

Appendix F
Intersection Level of Service Calculation Worksheets

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Existing AM.syn
12/01/2017

	↖	↗	↑	↘	↙	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖↖	↑	↖	↘↘	↓
Traffic Volume (vph)	0	976	490	87	923	668
Future Volume (vph)	0	976	490	87	923	668
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Flt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1122	563	100	1061	768
RTOR Reduction (vph)	0	225	0	18	0	0
Lane Group Flow (vph)	0	897	563	82	1061	768
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		25.3	22.9	22.9	25.3	58.0
Effective Green, g (s)		26.2	23.8	23.8	26.2	58.0
Actuated g/C Ratio		0.45	0.41	0.41	0.45	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1258	757	643	1535	1810
v/s Ratio Prot		c0.32	c0.31		0.31	0.42
v/s Ratio Perm				0.05		
v/c Ratio		0.71	0.74	0.13	0.69	0.42
Uniform Delay, d1		12.9	14.5	10.6	12.7	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.2	4.1	0.1	1.6	0.7
Delay (s)		15.1	18.6	10.7	14.3	0.7
Level of Service		B	B	B	B	A
Approach Delay (s)	15.1		17.4			8.6
Approach LOS	B		B			A
Intersection Summary						
HCM 2000 Control Delay		12.2			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.73				
Actuated Cycle Length (s)		58.0			Sum of lost time (s)	8.0
Intersection Capacity Utilization		66.6%			ICU Level of Service	C
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Existing AM.syn
12/01/2017

	↖	→	↘	↖	←	↗	↘	↑	↖	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↘↘	↖↖		↖	↖	↖		↖	↖
Traffic Volume (vph)	7	758	245	332	839	10	96	3	218	9	17	41
Future Volume (vph)	7	758	245	332	839	10	96	3	218	9	17	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Fltp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3529		1698	1708	1561		1733	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3529		1698	1708	1561		1733	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	972	314	426	1076	13	123	4	279	12	22	53
RTOR Reduction (vph)	0	0	158	0	0	0	0	0	70	0	0	50
Lane Group Flow (vph)	9	972	156	426	1089	0	64	63	209	0	34	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)				1					1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	27.3	27.3	11.0	37.6		4.7	4.7	15.7		2.2	2.2
Effective Green, g (s)	1.2	28.3	28.3	11.6	38.6		6.5	6.5	16.9		3.2	3.2
Actuated g/C Ratio	0.02	0.43	0.43	0.18	0.59		0.10	0.10	0.26		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	33	1526	674	607	2076		168	169	402		84	75
v/s Ratio Prot	0.00	c0.27		c0.12	0.31		0.04	0.04	c0.09		c0.02	
v/s Ratio Perm			0.10						0.04			0.00
v/c Ratio	0.27	0.64	0.23	0.70	0.52		0.38	0.37	0.52		0.40	0.03
Uniform Delay, d1	31.8	14.6	11.8	25.4	8.0		27.7	27.6	20.9		30.3	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	0.6	0.1	3.0	0.1		0.5	0.5	0.6		1.2	0.1
Delay (s)	33.4	15.3	11.8	28.4	8.1		28.2	28.1	21.4		31.4	29.8
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		14.6			13.8			23.5			30.4	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			15.8								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			65.6								Sum of lost time (s)	16.1
Intersection Capacity Utilization			50.4%								ICU Level of Service	A
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Existing AM.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	7	758	245	332	839	10	96	3	218	9	17	41
Future Volume (veh/h)	7	758	245	332	839	10	96	3	218	9	17	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1763	1863
Adj Flow Rate, veh/h	9	972	314	426	1076	13	126	0	279	12	22	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1188	525	545	1703	21	742	0	541	37	67	94
Arrive On Green	0.02	0.34	0.34	0.16	0.48	0.46	0.21	0.00	0.19	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3578	43	3583	0	1545	611	1121	1575
Grp Volume(v), veh/h	9	972	314	426	532	557	126	0	279	34	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1853	1792	0	1545	1733	0	1575
Q Serve(g_s), s	0.3	16.8	11.2	8.0	15.1	15.1	1.9	0.0	9.6	1.3	0.0	2.2
Cycle Q Clear(g_c), s	0.3	16.8	11.2	8.0	15.1	15.1	1.9	0.0	9.6	1.3	0.0	2.2
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.35		1.00
Lane Grp Cap(c), veh/h	30	1188	525	545	842	882	742	0	541	104	0	94
V/C Ratio(X)	0.30	0.82	0.60	0.78	0.63	0.63	0.17	0.00	0.52	0.33	0.00	0.56
Avail Cap(c_a), veh/h	122	1301	575	596	842	882	1810	0	1001	104	0	94
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.5	20.4	18.5	27.0	13.1	13.2	21.8	0.0	17.4	30.2	0.0	30.6
Incr Delay (d2), s/veh	2.0	3.5	0.8	5.3	1.2	1.1	0.0	0.0	0.3	0.7	0.0	4.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	8.7	4.9	4.2	7.5	7.9	0.9	0.0	4.1	0.6	0.0	1.1
LnGrp Delay(d),s/veh	34.5	23.9	19.3	32.3	14.3	14.3	21.9	0.0	17.7	30.9	0.0	35.3
LnGrp LOS	C	C	B	C	B	B	C		B	C		D
Approach Vol, veh/h		1295			1515			405			87	
Approach Delay, s/veh		22.8			19.4			19.0			33.6	
Approach LOS		C			B			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	35.9		17.9	14.6	26.5		8.0				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 11	23.6		3.0				
Max Q Clear Time (g_c+I1), s	2.3	17.1		11.6	10.0	18.8		4.2				
Green Ext Time (p_c), s	0.0	5.4		0.2	0.1	2.6		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay		21.1										
HCM 2010 LOS		C										
Notes												

HCM Signalized Intersection Capacity Analysis
 3: SR 1 & Rio Rd

Existing AM.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	199	289	26	6	81	265	150	38	228	63	266	335
Future Volume (vph)	199	289	26	6	81	265	150	38	228	63	266	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3494			1703	1827	1547	1752	1881	1590	3433	1761
Flt Permitted	0.95	1.00			0.32	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3494			578	1827	1547	1752	1881	1590	3433	1761
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	214	311	28	7	87	285	161	41	245	68	286	360
RTOR Reduction (vph)	0	9	0	0	0	0	122	0	0	49	0	8
Lane Group Flow (vph)	214	330	0	0	94	285	39	41	245	19	286	424
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases							6				8	
Actuated Green, G (s)	10.7	16.2			12.7	18.2	18.2	4.2	20.5	20.5	9.5	25.8
Effective Green, g (s)	10.4	16.4			12.4	18.4	18.4	3.9	21.4	21.4	9.2	26.7
Actuated g/C Ratio	0.14	0.22			0.16	0.24	0.24	0.05	0.28	0.28	0.12	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	234	759			95	445	377	90	533	451	418	623
v/s Ratio Prot	0.13	0.09			c0.16	c0.16		0.02	0.13		c0.08	c0.24
v/s Ratio Perm					c0.16	0.03				0.01		
v/c Ratio	0.91	0.44			0.99	0.64	0.10	0.46	0.46	0.04	0.68	0.68
Uniform Delay, d1	32.1	25.5			31.4	25.5	22.1	34.7	22.2	19.6	31.7	20.7
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	36.3	0.5			88.0	3.3	0.1	3.6	0.7	0.0	4.6	3.2
Delay (s)	68.3	26.0			119.5	28.8	22.3	38.3	23.0	19.6	36.3	23.9
Level of Service	E	C			F	C	C	D	C	B	D	C
Approach Delay (s)		42.4				42.6		24.1				28.8
Approach LOS		D				D		C				C
Intersection Summary												
HCM 2000 Control Delay		35.0										
HCM 2000 Volume to Capacity ratio		0.78										
Actuated Cycle Length (s)		75.4							16.0			
Intersection Capacity Utilization		67.2%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing AM.syn
12/01/2017

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↕
Traffic Volume (vph)	61	385	77	83	277	152	53
Future Volume (vph)	61	385	77	83	277	152	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3410		1687	3438	3367	1495
Flt Permitted	0.98	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1817	3410		1687	3438	3367	1495
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	66	423	85	91	304	167	58
RTOR Reduction (vph)	0	21	0	0	0	0	51
Lane Group Flow (vph)	66	487	0	91	304	167	7
Confl. Bikes (#/hr)			1				
Heavy Vehicles (%)	2%	3%	3%	7%	5%	4%	8%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.6	28.1		4.5	28.0	5.9	5.9
Effective Green, g (s)	4.1	28.1		4.0	28.0	5.9	5.9
Actuated g/C Ratio	0.08	0.56		0.08	0.56	0.12	0.12
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	148	1916		134	1925	397	176
v/s Ratio Prot		c0.14		c0.05	0.09	c0.05	
v/s Ratio Perm	0.04						0.00
v/c Ratio	0.45	0.25		0.68	0.16	0.42	0.04
Uniform Delay, d1	21.9	5.6		22.4	5.3	20.5	19.5
Progression Factor	1.00	1.00		1.37	0.78	1.00	1.00
Incremental Delay, d2	0.8	0.3		10.2	0.2	0.3	0.0
Delay (s)	22.6	5.9		40.8	4.3	20.7	19.6
Level of Service	C	A		D	A	C	B
Approach Delay (s)		7.8			12.7	20.4	
Approach LOS		A			B	C	

Intersection Summary

HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	351	87	48	333	0	27	0	27	0	0	0
Future Volume (vph)	0	351	87	48	333	0	27	0	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		0.99		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Fr		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)		3390		1805	3471			1552	1367			
Flt Permitted		1.00		0.95	1.00			0.98	1.00			
Satd. Flow (perm)		3390		1805	3471			1594	1367			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	413	102	56	392	0	32	0	32	0	0	0
RTOR Reduction (vph)	0	25	0	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	490	0	56	392	0	0	32	3	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		30.8		3.6	37.9			4.1	4.1			
Effective Green, g (s)		30.8		3.1	37.9			4.1	4.1			
Actuated g/C Ratio		0.62		0.06	0.76			0.08	0.08			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)	2088		111	2631		130	112					
v/s Ratio Prot	c0.14		c0.03	0.11								
v/s Ratio Perm						c0.02	0.00					
v/c Ratio	0.23		0.50	0.15		0.25	0.02					
Uniform Delay, d1	4.3		22.7	1.7		21.5	21.1					
Progression Factor	0.31		1.00	1.00		1.00	1.00					
Incremental Delay, d2	0.3		1.3	0.1		0.4	0.0					
Delay (s)	1.6		24.0	1.8		21.9	21.1					
Level of Service	A		C	A		C	C					
Approach Delay (s)	1.6			4.6		21.5				0.0		
Approach LOS	A			A		C				A		

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (veh/h)	0	351	87	48	333	0	27	0	27	0	0	0
Future Volume (veh/h)	0	351	87	48	333	0	27	0	27	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1652	1652	1900	1900	1900	1900
Adj Flow Rate, veh/h	0	413	102	56	392	0	32	0	32	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	15	0	0	0	0
Cap, veh/h	0	1901	465	60	2752	0	202	0	65	0	90	0
Arrive On Green	0.00	0.22	0.22	0.03	0.79	0.00	0.05	0.00	0.05	0.00	0.00	0.00
Sat Flow, veh/h	0	2889	684	1810	3563	0	1236	0	1383	0	1900	0
Grp Volume(v), veh/h	0	258	257	56	392	0	32	0	32	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1726	1810	1736	0	1236	0	1383	0	1900	0
Q Serve(g_s), s	0.0	6.0	6.1	1.5	1.3	0.0	1.3	0.0	1.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.0	6.1	1.5	1.3	0.0	1.3	0.0	1.1	0.0	0.0	0.0
Prop In Lane	0.00		0.40	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1193	1173	60	2752	0	202	0	65	0	90	0
V/C Ratio(X)	0.00	0.22	0.22	0.93	0.14	0.00	0.16	0.00	0.49	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1193	1173	181	2752	0	540	0	443	0	608	0
HCM Platoon Ratio	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.5	8.6	24.1	1.2	0.0	23.3	0.0	23.2	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	19.7	0.1	0.0	0.1	0.0	2.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.1	3.1	1.1	0.6	0.0	0.4	0.0	0.5	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	8.9	9.0	43.8	1.3	0.0	23.4	0.0	25.4	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		515			448			64				0
Approach Delay, s/veh		9.0			6.6			24.4				0.0
Approach LOS		A			A			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	5.7	38.0		6.4		43.6		6.4
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	5.5	17.0		16.0		26.0		16.0
Max Q Clear Time (g_c+I1), s	3.5	8.1		0.0		3.3		3.3
Green Ext Time (p_c), s	0.0	4.2		0.0		7.1		0.1

Intersection Summary			
HCM 2010 Ctrl Delay		8.9	
HCM 2010 LOS		A	

Synchro 9 Report

Synchro 9 Report

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Existing AM.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	10.5								
Intersection LOS	B								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↔↔	↕		↕	↔↔		↔↔	↕
Traffic Vol, veh/h	0	208	30	0	12	12	5	16	303
Future Vol, veh/h	0	208	30	0	12	12	5	16	303
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	236	34	0	14	14	5	18	344
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB			SB		
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB						WB		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	9.9			8.7			11		
HCM LOS	A			A			B		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	104	104	30	12	12	21	303		
LT Vol	104	104	0	0	0	21	0		
Through Vol	0	0	30	12	0	0	0		
RT Vol	0	0	0	0	12	0	303		
Lane Flow Rate	118	118	34	14	14	24	344		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.2	0.198	0.036	0.023	0.021	0.039	0.445		
Departure Headway (Hd)	6.104	6.018	3.8	6.166	5.455	5.885	4.651		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	584	592	929	584	660	607	771		
Service Time	3.884	3.799	1.579	3.866	3.155	3.631	2.398		
HCM Lane V/C Ratio	0.202	0.199	0.037	0.024	0.021	0.04	0.446		
HCM Control Delay	10.4	10.3	6.7	9	8.3	8.9	11.1		
HCM Lane LOS	B	B	A	A	A	A	B		
HCM 95th-tile Q	0.7	0.7	0.1	0.1	0.1	0.1	2.3		

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Existing AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔↔		↔	↔↔	↔	
Traffic Volume (vph)	144	50	98	151	43	63	115	1058	48	18	1328	113	
Future Volume (vph)	144	50	98	151	43	63	115	1058	48	18	1328	113	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1665	1517		1665	1649		1770	3465		1805	3471	1568	
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1665	1517		1665	1649		1770	3465		1805	3471	1568	
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)	157	54	107	164	47	68	125	1150	52	20	1443	123	
RTOR Reduction (vph)	0	65	0	0	39	0	0	3	0	0	0	57	
Lane Group Flow (vph)	141	112	0	143	97	0	125	1199	0	20	1443	66	
Confl. Peds. (#/hr)			46	46					46				
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%	
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm	
Protected Phases	2	2		6	6		3	8		7	4		
Permitted Phases	4												
Actuated Green, G (s)	12.8	12.8		8.8	8.8		7.3	46.0		2.8	41.5	41.5	
Effective Green, g (s)	13.0	13.0		9.0	9.0		7.0	46.9		2.5	42.4	42.4	
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.08	0.54		0.03	0.49	0.49	
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9	
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5	
Lane Grp Cap (vph)	247	225		171	169		141	1859		51	1683	760	
v/s Ratio Prot	c0.08	0.07		c0.09	0.06		c0.07	0.35		0.01	c0.42		
v/s Ratio Perm												0.04	
v/c Ratio	0.57	0.50		0.84	0.57		0.89	0.65		0.39	0.86	0.09	
Uniform Delay, d1	34.6	34.2		38.5	37.4		39.8	14.4		41.7	19.8	12.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.4	2.1		29.3	5.5		43.5	1.0		4.9	4.9	0.1	
Delay (s)	38.0	36.3		67.8	42.9		83.3	15.3		46.6	24.7	12.2	
Level of Service	D	D		E	D		F	B		D	C	B	
Approach Delay (s)		37.0			55.6			21.7			24.0		
Approach LOS		D			E			C			C		
Intersection Summary													
HCM 2000 Control Delay	26.8		HCM 2000 Level of Service					C					
HCM 2000 Volume to Capacity ratio	0.80												
Actuated Cycle Length (s)	87.4		Sum of lost time (s)					16.0					
Intersection Capacity Utilization	76.2%		ICU Level of Service					D					
Analysis Period (min)	15												
c Critical Lane Group													

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Existing AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	144	50	98	151	43	63	115	1058	48	18	1328	113
Future Volume (veh/h)	144	50	98	151	43	63	115	1058	48	18	1328	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.87	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	107	140	81	68	125	1150	52	20	1443	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	282	84	166	190	96	81	149	1744	79	50	1578	713
Arrive On Green	0.16	0.16	0.16	0.11	0.11	0.11	0.08	0.51	0.50	0.03	0.45	0.00
Sat Flow, veh/h	1757	524	1038	1757	886	743	1774	3412	154	1810	3471	1568
Grp Volume(v), veh/h	157	0	161	140	0	149	125	591	611	20	1443	0
Grp Sat Flow(s),veh/h/ln	1757	0	1561	1757	0	1629	1774	1755	1811	1810	1736	1568
Q Serve(g_s), s	6.8	0.0	8.0	6.4	0.0	7.5	5.8	20.6	20.7	0.9	32.3	0.0
Cycle Q Clear(g_c), s	6.8	0.0	8.0	6.4	0.0	7.5	5.8	20.6	20.7	0.9	32.3	0.0
Prop In Lane	1.00		0.66	1.00		0.46	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	282	0	250	190	0	176	149	897	926	50	1578	713
V/C Ratio(X)	0.56	0.00	0.64	0.74	0.00	0.84	0.84	0.66	0.66	0.40	0.91	0.00
Avail Cap(c_a), veh/h	380	0	338	190	0	176	149	897	926	152	1671	755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	0.0	32.7	35.9	0.0	36.4	37.5	15.0	15.0	39.7	21.2	0.0
Incr Delay (d2), s/veh	2.1	0.0	3.3	14.9	0.0	30.4	32.0	2.2	2.1	5.1	8.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	3.7	3.9	0.0	4.8	4.1	10.4	10.7	0.5	17.1	0.0
LnGrp Delay(d),s/veh	34.2	0.0	36.0	50.8	0.0	66.8	69.5	17.2	17.1	44.9	29.5	0.0
LnGrp LOS	C		D	D		E	E	B	B	D	C	
Approach Vol, veh/h		318			289			1327			1463	
Approach Delay, s/veh		35.2			59.0			22.1			29.7	
Approach LOS		D			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		17.3	11.0	41.8		13.0	6.3	46.5				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 18	7.3	39.1		8.8	7.3	39.1				
Max Q Clear Time (g_c+I1), s		10.0	7.8	34.3		9.5	2.9	22.7				
Green Ext Time (p_c), s		1.0	0.0	2.6		0.0	0.0	15.6				
Intersection Summary												
HCM 2010 Ctrl Delay		29.7										
HCM 2010 LOS		C										
Notes												

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Existing AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	382	4	24	34	14	44	35	1210	16	71	1587	774
Future Volume (vph)	382	4	24	34	14	44	35	1210	16	71	1587	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	26	37	15	48	38	1330	18	78	1744	851
RTOR Reduction (vph)	0	22	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	26	3	38	1347	0	78	1744	851	
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	52.7		6.2	54.8	99.3
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	53.6		6.4	55.7	99.3
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54		0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	560	249		122	121	113	75	1906		105	1946	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.38		0.05	c0.50	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.75	0.03		0.21	0.21	0.03	0.51	0.71		0.74	0.90	0.54
Uniform Delay, d1	39.6	35.0		43.5	43.5	42.9	46.5	17.0		45.6	19.2	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.3	0.1		1.5	1.5	0.2	5.3	1.5		24.4	6.3	1.3
Delay (s)	45.9	35.1		45.0	45.0	43.1	51.8	18.5		70.0	25.5	1.3
Level of Service	D	D		D	D	D	D	B		E	C	A
Approach Delay (s)		45.2			44.1			19.4			19.1	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay		22.3			HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		99.3			Sum of lost time (s)					16.0		
Intersection Capacity Utilization		78.1%			ICU Level of Service					D		
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Existing AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 0.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	20	0	8	0	0	0	2	210	2	8	329	71
Future Vol, veh/h	20	0	8	0	0	0	2	210	2	8	329	71
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	23	0	9	0	0	0	2	241	2	9	378	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	568	691	236	460	731	128	463	0	0	247	0	0
Stage 1	440	440	-	250	250	-	-	-	-	-	-	-
Stage 2	128	251	-	210	481	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	389	370	700	489	351	905	1109	-	-	1331	-	-
Stage 1	545	581	-	738	704	-	-	-	-	-	-	-
Stage 2	840	703	-	778	557	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	384	364	697	476	345	900	1106	-	-	1328	-	-
Mov Cap-2 Maneuver	384	364	-	476	345	-	-	-	-	-	-	-
Stage 1	543	574	-	735	701	-	-	-	-	-	-	-
Stage 2	836	700	-	759	551	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	13.8			0			0.1			0.2		
HCM LOS	B			A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1106	-	-	441	-	1328	-	-
HCM Lane V/C Ratio	0.002	-	-	0.073	-	0.007	-	-
HCM Control Delay (s)	8.3	0	-	13.8	0	7.7	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	-	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Existing AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	
Traffic Vol, veh/h	124	233	17	3	301	11	18	2	4	1	2	62
Future Vol, veh/h	124	233	17	3	301	11	18	2	4	1	2	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	143	268	20	3	346	13	21	2	5	1	2	71

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	359	0	0	287	0	0	744	929	144	779	931	179
Stage 1	-	-	-	-	-	-	563	563	-	359	359	-
Stage 2	-	-	-	-	-	-	181	366	-	420	572	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1175	-	-	1287	-	-	307	270	884	289	269	809
Stage 1	-	-	-	-	-	-	483	512	-	637	631	-
Stage 2	-	-	-	-	-	-	809	626	-	587	508	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1175	-	-	1287	-	-	252	237	884	258	236	809
Mov Cap-2 Maneuver	-	-	-	-	-	-	252	237	-	258	236	-
Stage 1	-	-	-	-	-	-	424	450	-	559	630	-
Stage 2	-	-	-	-	-	-	733	625	-	510	446	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.8			0.1			19			10.5		
HCM LOS							C					B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	284	1175	-	-	1287	-	-	730
HCM Lane V/C Ratio	0.097	0.121	-	-	0.003	-	-	0.102
HCM Control Delay (s)	19	8.5	-	-	7.8	-	-	10.5
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.4	-	-	0	-	-	0.3

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing AM.syn
12/01/2017

	→	↖	↙	←	↗	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	577	114	19	815	77	17
Future Volume (vph)	577	114	19	815	77	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1761	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1761	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	607	120	20	858	81	18
RTOR Reduction (vph)	0	58	0	0	15	0
Lane Group Flow (vph)	607	63	20	858	84	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	25.0	25.0	0.7	29.9	7.2	
Effective Green, g (s)	25.0	25.0	0.7	29.9	7.2	
Actuated g/C Ratio	0.52	0.52	0.01	0.62	0.15	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	960	808	26	1171	264	
v/s Ratio Prot	0.33		0.01	0.46	0.05	
v/s Ratio Perm		0.04				
v/c Ratio	0.63	0.08	0.77	0.73	0.32	
Uniform Delay, d1	8.2	5.7	23.6	6.3	18.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.1	75.0	2.5	0.3	
Delay (s)	9.7	5.8	98.6	8.8	18.5	
Level of Service	A	A	F	A	B	
Approach Delay (s)	9.0			10.8	18.5	
Approach LOS	A			B	B	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing AM.syn
12/01/2017

	→	↖	↙	←	↗	↘		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↑	↑	↑	↑		
Traffic Volume (veh/h)	577	114	19	815	77	17		
Future Volume (veh/h)	577	114	19	815	77	17		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1879	1900		
Adj Flow Rate, veh/h	607	120	20	858	81	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	3	4	0	1	0	0		
Cap, veh/h	899	757	36	1139	248	0		
Arrive On Green	0.49	0.49	0.02	0.61	0.14	0.00		
Sat Flow, veh/h	1845	1553	1810	1881	1769	0		
Grp Volume(V), veh/h	607	120	20	858	82	0		
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1791	0		
Q Serve(g_s), s	10.8	1.8	0.5	14.2	1.8	0.0		
Cycle Q Clear(g_c), s	10.8	1.8	0.5	14.2	1.8	0.0		
Prop In Lane		1.00	1.00		0.99	0.00		
Lane Grp Cap(c), veh/h	899	757	36	1139	251	0		
V/C Ratio(X)	0.68	0.16	0.56	0.75	0.33	0.00		
Avail Cap(c_a), veh/h	987	831	169	1367	753	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	8.4	6.1	20.8	6.1	16.6	0.0		
Incr Delay (d2), s/veh	1.8	0.1	5.0	2.2	0.3	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.8	0.8	0.3	7.8	0.9	0.0		
LnGrp Delay(d),s/veh	10.2	6.2	25.8	8.3	16.9	0.0		
LnGrp LOS	B	A	C	A	B			
Approach Vol, veh/h	727			878	82			
Approach Delay, s/veh	9.5			8.7	16.9			
Approach LOS	A			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.0	27.3				32.3		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	22.9				31.1		18.0
Max Q Clear Time (g_c+I1), s	2.5	12.8				16.2		3.8
Green Ext Time (p_c), s	0.0	7.2				9.7		0.1

Intersection Summary			
HCM 2010 Ctrl Delay		9.5	
HCM 2010 LOS		A	

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Existing AM.syn
12/01/2017

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔		↔	↔
Traffic Vol, veh/h	8	493	28	29	855	5	11	1	13	6	0	2
Future Vol, veh/h	8	493	28	29	855	5	11	1	13	6	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	9	542	31	32	940	5	12	1	14	7	0	2

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	945	0	0	542	0	0	1565	1568	542	1566	1565	942
Stage 1	-	-	-	-	-	-	559	559	-	1006	1006	-
Stage 2	-	-	-	-	-	-	1006	1009	-	560	559	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	7.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.9	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	734	-	-	1022	-	-	91	68	544	91	113	322
Stage 1	-	-	-	-	-	-	517	382	-	293	321	-
Stage 2	-	-	-	-	-	-	293	219	-	516	514	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	734	-	-	1022	-	-	87	65	544	85	108	322
Mov Cap-2 Maneuver	-	-	-	-	-	-	87	65	-	85	108	-
Stage 1	-	-	-	-	-	-	511	377	-	289	311	-
Stage 2	-	-	-	-	-	-	282	212	-	495	508	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	32.5	42.3
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	85	544	734	-	-	1022	-	-	85	322
HCM Lane V/C Ratio	0.155	0.026	0.012	-	-	0.031	-	-	0.078	0.007
HCM Control Delay (s)	55	11.8	10	-	-	8.6	-	-	50.9	16.3
HCM Lane LOS	F	B	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.5	0.1	0	-	-	0.1	-	-	0.2	0

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Existing AM.syn
12/01/2017

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	37	0	1	292	403	39
Future Vol, veh/h	37	0	1	292	403	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	42	0	1	328	453	44

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	783	453	453	0	-	0
Stage 1	453	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Critical Hdwy	6.43	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	361	611	1118	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	726	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	361	611	1118	-	-	-
Mov Cap-2 Maneuver	361	-	-	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	725	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1118	-	361	-	-
HCM Lane V/C Ratio	0.001	-	0.115	-	-
HCM Control Delay (s)	8.2	0	16.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Existing AM.syn
12/01/2017

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	14	93	313	20	22	412
Future Vol, veh/h	14	93	313	20	22	412
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	18	122	412	26	29	542

Major/Minor	Minor1	Major1	Major2	Minor2	Major2
Conflicting Flow All	1039	439	0	0	445
Stage 1	432	-	-	-	-
Stage 2	607	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2
Pot Cap-1 Maneuver	258	620	-	-	1126
Stage 1	659	-	-	-	-
Stage 2	548	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	246	613	-	-	1119
Mov Cap-2 Maneuver	246	-	-	-	-
Stage 1	655	-	-	-	-
Stage 2	525	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 513	1119	-
HCM Lane V/C Ratio	-	- 0.274	0.026	-
HCM Control Delay (s)	-	- 14.7	8.3	0
HCM Lane LOS	-	- B	A	A
HCM 95th %tile Q(veh)	-	- 1.1	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Existing AM.syn
12/01/2017

Intersection						
Int Delay, s/veh	5.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	17	155	173	226	259	21
Future Vol, veh/h	17	155	173	226	259	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	209	234	305	350	28

Major/Minor	Minor2	Major1	Major2	Minor2	Major2
Conflicting Flow All	1131	358	354	0	-
Stage 1	354	-	-	-	-
Stage 2	777	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-
Pot Cap-1 Maneuver	227	684	1194	-	-
Stage 1	715	-	-	-	-
Stage 2	457	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	181	679	1190	-	-
Mov Cap-2 Maneuver	181	-	-	-	-
Stage 1	713	-	-	-	-
Stage 2	366	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.8	3.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1190	- 534	-	-
HCM Lane V/C Ratio	0.196	- 0.435	-	-
HCM Control Delay (s)	8.8	- 16.8	-	-
HCM Lane LOS	A	- C	-	-
HCM 95th %tile Q(veh)	0.7	- 2.2	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Existing AM.syn
12/01/2017

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	28	115	125	112	164	92
Future Vol, veh/h	28	115	125	112	164	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	137	149	133	195	110
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	692	264	312	0	-	0
Stage 1	257	-	-	-	-	-
Stage 2	435	-	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	407	775	1248	-	-	-
Stage 1	781	-	-	-	-	-
Stage 2	648	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	354	766	1241	-	-	-
Mov Cap-2 Maneuver	354	-	-	-	-	-
Stage 1	776	-	-	-	-	-
Stage 2	567	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	12.9		4.4		0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1241	-	624	-	-	-
HCM Lane V/C Ratio	0.12	-	0.273	-	-	-
HCM Control Delay (s)	8.3	-	12.9	-	-	-
HCM Lane LOS	A	-	B	-	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-	-

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing AM.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	8.9												
Intersection LOS	A												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Lane Configurations			↔				↔				↔		
Traffic Vol, veh/h	0	1	0	67	0	4	0	0	0	66	76	1	
Future Vol, veh/h	0	1	0	67	0	4	0	0	0	66	76	1	
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0	
Mvmt Flow	0	1	0	86	0	5	0	0	0	85	97	1	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach	EB				WB				NB				
Opposing Approach	WB				EB				SB				
Opposing Lanes	1				1				1				
Conflicting Approach Left	SB				NB				EB				
Conflicting Lanes Left	1				1				1				
Conflicting Approach Right	NB				SB				WB				
Conflicting Lanes Right	1				1				1				
HCM Control Delay	7.8				8.2				9.1				
HCM LOS	A				A				A				
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	46%	1%	100%	0%									
Vol Thru, %	53%	0%	0%	100%									
Vol Right, %	1%	99%	0%	0%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	143	68	4	189									
LT Vol	66	1	4	0									
Through Vol	76	0	0	189									
RT Vol	1	67	0	0									
Lane Flow Rate	183	87	5	242									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0.237	0.104	0.007	0.29									
Departure Headway (Hd)	4.647	4.277	5.174	4.308									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	774	839	692	836									
Service Time	2.666	2.3	3.205	2.326									
HCM Lane V/C Ratio	0.236	0.104	0.007	0.289									
HCM Control Delay	9.1	7.8	8.2	9.1									
HCM Lane LOS	A	A	A	A									
HCM 95th-tile Q	0.9	0.3	0	1.2									

Synchro 9 Report

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing AM.syn
12/01/2017

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	189	0
Future Vol, veh/h	0	0	189	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	242	0
Number of Lanes	0	0	1	0
Approach			SB	
Opposing Approach			NB	
Opposing Lanes			1	
Conflicting Approach Left			WB	
Conflicting Lanes Left			1	
Conflicting Approach Right			EB	
Conflicting Lanes Right			1	
HCM Control Delay			9.1	
HCM LOS			A	

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Existing PM.syn
12/01/2017

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↕↕	↑	↗	↖↖	↓
Traffic Volume (vph)	0	849	714	117	863	563
Future Volume (vph)	0	849	714	117	863	563
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frbp, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	875	736	121	890	580
RTOR Reduction (vph)	0	194	0	13	0	0
Lane Group Flow (vph)	0	681	736	108	890	580
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		15.4	22.3	22.3	15.4	47.5
Effective Green, g (s)		16.3	23.2	23.2	16.3	47.5
Actuated g/C Ratio		0.34	0.49	0.49	0.34	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		965	901	751	1178	1881
v/s Ratio Prot		0.24	c0.40		c0.26	0.31
v/s Ratio Perm				0.07		
v/c Ratio		0.71	0.82	0.14	0.76	0.31
Uniform Delay, d1		13.5	10.3	6.7	13.8	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7	6.0	0.1	3.2	0.4
Delay (s)		16.2	16.3	6.8	17.0	0.4
Level of Service		B	B	A	B	A
Approach Delay (s)	16.2		15.0			10.5
Approach LOS	B		B			B
Intersection Summary						
HCM 2000 Control Delay			13.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.79			
Actuated Cycle Length (s)			47.5		Sum of lost time (s)	8.0
Intersection Capacity Utilization			73.9%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

Synchro 9 Report

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis

Existing PM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↘	↖	→	↘	↖	→	↘	↖	→	↘
Lane Configurations	↖	↖↗	↖	↖↗	↖↗	5	↖	↖	↖	6	↖	↖
Traffic Volume (vph)	26	720	234	349	584	5	258	21	517	6	8	7
Future Volume (vph)	26	720	234	349	584	5	258	21	517	6	8	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1732	1590		1733	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1732	1590		1733	1580
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)	28	783	254	379	635	5	280	23	562	7	9	8
RTOR Reduction (vph)	0	0	164	0	1	0	0	0	82	0	0	8
Lane Group Flow (vph)	28	783	90	379	639	0	151	152	480	0	16	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	pm+ov	Split	NA	Perm	
Protected Phases	1	6		5	2	4	4	5	8	8		
Permitted Phases			6					4				8
Actuated Green, G (s)	1.6	20.5	20.5	10.0	28.9		8.8	8.8	18.8		0.9	0.9
Effective Green, g (s)	2.1	21.5	21.5	10.6	29.9		10.6	10.6	20.0		1.9	1.9
Actuated g/C Ratio	0.03	0.35	0.35	0.17	0.49		0.17	0.17	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	62	1255	572	606	1761		299	302	524		54	49
v/s Ratio Prot	0.02	c0.22		0.11	0.18		0.09	0.09	c0.16		c0.01	
v/s Ratio Perm			0.06						0.14			0.00
v/c Ratio	0.45	0.62	0.16	0.63	0.36		0.51	0.50	0.92		0.30	0.01
Uniform Delay, d1	28.7	16.2	13.4	23.2	9.5		22.6	22.6	19.5		28.7	28.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.7	0.0	1.5	0.0		0.5	0.5	20.5		1.1	0.0
Delay (s)	30.6	16.9	13.4	24.6	9.5		23.1	23.1	40.0		29.8	28.4
Level of Service	C	B	B	C	A		C	C	D		C	C
Approach Delay (s)		16.4			15.1			34.1			29.4	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	16.1
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Synchro 9 Report

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HCM 2010 Signalized Intersection Summary

Existing PM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↘	↖	→	↘	↖	→	↘	↖	→	↘
Lane Configurations	↖	↖↗	↖	↖↗	↖↗	5	↖	↖	↖	6	↖	↖
Traffic Volume (veh/h)	26	720	234	349	584	5	258	21	517	6	8	7
Future Volume (veh/h)	26	720	234	349	584	5	258	21	517	6	8	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1881	1881	1900	1771	1900
Adj Flow Rate, veh/h	28	783	254	379	635	5	296	0	562	7	9	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	55	967	441	489	1390	11	1250	0	751	22	28	46
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.35	0.00	0.33	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3635	29	3619	0	1598	758	975	1591
Grp Volume(v), veh/h	28	783	254	379	312	328	296	0	562	16	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1876	1810	0	1598	1733	0	1591
Q Serve(g_s), s	1.2	15.6	10.3	7.9	9.9	9.9	4.4	0.0	21.7	0.7	0.0	0.4
Cycle Q Clear(g_c), s	1.2	15.6	10.3	7.9	9.9	9.9	4.4	0.0	21.7	0.7	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.44		1.00
Lane Grp Cap(c), veh/h	55	967	441	489	683	717	1250	0	751	50	0	46
V/C Ratio(X)	0.51	0.81	0.58	0.77	0.46	0.46	0.24	0.00	0.75	0.32	0.00	0.17
Avail Cap(c_a), veh/h	134	1087	495	598	722	758	1619	0	914	92	0	84
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.1	25.6	23.7	31.3	17.5	17.5	17.6	0.0	16.4	35.9	0.0	35.8
Incr Delay (d2), s/veh	2.7	3.7	0.6	4.0	0.2	0.2	0.0	0.0	2.0	1.3	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.1	4.7	4.1	4.9	5.1	2.2	0.0	9.9	0.3	0.0	0.2
LnGrp Delay(d),s/veh	38.8	29.3	24.3	35.3	17.6	17.7	17.7	0.0	18.4	37.3	0.0	36.5
LnGrp LOS	D	C	C	D	B	B	B		B	D		D
Approach Vol, veh/h		1065			1019			858			24	
Approach Delay, s/veh		28.4			24.2			18.1			37.0	
Approach LOS		C			C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.4	32.9		30.1	14.6	24.6		6.2				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	22.2		3.0				
Max Q Clear Time (g_c+I1), s	3.2	11.9		23.7	9.9	17.6		2.7				
Green Ext Time (p_c), s	0.0	3.7		0.5	0.1	2.0		0.0				

Intersection Summary

HCM 2010 Ctrl Delay	24.0
HCM 2010 LOS	C

Notes

Synchro 9 Report

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HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	113	335	70	12	134	372	291	78	427	178	193	309
Future Volume (vph)	113	335	70	12	134	372	291	78	427	178	193	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3457			1744	1863	1560	1805	1827	1556	3502	1832
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3457			656	1863	1560	1805	1827	1556	3502	1832
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	116	345	72	12	138	384	300	80	440	184	199	319
RTOR Reduction (vph)	0	21	0	0	0	0	214	0	0	128	0	8
Lane Group Flow (vph)	116	396	0	0	150	384	86	80	440	56	199	374
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.4	20.2			11.5	23.3	23.3	6.1	24.1	24.1	9.3	27.3
Effective Green, g (s)	8.1	20.4			11.2	23.5	23.5	5.8	25.0	25.0	9.0	28.2
Actuated g/C Ratio	0.10	0.25			0.14	0.29	0.29	0.07	0.31	0.31	0.11	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	173	864			90	536	449	128	559	476	386	633
v/s Ratio Prot	0.07	0.11				c0.21		0.04	c0.24		c0.06	c0.20
v/s Ratio Perm					c0.23		0.06			0.04		
v/c Ratio	0.67	0.46			1.67	0.72	0.19	0.62	0.79	0.12	0.52	0.59
Uniform Delay, d1	35.5	25.9			35.2	26.1	21.9	36.8	25.9	20.4	34.2	22.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.8	0.5			343.6	4.7	0.2	9.2	7.4	0.1	1.2	1.6
Delay (s)	45.2	26.4			378.8	30.8	22.1	46.0	33.3	20.5	35.4	23.5
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		30.5				90.3			31.4			27.6
Approach LOS		C				F			C			C
Intersection Summary												
HCM 2000 Control Delay		48.9				HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		81.6				Sum of lost time (s)				16.0		
Intersection Capacity Utilization		69.8%				ICU Level of Service				C		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	0.97
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.98
Flt Protected	1.00
Satd. Flow (prot)	1556
Flt Permitted	0.95
Satd. Flow (perm)	1556
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	Prot
Protected Phases	7
Permitted Phases	
Actuated Green, G (s)	24.1
Effective Green, g (s)	25.0
Actuated g/C Ratio	0.31
Clearance Time (s)	4.9
Vehicle Extension (s)	3.5
Lane Grp Cap (vph)	386
v/s Ratio Prot	c0.06
v/s Ratio Perm	
v/c Ratio	0.52
Uniform Delay, d1	20.4
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	20.5
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing PM.syn
12/01/2017

