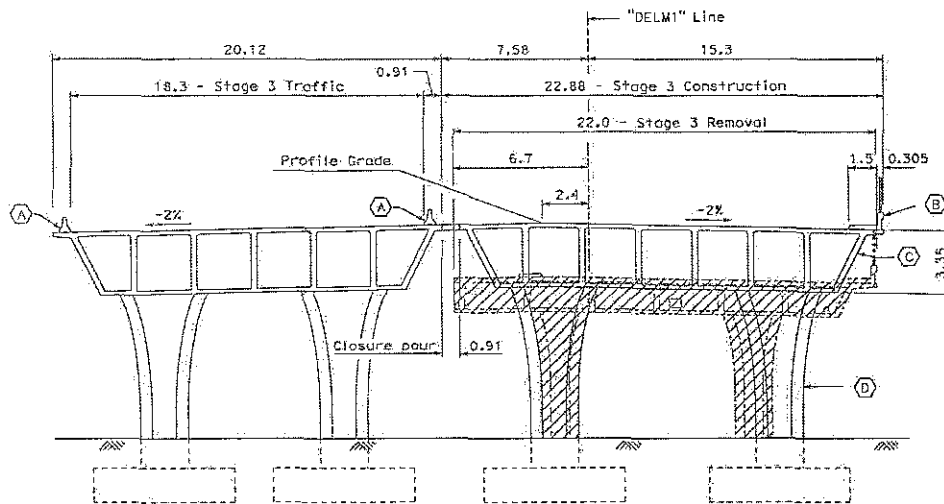
- ① Point "Bridge No. 57-0487"
- ② Point "Del Mar Heights OC"
- ③ Structure Approach Type N(9S)
- ④ Point of min vert clearance

NOTES:

All dimensions are in meters unless otherwise shown.



TYPICAL SECTION - STAGES 1 & 2
1:125



TYPICAL SECTION - STAGE 3
1:125

LEGEND

- (A) Temporary Railing Type K
- (B) Concrete Barrier Type 26 w/ Chain Link Railing Type 7
- (C) CIP/PS Conc Box Girder
- (D) 2.13 Ø hexagonal column with standard two way flare
- (E) Concrete median
- Denotes exist bridge removal

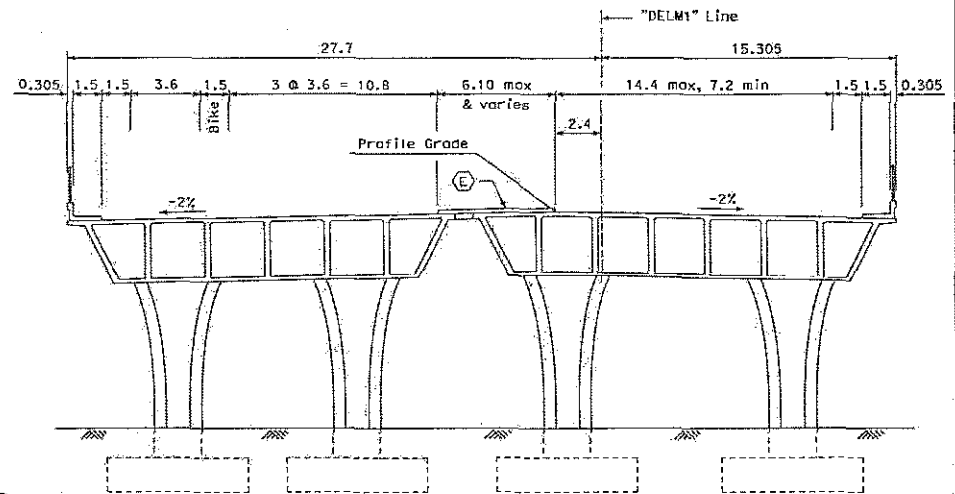


DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT
11	SD	5	52.6/56.0

Dakken Engineering
2365 Iron Point Rd, Suite 200
Folsom, CA 95630

NOTES:

All dimensions are in meters unless otherwise shown.



TYPICAL SECTION - FINAL CONFIGURATION
1:125

DESIGNED BY C. Tornaci	DATE 9-23-10
DRAWN BY C. Houghton	DATE 9-23-10
CHECKED BY J. Bishop	DATE 9-23-10
APPROVED X	DATE X

J. Bishop
PROJECT ENGINEER

PLANNING STUDY

DEL MAR HEIGHTS OC (REPLACE)

BRIDGE NO. 57-487	CS 11
SCALE: As Noted	EA 197700

Appendix J

Existing Count Data & Signal Timing Sheets

ONE PASEO – Updated Traffic Analysis for Revised Project

January 7, 2014

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H

Tustin, CA. 92780

Location : DEL MAR HEIGHTS ROAD
 Segment : MANGO DR TO CREST WAY
 Client : URBAN SYSTEMS

Site: DEL MAR
 Date: 09/19/12

Interval	EB				WB				Combined				Day:	Wednesday
Begin	AM	PM			AM	PM			AM	PM				
12:00	20	50	154	746	11	31	190	774	31	81	344	1,520		
12:15	11		186		8		162		19		348			
12:30	12		200		4		200		16		400			
12:45	7		206		8		222		15		428			
01:00	4	21	187	772	4	14	181	750	8	35	368	1,522		
01:15	6		182		5		193		11		375			
01:30	4		223		3		190		7		413			
01:45	7		180		2		186		9		366			
02:00	6	17	164	787	3	12	156	669	9	29	320	1,456		
02:15	2		194		3		157		5		351			
02:30	3		202		4		177		7		379			
02:45	6		227		2		179		8		406			
03:00	2	7	214	814	4	14	180	768	6	21	394	1,582		
03:15	1		208		4		182		5		390			
03:30	3		210		2		192		5		402			
03:45	1		182		4		214		5		396			
04:00	1	21	194	750	3	20	182	749	4	41	376	1,499		
04:15	3		178		4		177		7		355			
04:30	7		187		7		174		14		361			
04:45	10		191		6		216		16		407			
05:00	11	73	208	809	6	79	214	935	17	152	422	1,744		
05:15	14		231		14		240		28		471			
05:30	26		196		26		237		52		433			
05:45	22		174		33		244		55		418			
06:00	36	223	207	700	24	267	222	763	60	490	429	1,463		
06:15	50		167		45		205		95		372			
06:30	62		158		76		170		138		328			
06:45	75		168		122		166		197		334			
07:00	119	670	165	595	115	713	150	506	234	1,383	315	1,101		
07:15	165		158		158		124		323		282			
07:30	184		154		178		112		362		266			
07:45	202		118		262		120		464		238			
08:00	171	708	92	362	204	880	106	366	375	1,588	198	728		
08:15	164		92		207		102		371		194			
08:30	195		108		238		88		433		196			
08:45	178		70		231		70		409		140			
09:00	144	554	95	353	200	756	76	279	344	1,310	171	632		
09:15	118		86		206		84		324		170			
09:30	154		95		164		60		318		155			
09:45	138		77		186		59		324		136			
10:00	142	568	50	191	174	608	40	151	316	1,176	90	342		
10:15	138		52		146		53		284		105			
10:30	150		54		144		37		294		91			
10:45	138		35		144		21		282		56			
11:00	133	606	45	112	145	691	28	81	278	1,297	73	193		
11:15	145		27		158		22		303		49			
11:30	170		14		162		16		332		30			
11:45	158		26		226		15		384		41			
Totals	3,518		6,991		4,085		6,791		7,603		13,782			
Split%	46.3		50.7		53.7		49.3							
Day Totals		10,509				10,876				21,385				
Day Splits		49.1				50.9								
Peak Hour	07:45		02:45		07:45		05:15		07:45		05:15			
Volume	732		859		911		943		1,643		1,751			
Factor	0.91		0.95		0.87		0.97		0.89		0.93			

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H
Tustin, CA. 92780

Location : HIGH BLUFF DRIVE
Segment : DEL MAR HEIGHTS TO SEAHORN CIR
Client : URBAN SYSTEMS

Site: DEL MAR
Date: 09/12/12

Interval	NB				SB				Combined				Day:	Wednesday
Begin	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM		
12:00	3	16	49	162	3	9	50	196	6	25	99	358		
12:15	4		32		1		33		5		65			
12:30	7		40		2		54		9		94			
12:45	2		41		3		59		5		100			
01:00	0	4	37	186	0	1	32	154	0	5	69	340		
01:15	2		47		0		46		2		93			
01:30	2		50		1		37		3		87			
01:45	0		52		0		39		0		91			
02:00	1	4	57	290	0	2	46	294	1	6	103	584		
02:15	1		85		0		41		1		126			
02:30	1		88		2		61		3		149			
02:45	1		60		0		146		1		206			
03:00	0	5	52	218	0	2	63	228	0	7	115	446		
03:15	2		55		0		54		2		109			
03:30	1		53		1		61		2		114			
03:45	2		58		1		50		3		108			
04:00	1	6	63	301	3	16	40	178	4	22	103	479		
04:15	2		77		1		43		3		120			
04:30	1		69		4		51		5		120			
04:45	2		92		8		44		10		136			
05:00	1	7	74	333	7	42	48	206	8	49	122	539		
05:15	1		84		14		55		15		139			
05:30	2		81		14		45		16		126			
05:45	3		94		7		58		10		152			
06:00	4	32	92	315	17	110	38	185	21	142	130	500		
06:15	6		89		24		47		30		136			
06:30	9		70		32		53		41		123			
06:45	13		64		37		47		50		111			
07:00	26	101	76	239	48	303	33	118	74	404	109	357		
07:15	19		59		77		31		96		90			
07:30	30		52		101		30		131		82			
07:45	26		52		77		24		103		76			
08:00	50	208	49	164	94	535	21	60	144	743	70	224		
08:15	96		42		146		18		242		60			
08:30	23		29		195		11		218		40			
08:45	39		44		100		10		139		54			
09:00	32	117	41	110	61	249	15	45	93	366	56	155		
09:15	35		26		76		10		111		36			
09:30	26		24		58		7		84		31			
09:45	24		19		54		13		78		32			
10:00	25	126	23	57	48	192	12	26	73	318	35	83		
10:15	38		15		54		6		92		21			
10:30	31		12		42		1		73		13			
10:45	32		7		48		7		80		14			
11:00	38	148	3	22	40	173	5	14	78	321	8	36		
11:15	40		4		46		0		86		4			
11:30	28		4		46		3		74		7			
11:45	42		11		41		6		83		17			
Totals	774		2,397		1,634		1,704		2,408		4,101			
Split%	32.1		58.4		67.9		41.6							

Day Totals 3,171 3,338 6,509
Day Splits 48.7 51.3

Peak Hour 08:00 05:30 08:00 02:30 08:00 02:15
Volume 208 356 535 324 743 596
Factor 0.54 0.95 0.69 0.55 0.77 0.72

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H

Tustin, CA. 92780

Location: : PORTOFINIO DRIVE
 Segment: : DEL MAR HEIGHTS TO RUETTE PARC
 Client: : URBAN SYSTEMS

Site: DEL MAR
 Date: 09/12/12

Interval	NB				SB				Combined				Day:	Wednesday
Begin	AM		PM		AM		PM		AM		PM			
12:00	0	0	12	55	1	2	10	49	1	2	22	104		
12:15	0		13		0		9		0		22			
12:30	0		14		1		16		1		30			
12:45	0		16		0		14		0		30			
01:00	0	1	17	50	0	1	9	40	0	2	26	90		
01:15	0		14		0		11		0		25			
01:30	1		7		0		11		1		18			
01:45	0		12		1		9		1		21			
02:00	0	0	13	60	2	2	11	50	2	2	24	110		
02:15	0		13		0		9		0		22			
02:30	0		23		0		10		0		33			
02:45	0		11		0		20		0		31			
03:00	0	1	16	57	0	1	12	54	0	2	28	111		
03:15	0		14		0		17		0		31			
03:30	0		18		1		11		1		29			
03:45	1		9		0		14		1		23			
04:00	0	3	14	53	0	1	11	63	0	4	25	116		
04:15	0		14		0		12		0		26			
04:30	0		8		0		19		0		27			
04:45	3		17		1		21		4		38			
05:00	3	11	18	66	1	4	16	55	4	15	34	121		
05:15	3		22		1		12		4		34			
05:30	2		19		2		17		4		36			
05:45	3		7		0		10		3		17			
06:00	7	30	10	38	1	8	17	66	8	38	27	104		
06:15	9		7		2		18		11		25			
06:30	4		10		4		13		8		23			
06:45	10		11		1		18		11		29			
07:00	22	112	9	34	4	27	15	49	26	139	24	83		
07:15	36		11		8		4		44		15			
07:30	24		7		4		18		28		25			
07:45	30		7		11		12		41		19			
08:00	17	82	3	24	10	28	12	43	27	110	15	67		
08:15	26		9		8		12		34		21			
08:30	19		6		5		9		24		15			
08:45	20		6		5		10		25		16			
09:00	21	59	6	16	7	39	8	26	28	98	14	42		
09:15	19		4		21		9		40		13			
09:30	11		1		8		5		19		6			
09:45	8		5		3		4		11		9			
10:00	8	41	3	10	5	27	4	17	13	68	7	27		
10:15	12		2		8		7		20		9			
10:30	9		3		5		5		14		8			
10:45	12		2		9		1		21		3			
11:00	7	43	0	4	8	26	2	10	15	69	2	14		
11:15	9		0		8		1		17		1			
11:30	12		3		4		5		16		8			
11:45	15		1		6		2		21		3			
Totals	383		467		166		522		549		989			
Split%	69.8		47.2		30.2		52.8							

Day Totals	850		688		1,538
Day Splits	55.3		44.7		

Peak Hour	07:00	04:45	08:45	04:15	07:15	04:45
Volume	112	76	41	68	140	142
Factor	0.78	0.86	0.49	0.81	0.80	0.93

Trausportation Studies, Inc.

2640 Walnut Avenue, Ste H

Tustin, CA. 92780

Location: : MANGO DRIVE
 Segment: : DEL MAR HEIGHTS TO CALAIS DR
 Client: : URBAN SYSTEMS

Site: DEL MAR
 Date: 09/12/12

Interval	NB				SB				Combined				Day:	Wednesday
Begin	AM	PM			AM	PM			AM	PM				
12:00	1	2	26	121	0	3	25	79	1	5	51	200		
12:15	0		37		1		14		1		51			
12:30	1		36		1		14		2		50			
12:45	0		22		1		26		1		48			
01:00	0	2	19	66	0	3	14	62	0	5	33	128		
01:15	0		22		0		11		0		33			
01:30	0		12		1		17		1		29			
01:45	2		13		2		20		4		33			
02:00	2	4	14	97	2	3	13	71	4	7	27	168		
02:15	1		20		0		10		1		30			
02:30	0		29		1		16		1		45			
02:45	1		34		0		32		1		66			
03:00	0	0	25	96	0	0	16	82	0	0	41	178		
03:15	0		12		0		26		0		38			
03:30	0		31		0		20		0		51			
03:45	0		28		0		20		0		48			
04:00	0	4	30	114	1	2	22	87	1	6	52	201		
04:15	1		26		0		13		1		39			
04:30	1		24		1		24		2		48			
04:45	2		34		0		28		2		62			
05:00	3	12	26	105	0	0	14	86	3	12	40	191		
05:15	3		22		0		20		3		42			
05:30	5		27		0		24		5		51			
05:45	1		30		0		28		1		58			
06:00	6	40	22	78	3	11	20	98	9	51	42	176		
06:15	9		23		3		34		12		57			
06:30	11		18		1		24		12		42			
06:45	14		15		4		20		18		35			
07:00	13	154	10	55	8	68	17	75	21	222	27	130		
07:15	31		18		12		19		43		37			
07:30	48		18		22		22		70		40			
07:45	62		9		26		17		88		26			
08:00	22	119	14	45	36	129	17	72	58	248	31	117		
08:15	36		11		29		19		65		30			
08:30	31		8		22		18		53		26			
08:45	30		12		42		18		72		30			
09:00	38	91	14	45	28	52	22	51	66	143	36	96		
09:15	17		16		4		15		21		31			
09:30	24		9		10		6		34		15			
09:45	12		6		10		8		22		14			
10:00	19	69	6	17	14	61	5	21	33	130	11	38		
10:15	14		5		15		7		29		12			
10:30	12		3		14		7		26		10			
10:45	24		3		18		2		42		5			
11:00	12	74	0	8	14	53	3	15	26	127	3	23		
11:15	10		4		7		6		17		10			
11:30	24		2		16		4		40		6			
11:45	28		2		16		2		44		4			
Totals	571		847		385		799		956		1,646			
Split%	59.7		51.5		40.3		48.5							

Day Totals 1,418 1,184 2,602
 Day Splits 54.5 45.5

Peak Hour 07:30 12:00 08:00 05:30 07:30 05:30
 Volume 168 121 129 106 281 208
 Factor 0.68 0.82 0.77 0.78 0.80 0.90

Transportation Studies, Inc.

2640 Walnut Avenue, Ste H

Tustin, CA. 92780

Location: : MANGO DRIVE
 Segment: : LOZANA RD TO DEL MAR HEIGHTS
 Client: : URBAN SYSTEMS

Site: DEL MAR
 Date: 09/12/12

Interval	NB				SB				Combined				Day:	Wednesday
Begin	AM	PM			AM	PM			AM	PM				
12:00	0	10	54	219	2	9	72	361	2	19	126	580		
12:15	3		68		3		61		6		129			
12:30	5		61		1		104		6		165			
12:45	2		36		3		124		5		160			
01:00	0	2	32	143	3	5	66	288	3	7	98	431		
01:15	1		39		0		77		1		116			
01:30	0		28		2		67		2		95			
01:45	1		44		0		78		1		122			
02:00	1	3	27	146	0	5	74	300	1	8	101	446		
02:15	2		45		1		75		3		120			
02:30	0		36		1		74		1		110			
02:45	0		38		3		77		3		115			
03:00	1	2	44	189	4	6	76	282	5	8	120	471		
03:15	1		36		0		66		1		102			
03:30	0		60		1		66		1		126			
03:45	0		49		1		74		1		123			
04:00	3	6	38	178	3	8	77	284	6	14	115	462		
04:15	1		42		0		66		1		108			
04:30	0		40		3		69		3		109			
04:45	2		58		2		72		4		130			
05:00	1	8	49	201	8	35	78	306	9	43	127	507		
05:15	2		61		3		76		5		137			
05:30	1		43		11		90		12		133			
05:45	4		48		13		62		17		110			
06:00	5	42	38	141	10	65	60	216	15	107	98	357		
06:15	8		38		12		40		20		78			
06:30	12		44		19		60		31		104			
06:45	17		21		24		56		41		77			
07:00	25	234	31	136	32	260	46	166	57	494	77	302		
07:15	34		38		64		42		98		80			
07:30	63		33		76		46		139		79			
07:45	112		34		88		32		200		66			
08:00	30	112	33	98	126	292	33	118	156	404	66	216		
08:15	26		22		60		30		86		52			
08:30	22		24		62		26		84		50			
08:45	34		19		44		29		78		48			
09:00	38	117	18	61	68	193	18	71	106	310	36	132		
09:15	19		14		40		22		59		36			
09:30	30		14		50		20		80		34			
09:45	30		15		35		11		65		26			
10:00	21	96	13	35	49	182	20	38	70	278	33	73		
10:15	29		9		42		8		71		17			
10:30	24		7		44		6		68		13			
10:45	22		6		47		4		69		10			
11:00	25	127	4	10	62	238	2	14	87	365	6	24		
11:15	24		0		48		4		72		4			
11:30	36		3		70		8		106		11			
11:45	42		3		58		0		100		3			
Totals	759		1,557		1,298		2,444		2,057		4,001			
Split%	36.9		38.9		63.1		61.1							

Day Totals	2,316				3,742				6,058					
Day Splits	38.2				61.8									

Peak Hour	07:15	12:00			07:15	12:30			07:15	12:00				
Volume	239	219			354	371			593	580				
Factor	0.53	0.81			0.70	0.75			0.74	0.88				

DEL MAR HEIGHTS RD

DEL MAR HEIGHTS RD

MANGO DRIVE

200 SA 1.e

PHASE TIMING

PREEMPT

INTERVAL		1	2	3	4	5	6	7	8		E
WALK	0		7/10	7/10	7/10	6/10 10/17/03	7/10			RR 1 DELAY	0
FLASH D/W	1		7/12	20/22	20/22	FLG 11-22-99	7/9			RR 1 CLEAR	1
MIN GREEN	2	4	10	4	7	4	10			EVA DELAY	0
TYPE 3 DET	3									EVA CLEAR	3
ADD PER VEH	4									EV B DELAY	4
VEH EXTN *	5	2.0	3.7	2.0	3.0	2.0	3.7			EV B CLEAR	5
MAX GAP *	6	2.0	3.7	2.0	3.0	2.0	3.7			EVC DELAY	0
MIN GAP *	7	2.0	0.2	2.0	3.0	2.0	0.2			EVC CLEAR	3
MAX EXTN	8	30	60	40	50	30	60			EVD DELAY	8
MAX 2	9									EVD CLEAR	9
BUS LEAD	A									RR2 DELAY	A
CALL TO PHS	B									RR 2 CLEAR	B
REDUCE BY	C		0.1				0.1			EV CLR TMR	C
EVERY	D	3.4	0.9	3.4	3.4	3.4	0.9			EV DLY TMR	D
YELLOW	E	3.0	4.0	3.0	3.0	3.0	4.0	7-20-97		RR CLR TMR	E
RED CLEAR	F	1.0	1.0	1.0	1.0	1.0	1.0			RR DLY TMR	F

F + PHASE + LOCATION

MAX INITIAL (F-0-E) 0RED REVERT (F-0-F) 5.0ALL-RED START (F-C-0) 0.0

PHASE FUNCTION

FLAGS

		1	2	3	4	5	6	7	8
PERMIT	0	X	X	X	X	X	X		
RED LOCK	1								
YELLOW LOCK	2								
VEHICLE RECALL	3		X				X		
PED RECALL	4								
PEDS (VIEW)	5								
REST IN WALK	6								
RED REST	7								
DOUBLE ENTRY	8								
MAX RECALL	9								
SOFT RECALL	A		X				X		
MAX 2	B								
COND SERVICE	C								
	D								
START-UP	E		X				X		
FIRST PHASES	F		X						

F + F + FUNCTION #

Carryover of 2.0 seconds set into detector #1 and #6.

OVERLAP TIMING

LOAD
SWITCH

D + 0+
OVERLAP

GREEN YELLOW RED

9 C D

F + COLOR + OVERLAP

PHASE SEQUENCE

PHASE							
1	2	3	4	5	6	7	8
X	X	X	X				

C + F + 0

MANUAL (C-A-1) 14:00ADDRESS (C-0-0) 10/17/03

TURN-ON DATE: 09-30-1993

TIME: 14:40

DRAWING NO. D- 17168-1

LAST CHANGE: 08-23-1995

BY: MPS mlg

LOCATION DEL MAR HEIGHTS ROAD & MANGO DRIVE

INTERSECTION: DEL MAR HEIGHTS RD @ MANGO DR

223 Program

Row	Plan Name	Plan	PM
0	Cycle Length		120
1	Phase 1 - ForceOff		94
2	Phase 2 - ForceOff		0
3	Phase 3 - ForceOff		45
4	Phase 4 - ForceOff		82
5	Phase 5 - ForceOff		13
6	Phase 6 - ForceOff		0
7	Phase 7 - ForceOff		
8	Phase 8 - ForceOff		
9	Ring Offset		
10	Offset A		100
11	Offset B		
12	Offset C		
13	Permissive		12
14	Hold Release		255
15	Ped Shift		0

Coordination

<C Page>

C + Plan + ROW

Coordination Timing By: M2S
Implemented On: 11/16/2011

FOR OBSERVATION ONLY

Master Plan C + A + 2
Current Plan C + A + 3
Next Plan C + A + 4
T.O.D. Plan C + A + 5
Master Cycle C + A + 0
Ring A Cycle C + B + 0
Ring B Cycle C + D + 0
Min Cycle C + A + E
Max Cycle C + B + E

Row	Time	Plan	Offset	Day of Week
0	15 : 00	6	A	23456
1	19 : 00	E	A	1234567
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

TOD Coordination

<9 Key with C+0+9=1>

Plan Select
1 thru 9 = Coordination
Plan 1 thru 9
14 or E = Free
15 or F = Flash

Plan	Row	Free Lag
Plan 1	1	Plan 1 - Lag
Plan 2	2	Plan 2 - Lag
Plan 3	3	Plan 3 - Lag
Plan 4	4	Plan 4 - Lag
Plan 5	5	Plan 5 - Lag
Plan 6	6	Plan 6 - Lag
Plan 7	7	Plan 7 - Lag
Plan 8	8	Plan 8 - Lag
Plan 9	9	Plan 9 - Lag
Coord Ped*	A	Coord Max *
NEMA Hold	B	Coord Lag *
	C	
	D	
	E	
	F	