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↕↔		↕	↕↕	↕↕	↕
Traffic Volume (vph)	71	388	113	120	419	315	130
Future Volume (vph)	71	388	113	120	419	315	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3423		1770	3574	3467	1552
Flt Permitted	0.91	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1727	3423		1770	3574	3467	1552
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	76	417	122	129	451	339	140
RTOR Reduction (vph)	0	44	0	0	0	0	114
Lane Group Flow (vph)	76	495	0	129	451	339	26
Confl. Peds. (#/hr)			3	5		3	5
Heavy Vehicles (%)	0%	2%	0%	2%	1%	1%	2%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.9	22.8		6.5	24.4	9.2	9.2
Effective Green, g (s)	4.4	22.8		6.0	24.4	9.2	9.2
Actuated g/C Ratio	0.09	0.46		0.12	0.49	0.18	0.18
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	151	1560		212	1744	637	285
v/s Ratio Prot		c0.14		c0.07	0.13	c0.10	
v/s Ratio Perm	0.04						0.02
v/c Ratio	0.50	0.32		0.61	0.26	0.53	0.09
Uniform Delay, d1	21.8	8.7		20.9	7.5	18.5	16.9
Progression Factor	1.00	1.00		1.29	0.77	1.00	1.00
Incremental Delay, d2	1.0	0.5		3.3	0.4	0.4	0.1
Delay (s)	22.7	9.2		30.3	6.2	18.9	17.0
Level of Service	C	A		C	A	B	B
Approach Delay (s)		10.9			11.5	18.3	
Approach LOS		B			B	B	
Intersection Summary							
HCM 2000 Control Delay		13.2			HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.41					
Actuated Cycle Length (s)		50.0			Sum of lost time (s)		12.0
Intersection Capacity Utilization		40.0%			ICU Level of Service		A
Analysis Period (min)		15					
c Critical Lane Group							

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔		↕	↕↕			↕	↕		↕↔	
Traffic Volume (vph)	0	460	58	106	436	0	103	0	92	0	0	0
Future Volume (vph)	0	460	58	106	436	0	103	0	92	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	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)		3468		1752	3574			1749	1546			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3468		1752	3574			1394	1546			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	517	65	119	490	0	116	0	103	0	0	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	87	0	0	0
Lane Group Flow (vph)	0	567	0	119	490	0	0	116	16	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8	Perm			4
Permitted Phases							8		8			4
Actuated Green, G (s)		24.7		6.2	34.4			7.6	7.6			
Effective Green, g (s)		24.7		5.7	34.4			7.6	7.6			
Actuated g/C Ratio		0.49		0.11	0.69			0.15	0.15			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1713		199	2458			211	234			
v/s Ratio Prot		c0.16		c0.07	0.14							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.33		0.60	0.20			0.55	0.07			
Uniform Delay, d1		7.7		21.1	2.8			19.6	18.2			
Progression Factor		0.44		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.5		3.2	0.2			1.6	0.0			
Delay (s)		3.8		24.3	3.0			21.2	18.2			
Level of Service		A		C	A			C	B			
Approach Delay (s)		3.8			7.2			19.8				0.0
Approach LOS		A			A			B				A
Intersection Summary												
HCM 2000 Control Delay				7.8				HCM 2000 Level of Service				A
HCM 2000 Volume to Capacity ratio				0.41								
Actuated Cycle Length (s)				50.0				Sum of lost time (s)				12.0
Intersection Capacity Utilization				40.6%				ICU Level of Service				A
Analysis Period (min)				15								
c Critical Lane Group												

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center Pl & Rio Rd

Existing PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑	↑		↑↓	
Traffic Volume (veh/h)	0	460	58	106	436	0	103	0	92	0	0	0
Future Volume (veh/h)	0	460	58	106	436	0	103	0	92	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	517	65	119	490	0	116	0	103	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	1778	223	135	2569	0	314	0	189	0	231	0
Arrive On Green	0.00	1.00	1.00	0.08	0.72	0.00	0.12	0.00	0.12	0.00	0.00	0.00
Sat Flow, veh/h	0	3257	396	1757	3668	0	1405	0	1560	0	1900	0
Grp Volume(v), veh/h	0	288	294	119	490	0	116	0	103	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1790	1757	1787	0	1405	0	1560	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.4	2.2	0.0	4.0	0.0	3.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.4	2.2	0.0	4.0	0.0	3.1	0.0	0.0	0.0
Prop In Lane	0.00		0.22	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	995	1006	135	2569	0	314	0	189	0	231	0
V/C Ratio(X)	0.00	0.29	0.29	0.88	0.19	0.00	0.37	0.00	0.54	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	995	1006	211	2569	0	594	0	499	0	608	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	22.9	2.3	0.0	21.0	0.0	20.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.7	15.5	0.2	0.0	0.3	0.0	0.9	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	2.2	1.1	0.0	1.5	0.0	1.4	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.7	0.7	38.4	2.5	0.0	21.3	0.0	21.6	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		582			609			219			0	
Approach Delay, s/veh		0.7			9.5			21.4			0.0	
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	7.8	32.1		10.1		39.9		10.1				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0				
Max Q Clear Time (g_c+I1), s	5.4	2.0		0.0		4.2		6.0				
Green Ext Time (p_c), s	0.0	6.7		0.0		8.5		0.4				

Intersection Summary

HCM 2010 Ctrl Delay	7.7
HCM 2010 LOS	A

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Existing PM.syn
12/12/2017

Intersection

Intersection Delay, s/veh	15.1
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↑↑	↑		↑	↑		↑↓	↑
Traffic Vol, veh/h	0	394	22	0	24	14	6	23	388
Future Vol, veh/h	0	394	22	0	24	14	6	23	388
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	443	25	0	27	16	7	26	436
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	13.5	9.9	17.1
HCM LOS	B	A	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	197	197	22	24	14	29	388
LT Vol	197	197	0	0	0	29	0
Through Vol	0	0	22	24	0	0	0
RT Vol	0	0	0	0	14	0	388
Lane Flow Rate	221	221	25	27	16	33	436
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.407	0.405	0.03	0.053	0.028	0.06	0.651
Departure Headway (Hd)	6.621	6.587	4.358	7.103	6.386	6.574	5.374
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	545	547	820	503	559	545	671
Service Time	4.354	4.32	2.091	4.86	4.142	4.313	3.112
HCM Lane V/C Ratio	0.406	0.404	0.03	0.054	0.029	0.061	0.65
HCM Control Delay	13.8	13.8	7.2	10.3	9.3	9.7	17.6
HCM Lane LOS	B	B	A	B	A	A	C
HCM 95th-tile Q	2	1.9	0.1	0.2	0.1	0.2	4.8

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Existing PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	219	0	146	62	20	26	160	1361	4	17	1258	205
Future Volume (vph)	219	0	146	62	20	26	160	1361	4	17	1258	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1472		1715	1662		1805	3572		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1472		1715	1662		1805	3572		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	151	64	21	27	165	1403	4	18	1297	211
RTOR Reduction (vph)	0	124	0	0	25	0	0	0	0	0	0	118
Lane Group Flow (vph)	197	56	0	57	30	0	165	1407	0	18	1297	93
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	13.7	13.7		5.3	5.3		8.4	40.6		1.4	33.6	33.6
Effective Green, g (s)	13.9	13.9		5.5	5.5		8.1	41.5		1.1	34.5	34.5
Actuated g/C Ratio	0.18	0.18		0.07	0.07		0.10	0.53		0.01	0.44	0.44
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	302	262		120	117		187	1900		25	1580	700
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.09	0.39		0.01	c0.36	
v/s Ratio Perm												0.06
v/c Ratio	0.65	0.21		0.47	0.26		0.88	0.74		0.72	0.82	0.13
Uniform Delay, d1	29.8	27.4		34.9	34.3		34.5	14.1		38.3	19.0	12.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.2	0.5		4.0	1.6		35.1	1.8		67.0	3.9	0.2
Delay (s)	35.0	27.9		38.9	35.9		69.6	15.9		105.3	22.9	13.0
Level of Service	C	C		D	D		E	B		F	C	B
Approach Delay (s)		31.6			37.4			21.5			22.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Existing PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (veh/h)	219	0	146	62	20	26	160	1361	4	17	1258	205
Future Volume (veh/h)	219	0	146	62	20	26	160	1361	4	17	1258	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1821	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	188	52	151	56	32	27	165	1403	4	18	1297	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	308	70	204	164	85	72	197	1789	5	46	1450	642
Arrive On Green	0.17	0.17	0.17	0.09	0.09	0.09	0.11	0.49	0.48	0.03	0.41	0.00
Sat Flow, veh/h	1792	408	1186	1810	943	796	1810	3656	10	1810	3574	1583
Grp Volume(v), veh/h	188	0	203	56	0	59	165	686	721	18	1297	0
Grp Sat Flow(s),veh/h/ln	1792	0	1594	1810	0	1739	1810	1787	1879	1810	1787	1583
Q Serve(g_s), s	7.0	0.0	8.7	2.1	0.0	2.3	6.4	22.8	22.8	0.7	24.3	0.0
Cycle Q Clear(g_c), s	7.0	0.0	8.7	2.1	0.0	2.3	6.4	22.8	22.8	0.7	24.3	0.0
Prop In Lane	1.00		0.74	1.00		0.46	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	308	0	274	164	0	157	197	874	919	46	1450	642
V/C Ratio(X)	0.61	0.00	0.74	0.34	0.00	0.37	0.84	0.78	0.78	0.39	0.89	0.00
Avail Cap(c_a), veh/h	435	0	387	182	0	175	202	874	919	177	1565	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.5	0.0	28.3	30.6	0.0	30.8	31.3	15.2	15.2	34.4	19.9	0.0
Incr Delay (d2), s/veh	2.4	0.0	5.3	1.7	0.0	2.1	25.2	5.2	4.9	5.4	7.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.2	1.1	0.0	1.2	4.6	12.3	12.9	0.4	13.3	0.0
LnGrp Delay(d),s/veh	29.8	0.0	33.6	32.4	0.0	32.8	56.5	20.4	20.1	39.9	27.0	0.0
LnGrp LOS	C		C	C		C	E	C	C	D	C	
Approach Vol, veh/h		391			115			1572			1315	
Approach Delay, s/veh		31.8			32.6			24.0			27.2	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		16.3	11.8	33.1		10.5	5.8	39.1				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 17	8.3	30.5		7.0	7.3	31.5				
Max Q Clear Time (g_c+I1), s		10.7	8.4	26.3		4.3	2.7	24.8				
Green Ext Time (p_c), s		1.2	0.0	1.9		0.1	0.0	6.5				

Intersection Summary			
HCM 2010 Ctrl Delay		26.5	
HCM 2010 LOS		C	

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Existing PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	869	18	21	17	6	54	6	1636	17	55	1428	493
Future Volume (vph)	869	18	21	17	6	54	6	1636	17	55	1428	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Flt	1.00	0.92		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1747		1715	1761	1524	1805	3530		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1747		1715	1761	1524	1805	3530		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	21	17	6	55	6	1669	17	56	1457	503
RTOR Reduction (vph)	0	15	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	24	0	11	12	3	6	1686	0	56	1457	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	38.6	38.6		6.6	6.6	6.6	1.5	71.6		6.2	76.8	140.9
Effective Green, g (s)	39.2	39.2		6.8	6.8	6.8	1.2	72.5		6.4	77.7	140.9
Actuated g/C Ratio	0.28	0.28		0.05	0.05	0.05	0.01	0.51		0.05	0.55	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	964	486		82	84	73	15	1816		81	1970	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.00	c0.48		c0.03	0.41	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.92	0.05		0.13	0.14	0.04	0.40	0.93		0.69	0.74	0.31
Uniform Delay, d1	49.3	37.2		64.2	64.3	63.9	69.5	31.8		66.3	23.9	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.0	0.1		1.3	1.4	0.4	16.6	9.2		22.5	1.8	0.5
Delay (s)	63.3	37.3		65.5	65.6	64.3	86.1	41.0		88.7	25.8	0.5
Level of Service	E	D		E	E	E	F	D		F	C	A
Approach Delay (s)		62.2			64.7			41.1			21.2	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Existing PM.syn
12/01/2017

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	102	1	12	4	0	4	6	406	0	1	399	40
Future Vol, veh/h	102	1	12	4	0	4	6	406	0	1	399	40
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	112	1	13	4	0	4	7	446	0	1	438	44
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	715	935	257	694	957	236	490	0	0	451	0	0
Stage 1	471	471	-	464	464	-	-	-	-	-	-	-
Stage 2	244	464	-	230	493	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	318	267	724	333	260	772	1084	-	-	1120	-	-
Stage 1	542	563	-	553	567	-	-	-	-	-	-	-
Stage 2	738	567	-	758	550	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	310	261	714	320	255	764	1077	-	-	1113	-	-
Mov Cap-2 Maneuver	310	261	-	320	255	-	-	-	-	-	-	-
Stage 1	534	559	-	546	560	-	-	-	-	-	-	-
Stage 2	722	560	-	737	546	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	22.6			13.1			0.1			0		
HCM LOS	C			B								
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WB Ln1	SBL	SBT	SBR				
Capacity (veh/h)	1077	-	-	329	451	1113	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.384	0.019	0.001	-	-				
HCM Control Delay (s)	8.4	0	-	22.6	13.1	8.2	0	-				
HCM Lane LOS	A	A	-	C	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	1.8	0.1	0	-	-				

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Existing PM.syn
12/01/2017

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕		↕		
Traffic Vol, veh/h	148	406	16	6	377	29	10	6	4	6	3	155
Future Vol, veh/h	148	406	16	6	377	29	10	6	4	6	3	155
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	157	432	17	6	401	31	11	6	4	6	3	165

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	436	0	0	466	0	0	1000	1221	258	984	1214	233
Stage 1	-	-	-	-	-	-	772	772	-	433	433	-
Stage 2	-	-	-	-	-	-	228	449	-	551	781	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1127	-	-	1106	-	-	200	181	747	206	183	769
Stage 1	-	-	-	-	-	-	363	412	-	577	585	-
Stage 2	-	-	-	-	-	-	760	576	-	491	408	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1115	-	-	1090	-	-	133	152	726	173	154	758
Mov Cap-2 Maneuver	-	-	-	-	-	-	133	152	-	173	154	-
Stage 1	-	-	-	-	-	-	307	349	-	494	580	-
Stage 2	-	-	-	-	-	-	582	571	-	406	346	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.1	29.9	12.8
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	166	1115	-	-	1090	-	-	634
HCM Lane V/C Ratio	0.128	0.141	-	-	0.006	-	-	0.275
HCM Control Delay (s)	29.9	8.8	-	-	8.3	-	-	12.8
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.5	-	-	0	-	-	1.1

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing PM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	861	107	10	516	134	30
Future Volume (vph)	861	107	10	516	134	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1752	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1752	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	926	115	11	555	144	32
RTOR Reduction (vph)	0	48	0	0	11	0
Lane Group Flow (vph)	926	67	11	555	165	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	36.1	36.1	0.6	40.9	10.5	
Effective Green, g (s)	36.1	36.1	0.6	40.9	10.5	
Actuated g/C Ratio	0.58	0.58	0.01	0.66	0.17	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1089	907	17	1223	295	
v/s Ratio Prot	c0.49		0.01	c0.30	c0.09	
v/s Ratio Perm		0.04				
v/c Ratio	0.85	0.07	0.65	0.45	0.56	
Uniform Delay, d1	10.9	5.8	30.7	5.2	23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	0.0	49.2	0.3	1.3	
Delay (s)	17.5	5.8	79.9	5.6	25.1	
Level of Service	B	A	E	A	C	
Approach Delay (s)	16.2			7.0	25.1	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	62.3	Sum of lost time (s)	15.1
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing PM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↑	↑	↑	↑		
Traffic Volume (veh/h)	861	107	10	516	134	30		
Future Volume (veh/h)	861	107	10	516	134	30		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1869	1900		
Adj Flow Rate, veh/h	926	115	11	555	144	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	1	1	0	2	0	0		
Cap, veh/h	1154	961	20	1298	204	0		
Arrive On Green	0.61	0.61	0.01	0.70	0.12	0.00		
Sat Flow, veh/h	1881	1566	1810	1863	1769	0		
Grp Volume(V), veh/h	926	115	11	555	145	0		
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1781	0		
Q Serve(g_s), s	21.8	1.8	0.4	7.5	4.6	0.0		
Cycle Q Clear(g_c), s	21.8	1.8	0.4	7.5	4.6	0.0		
Prop In Lane		1.00	1.00		0.99	0.00		
Lane Grp Cap(c), veh/h	1154	961	20	1298	205	0		
V/C Ratio(X)	0.80	0.12	0.54	0.43	0.71	0.00		
Avail Cap(c_a), veh/h	1390	1158	125	1640	552	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	8.5	4.7	28.5	3.8	24.7	0.0		
Incr Delay (d2), s/veh	3.1	0.1	8.1	0.3	1.7	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	12.1	0.8	0.2	3.8	2.3	0.0		
LnGrp Delay(d),s/veh	11.7	4.7	36.7	4.1	26.4	0.0		
LnGrp LOS	B	A	D	A	C			
Approach Vol, veh/h	1041			566	145			
Approach Delay, s/veh	10.9			4.7	26.4			
Approach LOS	B			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	4.9	42.0				46.9		11.2
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	42.9				51.1		18.0
Max Q Clear Time (g_c+I1), s	2.4	23.8				9.5		6.6
Green Ext Time (p_c), s	0.0	11.8				18.1		0.1
Intersection Summary								
HCM 2010 Ctrl Delay			10.2					
HCM 2010 LOS			B					
Notes								

Synchro 9 Report

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Existing PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	24	↑	↑	9	24	1	28	8	2	12
Traffic Vol, veh/h	3	854	24	16	478	9	24	1	28	8	2	12
Future Vol, veh/h	3	854	24	16	478	9	24	1	28	8	2	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	3	960	27	18	537	10	27	1	31	9	2	13
Major/Minor												
Conflicting Flow All	Major1	Major2	Minor1	Minor2								
Stage 1	547	0	0	960	0	0	1545	1549	960	1545	1544	542
Stage 2	-	-	-	-	-	-	966	966	-	578	578	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1033	-	-	725	-	-	94	115	314	94	116	544
Stage 1	-	-	-	-	-	-	309	336	-	505	504	-
Stage 2	-	-	-	-	-	-	504	502	-	308	336	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1033	-	-	725	-	-	88	112	314	82	113	544
Mov Cap-2 Maneuver	-	-	-	-	-	-	88	112	-	82	113	-
Stage 1	-	-	-	-	-	-	308	335	-	504	491	-
Stage 2	-	-	-	-	-	-	477	490	-	275	335	-
Approach												
HCM Control Delay, s	EB	WB	NB	SB								
HCM LOS	0	0.3	39.1	30.3			E			D		
Minor Lane/Major Mvmt												
Capacity (veh/h)	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2		
HCM Lane V/C Ratio	89	314	1033	-	-	725	-	-	87	544		
HCM Control Delay (s)	0.316	0.1	0.003	-	-	0.025	-	-	0.129	0.025		
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B		
HCM 95th %ile Q(veh)	1.2	0.3	0	-	-	0.1	-	-	0.4	0.1		

Synchro 9 Report

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Existing PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 0.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	↕
Traffic Vol, veh/h	37	1	7	646	476	37
Future Vol, veh/h	37	1	7	646	476	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	39	1	7	680	501	39

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	1196	501	501	0	0
Stage 1	501	-	-	-	-
Stage 2	695	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	208	574	1074	-	-
Stage 1	613	-	-	-	-
Stage 2	499	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	206	574	1074	-	-
Mov Cap-2 Maneuver	206	-	-	-	-
Stage 1	613	-	-	-	-
Stage 2	494	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.1	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1074	-	210	-	-
HCM Lane V/C Ratio	0.007	-	0.19	-	-
HCM Control Delay (s)	8.4	0	26.1	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Existing PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.4						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	↕
Traffic Vol, veh/h	21	58	408	36	30	442
Future Vol, veh/h	21	58	408	36	30	442
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	22	61	429	38	32	465

Major/Minor	Minor1	Major1	Major2	Major2	Major2
Conflicting Flow All	988	459	0	0	473
Stage 1	454	-	-	-	-
Stage 2	534	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	276	606	-	-	1099
Stage 1	644	-	-	-	-
Stage 2	592	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	263	600	-	-	1094
Mov Cap-2 Maneuver	263	-	-	-	-
Stage 1	641	-	-	-	-
Stage 2	566	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.9	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	448	1094	-
HCM Lane V/C Ratio	-	-	0.186	0.029	-
HCM Control Delay (s)	-	-	14.9	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Existing PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	14	114	124	362	324	28
Future Vol, veh/h	14	114	124	362	324	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	125	136	398	356	31
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1034	364	360	0	0	
Stage 1	360	-	-	-	-	
Stage 2	674	-	-	-	-	
Critical Hdwy	6.4	6.21	4.1	-	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	
Follow-up Hdwy	3.5	3.309	2.2	-	-	
Pot Cap-1 Maneuver	259	683	1210	-	-	
Stage 1	710	-	-	-	-	
Stage 2	510	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	228	678	1206	-	-	
Mov Cap-2 Maneuver	228	-	-	-	-	
Stage 1	708	-	-	-	-	
Stage 2	451	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	13.6	2.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1206	-	558	-	-	
HCM Lane V/C Ratio	0.113	-	0.252	-	-	
HCM Control Delay (s)	8.4	-	13.6	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.4	-	1	-	-	

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Existing PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 3.6						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	27	128	101	275	218	17
Future Vol, veh/h	27	128	101	275	218	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	136	107	293	232	18
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	758	251	255	0	0	
Stage 1	246	-	-	-	-	
Stage 2	512	-	-	-	-	
Critical Hdwy	6.4	6.22	4.11	-	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	
Follow-up Hdwy	3.5	3.318	2.209	-	-	
Pot Cap-1 Maneuver	378	788	1316	-	-	
Stage 1	800	-	-	-	-	
Stage 2	606	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	344	781	1311	-	-	
Mov Cap-2 Maneuver	344	-	-	-	-	
Stage 1	797	-	-	-	-	
Stage 2	554	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	12.6	2.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1311	-	639	-	-	
HCM Lane V/C Ratio	0.082	-	0.258	-	-	
HCM Control Delay (s)	8	-	12.6	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	1	-	-	

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing PM.syn
12/01/2017

Intersection											
Intersection Delay, s/veh	9.5										
Intersection LOS	A										

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	2	1	111	0	3	0	0	0	128	164	3
Future Vol, veh/h	0	2	1	111	0	3	0	0	0	128	164	3
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0
Mvmt Flow	0	2	1	122	0	3	0	0	0	141	180	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.2	8.4	10.4
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	43%	2%	100%	1%
Vol Thru, %	56%	1%	0%	99%
Vol Right, %	1%	97%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	295	114	3	127
LT Vol	128	2	3	1
Through Vol	164	1	0	126
RT Vol	3	111	0	0
Lane Flow Rate	324	125	3	140
Geometry Grp	1	1	1	1
Degree of Util (X)	0.4	0.152	0.005	0.176
Departure Headway (Hd)	4.44	4.371	5.317	4.541
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	810	821	672	790
Service Time	2.464	2.4	3.358	2.569
HCM Lane V/C Ratio	0.4	0.152	0.004	0.177
HCM Control Delay	10.4	8.2	8.4	8.5
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.9	0.5	0	0.6

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing PM.syn
12/01/2017

Intersection				
Intersection Delay, s/veh	9.5			
Intersection LOS	A			

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	126	0
Future Vol, veh/h	0	1	126	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	138	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.5
HCM LOS	A

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Existing Saturday.syn
12/01/2017

	↖	↗	↑	↘	↙	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖↖	↑	↘	↙↙	↓
Traffic Volume (vph)	0	802	705	68	820	758
Future Volume (vph)	0	802	705	68	820	758
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Flt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	827	727	70	845	781
RTOR Reduction (vph)	0	201	0	16	0	0
Lane Group Flow (vph)	0	626	727	54	845	781
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		15.2	21.8	21.8	15.2	46.8
Effective Green, g (s)		16.1	22.7	22.7	16.1	46.8
Actuated g/C Ratio		0.34	0.49	0.49	0.34	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		977	912	783	1192	1881
v/s Ratio Prot		0.22	c0.39		c0.24	0.42
v/s Ratio Perm				0.03		
v/c Ratio		0.64	0.80	0.07	0.71	0.42
Uniform Delay, d1		12.9	10.1	6.4	13.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.8	5.0	0.0	2.2	0.7
Delay (s)		14.7	15.2	6.5	15.6	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	14.7		14.4			8.4
Approach LOS	B		B			A
Intersection Summary						
HCM 2000 Control Delay		11.5			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.76				
Actuated Cycle Length (s)		46.8		Sum of lost time (s)		8.0
Intersection Capacity Utilization		71.8%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Existing Saturday.syn
12/01/2017

	↖	→	↘	↙	←	↗	↘	↑	↘	↙	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↘	↙↙	↖↖		↖	↖	↘	↙	↙	↖
Traffic Volume (vph)	25	612	251	381	586	3	202	15	364	2	15	14
Future Volume (vph)	25	612	251	381	586	3	202	15	364	2	15	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1716	1575		1890	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1716	1575		1890	1615
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)	27	651	267	405	623	3	215	16	387	2	16	15
RTOR Reduction (vph)	0	0	174	0	0	0	0	0	105	0	0	14
Lane Group Flow (vph)	27	651	93	405	626	0	116	115	282	0	18	1
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1				1		1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.5	18.7	18.7	10.6	27.8		6.1	6.1	16.7		0.9	0.9
Effective Green, g (s)	2.0	19.7	19.7	11.2	28.8		7.9	7.9	17.9		1.9	1.9
Actuated g/C Ratio	0.04	0.35	0.35	0.20	0.51		0.14	0.14	0.32		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	63	1241	553	684	1832		236	239	497		63	54
v/s Ratio Prot	0.01	c0.18		c0.12	0.17		c0.07	0.07	0.11		c0.01	
v/s Ratio Perm			0.06						0.07			0.00
v/c Ratio	0.43	0.52	0.17	0.59	0.34		0.49	0.48	0.57		0.29	0.01
Uniform Delay, d1	26.8	14.8	12.8	20.7	8.3		22.5	22.5	16.2		26.7	26.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	0.2	0.1	0.9	0.0		0.6	0.6	0.9		0.9	0.0
Delay (s)	28.5	14.9	12.9	21.6	8.3		23.1	23.1	17.1		27.6	26.5
Level of Service	C	B	B	C	A		C	C	B		C	C
Approach Delay (s)		14.7			13.5			19.3			27.1	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			15.5				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			56.7		Sum of lost time (s)				16.1			
Intersection Capacity Utilization			52.9%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Existing Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (veh/h)	25	612	251	381	586	3	202	15	364	2	15	14
Future Volume (veh/h)	25	612	251	381	586	3	202	15	364	2	15	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	651	267	405	623	3	226	0	387	2	16	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	59	940	419	548	1423	7	965	0	638	8	64	62
Arrive On Green	0.03	0.26	0.26	0.16	0.39	0.37	0.27	0.00	0.25	0.04	0.04	0.04
Sat Flow, veh/h	1810	3574	1592	3476	3684	18	3583	0	1561	210	1680	1615
Grp Volume(V), veh/h	27	651	267	405	305	321	226	0	387	18	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1592	1738	1805	1896	1792	0	1561	1890	0	1615
Q Serve(g_s), s	0.9	9.7	8.7	6.5	7.4	7.4	2.9	0.0	11.5	0.5	0.0	0.5
Cycle Q Clear(q_c), s	0.9	9.7	8.7	6.5	7.4	7.4	2.9	0.0	11.5	0.5	0.0	0.5
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.11		1.00
Lane Grp Cap(c), veh/h	59	940	419	548	697	733	965	0	638	72	0	62
V/C Ratio(X)	0.46	0.69	0.64	0.74	0.44	0.44	0.23	0.00	0.61	0.25	0.00	0.24
Avail Cap(c_a), veh/h	169	1348	600	826	938	986	2057	0	1114	128	0	110
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	19.5	19.2	23.6	13.3	13.3	16.8	0.0	13.8	27.5	0.0	27.5
Incr Delay (d2), s/veh	2.0	0.3	0.6	0.7	0.2	0.2	0.0	0.0	0.3	0.7	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.7	3.9	3.2	3.7	3.9	1.4	0.0	5.0	0.3	0.0	0.2
LnGrp Delay(d),s/veh	30.0	19.9	19.8	24.4	13.5	13.5	16.8	0.0	14.1	28.2	0.0	28.2
LnGrp LOS	C	B	B	C	B	B	B		B	C		C
Approach Vol, veh/h		945			1031			613			33	
Approach Delay, s/veh		20.2			17.8			15.1			28.2	
Approach LOS		C			B			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	26.7		19.9	13.3	19.5		6.3				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 13	21.2		3.0				
Max Q Clear Time (q_c+I1), s	2.9	9.4		13.5	8.5	11.7		2.5				
Green Ext Time (p_c), s	0.0	3.3		0.4	0.2	2.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay		18.1										
HCM 2010 LOS		B										
Notes												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	132	318	70	8	174	321	278	72	363	151	264	440
Future Volume (vph)	132	318	70	8	174	321	278	72	363	151	264	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frbp, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3486			1795	1881	1556	1805	1863	1590	3502	1838
Flt Permitted	0.95	1.00			0.35	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3486			669	1881	1556	1805	1863	1590	3502	1838
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	133	321	71	8	176	324	281	73	367	153	267	444
RTOR Reduction (vph)	0	23	0	0	0	0	206	0	0	106	0	5
Lane Group Flow (vph)	133	369	0	0	184	324	75	73	367	47	267	494
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)	8		8			1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.5	17.6			11.6	20.7	20.7	6.1	23.2	23.2	9.4	26.5
Effective Green, g (s)	8.2	17.8			11.3	20.9	20.9	5.8	24.1	24.1	9.1	27.4
Actuated g/C Ratio	0.10	0.23			0.14	0.27	0.27	0.07	0.31	0.31	0.12	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	187	792			96	502	415	133	573	489	407	643
v/s Ratio Prot	0.07	0.11				c0.17		0.04	0.20		c0.08	c0.27
v/s Ratio Perm					c0.28		0.05			0.03		
v/c Ratio	0.71	0.47			1.92	0.65	0.18	0.55	0.64	0.10	0.66	0.77
Uniform Delay, d1	33.9	26.1			33.5	25.4	22.1	35.0	23.4	19.3	33.1	22.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.0	0.5			448.6	3.0	0.2	4.6	2.6	0.1	3.8	5.7
Delay (s)	45.9	26.7			482.1	28.4	22.4	39.6	25.9	19.4	36.9	28.3
Level of Service	D	C			F	C	C	D	C	B	D	C
Approach Delay (s)		31.5				132.0			25.9			31.3
Approach LOS		C				F			C			C
Intersection Summary												
HCM 2000 Control Delay		59.9							E			
HCM 2000 Volume to Capacity ratio		0.93										
Actuated Cycle Length (s)		78.3				Sum of lost time (s)			16.0			
Intersection Capacity Utilization		71.4%				ICU Level of Service			C			
Analysis Period (min)		15										
c Critical Lane Group												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	
HCM 2000 Volume to Capacity ratio	
Actuated Cycle Length (s)	
Intersection Capacity Utilization	
Analysis Period (min)	
c Critical Lane Group	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing Saturday.syn
12/01/2017

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	84	320	160	141	392	298	139
Future Volume (vph)	84	320	160	141	392	298	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3405		1787	3610	3467	1535
Flt Permitted	0.67	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1267	3405		1787	3610	3467	1535
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	337	168	148	413	314	146
RTOR Reduction (vph)	0	92	0	0	0	0	120
Lane Group Flow (vph)	88	413	0	148	413	314	26
Confl. Peds. (#/hr)			5	9		5	9
Confl. Bikes (#/hr)			11				11
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	1%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	6.5	22.6		7.0	23.1	8.9	8.9
Effective Green, g (s)	6.0	22.6		6.5	23.1	8.9	8.9
Actuated g/C Ratio	0.12	0.45		0.13	0.46	0.18	0.18
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	152	1539		232	1667	617	273
v/s Ratio Prot		c0.12		c0.08	0.11	c0.09	
v/s Ratio Perm	0.07						0.02
v/c Ratio	0.58	0.27		0.64	0.25	0.51	0.10
Uniform Delay, d1	20.8	8.5		20.6	8.2	18.6	17.2
Progression Factor	1.00	1.00		1.38	0.79	1.00	1.00
Incremental Delay, d2	3.3	0.4		4.1	0.4	0.2	0.1
Delay (s)	24.1	9.0		32.6	6.8	18.8	17.2
Level of Service	C	A		C	A	B	B
Approach Delay (s)		11.2			13.7	18.3	
Approach LOS		B			B	B	

Intersection Summary

HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	417	42	109	455	0	78	0	69	0	0	0
Future Volume (vph)	0	417	42	109	455	0	78	0	69	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.96			
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3551		1805	3574			1797	1539			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3551		1805	3574			1432	1539			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	458	46	120	500	0	86	0	76	0	0	0
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	66	0	0	0
Lane Group Flow (vph)	0	493	0	120	500	0	86	10	0	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		25.8		6.1	35.4			6.6	6.6			
Effective Green, g (s)		25.8		5.6	35.4			6.6	6.6			
Actuated g/C Ratio		0.52		0.11	0.71			0.13	0.13			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1832		202	2530			189	203			
v/s Ratio Prot		c0.14		c0.07	0.14							
v/s Ratio Perm								c0.06	0.01			
v/c Ratio		0.27		0.59	0.20			0.46	0.05			
Uniform Delay, d1		6.8		21.1	2.5			20.0	19.0			
Progression Factor		0.58		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.4		3.1	0.2			0.6	0.0			
Delay (s)		4.3		24.2	2.7			20.7	19.0			
Level of Service		A		C	A			C	B			
Approach Delay (s)		4.3			6.8			19.9		0.0		
Approach LOS		A			A			B		A		
Intersection Summary												
HCM 2000 Control Delay			7.5			HCM 2000 Level of Service			A			
HCM 2000 Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		50.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		33.2%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (veh/h)	0	417	42	109	455	0	78	0	69	0	0	0
Future Volume (veh/h)	0	417	42	109	455	0	78	0	69	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	458	46	120	500	0	86	0	76	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	1955	195	137	2671	0	278	0	141	0	176	0
Arrive On Green	0.00	1.00	1.00	0.08	0.75	0.00	0.09	0.00	0.09	0.00	0.00	0.00
Sat Flow, veh/h	0	3400	330	1810	3668	0	1440	0	1522	0	1900	0
Grp Volume(V), veh/h	0	249	255	120	500	0	86	0	76	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1831	1810	1787	0	1440	0	1522	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.3	2.1	0.0	2.9	0.0	2.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.3	2.1	0.0	2.9	0.0	2.4	0.0	0.0	0.0
Prop In Lane	0.00		0.18	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1068	1083	137	2671	0	278	0	141	0	176	0
V/C Ratio(X)	0.00	0.23	0.24	0.87	0.19	0.00	0.31	0.00	0.54	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1068	1083	217	2671	0	605	0	487	0	608	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.96	0.96	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	22.9	1.9	0.0	21.9	0.0	21.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	13.2	0.2	0.0	0.2	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	2.1	1.0	0.0	1.2	0.0	1.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.5	0.5	36.0	2.0	0.0	22.1	0.0	22.8	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		504			620			162			0	
Approach Delay, s/veh		0.5			8.6			22.5			0.0	
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	7.8	33.6		8.6		41.4		8.6				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0				
Max Q Clear Time (g_c+1), s	5.3	2.0		0.0		4.1		4.9				
Green Ext Time (p_c), s	0.0	6.5		0.0		8.3		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay					7.2							
HCM 2010 LOS					A							

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Existing Saturday.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	13								
Intersection LOS	B								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↔↔	↕		↕	↔↔		↔↔	↕
Traffic Vol, veh/h	0	289	18	0	22	11	2	19	407
Future Vol, veh/h	0	289	18	0	22	11	2	19	407
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	311	19	0	24	12	2	20	438
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB					
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB						WB		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	11.3			9.5			14.4		
HCM LOS	B			A			B		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	145	145	18	22	11	21	407		
LT Vol	145	145	0	0	0	21	0		
Through Vol	0	0	18	22	0	0	0		
RT Vol	0	0	0	0	11	0	407		
Lane Flow Rate	155	155	19	24	12	23	438		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.279	0.278	0.023	0.044	0.02	0.038	0.594		
Departure Headway (Hd)	6.461	6.444	4.218	6.668	6.11	6.089	4.889		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	559	561	854	539	588	583	731		
Service Time	4.163	4.145	1.919	4.384	3.826	3.882	2.681		
HCM Lane V/C Ratio	0.277	0.276	0.022	0.045	0.02	0.039	0.599		
HCM Control Delay	11.6	11.6	7	9.7	9	9.1	14.7		
HCM Lane LOS	B	B	A	A	A	A	B		
HCM 95th-tile Q	1.1	1.1	0.1	0.1	0.1	0.1	4		

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Existing Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔↔		↔	↔↔	↔
Traffic Volume (vph)	271	7	161	42	11	9	191	1241	7	5	1377	289
Future Volume (vph)	271	7	161	42	11	9	191	1241	7	5	1377	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Fr	1.00	0.88		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1577		1715	1683		1787	3569		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1577		1715	1683		1787	3569		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	163	42	11	9	193	1254	7	5	1391	292
RTOR Reduction (vph)	0	134	0	0	9	0	0	0	0	0	0	138
Lane Group Flow (vph)	233	77	0	31	22	0	193	1261	0	5	1391	154
Confl. Bikes (#/hr)							3					3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.3	15.3		3.9	3.9		11.3	50.3		1.3	40.3	40.3
Effective Green, g (s)	15.5	15.5		4.1	4.1		11.0	51.2		1.0	41.2	41.2
Actuated g/C Ratio	0.18	0.18		0.05	0.05		0.13	0.58		0.01	0.47	0.47
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	299	278		80	78		223	2081		20	1677	740
v/s Ratio Prot	c0.14	0.05		c0.02	0.01		c0.11	0.35		0.00	c0.39	
v/s Ratio Perm												0.10
v/c Ratio	0.78	0.28		0.39	0.29		0.87	0.61		0.25	0.83	0.21
Uniform Delay, d1	34.5	31.3		40.6	40.4		37.7	11.8		43.0	20.2	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.4	0.6		4.2	2.8		27.7	0.7		6.5	3.9	0.2
Delay (s)	46.9	31.9		44.8	43.2		65.3	12.5		49.5	24.1	13.9
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		39.8			44.0			19.5			22.5	
Approach LOS		D			D			B			C	
Intersection Summary												
HCM 2000 Control Delay	23.7		HCM 2000 Level of Service						C			
HCM 2000 Volume to Capacity ratio	0.80											
Actuated Cycle Length (s)	87.8		Sum of lost time (s)						16.0			
Intersection Capacity Utilization	78.1%		ICU Level of Service						D			
Analysis Period (min)	15											
c Critical Lane Group												

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
 7: SR 1 & Ocean Ave

Existing Saturday.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	7	161	42	11	9	191	1241	7	5	1377	289
Future Volume (veh/h)	271	7	161	42	11	9	191	1241	7	5	1377	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1896	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	222	80	163	31	26	9	193	1254	7	5	1391	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	318	99	202	125	93	32	224	2009	11	10	1544	698
Arrive On Green	0.18	0.18	0.18	0.07	0.07	0.07	0.13	0.55	0.54	0.01	0.43	0.00
Sat Flow, veh/h	1792	558	1137	1810	1342	465	1792	3642	20	1810	3574	1615
Grp Volume(V), veh/h	222	0	243	31	0	35	193	615	646	5	1391	0
Grp Sat Flow(s),veh/h/ln	1792	0	1696	1810	0	1807	1792	1786	1876	1810	1787	1615
Q Serve(g_s), s	9.5	0.0	11.2	1.3	0.0	1.5	8.6	19.2	19.2	0.2	29.5	0.0
Cycle Q Clear(q_c), s	9.5	0.0	11.2	1.3	0.0	1.5	8.6	19.2	19.2	0.2	29.5	0.0
Prop In Lane	1.00		0.67	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	318	0	301	125	0	125	224	985	1035	10	1544	698
V/C Ratio(X)	0.70	0.00	0.81	0.25	0.00	0.28	0.86	0.62	0.62	0.50	0.90	0.00
Avail Cap(c_a), veh/h	391	0	370	160	0	159	242	985	1035	155	1665	752
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.5	0.0	32.3	36.0	0.0	36.1	35.0	12.5	12.5	40.5	21.5	0.0
Incr Delay (d2), s/veh	4.6	0.0	10.9	1.5	0.0	1.7	24.4	1.6	1.5	34.0	7.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	6.2	0.7	0.0	0.8	5.8	9.8	10.3	0.2	16.0	0.0
LnGrp Delay(d),s/veh	36.0	0.0	43.2	37.4	0.0	37.8	59.3	14.1	14.0	74.5	28.8	0.0
LnGrp LOS	D		D	D		D	E	B	B	E	C	
Approach Vol, veh/h		465			66			1454			1396	
Approach Delay, s/veh		39.8			37.6			20.1			28.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.5	14.2	39.2		9.6	4.4	49.0				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 18	11.3	37.1		7.0	7.3	41.1				
Max Q Clear Time (q_c+I1), s		13.2	10.6	31.5		3.5	2.2	21.2				
Green Ext Time (p_c), s		1.1	0.0	2.8		0.1	0.0	18.7				
Intersection Summary												
HCM 2010 Ctrl Delay			26.8									
HCM 2010 LOS			C									

Notes

Synchro 9 Report

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HCM Signalized Intersection Capacity Analysis
 8: SR 1 & Carpenter St

Existing Saturday.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	390	10	22	21	11	34	36	1440	25	40	1708	557
Future Volume (vph)	390	10	22	21	11	34	36	1440	25	40	1708	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1684		1715	1774	1582	1805	3564		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1684		1715	1774	1582	1805	3564		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	23	22	11	35	37	1485	26	41	1761	574
RTOR Reduction (vph)	0	19	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	14	0	16	17	2	37	1510	0	41	1761	574
Confl. Bikes (#/hr)				2			2			2		2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.5	15.5		4.7	4.7	4.7	4.4	53.2		4.3	53.6	95.6
Effective Green, g (s)	16.1	16.1		4.9	4.9	4.9	4.1	54.1		4.5	54.5	95.6
Actuated g/C Ratio	0.17	0.17		0.05	0.05	0.05	0.04	0.57		0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	578	283		87	90	81	77	2016		84	2037	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.42		0.02	c0.49	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.70	0.05		0.18	0.19	0.02	0.48	0.75		0.49	0.86	0.37
Uniform Delay, d1	37.4	33.3		43.4	43.4	43.1	44.7	15.6		44.4	17.4	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.2	0.1		1.8	1.8	0.2	4.7	1.9		4.4	4.5	0.7
Delay (s)	41.6	33.5		45.2	45.2	43.3	49.4	17.5		48.8	21.9	0.7
Level of Service	D	C		D	D	D	D	B		D	C	A
Approach Delay (s)		41.0				44.2		18.3				17.2
Approach LOS		D				B		B				B
Intersection Summary												
HCM 2000 Control Delay			20.4				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			95.6				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			71.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Synchro 9 Report

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HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Existing Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 1.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	63	0	14	1	0	0	6	299	0	0	408	30
Future Vol, veh/h	63	0	14	1	0	0	6	299	0	0	408	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	72	0	16	1	0	0	7	340	0	0	464	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	665	834	249	585	851	170	498	0	0	340	0	0
Stage 1	481	481	-	353	353	-	-	-	-	-	-	-
Stage 2	184	353	-	232	498	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	345	306	757	399	299	851	1076	-	-	1230	-	-
Stage 1	535	557	-	642	634	-	-	-	-	-	-	-
Stage 2	800	634	-	756	548	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	343	304	757	388	297	851	1076	-	-	1230	-	-
Mov Cap-2 Maneuver	343	304	-	388	297	-	-	-	-	-	-	-
Stage 1	531	557	-	637	629	-	-	-	-	-	-	-
Stage 2	794	629	-	740	548	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	17.2			14.3			0.2			0		
HCM LOS	C			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1076	-	-	381	388	1230	-	-
HCM Lane V/C Ratio	0.006	-	-	0.23	0.003	-	-	-
HCM Control Delay (s)	8.4	0	-	17.2	14.3	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Existing Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 3.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕		↕	↕		↕			↕		↕
Traffic Vol, veh/h	191	295	12	5	393	31	7	0	6	6	1	164
Future Vol, veh/h	191	295	12	5	393	31	7	0	6	6	1	164
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	208	321	13	5	427	34	8	0	7	7	1	178

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	465	0	0	342	0	0	979	1226	183	1043	1216	238
Stage 1	-	-	-	-	-	-	750	750	-	459	459	-
Stage 2	-	-	-	-	-	-	229	476	-	584	757	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1100	-	-	1228	-	-	207	180	834	186	183	769
Stage 1	-	-	-	-	-	-	374	422	-	557	570	-
Stage 2	-	-	-	-	-	-	759	560	-	470	419	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1096	-	-	1220	-	-	133	144	823	156	146	764
Mov Cap-2 Maneuver	-	-	-	-	-	-	133	144	-	156	146	-
Stage 1	-	-	-	-	-	-	301	340	-	450	566	-
Stage 2	-	-	-	-	-	-	576	556	-	375	337	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	3.5			0.1			22.7			12.6		
HCM LOS	C						C			B		

Minor Lane/Major Mvmt	NBLn1	EBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	217	1096	-	-	1220	-	-	658
HCM Lane V/C Ratio	0.065	0.189	-	-	0.004	-	-	0.282
HCM Control Delay (s)	22.7	9.1	-	-	8	-	-	12.6
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.7	-	-	0	-	-	1.2

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing Saturday.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↑
Traffic Volume (vph)	665	113	27	648	120	16
Future Volume (vph)	665	113	27	648	120	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1788	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1788	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	707	120	29	689	128	17
RTOR Reduction (vph)	0	62	0	0	8	0
Lane Group Flow (vph)	707	58	29	689	137	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	23.3	23.3	1.3	28.8	8.5	
Effective Green, g (s)	23.3	23.3	1.3	28.8	8.5	
Actuated g/C Ratio	0.48	0.48	0.03	0.60	0.18	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	909	762	46	1123	315	
v/s Ratio Prot	c0.38		0.02	c0.37	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.78	0.08	0.63	0.61	0.43	
Uniform Delay, d1	10.3	6.7	23.2	6.2	17.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.4	0.1	18.8	1.1	0.4	
Delay (s)	14.7	6.7	42.0	7.2	18.1	
Level of Service	B	A	D	A	B	
Approach Delay (s)	13.5			8.6	18.1	
Approach LOS	B			A	B	

Intersection Summary					
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.71				
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	15.1		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing Saturday.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↑
Traffic Volume (veh/h)	665	113	27	648	120	16
Future Volume (veh/h)	665	113	27	648	120	16
Number	2	12	1	6	3	18
Initial Q (Ob), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	707	120	29	689	128	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	965	809	47	1188	235	0
Arrive On Green	0.51	0.51	0.03	0.63	0.13	0.00
Sat Flow, veh/h	1881	1578	1740	1881	1796	0
Grp Volume(V), veh/h	707	120	29	689	129	0
Grp Sat Flow(s),veh/h/ln	1881	1578	1740	1881	1810	0
Q Serve(g_s), s	13.4	1.8	0.8	9.8	3.1	0.0
Cycle Q Clear(g_c), s	13.4	1.8	0.8	9.8	3.1	0.0
Prop In Lane	1.00	1.00	1.00	0.99	0.00	
Lane Grp Cap(c), veh/h	965	809	47	1188	237	0
V/C Ratio(X)	0.73	0.15	0.62	0.58	0.54	0.00
Avail Cap(c_a), veh/h	1144	960	152	1481	710	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.7	5.9	22.1	4.9	18.7	0.0
Incr Delay (d2), s/veh	2.2	0.1	4.8	0.6	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	0.8	0.4	5.2	1.6	0.0
LnGrp Delay(d),s/veh	10.9	6.0	26.9	5.5	19.4	0.0
LnGrp LOS	B	A	C	A	B	
Approach Vol, veh/h	827			718	129	
Approach Delay, s/veh	10.2			6.3	19.4	
Approach LOS	B			A	B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	29.9				35.4		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	27.9				36.1		18.0
Max Q Clear Time (g_c+I1), s	2.8	15.4				11.8		5.1
Green Ext Time (p_c), s	0.0	8.1				12.5		0.1

Intersection Summary					
HCM 2010 Ctrl Delay			9.3		
HCM 2010 LOS			A		

Notes

Synchro 9 Report

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Existing Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 1.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔		↔	↔
Traffic Vol, veh/h	8	643	29	14	590	8	30	0	40	4	0	8
Future Vol, veh/h	8	643	29	14	590	8	30	0	40	4	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	9	684	31	15	628	9	32	0	43	4	0	9

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	636	0	0	684
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.1	-	-	4.1
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2
Pot Cap-1 Maneuver	957	-	-	919
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	957	-	-	919
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	27.2	21.2
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	121	452	957	-	-	919	-	-	112	484
HCM Lane V/C Ratio	0.264	0.094	0.009	-	-	0.016	-	-	0.038	0.018
HCM Control Delay (s)	45.1	13.8	8.8	-	-	9	-	-	38.4	12.6
HCM Lane LOS	E	B	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	1	0.3	0	-	-	0	-	-	0.1	0.1

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Existing Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.3						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	38	4	5	548	645	39
Future Vol, veh/h	38	4	5	548	645	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	40	4	5	577	679	41

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1266	679	679
Stage 1	679	-	-
Stage 2	587	-	-
Critical Hdwy	7.1	6.2	4.1
Critical Hdwy Stg 1	6.1	-	-
Critical Hdwy Stg 2	6.1	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	147	455	923
Stage 1	445	-	-
Stage 2	499	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	146	455	923
Mov Cap-2 Maneuver	146	-	-
Stage 1	441	-	-
Stage 2	495	-	-

Approach	EB	NB	SB
HCM Control Delay, s	37	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	923	-	156	-	-
HCM Lane V/C Ratio	0.006	-	0.283	-	-
HCM Control Delay (s)	8.9	0	37	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0	-	1.1	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Existing Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.3						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	24	37	355	32	28	358
Future Vol, veh/h	24	37	355	32	28	358
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	25	38	366	33	29	369

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	821	394	0	0	405	0
Stage 1	388	-	-	-	-	-
Stage 2	433	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	347	659	-	-	1165	-
Stage 1	690	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	333	652	-	-	1159	-
Mov Cap-2 Maneuver	333	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	634	-	-	-	-	-

Approach	WB		NB		SB
HCM Control Delay, s	13.8		0		0.6
HCM LOS	B				

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	474	1159	-
HCM Lane V/C Ratio	-	-	0.133	0.025	-
HCM Control Delay (s)	-	-	13.8	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Synchro 9 Report

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Existing Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	10	79	63	312	304	16
Future Vol, veh/h	10	79	63	312	304	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	84	67	332	323	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	810	345	334	0	-	0
Stage 1	334	-	-	-	-	-
Stage 2	476	-	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-	-
Pot Cap-1 Maneuver	352	696	1225	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	327	683	1214	-	-	-
Mov Cap-2 Maneuver	327	-	-	-	-	-
Stage 1	723	-	-	-	-	-
Stage 2	589	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s	12		1.4		0
HCM LOS	B				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1214	-	609	-	-
HCM Lane V/C Ratio	0.055	-	0.155	-	-
HCM Control Delay (s)	8.1	-	12	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.5	-	-

Synchro 9 Report

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Existing Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	20	114	98	240	199	8
Future Vol, veh/h	20	114	98	240	199	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	127	109	267	221	9
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	724	240	237	0	-	0
Stage 1	233	-	-	-	-	-
Stage 2	491	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	396	804	1336	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	359	795	1328	-	-	-
Mov Cap-2 Maneuver	359	-	-	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	565	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	11.9		2.3		0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1328	-	673	-	-	-
HCM Lane V/C Ratio	0.082	-	0.221	-	-	-
HCM Control Delay (s)	8	-	11.9	-	-	-
HCM Lane LOS	A	-	B	-	-	-
HCM 95th %tile Q(veh)	0.3	-	0.8	-	-	-

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing Saturday.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	9.2												
Intersection LOS	A												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Lane Configurations			↕				↕				↕		
Traffic Vol, veh/h	0	0	1	94	0	3	0	0	0	161	95	4	
Future Vol, veh/h	0	0	1	94	0	3	0	0	0	161	95	4	
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0	
Mvmt Flow	0	0	1	108	0	3	0	0	0	185	109	5	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach	EB			WB				NB			SB		
Opposing Approach	WB			EB				SB			NB		
Opposing Lanes	1			1				1			1		
Conflicting Approach Left	SB			NB				EB			WB		
Conflicting Lanes Left	1			1				1			1		
Conflicting Approach Right	NB			SB				WB			EB		
Conflicting Lanes Right	1			1				1			1		
HCM Control Delay	7.9			8.3				10			10		
HCM LOS	A			A				A			A		
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	62%	0%	100%	0%									
Vol Thru, %	37%	1%	0%	100%									
Vol Right, %	2%	99%	0%	0%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	260	95	3	110									
LT Vol	161	0	3	0									
Through Vol	95	1	0	110									
RT Vol	4	94	0	0									
Lane Flow Rate	299	109	3	126									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0.37	0.13	0.005	0.158									
Departure Headway (Hd)	4.454	4.276	5.207	4.486									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	813	839	687	800									
Service Time	2.454	2.301	3.242	2.511									
HCM Lane V/C Ratio	0.368	0.13	0.004	0.158									
HCM Control Delay	10	7.9	8.3	8.4									
HCM Lane LOS	A	A	A	A									
HCM 95th-tile Q	1.7	0.4	0	0.6									

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing Saturday.syn
12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	110	0
Future Vol, veh/h	0	0	110	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	126	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.4
HCM LOS	A

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Existing + Project AM.syn
12/01/2017

	↙	↘	↑	↗	↖	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↕↕	↑	↕	↕↕	↑
Traffic Volume (vph)	0	976	495	87	923	676
Future Volume (vph)	0	976	495	87	923	676
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Fr't		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Sat'd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Sat'd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1122	569	100	1061	777
RTOR Reduction (vph)	0	183	0	22	0	0
Lane Group Flow (vph)	0	939	569	78	1061	777
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		20.2	18.2	18.2	20.2	48.2
Effective Green, g (s)		21.1	19.1	19.1	21.1	48.2
Actuated g/C Ratio		0.44	0.40	0.40	0.44	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1220	731	621	1488	1810
v/s Ratio Prot		c0.34	c0.31		0.31	0.43
v/s Ratio Perm				0.05		
v/c Ratio		0.77	0.78	0.13	0.71	0.43
Uniform Delay, d1		11.5	12.7	9.2	11.1	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.4	5.4	0.1	1.9	0.7
Delay (s)		14.9	18.1	9.4	13.0	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	14.9		16.8			7.8
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Existing + Project AM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔↕	↔	↔↕	↔↕	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	7	756	247	350	832	10	98	3	228	9	18	41	
Future Volume (vph)	7	756	247	350	832	10	98	3	228	9	18	41	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	1.00	1.00	0.85	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.96	1.00	0.98	1.00	0.98	1.00	
Satd. Flow (prot)	1805	3539	1564	3433	3529	1698	1708	1561	1737	1555	1737	1555	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.96	1.00	0.98	1.00	0.98	1.00	
Satd. Flow (perm)	1805	3539	1564	3433	3529	1698	1708	1561	1737	1555	1737	1555	
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	
Adj. Flow (vph)	9	969	317	449	1067	13	126	4	292	12	23	53	
RTOR Reduction (vph)	0	0	159	0	0	0	0	0	70	0	0	50	
Lane Group Flow (vph)	9	969	158	449	1080	0	66	64	222	0	35	3	
Confl. Peds. (#/hr)				1		1	1		1	1		1	
Confl. Bikes (#/hr)				1					1				
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm	
Protected Phases	1	6		5	2		4	4	5	8	8		
Permitted Phases			6						4			8	
Actuated Green, G (s)	0.7	27.4	27.4	11.4	38.1		4.9	4.9	16.3		2.2	2.2	
Effective Green, g (s)	1.2	28.4	28.4	12.0	39.1		6.7	6.7	17.5		3.2	3.2	
Actuated g/C Ratio	0.02	0.43	0.43	0.18	0.59		0.10	0.10	0.26		0.05	0.05	
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0	
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	32	1515	669	621	2081		171	172	412		83	75	
v/s Ratio Prot	0.00	c0.27		c0.13	0.31		0.04	0.04	c0.10		c0.02		
v/s Ratio Perm			0.10						0.04			0.00	
v/c Ratio	0.28	0.64	0.24	0.72	0.52		0.39	0.37	0.54		0.42	0.03	
Uniform Delay, d1	32.1	14.9	12.1	25.6	8.0		27.9	27.8	20.9		30.7	30.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.7	0.1	3.5	0.1		0.5	0.5	0.7		1.3	0.1	
Delay (s)	33.9	15.6	12.1	29.1	8.1		28.4	28.3	21.6		31.9	30.1	
Level of Service	C	B	B	C	A		C	C	C		C	C	
Approach Delay (s)		14.9			14.3			23.7			30.8		
Approach LOS		B			B			C			C		
Intersection Summary													
HCM 2000 Control Delay			16.1	HCM 2000 Level of Service						B			
HCM 2000 Volume to Capacity ratio			0.62										
Actuated Cycle Length (s)			66.3	Sum of lost time (s)						16.1			
Intersection Capacity Utilization			50.9%	ICU Level of Service						A			
Analysis Period (min)			15										
c Critical Lane Group													

Synchro 9 Report

HCM 2010 Signalized Intersection Summary

Existing + Project AM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↕	↔	↔↕	↔↕	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	7	756	247	350	832	10	98	3	228	9	18	41
Future Volume (veh/h)	7	756	247	350	832	10	98	3	228	9	18	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863
Adj Flow Rate, veh/h	9	969	317	449	1067	13	129	0	292	12	23	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1159	512	567	1696	21	760	0	558	35	68	93
Arrive On Green	0.02	0.33	0.33	0.16	0.47	0.46	0.21	0.00	0.19	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3578	44	3583	0	1545	596	1141	1575
Grp Volume(v), veh/h	9	969	317	449	527	553	129	0	292	35	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1853	1792	0	1545	1737	0	1575
Q Serve(g_s), s	0.3	17.1	11.6	8.5	15.1	15.1	2.0	0.0	10.1	1.3	0.0	2.2
Cycle Q Clear(g_c), s	0.3	17.1	11.6	8.5	15.1	15.1	2.0	0.0	10.1	1.3	0.0	2.2
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00
Lane Grp Cap(c), veh/h	30	1159	512	567	838	879	760	0	558	103	0	93
V/C Ratio(X)	0.30	0.84	0.62	0.79	0.63	0.63	0.17	0.00	0.52	0.34	0.00	0.57
Avail Cap(c_a), veh/h	120	1256	555	621	838	879	1791	0	1003	103	0	93
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.9	21.1	19.2	27.1	13.3	13.3	21.8	0.0	17.1	30.6	0.0	31.0
Incr Delay (d2), s/veh	2.0	4.3	1.2	5.6	1.1	1.1	0.0	0.0	0.3	0.7	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	9.0	5.1	4.4	7.6	7.9	1.0	0.0	4.3	0.6	0.0	1.1
LnGrp Delay(d),s/veh	34.9	25.4	20.4	32.8	14.5	14.4	21.8	0.0	17.4	31.3	0.0	36.1
LnGrp LOS	C	C	C	C	B	B	C		B	C		D
Approach Vol, veh/h			1295			1529			421			
Approach Delay, s/veh			24.2			19.8			18.8			
Approach LOS			C			B			B			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	36.1		18.3	15.1	26.2		8.0				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 12	23.0		3.0				
Max Q Clear Time (g_c+I1), s	2.3	17.1		12.1	10.5	19.1		4.2				
Green Ext Time (p_c), s	0.0	5.4		0.3	0.1	2.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			21.8									
HCM 2010 LOS			C									
Notes												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕↔			↕	↕	↕	↕	↕	↕	↕↔	↕
Traffic Volume (vph)	198	304	26	6	84	274	155	38	228	68	275	334
Future Volume (vph)	198	304	26	6	84	274	155	38	228	68	275	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3496			1703	1827	1547	1752	1881	1590	3433	1761
Flt Permitted	0.95	1.00			0.32	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3496			578	1827	1547	1752	1881	1590	3433	1761
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	213	327	28	7	90	295	167	41	245	73	296	359
RTOR Reduction (vph)	0	8	0	0	0	0	124	0	0	52	0	8
Lane Group Flow (vph)	213	347	0	0	97	295	43	41	245	21	296	423
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	9.6	15.8			12.7	18.9	18.9	4.2	20.4	20.4	9.5	25.7
Effective Green, g (s)	9.3	16.0			12.4	19.1	19.1	3.9	21.3	21.3	9.2	26.6
Actuated g/C Ratio	0.12	0.21			0.17	0.26	0.26	0.05	0.28	0.28	0.12	0.36
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	211	746			95	465	394	91	534	452	421	625
v/s Ratio Prot	0.13	0.10				c0.16		0.02	0.13		c0.09	c0.24
v/s Ratio Perm					c0.17		0.03			0.01		
v/c Ratio	1.01	0.47			1.02	0.63	0.11	0.45	0.46	0.05	0.70	0.68
Uniform Delay, d1	32.8	25.7			31.3	24.8	21.4	34.5	22.1	19.4	31.5	20.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	64.4	0.5			98.2	3.0	0.1	3.5	0.7	0.0	5.3	3.0
Delay (s)	97.2	26.3			129.4	27.8	21.5	38.0	22.8	19.5	36.8	23.5
Level of Service	F	C			F	C	C	D	C	B	D	C
Approach Delay (s)		52.9				43.5			23.9			28.9
Approach LOS		D				D			C			C
Intersection Summary												
HCM 2000 Control Delay		37.9			HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		74.9			Sum of lost time (s)				16.0			
Intersection Capacity Utilization		67.6%			ICU Level of Service				C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project AM.syn
12/01/2017

Movement	SBR
Lane Configurations	↕
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	1.00
Satd. Flow (prot)	1703
Flt Permitted	1.00
Satd. Flow (perm)	1703
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	Prot
Protected Phases	7
Permitted Phases	
Actuated Green, G (s)	20.4
Effective Green, g (s)	19.4
Actuated g/C Ratio	0.12
Clearance Time (s)	3.7
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	421
v/s Ratio Prot	c0.09
v/s Ratio Perm	
v/c Ratio	0.70
Uniform Delay, d1	31.5
Progression Factor	1.00
Incremental Delay, d2	5.3
Delay (s)	36.8
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing + Project AM.syn
12/01/2017

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	61	62	352	77	83	261	6	152	3	53	5	2
Future Volume (vph)	61	62	352	77	83	261	6	152	3	53	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			4.0
Lane Util. Factor	1.00	0.95			1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			1.00
Frt	1.00	0.97			1.00	1.00		1.00	0.86			0.87
Flt Protected	0.95	1.00			0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)	1770	3403			1687	3428		3367	1512			3077
Flt Permitted	0.57	1.00			0.95	1.00		0.95	1.00			0.92
Satd. Flow (perm)	1066	3403			1687	3428		3367	1512			2835
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92
Adj. Flow (vph)	66	67	387	85	91	287	7	167	3	58	5	2
RTOR Reduction (vph)	0	0	17	0	0	1	0	0	45	0	0	34
Lane Group Flow (vph)	0	133	455	0	91	293	0	167	16	0	0	9
Confl. Bikes (#/hr)				1								
Heavy Vehicles (%)	2%	2%	3%	3%	7%	5%	2%	4%	2%	8%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2										
Actuated Green, G (s)		36.1	36.1		6.7	46.3		7.9	15.7			3.8
Effective Green, g (s)		36.1	36.1		6.2	46.3		7.9	15.7			3.8
Actuated g/C Ratio		0.52	0.52		0.09	0.66		0.11	0.22			0.05
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)	549	1754			149	2267		379	339			153
v/s Ratio Prot		c0.13			c0.05	0.09		c0.05	c0.01			
v/s Ratio Perm		0.12										0.00
v/c Ratio		0.24	0.26		0.61	0.13		0.44	0.05			0.06
Uniform Delay, d1		9.4	9.5		30.7	4.4		29.0	21.3			31.4
Progression Factor		1.00	1.00		0.93	0.91		1.00	1.00			1.00
Incremental Delay, d2		1.0	0.4		5.1	0.1		0.3	0.1			0.2
Delay (s)		10.4	9.8		33.5	4.1		29.3	21.3			31.6
Level of Service		B	A		C	A		C	C			C
Approach Delay (s)			10.0			11.1			27.2			31.6
Approach LOS			A			B			C			C
Intersection Summary												
HCM 2000 Control Delay			14.1									B
HCM 2000 Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			37.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing + Project AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	36
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	323	87	48	323	0	27	0	27	0	0	0
Future Volume (vph)	0	323	87	48	323	0	27	0	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		0.99		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Fr		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)		3380		1805	3471			1548	1362			
Flt Permitted		1.00		0.95	1.00			0.89	1.00			
Satd. Flow (perm)		3380		1805	3471			1448	1362			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	380	102	56	380	0	32	0	32	0	0	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	466	0	56	380	0	0	32	2	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases						8		8		4		
Actuated Green, G (s)		49.9		4.1	57.5			4.5	4.5			
Effective Green, g (s)		49.9		3.6	57.5			4.5	4.5			
Actuated g/C Ratio		0.71		0.05	0.82			0.06	0.06			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2409		92	2851			93	87			
v/s Ratio Prot		c0.14		c0.03	0.11							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.19		0.61	0.13			0.34	0.02			
Uniform Delay, d1		3.3		32.5	1.3			31.3	30.7			
Progression Factor		0.62		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.6	0.1			0.8	0.0			
Delay (s)		2.2		40.1	1.4			32.1	30.7			
Level of Service		A		D	A			C	C			
Approach Delay (s)		2.2			6.3			31.4		0.0		
Approach LOS		A			A			C		A		

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	28.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (veh/h)	0	323	87	48	323	0	27	0	27	0	0	0
Future Volume (veh/h)	0	323	87	48	323	0	27	0	27	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	380	102	56	380	0	32	0	32	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	15	0	0	0	0
Cap, veh/h	0	2074	550	59	2933	0	153	0	56	0	77	0
Arrive On Green	0.00	0.76	0.76	0.03	0.85	0.00	0.04	0.00	0.04	0.00	0.00	0.00
Sat Flow, veh/h	0	2838	729	1810	3563	0	1234	0	1375	0	1900	0
Grp Volume(v), veh/h	0	241	241	56	380	0	32	0	32	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1718	1810	1736	0	1234	0	1375	0	1900	0
Q Serve(g_s), s	0.0	2.7	2.8	2.2	1.3	0.0	1.8	0.0	1.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.7	2.8	2.2	1.3	0.0	1.8	0.0	1.6	0.0	0.0	0.0
Prop In Lane	0.00		0.42	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1327	1298	59	2933	0	153	0	56	0	77	0
V/C Ratio(X)	0.00	0.18	0.19	0.96	0.13	0.00	0.21	0.00	0.57	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1327	1298	284	2933	0	455	0	393	0	543	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	2.4	2.4	33.8	0.9	0.0	33.1	0.0	33.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	24.0	0.1	0.0	0.2	0.0	3.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.4	1.4	1.5	0.7	0.0	0.6	0.0	0.7	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	2.7	2.7	57.8	1.0	0.0	33.3	0.0	36.4	0.0	0.0	0.0
LnGrp LOS		A	A	E	A		C		D			
Approach Vol, veh/h		482			436			64			0	
Approach Delay, s/veh		2.7			8.3			34.8			0.0	
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.3	56.9		6.8		63.2		6.8				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	11.5	27.0		20.0		42.0		20.0				
Max Q Clear Time (g_c+I1), s	4.2	4.8		0.0		3.3		3.8				
Green Ext Time (p_c), s	0.0	6.7		0.0		7.8		0.1				

Intersection Summary			
HCM 2010 Ctrl Delay		7.3	
HCM 2010 LOS		A	

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Existing + Project AM.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	10.5								
Intersection LOS	B								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↔↔	↕		↕	↔↔		↔↔	↕
Traffic Vol, veh/h	0	210	30	0	13	12	5	16	307
Future Vol, veh/h	0	210	30	0	13	12	5	16	307
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	239	34	0	15	14	5	18	349
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB			SB		
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB						WB		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	9.9			8.7			11.1		
HCM LOS	A			A			B		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	105	105	30	13	12	21	307		
LT Vol	105	105	0	0	0	21	0		
Through Vol	0	0	30	13	0	0	0		
RT Vol	0	0	0	0	12	0	307		
Lane Flow Rate	119	119	34	15	14	24	349		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.203	0.2	0.036	0.025	0.021	0.039	0.452		
Departure Headway (Hd)	6.12	6.034	3.816	6.188	5.477	5.899	4.665		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	582	591	924	582	658	606	771		
Service Time	3.902	3.817	1.597	3.888	3.177	3.644	2.41		
HCM Lane V/C Ratio	0.204	0.201	0.037	0.026	0.021	0.04	0.453		
HCM Control Delay	10.5	10.3	6.7	9	8.3	8.9	11.2		
HCM Lane LOS	B	B	A	A	A	A	B		
HCM 95th-tile Q	0.8	0.7	0.1	0.1	0.1	0.1	2.4		

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Existing + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔↔		↔	↔↔	↔
Traffic Volume (vph)	144	50	101	151	43	63	117	1061	48	18	1333	113
Future Volume (vph)	144	50	101	151	43	63	117	1061	48	18	1333	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1515		1665	1649		1770	3465		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1515		1665	1649		1770	3465		1805	3471	1568
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)	157	54	110	164	47	68	127	1153	52	20	1449	123
RTOR Reduction (vph)	0	67	0	0	39	0	0	3	0	0	0	57
Lane Group Flow (vph)	141	113	0	143	97	0	127	1202	0	20	1449	66
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	12.8	12.8		8.8	8.8		7.3	46.0		2.8	41.5	41.5
Effective Green, g (s)	13.0	13.0		9.0	9.0		7.0	46.9		2.5	42.4	42.4
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.08	0.54		0.03	0.49	0.49
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	247	225		171	169		141	1859		51	1683	760
v/s Ratio Prot	c0.08	0.07		c0.09	0.06		c0.07	0.35		0.01	c0.42	
v/s Ratio Perm												0.04
v/c Ratio	0.57	0.50		0.84	0.57		0.90	0.65		0.39	0.86	0.09
Uniform Delay, d1	34.6	34.2		38.5	37.4		39.9	14.4		41.7	19.9	12.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.4	2.1		29.3	5.5		47.3	1.0		4.9	5.1	0.1
Delay (s)	38.0	36.3		67.8	42.9		87.1	15.3		46.6	25.0	12.2
Level of Service	D	D		E	D		F	B		D	C	B
Approach Delay (s)		37.0			55.6			22.2			24.3	
Approach LOS		D			E			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.1		HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			87.4		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			76.4%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Existing + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	144	50	101	151	43	63	117	1061	48	18	1333	113
Future Volume (veh/h)	144	50	101	151	43	63	117	1061	48	18	1333	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.87	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	110	140	81	68	127	1153	52	20	1449	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	283	83	169	190	96	80	149	1744	79	50	1578	713
Arrive On Green	0.16	0.16	0.16	0.11	0.11	0.11	0.08	0.51	0.50	0.03	0.45	0.00
Sat Flow, veh/h	1757	514	1046	1757	885	743	1774	3412	154	1810	3471	1568
Grp Volume(v), veh/h	157	0	164	140	0	149	127	593	612	20	1449	0
Grp Sat Flow(s),veh/h/ln	1757	0	1560	1757	0	1629	1774	1755	1811	1810	1736	1568
Q Serve(g_s), s	6.9	0.0	8.2	6.4	0.0	7.5	5.9	20.8	20.8	0.9	32.6	0.0
Cycle Q Clear(g_c), s	6.9	0.0	8.2	6.4	0.0	7.5	5.9	20.8	20.8	0.9	32.6	0.0
Prop In Lane	1.00		0.67	1.00		0.46	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	283	0	252	190	0	176	149	897	926	50	1578	713
V/C Ratio(X)	0.55	0.00	0.65	0.74	0.00	0.85	0.85	0.66	0.66	0.40	0.92	0.00
Avail Cap(c_a), veh/h	380	0	337	190	0	176	149	897	926	152	1667	753
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	0.0	32.8	36.0	0.0	36.5	37.6	15.0	15.1	39.8	21.3	0.0
Incr Delay (d2), s/veh	2.0	0.0	3.4	15.1	0.0	30.8	35.0	2.2	2.2	5.1	8.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	3.8	3.9	0.0	4.9	4.3	10.6	10.9	0.5	17.4	0.0
LnGrp Delay(d),s/veh	34.2	0.0	36.2	51.1	0.0	67.3	72.6	17.2	17.2	45.0	29.9	0.0
LnGrp LOS	C		D	D		E	E	B	B	D	C	
Approach Vol, veh/h		321			289			1332			1469	
Approach Delay, s/veh		35.2			59.5			22.5			30.2	
Approach LOS		D			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		17.4	11.0	41.9		13.0	6.3	46.6				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 18	7.3	39.1		8.8	7.3	39.1				
Max Q Clear Time (g_c+I1), s		10.2	7.9	34.6		9.5	2.9	22.8				
Green Ext Time (p_c), s		1.0	0.0	2.4		0.0	0.0	15.5				
Intersection Summary												
HCM 2010 Ctrl Delay		30.1										
HCM 2010 LOS		C										
Notes												

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Existing + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	382	4	25	35	14	44	36	1211	17	71	1590	774
Future Volume (vph)	382	4	25	35	14	44	36	1211	17	71	1590	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	38	15	48	40	1331	19	78	1747	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	40	1349	0	78	1747	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	52.8		6.2	54.9	99.4
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	53.7		6.4	55.8	99.4
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54		0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	559	249		122	121	113	75	1908		105	1948	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.38		0.05	c0.50	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.75	0.03		0.22	0.21	0.03	0.53	0.71		0.74	0.90	0.54
Uniform Delay, d1	39.7	35.0		43.5	43.5	42.9	46.6	17.0		45.7	19.3	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	0.1		1.6	1.5	0.2	7.1	1.5		24.4	6.3	1.3
Delay (s)	46.0	35.1		45.1	45.1	43.1	53.7	18.5		70.1	25.5	1.3
Level of Service	D	D		D	D	D	D	B		E	C	A
Approach Delay (s)		45.3			44.2			19.5			19.1	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay		22.4			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		99.4			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		78.2%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Existing + Project AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 0.9												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	29	0	8	0	0	0	2	214	2	8	333	90
Future Vol, veh/h	29	0	8	0	0	0	2	214	2	8	333	90
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	33	0	9	0	0	0	2	246	2	9	383	103

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	587	712	249	468	763	130	489	0	0	251	0	0
Stage 1	456	456	-	255	255	-	-	-	-	-	-	-
Stage 2	131	256	-	213	508	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	377	360	686	483	337	902	1085	-	-	1326	-	-
Stage 1	533	572	-	733	700	-	-	-	-	-	-	-
Stage 2	836	699	-	775	542	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	372	354	683	470	332	897	1082	-	-	1323	-	-
Mov Cap-2 Maneuver	372	354	-	470	332	-	-	-	-	-	-	-
Stage 1	531	565	-	730	697	-	-	-	-	-	-	-
Stage 2	832	696	-	756	536	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.7			0			0.1			0.1		
HCM LOS	B			A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1082	-	-	413	-	1323	-	-
HCM Lane V/C Ratio	0.002	-	-	0.103	-	0.007	-	-
HCM Control Delay (s)	8.3	0	-	14.7	0	7.7	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	-	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Existing + Project AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.4												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	94	235	17	3	306	11	18	2	4	1	2	47
Future Vol, veh/h	94	235	17	3	306	11	18	2	4	1	2	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	108	270	20	3	352	13	21	2	5	1	2	54

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	364	0	0	290	0	0	680	867	145	717	871	182
Stage 1	-	-	-	-	-	-	496	496	-	365	365	-
Stage 2	-	-	-	-	-	-	184	371	-	352	506	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1170	-	-	1283	-	-	341	293	882	321	291	805
Stage 1	-	-	-	-	-	-	529	549	-	632	627	-
Stage 2	-	-	-	-	-	-	806	623	-	643	543	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1170	-	-	1283	-	-	293	265	882	294	264	805
Mov Cap-2 Maneuver	-	-	-	-	-	-	293	265	-	294	264	-
Stage 1	-	-	-	-	-	-	480	498	-	574	626	-
Stage 2	-	-	-	-	-	-	747	622	-	578	493	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.3			0.1			17.1			10.4		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	326	1170	-	-	1283	-	-	721
HCM Lane V/C Ratio	0.085	0.092	-	-	0.003	-	-	0.08
HCM Control Delay (s)	17.1	8.4	-	-	7.8	-	-	10.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.3	-	-	0	-	-	0.3

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing + Project AM.syn
12/01/2017

	→	↖	↙	←	↗	↘
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (vph)	582	115	19	824	78	17
Future Volume (vph)	582	115	19	824	78	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1762	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1762	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	613	121	20	867	82	18
RTOR Reduction (vph)	0	58	0	0	15	0
Lane Group Flow (vph)	613	64	20	867	85	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	25.4	25.4	0.7	30.3	7.2	
Effective Green, g (s)	25.4	25.4	0.7	30.3	7.2	
Actuated g/C Ratio	0.52	0.52	0.01	0.63	0.15	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	968	815	26	1177	262	
v/s Ratio Prot	0.33		0.01	0.46	0.05	
v/s Ratio Perm		0.04				
v/c Ratio	0.63	0.08	0.77	0.74	0.32	
Uniform Delay, d1	8.2	5.7	23.8	6.3	18.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.4	0.1	75.0	2.5	0.3	
Delay (s)	9.6	5.7	98.8	8.8	18.7	
Level of Service	A	A	F	A	B	
Approach Delay (s)	9.0			10.8	18.7	
Approach LOS	A			B	B	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	48.4	Sum of lost time (s)	15.1
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing + Project AM.syn
12/01/2017

	→	↖	↙	←	↗	↘		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↓	↑	↓	↓		
Traffic Volume (veh/h)	582	115	19	824	78	17		
Future Volume (veh/h)	582	115	19	824	78	17		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1880	1900		
Adj Flow Rate, veh/h	613	121	20	867	82	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	3	4	0	1	0	0		
Cap, veh/h	904	761	36	1143	247	0		
Arrive On Green	0.49	0.49	0.02	0.61	0.14	0.00		
Sat Flow, veh/h	1845	1553	1810	1881	1770	0		
Grp Volume(V), veh/h	613	121	20	867	83	0		
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1791	0		
Q Serve(g_s), s	10.9	1.9	0.5	14.4	1.8	0.0		
Cycle Q Clear(g_c), s	10.9	1.9	0.5	14.4	1.8	0.0		
Prop In Lane		1.00	1.00		0.99	0.00		
Lane Grp Cap(c), veh/h	904	761	36	1143	250	0		
V/C Ratio(X)	0.68	0.16	0.56	0.76	0.33	0.00		
Avail Cap(c_a), veh/h	981	826	168	1359	749	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	8.4	6.1	20.9	6.2	16.7	0.0		
Incr Delay (d2), s/veh	1.9	0.1	5.0	2.3	0.3	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.9	0.8	0.3	8.0	0.9	0.0		
LnGrp Delay(d),s/veh	10.3	6.2	25.9	8.4	17.0	0.0		
LnGrp LOS	B	A	C	A	B			
Approach Vol, veh/h	734			887	83			
Approach Delay, s/veh	9.6			8.8	17.0			
Approach LOS	A			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.1	27.5				32.6		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	22.9				31.1		18.0
Max Q Clear Time (g_c+I1), s	2.5	12.9				16.4		3.8
Green Ext Time (p_c), s	0.0	7.2				9.7		0.1

Intersection Summary			
HCM 2010 Ctrl Delay		9.6	
HCM 2010 LOS		A	

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Existing + Project AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 1.1												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔		↔	↔
Traffic Vol, veh/h	8	497	29	29	863	5	12	1	13	6	0	2
Future Vol, veh/h	8	497	29	29	863	5	12	1	13	6	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	9	546	32	32	948	5	13	1	14	7	0	2

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	954	0	0	546
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.1	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.227
Pot Cap-1 Maneuver	729	-	-	1018
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	729	-	-	1018
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	34.5	43.2
HCM LOS			D	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	83	541	729	-	-	1018	-	-	83	318
HCM Lane V/C Ratio	0.172	0.026	0.012	-	-	0.031	-	-	0.079	0.007
HCM Control Delay (s)	57.2	11.8	10	-	-	8.7	-	-	52.1	16.4
HCM Lane LOS	F	B	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.6	0.1	0	-	-	0.1	-	-	0.3	0