Sync Phases

C + E + FUNCTION #

Lag Phases <C Page>

C + F + FUNCTION #

Transition Type 0

TBC Transition
C + D + D

Transition Type
0 = Shortway
Non-zero = Lengthen

DETECTOR TIMES

Y	X	SET DELAY		SET CARRY		OBS COUNT		OBS DELAY		OBS CARRY	
		1	2	3	4	5	6	7	8	9	A
0		111	6J1	111	6J1	111	6J1	111	6J1	111	6J1
1		212U	6J2U	212U	6J2U	212U	6J2U	212U	6J2U	212U	6J2U
2		212L	6J2L	212L	6J2L	212L	6J2L	212L	6J2L	212L	6J2L
3		213U	6J3U	213U	6J3U	213U	6J3U	213U	6J3U	213U	6J3U
4		213L	6J3L	213L	6J3L	213L	6J3L	213L	6J3L	213L	6J3L
5		214	6J4	214	6J4	214	6J4	214	6J4	214	6J4
6		315	7J5	315	7J5	315	7J5	315	7J5	315	7J5
7		416U	8J6U	416U	8J6U	416U	8J6U	416U	8J6U	416U	8J6U
8		416L	8J6L	416L	8J6L	416L	8J6L	416L	8J6L	416L	8J6L
9		417U	8J7U	417U	8J7U	417U	8J7U	417U	8J7U	417U	8J7U
A		417L	8J7L	417L	8J7L	417L	8J7L	417L	8J7L	417L	8J7L
B		418	8J8	418	8J8	418	8J8	418	8J8	418	8J8
C		119U	6J9U	119U	6J9U	119U	6J9U	119U	6J9U	119U	6J9U
D		319L	7J9L	319L	7J9L	319L	7J9L	319L	7J9L	319L	7J9L

D + X (ACROSS) + Y (DOWN)

TO ACCESS CONFIGURATION DATA, SET F-0-E = 1

CONFIGURATION DATA

		PHASE							
		1	2	3	4	5	6	7	8
EXCLUSIVE	0								
RR1 GN CLR	1								
RR2 GRN CLR	2								
RR2 LTD SRV	3								
PRO/PERM	4								
OLA GN OMIT	5								
OLB GN OMIT	6								
OLC GN OMIT	7								
OLD GN OMIT	8								
OV FL YELLOW	9								
EMVEH A	A	X			X				
EMVEH B	B								
EMVEH C	C	X				X			
EMVEH D	D								
EXTRA	E	X	X	X					
IC SELECT	F	X							

E + E + INTERVAL

EXTRA (E+E+E)

- 1-TBC TYPE 1
- 2-NEMA COORD
- 3-DAVLIGHT SAVINGS
- 4-EV ADVANCE
- 5-REMOTE EVP
- 6-SPECIAL EVENT
- 7-PRETIMED
- 8-SPLIT RING

ICSELECT (E+E+F)

- 1-SIMPLEX IN
- 2-2 WAY MODEM
- 3-7 WIRE IN
- 4-FLH/FREE
- 5-SIMPLEX OUT
- 6-7 WIRE OUT

ASSIGN5 (E+F+F)

- 1-RT OVERLAP
- 2-TOD OUTPUTS
- 3-STEADY EV BEACON
- 4-FLASH EV BEACON

CONFIGURATION DATA

		PHASE							
		1	2	3	4	5	6	7	8
RR OLAP A	0								
RR OLAP B	1								
RR OLAP C	2								
RR OLAP D	3								
PED 2P	4								
PED 6P	5	X							
PED 6P	6					X			
PED 4P	7			X					
PED 8P	8							X	
FLH YELLOW	9								
OVERLAP A	A								
OVERLAP B	B								
OVERLAP C	C								
OVERLAP D	D								
RESTRICT	E								
ASSIGN5	F								

E + F + INTERVAL

TIME OF DAY FEATURES

EVENT	TIME	FUNC	DAY OF WEEK							PHASE OR FUNCTION						
			S	M	T	W	T	F	S							
			1	2	3	4	5	6	7							
0																
1																
2																
3																
4																
5																
6																
7																
8																
9																

7 + EVENT #

D + F + EVENT

TIME OF DAY FUNCTION CODES

0-PERMIT
1-RED LOCK
2-YELLOW LOCK
3-VEH RECALL
4-PED RECALL
5-(RESERVED)
6-REST IN WALK
7-RED REST
8-DBL ENTRY
9-VEH MAX RCL
A-SOFT RCL
B-MAX 2 EXT
C-COND SERV
D-TOD LAG PHS

E-1-LOCAL OVERRIDE
2-PHASE BANK 2
3-PHASE BANK 3
7-DET COUNT
8-SPLIT MONITOR

F- TOD OUTPUTS
1- TOD OUTPUT 1
2- TOD OUTPUT 2
3- TOD OUTPUT 3
4- TOD OUTPUT 4

TIME AND DATE

- B-0 HOUR, MINUTE, DAY-OF-WEEK
- B-1 DAY-OF-MONTH, YEAR, MONTH
- B-F SECONDS

LOCATION

DEL MAR HEIGHTS ROAD & MANGO DRIVE

LOCATION: RTE 5 SB @ DEL MAR HEIGHTS ROAD
CALTRANS C8 Version 3
PAGE

DATE: 5/15/10

PAGE 1

INTERVAL	PHASE TIMING								PRE-EMPTION	F							
	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8
0 WALK	1	1	1	1	1	7	1	7	CDK RST	1	1	1	1	1	1	1	1
1 DOWN WALK	1	1	1	1	1	12	1	18	RAI CLR	15	RED LOCK						1
2 MIN GREEN	1	5	6	5	1	5	1	1	EVA DLY	0	YEL LOCK			3			2
3 TYPE 3 DET	0	255	0	0	0	255	0	0	EVA CLR	5	V RECALL			2		5	3
4 ADD/VER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	EVE DLY	0	P RECALL						4
5 PASSAGE	0.0	5.0	0.0	2.0	0.0	5.0	0.0	0.0	EVE CLR	5							5
6 MAX GAP	0.0	6.5	0.0	2.0	0.0	6.5	0.0	0.0	EVC DLY	0	RT CLR						6
7 MIN GAP	0.0	3.0	0.0	2.0	0.0	3.0	0.0	0.0	EVC CLR	5	RT OLE						7
8 MAX EXT	0	35	0	25	0	35	0	25	EVD DLY	0	DEL ENTRY			4			8
9 MAX 2									YR	EVD CLR	5	MAX 2 PHASES					9
A MAX 3									MO	MAX 3	255	LAG PHASES					A
B									DAY	RST CLR	15	RED RST					B
C REDUCE BY	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	DCN		REST-IN-WALK						C
D EVERY	1.0	0.7	1.0	1.0	1.0	0.7	1.0	1.0	HR		MAX 3 PHASES						D
E YELLOW	3.0	4.3	3.0	3.5	5.0	4.5	3.0	3.5	MMN		YEL START UP			2		5	E
F RED	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	SEC		FIRST PHASE			3		7	F
3.5 RED XING FT						50		80						1	2	3	4
RED XING FT	56					52								5	6	7	8

TOO LONG FAILURE	
POD SHORT FAILURE	
FOF	0
FOF	5
FOC	3
FOC	3
FOC	10
FOC	0.0
FOC	0.0
FOC	0.0
FOC	0.0

FOC TO SELECT	1
FOC PED SELECT	0
FOC 7 WKS	0
FOC PERMITIVE	0
FOC OR SEEKING	1

COB FLASH TYPE	1
COB DOWNLOD	1

NOTES:

FSO = 1

DELATED FS 4 WITH FS 8 RED CALL

FS 2 TYPE = 4 sec

REMARKS IN THESE LOCATIONS CAN BE CHANGED IN CCI PLANT ONLY

LOCATION: RTE 5 SB @ DEL MAR HEIGHTS ROAD
CALTRANS C8 Version 3
PAGE

DATE: 3/31/94

PAGE 2

	CONTROL PLANS								Y-COORD		LAG PHASE	FLAG							
	1	2	3	4	5	6	7	8	9	C	D	E	F	1	2	3	4	5	6
0 CYCLE LENGTH	0												ING FZ FREE						
1 FZ1 GRN FCTR	0											GAPOUT CP1	0	LAG FZ CP 1					
2												GAPOUT CP2		LAG FZ CP 2					
3 FZ3 GRN FCTR	0											GAPOUT CP3		LAG FZ CP 3					
4 FZ4 GRN FCTR	0											GAPOUT CP4		LAG FZ CP 4					
5 FZ5 GRN FCTR	0											GAPOUT CP5		LAG FZ CP 5					
6												GAPOUT CP6		LAG FZ CP 6					
7 FZ7 GRN FCTR	0											GAPOUT CP7		LAG FZ CP 7					
8 FZ8 GRN FCTR	0											GAPOUT CP8		LAG FZ CP 8					
9 MULTI CYCLE	0											GAPOUT CP9		LAG FZ CP 9					
A OFFSET A	0													LAG C COORD					
B OFFSET B														LAG D COORD					
C OFFSET C														COORD PHASES	2				
D FZ 3 EXT																			
E FZ 7 EXT																			
F OFFSET INTRPT																			

CO1 MANUAL CP

CO2 MASTER CP

CO3 CURRENT CP

CO4 LAST CP

CO7 TRANSAT CP

CO8 MANUAL OFFSET

CO9 LOCAL CYCLE TIMER

CBO MASTER CYCLE TIMER

CBA LOCAL OFFSET

CBA MASTER OFFSET

FEATURE

OFF ON

LOCATION

OFF ON

1		
2		
3		
4		
5		
6		
7		
8		

COO = 2

CCB/CDB OFFSET TIMER

CCB/CDB LAG GREEN TIMER

CCB/CDB FORCE OFF TIMER

CCB/CDB LONG GREEN TIMER

CCB/CDB NO GREEN TIMER

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[illegible]

NOUR = D-A-E

NOUR = D-A-E

MINUTE = D-12-72

DAY 14 D-C-E

RCL 1. = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

D-E-E = CB VERSION NUMBER

HOUR = D-A-F

D-E-F = LITHIUM BATTERY CONDITION

MINUTES OF THE DEBATE

$$\mathcal{B}_\perp = \mathbb{R}^n D$$

DAY = D-O-Y

B5 = GOOD

CONTROL PLAN TIME OF DAY								
S+EVENT+HR+MIN+CP+OP+E+DOW								
	HR	MIN	CP	OS	S	M	T	F
					1	2	3	4
					5	6	7	8
0								
1								
2								
3								
4								
5								
6								
7								
8								
9								
A								
B								
C								
D								
E								
F								

ACTIVITY CODE

1 TYPE OF MAX. TERMINATION

2 MAX 2

3 MAR 3

4 COND BERV (2ST SELECT)

5 COND SERV (2ND SELECT)

6 ENERGIZE AND OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

3 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)

A TRAFFIC ACT. MAX 2 OPERATION

3 TIME OF DAY MAX RECALL (2ND SELECT)

C YELLOW YIELD COORDINATION

D YELLOW YIELD COORDINATION

D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION

E TIME OF DAY FREE C.
F FLASHING OPERATION

LOCATION: Del Mar Heights Rd WB to 5 SB
(Loc #1)
Discharge (veh/hr/lane)
Least Restrictive 570
Most Restrictive 366
CPM (cycles/min)
Least Restrictive 8.5
Most Restrictive 6.1

Schedule Hours 0530-1100
1400-1900
Veh/Cyc 1
SOV 2
HOV 0

Meter ID	82
Hex	Dec
HICPM	51 #NAME?
DLCPM	18 #NAME?