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Existing + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 0.8						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	38	0	1	296	406	39
Future Vol, veh/h	38	0	1	296	406	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	43	0	1	333	456	44

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	791	456	456
Stage 1	456	-	-
Stage 2	335	-	-
Critical Hdwy	6.43	6.2	4.1
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.43	-	-
Follow-up Hdwy	3.527	3.3	2.2
Pot Cap-1 Maneuver	357	609	1115
Stage 1	636	-	-
Stage 2	722	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	357	609	1115
Mov Cap-2 Maneuver	357	-	-
Stage 1	636	-	-
Stage 2	721	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1115	-	357	-	-
HCM Lane V/C Ratio	0.001	-	0.12	-	-
HCM Control Delay (s)	8.2	0	16.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Existing + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.1						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	16	93	321	21	22	423
Future Vol, veh/h	16	93	321	21	22	423
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	21	122	422	28	29	557

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1064	450	0 0 457 0
Stage 1	443	-	- - - -
Stage 2	621	-	- - - -
Critical Hdwy	6.4	6.21	- - 4.1 -
Critical Hdwy Stg 1	5.4	-	- - - -
Critical Hdwy Stg 2	5.4	-	- - - -
Follow-up Hdwy	3.5	3.309	- - 2.2 -
Pot Cap-1 Maneuver	249	611	- - 1114 -
Stage 1	651	-	- - - -
Stage 2	540	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	237	604	- - 1108 -
Mov Cap-2 Maneuver	237	-	- - - -
Stage 1	647	-	- - - -
Stage 2	516	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 492	1108	-
HCM Lane V/C Ratio	-	- 0.292	0.026	-
HCM Control Delay (s)	-	- 15.3	8.3	0
HCM Lane LOS	-	- C	A	A
HCM 95th %tile Q(veh)	-	- 1.2	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Existing + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 5.2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	17	157	174	231	268	21
Future Vol, veh/h	17	157	174	231	268	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	212	235	312	362	28

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1152	370	366 0 - 0
Stage 1	366	-	- - - -
Stage 2	786	-	- - - -
Critical Hdwy	6.4	6.23	4.14 - -
Critical Hdwy Stg 1	5.4	-	- - - -
Critical Hdwy Stg 2	5.4	-	- - - -
Follow-up Hdwy	3.5	3.327	2.236 - -
Pot Cap-1 Maneuver	221	673	1182 - -
Stage 1	706	-	- - - -
Stage 2	453	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	176	669	1178 - -
Mov Cap-2 Maneuver	176	-	- - - -
Stage 1	704	-	- - - -
Stage 2	361	-	- - - -

Approach	EB	NB	SB
HCM Control Delay, s	17.3	3.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1178	- 525	-	-
HCM Lane V/C Ratio	0.2	- 0.448	-	-
HCM Control Delay (s)	8.8	- 17.3	-	-
HCM Lane LOS	A	- C	-	-
HCM 95th %tile Q(veh)	0.7	- 2.3	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Existing + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	28	118	127	115	170	92
Future Vol, veh/h	28	118	127	115	170	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	140	151	137	202	110

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	707	271	319	0	0
Stage 1	264	-	-	-	-
Stage 2	443	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-
Pot Cap-1 Maneuver	399	768	1241	-	-
Stage 1	776	-	-	-	-
Stage 2	643	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	346	759	1234	-	-
Mov Cap-2 Maneuver	346	-	-	-	-
Stage 1	771	-	-	-	-
Stage 2	561	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	4.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1234	-	618	-	-
HCM Lane V/C Ratio	0.123	-	0.281	-	-
HCM Control Delay (s)	8.3	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing + Project AM.syn
12/01/2017

Intersection												
Intersection Delay, s/veh	8.9											
Intersection LOS	A											

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	1	0	71	0	4	0	0	0	68	77	1
Future Vol, veh/h	0	1	0	71	0	4	0	0	0	68	77	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	91	0	5	0	0	0	87	99	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.8	8.3	9.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	47%	1%	100%	0%
Vol Thru, %	53%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	72	4	191
LT Vol	68	1	4	0
Through Vol	77	0	0	191
RT Vol	1	71	0	0
Lane Flow Rate	187	92	5	245
Geometry Grp	1	1	1	1
Degree of Util (X)	0.243	0.11	0.007	0.294
Departure Headway (Hd)	4.664	4.294	5.199	4.326
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	771	835	688	833
Service Time	2.683	2.317	3.23	2.344
HCM Lane V/C Ratio	0.243	0.11	0.007	0.294
HCM Control Delay	9.2	7.8	8.3	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0	1.2

HCM 2010 AWSC

17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing + Project AM.syn

12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	191	0
Future Vol, veh/h	0	0	191	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	245	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.1
HCM LOS	A

HCM Signalized Intersection Capacity Analysis

1: SR 1 & Carmel Valley Rd

Existing + Project PM.syn

12/01/2017

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↕↕	↑	↕	↕↕	↑
Traffic Volume (vph)	0	849	741	117	863	586
Future Volume (vph)	0	849	741	117	863	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	875	764	121	890	604
RTOR Reduction (vph)	0	177	0	14	0	0
Lane Group Flow (vph)	0	698	764	107	890	604
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		15.6	22.8	22.8	15.6	48.2
Effective Green, g (s)		16.5	23.7	23.7	16.5	48.2
Actuated g/C Ratio		0.34	0.49	0.49	0.34	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		963	907	756	1175	1881
v/s Ratio Prot		0.25	c0.41		c0.26	0.32
v/s Ratio Perm				0.07		
v/c Ratio		0.72	0.84	0.14	0.76	0.32
Uniform Delay, d1		13.9	10.6	6.7	14.1	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.1	7.3	0.1	3.2	0.5
Delay (s)		17.0	18.0	6.8	17.3	0.5
Level of Service		B	B	A	B	A
Approach Delay (s)	17.0		16.4			10.5
Approach LOS	B		B			B

Intersection Summary

HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Existing + Project PM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	5	↔	↔	↔	6	↔	↔
Traffic Volume (vph)	26	714	240	391	577	5	264	22	562	6	10	7
Future Volume (vph)	26	714	240	391	577	5	264	22	562	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.98	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	1.00	0.85	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.96	1.00	0.98	1.00	0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570	1715	1732	1590	1727	1580	1727	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.96	1.00	0.98	1.00	0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570	1715	1732	1590	1727	1580	1727	1580
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)	28	776	261	425	627	5	287	24	611	7	11	8
RTOR Reduction (vph)	0	0	170	0	1	0	0	0	80	0	0	8
Lane Group Flow (vph)	28	776	91	425	631	0	155	156	531	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Split	NA	pm+ov	Split	NA	Perm	
Protected Phases	1	6		5	2	4	4	5	8	8		
Permitted Phases			6					4				8
Actuated Green, G (s)	1.6	20.5	20.5	10.8	29.7	9.0	9.0	19.8		0.9	0.9	0.9
Effective Green, g (s)	2.1	21.5	21.5	11.4	30.7	10.8	10.8	21.0		1.9	1.9	1.9
Actuated g/C Ratio	0.03	0.35	0.35	0.19	0.50	0.18	0.18	0.34		0.03	0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0	5.8	5.8	4.6		5.0	5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3	1.0	1.0	1.0		1.0	1.0	1.0
Lane Grp Cap (vph)	61	1235	563	641	1779	300	303	542		53	48	
v/s Ratio Prot	0.02	c0.22		0.12	0.18	0.09	0.09	c0.18		c0.01		
v/s Ratio Perm			0.06					0.15				0.00
v/c Ratio	0.46	0.63	0.16	0.66	0.35	0.52	0.51	0.98		0.34	0.01	
Uniform Delay, d1	29.2	16.7	13.8	23.3	9.4	23.0	23.0	20.1		29.2	28.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.7	0.0	2.0	0.0	0.6	0.6	32.8		1.4	0.0	
Delay (s)	31.2	17.4	13.9	25.3	9.5	23.7	23.6	52.8		30.6	28.9	
Level of Service	C	B	B	C	A	C	C	D		C	C	
Approach Delay (s)		16.9			15.8			43.0			30.1	
Approach LOS		B			B			D			C	

Intersection Summary

HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	16.1
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary

Existing + Project PM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	5	↔	↔	↔	6	↔	↔
Traffic Volume (veh/h)	26	714	240	391	577	5	264	22	562	6	10	7
Future Volume (veh/h)	26	714	240	391	577	5	264	22	562	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1881	1900	1881	1900	1760
Adj Flow Rate, veh/h	28	776	261	425	627	5	304	0	611	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	53	922	420	524	1385	11	1314	0	797	19	30	46
Arrive On Green	0.03	0.26	0.26	0.15	0.38	0.37	0.36	0.00	0.35	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3634	29	3619	0	1598	671	1055	1589
Grp Volume(v), veh/h	28	776	261	425	308	324	304	0	611	18	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1876	1810	0	1598	1727	0	1589
Q Serve(g_s), s	1.2	16.9	11.6	9.6	10.5	10.5	4.7	0.0	25.2	0.8	0.0	0.4
Cycle Q Clear(g_c), s	1.2	16.9	11.6	9.6	10.5	10.5	4.7	0.0	25.2	0.8	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	53	922	420	524	681	715	1314	0	797	50	0	46
V/C Ratio(X)	0.53	0.84	0.62	0.81	0.45	0.45	0.23	0.00	0.77	0.36	0.00	0.18
Avail Cap(c_a), veh/h	125	1010	461	556	681	715	1505	0	882	85	0	78
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.9	28.4	26.5	33.4	18.8	18.8	18.0	0.0	16.5	38.7	0.0	38.5
Incr Delay (d2), s/veh	3.0	5.5	1.4	7.7	0.2	0.2	0.0	0.0	3.1	1.6	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	8.9	5.3	5.2	5.2	5.4	2.4	0.0	11.7	0.4	0.0	0.2
LnGrp Delay(d),s/veh	41.9	34.0	27.9	41.0	19.0	19.0	18.0	0.0	19.6	40.4	0.0	39.2
LnGrp LOS	D	C	C	D	B	B	B		B	D		D
Approach Vol, veh/h		1065			1057			915			26	
Approach Delay, s/veh		32.7			27.9			19.1			40.0	
Approach LOS		C			C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.5	35.0		33.5	16.3	25.2		6.3				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	22.2		3.0				
Max Q Clear Time (g_c+I1), s	3.2	12.5		27.2	11.6	18.9		2.8				
Green Ext Time (p_c), s	0.0	3.7		0.4	0.0	1.3		0.0				

Intersection Summary

HCM 2010 Ctrl Delay	27.0
HCM 2010 LOS	C

Notes

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	112	377	69	12	151	417	322	77	424	196	218	307
Future Volume (vph)	112	377	69	12	151	417	322	77	424	196	218	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3469			1746	1863	1560	1805	1827	1556	3502	1831
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3469			656	1863	1560	1805	1827	1556	3502	1831
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	115	389	71	12	156	430	332	79	437	202	225	316
RTOR Reduction (vph)	0	18	0	0	0	0	230	0	0	142	0	8
Lane Group Flow (vph)	115	442	0	0	168	430	102	79	437	60	225	371
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.4	22.0			11.5	25.1	25.1	6.1	24.1	24.1	9.4	27.4
Effective Green, g (s)	8.1	22.2			11.2	25.3	25.3	5.8	25.0	25.0	9.1	28.3
Actuated g/C Ratio	0.10	0.27			0.13	0.30	0.30	0.07	0.30	0.30	0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	169	922			87	564	472	125	547	465	381	620
v/s Ratio Prot	0.07	0.13				c0.23		0.04	c0.24		c0.06	c0.20
v/s Ratio Perm					c0.26		0.07			0.04		
v/c Ratio	0.68	0.48			1.93	0.76	0.22	0.63	0.80	0.13	0.59	0.60
Uniform Delay, d1	36.4	25.8			36.1	26.4	21.7	37.8	26.9	21.3	35.4	22.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.7	0.5			458.2	6.2	0.3	10.0	8.2	0.2	2.4	1.7
Delay (s)	47.2	26.3			494.4	32.6	22.0	47.8	35.2	21.5	37.9	24.5
Level of Service	D	C			F	C	C	D	D	C	D	C
Approach Delay (s)		30.4				112.2			32.7			29.5
Approach LOS		C				F			C			C
Intersection Summary												
HCM 2000 Control Delay		57.7				HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		83.5				Sum of lost time (s)			16.0			
Intersection Capacity Utilization		71.8%				ICU Level of Service			C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	0.97
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.98
Flt Protected	0.95
Satd. Flow (prot)	3502
Flt Permitted	0.95
Satd. Flow (perm)	1831
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	Prot
Protected Phases	7
Permitted Phases	4
Actuated Green, G (s)	24.1
Effective Green, g (s)	24.1
Actuated g/C Ratio	0.11
Clearance Time (s)	3.7
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	381
v/s Ratio Prot	c0.06
v/s Ratio Perm	
v/c Ratio	0.59
Uniform Delay, d1	21.3
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	21.5
Level of Service	C
Approach Delay (s)	29.5
Approach LOS	C
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing + Project PM.syn
12/01/2017

	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Movement												
Lane Configurations		↔	↕	↔	↔	↕	↕	↕	↕	↔	↔	↕
Traffic Volume (vph)	71	128	345	113	120	377	18	315	9	130	20	11
Future Volume (vph)	71	128	345	113	120	377	18	315	9	130	20	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.96		1.00	0.99		1.00	0.86			0.88
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1782	3411		1770	3547		3467	1574			3089
Flt Permitted		0.50	1.00		0.95	1.00		0.95	1.00			0.90
Satd. Flow (perm)		945	3411		1770	3547		3467	1574			2790
Peak-hour factor, PHF	0.93	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92
Adj. Flow (vph)	76	139	371	122	129	405	20	339	10	140	22	12
RTOR Reduction (vph)	0	0	35	0	0	3	0	0	98	0	0	133
Lane Group Flow (vph)	0	215	458	0	129	422	0	339	52	0	0	48
Confl. Peds. (#/hr)				3	5			3		5		
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	2%	1%	2%	2%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2										
Actuated Green, G (s)		30.7	30.7		10.2	44.4		11.6	22.6			7.0
Effective Green, g (s)		30.7	30.7		9.7	44.4		11.6	22.6			7.0
Actuated g/C Ratio		0.41	0.41		0.13	0.59		0.15	0.30			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		386	1396		228	2099		536	474			260
v/s Ratio Prot			0.13		c0.07	0.12		c0.10	0.03			
v/s Ratio Perm		c0.23										c0.02
v/c Ratio		0.56	0.33		0.57	0.20		0.63	0.11			0.18
Uniform Delay, d1		16.9	15.1		30.7	7.1		29.7	18.9			31.4
Progression Factor		1.00	1.00		0.91	1.31		1.00	1.00			1.00
Incremental Delay, d2		5.7	0.6		1.9	0.2		1.8	0.1			0.3
Delay (s)		22.6	15.7		29.7	9.5		31.5	19.0			31.7
Level of Service		C	B		C	A		C	B			C
Approach Delay (s)			17.8			14.2			27.7			31.7
Approach LOS			B			B			C			C
Intersection Summary												
HCM 2000 Control Delay			20.6									
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			75.0									
Intersection Capacity Utilization			50.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing + Project PM.syn
12/01/2017

	SBR
Movement	
Lane Configurations	↕
Traffic Volume (vph)	135
Future Volume (vph)	135
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	147
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	437	58	106	412	0	103	0	92	0	0	0
Future Volume (vph)	0	437	58	106	412	0	103	0	92	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	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)		3462		1752	3574			1744	1542			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3462		1752	3574			1390	1542			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	491	65	119	463	0	116	0	103	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	90	0	0	0
Lane Group Flow (vph)	0	548	0	119	463	0	0	116	13	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases						8		8		4		4
Actuated Green, G (s)		46.4		7.6	57.5			9.5	9.5			
Effective Green, g (s)		46.4		7.1	57.5			9.5	9.5			
Actuated g/C Ratio		0.62		0.09	0.77			0.13	0.13			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2141		165	2740			176	195			
v/s Ratio Prot		c0.16		c0.07	0.13							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.26		0.72	0.17			0.66	0.07			
Uniform Delay, d1		6.5		33.0	2.3			31.2	28.8			
Progression Factor		0.72		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		12.3	0.1			6.6	0.1			
Delay (s)		5.0		45.3	2.5			37.8	28.9			
Level of Service		A		D	A			D	C			
Approach Delay (s)		5.0		11.2				33.6		0.0		
Approach LOS		A		B				C		A		
Intersection Summary												
HCM 2000 Control Delay		12.3				HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio		0.37										
Actuated Cycle Length (s)		75.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		39.9%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (veh/h)	0	437	58	106	412	0	103	0	92	0	0	0
Future Volume (veh/h)	0	437	58	106	412	0	103	0	92	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	491	65	119	463	0	116	0	103	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	2038	269	139	2793	0	253	0	175	0	213	0
Arrive On Green	0.00	0.86	0.86	0.08	0.78	0.00	0.11	0.00	0.11	0.00	0.00	0.00
Sat Flow, veh/h	0	3236	414	1757	3668	0	1404	0	1558	0	1900	0
Grp Volume(V), veh/h	0	276	280	119	463	0	116	0	103	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1787	1757	1787	0	1404	0	1558	0	1900	0
Q Serve(g_s), s	0.0	2.0	2.0	5.0	2.4	0.0	6.0	0.0	4.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.0	2.0	5.0	2.4	0.0	6.0	0.0	4.7	0.0	0.0	0.0
Prop In Lane	0.00		0.23	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1148	1159	139	2793	0	253	0	175	0	213	0
V/C Ratio(X)	0.00	0.24	0.24	0.85	0.17	0.00	0.46	0.00	0.59	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1148	1159	328	2793	0	508	0	457	0	557	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.9	2.0	34.1	2.1	0.0	32.2	0.0	31.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	5.5	0.1	0.0	0.5	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.1	1.1	2.7	1.2	0.0	2.4	0.0	2.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	2.4	2.4	39.6	2.2	0.0	32.7	0.0	32.8	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		556			582			219			0	
Approach Delay, s/veh		2.4			9.8			32.8			0.0	
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	52.6		12.4		62.6		12.4				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	14.5	27.0		22.0		45.0		22.0				
Max Q Clear Time (g_c+I1), s	7.0	4.0		0.0		4.4		8.0				
Green Ext Time (p_c), s	0.0	8.2		0.0		9.8		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay					10.5							
HCM 2010 LOS					B							

Synchro 9 Report

Synchro 9 Report

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Existing + Project PM.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	16								
Intersection LOS	C								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↔↔	↑		↑	↔		↔	↑
Traffic Vol, veh/h	0	409	24	0	27	14	6	23	401
Future Vol, veh/h	0	409	24	0	27	14	6	23	401
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	460	27	0	30	16	7	26	451
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB			SB		
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB						WB		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	14			10.1			18.5		
HCM LOS	B			B			C		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	205	205	24	27	14	29	401		
LT Vol	205	205	0	0	0	29	0		
Through Vol	0	0	24	27	0	0	0		
RT Vol	0	0	0	0	14	0	401		
Lane Flow Rate	230	230	27	30	16	33	451		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.427	0.425	0.033	0.061	0.028	0.06	0.682		
Departure Headway (Hd)	6.694	6.66	4.43	7.214	6.496	6.647	5.446		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	538	540	806	495	549	539	662		
Service Time	4.432	4.397	2.167	4.977	4.258	4.387	3.187		
HCM Lane V/C Ratio	0.428	0.426	0.033	0.061	0.029	0.061	0.681		
HCM Control Delay	14.4	14.3	7.3	10.4	9.4	9.8	19.1		
HCM Lane LOS	B	B	A	B	A	A	C		
HCM 95th-tile Q	2.1	2.1	0.1	0.2	0.1	0.2	5.3		

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Existing + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔↔		↔	↔↔	↔	
Traffic Volume (vph)	219	0	155	62	20	26	169	1377	4	17	1271	205	
Future Volume (vph)	219	0	155	62	20	26	169	1377	4	17	1271	205	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1698	1463		1715	1662		1805	3572		1805	3574	1583	
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1698	1463		1715	1662		1805	3572		1805	3574	1583	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	226	0	160	64	21	27	174	1420	4	18	1310	211	
RTOR Reduction (vph)	0	132	0	0	25	0	0	0	0	0	0	117	
Lane Group Flow (vph)	203	51	0	57	30	0	174	1424	0	18	1310	94	
Confl. Peds. (#/hr)			7	7			7		7				
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%	
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm	
Protected Phases	2	2		6	6		3	8		7	4		
Permitted Phases												4	
Actuated Green, G (s)	13.7	13.7		5.3	5.3		8.4	41.1		1.4	34.1	34.1	
Effective Green, g (s)	13.9	13.9		5.5	5.5		8.1	42.0		1.1	35.0	35.0	
Actuated g/C Ratio	0.18	0.18		0.07	0.07		0.10	0.54		0.01	0.45	0.45	
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9	
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5	
Lane Grp Cap (vph)	300	259		120	116		186	1911		25	1593	705	
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.10	0.40		0.01	c0.37		
v/s Ratio Perm												0.06	
v/c Ratio	0.68	0.20		0.47	0.26		0.94	0.75		0.72	0.82	0.13	
Uniform Delay, d1	30.2	27.5		35.1	34.6		34.9	14.1		38.5	19.0	12.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	6.2	0.4		4.0	1.6		47.4	1.8		67.0	3.9	0.1	
Delay (s)	36.4	28.0		39.1	36.2		82.3	15.9		105.5	22.9	13.0	
Level of Service	D	C		D	D		F	B		F	C	B	
Approach Delay (s)		32.4			37.7			23.2			22.5		
Approach LOS		C			D			C			C		
Intersection Summary													
HCM 2000 Control Delay	24.3		HCM 2000 Level of Service					C					
HCM 2000 Volume to Capacity ratio	0.77												
Actuated Cycle Length (s)	78.5		Sum of lost time (s)					16.0					
Intersection Capacity Utilization	75.2%		ICU Level of Service					D					
Analysis Period (min)	15												
c Critical Lane Group													

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Existing + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	219	0	155	62	20	26	169	1377	4	17	1271	205
Future Volume (veh/h)	219	0	155	62	20	26	169	1377	4	17	1271	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s,veh/h/ln)	1881	1818	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	193	46	160	56	32	27	174	1420	4	18	1310	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	309	61	212	162	84	71	199	1802	5	46	1459	646
Arrive On Green	0.17	0.17	0.17	0.09	0.09	0.09	0.11	0.49	0.48	0.03	0.41	0.00
Sat Flow, veh/h	1792	354	1230	1810	943	796	1810	3656	10	1810	3574	1583
Grp Volume(v), veh/h	193	0	206	56	0	59	174	694	730	18	1310	0
Grp Sat Flow(s,veh/h/ln)	1792	0	1583	1810	0	1739	1810	1787	1879	1810	1787	1583
Q Serve(g_s), s	7.3	0.0	9.0	2.1	0.0	2.3	6.9	23.4	23.4	0.7	24.9	0.0
Cycle Q Clear(g_c), s	7.3	0.0	9.0	2.1	0.0	2.3	6.9	23.4	23.4	0.7	24.9	0.0
Prop In Lane	1.00		0.78	1.00		0.46	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	309	0	273	162	0	156	199	881	926	46	1459	646
V/C Ratio(X)	0.62	0.00	0.75	0.35	0.00	0.38	0.88	0.79	0.79	0.39	0.90	0.00
Avail Cap(c_a), veh/h	413	0	365	179	0	172	199	881	926	174	1571	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	27.9	0.0	28.7	31.1	0.0	31.3	31.9	15.3	15.3	34.9	20.1	0.0
Incr Delay (d2), s/veh	2.5	0.0	6.8	1.8	0.0	2.2	32.4	5.3	5.0	5.4	7.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	4.5	1.1	0.0	1.2	5.2	12.7	13.3	0.4	13.7	0.0
LnGrp Delay(d),s/veh	30.4	0.0	35.5	32.9	0.0	33.4	64.3	20.6	20.3	40.4	27.5	0.0
LnGrp LOS	C		D	C		C	E	C	C	D	C	
Approach Vol, veh/h		399			115			1598			1328	
Approach Delay, s/veh		33.0			33.2			25.2			27.7	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		16.6	12.0	33.7		10.5	5.8	39.9				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 17	8.3	31.1		7.0	7.3	32.1				
Max Q Clear Time (g_c+I1), s		11.0	8.9	26.9		4.3	2.7	25.4				
Green Ext Time (p_c), s		1.1	0.0	1.9		0.1	0.0	6.5				

Intersection Summary

HCM 2010 Ctrl Delay	27.3
HCM 2010 LOS	C

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Existing + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	869	18	25	18	6	54	10	1645	19	55	1435	493
Future Volume (vph)	869	18	25	18	6	54	10	1645	19	55	1435	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1732		1715	1761	1524	1805	3529		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1732		1715	1761	1524	1805	3529		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	26	18	6	55	10	1679	19	56	1464	503
RTOR Reduction (vph)	0	19	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	25	0	12	12	3	10	1698	0	56	1464	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	38.6	38.6		6.6	6.6	6.6	1.5	71.6		6.2	76.8	140.9
Effective Green, g (s)	39.2	39.2		6.8	6.8	6.8	1.2	72.5		6.4	77.7	140.9
Actuated g/C Ratio	0.28	0.28		0.05	0.05	0.05	0.01	0.51		0.05	0.55	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	964	481		82	84	73	15	1815		81	1970	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	c0.48		c0.03	0.41	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.92	0.05		0.15	0.14	0.04	0.67	0.94		0.69	0.74	0.31
Uniform Delay, d1	49.3	37.2		64.3	64.3	63.9	69.7	32.0		66.3	24.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.0	0.1		1.4	1.4	0.4	75.9	9.9		22.5	1.9	0.5
Delay (s)	63.3	37.3		65.7	65.6	64.3	145.5	41.9		88.7	25.9	0.5
Level of Service	E	D		E	E	E	F	D		F	C	A
Approach Delay (s)		62.1			64.7			42.5			21.3	
Approach LOS		E			E			D			C	

Intersection Summary

HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Existing + Project PM.syn
12/01/2017

Intersection												
Int Delay, s/veh 4.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	144	1	12	4	0	4	6	421	0	1	412	82
Future Vol, veh/h	144	1	12	4	0	4	6	421	0	1	412	82
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	158	1	13	4	0	4	7	463	0	1	453	90

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	761	989	287	718	1034	244	551	0	0	468	0	0
Stage 1	508	508	-	481	481	-	-	-	-	-	-	-
Stage 2	253	481	-	237	553	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	295	249	692	320	234	763	1029	-	-	1104	-	-
Stage 1	516	542	-	540	557	-	-	-	-	-	-	-
Stage 2	729	557	-	751	518	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	287	244	683	307	229	755	1022	-	-	1097	-	-
Mov Cap-2 Maneuver	287	244	-	307	229	-	-	-	-	-	-	-
Stage 1	508	538	-	533	550	-	-	-	-	-	-	-
Stage 2	713	550	-	729	514	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.1	13.4	0.1	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1022	-	-	300	437	1097	-	-
HCM Lane V/C Ratio	0.006	-	-	0.575	0.02	0.001	-	-
HCM Control Delay (s)	8.5	0	-	32.1	13.4	8.3	0	-
HCM Lane LOS	A	A	-	D	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	3.4	0.1	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Existing + Project PM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕		↕	↕		↕			↕		↕
Traffic Vol, veh/h	108	423	16	6	393	29	10	6	4	6	3	115
Future Vol, veh/h	108	423	16	6	393	29	10	6	4	6	3	115
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	115	450	17	6	418	31	11	6	4	6	3	122

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	453	0	0	484	0	0	941	1171	268	925	1164	241
Stage 1	-	-	-	-	-	-	705	705	-	450	450	-
Stage 2	-	-	-	-	-	-	236	466	-	475	714	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1111	-	-	1089	-	-	221	194	736	227	196	760
Stage 1	-	-	-	-	-	-	398	442	-	564	575	-
Stage 2	-	-	-	-	-	-	752	566	-	545	438	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1099	-	-	1074	-	-	163	170	715	197	171	749
Mov Cap-2 Maneuver	-	-	-	-	-	-	163	170	-	197	171	-
Stage 1	-	-	-	-	-	-	351	390	-	503	570	-
Stage 2	-	-	-	-	-	-	615	561	-	470	387	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.1	25.6	12.4
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	196	1099	-	-	1074	-	-	615
HCM Lane V/C Ratio	0.109	0.105	-	-	0.006	-	-	0.214
HCM Control Delay (s)	25.6	8.7	-	-	8.4	-	-	12.4
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.3	-	-	0	-	-	0.8

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing + Project PM.syn
12/01/2017

	→	↖	↙	←	↘	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (vph)	888	111	10	540	138	30
Future Volume (vph)	888	111	10	540	138	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1752	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1752	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	955	119	11	581	148	32
RTOR Reduction (vph)	0	48	0	0	11	0
Lane Group Flow (vph)	955	71	11	581	169	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	38.5	38.5	0.6	43.3	10.5	
Effective Green, g (s)	38.5	38.5	0.6	43.3	10.5	
Actuated g/C Ratio	0.60	0.60	0.01	0.67	0.16	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1119	931	16	1246	284	
v/s Ratio Prot	c0.51		0.01	c0.31	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.85	0.08	0.69	0.47	0.60	
Uniform Delay, d1	10.8	5.6	32.0	5.1	25.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	0.0	67.5	0.3	2.2	
Delay (s)	17.4	5.6	99.5	5.5	27.4	
Level of Service	B	A	F	A	C	
Approach Delay (s)	16.1			7.2	27.4	
Approach LOS	B			A	C	

Intersection Summary					
HCM 2000 Control Delay	14.4		HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.81				
Actuated Cycle Length (s)	64.7		Sum of lost time (s)	15.1	
Intersection Capacity Utilization	65.3%		ICU Level of Service	C	
Analysis Period (min)	15				
c Critical Lane Group					

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing + Project PM.syn
12/01/2017

	→	↖	↙	←	↘	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (veh/h)	888	111	10	540	138	30
Future Volume (veh/h)	888	111	10	540	138	30
Number	2	12	1	6	3	18
Initial Q (Ob), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1869	1900
Adj Flow Rate, veh/h	955	119	11	581	148	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	0	2	0	0
Cap, veh/h	1165	970	20	1306	206	0
Arrive On Green	0.62	0.62	0.01	0.70	0.12	0.00
Sat Flow, veh/h	1881	1566	1810	1863	1769	0
Grp Volume(V), veh/h	955	119	11	581	149	0
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1781	0
Q Serve(g_s), s	23.4	1.9	0.4	8.1	4.8	0.0
Cycle Q Clear(g_c), s	23.4	1.9	0.4	8.1	4.8	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1165	970	20	1306	207	0
V/C Ratio(X)	0.82	0.12	0.54	0.44	0.72	0.00
Avail Cap(c_a), veh/h	1351	1125	121	1594	537	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.8	4.7	29.4	3.9	25.4	0.0
Incr Delay (d2), s/veh	3.8	0.1	8.2	0.3	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.2	0.8	0.2	4.1	2.5	0.0
LnGrp Delay(d),s/veh	12.6	4.7	37.6	4.2	27.2	0.0
LnGrp LOS	B	A	D	A	C	
Approach Vol, veh/h	1074			592	149	
Approach Delay, s/veh	11.7			4.8	27.2	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	4.9	43.4				48.3		11.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	42.9				51.1		18.0
Max Q Clear Time (g_c+I1), s	2.4	25.4				10.1		6.8
Green Ext Time (p_c), s	0.0	11.6				19.2		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.7
HCM 2010 LOS	B

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Existing + Project PM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.3												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔		↔	↔
Traffic Vol, veh/h	3	878	27	16	499	9	27	1	28	8	2	12
Future Vol, veh/h	3	878	27	16	499	9	27	1	28	8	2	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	3	987	30	18	561	10	30	1	31	9	2	13

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	571	0	0	987
Stage 1	-	-	-	993
Stage 2	-	-	-	603
Critical Hdwy	4.1	-	-	4.1
Critical Hdwy Stg 1	-	-	-	6.1
Critical Hdwy Stg 2	-	-	-	6.1
Follow-up Hdwy	2.2	-	-	2.2
Pot Cap-1 Maneuver	1012	-	-	708
Stage 1	-	-	-	298
Stage 2	-	-	-	489
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1012	-	-	708
Mov Cap-2 Maneuver	-	-	-	82
Stage 1	-	-	-	297
Stage 2	-	-	-	462

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	45.5	32.5
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	83	303	1012	-	-	708	-	-	80	528
HCM Lane V/C Ratio	0.379	0.104	0.003	-	-	0.025	-	-	0.14	0.026
HCM Control Delay (s)	72.7	18.3	8.6	-	-	10.2	-	-	57.2	12
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	1.5	0.3	0	-	-	0.1	-	-	0.5	0.1

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Existing + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 0.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	39	1	7	658	489	40
Future Vol, veh/h	39	1	7	658	489	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	-	0
Grade, %	0	-	-	0	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	41	1	7	693	515	42

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1222	515	515
Stage 1	515	-	-
Stage 2	707	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	200	564	1061
Stage 1	604	-	-
Stage 2	493	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	198	564	1061
Mov Cap-2 Maneuver	198	-	-
Stage 1	604	-	-
Stage 2	488	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.6	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1061	-	201	-	-
HCM Lane V/C Ratio	0.007	-	0.209	-	-
HCM Control Delay (s)	8.4	0	27.6	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Existing + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	27	58	444	43	30	476
Future Vol, veh/h	27	58	444	43	30	476
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	28	61	467	45	32	501

Major/Minor	Minor1	Major1	Major2	Minor2	Major2
Conflicting Flow All	1066	501	0	0	519
Stage 1	496	-	-	-	-
Stage 2	570	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	248	574	-	-	1057
Stage 1	616	-	-	-	-
Stage 2	570	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	235	569	-	-	1053
Mov Cap-2 Maneuver	235	-	-	-	-
Stage 1	613	-	-	-	-
Stage 2	543	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	392	1053	-
HCM Lane V/C Ratio	-	-	0.228	0.03	-
HCM Control Delay (s)	-	-	16.9	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Existing + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	14	121	131	385	347	28
Future Vol, veh/h	14	121	131	385	347	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	133	144	423	381	31

Major/Minor	Minor2	Major1	Major2	Minor2	Major2
Conflicting Flow All	1100	389	385	0	0
Stage 1	385	-	-	-	-
Stage 2	715	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-
Pot Cap-1 Maneuver	237	661	1185	-	-
Stage 1	692	-	-	-	-
Stage 2	488	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	207	657	1181	-	-
Mov Cap-2 Maneuver	207	-	-	-	-
Stage 1	690	-	-	-	-
Stage 2	427	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1181	-	536	-	-
HCM Lane V/C Ratio	0.122	-	0.277	-	-
HCM Control Delay (s)	8.5	-	14.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Existing + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	27	136	109	290	233	17
Future Vol, veh/h	27	136	109	290	233	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	145	116	309	248	18
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	807	267	271	0	-	0
Stage 1	262	-	-	-	-	-
Stage 2	545	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	354	772	1298	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	585	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	320	766	1293	-	-	-
Mov Cap-2 Maneuver	320	-	-	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	530	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	13		2.2		0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1293	-	622	-	-	-
HCM Lane V/C Ratio	0.09	-	0.279	-	-	-
HCM Control Delay (s)	8.1	-	13	-	-	-
HCM Lane LOS	A	-	B	-	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-	-

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing + Project PM.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	9.8												
Intersection LOS	A												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Lane Configurations			↕				↕				↕		
Traffic Vol, veh/h	0	2	1	121	0	3	0	0	0	138	169	3	
Future Vol, veh/h	0	2	1	121	0	3	0	0	0	138	169	3	
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0	
Mvmt Flow	0	2	1	133	0	3	0	0	0	152	186	3	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach	EB				WB				NB				
Opposing Approach	WB				EB				SB				
Opposing Lanes	1				1				1				
Conflicting Approach Left	SB				NB				EB				
Conflicting Lanes Left	1				1				1				
Conflicting Approach Right	NB				SB				WB				
Conflicting Lanes Right	1				1				1				
HCM Control Delay	8.3				8.5				10.8				
HCM LOS	A				A				B				
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	45%	2%	100%	1%									
Vol Thru, %	55%	1%	0%	99%									
Vol Right, %	1%	98%	0%	0%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	310	124	3	132									
LT Vol	138	2	3	1									
Through Vol	169	1	0	131									
RT Vol	3	121	0	0									
Lane Flow Rate	341	136	3	145									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0.424	0.167	0.005	0.185									
Departure Headway (Hd)	4.479	4.423	5.39	4.591									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	804	809	662	780									
Service Time	2.505	2.457	3.438	2.623									
HCM Lane V/C Ratio	0.424	0.168	0.005	0.186									
HCM Control Delay	10.8	8.3	8.5	8.7									
HCM Lane LOS	B	A	A	A									
HCM 95th-tile Q	2.1	0.6	0	0.7									

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing + Project PM.syn
12/01/2017

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	131	0
Future Vol, veh/h	0	1	131	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	144	0
Number of Lanes	0	0	1	0
Approach		SB		
Opposing Approach	NB			
Opposing Lanes	1			
Conflicting Approach Left	WB			
Conflicting Lanes Left	1			
Conflicting Approach Right	EB			
Conflicting Lanes Right	1			
HCM Control Delay	8.7			
HCM LOS	A			

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Existing + Project Saturday.syn
12/01/2017