Rate	cyc/min	veh/cyc	veh/hr/lane	sec/cyc
Rate 1	8.50	1	570	8.3
Rate 2	8.26	1	566	8.6
Rate 3	8.02	1	541	6.7
Rate 4	8.72	1	527	5.8
Rate 5	8.54	1	512	7.0
Rate 6	8.30	1	498	7.2
Rate 7	8.05	1	484	7.4
Rate 8	7.82	1	469	7.7
Rate 9	7.56	1	455	7.9
Rate 10	7.34	1	440	8.2
Rate 11	7.10	1	426	8.5
Rate 12	6.86	1	412	8.7
Rate 13	6.62	1	397	9.1
Rate 14	6.38	1	383	9.4
Rate 15	6.14	1	368	9.8

LOCATION: Del Mar Heights Rd EB to 5 SB
(Loc #2)
Discharge (veh/hr/lane)
Least Restrictive 896
Most Restrictive 499
CPM (cycles/min)
Least Restrictive 8.3
Most Restrictive 4.2
Schedule Hours 0530-1100
1400-1900

Veh/Cyc 2
SOV 1
HOV 1

Meter ID	83
Hex	Dec
HICPM	55 #NAME?
DLCPM	16 #NAME?

Rate	cyc/min	veh/cyc	veh/hr/lane	sec/cyc
Rate 1	8.30	2	896	7.2
Rate 2	8.06	2	967	7.4
Rate 3	7.76	2	931	7.7
Rate 4	7.48	2	885	8.0
Rate 5	7.16	2	859	8.4
Rate 6	6.86	2	823	8.7
Rate 7	6.56	2	787	9.1
Rate 8	6.26	2	751	9.6
Rate 9	5.96	2	715	10.1
Rate 10	5.66	2	679	10.6
Rate 11	5.36	2	643	11.2
Rate 12	5.06	2	607	11.9
Rate 13	4.76	2	571	12.6
Rate 14	4.46	2	535	13.5
Rate 15	4.16	2	499	14.4

LOCATION: Del Mar Heights Rd to 5 NB
(Loc #3)
Discharge (veh/hr/lane)
Least Restrictive 996
Most Restrictive 583
CPM (cycles/min)
Least Restrictive 8.3
Most Restrictive 4.9
Schedule Hours 1500-1800

Veh/Cyc 2
SOV 2
HOV 0

Meter ID	128
Hex	Dec
HICPM	53 #NAME?
DLCPM	18 #NAME?

Rate	cyc/min	veh/cyc	veh/hr/lane	sec/cyc
Rate 1	8.30	2	996	7.2
Rate 2	8.05	2	967	7.4
Rate 3	7.82	2	938	7.7
Rate 4	7.55	2	910	7.9
Rate 5	7.34	2	881	8.2
Rate 6	7.10	2	852	8.5
Rate 7	6.86	2	823	8.7
Rate 8	6.62	2	794	9.1
Rate 9	6.36	2	765	9.4
Rate 10	6.14	2	737	9.8
Rate 11	5.90	2	708	10.2
Rate 12	5.66	2	679	10.6
Rate 13	5.42	2	650	11.1
Rate 14	5.18	2	622	11.6
Rate 15	4.94	2	593	12.1

LOCATION: DEL MAR HEIGHTS ROAD
CMT/TRANS CS Version 3

DATE: 8/16/10

PAGE 1

P PAGE

INTERVAL	1	2	3	4	5	6	7	8	9	PHASE	1	2	3	4	5	6	7	8	9	PHASE
0 WALK	1	7	1	1	1	7	1	1	2	CLK RES	1	1	1	1	1	1	1	1	1	1
1 CONT WALK	1	10	1	1	1	10	1	1	1	RRL CLR	1	1	1	1	1	1	1	1	1	1
2 MIN GREEN	1	7	1	1	1	5	5	1	5	EVA DLY	0	1	1	1	1	1	1	1	1	1
3 TYPE 3 DET	0	253	0	0	0	253	0	0	0	EVA CLR	5	1	1	1	1	1	1	1	1	1
4 RDD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	EVE DLY	0	1	1	1	1	1	1	1	1	1
5 PASSAGE	0.9	5.0	0.9	0.9	2.0	5.0	0.9	2.0	2.0	EVE CLR	5	1	1	1	1	1	1	1	1	1
6 MAX GAP	0.9	6.5	0.9	0.9	2.0	6.5	0.9	2.0	2.0	BVC DLY	0	1	1	1	1	1	1	1	1	1
7 MIN GAP	0.9	3.0	0.9	0.9	2.0	3.0	0.9	2.0	2.0	SVC CLR	5	1	1	1	1	1	1	1	1	1
8 MAX EXT	9	35	9	9	35	9	9	35	25	EVD DLY	0	1	1	1	1	1	1	1	1	1
9 MAX 2									40	EVD CLR	5	1	1	1	1	1	1	1	1	1
A MAX 3									45	NO DLY	255	1	1	1	1	1	1	1	1	1
B										RR2 CLR	15	1	1	1	1	1	1	1	1	1
C REDUCE BY	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	LOW										
D EVDLY	1.0	0.7	1.0	1.0	1.0	0.7	1.0	1.0	1.0	HR										
E YELLOW	3.0	4.3	3.0	3.6	3.2	4.3	3.0	3.6	3.6	MIN										
F RED	1.0	2.0	1.0	2.0	2.0	2.0	1.0	2.0	2.0	SEC										
G RED XING FT	94								64											
H RED XING FT	53								47											

NOTES:

C/M = 22'

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN DCL FLASH ONLY

CO5 FLAG TYPE	1
CC2 DOWNLOAD	1

[illegible]

```

G01 MANUAL CP
G02 MASTER CP
G03 CURRENT CP      SYSTEM MASTER:
G04 LAST CP         RFE 5 SR RAMP
G07 TRANSMT CP
G0D MANUAL OFFSET
G80 LOCAL CYCLE TIMER
G80 MASTER CYCLE TIMER
G8A LOCAL OFFSET
G8A MASTER OFFSET

```

FEATURES	OFF	ON
1	☒	☐
2	☒	☐
3	☒	☐
4	☒	☐
5	☒	☐
6	☒	☐
7	☒	☐
8	☒	☐

LOCATION	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

COB = 1

	C		FLAGS					B	FLAGS					F	FLAGS																	
	MAX	RCL	1	2	3	4	5	6	7	8	MIN	RCL	1	2	3	4	5	6	7	8	END	RCL	1	2	3	4	5	6	7	8		
D																																
1	CP 1										CP 1										B	CP 1										
2	CP 2										CP 2											CP 2										
3	CP 3										CP 3											CP 3										
4	CP 4										CP 4											CP 4										
5	CP 5										CP 5											CP 5										
6	CP 6										CP 6											CP 6										
7	CP 7										CP 7											CP 7										
8	CP 8										CP 8											CP 8										
9	CP 9										CP 9											CP 9										
A																						RCL 1										
B																						RCL 2										
C																																
D																																
E																																
F																																
			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8		

E		FLAGS						E		FLAGS								
FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0									CODE 4									
1									CODE 5									
2									C-RECALL									
3									D-RECALL									
4																		
5																		
6																		
7																		
8																		
9																		
A																		
B																		
C																		
D																		
E																		
F																		
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

LAST POWER FAILURE REGISTER

HOUR = D-A-E
 MINUTE = D-B-E
 DAY = D-C-E

LAST FLARE TIME REGISTER

HOUR = D-A-F
 MINUTE = D-B-F
 DAY = D-C-F

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES
(CALL ACTIVE LIGHTS)
RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES
(CALL ACTIVE LIGHTS)

D-E-E = CB VERSION NUMBER
D-E-F = LITHIUM BATTERY CONDITION
84 = BAD
85 = GOOD

TIME OF DAY ACTIVITY TABLE													
7+EVENT+HR+MIN+ACT+H+ON/OFF+DOW LYS													
	HR	MIN	ACT	ON/ OFF	1	2	3	4	5	6	7	S	
	0	05	00	3	ON		2	3	4	5	6		
	1	05	00	3			2	3	4	5	6		
	2	15	00	2	ON		2	3	4	5	6		
	3	15	00	2			2	3	4	5	6		
	4												
	5												
	6												
	7												
	8												
	9												
	A												
	B												
	C												
	D												
	E	16	30	B			2	3	4	5	6		
	F	18	30	E	ON	1	2	3	4	5	6	7	

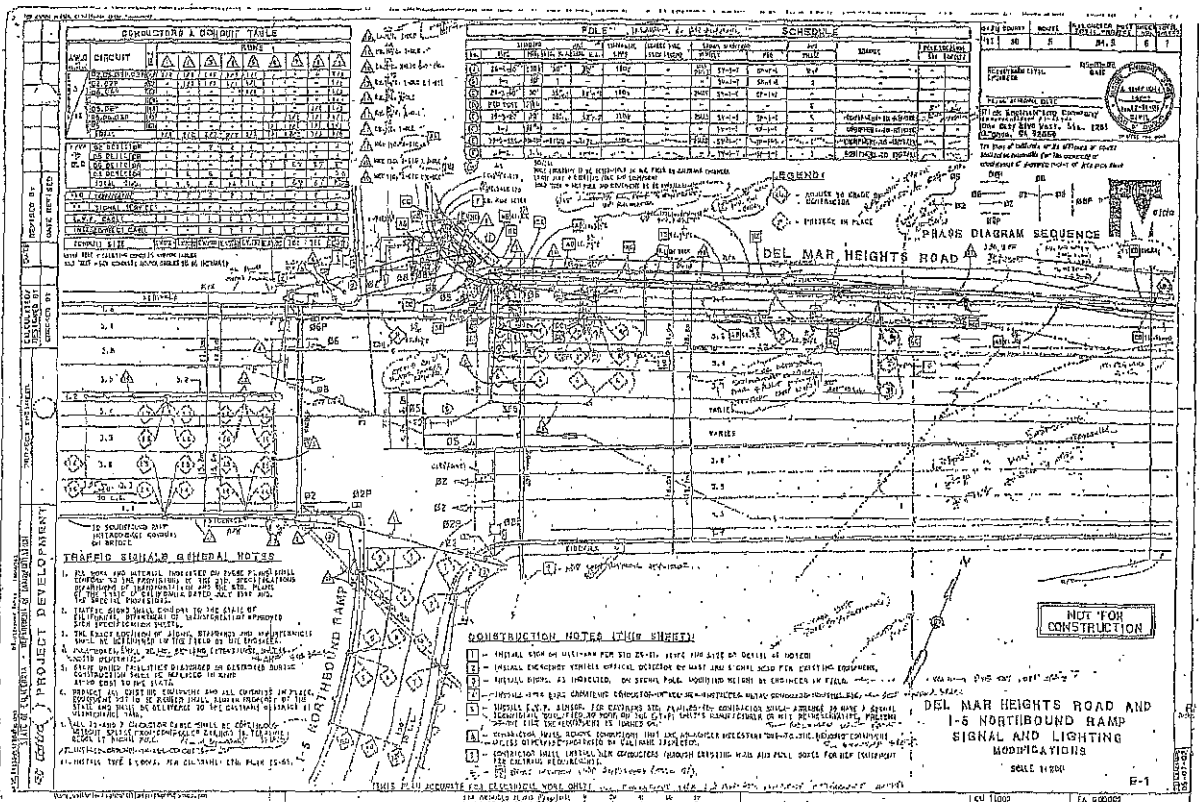
ACTIVITY CODE

- 1 TYPE OF MAX TERMINATION
- 2 MAX 2
- 3 MAX 3
- 4 COND SERV (1ST SELECT)
- 5 COND SERV (2ND SELECT)
- 6 ENERGIZE AUX OUTPUT-RED
- 7 ENERGIZE AUX OUTPUT-GREEN

CONTROL PLAN TIME OF DAY												
8+EVENT+HR+MIN+CP+OS+D+DOW												
	HR	MIN	CP	OS	S	M	T	W	T	F		
0					1	2	3	4	5	6		
1												
2												
3												
4	16	30	1	A		2	3	4	5	6		
5	18	30	E			2	3	4	5	6		
6												
7												
8												
9												
A												
B												
C												
D												
E												
F												

- 8 ENERGIZE AUX OUTPUT-YELLOW
- 9 TIME OF DAY MAX RECALL (1ST SELECT)
- A TRAFFIC ACT. MAX 2 OPERATION
- B TIME OF DAY MAX RECALL (2ND SELECT)
- C YELLOW YIELD COORDINATION
- D YELLOW YIELD COORDINATION
- E TIME OF DAY FREE OPERATION
- F FLASHING OPERATION

CONTROL PLAN TIME OF DAY												
9+EVENT+HR+MIN+CP+OS+E+DOW												
	HR	MIN	CP	OS	S	M	T	H	T	F	S	
					1	2	3	4	5	6	7	
D												
1												
2												
3												
4												
5												
6												
7												
8												
9												
A												
B												
C												
D												
E												
F												



10

Last Database Change:
System Ref. Number:

Phase Functions <F Page>
F + F + Row

Lag Phases <C Page>D ÷ Q ÷ OVERLAP

Manual Offset
 0 = Automatic
 1 = Offset A
 2 = Offset B
 3 = Offset C

Timing Implemented On:

 $\cdot D + D + 9$

INTERSECTION: DEL MAR HEIGHTS RD @ HIGH BLUFF DR

223 Program

Row	Time	Function	Day of Week	Column F Phases/Bits
0	:	:	:	:
1	:	:	:	:
2	:	:	:	:
3	:	:	:	:
4	:	:	:	:
5	:	:	:	:
6	:	:	:	:
7	:	:	:	:
8	:	:	:	:
9	:	:	:	:
A	:	:	:	:
B	:	:	:	:
C	:	:	:	:
D	:	:	:	:
E	:	:	:	:
F	:	:	:	:

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions

0 = Permitted Phases

1 = Red Lock

2 = Yellow Lock

3 = Veh Min Recall

4 = Ped Recall

5 =

6 = Rest In Walk

7 = Red Rest

8 = Double Entry

9 = Veh Max Recall

A = Veh Soft Recall

B = Maximum 2

C = Conditional Service

D = Free Lag Phases

E = Bit 1 - Local Override

Bit 2 - Phase Bank 2

Bit 3 - Phase Bank 3

Bit 4 - Disable Detector

OFF Monitor

Bit 7 - Detector Count Monitor

Bit 8 - Real Time Split Monitor

F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	45
B	Overlap B - Phases	23
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	1

Configuration

E + F + ROW

<E Page>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	4
6	Overlap B - Green Omit	2
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration

E + E + ROW

For access, set F + 9 + E = 1

Extra 1 Flags

1 = TBC Type 1

2 = NEMA Ext. Coord

3 = Auto Daylight Savings

4 = EV Advance

5 = Remote Download

6 = Special Event

7 = Pretimed Operation

8 = Split Ring Operation

IC Select Flags

1 =

2 = Modem

3 = 7-Wire Slave

4 = Flash / Free

5 =

6 = Simplex Master

7 = 7-Wire Master

8 = Offset Interrupter

Day of Week

1 = Sunday

2 = Monday

3 = Tuesday

4 = Wednesday

5 = Thursday

6 = Friday

7 = Saturday

Assign 5 Outputs

1 = Right Turn Overlap

2 = TOD Outputs

3 = EV Beacon - Steady

4 = EV Beacon - Flashing

5 = Special Event Outputs

6 = Phase 3 & 7 Ped

7 = Advanced Warning Sign

8 =

Time and Date

8-0 Hour, Minute, Day-of-Week

8-1 Day-of-Month, Year, Month

8-F Seconds

Disable Parity

0

D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

Program Information

C + C + 0 = program

C + C + F = version

Remote Download

C + 0 + 4 = 1 - 255

w/ E + E + E bit 5 on

	1	3			
Row	Delay	Carry-over	Detector Name	332 Input File	Detector Number
0				111	14
1		1.8		212U	1
2		1.8		212L	5
3				213U	21
4				213L	25
5				214	9
6				315	16
7				416U	3
8				416L	7
9				417U	23
A				417L	27
B				418	11
C				119U	18
D				319L	20
E	---	---	---	---	---
F	---	---	---	---	---

	2	4			
Row	Delay	Carry-over	Detector Name	332 Input File	Detector Number
0				5J1	13
1		1.8		6J2U	2
2				6J2L	6
3				6J3U	22
4				6J3L	28
5				6J4	10
6				7J5	15
7				8J6U	4
8				8J6L	8
9				8J7U	24
A				8J7L	28
B				8J8	12
C				5J9U	17
D				7J9L	19
E	---	---	---	---	---
F	---	---	---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW



Detector Numbers	E
1 2 3 4 5 6 7 8	12345678
9 10 11 12 -- -- --	1234
13 14 15 16 17 18 19 20	12345678
-- -- -- 21 22 23 24	5678
-- -- -- -- -- --	1234
-- 25 26 27 28 -- --	2345

Active Detectors <D Page>



	0
	Detector #
System Det. # 1	
System Det. # 2	
System Det. # 3	
System Det. # 4	
System Det. # 5	
System Det. # 6	
System Det. # 7	
System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number		F+C+1
Time Before Yellow		F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: DEL MAR HEIGHTS RD @ HIGH BLUFF DR

223 Program

Coordination Timing By: JDS
Implemented On: 2/5/2010

Row	Column # -->	Plan						
		AM	MD	PM				
0	Cycle Length	120	120	120				
1	Phase 1 - ForceOff	16	15	81				
2	Phase 2 - ForceOff	0	0	0				
3	Phase 3 - ForceOff	74 30	34	69 29				
4	Phase 4 - ForceOff	51 74	78	29 68				
5	Phase 5 - ForceOff	86	96	89				
6	Phase 6 - ForceOff	0	0	0				
7	Phase 7 - ForceOff	74	27	69 12				
8	Phase 8 - ForceOff	56	78	29 69				
9	Ring Offset							
A	Offset A	78	8	3 53	①			
B	Offset B							
C	Offset C							
D	Permissive	12	12	12				
E	Hold Release	117 255	255	255				
F	Ped Shift	0	0	0				

Coordination <C Page>
C + Plan + ROW

FOR OBSERVATION ONLY

Master Plan C + A + 2
Current Plan C + A + 3
Next Plan C + A + 4
T.O.D. Plan C + A + 5
Master Cycle C + A + 0
Ring A Cycle C + B + 0
Ring B Cycle C + D + 0
Min Cycle C + A + E
Max Cycle C + B + E

Row	Time	Plan	Offset	Day of Week
0	06 : 30	1	A	23456
1	10 : 30	E	A	23456
2	11 : 30	2	A	23456
3	15 : 00	3	A	23456
4	19 : 00	E	A	1234567
5	:			
6	:			
7	:			
8	:			
9	:			
A	:			
B	:			
C	:			
D	:			
E	:			
F	:			

TOD Coordination
<@ Key with C+0+9=1>

Plan	Sync Phases	Row	Lag Phases
Plan 1	2 6	0	Free Lag
Plan 2	2 6	1	Plan 1 - Lag 1 3 4 6 7
Plan 3	2 6	2	Plan 2 - Lag 1 4 6 8
Plan 4		3	Plan 3 - Lag 2 4 6 8 3 7
Plan 5		4	Plan 4 - Lag
Plan 6		5	Plan 5 - Lag
Plan 7		6	Plan 6 - Lag
Plan 8		7	Plan 7 - Lag
Plan 9		8	Plan 8 - Lag
Coord Ped*		9	Plan 9 - Lag
NEMA Hold		A	Coord Max *
		B	Coord Lag *
		C	
		D	
		E	
		F	

Sync Phases <C Page>
C + E + FUNCTION # Lag Phases C + F + FUNCTION #

Plan Select
1 thru 9 = Coordination
Plan 1 thru 9
14 or E = Free
15 or F = Flash

Transition Type 0
TBC Transition
C + D + D

Transition Type
0 = Shortway
Non-zero = Lengthen

INTERSECTION: DEL MAR HEIGHTS RD @ EL CAMINO REAL

223 Program

Group Assignment:
Field Master Assignment:

N/S Street Name: El Camino Real
E/W Street Name: Del Mar Heights Rd

Last Database Change:
System Ref. Number:

Column # →		Phase							
Phase # →		1	2	3	4	5	6	7	8
Row		↓ 1+8	→	←	↓	↑	←	→	↑
0	Ped Walk		7		7		7		7
1	Ped FDW		26		26		28		34
2	Min Green	4	10	4	7	4	10	4	7
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	3.8	2.0	3.3	2.0	3.8	2.0	3.8
6	Max Gap	2.0	3.8	2.0	3.3	2.0	3.8	2.0	3.8
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	40	30	60	30	40
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1		0.1		0.1		0.1
D	Every		0.8		1.0		0.8		0.8
E	Yellow	3.4	5.1	3.4	5.4	3.4	4.9	3.4	4.6
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Grade								

Phase Timing - Bank 1
F + Phase + Row

<F Page>

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + 0

Start / Revert Times

Drop Number	6.11	C + 0 + 0
Zone Number	6.11	C + 0 + 1
Area Number	4	C + 0 + 2
Area Address	163169	C + 0 + 3
QuickNet Channel	FM Del Mar	(QuickNet)

Communication Addresses

C + F + 0	F	Row
Free Lag	2 4 6 8	0

Lag Phases <C Page>

Overlap Timing

Row		Green Clear	Yellow Change	Red Clear	Load-Switch #
Overlap A	A				
Overlap B	B				
Overlap C	C				
Overlap D	D				

<F Page>

F + COLOR +

<D Page>

D + 0 + OVERLAP

Downtime Flash 255 (minutes)

Downtime Before Auto Manual Flash

F + 0 + 8

Disable Ports 234

Disable Communication Ports

D + D + 9

RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing

F + E + Row

Phase Functions <F Page>

F + F + Row

Manual Plan	0	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
15 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Timing Sheet By: JDS

Approved By: FLG

Drawing Number: 22119-20

Timing Implemented On:

INTERSECTION: DEL MAR HEIGHTS RD @ EL CAÑO REAL

223 Program

Row	Time	Function	Day of Week	Phases/Bits
0	:	:	:	:
1	:	:	:	:
2	:	:	:	:
3	:	:	:	:
4	:	:	:	:
5	:	:	:	:
6	:	:	:	:
7	:	:	:	:
8	:	:	:	:
9	:	:	:	:
A	:	:	:	:
B	:	:	:	:
C	:	:	:	:
D	:	:	:	:
E	:	:	:	:
F	:	:	:	:

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions

0 = Permitted Phases

1 = Red Lock

2 = Yellow Lock

3 = Veh Min Recall

4 = Ped Recall

5 =

6 = Rest In Walk

7 = Red Rest

8 = Double Entry

9 = Veh Max Recall

A = Veh Soft Recall

B = Maximum 2

C = Conditional Service

D = Free Lag Phases

E = Bit 1 - Local Override

Bit 2 - Phase Bank 2

Bit 3 - Phase Bank 3

Bit 4 - Disable Detector

OFF Monitor

Bit 7 - Detector Count Monitor

Bit 8 - Real Time Split Monitor

F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 8P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	1 8
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	1

Configuration

E + F + ROW

<E Page>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Onit	8
6	Overlap B - Green Onit	
7	Overlap C - Green Onit	
8	Overlap D - Green Onit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Extra 1 Flags

1 = TBC Type 1

2 = NEMA Ext. Coord

3 = Auto Daylight Savings

4 = EV Advance

5 = Remote Download

6 = Special Event

7 = Pretimed Operation

8 = Split Ring Operation

IC Select Flags

1 =

2 = Modem

3 = 7-Wire Slave

4 = Flash / Free

5 =

6 = Simplex Master

7 = 7-Wire Master

8 = Offset Interrupter

Day of Week

1 = Sunday

2 = Monday

3 = Tuesday

4 = Wednesday

5 = Thursday

6 = Friday

7 = Saturday

Assign 5 Outputs

1 = Right Turn Overlap

2 = TOD Outputs

3 = EV Beacon - Steady

4 = EV Beacon - Flashing

5 = Special Event Outputs

6 = Phase 3 & 7 Ped

7 = Advanced Warning Sign

8 =

Time and Date

8-0 Hour, Minute, Day-of-Week

8-1 Day-of-Month, Year, Month

8-F Seconds

Disable Parity

0

D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

Program Information

C + C + Q = program

C + C + F = version

Remote Download

C + C + 4 = 1 -255

w/ E + E + E bit 5 on

Configuration

E + E + ROW

For access, set F + 9 + E = 1

Row	Delay	Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
	2I2U	1
	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	16
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Row	Delay	Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		1.8
8		
9		
A	10.0	
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row

Detector Numbers	E
1 2 3 4 5 6 7 8	12345678
9 10 11 12 - - - -	1234
13 14 15 16 17 18 19 20	12345678
- - - - 21 22 23 24	5678
- - - - - - - -	1234
- 25 26 27 28 - - - -	2345

Active Detectors <D Page>

Row

Detector #
System Det. # 1
System Det. # 2
System Det. # 3
System Det. # 4
System Det. # 5
System Det. # 6
System Det. # 7
System Det. # 8

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	F+C+1
Time Before Yellow	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	F+D+1
Time Before Yellow	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: DEL MAR HEIGHTS RD @ EL CAMINO REAL