	↙	↘	↑	↗	↖	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗↘	↑	↗	↖↗	↑
Traffic Volume (vph)	0	802	742	68	820	795
Future Volume (vph)	0	802	742	68	820	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Friction		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	827	765	70	845	820
RTOR Reduction (vph)	0	181	0	14	0	0
Lane Group Flow (vph)	0	646	765	56	845	820
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		13.2	20.3	20.3	13.2	43.3
Effective Green, g (s)		14.1	21.2	21.2	14.1	43.3
Actuated g/C Ratio		0.33	0.49	0.49	0.33	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		925	920	790	1128	1881
v/s Ratio Prot		0.23	c0.41		c0.24	0.44
v/s Ratio Perm				0.03		
v/c Ratio		0.70	0.83	0.07	0.75	0.44
Uniform Delay, d1		12.7	9.5	5.8	13.0	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7	6.6	0.0	3.1	0.7
Delay (s)		15.4	16.2	5.9	16.2	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	15.4		15.3			8.6
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	43.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis Existing + Project Saturday.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (vph)	25	603	260	449	576	3	211	17	425	2	17	14
Future Volume (vph)	25	603	260	449	576	3	211	17	425	2	17	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.96	1.00	1.00	1.00	1.00	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607	1698	1717	1575	1891	1891	1615	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.96	1.00	1.00	1.00	1.00	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607	1698	1717	1575	1891	1891	1615	1615
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)	27	641	277	478	613	3	224	18	452	2	18	15
RTOR Reduction (vph)	0	0	188	0	1	0	0	0	102	0	0	15
Lane Group Flow (vph)	27	641	89	478	615	0	121	121	350	0	20	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.6	17.9	17.9	11.7	28.0		7.8	7.8	19.5		0.9	0.9
Effective Green, g (s)	2.1	18.9	18.9	12.3	29.0		9.6	9.6	20.7		1.9	1.9
Actuated g/C Ratio	0.04	0.32	0.32	0.21	0.49		0.16	0.16	0.35		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	64	1150	512	726	1781		277	280	555		61	52
v/s Ratio Prot	0.01	c0.18		c0.14	0.17		0.07	0.07	c0.13		c0.01	
v/s Ratio Perm			0.06						0.09			0.00
v/c Ratio	0.42	0.56	0.17	0.66	0.35		0.44	0.43	0.63		0.33	0.01
Uniform Delay, d1	27.7	16.4	14.3	21.3	9.1		22.1	22.1	15.8		27.8	27.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	0.3	0.1	1.7	0.0		0.4	0.4	1.7		1.1	0.0
Delay (s)	29.3	16.8	14.4	22.9	9.1		22.5	22.5	17.5		28.9	27.5
Level of Service	C	B	B	C	A		C	C	B		C	C
Approach Delay (s)		16.4			15.1			19.3			28.3	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay	16.8		HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio	0.58											
Actuated Cycle Length (s)	58.7		Sum of lost time (s)				16.1					
Intersection Capacity Utilization	56.4%		ICU Level of Service				B					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary Existing + Project Saturday.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (veh/h)	25	603	260	449	576	3	211	17	425	2	17	14
Future Volume (veh/h)	25	603	260	449	576	3	211	17	425	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	641	277	478	613	3	237	0	452	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	57	891	397	606	1439	7	1047	0	704	7	63	60
Arrive On Green	0.03	0.25	0.25	0.17	0.39	0.38	0.29	0.00	0.27	0.04	0.04	0.04
Sat Flow, veh/h	1810	3574	1592	3476	3683	18	3583	0	1561	189	1701	1615
Grp Volume(v), veh/h	27	641	277	478	300	316	237	0	452	20	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1592	1738	1805	1896	1792	0	1561	1891	0	1615
Q Serve(g_s), s	1.0	10.6	10.2	8.5	7.9	7.9	3.2	0.0	14.6	0.7	0.0	0.6
Cycle Q Clear(g_c), s	1.0	10.6	10.2	8.5	7.9	7.9	3.2	0.0	14.6	0.7	0.0	0.6
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	57	891	397	606	705	741	1047	0	704	70	0	60
V/C Ratio(X)	0.47	0.72	0.70	0.79	0.43	0.43	0.23	0.00	0.64	0.29	0.00	0.25
Avail Cap(c_a), veh/h	154	1170	521	805	853	896	1870	0	1062	117	0	100
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.8	22.2	22.1	25.6	14.4	14.4	17.4	0.0	13.9	30.4	0.0	30.3
Incr Delay (d2), s/veh	2.3	0.9	1.4	2.7	0.2	0.1	0.0	0.0	0.4	0.8	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.4	4.6	4.3	4.0	4.2	1.6	0.0	6.3	0.4	0.0	0.3
LnGrp Delay(d),s/veh	33.1	23.1	23.5	28.3	14.6	14.6	17.4	0.0	14.2	31.2	0.0	31.1
LnGrp LOS	C	C	C	C	B	B	B		B	C		C
Approach Vol, veh/h	945		1094				689		35			
Approach Delay, s/veh	23.5		20.6				15.3		31.1			
Approach LOS	C		C				B		C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	6.1	29.3	22.9		15.3	20.1	6.4					
Change Period (Y+Rc), s	* 4.6	5.0	* 5.8		* 4.6	5.0	5.0					
Max Green Setting (Gmax), s	* 5	29.6	* 32		* 14	20.2	3.0					
Max Q Clear Time (g_c+I1), s	3.0	9.9	16.6		10.5	12.6	2.7					
Green Ext Time (p_c), s	0.0	3.3	0.4		0.2	2.4	0.0					
Intersection Summary												
HCM 2010 Ctrl Delay	20.4											
HCM 2010 LOS	C											
Notes												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	131	385	69	8	197	384	321	71	359	180	304	437
Future Volume (vph)	131	385	69	8	197	384	321	71	359	180	304	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3506			1795	1881	1556	1805	1863	1590	3502	1838
Flt Permitted	0.95	1.00			0.35	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3506			669	1881	1556	1805	1863	1590	3502	1838
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	132	389	70	8	199	388	324	72	363	182	307	441
RTOR Reduction (vph)	0	17	0	0	0	0	229	0	0	128	0	5
Lane Group Flow (vph)	132	442	0	0	207	388	95	72	363	54	307	491
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.4	20.4			11.6	23.6	23.6	6.0	23.3	23.3	9.5	26.8
Effective Green, g (s)	8.1	20.6			11.3	23.8	23.8	5.7	24.2	24.2	9.2	27.7
Actuated g/C Ratio	0.10	0.25			0.14	0.29	0.29	0.07	0.30	0.30	0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	178	888			92	550	455	126	554	473	396	626
v/s Ratio Prot	0.07	0.13				c0.21		0.04	0.19		c0.09	c0.27
v/s Ratio Perm					c0.31		0.06			0.03		
v/c Ratio	0.74	0.50			2.25	0.71	0.21	0.57	0.66	0.11	0.78	0.78
Uniform Delay, d1	35.6	25.9			35.0	25.6	21.7	36.6	24.9	20.8	35.0	24.1
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.3	0.5			595.8	4.3	0.3	6.1	2.9	0.1	9.2	6.6
Delay (s)	50.9	26.4			630.8	29.9	21.9	42.7	27.8	20.9	44.2	30.7
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		31.9				162.4			27.5			35.9
Approach LOS		C				F			C			D
Intersection Summary												
HCM 2000 Control Delay		73.0										E
HCM 2000 Volume to Capacity ratio		1.00										
Actuated Cycle Length (s)		81.3				Sum of lost time (s)			16.0			
Intersection Capacity Utilization		74.1%				ICU Level of Service			D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	0.95
Satd. Flow (prot)	3502
Flt Permitted	0.95
Satd. Flow (perm)	1838
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing + Project Saturday.syn
12/01/2017

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	84	200	256	160	141	329	29	298	13	139	27	16
Future Volume (vph)	84	200	256	160	141	329	29	298	13	139	27	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			4.0
Lane Util. Factor	1.00	0.95			1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00		1.00	0.97			1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			1.00
Frt	1.00	0.94			1.00	0.99		1.00	0.86			0.88
Flt Protected	0.95	1.00			0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)	1780	3369			1787	3558		3467	1569			3087
Flt Permitted	0.53	1.00			0.95	1.00		0.95	1.00			0.90
Satd. Flow (perm)	988	3369			1787	3558		3467	1569			2782
Peak-hour factor, PHF	0.95	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	88	217	269	168	148	346	32	314	14	146	29	17
RTOR Reduction (vph)	0	0	88	0	0	5	0	0	107	0	0	191
Lane Group Flow (vph)	0	305	349	0	148	373	0	314	53	0	0	64
Confl. Peds. (#/hr)				5	9			5		9		
Confl. Bikes (#/hr)				11						11		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	2%	1%	2%	1%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2										
Actuated Green, G (s)		42.9	42.9		11.5	57.9		12.4	24.1			7.7
Effective Green, g (s)		42.9	42.9		11.0	57.9		12.4	24.1			7.7
Actuated g/C Ratio		0.48	0.48		0.12	0.64		0.14	0.27			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)	470	1605			218	2288		477	420			238
v/s Ratio Prot			0.10		c0.08	0.10		c0.09	0.03			
v/s Ratio Perm	c0.31											c0.02
v/c Ratio	0.65	0.22			0.68	0.16		0.66	0.13			0.27
Uniform Delay, d1	17.8	13.8			37.8	6.4		36.8	25.0			38.5
Progression Factor	1.00	1.00			0.98	1.42		1.00	1.00			1.00
Incremental Delay, d2	6.8	0.3			6.4	0.2		2.5	0.1			0.6
Delay (s)	24.6	14.1			43.4	9.3		39.3	25.1			39.1
Level of Service		C	B		D	A		D	C			D
Approach Delay (s)			18.4			18.9			34.5			39.1
Approach LOS			B			B			C			D
Intersection Summary												
HCM 2000 Control Delay			25.0									C
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			90.0						16.0			
Intersection Capacity Utilization			57.5%									B
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Existing + Project Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	192
Future Volume (vph)	192
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	209
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	380	42	109	421	0	78	0	69	0	0	0
Future Volume (vph)	0	380	42	109	421	0	78	0	69	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0				4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.95			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3545		1805	3574			1794	1525			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3545		1805	3574			1430	1525			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	418	46	120	463	0	86	0	76	0	0	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	69	0	0	0
Lane Group Flow (vph)	0	459	0	120	463	0	86	7	0	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		60.3		9.4	73.2			8.8	8.8			
Effective Green, g (s)		60.3		8.9	73.2			8.8	8.8			
Actuated g/C Ratio		0.67		0.10	0.81			0.10	0.10			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2375		178	2906			139	149			
v/s Ratio Prot		c0.13		c0.07	0.13							
v/s Ratio Perm								c0.06	0.00			
v/c Ratio		0.19		0.67	0.16			0.62	0.05			
Uniform Delay, d1		5.6		39.2	1.8			39.0	36.8			
Progression Factor		0.95		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.7	0.1			5.7	0.1			
Delay (s)		5.6		46.8	1.9			44.6	36.9			
Level of Service		A		D	A			D	D			
Approach Delay (s)		5.6			11.2			41.0		0.0		
Approach LOS		A			B			D		A		
Intersection Summary												
HCM 2000 Control Delay			13.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			32.2%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Existing + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (veh/h)	0	380	42	109	421	0	78	0	69	0	0	0
Future Volume (veh/h)	0	380	42	109	421	0	78	0	69	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	418	46	120	463	0	86	0	76	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	2308	252	141	2959	0	200	0	126	0	158	0
Arrive On Green	0.00	0.47	0.47	0.08	0.83	0.00	0.08	0.00	0.08	0.00	0.00	0.00
Sat Flow, veh/h	0	3367	358	1810	3668	0	1440	0	1515	0	1900	0
Grp Volume(V), veh/h	0	229	235	120	463	0	86	0	76	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1825	1810	1787	0	1440	0	1515	0	1900	0
Q Serve(g_s), s	0.0	6.6	6.7	5.9	2.3	0.0	5.2	0.0	4.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.6	6.7	5.9	2.3	0.0	5.2	0.0	4.4	0.0	0.0	0.0
Prop In Lane	0.00		0.20	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1273	1287	141	2959	0	200	0	126	0	158	0
V/C Ratio(X)	0.00	0.18	0.18	0.85	0.16	0.00	0.43	0.00	0.60	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1273	1287	422	2959	0	464	0	404	0	507	0
HCM Platoon Ratio	1.00	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.7	8.8	41.0	1.5	0.0	40.2	0.0	39.8	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	5.3	0.1	0.0	0.5	0.0	1.7	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.4	3.5	3.1	1.1	0.0	2.1	0.0	1.9	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	9.0	9.1	46.2	1.6	0.0	40.8	0.0	41.6	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		D		D			
Approach Vol, veh/h		464			583			162			0	
Approach Delay, s/veh		9.0			10.8			41.1			0.0	
Approach LOS		A			B			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.0	67.5		11.5		78.5		11.5				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	21.5	33.0		24.0		58.0		24.0				
Max Q Clear Time (g_c+1), s	7.9	8.7		0.0		4.3		7.2				
Green Ext Time (p_c), s	0.0	7.9		0.0		9.5		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay					14.2							
HCM 2010 LOS					B							

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Existing + Project Saturday.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	14.2								
Intersection LOS	B								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↔↔	↑		↑	↔↔		↔↔	↑
Traffic Vol, veh/h	0	308	22	0	26	11	2	19	429
Future Vol, veh/h	0	308	22	0	26	11	2	19	429
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	331	24	0	28	12	2	20	461
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB					
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB						WB		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	11.8			9.8			16.4		
HCM LOS	B			A			C		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	154	154	22	26	11	21	429		
LT Vol	154	154	0	0	0	21	0		
Through Vol	0	0	22	26	0	0	0		
RT Vol	0	0	0	0	11	0	429		
Lane Flow Rate	166	166	24	28	12	23	461		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.302	0.301	0.028	0.053	0.021	0.039	0.651		
Departure Headway (Hd)	6.566	6.549	4.321	6.825	6.266	6.28	5.08		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	548	550	827	524	570	574	715		
Service Time	4.301	4.284	2.055	4.575	4.016	3.98	2.78		
HCM Lane V/C Ratio	0.303	0.302	0.029	0.053	0.021	0.04	0.645		
HCM Control Delay	12.1	12.1	7.2	10	9.2	9.2	16.7		
HCM Lane LOS	B	B	A	A	A	A	C		
HCM 95th-tile Q	1.3	1.3	0.1	0.2	0.1	0.1	4.8		

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Existing + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔↔		↔	↔↔	↔
Traffic Volume (vph)	271	7	175	42	11	9	203	1262	7	5	1398	289
Future Volume (vph)	271	7	175	42	11	9	203	1262	7	5	1398	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Fr	1.00	0.88		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1572		1715	1683		1787	3569		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1572		1715	1683		1787	3569		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	177	42	11	9	205	1275	7	5	1412	292
RTOR Reduction (vph)	0	146	0	0	9	0	0	0	0	0	0	136
Lane Group Flow (vph)	238	74	0	31	22	0	205	1282	0	5	1412	156
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.1	15.1		3.9	3.9		12.0	51.2		1.3	40.5	40.5
Effective Green, g (s)	15.3	15.3		4.1	4.1		11.7	52.1		1.0	41.4	41.4
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.13	0.59		0.01	0.47	0.47
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	293	271		79	77		236	2101		20	1671	738
v/s Ratio Prot	c0.14	0.05		c0.02	0.01		c0.11	0.36		0.00	c0.40	
v/s Ratio Perm												0.10
v/c Ratio	0.81	0.27		0.39	0.29		0.87	0.61		0.25	0.85	0.21
Uniform Delay, d1	35.2	31.8		41.0	40.8		37.6	11.7		43.4	20.7	13.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.0	0.6		4.3	2.9		26.9	0.7		6.5	4.5	0.2
Delay (s)	51.2	32.4		45.3	43.6		64.5	12.3		49.9	25.2	14.2
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		42.2			44.5			19.5			23.4	
Approach LOS		D			D			B			C	
Intersection Summary												
HCM 2000 Control Delay	24.5			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.82											
Actuated Cycle Length (s)	88.5			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	79.6%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Existing + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	271	7	175	42	11	9	203	1262	7	5	1398	289
Future Volume (veh/h)	271	7	175	42	11	9	203	1262	7	5	1398	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1897	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	229	70	177	31	26	9	205	1275	7	5	1412	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	317	84	214	123	91	32	236	2031	11	10	1541	696
Arrive On Green	0.18	0.18	0.17	0.07	0.07	0.07	0.13	0.56	0.55	0.01	0.43	0.00
Sat Flow, veh/h	1792	477	1207	1810	1342	465	1792	3642	20	1810	3574	1615
Grp Volume(V), veh/h	229	0	247	31	0	35	205	625	657	5	1412	0
Grp Sat Flow(s),veh/h/ln	1792	0	1684	1810	0	1807	1792	1786	1876	1810	1787	1615
Q Serve(g_s), s	10.1	0.0	11.8	1.4	0.0	1.5	9.4	19.9	19.9	0.2	31.0	0.0
Cycle Q Clear(q_c), s	10.1	0.0	11.8	1.4	0.0	1.5	9.4	19.9	19.9	0.2	31.0	0.0
Prop In Lane	1.00		0.72	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	317	0	298	123	0	123	236	996	1046	10	1541	696
V/C Ratio(X)	0.72	0.00	0.83	0.25	0.00	0.28	0.87	0.63	0.63	0.49	0.92	0.00
Avail Cap(c_a), veh/h	361	0	339	156	0	156	258	996	1046	152	1628	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.4	0.0	33.2	36.9	0.0	37.0	35.5	12.6	12.6	41.4	22.3	0.0
Incr Delay (d2), s/veh	6.5	0.0	14.7	1.5	0.0	1.8	24.0	1.6	1.5	32.9	8.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.0	6.7	0.7	0.0	0.8	6.2	10.2	10.7	0.2	17.0	0.0
LnGrp Delay(d),s/veh	38.9	0.0	47.9	38.4	0.0	38.7	59.5	14.2	14.1	74.3	31.0	0.0
LnGrp LOS	D		D	D		D	E	B	B	E	C	
Approach Vol, veh/h		476			66			1487			1417	
Approach Delay, s/veh		43.6			38.6			20.4			31.1	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.8	15.0	40.0		9.7	4.5	50.5				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 17	12.3	37.1		7.0	7.3	42.1				
Max Q Clear Time (q_c+I1), s		13.8	11.4	33.0		3.5	2.2	21.9				
Green Ext Time (p_c), s		0.8	0.1	2.1		0.1	0.0	19.1				
Intersection Summary												
HCM 2010 Ctrl Delay	28.3											
HCM 2010 LOS	C											
Notes												

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Existing + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	390	10	28	23	11	34	41	1452	27	40	1719	557
Future Volume (vph)	390	10	28	23	11	34	41	1452	27	40	1719	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1670		1715	1771	1582	1805	3564		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1670		1715	1771	1582	1805	3564		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97		0.97	0.97	0.97	0.97	0.97		0.97	0.97	0.97
Adj. Flow (vph)	402	10	29	24	11	35	42	1497	28	41	1772	574
RTOR Reduction (vph)	0	24	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	15	0	17	18	2	42	1524	0	41	1772	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.5	15.5		4.7	4.7	4.7	4.4	53.2		4.3	53.6	95.6
Effective Green, g (s)	16.1	16.1		4.9	4.9	4.9	4.1	54.1		4.5	54.5	95.6
Actuated g/C Ratio	0.17	0.17		0.05	0.05	0.05	0.04	0.57		0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	578	281		87	90	81	77	2016		84	2037	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.43		0.02	c0.50	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.70	0.05		0.20	0.20	0.02	0.55	0.76		0.49	0.87	0.37
Uniform Delay, d1	37.4	33.4		43.5	43.5	43.1	44.8	15.7		44.4	17.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.2	0.1		1.9	1.9	0.2	7.7	2.0		4.4	4.7	0.7
Delay (s)	41.6	33.5		45.4	45.4	43.3	52.5	17.7		48.8	22.2	0.7
Level of Service	D	C		D	D	D	D	B		D	C	A
Approach Delay (s)		40.9			44.3			18.7			17.5	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay	20.6			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.82											
Actuated Cycle Length (s)	95.6			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	72.0%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Existing + Project Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 3.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	123	0	14	1	0	0	6	318	0	0	430	94
Future Vol, veh/h	123	0	14	1	0	0	6	318	0	0	430	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	140	0	16	1	0	0	7	361	0	0	489	107

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	736	917	298	619	970	181	595	0	0	361	0	0
Stage 1	542	542	-	375	375	-	-	-	-	-	-	-
Stage 2	194	375	-	244	595	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	307	274	704	377	255	837	991	-	-	1209	-	-
Stage 1	492	523	-	624	621	-	-	-	-	-	-	-
Stage 2	789	621	-	744	496	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	305	272	704	366	253	837	991	-	-	1209	-	-
Mov Cap-2 Maneuver	305	272	-	366	253	-	-	-	-	-	-	-
Stage 1	488	523	-	618	615	-	-	-	-	-	-	-
Stage 2	782	615	-	727	496	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	26			14.9			0.2			0		
HCM LOS	D			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	991	-	-	324	366	1209	-	-
HCM Lane V/C Ratio	0.007	-	-	0.48	0.003	-	-	-
HCM Control Delay (s)	8.7	0	-	26	14.9	0	-	-
HCM Lane LOS	A	A	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.5	0	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Existing + Project Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	131	318	12	5	419	31	7	0	6	6	1	104
Future Vol, veh/h	131	318	12	5	419	31	7	0	6	6	1	104
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	142	346	13	5	455	34	8	0	7	7	1	113

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	493	0	0	367	0	0	888	1149	195	953	1138	253
Stage 1	-	-	-	-	-	-	645	645	-	487	487	-
Stage 2	-	-	-	-	-	-	243	504	-	466	651	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1074	-	-	1203	-	-	241	200	820	217	203	753
Stage 1	-	-	-	-	-	-	432	471	-	536	554	-
Stage 2	-	-	-	-	-	-	745	544	-	551	468	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1070	-	-	1195	-	-	181	171	809	191	174	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	181	171	-	191	174	-
Stage 1	-	-	-	-	-	-	372	406	-	463	550	-
Stage 2	-	-	-	-	-	-	626	540	-	471	403	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.5			0.1			18.4			12.1		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	282	1070	-	-	1195	-	-	630
HCM Lane V/C Ratio	0.05	0.133	-	-	0.005	-	-	0.192
HCM Control Delay (s)	18.4	8.9	-	-	8	-	-	12.1
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	0.7

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing + Project Saturday.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (vph)	700	118	27	689	126	16
Future Volume (vph)	700	118	27	689	126	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1789	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1789	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	745	126	29	733	134	17
RTOR Reduction (vph)	0	63	0	0	7	0
Lane Group Flow (vph)	745	63	29	733	144	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	25.4	25.4	1.2	30.8	9.1	
Effective Green, g (s)	25.4	25.4	1.2	30.8	9.1	
Actuated g/C Ratio	0.50	0.50	0.02	0.61	0.18	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	940	789	41	1140	320	
v/s Ratio Prot	c0.40		0.02	c0.39	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.79	0.08	0.71	0.64	0.45	
Uniform Delay, d1	10.5	6.6	24.6	6.5	18.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.8	0.1	36.5	1.3	0.4	
Delay (s)	15.3	6.7	61.2	7.8	19.0	
Level of Service	B	A	E	A	B	
Approach Delay (s)	14.1			9.8	19.0	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	15.1
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Existing + Project Saturday.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (veh/h)	700	118	27	689	126	16
Future Volume (veh/h)	700	118	27	689	126	16
Number	2	12	1	6	3	18
Initial Q (Ob), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	745	126	29	733	134	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	1028	863	46	1238	218	0
Arrive On Green	0.55	0.55	0.03	0.66	0.12	0.00
Sat Flow, veh/h	1881	1578	1740	1881	1797	0
Grp Volume(V), veh/h	745	126	29	733	135	0
Grp Sat Flow(s),veh/h/ln	1881	1578	1740	1881	1810	0
Q Serve(g_s), s	14.7	1.9	0.8	10.8	3.5	0.0
Cycle Q Clear(g_c), s	14.7	1.9	0.8	10.8	3.5	0.0
Prop In Lane	1.00	1.00	1.00	0.99	0.99	0.00
Lane Grp Cap(c), veh/h	1028	863	46	1238	220	0
V/C Ratio(X)	0.72	0.15	0.63	0.59	0.61	0.00
Avail Cap(c_a), veh/h	1252	1050	141	1564	659	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.4	5.5	23.8	4.7	20.6	0.0
Incr Delay (d2), s/veh	1.9	0.1	5.1	0.6	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	0.9	0.5	5.7	1.8	0.0
LnGrp Delay(d),s/veh	10.3	5.6	28.9	5.3	21.7	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	871			762	135	
Approach Delay, s/veh	9.6			6.2	21.7	
Approach LOS	A			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.5	33.4				39.0		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	32.9				41.1		18.0
Max Q Clear Time (g_c+I1), s	2.8	16.7				12.8		5.5
Green Ext Time (p_c), s	0.0	10.3				14.6		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.1
HCM 2010 LOS	A

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Existing + Project Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 2												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔	↔	↔	↔
Traffic Vol, veh/h	8	673	34	14	626	8	35	0	40	4	0	8
Future Vol, veh/h	8	673	34	14	626	8	35	0	40	4	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	9	716	36	15	666	9	37	0	43	4	0	9

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	674	0	0	716
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.1	-	-	4.1
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2
Pot Cap-1 Maneuver	927	-	-	894
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	927	-	-	894
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	32.9	22.9
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	109	434	927	-	-	894	-	-	100	460
HCM Lane V/C Ratio	0.342	0.098	0.009	-	-	0.017	-	-	0.043	0.019
HCM Control Delay (s)	54.3	14.2	8.9	-	-	9.1	-	-	42.6	13
HCM Lane LOS	F	B	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	1.4	0.3	0	-	-	0.1	-	-	0.1	0.1

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Existing + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.1						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	42	4	5	567	663	43
Future Vol, veh/h	42	4	5	567	663	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	44	4	5	597	698	45

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1305	698	698
Stage 1	698	-	-
Stage 2	607	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	178	444	908
Stage 1	497	-	-
Stage 2	548	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	177	444	908
Mov Cap-2 Maneuver	177	-	-
Stage 1	497	-	-
Stage 2	544	-	-

Approach	EB	NB	SB
HCM Control Delay, s	30.8	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	908	-	187	-	-
HCM Lane V/C Ratio	0.006	-	0.259	-	-
HCM Control Delay (s)	9	0	30.8	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	1	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Existing + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.4						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	34	37	406	41	28	412
Future Vol, veh/h	34	37	406	41	28	412
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	0	-
Grade, %	0	-	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	35	38	419	42	29	425

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	934	452	0 0 467 0
Stage 1	446	-	- - - -
Stage 2	488	-	- - - -
Critical Hdwy	6.4	6.2	- - 4.1 -
Critical Hdwy Stg 1	5.4	-	- - - -
Critical Hdwy Stg 2	5.4	-	- - - -
Follow-up Hdwy	3.5	3.3	- - 2.2 -
Pot Cap-1 Maneuver	297	612	- - 1105 -
Stage 1	649	-	- - - -
Stage 2	621	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	284	606	- - 1099 -
Mov Cap-2 Maneuver	284	-	- - - -
Stage 1	646	-	- - - -
Stage 2	596	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 393	1099	-
HCM Lane V/C Ratio	-	- 0.186	0.026	-
HCM Control Delay (s)	-	- 16.2	8.4	0
HCM Lane LOS	-	- C	A	A
HCM 95th %tile Q(veh)	-	- 0.7	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Existing + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	10	90	74	345	339	16
Future Vol, veh/h	10	90	74	345	339	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	96	79	367	361	17

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	906	383	372 0 - 0
Stage 1	372	-	- - - -
Stage 2	534	-	- - - -
Critical Hdwy	6.4	6.23	4.12 - - -
Critical Hdwy Stg 1	5.4	-	- - - -
Critical Hdwy Stg 2	5.4	-	- - - -
Follow-up Hdwy	3.5	3.327	2.218 - - -
Pot Cap-1 Maneuver	309	662	1186 - - -
Stage 1	702	-	- - - -
Stage 2	592	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	283	650	1175 - - -
Mov Cap-2 Maneuver	283	-	- - - -
Stage 1	696	-	- - - -
Stage 2	547	-	- - - -

Approach	EB	NB	SB
HCM Control Delay, s	12.7	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1175	- 575	-	-
HCM Lane V/C Ratio	0.067	- 0.185	-	-
HCM Control Delay (s)	8.3	- 12.7	-	-
HCM Lane LOS	A	- B	-	-
HCM 95th %tile Q(veh)	0.2	- 0.7	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Existing + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	20	126	109	262	222	8
Future Vol, veh/h	20	126	109	262	222	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	140	121	291	247	9
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	798	265	263	0	-	0
Stage 1	258	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-	-
Pot Cap-1 Maneuver	358	779	1307	-	-	-
Stage 1	790	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	321	770	1299	-	-	-
Mov Cap-2 Maneuver	321	-	-	-	-	-
Stage 1	785	-	-	-	-	-
Stage 2	530	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	12.4		2.4		0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1299	-	646	-	-	-
HCM Lane V/C Ratio	0.093	-	0.251	-	-	-
HCM Control Delay (s)	8.1	-	12.4	-	-	-
HCM Lane LOS	A	-	B	-	-	-
HCM 95th %tile Q(veh)	0.3	-	1	-	-	-

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing + Project Saturday.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	9.5												
Intersection LOS	A												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Lane Configurations			↕				↕				↕		
Traffic Vol, veh/h	0	0	1	110	0	3	0	0	0	175	103	4	
Future Vol, veh/h	0	0	1	110	0	3	0	0	0	175	103	4	
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0	
Mvmt Flow	0	0	1	126	0	3	0	0	0	201	118	5	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach	EB				WB				NB				
Opposing Approach	WB				EB				SB				
Opposing Lanes	1				1				1				
Conflicting Approach Left	SB				NB				EB				
Conflicting Lanes Left	1				1				1				
Conflicting Approach Right	NB				SB				WB				
Conflicting Lanes Right	1				1				1				
HCM Control Delay	8.2				8.4				10.5				
HCM LOS	A				A				B				
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	62%	0%	100%	0%									
Vol Thru, %	37%	1%	0%	100%									
Vol Right, %	1%	99%	0%	0%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	282	111	3	117									
LT Vol	175	0	3	0									
Through Vol	103	1	0	117									
RT Vol	4	110	0	0									
Lane Flow Rate	324	128	3	134									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0.404	0.154	0.005	0.171									
Departure Headway (Hd)	4.491	4.356	5.318	4.566									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	801	823	672	785									
Service Time	2.516	2.385	3.359	2.593									
HCM Lane V/C Ratio	0.404	0.156	0.004	0.171									
HCM Control Delay	10.5	8.2	8.4	8.5									
HCM Lane LOS	B	A	A	A									
HCM 95th-tile Q	2	0.5	0	0.6									

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Existing + Project Saturday.syn
12/01/2017

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	117	0
Future Vol, veh/h	0	0	117	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	134	0
Number of Lanes	0	0	1	0
Approach			SB	
Opposing Approach	NB			
Opposing Lanes	1			
Conflicting Approach Left	WB			
Conflicting Lanes Left	1			
Conflicting Approach Right	EB			
Conflicting Lanes Right	1			
HCM Control Delay	8.5			
HCM LOS	A			

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Background AM.syn
12/01/2017

	↙	↘	↑	↗	↖	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↕↕	↑	↗	↖↖	↓
Traffic Volume (vph)	0	1082	490	91	976	668
Future Volume (vph)	0	1082	490	91	976	668
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1244	563	105	1122	768
RTOR Reduction (vph)	0	155	0	27	0	0
Lane Group Flow (vph)	0	1089	563	78	1122	768
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		27.2	20.9	20.9	27.2	57.9
Effective Green, g (s)		28.1	21.8	21.8	28.1	57.9
Actuated g/C Ratio		0.49	0.38	0.38	0.49	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1352	694	590	1650	1810
v/s Ratio Prot		c0.39	c0.31		0.33	0.42
v/s Ratio Perm				0.05		
v/c Ratio		0.81	0.81	0.13	0.68	0.42
Uniform Delay, d1		12.6	16.2	11.8	11.4	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.0	7.3	0.1	1.4	0.7
Delay (s)		16.6	23.5	12.0	12.8	0.7
Level of Service		B	C	B	B	A
Approach Delay (s)	16.6		21.7			7.9
Approach LOS	B		C			A
Intersection Summary						
HCM 2000 Control Delay			13.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.81			
Actuated Cycle Length (s)			57.9		Sum of lost time (s)	8.0
Intersection Capacity Utilization			70.3%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

Background AM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	7	814	245	369	945	10	96	3	232	9	17	41
Future Volume (vph)	7	814	245	369	945	10	96	3	232	9	17	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.96	1.00	0.98	1.00	0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3530	1698	1708	1562	1733	1555	1733	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.96	1.00	0.98	1.00	0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3530	1698	1708	1562	1733	1555	1733	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	1044	314	473	1212	13	123	4	297	12	22	53
RTOR Reduction (vph)	0	0	147	0	0	0	0	68	0	0	50	0
Lane Group Flow (vph)	9	1044	167	473	1225	0	64	63	229	0	34	3
Confl. Peds. (#/hr)			1			1	1		1	1		1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	27.4	27.4	11.9	38.6		4.8	4.8	16.7		2.3	2.3
Effective Green, g (s)	1.2	28.4	28.4	12.5	39.6		6.6	6.6	17.9		3.3	3.3
Actuated g/C Ratio	0.02	0.43	0.43	0.19	0.59		0.10	0.10	0.27		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	32	1504	664	642	2092		167	168	418		85	76
v/s Ratio Prot	0.00	c0.29		c0.14	0.35		0.04	0.04	c0.10		c0.02	
v/s Ratio Perm			0.11						0.04			0.00
v/c Ratio	0.28	0.69	0.25	0.74	0.59		0.38	0.38	0.55		0.40	0.03
Uniform Delay, d1	32.4	15.7	12.4	25.6	8.5		28.2	28.2	21.0		30.8	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	1.1	0.1	3.8	0.3		0.5	0.5	0.8		1.1	0.1
Delay (s)	34.1	16.8	12.4	29.4	8.8		28.7	28.7	21.8		31.9	30.3
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		15.9			14.5			23.8			30.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	16.1
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Synchro 9 Report

HCM 2010 Signalized Intersection Summary

Background AM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	7	814	245	369	945	10	96	3	232	9	17	41
Future Volume (veh/h)	7	814	245	369	945	10	96	3	232	9	17	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1763	1863
Adj Flow Rate, veh/h	9	1044	314	473	1212	13	126	4	297	12	22	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1172	518	585	1732	19	760	0	567	35	64	90
Arrive On Green	0.02	0.33	0.33	0.17	0.48	0.47	0.21	0.00	0.19	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3584	38	3583	0	1545	611	1121	1575
Grp Volume(v), veh/h	9	1044	314	473	598	627	126	0	297	34	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1733	0	1575
Q Serve(g_s), s	0.3	19.5	11.7	9.2	18.4	18.4	2.0	0.0	10.5	1.3	0.0	2.3
Cycle Q Clear(g_c), s	0.3	19.5	11.7	9.2	18.4	18.4	2.0	0.0	10.5	1.3	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.35		1.00
Lane Grp Cap(c), veh/h	30	1172	518	585	854	896	760	0	567	99	0	90
V/C Ratio(X)	0.30	0.89	0.61	0.81	0.70	0.70	0.17	0.00	0.52	0.34	0.00	0.59
Avail Cap(c_a), veh/h	117	1219	538	602	854	896	1737	0	989	99	0	90
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.9	22.1	19.5	27.8	14.1	14.1	22.4	0.0	17.4	31.6	0.0	32.0
Incr Delay (d2), s/veh	2.1	7.9	1.2	7.3	2.2	2.1	0.0	0.0	0.3	0.8	0.0	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.7	5.2	4.9	9.5	9.9	1.0	0.0	4.5	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.0	30.1	20.8	35.1	16.2	16.1	22.5	0.0	17.7	32.3	0.0	38.6
LnGrp LOS	D	C	C	D	B	B	C		B	C		D
Approach Vol, veh/h		1367			1698			423				87
Approach Delay, s/veh		28.0			21.5			19.1				36.1
Approach LOS		C			C			B				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	37.7		18.8	15.8	27.1		8.0				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 12	23.0		3.0				
Max Q Clear Time (g_c+I1), s	2.3	20.4		12.5	11.2	21.5		4.3				
Green Ext Time (p_c), s	0.0	5.2		0.3	0.0	0.6		0.0				

Intersection Summary			
HCM 2010 Ctrl Delay	24.0		
HCM 2010 LOS	C		

Notes

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	200	289	26	6	88	268	150	38	232	63	266	335
Future Volume (vph)	200	289	26	6	88	268	150	38	232	63	266	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3494			1703	1827	1547	1752	1881	1589	3433	1761
Flt Permitted	0.95	1.00			0.18	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3494			320	1827	1547	1752	1881	1589	3433	1761
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	215	311	28	7	95	288	161	41	249	68	286	360
RTOR Reduction (vph)	0	7	0	0	0	0	116	0	0	50	0	7
Lane Group Flow (vph)	215	332	0	0	102	288	45	41	249	18	286	425
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	14.4	15.1			22.7	23.4	23.4	4.3	21.5	21.5	9.5	26.7
Effective Green, g (s)	14.1	15.3			22.4	23.6	23.6	4.0	22.4	22.4	9.2	27.6
Actuated g/C Ratio	0.17	0.18			0.26	0.28	0.28	0.05	0.26	0.26	0.11	0.32
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	281	626			84	505	428	82	493	417	370	569
v/s Ratio Prot	0.13	0.09				c0.16		0.02	0.13		c0.08	c0.24
v/s Ratio Perm					c0.32		0.03			0.01		
v/c Ratio	0.77	0.53			1.21	0.57	0.10	0.50	0.51	0.04	0.77	0.75
Uniform Delay, d1	34.0	31.7			31.4	26.5	23.0	39.7	26.7	23.5	37.0	25.7
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	0.9			166.7	1.7	0.1	4.7	1.0	0.1	9.7	5.5
Delay (s)	45.7	32.7			198.1	28.2	23.1	44.4	27.7	23.5	46.7	31.2
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		37.7				58.2			28.8			37.4
Approach LOS		D				E			C			D
Intersection Summary												
HCM 2000 Control Delay		41.3			HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		85.3			Sum of lost time (s)				16.0			
Intersection Capacity Utilization		67.4%			ICU Level of Service				C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	1.00
Satd. Flow (prot)	3433
Flt Permitted	1.00
Satd. Flow (perm)	3433
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	Prot
Protected Phases	7
Permitted Phases	
Actuated Green, G (s)	21.5
Effective Green, g (s)	21.5
Actuated g/C Ratio	0.11
Clearance Time (s)	3.7
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	370
v/s Ratio Prot	c0.08
v/s Ratio Perm	
v/c Ratio	0.77
Uniform Delay, d1	37.0
Progression Factor	1.00
Incremental Delay, d2	9.7
Delay (s)	46.7
Level of Service	D
Approach Delay (s)	37.4
Approach LOS	D
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Background AM.syn
12/01/2017

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↕↔		↕	↕↕	↕↕	↕
Traffic Volume (vph)	61	385	77	99	287	152	62
Future Volume (vph)	61	385	77	99	287	152	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
FrT	1.00	0.97		1.00	1.00	1.00	0.85
FlT Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3410		1687	3438	3367	1495
FlT Permitted	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1863	3410		1687	3438	3367	1495
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	66	423	85	109	315	167	68
RTOR Reduction (vph)	0	23	0	0	0	0	60
Lane Group Flow (vph)	66	485	0	109	315	167	8
Confl. Bikes (#/hr)			1				
Heavy Vehicles (%)	2%	3%	3%	7%	5%	4%	8%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.2	26.6		6.0	28.4	5.9	5.9
Effective Green, g (s)	3.7	26.6		5.5	28.4	5.9	5.9
Actuated g/C Ratio	0.07	0.53		0.11	0.57	0.12	0.12
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	137	1814		185	1952	397	176
v/s Ratio Prot		c0.14		c0.06	0.09	c0.05	
v/s Ratio Perm	0.04						0.01
v/c Ratio	0.48	0.27		0.59	0.16	0.42	0.05
Uniform Delay, d1	22.2	6.4		21.2	5.1	20.5	19.6
Progression Factor	1.00	1.00		1.41	0.76	1.00	1.00
Incremental Delay, d2	1.0	0.4		3.1	0.2	0.3	0.0
Delay (s)	23.2	6.7		32.9	4.1	20.7	19.6
Level of Service	C	A		C	A	C	B
Approach Delay (s)		8.6			11.5	20.4	
Approach LOS		A			B	C	

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Background AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔		↕	↕↔			↕	↕		↕↔	
Traffic Volume (vph)	0	360	87	49	359	0	27	0	27	0	0	0
Future Volume (vph)	0	360	87	49	359	0	27	0	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	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)		3392		1805	3471			1552	1367			
FlT Permitted		1.00		0.95	1.00			0.98	1.00			
Satd. Flow (perm)		3392		1805	3471			1594	1367			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	424	102	58	422	0	32	0	32	0	0	0
RTOR Reduction (vph)	0	25	0	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	501	0	58	422	0	0	32	3	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8				4
Permitted Phases							8		8			
Actuated Green, G (s)		30.8		3.6	37.9			4.1	4.1			
Effective Green, g (s)		30.8		3.1	37.9			4.1	4.1			
Actuated g/C Ratio		0.62		0.06	0.76			0.08	0.08			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2089		111	2631			130	112			
v/s Ratio Prot		c0.15		c0.03	0.12							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.24		0.52	0.16			0.25	0.02			
Uniform Delay, d1		4.3		22.7	1.7			21.5	21.1			
Progression Factor		0.34		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		2.0	0.1			0.4	0.0			
Delay (s)		1.7		24.8	1.8			21.9	21.1			
Level of Service		A		C	A			C	C			
Approach Delay (s)		1.7			4.6			21.5			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM 2000 Control Delay	4.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	29.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center Pl & Rio Rd

Background AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↓	↑↑			↓	↑		↑↓	
Traffic Volume (veh/h)	0	360	87	49	359	0	27	0	27	0	0	0
Future Volume (veh/h)	0	360	87	49	359	0	27	0	27	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	424	102	58	422	0	32	0	32	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	0	15	0	0	0
Cap, veh/h	0	1909	455	62	2752	0	202	0	65	0	90	0
Arrive On Green	0.00	0.22	0.22	0.03	0.79	0.00	0.05	0.00	0.05	0.00	0.00	0.00
Sat Flow, veh/h	0	2905	671	1810	3563	0	1236	0	1383	0	1900	0
Grp Volume(v), veh/h	0	263	263	58	422	0	32	0	32	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1728	1810	1736	0	1236	0	1383	0	1900	0
Q Serve(g_s), s	0.0	6.1	6.2	1.6	1.4	0.0	1.3	0.0	1.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.1	6.2	1.6	1.4	0.0	1.3	0.0	1.1	0.0	0.0	0.0
Prop In Lane	0.00		0.39	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1192	1173	62	2752	0	202	0	65	0	90	0
V/C Ratio(X)	0.00	0.22	0.22	0.94	0.15	0.00	0.16	0.00	0.49	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1192	1173	181	2752	0	540	0	443	0	608	0
HCM Platoon Ratio	1.00	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.6	8.6	24.1	1.2	0.0	23.3	0.0	23.2	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	20.0	0.1	0.0	0.1	0.0	2.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.1	3.1	1.1	0.7	0.0	0.4	0.0	0.5	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	9.0	9.1	44.1	1.3	0.0	23.4	0.0	25.4	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		526			480			64				0
Approach Delay, s/veh		9.1			6.5			24.4				0.0
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	5.7	37.9		6.4		43.6		6.4				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	5.5	17.0		16.0		26.0		16.0				
Max Q Clear Time (g_c+I1), s	3.6	8.2		0.0		3.4		3.3				
Green Ext Time (p_c), s	0.0	4.4		0.0		7.5		0.1				

Intersection Summary

HCM 2010 Ctrl Delay	8.8
HCM 2010 LOS	A

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Background AM.syn
12/12/2017

Intersection

Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↑↑	↑		↑	↑		↑	↑
Traffic Vol, veh/h	0	217	30	0	12	12	5	16	330
Future Vol, veh/h	0	217	30	0	12	12	5	16	330
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	247	34	0	14	14	5	18	375
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	10.1	8.8	11.7
HCM LOS	B	A	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	109	109	30	12	12	21	330
LT Vol	109	109	0	0	0	21	0
Through Vol	0	0	30	12	0	0	0
RT Vol	0	0	0	0	12	0	330
Lane Flow Rate	123	123	34	14	14	24	375
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.212	0.209	0.037	0.024	0.021	0.039	0.489
Departure Headway (Hd)	6.188	6.102	3.883	6.294	5.582	5.926	4.692
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	575	583	907	572	645	603	765
Service Time	3.98	3.894	1.672	3.994	3.282	3.674	2.44
HCM Lane V/C Ratio	0.214	0.211	0.037	0.024	0.022	0.04	0.49
HCM Control Delay	10.7	10.5	6.8	9.1	8.4	8.9	11.9
HCM Lane LOS	B	B	A	A	A	A	B
HCM 95th-tile Q	0.8	0.8	0.1	0.1	0.1	0.1	2.7

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Background AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	144	50	106	151	43	63	130	1149	48	18	1373	113	
Future Volume (vph)	144	50	106	151	43	63	130	1149	48	18	1373	113	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00	
Frbp, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1665	1510		1665	1649		1770	3468		1805	3471	1568	
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1665	1510		1665	1649		1770	3468		1805	3471	1568	
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)	157	54	115	164	47	68	141	1249	52	20	1492	123	
RTOR Reduction (vph)	0	69	0	0	40	0	0	3	0	0	0	57	
Lane Group Flow (vph)	141	116	0	143	96	0	141	1298	0	20	1492	66	
Confl. Peds. (#/hr)			46	46				46					
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%	
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm	
Protected Phases	2	2		6	6		3	8		7	4		
Permitted Phases												4	
Actuated Green, G (s)	12.7	12.7		8.8	8.8		8.3	47.0		2.8	41.5	41.5	
Effective Green, g (s)	12.9	12.9		9.0	9.0		8.0	47.9		2.5	42.4	42.4	
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.09	0.54		0.03	0.48	0.48	
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9	
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5	
Lane Grp Cap (vph)	243	220		169	168		160	1881		51	1666	752	
v/s Ratio Prot	c0.08	0.08		c0.09	0.06		c0.08	0.37		0.01	c0.43		
v/s Ratio Perm												0.04	
v/c Ratio	0.58	0.53		0.85	0.57		0.88	0.69		0.39	0.90	0.09	
Uniform Delay, d1	35.2	34.9		39.0	37.8		39.7	14.8		42.2	20.9	12.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.7	2.6		31.3	5.6		39.0	1.3		4.9	7.0	0.1	
Delay (s)	38.9	37.5		70.3	43.4		78.7	16.1		47.1	27.9	12.5	
Level of Service	D	D		E	D		E	B		D	C	B	
Approach Delay (s)		38.1			57.2			22.2			27.0		
Approach LOS		D			E			C			C		

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Background AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	144	50	106	151	43	63	130	1149	48	18	1373	113	
Future Volume (veh/h)	144	50	106	151	43	63	130	1149	48	18	1373	113	
Number	5	2	12	1	6	16	3	8	18	7	4	14	
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.87	1.00		0.95	1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845	
Adj Flow Rate, veh/h	157	54	115	140	81	68	141	1249	52	20	1492	0	
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3	
Cap, veh/h	281	80	169	184	93	78	165	1786	74	50	1581	714	
Arrive On Green	0.16	0.16	0.16	0.10	0.10	0.10	0.09	0.52	0.51	0.03	0.46	0.00	
Sat Flow, veh/h	1757	497	1058	1757	883	741	1774	3426	142	1810	3471	1568	
Grp Volume(V), veh/h	157	0	169	140	0	149	141	639	662	20	1492	0	
Grp Sat Flow(s),veh/h/ln	1757	0	1555	1757	0	1625	1774	1754	1814	1810	1736	1568	
Q Serve(g_s), s	7.1	0.0	8.8	6.7	0.0	7.8	6.7	23.5	23.6	0.9	35.2	0.0	
Cycle Q Clear(g_c), s	7.1	0.0	8.8	6.7	0.0	7.8	6.7	23.5	23.6	0.9	35.2	0.0	
Prop In Lane	1.00		0.68	1.00		0.46	1.00		0.08	1.00		1.00	
Lane Grp Cap(c), veh/h	281	0	249	184	0	170	165	915	946	50	1581	714	
V/C Ratio(X)	0.56	0.00	0.68	0.76	0.00	0.87	0.85	0.70	0.70	0.40	0.94	0.00	
Avail Cap(c_a), veh/h	348	0	308	184	0	170	165	915	946	148	1617	731	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	
Uniform Delay (d), s/veh	33.3	0.0	34.0	37.4	0.0	37.9	38.3	15.5	15.5	41.1	22.3	0.0	
Incr Delay (d2), s/veh	2.1	0.0	4.9	17.8	0.0	36.9	32.6	2.8	2.7	5.2	11.7	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.1	4.1	0.0	5.2	4.8	12.1	12.5	0.5	19.4	0.0	
LnGrp Delay(d),s/veh	35.3	0.0	39.0	55.1	0.0	74.8	70.9	18.2	18.2	46.2	34.1	0.0	
LnGrp LOS	D		D	E		E	E	B	B	D	C		
Approach Vol, veh/h		326			289			1442			1512		
Approach Delay, s/veh		37.2			65.3			23.4			34.2		
Approach LOS		D			E			C			C		
Timer	1	2	3	4	5	6	7	8					
Assigned Phs		2	3	4		6	7	8					
Phs Duration (G+Y+Rc), s		17.7	12.0	43.1		13.0	6.4	48.8					
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9					
Max Green Setting (Gmax), s		* 17	8.3	39.1		8.8	7.3	40.1					
Max Q Clear Time (g_c+I1), s		10.8	8.7	37.2		9.8	2.9	25.6					
Green Ext Time (p_c), s		0.9	0.0	1.0		0.0	0.0	14.0					

Intersection Summary			
HCM 2010 Ctrl Delay	32.6		
HCM 2010 LOS	C		

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Background AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔		↔	↔	↔
Traffic Volume (vph)	382	4	24	34	14	44	36	1300	16	71	1632	774
Future Volume (vph)	382	4	24	34	14	44	36	1300	16	71	1632	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	26	37	15	48	40	1429	18	78	1793	851
RTOR Reduction (vph)	0	22	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	26	26	3	40	1446	0	78	1793	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	53.2		6.2	55.3	99.8
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	54.1		6.4	56.2	99.8
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54		0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	557	248		122	120	113	75	1914		105	1954	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.41		0.05	c0.52	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.75	0.03		0.21	0.22	0.03	0.53	0.76		0.74	0.92	0.54
Uniform Delay, d1	39.9	35.2		43.7	43.7	43.1	46.8	17.7		45.9	19.7	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.5	0.1		1.5	1.6	0.2	7.1	2.1		24.4	7.7	1.3
Delay (s)	46.4	35.3		45.2	45.3	43.3	53.9	19.8		70.3	27.4	1.3
Level of Service	D	D		D	D	D	D	B		E	C	A
Approach Delay (s)		45.6			44.3			20.7			20.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Background AM.syn
12/01/2017

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	20	0	8	0	0	0	2	219	2	8	356	71
Future Vol, veh/h	20	0	8	0	0	0	2	219	2	8	356	71
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	23	0	9	0	0	0	2	252	2	9	409	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	604	733	251	486	772	133	494	0	0	257	0	0
Stage 1	471	471	-	260	260	-	-	-	-	-	-	-
Stage 2	133	262	-	226	512	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	366	350	683	469	333	898	1080	-	-	1320	-	-
Stage 1	522	563	-	728	697	-	-	-	-	-	-	-
Stage 2	834	695	-	762	540	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	361	344	680	456	327	894	1077	-	-	1317	-	-
Mov Cap-2 Maneuver	361	344	-	456	327	-	-	-	-	-	-	-
Stage 1	520	556	-	725	694	-	-	-	-	-	-	-
Stage 2	830	692	-	742	533	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	0	0.1	0.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1077	-	-	417	-	1317	-	-
HCM Lane V/C Ratio	0.002	-	-	0.077	-	0.007	-	-
HCM Control Delay (s)	8.3	0	-	14.4	0	7.8	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	-	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Background AM.syn
12/01/2017

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔		↕		↕	↕	
Traffic Vol, veh/h	124	242	17	3	328	11	18	2	4	1	2	62
Future Vol, veh/h	124	242	17	3	328	11	18	2	4	1	2	62
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	143	278	20	3	377	13	21	2	5	1	2	71

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	390	0	0	298	0	0	770	970	149	815	973	195
Stage 1	-	-	-	-	-	-	573	573	-	390	390	-
Stage 2	-	-	-	-	-	-	197	397	-	425	583	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1144	-	-	1275	-	-	294	255	877	273	254	789
Stage 1	-	-	-	-	-	-	477	507	-	611	611	-
Stage 2	-	-	-	-	-	-	792	607	-	583	502	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1144	-	-	1275	-	-	240	223	877	243	222	789
Mov Cap-2 Maneuver	-	-	-	-	-	-	240	223	-	243	222	-
Stage 1	-	-	-	-	-	-	417	444	-	535	610	-
Stage 2	-	-	-	-	-	-	716	606	-	505	439	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	0.1	19.8	10.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	271	1144	-	-	1275	-	-	709
HCM Lane V/C Ratio	0.102	0.125	-	-	0.003	-	-	0.105
HCM Control Delay (s)	19.8	8.6	-	-	7.8	-	-	10.7
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.4	-	-	0	-	-	0.4

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Background AM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	635	116	22	894	79	19
Future Volume (vph)	635	116	22	894	79	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Flt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1758	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1758	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	668	122	23	941	83	20
RTOR Reduction (vph)	0	54	0	0	15	0
Lane Group Flow (vph)	668	68	23	941	88	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	29.3	29.3	0.7	34.2	7.5	
Effective Green, g (s)	29.3	29.3	0.7	34.2	7.5	
Actuated g/C Ratio	0.56	0.56	0.01	0.65	0.14	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1027	865	24	1223	250	
v/s Ratio Prot	0.36		0.01	c0.50	c0.05	
v/s Ratio Perm		0.04				
v/c Ratio	0.65	0.08	0.96	0.77	0.35	
Uniform Delay, d1	8.1	5.4	25.9	6.4	20.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.0	162.4	3.1	0.3	
Delay (s)	9.7	5.4	188.4	9.5	20.7	
Level of Service	A	A	F	A	C	
Approach Delay (s)	9.0			13.8	20.7	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	15.1
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Background AM.syn
12/01/2017

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↓	↑	↓	↓		
Traffic Volume (veh/h)	635	116	22	894	79	19		
Future Volume (veh/h)	635	116	22	894	79	19		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1878	1900		
Adj Flow Rate, veh/h	668	122	23	941	83	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	3	4	0	1	0	0		
Cap, veh/h	987	831	40	1214	223	0		
Arrive On Green	0.54	0.54	0.02	0.65	0.13	0.00		
Sat Flow, veh/h	1845	1553	1810	1881	1768	0		
Grp Volume(V), veh/h	668	122	23	941	84	0		
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1790	0		
Q Serve(g_s), s	12.6	1.9	0.6	16.9	2.1	0.0		
Cycle Q Clear(g_c), s	12.6	1.9	0.6	16.9	2.1	0.0		
Prop In Lane		1.00	1.00		0.99	0.00		
Lane Grp Cap(c), veh/h	987	831	40	1214	225	0		
V/C Ratio(X)	0.68	0.15	0.58	0.78	0.37	0.00		
Avail Cap(c_a), veh/h	1080	909	152	1425	676	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	8.1	5.6	23.1	6.0	19.1	0.0		
Incr Delay (d2), s/veh	1.7	0.1	4.8	2.5	0.4	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	6.8	0.8	0.3	9.2	1.0	0.0		
LnGrp Delay(d),s/veh	9.7	5.7	27.9	8.5	19.5	0.0		
LnGrp LOS	A	A	C	A	B			
Approach Vol, veh/h	790			964	84			
Approach Delay, s/veh	9.1			9.0	19.5			
Approach LOS	A			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.3	31.9				37.2		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	27.9				36.1		18.0
Max Q Clear Time (g_c+I1), s	2.6	14.6				18.9		4.1
Green Ext Time (p_c), s	0.0	9.7				11.8		0.1
Intersection Summary								
HCM 2010 Ctrl Delay			9.5					
HCM 2010 LOS			A					

Notes

Synchro 9 Report

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HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Background AM.syn
12/01/2017

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↓	↑	↓	↓	↑	↓	↑	↓	↓	↑	↓	↓
Traffic Vol, veh/h	27	534	28	29	892	8	11	1	13	14	0	47
Future Vol, veh/h	27	534	28	29	892	8	11	1	13	14	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	30	587	31	32	980	9	12	1	14	15	0	52
Major/Minor												
	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	989	0	0	587	0	0	1694	1699	587	1695	1694	985
Stage 1	-	-	-	-	-	-	646	646	-	1048	1048	-
Stage 2	-	-	-	-	-	-	1048	1053	-	647	646	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	7.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.9	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	707	-	-	983	-	-	74	55	513	74	94	304
Stage 1	-	-	-	-	-	-	464	344	-	278	307	-
Stage 2	-	-	-	-	-	-	278	207	-	463	470	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	707	-	-	983	-	-	58	51	513	67	87	304
Mov Cap-2 Maneuver	-	-	-	-	-	-	58	51	-	67	87	-
Stage 1	-	-	-	-	-	-	444	329	-	266	297	-
Stage 2	-	-	-	-	-	-	223	200	-	430	450	-
Approach												
	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.3			47.7			31.9		
HCM LOS	E			E			E			D		
Minor Lane/Major Mvmt												
	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2		
Capacity (veh/h)	57	513	707	-	-	983	-	-	67	304		
HCM Lane V/C Ratio	0.231	0.028	0.042	-	-	0.032	-	-	0.23	0.17		
HCM Control Delay (s)	86.2	12.2	10.3	-	-	8.8	-	-	74.1	19.3		
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C		
HCM 95th %tile Q(veh)	0.8	0.1	0.1	-	-	0.1	-	-	0.8	0.6		

Synchro 9 Report

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HCM 2010 TWSC
13: SR 1 & Ribera Rd

Background AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 0.8						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	↕
Traffic Vol, veh/h	37	0	1	296	405	39
Future Vol, veh/h	37	0	1	296	405	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	42	0	1	333	455	44

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	790	455	455	0	0
Stage 1	455	-	-	-	-
Stage 2	335	-	-	-	-
Critical Hdwy	6.43	6.2	4.1	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-
Pot Cap-1 Maneuver	358	609	1116	-	-
Stage 1	637	-	-	-	-
Stage 2	722	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	358	609	1116	-	-
Mov Cap-2 Maneuver	358	-	-	-	-
Stage 1	637	-	-	-	-
Stage 2	721	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1116	-	358	-	-
HCM Lane V/C Ratio	0.001	-	0.116	-	-
HCM Control Delay (s)	8.2	0	16.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Background AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 2						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	↕
Traffic Vol, veh/h	14	93	316	20	22	413
Future Vol, veh/h	14	93	316	20	22	413
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	18	122	416	26	29	543

Major/Minor	Minor1	Major1	Major2	Major2	Major2
Conflicting Flow All	1044	443	0	0	449
Stage 1	436	-	-	-	-
Stage 2	608	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2
Pot Cap-1 Maneuver	256	617	-	-	1122
Stage 1	656	-	-	-	-
Stage 2	547	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	244	610	-	-	1115
Mov Cap-2 Maneuver	244	-	-	-	-
Stage 1	652	-	-	-	-
Stage 2	524	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.7	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	510	1115	-
HCM Lane V/C Ratio	-	-	0.276	0.026	-
HCM Control Delay (s)	-	-	14.7	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Background AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 5.2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↕	
Traffic Vol, veh/h	17	155	173	229	260	21
Future Vol, veh/h	17	155	173	229	260	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	209	234	309	351	28

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	1136	359	355	0	0
Stage 1	355	-	-	-	-
Stage 2	781	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-
Pot Cap-1 Maneuver	225	683	1193	-	-
Stage 1	714	-	-	-	-
Stage 2	455	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	180	678	1189	-	-
Mov Cap-2 Maneuver	180	-	-	-	-
Stage 1	712	-	-	-	-
Stage 2	364	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	3.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1189	-	532	-	-
HCM Lane V/C Ratio	0.197	-	0.437	-	-
HCM Control Delay (s)	8.8	-	16.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.2	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Background AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 4.5						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↕	
Traffic Vol, veh/h	28	115	125	115	165	92
Future Vol, veh/h	28	115	125	115	165	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	137	149	137	196	110

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	697	265	313	0	0
Stage 1	258	-	-	-	-
Stage 2	439	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-
Pot Cap-1 Maneuver	404	774	1247	-	-
Stage 1	780	-	-	-	-
Stage 2	646	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	351	765	1240	-	-
Mov Cap-2 Maneuver	351	-	-	-	-
Stage 1	775	-	-	-	-
Stage 2	565	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	4.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1240	-	621	-	-
HCM Lane V/C Ratio	0.12	-	0.274	-	-
HCM Control Delay (s)	8.3	-	13	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background AM.syn
12/01/2017

Intersection

Intersection Delay, s/veh 8.9
Intersection LOS A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	1	0	67	0	4	0	0	0	66	79	1
Future Vol, veh/h	0	1	0	67	0	4	0	0	0	66	79	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	86	0	5	0	0	0	85	101	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.8	8.3	9.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	45%	1%	100%	0%
Vol Thru, %	54%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	68	4	190
LT Vol	66	1	4	0
Through Vol	79	0	0	190
RT Vol	1	67	0	0
Lane Flow Rate	187	87	5	244
Geometry Grp	1	1	1	1
Degree of Util (X)	0.242	0.104	0.007	0.292
Departure Headway (Hd)	4.647	4.289	5.187	4.313
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	775	836	690	836
Service Time	2.666	2.312	3.218	2.33
HCM Lane V/C Ratio	0.241	0.104	0.007	0.292
HCM Control Delay	9.1	7.8	8.3	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	0	1.2

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background AM.syn
12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	190	0
Future Vol, veh/h	0	0	190	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	244	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.1
HCM LOS	A

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Background PM.syn
12/01/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	940	714	129	992	563
Future Volume (vph)	0	940	714	129	992	563
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	0.88	1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.85	1.00	0.85	1.00	1.00	1.00
Flt Protected	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2814	1845	1538	3433	1881	1881
Flt Permitted	1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	2814	1845	1538	3433	1881	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	969	736	133	1023	580
RTOR Reduction (vph)	0	166	0	13	0	0
Lane Group Flow (vph)	0	803	736	120	1023	580
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type	Over	NA	Perm	Prot	NA	NA
Protected Phases	3	2		3	Free	
Permitted Phases			2			
Actuated Green, G (s)	19.2	24.0	24.0	19.2	53.0	
Effective Green, g (s)	20.1	24.9	24.9	20.1	53.0	
Actuated g/C Ratio	0.38	0.47	0.47	0.38	1.00	
Clearance Time (s)	4.9	4.9	4.9	4.9		
Vehicle Extension (s)	4.5	3.5	3.5	4.5		
Lane Grp Cap (vph)	1067	866	722	1301	1881	
v/s Ratio Prot	0.29	c0.40		c0.30	0.31	
v/s Ratio Perm			0.08			
v/c Ratio	0.75	0.85	0.17	0.79	0.31	
Uniform Delay, d1	14.3	12.4	8.1	14.6	0.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.4	8.0	0.1	3.6	0.4	
Delay (s)	17.7	20.4	8.2	18.1	0.4	
Level of Service	B	C	A	B	A	
Approach Delay (s)	17.7	18.6			11.7	
Approach LOS	B	B			B	
Intersection Summary						
HCM 2000 Control Delay		15.1		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.82				
Actuated Cycle Length (s)		53.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		77.1%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Background PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	862	234	383	674	5	258	21	551	6	8	7
Future Volume (vph)	26	862	234	383	674	5	258	21	551	6	8	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.99	1.00	0.98	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	1.00	1.00	0.85	1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.96	1.00	0.98	0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570	1715	1732	1590	1733	1580	1733	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.95	0.96	1.00	0.98	0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570	1715	1732	1590	1733	1580	1733	1580
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)	28	937	254	416	733	5	280	23	599	7	9	8
RTOR Reduction (vph)	0	0	140	0	0	0	0	0	75	0	0	8
Lane Group Flow (vph)	28	937	114	416	738	0	151	152	524	0	16	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4		5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.7	25.0	25.0	10.7	34.0		8.8	8.8	19.5		1.0	1.0
Effective Green, g (s)	2.2	26.0	26.0	11.3	35.0		10.6	10.6	20.7		2.0	2.0
Actuated g/C Ratio	0.03	0.39	0.39	0.17	0.53		0.16	0.16	0.31		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	60	1396	637	594	1896		275	278	499		52	47
v/s Ratio Prot	0.02	c0.26		0.12	0.21		0.09	0.09	c0.18		c0.01	
v/s Ratio Perm			0.07						0.15			0.00
v/c Ratio	0.47	0.67	0.18	0.70	0.39		0.55	0.55	1.05		0.31	0.01
Uniform Delay, d1	31.3	16.4	13.0	25.7	9.1		25.5	25.4	22.6		31.3	31.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	1.0	0.0	3.0	0.0		1.2	1.2	53.8		1.2	0.0
Delay (s)	33.4	17.4	13.0	28.8	9.2		26.7	26.6	76.4		32.5	31.0
Level of Service	C	B	B	C	A		C	C	E		C	C
Approach Delay (s)		16.9			16.2			59.7			32.0	
Approach LOS		B			B			E			C	
Intersection Summary												
HCM 2000 Control Delay				28.5			HCM 2000 Level of Service		C			
HCM 2000 Volume to Capacity ratio				0.80								
Actuated Cycle Length (s)				65.9			Sum of lost time (s)		16.1			
Intersection Capacity Utilization				71.4%			ICU Level of Service		C			
Analysis Period (min)				15								
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Background PM.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	26	862	234	383	674	5	258	21	551	6	8	7
Future Volume (veh/h)	26	862	234	383	674	5	258	21	551	6	8	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s,veh/h/ln)	1900	1863	1900	1881	1881	1900	1900	1881	1881	1900	1771	1900
Adj Flow Rate, veh/h	28	937	254	416	733	5	296	0	599	7	9	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	52	1009	460	491	1443	10	1297	0	776	21	26	43
Arrive On Green	0.03	0.28	0.28	0.14	0.40	0.38	0.36	0.00	0.34	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3639	25	3619	0	1598	758	975	1588
Grp Volume(v), veh/h	28	937	254	416	360	378	296	0	599	16	0	8
Grp Sat Flow(s,veh/h/ln)	1810	1770	1613	1738	1787	1877	1810	0	1598	1733	0	1588
Q Serve(g_s), s	1.3	21.9	11.3	9.9	12.9	12.9	4.9	0.0	26.2	0.8	0.0	0.4
Cycle Q Clear(c_c), s	1.3	21.9	11.3	9.9	12.9	12.9	4.9	0.0	26.2	0.8	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.44		1.00
Lane Grp Cap(c), veh/h	52	1009	460	491	709	744	1297	0	776	47	0	43
V/C Ratio(X)	0.54	0.93	0.55	0.85	0.51	0.51	0.23	0.00	0.77	0.34	0.00	0.19
Avail Cap(c_a), veh/h	119	1009	460	491	709	744	1440	0	839	82	0	75
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.7	29.5	25.8	35.6	19.4	19.4	19.0	0.0	18.0	40.6	0.0	40.4
Incr Delay (d2), s/veh	3.2	14.1	0.9	12.4	0.2	0.2	0.0	0.0	3.6	1.6	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	12.6	5.1	5.6	6.3	6.7	2.4	0.0	12.2	0.4	0.0	0.2
LnGrp Delay(d),s/veh	43.9	43.6	26.6	47.9	19.6	19.6	19.1	0.0	21.6	42.2	0.0	41.2
LnGrp LOS	D	D	C	D	B	B	B		C	D		D
Approach Vol, veh/h		1219			1154			895			24	
Approach Delay, s/veh		40.1			29.8			20.8			41.8	
Approach LOS		D			C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.5	37.7		34.4	16.0	28.2		6.3				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 11	23.2		3.0				
Max Q Clear Time (g_c+I1), s	3.3	14.9		28.2	11.9	23.9		2.8				
Green Ext Time (p_c), s	0.0	4.4		0.4	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay		31.2										
HCM 2010 LOS		C										
Notes												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
 3: SR 1 & Rio Rd

Background PM.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↔	↕	↕	↔	↔	↔	↔	↕
Traffic Volume (vph)	115	336	70	12	142	374	291	78	438	179	193	309
Future Volume (vph)	115	336	70	12	142	374	291	78	438	179	193	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frbp, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3457			1744	1863	1560	1805	1827	1556	3502	1832
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3457			656	1863	1560	1805	1827	1556	3502	1832
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	119	346	72	12	146	386	300	80	452	185	199	319
RTOR Reduction (vph)	0	21	0	0	0	0	213	0	0	128	0	8
Lane Group Flow (vph)	119	397	0	0	158	386	87	80	452	57	199	374
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases							6			8		
Actuated Green, G (s)	8.4	20.4			11.5	23.5	23.5	6.1	24.4	24.4	9.3	27.6
Effective Green, g (s)	8.1	20.6			11.2	23.7	23.7	5.8	25.3	25.3	9.0	28.5
Actuated g/C Ratio	0.10	0.25			0.14	0.29	0.29	0.07	0.31	0.31	0.11	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	172	867			89	537	450	127	563	479	383	635
v/s Ratio Prot	0.07	0.11				0.21		0.04	0.25		0.06	0.20
v/s Ratio Perm					0.24		0.06			0.04		
v/c Ratio	0.69	0.46			1.78	0.72	0.19	0.63	0.80	0.12	0.52	0.59
Uniform Delay, d1	35.8	26.0			35.4	26.2	22.0	37.1	26.1	20.4	34.5	22.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.4	0.5			390.3	4.7	0.2	9.4	8.3	0.1	1.2	1.5
Delay (s)	47.2	26.5			425.7	30.9	22.2	46.5	34.4	20.5	35.7	23.5
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		31.1				101.8			32.2			27.7
Approach LOS		C				F			C			C
Intersection Summary												
HCM 2000 Control Delay		52.9										
HCM 2000 Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		82.1					Sum of lost time (s)		16.0			
Intersection Capacity Utilization		70.5%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Background PM.syn
12/01/2017

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↕
Traffic Volume (vph)	71	390	113	136	429	315	149
Future Volume (vph)	71	390	113	136	429	315	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3423		1770	3574	3467	1552
Flt Permitted	0.91	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1727	3423		1770	3574	3467	1552
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	76	419	122	146	461	339	160
RTOR Reduction (vph)	0	44	0	0	0	0	131
Lane Group Flow (vph)	76	497	0	146	461	339	29
Confl. Peds. (#/hr)			3	5		3	5
Heavy Vehicles (%)	0%	2%	0%	2%	1%	1%	2%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.9	22.4		6.9	24.4	9.2	9.2
Effective Green, g (s)	4.4	22.4		6.4	24.4	9.2	9.2
Actuated g/C Ratio	0.09	0.45		0.13	0.49	0.18	0.18
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	151	1533		226	1744	637	285
v/s Ratio Prot		c0.15		c0.08	0.13	c0.10	
v/s Ratio Perm	0.04						0.02
v/c Ratio	0.50	0.32		0.65	0.26	0.53	0.10
Uniform Delay, d1	21.8	8.9		20.7	7.5	18.5	17.0
Progression Factor	1.00	1.00		1.31	0.76	1.00	1.00
Incremental Delay, d2	1.0	0.6		4.6	0.4	0.4	0.1
Delay (s)	22.7	9.5		31.8	6.1	18.9	17.0
Level of Service	C	A		C	A	B	B
Approach Delay (s)		11.1			12.3	18.3	
Approach LOS		B			B	B	

Intersection Summary

HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Background PM.syn
12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↑↓		↔	↑↓			↔	↔		↔	
Traffic Volume (vph)	0	481	58	106	462	0	103	0	93	0	0	0
Future Volume (vph)	0	481	58	106	462	0	103	0	93	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	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)		3470		1752	3574			1749	1546			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3470		1752	3574			1394	1546			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	540	65	119	519	0	116	0	104	0	0	0
RTOR Reduction (vph)	0	14	0	0	0	0	0	0	88	0	0	0
Lane Group Flow (vph)	0	591	0	119	519	0	0	116	16	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases						8		8		4		
Actuated Green, G (s)		24.7		6.2	34.4			7.6	7.6			
Effective Green, g (s)		24.7		5.7	34.4			7.6	7.6			
Actuated g/C Ratio		0.49		0.11	0.69			0.15	0.15			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1714		199	2458			211	234			
v/s Ratio Prot		c0.17		c0.07	0.15							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.35		0.60	0.21			0.55	0.07			
Uniform Delay, d1		7.7		21.1	2.8			19.6	18.2			
Progression Factor		0.46		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.5		3.2	0.2			1.6	0.0			
Delay (s)		4.1		24.3	3.0			21.2	18.2			
Level of Service		A		C	A			C	B			
Approach Delay (s)		4.1		7.0				19.8		0.0		
Approach LOS		A		A				B		A		

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Background PM.syn
12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↑↓		↔	↑↓			↔	↔		↔	
Traffic Volume (veh/h)	0	481	58	106	462	0	103	0	93	0	0	0
Future Volume (veh/h)	0	481	58	106	462	0	103	0	93	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	540	65	119	519	0	116	0	104	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	1787	214	135	2568	0	315	0	189	0	231	0
Arrive On Green	0.00	1.00	1.00	0.08	0.72	0.00	0.12	0.00	0.12	0.00	0.00	0.00
Sat Flow, veh/h	0	3274	382	1757	3668	0	1405	0	1560	0	1900	0
Grp Volume(V), veh/h	0	300	305	119	519	0	116	0	104	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1793	1757	1787	0	1405	0	1560	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.4	2.4	0.0	4.0	0.0	3.1	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.4	2.4	0.0	4.0	0.0	3.1	0.0	0.0	0.0
Prop In Lane	0.00		0.21	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	994	1007	135	2568	0	315	0	189	0	231	0
V/C Ratio(X)	0.00	0.30	0.30	0.88	0.20	0.00	0.37	0.00	0.55	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	994	1007	211	2568	0	594	0	499	0	608	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	22.9	2.3	0.0	21.0	0.0	20.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.7	15.5	0.2	0.0	0.3	0.0	0.9	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	2.2	1.2	0.0	1.5	0.0	1.4	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.7	0.7	38.4	2.5	0.0	21.3	0.0	21.6	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		605			638			220				0
Approach Delay, s/veh		0.7			9.2			21.4				0.0
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	7.8	32.1		10.1		39.9		10.1				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0				
Max Q Clear Time (g_c+I1), s	5.4	2.0		0.0		4.4		6.0				
Green Ext Time (p_c), s	0.0	7.1		0.0		9.0		0.4				

Intersection Summary			
HCM 2010 Ctrl Delay	7.5		
HCM 2010 LOS	A		

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Background PM.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	16.6								
Intersection LOS	C								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↑↑	↑		↑	↑	6	23	↑
Traffic Vol, veh/h	0	416	22	0	24	14	6	23	414
Future Vol, veh/h	0	416	22	0	24	14	6	23	414
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	467	25	0	27	16	7	26	465
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB			0		
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB			WB			0		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	14.2			10.1			19.6		
HCM LOS	B			B			C		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	208	208	22	24	14	29	414		
LT Vol	208	208	0	0	0	29	0		
Through Vol	0	0	22	24	0	0	0		
RT Vol	0	0	0	0	14	0	414		
Lane Flow Rate	234	234	25	27	16	33	465		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.437	0.435	0.031	0.055	0.029	0.06	0.706		
Departure Headway (Hd)	6.735	6.7	4.47	7.282	6.563	6.66	5.46		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	535	538	799	490	543	537	661		
Service Time	4.474	4.44	2.209	5.05	4.331	4.405	3.204		
HCM Lane V/C Ratio	0.437	0.435	0.031	0.055	0.029	0.061	0.703		
HCM Control Delay	14.6	14.5	7.4	10.5	9.5	9.8	20.3		
HCM Lane LOS	B	B	A	B	A	A	C		
HCM 95th-tile Q	2.2	2.2	0.1	0.2	0.1	0.2	5.8		

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Background PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↑	↑↓		↑	↑↓		↑	↑↓		↑	↑↑	↑	
Traffic Volume (vph)	219	0	165	62	20	26	173	1438	4	17	1368	205	
Future Volume (vph)	219	0	165	62	20	26	173	1438	4	17	1368	205	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Fr	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1698	1459		1715	1662		1805	3573		1805	3574	1583	
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1698	1459		1715	1662		1805	3573		1805	3574	1583	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	226	0	170	64	21	27	178	1482	4	18	1410	211	
RTOR Reduction (vph)	0	141	0	0	25	0	0	0	0	0	0	100	
Lane Group Flow (vph)	203	52	0	57	30	0	178	1486	0	18	1410	111	
Confl. Peds. (#/hr)			7	7			7		7				
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%	
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm	
Protected Phases	2	2		6	6		3	8		7	4		
Permitted Phases	4												
Actuated Green, G (s)	14.7	14.7		5.3	5.3		10.4	47.8		2.7	40.1	40.1	
Effective Green, g (s)	14.9	14.9		5.5	5.5		10.1	48.7		2.4	41.0	41.0	
Actuated g/C Ratio	0.17	0.17		0.06	0.06		0.12	0.56		0.03	0.47	0.47	
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9	
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5	
Lane Grp Cap (vph)	289	248		107	104		208	1988		49	1674	741	
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.10	0.42		0.01	c0.39		
v/s Ratio Perm												0.07	
v/c Ratio	0.70	0.21		0.53	0.29		0.86	0.75		0.37	0.84	0.15	
Uniform Delay, d1	34.2	31.2		39.8	39.1		38.0	14.7		41.8	20.4	13.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	7.8	0.5		6.4	2.1		27.4	1.8		4.6	4.4	0.2	
Delay (s)	42.0	31.7		46.1	41.2		65.4	16.5		46.4	24.8	13.4	
Level of Service	D	C		D	D		E	B		D	C	B	
Approach Delay (s)		37.0			43.7			21.7			23.6		
Approach LOS		D			D			C			C		
Intersection Summary													
HCM 2000 Control Delay	24.8		HCM 2000 Level of Service					C					
HCM 2000 Volume to Capacity ratio	0.79												
Actuated Cycle Length (s)	87.5		Sum of lost time (s)					16.0					
Intersection Capacity Utilization	78.4%		ICU Level of Service					D					
Analysis Period (min)	15												
c Critical Lane Group													

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Background PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	219	0	165	62	20	26	173	1438	4	17	1368	205
Future Volume (veh/h)	219	0	165	62	20	26	173	1438	4	17	1368	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1818	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	198	39	170	56	32	27	178	1482	4	18	1410	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	302	50	216	146	76	64	208	1946	5	45	1579	700
Arrive On Green	0.17	0.17	0.17	0.08	0.08	0.08	0.12	0.53	0.52	0.03	0.44	0.00
Sat Flow, veh/h	1792	293	1279	1810	942	794	1810	3657	10	1810	3574	1583
Grp Volume(V), veh/h	198	0	209	56	0	59	178	724	762	18	1410	0
Grp Sat Flow(s),veh/h/ln	1792	0	1573	1810	0	1736	1810	1787	1879	1810	1787	1583
Q Serve(g_s), s	8.6	0.0	10.6	2.4	0.0	2.7	8.0	26.4	26.4	0.8	30.1	0.0
Cycle Q Clear(g_c), s	8.6	0.0	10.6	2.4	0.0	2.7	8.0	26.4	26.4	0.8	30.1	0.0
Prop In Lane	1.00		0.81	1.00		0.46	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	302	0	265	146	0	141	208	951	1000	45	1579	700
V/C Ratio(X)	0.66	0.00	0.79	0.38	0.00	0.42	0.85	0.76	0.76	0.40	0.89	0.00
Avail Cap(c_a), veh/h	385	0	338	157	0	151	219	951	1000	153	1683	746
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.2	0.0	33.1	36.1	0.0	36.2	35.9	15.2	15.2	39.8	21.3	0.0
Incr Delay (d2), s/veh	3.1	0.0	9.9	2.3	0.0	2.8	25.7	4.1	3.9	5.5	6.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	5.3	1.3	0.0	1.4	5.5	14.0	14.6	0.5	16.1	0.0
LnGrp Delay(d),s/veh	35.3	0.0	43.0	38.4	0.0	39.1	61.7	19.3	19.1	45.3	27.9	0.0
LnGrp LOS	D		D	D		D	E	B	B	D	C	
Approach Vol, veh/h		407			115			1664			1428	
Approach Delay, s/veh		39.3			38.7			23.8			28.1	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.0	13.5	40.6		10.7	6.1	48.1				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 18	10.3	38.1		7.0	7.3	41.1				
Max Q Clear Time (g_c+I1), s		12.6	10.0	32.1		4.7	2.8	28.4				
Green Ext Time (p_c), s		1.0	0.0	3.6		0.1	0.0	12.4				

Intersection Summary

HCM 2010 Ctrl Delay	27.7
HCM 2010 LOS	C

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Background PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	869	18	22	17	6	54	6	1713	17	55	1537	493
Future Volume (vph)	869	18	22	17	6	54	6	1713	17	55	1537	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1743		1715	1761	1524	1805	3531		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1743		1715	1761	1524	1805	3531		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	22	17	6	55	6	1748	17	56	1568	503
RTOR Reduction (vph)	0	16	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	24	0	11	12	3	6	1765	0	56	1568	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	37.5	37.5		6.6	6.6	6.6	1.5	73.1		6.3	78.4	141.4
Effective Green, g (s)	38.1	38.1		6.8	6.8	6.8	1.2	74.0		6.5	79.3	141.4
Actuated g/C Ratio	0.27	0.27		0.05	0.05	0.05	0.01	0.52		0.05	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	934	469		82	84	73	15	1847		82	2004	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.00	c0.50		c0.03	0.44	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.95	0.05		0.13	0.14	0.04	0.40	0.96		0.68	0.78	0.31
Uniform Delay, d1	50.7	38.3		64.5	64.5	64.2	69.7	32.1		66.4	24.3	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.6	0.1		1.3	1.4	0.4	16.6	12.3		20.9	2.4	0.5
Delay (s)	69.3	38.3		65.8	65.9	64.5	86.3	44.4		87.4	26.7	0.5
Level of Service	E	D		E	E	E	F	D		F	C	A
Approach Delay (s)		67.9			64.9			44.6			22.1	
Approach LOS		E			E			D			C	

Intersection Summary

HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Background PM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.9												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	103	1	12	4	0	4	6	428	0	1	425	40
Future Vol, veh/h	103	1	12	4	0	4	6	428	0	1	425	40
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	113	1	13	4	0	4	7	470	0	1	467	44