223 Program

Column # →		Plan							
Row	Plan Name →	AM	MD	PM					
0	Cycle Length	120	120	120					
1	Phase 1 - ForceOff	17	94	81 15					
2	Phase 2 - ForceOff	0	0	0					
3	Phase 3 - ForceOff	76 17	80	59 38					
4	Phase 4 - ForceOff	55 62	57	25 73					
5	Phase 5 - ForceOff	92	19	81 96					
6	Phase 6 - ForceOff	0	0	0 18					
7	Phase 7 - ForceOff	76 30	33	59 74					
8	Phase 8 - ForceOff	55 76	79	47 62					
9	Ring Offset								
A	Offset A	80 09	7	18 2					
B	Offset B								
C	Offset C								
D	Permissive	12	12	12					
E	Hold Release	255	255	255					
F	Ped Shift	0	0	0					

Coordination Timing By: JDS
Implemented On: 2/5/2010

FOR OBSERVATION ONLY

Master Plan C + A + 2
Current Plan C + A + 3
Next Plan C + A + 4
T.O.D. Plan C + A + 5
Master Cycle C + A + 0
Ring A Cycle C + B + 0
Ring B Cycle C + D + 0
Min Cycle C + A + E
Max Cycle C + B + E

Coordination
C + Plan + ROW
<C Page>

Row	Time	Plan	Offset	Day of Week
0	06 : 30	1	A	23456
1	10 : 30	E	A	23456
2	11 : 30	2	A	23456
3	15 : 00	3	A	23456
4	19 : 00	E	A	1234567
5	:			
6	:			
7	:			
8	:			
9	:			
A	:			
B	:			
C	:			
D	:			
E	:			
F	:			

TOD Coordination
<9 Key with C+0+9=1>

Plan Select
1 thru 9 = Coordination
Plan 1 thru 9
14 or E = Free
15 or F = Flash

Row	Plan	Offset	Day of Week
0	Free Lag		
1	Plan 1 - Lag	1 3 6 8	
2	Plan 2 - Lag	23 5 8	
3	Plan 3 - Lag	2 3 1 6 7	
4	Plan 4 - Lag		
5	Plan 5 - Lag		
6	Plan 6 - Lag		
7	Plan 7 - Lag		
8	Plan 8 - Lag		
9	Plan 9 - Lag		
A	Coord Max *		
B	Coord Lag *		
C			
D			
E			
F			

Sync Phases
C + E + FUNCTION #

Lag Phases
C + F + FUNCTION #

Transition Type 0
TBC Transition
C + D + D

Transition Type
0 = Shortway
Non-zero = Lengthen

INTERSECTION: CARMEL COUNTRY RD @ DEL MAR HEIGHTS RD

223 Program

Group Assignment:
Field Master Assignment:

N/S Street Name: Carmel Country Rd
E/W Street Name: Del Mar Heights Rd

Last Database Change:
System Ref. Number:

14

		Del Mar Heights Rd		Hartfield Av		Del Mar Heights Rd		Carmel Country Rd	
		Phase		Phase		Phase		Phase	
Row	Phase #	1	2	3	4	5	6	7	8
0	Ped Walk		7		7		7		7
1	Ped FDW		22		27		19		26
2	Min Green	4	7	4	7	4	7	4	7
3	Type 3 Limit								
4	Add/Veh								
5	Veh Extn	2.0	3.8	2.0	5.8	2.0	4.0	2.0	4.0
6	Max Gap	2.0	3.8	2.0	5.8	2.0	4.0	2.0	4.0
7	Min Gap	2.0	0.2	2.0	0.2	2.0	0.2	2.0	0.2
8	Max Limit	30	60	30	50	30	60	30	50
9	Max Limit 2								
A	Bus Adv								
B	Call to Phs								
C	Reduce By		0.1		0.1		0.1		0.1
D	Every		0.8		0.5		0.8		0.8
E	Yellow	3.4	4.6	3.4	3.9	3.4	4.8	3.4	4.4
F	Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Grade								

Phase Timing - Bank 1
F + Phase + Row

<F Page>

Max Initial	0	F + 0 + E
Red Revert	5.0	F + 0 + F
All Red Start	0.0	F + C + 0
Start / Revert Times		
Drop Number	8	C + 0 + 0
Zone Number	8	C + 0 + 1
Area Number	4	C + 0 + 2
Area Address	165	C + 0 + 3
QuickNet Channel	DEL MAR	(QuickNet)

Communication Addresses		Row
C + F + 0	2 4 6 8	0
Free Lag	2 4 6 8	0
Lag Phases		<C Page>

Overlap Timing

Row	Overlap			
	Green Clear	Yellow Change	Red Clear	Load-Switch #
Overlap A				
Overlap B				
Overlap C				
Overlap D				

<F Page>
F + COLOR +

<D Page>
D + 0 + OVERLAP

Downtime Flash	255	(minutes)
Downtime Before Auto Manual Flash		
F + 0 + B		

Disable Ports	234
Disable Communication Ports	
D + D + 8	

RR-1 Delay	
RR-1 Clear	
EV-A Delay	0
EV-A Clear	0
EV-B Delay	0
EV-B Clear	0
EV-C Delay	0
EV-C Clear	0
EV-D Delay	0
EV-D Clear	0
RR-2 Delay	
RR-2 Clear	
View EV Delay	---
View EV Clear	---
View RR Delay	---
View RR Clear	---

Preempt Timing

F + E + Row

Phase Functions <F Page>

F + F + Row

Manual Plan	0	C + A + 1
Manual Offset	0	C + B + 1
Manual Selection		
Manual Plan	0 = Automatic	Manual Offset
1-9 = Plan 1-9	1 = Offset A	
14 = Free	2 = Offset B	
15 = Flash	3 = Offset C	

Timing Sheet By: JDS
Approved By: FLG
Drawing Number: 23322-4-0
Timing Implemented On:

INTERSECTION: CARMEL COUNTRY RD @ DEL MAR HEIGHTS RD

223 Program

Row	Time	Function	Day of Week	Column F Phases/Bits
0	:	:	:	:
1	:	:	:	:
2	:	:	:	:
3	:	:	:	:
4	:	:	:	:
5	:	:	:	:
6	:	:	:	:
7	:	:	:	:
8	:	:	:	:
9	:	:	:	:
A	:	:	:	:
B	:	:	:	:
C	:	:	:	:
D	:	:	:	:
E	:	:	:	:
F	:	:	:	:

T.O.D. Functions
 0 = Permitted Phases
 1 = Red Lock
 2 = Yellow Lock
 3 = Veh Min Recall
 4 = Ped Recall
 5 =
 6 = Rest In Walk
 7 = Red Rest
 8 = Double Entry
 9 = Veh Max Recall
 A = Veh Soft Recall
 B = Maximum 2
 C = Conditional Service
 D = Free Lag Phases
 E = Bit 1 - Local Override
 Bit 2 - Phase Bank 2
 Bit 3 - Phase Bank 3
 Bit 4 - Disable Detector
 OFF Monitor
 Bit 7 - Detector Count Monitor
 Bit 8 - Real Time Split Monitor
 F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

TOD Function

7 + ROW

<D Page>

D + F + ROW

Day of Week

1 = Sunday
 2 = Monday
 3 = Tuesday
 4 = Wednesday
 5 = Thursday
 6 = Friday
 7 = Saturday

Configuration

E + F + ROW

<E Page>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-3 Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Extra 1 Flags
 1 = TBC Type 1
 2 = NEMA Ext. Coord
 3 = Auto Daylight Savings
 4 = EV Advance
 5 = Remote Download
 6 = Special Event
 7 = Pretimed Operation
 8 = Split Ring Operation

IC Select Flags

1 =
 2 = Modem
 3 = 7-Wire Slave
 4 = Flash / Free
 5 =
 6 = Simplex Master
 7 = 7-Wire Master
 8 = Offset Interrupter

Configuration

E + E + ROW

For access, set F + 9 + E = 1

Assign 5 Outputs
 1 = Right Turn Overlap
 2 = TOD Outputs
 3 = EV Beacon - Steady
 4 = EV Beacon - Flashing
 5 = Special Event Outputs
 6 = Phase 3 & 7 Ped
 7 = Advanced Warning Sign
 8 =

Time and Date

8-0 Hour, Minute, Day-of-Week
 8-1 Day-of-Month, Year, Month
 8-F Seconds

Program Information

C + C + 0 = program
 C + C + F = version

Remote Download

C + 0 + 4 = 1-255
 w/ E + E + E bit 5 on

Disable Parity 0 D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

Row	1	2
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		1.8
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	111	14
	212U	1
	212L	5
	213U	24
	213L	25
	214	9
	315	16
	416U	3
	416L	7
	417U	23
	417L	27
	418	11
	119U	18
	319L	20
---	---	---
---	---	---

	2	4
Row	Delay	Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7	10.0	
8		
9		1.8
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
	6J2U	2
	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

[illegible]

Detector Numbers	E
1 2 3 4 5 6 7 8	12345678
9 10 11 12 -- -- --	1234
13 14 15 16 17 18 19 20	12345678
-- -- -- 21 22 23 24	5678
-- -- -- -- -- -- --	1234
-- 25 26 27 28 -- -- --	2345

Active Detectors <D Page>

1. 姓名: 王德林
 2. 性别: 男
 3. 年龄: 45
 4. 籍贯: 山东烟台
 5. 民族: 汉族
 6. 职业: 教师
 7. 学历: 大学
 8. 婚姻状况: 已婚
 9. 子女情况: 一子一女
 10. 健康状况: 良好
 11. 兴趣爱好: 读书、运动
 12. 自我评价: 为人正直, 工作认真
 13. 社会评价: 同事尊敬, 学生喜爱
 14. 未来规划: 继续深造, 提高业务水平
 15. 其他说明: 无不良嗜好, 遵纪守法

	0
	Detector #
System Det. # 1	
System Det. # 2	
System Det. # 3	
System Det. # 4	
System Det. # 5	
System Det. # 6	
System Det. # 7	
System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	F+C+1
Time Before Yellow	F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: CARMEL COUNTRY RD @ DEL MAR HEIGHTS RD

223 Program

Column # -->	Plan Name -->	Plan						
		1	2	3	4	5	6	7
Row		AM	MD	PM				
0	Cycle Length	120	120	120				
1	Phase 1 - ForceOff	99	92	86				
2	Phase 2 - ForceOff	15	14	13				
3	Phase 3 - ForceOff	70	38	73				
4	Phase 4 - ForceOff	50	77	50				
5	Phase 5 - ForceOff	15	14	13				
6	Phase 6 - ForceOff	0	0	0				
7	Phase 7 - ForceOff	38	28	29				
8	Phase 8 - ForceOff	70	77	73				
9	Ring Offset							
A	Offset A	70	3	19				
B	Offset B							
C	Offset C							
D	Permissive	15	14	13				
E	Hold Release	255	255	255				
F	Ped Shift	0	0	0				

Coordination

<C Page>

C + Plan + ROW

Row	Time	Plan	Offset	Day of Week
0	06 : 30	1	A	23456
1	10 : 30	E	A	23456
2	11 : 30	2	A	23456
3	15 : 00	3	A	23456
4	19 : 00	E	A	1234567
5	:			
6	:			
7	:			
8	:			
9	:			
A	:			
B	:			
C	:			
D	:			
E	:			
F	:			

TOD Coordination

<9 Key with C+0+9=1>

Plan Select
1 thru 9 = Coordination
Plan 1 thru 9
14 or E = Free
15 or F = Flash

Plan	Row	Free Lag
Plan 1	0	
Plan 1	1	23 5 8
Plan 2	2	2 45 8
Plan 3	3	23 5 8
Plan 4	4	
Plan 5	5	
Plan 6	6	
Plan 7	7	
Plan 8	8	
Plan 9	9	
Coord Ped*	A	Coord Max *
NEMA Hold	B	Coord Lag *
	C	
	D	
	E	
	F	

Sync Phases

C + E + FUNCTION #

Lag Phases <C Page>

C + F + FUNCTION #

Transition Type 0

TBC Transition
C + D + D

Transition Type
0 = Shortway
Non-zero = Lengthen

Downline Before Auto Manual Flash

255

254

Disable Communication Ports

D + D + 9

Manual Print
Manual Offset
Manual Selection
Manual Load
Manual Switch
Manual Clear
Manual Flash
Manual Alarm
Manual Silence
Manual Reset
Manual Test
Manual Stop
Manual Start
Manual Hold
Manual Release
Manual Lock
Manual Unlock
Manual Freeze
Manual Thaw
Manual Defrost
Manual Dry
Manual Vent
Manual Exhaust
Manual Fan
Manual Motor
Manual Relay
Manual Switch
Manual Button
Manual Keypad
Manual Remote
Manual Transmitter
Manual Receiver
Manual Antenna
Manual Cable
Manual Connector
Manual Plug
Manual Jack
Manual Port
Manual Socket
Manual Receptacle
Manual Outlet
Manual Inlet
Manual Valve
Manual Fitting
Manual Tee
Manual Elbow
Manual Coupling
Manual Union
Manual Flange
Manual Gasket
Manual Seal
Manual O-ring
Manual Gasket
Manual Seal
Manual O-ring

253

252

251

250

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247

246

245

244

243

242

Free 158		Free 159	
C + F + 0	2.4	C + F + 0	2.4
Communication	2.4	Communication	2.4
Addresses	2.4	Addresses	2.4
Zone Number	2.4	Zone Number	2.4
Start/Revert Times	2.4	Start/Revert Times	2.4
All Red Start	2.4	All Red Start	2.4
Max Interval	2.4	Max Interval	2.4

Free 158

Free 159

Free 160

Free 161

Free 162

Free 163

Free 164

Free 165

Free 166

Free 167

Free 168

Free 169

Free 170

Free 171

Free 172

Free 173

Free 174

Free 175

Free 176

Free 177

Free 178

Free 179

Free 180

Free 181

Free 182

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242

INTERSECTION: DEL MAR HEIGHTS RD @ TORREY RIDGE DR

223 Program

Row	Time	Function	Day of Week	Phases/Bits
0	:	:	:	:
1	:	:	:	:
2	:	:	:	:
3	:	:	:	:
4	:	:	:	:
5	:	:	:	:
6	:	:	:	:
7	:	:	:	:
8	:	:	:	:
9	:	:	:	:
A	:	:	:	:
B	:	:	:	:
C	:	:	:	:
D	:	:	:	:
E	:	:	:	:
F	:	:	:	:

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions

0 = Permitted Phases

1 = Red Lock

2 = Yellow Lock

3 = Veh Min Recall

4 = Ped Recall

5 =

6 = Rest In Walk

7 = Red Rest

8 = Double Entry

9 = Veh Max Recall

A = Veh Soft Recall

B = Maximum 2

C = Conditional Service

D = Free Lag Phases

E = Bit 1 - Local Override

Bit 2 - Phase Bank 2

Bit 3 - Phase Bank 3

Bit 4 - Disable Detector

OFF Monitor

Bit 7 - Detector Count Monitor

Bit 8 - Real Time Split Monitor

F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration

E + F + ROW

<E Page>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	
C	EV-C Phases	1 6
D	EV-D Phases	
E	Extra 1 Config. Bits	1 345
F	IC Select (Interconnect)	2

Configuration

For access, set F + 9 + E = 1

E + E + ROW

Extra 1 Flags

1 = TBC Type 1

2 = NEMA Ext. Coord

3 = Auto Daylight Savings

4 = EV Advance

5 = Remote Download

6 = Special Event

7 = Pretimed Operation

8 = Split Ring Operation

IC Select Flags

1 =

2 = Modem

3 = 7-Wire Slave

4 = Flash / Free

5 =

6 = Simplex Master

7 = 7-Wire Master

8 = Offset Interrupter

Day of Week

1 = Sunday

2 = Monday

3 = Tuesday

4 = Wednesday

5 = Thursday

6 = Friday

7 = Saturday

Assign 5 Outputs

1 = Right Turn Overlap

2 = TOD Outputs

3 = EV Beacon - Steady

4 = EV Beacon - Flashing

5 = Special Event Outputs

6 = Phase 3 & 7 Ped

7 = Advanced Warning Sign

8 =

Time and Date

8-0 Hour, Minute, Day-of-Week

8-1 Day-of-Month, Year, Month

8-F Seconds

Program Information

C + C + 0 = program

C + C + F = version

Remote Download

C + 0 + 4 = 1 -255

w/E + E + E bit 5 on

Disable Parity 0 D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

Row	1	3
	Delay	Carry-over
D		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	111	14
	212U	1
	212L	5
	213U	21
	213L	25
	214	9
	315	16
	416U	3
	416L	7
	417U	23
	417L	27
	418	11
	119U	18
	319L	20
---	---	---
---	---	---

	2	4
Row	Delay	Carry-over
0		
1		1.8
2		
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Delay & Carryover <D Paca>

D + X (across) + ROW

Flow	Detector Numbers	Flow
1	1 2 3 4 5 6 7 8	12345678
2	9 10 11 12 -- -- --	1234
3	13 14 15 16 17 18 19 20	12345678
4	-- -- -- 21 22 23 24	5678
5	-- -- -- -- -- --	1234
6	-- 25 26 27 28 -- --	2345

Active Detectors <D Page>

	D
#	Detector #
System Det. # 1	
System Det. # 2	
System Det. # 3	
System Det. # 4	
System Det. # 5	
System Det. # 6	
System Det. # 7	
System Det. # 8	

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	F+C+1
Time Before Yellow	F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	$F+0+6$
Short Failure	0.5	$F+0+7$

Power Cycle Correction (Default = 0.5)

INTERSECTION: DEL MAR HEIGHTS RD @ TORREY RIDGE DR

223 Program

Column # →		Plan							
Row	Plan Name →	AM		PM					
0	Cycle Length	120		120					
1	Phase 1 - ForceOff	24		17					
2	Phase 2 - ForceOff	0		0					
3	Phase 3 - ForceOff								
4	Phase 4 - ForceOff	62		58					
5	Phase 5 - ForceOff	94		79					
6	Phase 6 - ForceOff	0		17					
7	Phase 7 - ForceOff								
8	Phase 8 - ForceOff	62		58					
9	Ring Offset								
A	Offset A	29		76					
B	Offset B								
C	Offset C								
D	Permissive	12		17					
E	Hold Release	255		255					
F	Ped Shift	0		0					

Coordination

<C Page>

C + Plan + ROW

Row	Time	Plan	Offset	Day of Week
0	07 : 00	1	A	23456
1	09 : 00	E	A	23456
2	15 : 00	3	A	23456
3	19 : 00	E	A	1234567
4	:			
5	:			
6	:			
7	:			
8	:			
9	:			
A	:			
B	:			
C	:			
D	:			
E	:			
F	:			

TOD Coordination

<9 Key with C+0+9=1>

Plan Select
1 thru 9 = Coordination
Plan 1 thru 9
14 or E = Free
15 or F = Flash

Row	Plan	Sync Phases	Lag Phases
0	Free Lag		
1	Plan 1 - Lag	2 6	1 4 6 8
2	Plan 2 - Lag		
3	Plan 3 - Lag	2	1 4 6 8
4	Plan 4 - Lag		
5	Plan 5 - Lag		
6	Plan 6 - Lag		
7	Plan 7 - Lag		
8	Plan 8 - Lag		
9	Plan 9 - Lag		
A	Coord Max *		
B	Coord Lag *		
C			
D			
E			
F			

Sync Phases

C + E + FUNCTION #

Lag Phases <C Page>

C + F + FUNCTION #

Transition Type 0

TBC Transition
C + D + D

Transition Type

0 = Shortway
Non-zero = Lengthen

INTERSECTION: DEL MAR HEIGHTS RD @ LANSDALE (W) DR

223 Program

Group Assignment:
Field Master Assignment:

N/S Street Name: Lansdale (W) Dr
EW Street Name: Del Mar Heights Rd

Last Database Change:
System Ref. Number:

Column #	Del Mar Hts Rd	Lansdale (W) Dr	Del Mar Hts Rd	Lansdale (W) Dr
Phase #	Phase	Phase	Phase	Phase
0	Ped Walk	7	7	7
1	Ped FDW	14	27 26	15 14
2	Min Green	4 10	4 4	4 10
3	Type 3 Limit			
4	Add/Veh			
5	Veh Extn	2.0 4.0	2.0 2.0	2.0 4.0
6	Max Gap	2.0 4.0	2.0 2.0	2.0 4.0
7	Min Gap	2.0 0.2	2.0 2.0	2.0 0.2
8	Max Limit	30 60	30 40	30 60
9	Max Limit 2			
A	Bus Adv			
B	Call to Phs			
C	Reduce By	0.1		0.1
D	Every	0.8		0.8
E	Yellow	3.4 4.4	3.4 4.1	3.4 4.4
F	Red Clear	1.0 1.0	1.0 1.0	1.0 1.0
	Grade			

Phase Timing - Bank 1
F + Phase + Row

<F Page>

RR-1 Delay		Permit	12345678	0
RR-1 Clear		Red Lock		1
EV-A Delay	0	Yellow Lock		2
EV-A Clear	0	Min Recall		3
EV-B Delay	0	Ped Recall		4
EV-B Clear	0	Peds (View)	2 4 6 8	5
EV-C Delay	0	Rest In Walk		6
EV-C Clear	0	Red Rest		7
EV-D Delay	0	Dbt Entry		8
EV-D Clear	0	Max Recall		9
RR-2 Delay		Soft Recall	2 6	A
RR-2 Clear		Max 2		B
View EV Delay	---	Cond Serv		C
View EV Clear	---	Ped Lock	12345678	D
View RR Delay	---	Yellow Start	2 6	E
View RR Clear	---	1st Phases	3 7	F

Preempt Timing

F + E + Row

Phase Functions <F Page>

F + F + Row

Max Initial	0
Red Revert	5.0
All Red Start	0.0

F + 0 + E

F + 0 + F

F + C + 0

Start / Revert Times

Drop Number	10
Zone Number	10
Area Number	4
Area Address	167

C + 0 + 0

C + 0 + 1

C + 0 + 2

C + 0 + 3

QuickNet Channel DEL MAR

(QuickNet)

Communication Addresses

C + F + 0

Free Lag 2 4 6 8

Lag Phases

<C Page>

Overlap Timing

Row	Green Clear	Yellow Change	Red Clear	Load-Switch #
Overlap A				
Overlap B				
Overlap C				
Overlap D				

<F Page>

F + COLOR +

<D Page>

D + 0 + OVERLAP

Downtime Flash 255 (minutes)

Downtime Before Auto Manual Flash

F + 0 + 8

Disable Ports 234

Disable Communication Ports

D + D + 9

Manual Plan	0	C + A + 1
Manual Offset	0	C + B + 1

Manual Selection

Manual Plan
0 = Automatic
1-9 = Plan 1-9
14 = Free
16 = Flash

Manual Offset
0 = Automatic
1 = Offset A
2 = Offset B
3 = Offset C

Timing Sheet By: JDS

Approved By: FLG

Drawing Number: Z2798-7-D

Timing Implemented On:

INTERSECTION: DEL MAR HEIGHTS RD @ LANSDALE (W) DR

223 Program

Row	Time	Function	Day of Week	Phases/Bits
0	:			
1	:			
2	:			
3	:			
4	:			
5	:			
6	:			
7	:			
8	:			
9	:			
A	:			
B	:			
C	:			
D	:			
E	:			
F	:			

TOD Function

7 + ROW

<D Page>

D + F + ROW

T.O.D. Functions:
0 = Permitted Phases
1 = Red Lock
2 = Yellow Lock
3 = Veh Min Recall
4 = Ped Recall
5 =
6 = Root In Walk
7 = Red Rest
8 = Double Entry
9 = Veh Max Recall
A = Veh Soft Recall
B = Maximum 2
C = Conditional Service
D = Free Lag Phases
E = Bit 1 - Local Override
Bit 2 - Phase Bank 2
Bit 3 - Phase Bank 3
Bit 4 - Disable Detector
OFF Monitor
Bit 7 - Detector Count Monitor
Bit 8 - Real Time Split Monitor
F = Output Bits 1 thru 4

Row		F
0		
1	RR Overlap A - Phases	
2	RR Overlap B - Phases	
3	RR Overlap C - Phases	
4	RR Overlap D - Phases	
5	Ped 2P	2
6	Ped 6P	6
7	Ped 4P	4
8	Ped 8P	8
9	Yellow Flash Phases	
A	Overlap A - Phases	
B	Overlap B - Phases	
C	Overlap C - Phases	
D	Overlap D - Phases	
E	Restricted Phases	
F	Assign 5 Outputs	