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	755	988	271	733	1010	248	519	0	0	475	0	0
Stage 1	499	499	-	489	489	-	-	-	-	-	-	-
Stage 2	256	489	-	244	521	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	298	249	709	312	242	758	1057	-	-	1098	-	-
Stage 1	522	547	-	534	553	-	-	-	-	-	-	-
Stage 2	726	553	-	744	535	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	290	244	700	299	237	750	1050	-	-	1091	-	-
Mov Cap-2 Maneuver	290	244	-	299	237	-	-	-	-	-	-	-
Stage 1	514	543	-	527	546	-	-	-	-	-	-	-
Stage 2	710	546	-	723	531	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	24.7			13.6			0.1			0		
HCM LOS	C			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1050	-	-	308	428	1091	-	-
HCM Lane V/C Ratio	0.006	-	-	0.414	0.021	0.001	-	-
HCM Control Delay (s)	8.4	0	-	24.7	13.6	8.3	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.9	0.1	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Background PM.syn
12/01/2017

Intersection												
Int Delay, s/veh 3.4												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	148	428	16	6	403	29	10	6	4	6	3	155
Future Vol, veh/h	148	428	16	6	403	29	10	6	4	6	3	155
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	157	455	17	6	429	31	11	6	4	6	3	165

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	464	0	0	489	0	0	1038	1272	270	1024	1265	247
Stage 1	-	-	-	-	-	-	796	796	-	461	461	-
Stage 2	-	-	-	-	-	-	242	476	-	563	804	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1101	-	-	1085	-	-	188	169	734	192	171	753
Stage 1	-	-	-	-	-	-	351	402	-	555	569	-
Stage 2	-	-	-	-	-	-	746	560	-	483	398	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1089	-	-	1070	-	-	124	141	713	160	143	742
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	141	-	160	143	-
Stage 1	-	-	-	-	-	-	296	339	-	473	564	-
Stage 2	-	-	-	-	-	-	567	555	-	397	336	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.2			0.1			31.9			13.2		
HCM LOS	D						D			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	155	1089	-	-	1070	-	-	613
HCM Lane V/C Ratio	0.137	0.145	-	-	0.006	-	-	0.285
HCM Control Delay (s)	31.9	8.9	-	-	8.4	-	-	13.2
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.5	-	-	0	-	-	1.2

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Background PM.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (vph)	965	111	15	606	136	34
Future Volume (vph)	965	111	15	606	136	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1749	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1749	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1038	119	16	652	146	37
RTOR Reduction (vph)	0	45	0	0	11	0
Lane Group Flow (vph)	1038	74	16	652	172	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	45.6	45.6	0.6	50.4	11.8	
Effective Green, g (s)	45.6	45.6	0.6	50.4	11.8	
Actuated g/C Ratio	0.62	0.62	0.01	0.69	0.16	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1173	976	14	1284	282	
v/s Ratio Prot	c0.55		0.01	c0.35	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.88	0.08	1.14	0.51	0.61	
Uniform Delay, d1	11.5	5.4	36.2	5.4	28.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.4	0.0	291.3	0.4	2.7	
Delay (s)	20.0	5.5	327.5	5.8	31.2	
Level of Service	B	A	F	A	C	
Approach Delay (s)	18.5			13.5	31.2	
Approach LOS	B			B	C	

Intersection Summary					
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.84				
Actuated Cycle Length (s)	73.1	Sum of lost time (s)		15.1	
Intersection Capacity Utilization	69.5%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Background PM.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (veh/h)	965	111	15	606	136	34
Future Volume (veh/h)	965	111	15	606	136	34
Number	2	12	1	6	3	18
Initial Q (Ob), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1870	1900
Adj Flow Rate, veh/h	1038	119	16	652	146	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	0	2	0	0
Cap, veh/h	1240	1032	28	1368	195	0
Arrive On Green	0.66	0.66	0.02	0.73	0.11	0.00
Sat Flow, veh/h	1881	1566	1810	1863	1770	0
Grp Volume(V), veh/h	1038	119	16	652	147	0
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1782	0
Q Serve(g_s), s	29.4	2.0	0.6	10.0	5.6	0.0
Cycle Q Clear(g_c), s	29.4	2.0	0.6	10.0	5.6	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1240	1032	28	1368	197	0
V/C Ratio(X)	0.84	0.12	0.58	0.48	0.75	0.00
Avail Cap(c_a), veh/h	1418	1180	103	1622	457	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.1	4.4	34.3	3.8	30.3	0.0
Incr Delay (d2), s/veh	4.3	0.1	6.9	0.3	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.5	0.8	0.4	5.2	2.9	0.0
LnGrp Delay(d),s/veh	13.4	4.5	41.2	4.1	32.4	0.0
LnGrp LOS	B	A	D	A	C	
Approach Vol, veh/h	1157			668	147	
Approach Delay, s/veh	12.5			5.0	32.4	
Approach LOS	B			A	C	
Timer	1	2	3	4	5	6
Assigned Phs	1	2				6
Phs Duration (G+Y+Rc), s	5.3	52.7				57.9
Change Period (Y+Rc), s	* 4.2	6.4				6.4
Max Green Setting (Gmax), s	* 4	52.9				61.1
Max Q Clear Time (g_c+I1), s	2.6	31.4				12.0
Green Ext Time (p_c), s	0.0	14.8				24.5

Intersection Summary							
HCM 2010 Ctrl Delay	11.4						
HCM 2010 LOS	B						

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Background PM.syn
12/01/2017

Intersection												
Int Delay, s/veh 4.2												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔		↔	↔
Traffic Vol, veh/h	57	910	24	16	539	19	24	1	28	14	2	46
Future Vol, veh/h	57	910	24	16	539	19	24	1	28	14	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	64	1022	27	18	606	21	27	1	31	16	2	52

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3							
Conflicting Flow All	627	0	0	1022	0	0	1804	1814	1022	1803	1803	616
Stage 1	-	-	-	-	-	-	1151	1151	-	652	652	-
Stage 2	-	-	-	-	-	-	653	663	-	1151	1151	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	965	-	-	687	-	-	62	79	289	62	80	494
Stage 1	-	-	-	-	-	-	243	275	-	460	467	-
Stage 2	-	-	-	-	-	-	460	462	-	243	275	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	965	-	-	687	-	-	50	72	289	51	73	494
Mov Cap-2 Maneuver	-	-	-	-	-	-	50	72	-	51	73	-
Stage 1	-	-	-	-	-	-	227	257	-	429	455	-
Stage 2	-	-	-	-	-	-	399	450	-	201	257	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	76.5	36.7
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	51	289	965	-	-	687	-	-	53	494
HCM Lane V/C Ratio	0.551	0.109	0.066	-	-	0.026	-	-	0.339	0.105
HCM Control Delay (s)	141	19	9	-	-	10.4	-	-	104.4	13.1
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	2.1	0.4	0.2	-	-	0.1	-	-	1.2	0.3

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Background PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 0.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	37	1	7	657	484	37
Future Vol, veh/h	37	1	7	657	484	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	-	0
Grade, %	0	-	-	0	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	39	1	7	692	509	39

Major/Minor	Minor2	Major1	Major2	Minor3		
Conflicting Flow All	1215	509	509	0	-	0
Stage 1	509	-	-	-	-	-
Stage 2	706	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	202	568	1066	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	200	568	1066	-	-	-
Mov Cap-2 Maneuver	200	-	-	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	488	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1066	-	203	-	-
HCM Lane V/C Ratio	0.007	-	0.197	-	-
HCM Control Delay (s)	8.4	0	27	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.7	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Background PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.4						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕			↕
Traffic Vol, veh/h	21	58	410	36	30	445
Future Vol, veh/h	21	58	410	36	30	445
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	22	61	432	38	32	468

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	995	462	0 0 475 0
Stage 1	457	-	- - - -
Stage 2	538	-	- - - -
Critical Hdwy	6.4	6.2	- - 4.1 -
Critical Hdwy Stg 1	5.4	-	- - - -
Critical Hdwy Stg 2	5.4	-	- - - -
Follow-up Hdwy	3.5	3.3	- - 2.2 -
Pot Cap-1 Maneuver	274	604	- - 1098 -
Stage 1	642	-	- - - -
Stage 2	589	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	260	598	- - 1093 -
Mov Cap-2 Maneuver	260	-	- - - -
Stage 1	639	-	- - - -
Stage 2	563	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	15	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 444 1093	-	-
HCM Lane V/C Ratio	-	- 0.187 0.029	-	-
HCM Control Delay (s)	-	- 15 8.4	0	-
HCM Lane LOS	-	- C A A	-	-
HCM 95th %tile Q(veh)	-	- 0.7 0.1	-	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Background PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↕	↕	↕
Traffic Vol, veh/h	14	114	124	364	327	28
Future Vol, veh/h	14	114	124	364	327	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	125	136	400	359	31

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1040	367	363 0 - 0
Stage 1	363	-	- - - -
Stage 2	677	-	- - - -
Critical Hdwy	6.4	6.21	4.1 - - -
Critical Hdwy Stg 1	5.4	-	- - - -
Critical Hdwy Stg 2	5.4	-	- - - -
Follow-up Hdwy	3.5	3.309	2.2 - - -
Pot Cap-1 Maneuver	257	681	1207 - - -
Stage 1	708	-	- - - -
Stage 2	509	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	226	676	1203 - - -
Mov Cap-2 Maneuver	226	-	- - - -
Stage 1	706	-	- - - -
Stage 2	450	-	- - - -

Approach	EB	NB	SB
HCM Control Delay, s	13.7	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1203	- 555	-	-
HCM Lane V/C Ratio	0.113	- 0.253	-	-
HCM Control Delay (s)	8.4	- 13.7	-	-
HCM Lane LOS	A	- B	-	-
HCM 95th %tile Q(veh)	0.4	- 1	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Background PM.syn
12/01/2017

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	27	128	101	277	221	17
Future Vol, veh/h	27	128	101	277	221	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	136	107	295	235	18
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	764	254	258	0	0	
Stage 1	249	-	-	-	-	
Stage 2	515	-	-	-	-	
Critical Hdwy	7.1	6.22	4.11	-	-	
Critical Hdwy Stg 1	6.1	-	-	-	-	
Critical Hdwy Stg 2	6.1	-	-	-	-	
Follow-up Hdwy	3.5	3.318	2.209	-	-	
Pot Cap-1 Maneuver	323	785	1313	-	-	
Stage 1	759	-	-	-	-	
Stage 2	546	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	300	778	1308	-	-	
Mov Cap-2 Maneuver	300	-	-	-	-	
Stage 1	694	-	-	-	-	
Stage 2	499	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	13.1	2.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1308	-	609	-	-	
HCM Lane V/C Ratio	0.082	-	0.271	-	-	
HCM Control Delay (s)	8	-	13.1	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-	

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background PM.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	9.6												
Intersection LOS	A												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Lane Configurations			↕				↕				↕		
Traffic Vol, veh/h	0	2	1	111	0	3	0	0	0	128	166	3	
Future Vol, veh/h	0	2	1	111	0	3	0	0	0	128	166	3	
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0	
Mvmt Flow	0	2	1	122	0	3	0	0	0	141	182	3	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach	EB			WB				NB					
Opposing Approach	WB			EB				SB					
Opposing Lanes	1			1				1					
Conflicting Approach Left	SB			NB				EB					
Conflicting Lanes Left	1			1				1					
Conflicting Approach Right	NB			SB				WB					
Conflicting Lanes Right	1			1				1					
HCM Control Delay	8.2			8.4				10.5					
HCM LOS	A			A				B					
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	43%	2%	100%	1%									
Vol Thru, %	56%	1%	0%	99%									
Vol Right, %	1%	97%	0%	0%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	297	114	3	130									
LT Vol	128	2	3	1									
Through Vol	166	1	0	129									
RT Vol	3	111	0	0									
Lane Flow Rate	326	125	3	143									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0.403	0.153	0.005	0.18									
Departure Headway (Hd)	4.443	4.383	5.33	4.544									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	809	818	670	789									
Service Time	2.469	2.412	3.372	2.574									
HCM Lane V/C Ratio	0.403	0.153	0.004	0.181									
HCM Control Delay	10.5	8.2	8.4	8.6									
HCM Lane LOS	B	A	A	A									
HCM 95th-tile Q	2	0.5	0	0.7									

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background PM.syn
12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	129	0
Future Vol, veh/h	0	1	129	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	142	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.6
HCM LOS	A

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Background Saturday.syn
12/01/2017

	↙	↘	↑	↗	↖	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗↘	↑	↗	↖↗	↑
Traffic Volume (vph)	0	886	708	80	941	758
Future Volume (vph)	0	886	708	80	941	758
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Flt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	913	730	82	970	781
RTOR Reduction (vph)	0	177	0	13	0	0
Lane Group Flow (vph)	0	736	730	69	970	781
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		16.4	21.6	21.6	16.4	47.8
Effective Green, g (s)		17.3	22.5	22.5	17.3	47.8
Actuated g/C Ratio		0.36	0.47	0.47	0.36	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1028	885	760	1254	1881
v/s Ratio Prot		0.26	c0.39		c0.28	0.42
v/s Ratio Perm				0.04		
v/c Ratio		0.72	0.82	0.09	0.77	0.42
Uniform Delay, d1		13.1	10.9	7.0	13.5	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		2.7	6.5	0.1	3.4	0.7
Delay (s)		15.9	17.4	7.1	16.9	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	15.9		16.4			9.7
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	47.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Background Saturday.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	746	251	412	669	3	202	15	395	2	15	14
Future Volume (vph)	25	746	251	412	669	3	202	15	395	2	15	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1716	1575		1890	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1716	1575		1890	1615
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)	27	794	267	438	712	3	215	16	420	2	16	15
RTOR Reduction (vph)	0	0	172	0	0	0	0	0	92	0	0	15
Lane Group Flow (vph)	27	794	95	438	715	0	116	115	328	0	18	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.6	20.7	20.7	11.2	30.3		7.7	7.7	18.9		1.0	1.0
Effective Green, g (s)	2.1	21.7	21.7	11.8	31.3		9.5	9.5	20.1		2.0	2.0
Actuated g/C Ratio	0.03	0.36	0.36	0.19	0.51		0.16	0.16	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	62	1271	566	670	1850		264	267	518		61	52
v/s Ratio Prot	0.01	c0.22		c0.13	0.20		0.07	0.07	c0.12		c0.01	
v/s Ratio Perm			0.06						0.09			0.00
v/c Ratio	0.44	0.62	0.17	0.65	0.39		0.44	0.43	0.63		0.30	0.01
Uniform Delay, d1	28.9	16.3	13.5	22.7	9.0		23.3	23.3	17.3		28.8	28.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.7	0.1	1.8	0.0		0.4	0.4	1.9		1.0	0.0
Delay (s)	30.6	17.0	13.5	24.5	9.1		23.8	23.7	19.2		29.8	28.6
Level of Service	C	B	B	C	A		C	C	B		C	C
Approach Delay (s)		16.5			14.9			20.8			29.2	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	16.1
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary

Background Saturday.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	746	251	412	669	3	202	15	395	2	15	14
Future Volume (veh/h)	25	746	251	412	669	3	202	15	395	2	15	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	794	267	438	712	3	226	0	420	2	16	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	56	1030	459	560	1536	6	995	0	661	7	59	57
Arrive On Green	0.03	0.29	0.29	0.16	0.42	0.40	0.28	0.00	0.26	0.04	0.04	0.04
Sat Flow, veh/h	1810	3574	1593	3476	3686	16	3583	0	1561	210	1680	1615
Grp Volume(v), veh/h	27	794	267	438	349	366	226	0	420	18	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1593	1738	1805	1897	1792	0	1561	1890	0	1615
Q Serve(g_s), s	1.0	13.7	9.6	8.1	9.4	9.4	3.3	0.0	14.3	0.6	0.0	0.6
Cycle Q Clear(g_c), s	1.0	13.7	9.6	8.1	9.4	9.4	3.3	0.0	14.3	0.6	0.0	0.6
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.11		1.00
Lane Grp Cap(c), veh/h	56	1030	459	560	752	790	995	0	661	67	0	57
V/C Ratio(X)	0.48	0.77	0.58	0.78	0.46	0.46	0.23	0.00	0.64	0.27	0.00	0.26
Avail Cap(c_a), veh/h	148	1232	549	671	821	863	1800	0	1011	112	0	96
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.1	21.9	20.5	27.1	14.2	14.2	18.7	0.0	15.4	31.6	0.0	31.6
Incr Delay (d2), s/veh	2.4	2.0	0.4	4.0	0.2	0.2	0.0	0.0	0.4	0.8	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.0	4.3	4.2	4.7	4.9	1.6	0.0	6.1	0.3	0.0	0.3
LnGrp Delay(d),s/veh	34.4	23.9	20.9	31.1	14.4	14.3	18.8	0.0	15.8	32.4	0.0	32.5
LnGrp LOS	C	C	C	C	B	B	B		B	C		C
Approach Vol, veh/h		1088			1153			646			33	
Approach Delay, s/veh		23.4			20.7			16.9			32.4	
Approach LOS		C			C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	32.0		22.7	14.8	23.4		6.4				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 12	22.2		3.0				
Max Q Clear Time (g_c+I1), s	3.0	11.4		16.3	10.1	15.7		2.6				
Green Ext Time (p_c), s	0.0	4.0		0.4	0.1	2.7		0.0				

Intersection Summary			
HCM 2010 Ctrl Delay	21.0		
HCM 2010 LOS	C		

Notes

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	134	319	70	8	182	323	278	72	377	152	264	440
Future Volume (vph)	134	319	70	8	182	323	278	72	377	152	264	440
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3486			1795	1881	1556	1805	1863	1590	3502	1838
Flt Permitted	0.95	1.00			0.35	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3486			669	1881	1556	1805	1863	1590	3502	1838
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	135	322	71	8	184	326	281	73	381	154	267	444
RTOR Reduction (vph)	0	23	0	0	0	0	206	0	0	106	0	5
Lane Group Flow (vph)	135	370	0	0	192	326	75	73	381	48	267	494
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.5	17.6			11.6	20.7	20.7	6.1	23.3	23.3	9.4	26.6
Effective Green, g (s)	8.2	17.8			11.3	20.9	20.9	5.8	24.2	24.2	9.1	27.5
Actuated g/C Ratio	0.10	0.23			0.14	0.27	0.27	0.07	0.31	0.31	0.12	0.35
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	186	791			96	501	414	133	575	490	406	644
v/s Ratio Prot	0.08	0.11				c0.17		0.04	0.20		c0.08	c0.27
v/s Ratio Perm					c0.29		0.05			0.03		
v/c Ratio	0.73	0.47			2.00	0.65	0.18	0.55	0.66	0.10	0.66	0.77
Uniform Delay, d1	34.0	26.2			33.6	25.5	22.2	35.0	23.6	19.3	33.2	22.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.1	0.5			484.8	3.1	0.2	4.6	3.0	0.1	3.8	5.6
Delay (s)	47.2	26.7			518.4	28.7	22.4	39.6	26.5	19.4	37.0	28.3
Level of Service	D	C			F	C	C	D	C	B	D	C
Approach Delay (s)		31.9				144.1			26.3			31.3
Approach LOS		C				F			C			C
Intersection Summary												
HCM 2000 Control Delay		63.7										E
HCM 2000 Volume to Capacity ratio		0.94										
Actuated Cycle Length (s)		78.4				Sum of lost time (s)		16.0				
Intersection Capacity Utilization		71.6%				ICU Level of Service		C				
Analysis Period (min)		15										
c Critical Lane Group												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background Saturday.syn
12/01/2017

Movement	
Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	1.00
Satd. Flow (prot)	3502
Flt Permitted	1.00
Satd. Flow (perm)	3502
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Background Saturday.syn
12/01/2017

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	84	322	160	157	402	298	156
Future Volume (vph)	84	322	160	157	402	298	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3405		1787	3610	3467	1532
Flt Permitted	0.42	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	800	3405		1787	3610	3467	1532
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	339	168	165	423	314	164
RTOR Reduction (vph)	0	81	0	0	0	0	136
Lane Group Flow (vph)	88	426	0	165	423	314	28
Confl. Peds. (#/hr)			5	9		5	9
Confl. Bikes (#/hr)			11			11	
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	1%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	10.0	26.6		7.6	24.2	9.3	9.3
Effective Green, g (s)	9.5	26.6		7.1	24.2	9.3	9.3
Actuated g/C Ratio	0.17	0.48		0.13	0.44	0.17	0.17
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	138	1646		230	1588	586	259
v/s Ratio Prot		c0.13		0.09	0.12	c0.09	
v/s Ratio Perm	c0.11						0.02
v/c Ratio	0.64	0.26		0.72	0.27	0.54	0.11
Uniform Delay, d1	21.2	8.4		23.0	9.8	20.9	19.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	6.9	0.4		8.6	0.4	0.5	0.1
Delay (s)	28.1	8.8		31.5	10.2	21.4	19.4
Level of Service	C	A		C	B	C	B
Approach Delay (s)		11.6			16.2	20.7	
Approach LOS		B			B	C	
Intersection Summary							
HCM 2000 Control Delay		15.8		HCM 2000 Level of Service			B
HCM 2000 Volume to Capacity ratio		0.40					
Actuated Cycle Length (s)		55.0		Sum of lost time (s)			12.0
Intersection Capacity Utilization		41.4%		ICU Level of Service			A
Analysis Period (min)		15					
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Background Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔			↔	↔		↔	↔
Traffic Volume (vph)	0	436	42	109	481	0	78	0	70	0	0	0
Future Volume (vph)	0	436	42	109	481	0	78	0	70	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.96			
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3553		1805	3574			1797	1539			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3553		1805	3574			1432	1539			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	479	46	120	529	0	86	0	77	0	0	0
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	67	0	0	0
Lane Group Flow (vph)	0	515	0	120	529	0	0	86	10	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10				10		10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6		8	8			4	
Permitted Phases							8	8		4		
Actuated Green, G (s)		25.8		6.1	35.4		6.6	6.6				
Effective Green, g (s)		25.8		5.6	35.4		6.6	6.6				
Actuated g/C Ratio		0.52		0.11	0.71		0.13	0.13				
Clearance Time (s)		4.0		3.5	4.0		4.0	4.0				
Vehicle Extension (s)		2.0		1.0	5.0		2.0	2.0				
Lane Grp Cap (vph)		1833		202	2530		189	203				
v/s Ratio Prot		c0.14		c0.07	0.15							
v/s Ratio Perm							c0.06	0.01				
v/c Ratio		0.28		0.59	0.21		0.46	0.05				
Uniform Delay, d1		6.8		21.1	2.5		20.0	19.0				
Progression Factor		1.00		1.00	1.00		1.00	1.00				
Incremental Delay, d2		0.4		3.1	0.2		0.6	0.0				
Delay (s)		7.2		24.2	2.7		20.7	19.0				
Level of Service		A		C	A		C	B				
Approach Delay (s)		7.2			6.7		19.9				0.0	
Approach LOS		A			A		B				A	
Intersection Summary												
HCM 2000 Control Delay				8.5			HCM 2000 Level of Service					A
HCM 2000 Volume to Capacity ratio				0.36								
Actuated Cycle Length (s)				50.0			Sum of lost time (s)					12.0
Intersection Capacity Utilization				33.8%			ICU Level of Service					A
Analysis Period (min)				15								
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center Pl & Rio Rd

Background Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↓	↑↑			↓	↑		↑↓	
Traffic Volume (veh/h)	0	436	42	109	481	0	78	0	70	0	0	0
Future Volume (veh/h)	0	436	42	109	481	0	78	0	70	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s,veh/h/ln)	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	479	46	120	529	0	86	0	77	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	1963	188	137	2670	0	278	0	141	0	177	0
Arrive On Green	0.00	0.59	0.59	0.08	0.75	0.00	0.09	0.00	0.09	0.00	0.00	0.00
Sat Flow, veh/h	0	3416	318	1810	3668	0	1440	0	1522	0	1900	0
Grp Volume(v), veh/h	0	259	266	120	529	0	86	0	77	0	0	0
Grp Sat Flow(s,veh/h/ln)	0	1805	1833	1810	1787	0	1440	0	1522	0	1900	0
Q Serve(g_s), s	0.0	3.4	3.5	3.3	2.2	0.0	2.9	0.0	2.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	3.4	3.5	3.3	2.2	0.0	2.9	0.0	2.4	0.0	0.0	0.0
Prop In Lane	0.00		0.17	1.00		0.00	1.00		1.00	0.00	0.00	0.00
Lane Grp Cap(c), veh/h	0	1067	1084	137	2670	0	278	0	141	0	177	0
V/C Ratio(X)	0.00	0.24	0.24	0.87	0.20	0.00	0.31	0.00	0.54	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1067	1084	217	2670	0	605	0	487	0	608	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.96	0.96	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	4.9	4.9	22.9	1.9	0.0	21.9	0.0	21.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	13.2	0.2	0.0	0.2	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.9	2.1	1.1	0.0	1.2	0.0	1.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	5.4	5.4	36.0	2.0	0.0	22.1	0.0	22.9	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		525			649			163			0	
Approach Delay, s/veh		5.4			8.3			22.5			0.0	
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	7.8	33.6		8.6		41.4		8.6				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0				
Max Q Clear Time (g_c+I1), s	5.3	5.5		0.0		4.2		4.9				
Green Ext Time (p_c), s	0.0	5.7		0.0		8.8		0.3				

Intersection Summary

HCM 2010 Ctrl Delay	8.9
HCM 2010 LOS	A

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Background Saturday.syn
12/12/2017

Intersection

Intersection Delay, s/veh	14.3
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↑↑	↑		↑	↑		↓	↑
Traffic Vol, veh/h	0	309	18	0	22	11	2	19	433
Future Vol, veh/h	0	309	18	0	22	11	2	19	433
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	332	19	0	24	12	2	20	466
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach

	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	11.8	9.7	16.4
HCM LOS	B	A	C

Lane

	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	155	155	18	22	11	21	433
LT Vol	155	155	0	0	0	21	0
Through Vol	0	0	18	22	0	0	0
RT Vol	0	0	0	0	11	0	433
Lane Flow Rate	166	166	19	24	12	23	466
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.303	0.302	0.023	0.045	0.021	0.039	0.655
Departure Headway (Hd)	6.564	6.547	4.319	6.831	6.272	6.262	5.062
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	548	550	828	524	570	575	717
Service Time	4.297	4.28	2.051	4.581	4.021	3.962	2.762
HCM Lane V/C Ratio	0.303	0.302	0.023	0.046	0.021	0.04	0.65
HCM Control Delay	12.1	12.1	7.2	9.9	9.2	9.2	16.8
HCM Lane LOS	B	B	A	A	A	A	C
HCM 95th-tile Q	1.3	1.3	0.1	0.1	0.1	0.1	4.9

Synchro 9 Report

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Background Saturday.syn
12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	↖
Traffic Volume (vph)	271	7	179	42	11	9	204	1314	7	5	1480	289
Future Volume (vph)	271	7	179	42	11	9	204	1314	7	5	1480	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.88		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1569		1715	1683		1787	3569		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1569		1715	1683		1787	3569		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	181	42	11	9	206	1327	7	5	1495	292
RTOR Reduction (vph)	0	150	0	0	9	0	0	0	0	0	0	129
Lane Group Flow (vph)	241	71	0	31	22	0	206	1334	0	5	1495	163
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.1	15.1		3.9	3.9		11.4	51.5		1.3	41.4	41.4
Effective Green, g (s)	15.3	15.3		4.1	4.1		11.1	52.4		1.0	42.3	42.3
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.12	0.59		0.01	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	292	270		79	77		223	2106		20	1702	752
v/s Ratio Prot	c0.14	0.05		c0.02	0.01		c0.12	0.37		0.00	c0.42	
v/s Ratio Perm												0.10
v/c Ratio	0.83	0.26		0.39	0.29		0.92	0.63		0.25	0.88	0.22
Uniform Delay, d1	35.5	31.9		41.1	40.9		38.4	11.9		43.5	20.9	13.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.4	0.6		4.3	2.9		39.6	0.8		6.5	5.8	0.3
Delay (s)	52.9	32.5		45.5	43.8		78.0	12.7		50.0	26.8	13.8
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		43.1			44.6			21.4			24.7	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	88.8	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 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Background Saturday.syn
12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	↖
Traffic Volume (veh/h)	271	7	179	42	11	9	204	1314	7	5	1480	289
Future Volume (veh/h)	271	7	179	42	11	9	204	1314	7	5	1480	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1897	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	231	67	181	31	26	9	206	1327	7	5	1495	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	315	80	216	121	90	31	229	2061	11	10	1586	717
Arrive On Green	0.18	0.18	0.17	0.07	0.07	0.06	0.13	0.57	0.56	0.01	0.44	0.00
Sat Flow, veh/h	1792	454	1227	1810	1342	465	1792	3643	19	1810	3574	1615
Grp Volume(v), veh/h	231	0	248	31	0	35	206	650	684	5	1495	0
Grp Sat Flow(s),veh/h/ln	1792	0	1681	1810	0	1807	1792	1786	1877	1810	1787	1615
Q Serve(g_s), s	10.5	0.0	12.3	1.4	0.0	1.6	9.8	21.4	21.4	0.2	34.4	0.0
Cycle Q Clear(g_c), s	10.5	0.0	12.3	1.4	0.0	1.6	9.8	21.4	21.4	0.2	34.4	0.0
Prop In Lane	1.00		0.73	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	315	0	295	121	0	121	229	1010	1062	10	1586	717
V/C Ratio(X)	0.73	0.00	0.84	0.26	0.00	0.29	0.90	0.64	0.64	0.49	0.94	0.00
Avail Cap(c_a), veh/h	350	0	328	151	0	151	229	1010	1062	147	1619	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.6	0.0	34.4	38.1	0.0	38.2	37.0	12.8	12.8	42.7	22.9	0.0
Incr Delay (d2), s/veh	7.4	0.0	16.6	1.6	0.0	1.9	33.9	1.8	1.7	31.6	11.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	0.0	7.1	0.8	0.0	0.9	7.0	11.0	11.5	0.2	19.4	0.0
LnGrp Delay(d),s/veh	40.9	0.0	50.9	39.7	0.0	40.1	70.9	14.5	14.4	74.2	34.5	0.0
LnGrp LOS	D		D	D		D	E	B	B	E	C	
Approach Vol, veh/h		479			66			1540				1500
Approach Delay, s/veh		46.1			39.9			22.0				34.7
Approach LOS		D			D			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.1	15.0	42.2		9.8	4.5	52.7				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 17	11.3	38.1		7.0	7.3	42.1				
Max Q Clear Time (g_c+I1), s		14.3	11.8	36.4		3.6	2.2	23.4				
Green Ext Time (p_c), s		0.6	0.0	0.9		0.1	0.0	17.9				

Intersection Summary			
HCM 2010 Ctrl Delay	30.9		
HCM 2010 LOS	C		
Notes			

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Background Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	390	10	23	21	11	34	36	1513	25	40	1810	557
Future Volume (vph)	390	10	23	21	11	34	36	1513	25	40	1810	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1681		1715	1774	1584	1805	3565		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1681		1715	1774	1584	1805	3565		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	24	22	11	35	37	1560	26	41	1866	574
RTOR Reduction (vph)	0	20	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	14	0	16	17	2	37	1585	0	41	1866	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.8	15.8		6.6	6.6	6.6	4.6	62.8		4.5	63.2	107.6
Effective Green, g (s)	16.4	16.4		6.8	6.8	6.8	4.3	63.7		4.7	64.1	107.6
Actuated g/C Ratio	0.15	0.15		0.06	0.06	0.06	0.04	0.59		0.04	0.60	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	523	256		108	112	100	72	2110		78	2129	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.44		0.02	c0.52	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.77	0.05		0.15	0.15	0.02	0.51	0.75		0.53	0.88	0.37
Uniform Delay, d1	43.8	39.0		47.7	47.7	47.3	50.6	16.1		50.4	18.4	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	0.2		1.1	1.1	0.2	6.1	1.9		6.3	4.8	0.7
Delay (s)	51.3	39.1		48.8	48.8	47.4	56.7	18.0		56.6	23.2	0.7
Level of Service	D	D		D	D	D	E	B		E	C	A
Approach Delay (s)		50.3			48.1			18.9			18.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	107.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Background Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	64	0	14	1	0	0	6	319	0	0	434	30
Future Vol, veh/h	64	0	14	1	0	0	6	319	0	0	434	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	73	0	16	1	0	0	7	363	0	0	493	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	705	886	264	623	903	181	527	0	0	363	0	0
Stage 1	510	510	-	376	376	-	-	-	-	-	-	-
Stage 2	195	376	-	247	527	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	323	286	741	375	279	837	1050	-	-	1207	-	-
Stage 1	514	541	-	623	620	-	-	-	-	-	-	-
Stage 2	788	620	-	741	532	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	321	284	741	365	277	837	1050	-	-	1207	-	-
Mov Cap-2 Maneuver	321	284	-	365	277	-	-	-	-	-	-	-
Stage 1	510	541	-	618	615	-	-	-	-	-	-	-
Stage 2	782	615	-	725	532	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.4	14.9	0.2	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1050	-	-	357	365	1207	-	-
HCM Lane V/C Ratio	0.006	-	-	0.248	0.003	-	-	-
HCM Control Delay (s)	8.5	0	-	18.4	14.9	0	-	-
HCM Lane LOS	A	A	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Background Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖			↕		↕		
Traffic Vol, veh/h	191	315	12	5	419	31	7	0	6	6	1	164
Future Vol, veh/h	191	315	12	5	419	31	7	0	6	6	1	164
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	208	342	13	5	455	34	8	0	7	7	1	178

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	493	0	0	363	0	0	1015	1276	194	1081	1266	253
Stage 1	-	-	-	-	-	-	772	772	-	487	487	-
Stage 2	-	-	-	-	-	-	243	504	-	594	779	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1074	-	-	1207	-	-	195	168	821	175	171	753
Stage 1	-	-	-	-	-	-	363	412	-	536	554	-
Stage 2	-	-	-	-	-	-	745	544	-	463	409	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1070	-	-	1199	-	-	124	133	810	146	136	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	133	-	146	136	-
Stage 1	-	-	-	-	-	-	290	330	-	430	550	-
Stage 2	-	-	-	-	-	-	562	540	-	368	327	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	0.1	24	12.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	204	1070	-	-	1199	-	-	639
HCM Lane V/C Ratio	0.069	0.194	-	-	0.005	-	-	0.291
HCM Control Delay (s)	24	9.2	-	-	8	-	-	12.9
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.7	-	-	0	-	-	1.2

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Background Saturday.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	761	117	32	732	122	20
Future Volume (vph)	761	117	32	732	122	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1784	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1784	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	810	124	34	779	130	21
RTOR Reduction (vph)	0	59	0	0	8	0
Lane Group Flow (vph)	810	65	34	779	143	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	28.7	28.7	1.2	34.1	9.5	
Effective Green, g (s)	28.7	28.7	1.2	34.1	9.5	
Actuated g/C Ratio	0.53	0.53	0.02	0.63	0.17	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	990	830	38	1176	310	
v/s Ratio Prot	c0.43		0.02	c0.41	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.82	0.08	0.89	0.66	0.46	
Uniform Delay, d1	10.7	6.4	26.6	6.5	20.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.5	0.0	102.2	1.5	0.4	
Delay (s)	16.2	6.4	128.8	8.0	20.6	
Level of Service	B	A	F	A	C	
Approach Delay (s)	14.9			13.1	20.6	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	15.1
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Background Saturday.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↓	↑	↓	↑		
Traffic Volume (veh/h)	761	117	32	732	122	20		
Future Volume (veh/h)	761	117	32	732	122	20		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	0.98	1.00	1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900		
Adj Flow Rate, veh/h	810	124	34	779	130	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	1	0	4	1	0	0		
Cap, veh/h	1093	917	51	1295	199	0		
Arrive On Green	0.58	0.58	0.03	0.69	0.11	0.00		
Sat Flow, veh/h	1881	1579	1740	1881	1796	0		
Grp Volume(V), veh/h	810	124	34	779	131	0		
Grp Sat Flow(s),veh/h/ln	1881	1579	1740	1881	1810	0		
Q Serve(g_s), s	17.2	1.9	1.0	11.9	3.8	0.0		
Cycle Q Clear(g_c), s	17.2	1.9	1.0	11.9	3.8	0.0		
Prop In Lane	1.00	1.00	1.00	0.99	0.00	0.00		
Lane Grp Cap(c), veh/h	1093	917	51	1295	200	0		
V/C Ratio(X)	0.74	0.14	0.66	0.60	0.65	0.00		
Avail Cap(c_a), veh/h	1316	1104	128	1600	601	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	8.4	5.2	26.0	4.5	23.1	0.0		
Incr Delay (d2), s/veh	2.0	0.1	5.3	0.6	1.3	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	9.4	0.8	0.6	6.3	1.9	0.0		
LnGrp Delay(d),s/veh	10.4	5.2	31.3	5.1	24.4	0.0		
LnGrp LOS	B	A	C	A	C			
Approach Vol, veh/h	934			813	131			
Approach Delay, s/veh	9.7			6.2	24.4			
Approach LOS	A			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.8	37.9				43.7		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	37.9				46.1		18.0
Max Q Clear Time (g_c+I1), s	3.0	19.2				13.9		5.8
Green Ext Time (p_c), s	0.0	12.3				17.3		0.1
Intersection Summary								
HCM 2010 Ctrl Delay			9.2					
HCM 2010 LOS			A					
Notes								

Synchro 9 Report

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Background Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↓	↑	29	↓	↑	17	30	0	40	10	0	40
Traffic Vol, veh/h	58	695	29	14	647	17	30	0	40	10	0	40
Future Vol, veh/h	58	695	29	14	647	17	30	0	40	10	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	62	739	31	15	688	18	32	0	43	11	0	43
Major/Minor												
	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	706	0	0	739	0	0	1590	1599	739	1590	1590	697
Stage 1	-	-	-	-	-	-	863	863	-	727	727	-
Stage 2	-	-	-	-	-	-	727	736	-	863	863	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	902	-	-	876	-	-	88	107	421	88	109	444
Stage 1	-	-	-	-	-	-	352	374	-	419	432	-
Stage 2	-	-	-	-	-	-	419	428	-	352	374	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	902	-	-	876	-	-	74	98	421	74	100	444
Mov Cap-2 Maneuver	-	-	-	-	-	-	74	98	-	74	100	-
Stage 1	-	-	-	-	-	-	328	348	-	390	425	-
Stage 2	-	-	-	-	-	-	372	421	-	295	348	-
Approach												
	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.2			45.3			23.5		
HCM LOS	E			E			E			C		
Minor Lane/Major Mvmt												
	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2		
Capacity (veh/h)	74	421	902	-	-	876	-	-	74	444		
HCM Lane V/C Ratio	0.431	0.101	0.068	-	-	0.017	-	-	0.144	0.096		
HCM Control Delay (s)	86.4	14.5	9.3	-	-	9.2	-	-	61.7	14		
HCM Lane LOS	F	B	A	-	-	A	-	-	F	B		
HCM 95th %tile Q(veh)	1.7	0.3	0.2	-	-	0.1	-	-	0.5	0.3		

Synchro 9 Report

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Background Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	↕
Traffic Vol, veh/h	38	4	5	559	653	39
Future Vol, veh/h	38	4	5	559	653	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	40	4	5	588	687	41

Major/Minor	Minor2	Major1	Major2	Minor1	Major1	Major2
Conflicting Flow All	1286	687	687	0	-	0
Stage 1	687	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	183	450	916	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	182	450	916	-	-	-
Mov Cap-2 Maneuver	182	-	-	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	549	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.1	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	916	-	193	-	-
HCM Lane V/C Ratio	0.006	-	0.229	-	-
HCM Control Delay (s)	9	0	29.1	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.9	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Background Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	↕
Traffic Vol, veh/h	24	37	357	32	28	361
Future Vol, veh/h	24	37	357	32	28	361
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	25	38	368	33	29	372

Major/Minor	Minor1	Major1	Major2	Minor1	Major1	Major2
Conflicting Flow All	827	397	0	0	407	0
Stage 1	391	-	-	-	-	-
Stage 2	436	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	344	657	-	-	1163	-
Stage 1	688	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	330	650	-	-	1157	-
Mov Cap-2 Maneuver	330	-	-	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	632	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.8	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	470	1157	-
HCM Lane V/C Ratio	-	-	0.134	0.025	-
HCM Control Delay (s)	-	-	13.8	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Background Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	10	79	63	314	307	16
Future Vol, veh/h	10	79	63	314	307	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	84	67	334	327	17