Configuration

E + F + ROW

<E Page>

Row		E
0	Exclusive Phases	
1	RR-1 Clear Phases	
2	RR-2 Clear Phases	
3	RR-2 Limited Service	
4	Prot / Perm Phases	
5	Overlap A - Green Omit	
6	Overlap B - Green Omit	
7	Overlap C - Green Omit	
8	Overlap D - Green Omit	
9	Overlap Yellow Flash	
A	EV-A Phases	2 5
B	EV-B Phases	4 7
C	EV-C Phases	1 6
D	EV-D Phases	3 8
E	Extra 1 Config. Bits	1 3 4 5
F	IC Select (Interconnect)	2

Configuration

E + E + ROW

For access, set F + 9 + E = 1

Extra 1 Flags
1 = TBC Type 1
2 = NEMA Ext. Coord
3 = Auto Daylight Savings
4 = EV Advance
5 = Remote Download
6 = Special Event
7 = Pretimed Operation
8 = Split Ring Operation

IC Select Flags

1 =
2 = Modern
3 = 7-Wire Slave
4 = Flash / Free
5 =
6 = Simplex Master
7 = 7-Wire Master
8 = Offset Interrupter

Day of Week

1 = Sunday
2 = Monday
3 = Tuesday
4 = Wednesday
5 = Thursday
6 = Friday
7 = Saturday

Assign 5 Outputs

1 = Right Turn Overlap
2 = TOD Outputs
3 = EV Beacon - Steady
4 = EV Beacon - Flashing
5 = Special Event Outputs
6 = Phase 3 & 7 Ped
7 = Advanced Warning Sign
8 =

Time and Date

8-0 Hour, Minute, Day-of-Week
8-1 Day-of-Month, Year, Month
8-F Seconds

Program Information

C + C + 0 = program
C + C + F = version

Remote Download

C + 0 + 4 = 1-255
w/ E + E + E bit 5 on

Disable Parity

0

D+B+0

Dial-Up Telephone Communications

(If set to a non-zero value, parity will be disabled)

INTERSECTION: DEL MAR HEIGHTS RD @ LANSDALE (W) DR

223 Program

Row	Delay	Carry-over	Detector Name	332 Input File	Detector Number
0				111	14
1		1.8		212U	1
2				212L	5
3				213U	21
4				213L	25
5				214	9
6				315	16
7				416U	3
8	10.0			416L	7
9				417U	23
A				417L	27
B				418	11
C				119U	18
D				319L	20
E	---	---	---	---	---
F	---	---	---	---	---

Row	Delay	Carry-over	Detector Name	332 Input File	Detector Number
0				5J1	13
1		1.8		6J2U	2
2				6J2L	6
3				6J3U	22
4				6J3L	26
5				6J4	10
6				7J5	15
7	10.0			8J6U	4
8				8J6L	8
9				8J7U	24
A				8J7L	28
B				8J8	12
C				5J9U	17
D				7J9L	19
E	---	---	---	---	---
F	---	---	---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW



Detector Numbers	E
1 2 3 4 5 6 7 8	12345678
9 10 11 12 - - - -	1234
13 14 15 16 17 18 19 20	12345678
- - - - 21 22 23 24	5678
- - - - - - - -	1234
- - 25 26 27 28 - - -	2345

Active Detectors <D Page>



Detector #
System Det. # 1
System Det. # 2
System Det. # 3
System Det. # 4
System Det. # 5
System Det. # 6
System Det. # 7
System Det. # 8

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	F+C+1
Time Before Yellow	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	F+D+1
Time Before Yellow	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

INTERSECTION: DEL MAR HEIGHTS RD @ LANSDALE (W) DR

223 Program

Column # →		Plan							
Row	Plan Name →	AM		PM					
0	Cycle Length	120		120					
1	Phase 1 - ForceOff	94		73					
2	Phase 2 - ForceOff	0		0					
3	Phase 3 - ForceOff	77		24					
4	Phase 4 - ForceOff	54		61					
5	Phase 5 - ForceOff	18		88					
6	Phase 6 - ForceOff	0		0					
7	Phase 7 - ForceOff	77		15					
8	Phase 8 - ForceOff	60		61					
9	Ring Offset								
A	Offset A	32		80					
B	Offset B								
C	Offset C								
D	Permissive	12		12					
E	Hold Release	255		255					
F	Ped Shift	0		0					

Coordination

C + Plan + ROW

<C Page>

Coordination Timing By: JDS

Implemented On: 2/5/2010

JDS

2/5/2010

FOR OBSERVATION ONLY

Master Plan C + A + 2

Current Plan C + A + 3

Next Plan C + A + 4

T.O.D. Plan C + A + 5

Master Cycle C + A + 0

Ring A Cycle C + B + 0

Ring B Cycle C + D + 0

Min Cycle C + A + E

Max Cycle C + B + E

Row	Time	Plan	Onset	Day of Week
0	07 : 00	1	A	23456
1	08 : 00	E	A	23456
2	15 : 00	3	A	23456
3	17 : 00	E	A	1234567
4	:			
5	:			
6	:			
7	:			
8	:			
9	:			
A	:			
B	:			
C	:			
D	:			
E	:			
F	:			

TOD Coordination

<9 Key with C+0+9=1>

Plan Select

1 thru 9 = Coordination

Plan 1 thru 9

14 or E = Free

15 or F = Flash

Row	Plan	Row	Plan
0	Free Lag	0	Free Lag
1	Plan 1 - Lag	1	Plan 1 - Lag
2	Plan 2 - Lag	2	Plan 2 - Lag
3	Plan 3 - Lag	3	Plan 3 - Lag
4	Plan 4 - Lag	4	Plan 4 - Lag
5	Plan 5 - Lag	5	Plan 5 - Lag
6	Plan 6 - Lag	6	Plan 6 - Lag
7	Plan 7 - Lag	7	Plan 7 - Lag
8	Plan 8 - Lag	8	Plan 8 - Lag
9	Plan 9 - Lag	9	Plan 9 - Lag
Coord Ped*		A	Coord Max *
NEMA Hold		B	Coord Lag *
		C	
		D	
		E	
		F	

Sync Phases

C + E + FUNCTION #

Lag Phases

C + F + FUNCTION #

Transition Type 0

TBC Transition

C + D + D

Transition Type

0 = Shortway

Non-zero = Lengthen

INTERSECTION: CARMEL CANYON RD @ DEL MAR HEIGHTS RD

223 Program

17

Group Assignment:
Field Master Assignment:

N/S Street Name: CARMEL CANYON
E/W Street Name: DEL MAR HEIGHTS

		DEL MAR HEIGHTS		DEL MAR HEIGHTS		CARMEL CANYON	
Column # -->		Phase		Phase		Phase	
Phase # -->		1		2		3	
Row		1+8	2	3	4	5	6
0	Ped Walk		7				7
1	Ped FDW		19				28
2	Min Green	4	10		10		4
3	Type 3 Limit						
4	Add/Veh						
5	Veh Extri	2.0	3.5		3.3		2.0
6	Max Gap	2.0	3.5		3.3		2.0
7	Min Gap	2.0	0.2		0.2		0.2
8	Max Limit	30	60		60		40
9	Max Limit 2						
A	Bus Adv						
B	Call to Phs						
C	Reduce By		0.1		0.1		0.1
D	Every		0.9		1.0		1.7
E	Yellow	3.4	5.3		4.6		4.3
F	Red Clear	1.0	1.0		1.0		1.0

Phase Timing - Bank 1
F + Phase + Row

<F Page>

F + E + Row

F + F + Row

Max Initial	0	F + C + E
Red Revert	5.0	F + C + F
All Red Start	0.0	F + C + O
Start / Revert Times		
Drop Number	11	C + C + 0
Zone Number	11	C + C + 1
Area Number	4	C + C + 2
Area Address	168	C + C + 3
QuickNet Channel	Del Mar FM	(QuickNet)

Communication Addresses		
C + F + O		Row
Free Lag	2 6 8	
Lag Phases <C Page>		

Overlap Timing

		9	0	0	0
		Green	Yellow	Red	Load-Switch #
Row		Clear	Change	Clear	
Overlap A					
Overlap B					
Overlap C					
Overlap D					

<F Page>
F + COLOR +

<D Page>
D + D + OVERLAP

Downtime Flash	255	(minutes)
Downtime Before Auto Manual Flash		
F + C + 8		

Disable Ports	234
Disable Communication Ports	
D + D + 9	

Manual Plan	14	C + A + 1
Manual Offset	0	C + C + 1
Manual Selection		
Manual Plan		
0 = Automatic		
1-9 = Plan 1-9		
14 = Free		
15 = Flash		
Manual Offset		
0 = Automatic		
1 = Offset A		
2 = Offset B		
3 = Offset C		

Timing Sheet By: M25
Approved By: FLG
Drawing Number: 29903-30-D
Timing Implemented On: 02/09/12

INTERSECTION: CARMEL CANYON RD @ DEL MAR HEIGHTS RD

223 Program

Row	Delay	Carry-over
0		
1		1.8
2		1.8
3		
4		
5		
6		
7		
8		
9		
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	1I1	14
Adv Loops	2I2U	1
Bike Loops	2I2L	5
	2I3U	21
	2I3L	25
	2I4	9
	3I5	18
	4I6U	3
	4I6L	7
	4I7U	23
	4I7L	27
	4I8	11
	1I9U	18
	3I9L	20
---	---	---
---	---	---

Flow

Detector Numbers	
1 2 3 4 5 6 7 8	12345678
9 10 11 12 - - - -	1234
13 14 15 16 17 18 19 20	12345678
- - - - 21 22 23 24	5678
- - - - - - - -	1234
- 25 26 27 28 - - - -	2345

Active Detectors <D Page>

Row	Delay	Carry-over
0		
1		1.8
2		1.8
3		
4		
5		
6		
7		1.8
8		
9	10.0	
A		
B		
C		
D		
E	---	---
F	---	---

Detector Name	332 Input File	Detector Number
	5J1	13
Adv Loops	6J2U	2
Bike Loops	6J2L	6
	6J3U	22
	6J3L	26
	6J4	10
	7J5	15
	8J6U	4
	8J6L	8
	8J7U	24
	8J7L	28
	8J8	12
	5J9U	17
	7J9L	19
---	---	---
---	---	---

Flow

Detector #
System Det. # 1
System Det. # 2
System Det. # 3
System Det. # 4
System Det. # 5
System Det. # 6
System Det. # 7
System Det. # 8

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number		F+C+1
Time Before Yellow		F+C+3

Advance Warning Beacon - Sign 1

Phase Number		F+D+1
Time Before Yellow		F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+0+6
Short Failure	0.5	F+0+7

Power Cycle Correction (Default = 0.5)

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Row	Delay	Carry-over	Detector Name	332 Input File	Detector Number
0				1I1	14
1		1.8	Adv Loops	2I2U	1
2		1.8	Bike Loops	2I2L	5
3				2I3U	21
4				2I3L	25
5				2I4	9
6				3I5	16
7				4I6U	3
8				4I6L	7
9				4I7U	23
A				4I7L	27
B				4I8	11
C				1I9U	18
D				3I9L	20
E	---	---	---	---	---
F	---	---	---	---	---

Row	Delay	Carry-over	Detector Name	332 Input File	Detector Number
0				5J1	13
1		1.8	Adv Loops	6J2U	2
2		1.8	Bike Loops	6J2L	6
3				6J3U	22
4				6J3L	26
5				6J4	10
6				7J5	15
7		1.8		8J6U	4
8				8J6L	8
9	10.0			8J7U	24
A				8J7L	28
B				8J8	12
C				5J9U	17
D				7J9L	19
E	---	---	---	---	---
F	---	---	---	---	---

Detector Delay & Carryover <D Page>

D + X (across) + ROW

Flow
D

Detector Numbers	E
1 2 3 4 5 6 7 8	12345678
9 10 11 12 -- -- --	1234
13 14 15 16 17 18 19 20	12345678
-- -- -- 21 22 23 24	5678
-- -- -- -- -- --	1234
-- 25 26 27 28 -- --	2345

Active Detectors <D Page>

Flow
D

Detector #
System Det. # 1
System Det. # 2
System Det. # 3
System Det. # 4
System Det. # 5
System Det. # 6
System Det. # 7
System Det. # 8

System Detectors <D Page>

Max ON (min)	5	D+A+E
Max OFF (min)	60	D+A+F

Detector Failure Monitor

Phase Number	F+C+1
Time Before Yellow	F+C+3

Advance Warning Beacon - Sign 1

Phase Number	F+D+1
Time Before Yellow	F+D+3

Advance Warning Beacon - Sign 2

Long Failure	0.5	F+O+6
Short Failure	0.5	F+O+7

Power Cycle Correction (Default = 0.5)