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	816	349	338	0	0
Stage 1	338	-	-	-	-
Stage 2	478	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-
Pot Cap-1 Maneuver	349	692	1221	-	-
Stage 1	727	-	-	-	-
Stage 2	628	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	324	679	1210	-	-
Mov Cap-2 Maneuver	324	-	-	-	-
Stage 1	720	-	-	-	-
Stage 2	588	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.1	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1210	-	605	-	-
HCM Lane V/C Ratio	0.055	-	0.156	-	-
HCM Control Delay (s)	8.2	-	12.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Background Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	20	114	98	242	202	8
Future Vol, veh/h	20	114	98	242	202	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	127	109	269	224	9

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	730	243	240	0	0
Stage 1	236	-	-	-	-
Stage 2	494	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-
Pot Cap-1 Maneuver	392	801	1333	-	-
Stage 1	808	-	-	-	-
Stage 2	617	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	356	792	1325	-	-
Mov Cap-2 Maneuver	356	-	-	-	-
Stage 1	803	-	-	-	-
Stage 2	563	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	2.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1325	-	670	-	-
HCM Lane V/C Ratio	0.082	-	0.222	-	-
HCM Control Delay (s)	8	-	11.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	0.8	-	-

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background Saturday.syn
12/01/2017

Intersection

Intersection Delay, s/veh 9.3
Intersection LOS A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	0	1	94	0	3	0	0	0	161	97	4
Future Vol, veh/h	0	0	1	94	0	3	0	0	0	161	97	4
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0
Mvmt Flow	0	0	1	108	0	3	0	0	0	185	111	5
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8	8.3	10.1
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	61%	0%	100%	0%
Vol Thru, %	37%	1%	0%	100%
Vol Right, %	2%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	262	95	3	113
LT Vol	161	0	3	0
Through Vol	97	1	0	113
RT Vol	4	94	0	0
Lane Flow Rate	301	109	3	130
Geometry Grp	1	1	1	1
Degree of Util (X)	0.373	0.13	0.005	0.162
Departure Headway (Hd)	4.457	4.286	5.218	4.488
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	813	836	685	800
Service Time	2.457	2.313	3.255	2.514
HCM Lane V/C Ratio	0.37	0.13	0.004	0.163
HCM Control Delay	10.1	8	8.3	8.4
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.7	0.4	0	0.6

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background Saturday.syn
12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	113	0
Future Vol, veh/h	0	0	113	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	130	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.4
HCM LOS	A

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Background + Project AM.syn
12/01/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↑↑	↑	↑	↑↑	↑
Traffic Volume (vph)	0	1082	495	91	976	676
Future Volume (vph)	0	1082	495	91	976	676
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1244	569	105	1122	777
RTOR Reduction (vph)	0	157	0	24	0	0
Lane Group Flow (vph)	0	1087	569	81	1122	777
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type	Over	NA	Perm	Prot	NA	NA
Protected Phases	3	2		3	Free	
Permitted Phases			2			
Actuated Green, G (s)	24.2	19.5	19.5	24.2	53.5	
Effective Green, g (s)	25.1	20.4	20.4	25.1	53.5	
Actuated g/C Ratio	0.47	0.38	0.38	0.47	1.00	
Clearance Time (s)	4.9	4.9	4.9	4.9		
Vehicle Extension (s)	4.5	3.5	3.5	4.5		
Lane Grp Cap (vph)	1307	703	597	1595	1810	
v/s Ratio Prot	c0.39	c0.31		0.33	0.43	
v/s Ratio Perm			0.05			
v/c Ratio	0.83	0.81	0.14	0.70	0.43	
Uniform Delay, d1	12.4	14.8	10.8	11.3	0.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.1	7.0	0.1	1.6	0.7	
Delay (s)	17.4	21.8	10.9	12.9	0.7	
Level of Service		B	C	B	B	A
Approach Delay (s)	17.4		20.1			7.9
Approach LOS	B		C			A
Intersection Summary						
HCM 2000 Control Delay		13.2		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.82				
Actuated Cycle Length (s)		53.5		Sum of lost time (s)		8.0
Intersection Capacity Utilization		70.6%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Background + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑↑	↑↑		↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	7	812	247	387	938	10	98	3	242	9	18	41
Future Volume (vph)	7	812	247	387	938	10	98	3	242	9	18	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3530		1698	1708	1561		1737	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3530		1698	1708	1561		1737	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	1041	317	496	1203	13	126	4	310	12	23	53
RTOR Reduction (vph)	0	0	147	0	0	0	0	0	68	0	0	50
Lane Group Flow (vph)	9	1041	170	496	1216	0	66	64	242	0	35	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)				1					1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	28.7	28.7	10.6	38.6		4.9	4.9	15.5		2.2	2.2
Effective Green, g (s)	1.2	29.7	29.7	11.2	39.6		6.7	6.7	16.7		3.2	3.2
Actuated g/C Ratio	0.02	0.44	0.44	0.17	0.59		0.10	0.10	0.25		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	32	1573	695	575	2092		170	171	390		83	74
v/s Ratio Prot	0.00	c0.29		c0.14	0.34		0.04	0.04	c0.10		c0.02	
v/s Ratio Perm			0.11						0.05			0.00
v/c Ratio	0.28	0.66	0.25	0.86	0.58		0.39	0.37	0.62		0.42	0.03
Uniform Delay, d1	32.4	14.6	11.6	27.1	8.4		28.1	28.1	22.2		30.9	30.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.8	0.1	12.3	0.3		0.5	0.5	2.1		1.3	0.1
Delay (s)	34.1	15.4	11.6	39.3	8.7		28.7	28.6	24.3		32.2	30.4
Level of Service		C	B	D	A		C	C	C		C	C
Approach Delay (s)		14.7			17.6			25.6			31.1	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay				17.8			HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio				0.67								
Actuated Cycle Length (s)				66.8			Sum of lost time (s)				16.1	
Intersection Capacity Utilization				53.5%			ICU Level of Service				A	
Analysis Period (min)				15								
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

Background + Project AM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	7	812	247	387	938	10	98	3	242	9	18	41
Future Volume (veh/h)	7	812	247	387	938	10	98	3	242	9	18	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863
Adj Flow Rate, veh/h	9	1041	317	496	1203	13	129	0	310	12	23	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1185	524	542	1701	18	792	0	562	34	65	90
Arrive On Green	0.02	0.33	0.33	0.16	0.47	0.46	0.22	0.00	0.20	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3584	39	3583	0	1545	596	1141	1575
Grp Volume(V), veh/h	9	1041	317	496	593	623	129	0	310	35	0	53
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1737	0	1575
Q Serve(g_s), s	0.3	19.3	11.8	9.9	18.5	18.5	2.0	0.0	11.2	1.4	0.0	2.3
Cycle Q Clear(g_c), s	0.3	19.3	11.8	9.9	18.5	18.5	2.0	0.0	11.2	1.4	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00
Lane Grp Cap(c), veh/h	30	1185	524	542	839	880	792	0	562	100	0	90
V/C Ratio(X)	0.30	0.88	0.61	0.91	0.71	0.71	0.16	0.00	0.55	0.35	0.00	0.59
Avail Cap(c_a), veh/h	117	1277	564	542	839	880	1735	0	969	100	0	90
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.9	21.9	19.4	28.9	14.5	14.5	22.0	0.0	17.8	31.7	0.0	32.1
Incr Delay (d2), s/veh	2.1	6.5	1.0	19.8	2.3	2.2	0.0	0.0	0.3	0.8	0.0	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.5	5.3	6.2	9.4	9.9	1.0	0.0	4.7	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.1	28.3	20.4	48.7	16.8	16.8	22.0	0.0	18.1	32.4	0.0	38.7
LnGrp LOS	D	C	C	D	B	B	C		B	C		D
Approach Vol, veh/h		1367			1712			439			88	
Approach Delay, s/veh		26.5			26.1			19.3			36.2	
Approach LOS		C			C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	37.1		19.4	15.0	27.4		8.0				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 10	24.2		3.0				
Max Q Clear Time (g_c+I1), s	2.3	20.5		13.2	11.9	21.3		4.3				
Green Ext Time (p_c), s	0.0	5.2		0.3	0.0	1.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay		25.7										
HCM 2010 LOS		C										
Notes												

HCM Signalized Intersection Capacity Analysis

Background + Project AM.syn

3: SR 1 & Rio Rd

12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↔	↕	↔	↔	↕	↔	↔	↕
Traffic Volume (vph)	199	304	26	6	91	277	155	38	232	68	275	334
Future Volume (vph)	199	304	26	6	91	277	155	38	232	68	275	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3496			1703	1827	1547	1752	1881	1589	3433	1761
Flt Permitted	0.95	1.00			0.18	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3496			319	1827	1547	1752	1881	1589	3433	1761
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	214	327	28	7	98	298	167	41	249	73	296	359
RTOR Reduction (vph)	0	7	0	0	0	0	120	0	0	54	0	7
Lane Group Flow (vph)	214	348	0	0	105	298	47	41	249	19	296	424
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	14.4	15.5			22.8	23.9	23.9	4.3	21.5	21.5	9.5	26.7
Effective Green, g (s)	14.1	15.7			22.5	24.1	24.1	4.0	22.4	22.4	9.2	27.6
Actuated g/C Ratio	0.16	0.18			0.26	0.28	0.28	0.05	0.26	0.26	0.11	0.32
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	279	639			83	513	434	81	491	414	368	566
v/s Ratio Prot	0.13	0.10			c0.16			0.02	0.13		c0.09	c0.24
v/s Ratio Perm					c0.33		0.03			0.01		
v/c Ratio	0.77	0.54			1.27	0.58	0.11	0.51	0.51	0.05	0.80	0.75
Uniform Delay, d1	34.3	31.8			31.6	26.5	22.9	39.9	27.0	23.7	37.4	26.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.9	1.1			185.7	1.8	0.1	4.9	1.0	0.1	12.0	5.6
Delay (s)	46.2	32.9			217.4	28.3	23.0	44.8	28.0	23.8	49.5	31.6
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		37.9				61.6			29.0			38.9
Approach LOS		D				E			C			D
Intersection Summary												
HCM 2000 Control Delay		42.8										
HCM 2000 Volume to Capacity ratio		0.93										
Actuated Cycle Length (s)		85.8							16.0			
Intersection Capacity Utilization		67.8%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background + Project AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Background + Project AM.syn
12/01/2017

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	61	62	352	77	99	271	6	152	3	62	5	2
Future Volume (vph)	61	62	352	77	99	271	6	152	3	62	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	1.00		1.00	0.86			0.87
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1770	3403		1687	3429		3367	1510			3077
Flt Permitted		0.57	1.00		0.95	1.00		0.95	1.00			0.91
Satd. Flow (perm)		1054	3403		1687	3429		3367	1510			2831
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92
Adj. Flow (vph)	66	67	387	85	109	298	7	167	3	68	5	2
RTOR Reduction (vph)	0	0	17	0	0	1	0	0	53	0	0	34
Lane Group Flow (vph)	0	133	455	0	109	304	0	167	18	0	0	9
Confl. Bikes (#/hr)				1								
Heavy Vehicles (%)	2%	2%	3%	3%	7%	5%	2%	4%	2%	8%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2										
Actuated Green, G (s)		35.2	35.2		7.6	46.3		7.9	15.7			3.8
Effective Green, g (s)		35.2	35.2		7.1	46.3		7.9	15.7			3.8
Actuated g/C Ratio		0.50	0.50		0.10	0.66		0.11	0.22			0.05
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		530	1711		171	2268		379	338			153
v/s Ratio Prot			c0.13		c0.06	0.09		c0.05	c0.01			
v/s Ratio Perm		0.13										0.00
v/c Ratio		0.25	0.27		0.64	0.13		0.44	0.05			0.06
Uniform Delay, d1		9.9	10.0		30.2	4.4		29.0	21.3			31.4
Progression Factor		1.00	1.00		0.93	0.89		1.00	1.00			1.00
Incremental Delay, d2		1.1	0.4		5.6	0.1		0.3	0.1			0.2
Delay (s)		11.0	10.4		33.6	4.1		29.3	21.4			31.6
Level of Service		B	B		C	A		C	C			C
Approach Delay (s)			10.5			11.8			26.9			31.6
Approach LOS			B			B			C			C
Intersection Summary												
HCM 2000 Control Delay			14.6			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			38.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Background + Project AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	36
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Background + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	332	87	49	349	0	27	0	27	0	0	0
Future Volume (vph)	0	332	87	49	349	0	27	0	27	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		0.99		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	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)		3383		1805	3471			1548	1362			
Flt Permitted		1.00		0.95	1.00			0.89	1.00			
Satd. Flow (perm)		3383		1805	3471			1448	1362			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	391	102	58	411	0	32	0	32	0	0	0
RTOR Reduction (vph)	0	16	0	0	0	0	0	0	30	0	0	0
Lane Group Flow (vph)	0	477	0	58	411	0	0	32	2	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8				4
Permitted Phases							8		8	4		
Actuated Green, G (s)		49.8		4.2	57.5			4.5	4.5			
Effective Green, g (s)		49.8		3.7	57.5			4.5	4.5			
Actuated g/C Ratio		0.71		0.05	0.82			0.06	0.06			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2406		95	2851			93	87			
v/s Ratio Prot		c0.14		c0.03	0.12							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.20		0.61	0.14			0.34	0.02			
Uniform Delay, d1		3.4		32.4	1.3			31.3	30.7			
Progression Factor		0.63		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.9	0.1			0.8	0.0			
Delay (s)		2.3		40.3	1.4			32.1	30.7			
Level of Service		A		D	A			C	C			
Approach Delay (s)		2.3			6.2			31.4				0.0
Approach LOS		A			A			C				A

Intersection Summary

HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center Pl & Rio Rd

Background + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↑	↑↑			↑	↑		↑↓	
Traffic Volume (veh/h)	0	332	87	49	349	0	27	0	27	0	0	0
Future Volume (veh/h)	0	332	87	49	349	0	27	0	27	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	391	102	58	411	0	32	0	32	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	0	15	0	0	0
Cap, veh/h	0	2084	538	61	2933	0	153	0	56	0	77	0
Arrive On Green	0.00	1.00	1.00	0.03	0.85	0.00	0.04	0.00	0.04	0.00	0.00	0.00
Sat Flow, veh/h	0	2856	713	1810	3563	0	1234	0	1375	0	1900	0
Grp Volume(v), veh/h	0	247	246	58	411	0	32	0	32	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1721	1810	1736	0	1234	0	1375	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	2.2	1.5	0.0	1.8	0.0	1.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.2	1.5	0.0	1.8	0.0	1.6	0.0	0.0	0.0
Prop In Lane	0.00		0.41	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1324	1297	61	2933	0	153	0	56	0	77	0
V/C Ratio(X)	0.00	0.19	0.19	0.95	0.14	0.00	0.21	0.00	0.57	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1324	1297	284	2933	0	455	0	393	0	543	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.98	0.98	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	33.7	1.0	0.0	33.1	0.0	33.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	21.6	0.1	0.0	0.2	0.0	3.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	1.5	0.7	0.0	0.6	0.0	0.7	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.3	0.3	55.4	1.1	0.0	33.3	0.0	36.4	0.0	0.0	0.0
LnGrp LOS		A	A	E	A		C		D			
Approach Vol, veh/h		493			469			64			0	
Approach Delay, s/veh		0.3			7.8			34.8			0.0	
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	6.4	56.8		6.8		63.2		6.8				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	11.5	27.0		20.0		42.0		20.0				
Max Q Clear Time (g_c+I1), s	4.2	2.0		0.0		3.5		3.8				
Green Ext Time (p_c), s	0.0	7.5		0.0		8.4		0.1				

Intersection Summary

HCM 2010 Ctrl Delay	5.9
HCM 2010 LOS	A

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Background + Project AM.syn
12/12/2017

Intersection

Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↑↑	↑		↑	↑		↑↓	↑
Traffic Vol, veh/h	0	219	30	0	13	12	5	16	334
Future Vol, veh/h	0	219	30	0	13	12	5	16	334
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	249	34	0	15	14	5	18	380
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	10.2	8.8	11.8
HCM LOS	B	A	B

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	110	110	30	13	12	21	334
LT Vol	110	110	0	0	0	21	0
Through Vol	0	0	30	13	0	0	0
RT Vol	0	0	0	0	12	0	334
Lane Flow Rate	124	124	34	15	14	24	380
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.214	0.211	0.037	0.026	0.021	0.039	0.496
Departure Headway (Hd)	6.204	6.118	3.898	6.314	5.603	5.937	4.703
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	574	581	903	570	643	602	763
Service Time	3.998	3.912	1.69	4.014	3.303	3.685	2.451
HCM Lane V/C Ratio	0.216	0.213	0.038	0.026	0.022	0.04	0.498
HCM Control Delay	10.7	10.6	6.8	9.2	8.4	8.9	12
HCM Lane LOS	B	B	A	A	A	A	B
HCM 95th-tile Q	0.8	0.8	0.1	0.1	0.1	0.1	2.8

HCM Signalized Intersection Capacity Analysis

Background + Project AM.syn

7: SR 1 & Ocean Ave

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	50	109	151	43	63	132	1152	48	18	1378	113
Future Volume (vph)	144	50	109	151	43	63	132	1152	48	18	1378	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1508		1665	1649		1770	3468		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1508		1665	1649		1770	3468		1805	3471	1568
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)	157	54	118	164	47	68	143	1252	52	20	1498	123
RTOR Reduction (vph)	0	71	0	0	40	0	0	3	0	0	0	57
Lane Group Flow (vph)	141	117	0	143	96	0	143	1301	0	20	1498	66
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	12.7	12.7		8.8	8.8		8.3	47.0		2.8	41.5	41.5
Effective Green, g (s)	12.9	12.9		9.0	9.0		8.0	47.9		2.5	42.4	42.4
Actuated g/C Ratio	0.15	0.15		0.10	0.10		0.09	0.54		0.03	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	243	220		169	168		160	1881		51	1666	752
v/s Ratio Prot	c0.08	0.08		c0.09	0.06		c0.08	0.38		0.01	c0.43	
v/s Ratio Perm												0.04
v/c Ratio	0.58	0.53		0.85	0.57		0.89	0.69		0.39	0.90	0.09
Uniform Delay, d1	35.2	34.9		39.0	37.8		39.7	14.8		42.2	21.0	12.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	2.8		31.3	5.6		41.7	1.3		4.9	7.2	0.1
Delay (s)	38.9	37.7		70.3	43.4		81.4	16.1		47.1	28.2	12.5
Level of Service	D	D		E	D		F	B		D	C	B
Approach Delay (s)		38.2			57.2			22.5			27.3	
Approach LOS		D			E			C			C	

Intersection Summary

HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary

Background + Project AM.syn

7: SR 1 & Ocean Ave

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	50	109	151	43	63	132	1152	48	18	1378	113
Future Volume (veh/h)	144	50	109	151	43	63	132	1152	48	18	1378	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.86	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	118	140	81	68	143	1252	52	20	1498	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	283	78	171	184	92	77	165	1786	74	50	1583	715
Arrive On Green	0.16	0.16	0.16	0.10	0.10	0.10	0.09	0.52	0.51	0.03	0.46	0.00
Sat Flow, veh/h	1757	488	1066	1757	883	741	1774	3426	142	1810	3471	1568
Grp Volume(v), veh/h	157	0	172	140	0	149	143	640	664	20	1498	0
Grp Sat Flow(s),veh/h/ln	1757	0	1554	1757	0	1624	1774	1754	1814	1810	1736	1568
Q Serve(g_s), s	7.1	0.0	9.0	6.7	0.0	7.8	6.8	23.7	23.8	0.9	35.6	0.0
Cycle Q Clear(g_c), s	7.1	0.0	9.0	6.7	0.0	7.8	6.8	23.7	23.8	0.9	35.6	0.0
Prop In Lane	1.00		0.69	1.00		0.46	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	283	0	250	184	0	170	165	915	946	50	1583	715
V/C Ratio(X)	0.56	0.00	0.69	0.76	0.00	0.88	0.87	0.70	0.70	0.40	0.95	0.00
Avail Cap(c_a), veh/h	347	0	307	184	0	170	165	915	946	147	1612	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.3	0.0	34.2	37.5	0.0	38.1	38.5	15.5	15.6	41.2	22.4	0.0
Incr Delay (d2), s/veh	2.1	0.0	5.4	18.1	0.0	37.6	35.6	2.8	2.7	5.2	12.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.2	4.2	0.0	5.3	5.0	12.1	12.5	0.5	19.5	0.0
LnGrp Delay(d),s/veh	35.4	0.0	39.5	55.6	0.0	75.7	74.1	18.3	18.3	46.4	34.6	0.0
LnGrp LOS	D		D	E		E	E	B	B	D	C	
Approach Vol, veh/h		329			289			1447			1518	
Approach Delay, s/veh		37.5			66.0			23.8			34.7	
Approach LOS		D			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		17.9	12.0	43.3		13.0	6.4	48.9				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 17	8.3	39.1		8.8	7.3	40.1				
Max Q Clear Time (g_c+I1), s		11.0	8.8	37.6		9.8	2.9	25.8				
Green Ext Time (p_c), s		0.9	0.0	0.8		0.0	0.0	13.8				

Intersection Summary

HCM 2010 Ctrl Delay	33.1
HCM 2010 LOS	C

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Background + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔		↔	↔	↔
Traffic Volume (vph)	382	4	25	35	14	44	37	1301	17	71	1635	774
Future Volume (vph)	382	4	25	35	14	44	37	1301	17	71	1635	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3532		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	38	15	48	41	1430	19	78	1797	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	41	1448	0	78	1797	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	53.3		6.2	55.4	99.9
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	54.2		6.4	56.3	99.9
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54		0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	556	247		121	120	112	75	1916		105	1956	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.41		0.05	c0.52	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.76	0.03		0.22	0.22	0.03	0.55	0.76		0.74	0.92	0.54
Uniform Delay, d1	40.0	35.3		43.8	43.8	43.2	46.8	17.7		45.9	19.7	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.5	0.1		1.6	1.6	0.2	7.9	2.1		24.4	7.8	1.3
Delay (s)	46.5	35.4		45.4	45.3	43.4	54.8	19.8		70.3	27.5	1.3
Level of Service	D	D		D	D	D	D	B		E	C	A
Approach Delay (s)		45.7			44.4			20.8			20.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Background + Project AM.syn
12/01/2017

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	29	0	8	0	0	0	2	223	2	8	360	90
Future Vol, veh/h	29	0	8	0	0	0	2	223	2	8	360	90
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	33	0	9	0	0	0	2	256	2	9	414	103

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	623	753	265	493	804	135	520	0	0	262	0	0
Stage 1	487	487	-	265	265	-	-	-	-	-	-	-
Stage 2	136	266	-	228	539	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	354	341	668	464	319	895	1056	-	-	1314	-	-
Stage 1	510	554	-	723	693	-	-	-	-	-	-	-
Stage 2	830	692	-	760	525	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	349	335	665	451	314	891	1053	-	-	1311	-	-
Mov Cap-2 Maneuver	349	335	-	451	314	-	-	-	-	-	-	-
Stage 1	508	547	-	720	690	-	-	-	-	-	-	-
Stage 2	826	689	-	740	518	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.4	0	0.1	0.1
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WB Ln1	SBL	SBT	SBR
Capacity (veh/h)	1053	-	-	389	-	1311	-	-
HCM Lane V/C Ratio	0.002	-	-	0.109	-	0.007	-	-
HCM Control Delay (s)	8.4	0	-	15.4	0	7.8	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	0	-	-

Synchro 9 Report

Synchro 9 Report

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Background + Project AM.syn
12/01/2017

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗			↕			↕	
Traffic Vol, veh/h	94	244	17	3	333	11	18	2	4	1	2	47
Future Vol, veh/h	94	244	17	3	333	11	18	2	4	1	2	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	108	280	20	3	383	13	21	2	5	1	2	54

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	395	0	0	300	0	0	705	908	150	753	912	198
Stage 1	-	-	-	-	-	-	506	506	-	396	396	-
Stage 2	-	-	-	-	-	-	199	402	-	357	516	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1139	-	-	1273	-	-	327	277	876	302	276	786
Stage 1	-	-	-	-	-	-	522	543	-	606	607	-
Stage 2	-	-	-	-	-	-	790	604	-	639	538	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1139	-	-	1273	-	-	280	250	876	276	249	786
Mov Cap-2 Maneuver	-	-	-	-	-	-	280	250	-	276	249	-
Stage 1	-	-	-	-	-	-	473	492	-	549	606	-
Stage 2	-	-	-	-	-	-	731	603	-	573	487	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.2	0.1	17.7	10.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	312	1139	-	-	1273	-	-	700
HCM Lane V/C Ratio	0.088	0.095	-	-	0.003	-	-	0.082
HCM Control Delay (s)	17.7	8.5	-	-	7.8	-	-	10.6
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.3	-	-	0	-	-	0.3

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Background + Project AM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	640	117	22	903	80	19
Future Volume (vph)	640	117	22	903	80	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Flt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1759	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1759	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	674	123	23	951	84	20
RTOR Reduction (vph)	0	54	0	0	15	0
Lane Group Flow (vph)	674	69	23	951	89	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	30.0	30.0	0.7	34.9	7.5	
Effective Green, g (s)	30.0	30.0	0.7	34.9	7.5	
Actuated g/C Ratio	0.56	0.56	0.01	0.65	0.14	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1038	874	23	1231	247	
v/s Ratio Prot	0.37		0.01	c0.51	c0.05	
v/s Ratio Perm		0.04				
v/c Ratio	0.65	0.08	1.00	0.77	0.36	
Uniform Delay, d1	8.0	5.3	26.3	6.4	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.0	187.7	3.2	0.3	
Delay (s)	9.5	5.4	214.0	9.6	21.0	
Level of Service	A	A	F	A	C	
Approach Delay (s)	8.9			14.4	21.0	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	53.3	Sum of lost time (s)	15.1
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Background + Project AM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↓	↑	↓	↑		
Traffic Volume (veh/h)	640	117	22	903	80	19		
Future Volume (veh/h)	640	117	22	903	80	19		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1878	1900		
Adj Flow Rate, veh/h	674	123	23	951	84	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	3	4	0	1	0	0		
Cap, veh/h	992	835	40	1218	221	0		
Arrive On Green	0.54	0.54	0.02	0.65	0.13	0.00		
Sat Flow, veh/h	1845	1553	1810	1881	1769	0		
Grp Volume(V), veh/h	674	123	23	951	85	0		
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1790	0		
Q Serve(g_s), s	12.8	1.9	0.6	17.3	2.1	0.0		
Cycle Q Clear(g_c), s	12.8	1.9	0.6	17.3	2.1	0.0		
Prop In Lane		1.00	1.00		0.99	0.00		
Lane Grp Cap(c), veh/h	992	835	40	1218	224	0		
V/C Ratio(X)	0.68	0.15	0.58	0.78	0.38	0.00		
Avail Cap(c_a), veh/h	1073	903	151	1416	672	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	8.1	5.6	23.2	6.0	19.3	0.0		
Incr Delay (d2), s/veh	1.7	0.1	4.8	2.7	0.4	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	6.8	0.8	0.4	9.6	1.1	0.0		
LnGrp Delay(d),s/veh	9.8	5.7	28.0	8.7	19.7	0.0		
LnGrp LOS	A	A	C	A	B			
Approach Vol, veh/h	797			974	85			
Approach Delay, s/veh	9.2			9.1	19.7			
Approach LOS	A			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.3	32.2				37.5		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	27.9				36.1		18.0
Max Q Clear Time (g_c+I1), s	2.6	14.8				19.3		4.1
Green Ext Time (p_c), s	0.0	9.7				11.8		0.1

Intersection Summary

HCM 2010 Ctrl Delay	9.6
HCM 2010 LOS	A

Notes

Synchro 9 Report

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HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Background + Project AM.syn
12/01/2017

Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↓	↑	↓	↓	↑	↓	↓	↑	↑	↓	↓	↑
Traffic Vol, veh/h	27	538	29	29	900	8	12	1	13	14	0	47
Future Vol, veh/h	27	538	29	29	900	8	12	1	13	14	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	30	591	32	32	989	9	13	1	14	15	0	52

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	998	0	0	1708
Stage 1	-	-	-	651
Stage 2	-	-	-	1057
Critical Hdwy	4.1	-	-	4.13
Critical Hdwy Stg 1	-	-	-	6.1
Critical Hdwy Stg 2	-	-	-	6.1
Follow-up Hdwy	2.2	-	-	2.227
Pot Cap-1 Maneuver	701	-	-	980
Stage 1	-	-	-	461
Stage 2	-	-	-	275
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	701	-	-	980
Mov Cap-2 Maneuver	-	-	-	57
Stage 1	-	-	-	441
Stage 2	-	-	-	220

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	51.1	32.3
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	56	511	701	-	-	980	-	-	66	300
HCM Lane V/C Ratio	0.255	0.028	0.042	-	-	0.033	-	-	0.233	0.172
HCM Control Delay (s)	90	12.2	10.4	-	-	8.8	-	-	75.4	19.5
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %ile Q(veh)	0.9	0.1	0.1	-	-	0.1	-	-	0.8	0.6

Synchro 9 Report

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HCM 2010 TWSC
13: SR 1 & Ribera Rd

Background + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 0.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	↕
Traffic Vol, veh/h	38	0	1	300	408	39
Future Vol, veh/h	38	0	1	300	408	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	43	0	1	337	458	44

Major/Minor	Minor2	Major1	Major2	Minor1	Major1	Major2
Conflicting Flow All	797	458	458	0	-	0
Stage 1	458	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Critical Hdwy	7.13	6.2	4.1	-	-	-
Critical Hdwy Stg 1	6.13	-	-	-	-	-
Critical Hdwy Stg 2	6.13	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	303	607	1114	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	673	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	303	607	1114	-	-	-
Mov Cap-2 Maneuver	303	-	-	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	672	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1114	-	303	-	-
HCM Lane V/C Ratio	0.001	-	0.141	-	-
HCM Control Delay (s)	8.2	0	18.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Background + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.1						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	↕
Traffic Vol, veh/h	16	93	324	21	22	424
Future Vol, veh/h	16	93	324	21	22	424
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	21	122	426	28	29	558

Major/Minor	Minor1	Major1	Major2	Minor1	Major1	Major2
Conflicting Flow All	1070	454	0	0	461	0
Stage 1	447	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	247	608	-	-	1111	-
Stage 1	649	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	235	601	-	-	1105	-
Mov Cap-2 Maneuver	235	-	-	-	-	-
Stage 1	645	-	-	-	-	-
Stage 2	515	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	489	1105	-
HCM Lane V/C Ratio	-	-	0.293	0.026	-
HCM Control Delay (s)	-	-	15.4	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.2	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Background + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 5.2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↔	
Traffic Vol, veh/h	17	157	174	234	269	21
Future Vol, veh/h	17	157	174	234	269	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	212	235	316	364	28

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	1158	372	368	0	0
Stage 1	368	-	-	-	-
Stage 2	790	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-
Pot Cap-1 Maneuver	219	672	1180	-	-
Stage 1	704	-	-	-	-
Stage 2	451	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	174	668	1176	-	-
Mov Cap-2 Maneuver	174	-	-	-	-
Stage 1	702	-	-	-	-
Stage 2	360	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.4	3.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1176	-	523	-	-
HCM Lane V/C Ratio	0.2	-	0.45	-	-
HCM Control Delay (s)	8.8	-	17.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.7	-	2.3	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Background + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 4.5						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↔	
Traffic Vol, veh/h	28	118	127	118	171	92
Future Vol, veh/h	28	118	127	118	171	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	140	151	140	204	110

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	712	272	320	0	0
Stage 1	265	-	-	-	-
Stage 2	447	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-
Pot Cap-1 Maneuver	396	767	1240	-	-
Stage 1	775	-	-	-	-
Stage 2	640	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	343	758	1233	-	-
Mov Cap-2 Maneuver	343	-	-	-	-
Stage 1	770	-	-	-	-
Stage 2	558	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	4.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1233	-	615	-	-
HCM Lane V/C Ratio	0.123	-	0.283	-	-
HCM Control Delay (s)	8.3	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.2	-	-

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background + Project AM.syn
12/01/2017

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	1	0	71	0	4	0	0	0	68	80	1
Future Vol, veh/h	0	1	0	71	0	4	0	0	0	68	80	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	91	0	5	0	0	0	87	103	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	8.3	9.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	46%	1%	100%	0%
Vol Thru, %	54%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	149	72	4	192
LT Vol	68	1	4	0
Through Vol	80	0	0	192
RT Vol	1	71	0	0
Lane Flow Rate	191	92	5	246
Geometry Grp	1	1	1	1
Degree of Util (X)	0.247	0.11	0.007	0.296
Departure Headway (Hd)	4.664	4.304	5.21	4.33
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	772	834	687	832
Service Time	2.683	2.327	3.241	2.347
HCM Lane V/C Ratio	0.247	0.11	0.007	0.296
HCM Control Delay	9.2	7.9	8.3	9.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0	1.2

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background + Project AM.syn
12/01/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	192	0
Future Vol, veh/h	0	0	192	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	246	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.2
HCM LOS	A

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Background + Project PM.syn
12/01/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	940	741	129	992	586
Future Volume (vph)	0	940	741	129	992	586
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	969	764	133	1023	604
RTOR Reduction (vph)	0	170	0	10	0	0
Lane Group Flow (vph)	0	799	764	123	1023	604
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		18.2	24.8	24.8	18.2	52.8
Effective Green, g (s)		19.1	25.7	25.7	19.1	52.8
Actuated g/C Ratio		0.36	0.49	0.49	0.36	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1017	898	748	1241	1881
v/s Ratio Prot		0.28	c0.41		c0.30	0.32
v/s Ratio Perm				0.08		
v/c Ratio		0.79	0.85	0.16	0.82	0.32
Uniform Delay, d1		15.0	11.9	7.6	15.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		4.5	8.0	0.1	5.0	0.5
Delay (s)		19.6	19.8	7.7	20.3	0.5
Level of Service		B	B	A	C	A
Approach Delay (s)		19.6		18.0		13.0
Approach LOS		B		B		B
Intersection Summary						
HCM 2000 Control Delay			16.1			HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio			0.84			B
Actuated Cycle Length (s)			52.8		Sum of lost time (s)	8.0
Intersection Capacity Utilization			78.6%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Background + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	856	240	425	667	5	264	22	596	6	10	7
Future Volume (vph)	26	856	240	425	667	5	264	22	596	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	0.95	1.00	0.97		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	0.85	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected		0.95	1.00	1.00	0.95		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)		1805	3539	1615	3467		1715	1732	1590		1727	1580
Flt Permitted		0.95	1.00	1.00	0.95		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)		1805	3539	1615	3467		1715	1732	1590		1727	1580
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)	28	930	261	462	725	5	287	24	648	7	11	8
RTOR Reduction (vph)	0	0	146	0	0	0	0	0	75	0	0	8
Lane Group Flow (vph)	28	930	115	462	730	0	155	156	573	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4		5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	25.2	25.2	11.8	35.2		9.1	9.1	20.9		1.0	1.0
Effective Green, g (s)	2.3	26.2	26.2	12.4	36.2		10.9	10.9	22.1		2.0	2.0
Actuated g/C Ratio	0.03	0.39	0.39	0.18	0.54		0.16	0.16	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1373	626	636	1914		276	279	520		51	46
v/s Ratio Prot	0.02	c0.26		0.13	0.20		0.09	0.09	c0.20		c0.01	
v/s Ratio Perm			0.07						0.16			0.00
v/c Ratio	0.46	0.68	0.18	0.73	0.38		0.56	0.56	1.10		0.35	0.01
Uniform Delay, d1	32.0	17.1	13.6	26.0	9.1		26.1	26.1	22.7		32.1	31.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	1.1	0.1	3.5	0.0		1.6	1.4	70.5		1.5	0.0
Delay (s)	34.0	18.2	13.7	29.5	9.2		27.7	27.5	93.2		33.6	31.8
Level of Service	C	B	B	C	A		C	C	F		C	C
Approach Delay (s)		17.6			17.0			71.9			33.1	
Approach LOS		B			B			E			C	
Intersection Summary												
HCM 2000 Control Delay				32.9							C	
HCM 2000 Volume to Capacity ratio				0.83								
Actuated Cycle Length (s)				67.5		Sum of lost time (s)			16.1			
Intersection Capacity Utilization				74.0%		ICU Level of Service			D			
Analysis Period (min)				15								
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

Background + Project PM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	26	856	240	425	667	5	264	22	596	6	10	7
Future Volume (veh/h)	26	856	240	425	667	5	264	22	596	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1881	1881	1900	1760	1900
Adj Flow Rate, veh/h	28	930	261	462	725	5	304	0	648	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	51	956	436	489	1388	10	1376	0	811	18	29	43
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.38	0.00	0.37	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3639	25	3619	0	1598	671	1055	1587
Grp Volume(V), veh/h	28	930	261	462	356	374	304	0	648	18	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1727	0	1587
Q Serve(g_s), s	1.3	22.9	12.4	11.6	13.6	13.6	5.0	0.0	29.6	0.9	0.0	0.4
Cycle Q Clear(g_c), s	1.3	22.9	12.4	11.6	13.6	13.6	5.0	0.0	29.6	0.9	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	51	956	436	489	682	716	1376	0	811	47	0	43
V/C Ratio(X)	0.55	0.97	0.60	0.94	0.52	0.52	0.22	0.00	0.80	0.38	0.00	0.18
Avail Cap(c_a), veh/h	115	956	436	489	682	716	1388	0	816	78	0	72
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.3	31.8	28.0	37.5	21.0	21.0	18.5	0.0	18.0	42.1	0.0	41.9
Incr Delay (d2), s/veh	3.4	22.5	1.6	27.0	0.3	0.3	0.0	0.0	5.2	1.9	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	14.1	5.7	7.4	6.7	7.0	2.5	0.0	14.0	0.5	0.0	0.2
LnGrp Delay(d),s/veh	45.6	54.3	29.6	64.5	21.4	21.4	18.5	0.0	23.2	44.0	0.0	42.6
LnGrp LOS	D	D	C	E	C	C	B		C	D		D
Approach Vol, veh/h		1219			1192			952			26	
Approach Delay, s/veh		48.8			38.1			21.7			43.6	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	37.6		37.5	16.4	27.8		6.4				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	22.8		3.0				
Max Q Clear Time (g_c+I1), s	3.3	15.6		31.6	13.6	24.9		2.9				
Green Ext Time (p_c), s	0.0	4.3		0.1	0.0	0.0		0.0				

Intersection Summary

HCM 2010 Ctrl Delay	37.4
HCM 2010 LOS	D

Notes

HCM Signalized Intersection Capacity Analysis

Background + Project PM.syn

3: SR 1 & Rio Rd

12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↔	↕	↔	↔	↕	↔	↔	↕
Traffic Volume (vph)	114	378	69	12	159	419	322	77	435	197	218	307
Future Volume (vph)	114	378	69	12	159	419	322	77	435	197	218	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frbp, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3469			1746	1863	1560	1805	1827	1556	3502	1831
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3469			656	1863	1560	1805	1827	1556	3502	1831
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	118	390	71	12	164	432	332	79	448	203	225	316
RTOR Reduction (vph)	0	18	0	0	0	0	226	0	0	142	0	8
Lane Group Flow (vph)	118	443	0	0	176	432	106	79	448	61	225	371
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases					1		6				8	
Actuated Green, G (s)	8.3	22.1			11.5	25.3	25.3	6.1	24.4	24.4	9.4	27.7
Effective Green, g (s)	8.0	22.3			11.2	25.5	25.5	5.8	25.3	25.3	9.1	28.6
Actuated g/C Ratio	0.10	0.27			0.13	0.30	0.30	0.07	0.30	0.30	0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	167	922			87	566	474	124	550	469	379	624
v/s Ratio Prot	0.07	0.13			c0.23			0.04	c0.25		c0.06	c0.20
v/s Ratio Perm					c0.27		0.07			0.04		
v/c Ratio	0.71	0.48			2.02	0.76	0.22	0.64	0.81	0.13	0.59	0.59
Uniform Delay, d1	36.8	25.9			36.4	26.5	21.8	38.0	27.1	21.3	35.6	22.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.8	0.5			498.2	6.2	0.3	10.3	9.3	0.1	2.5	1.6
Delay (s)	49.6	26.4			534.5	32.7	22.1	48.3	36.4	21.5	38.1	24.5
Level of Service	D	C			F	C	C	D	D	C	D	C
Approach Delay (s)		31.1				122.9		33.5			29.6	
Approach LOS		C				F		C			C	

Intersection Summary

HCM 2000 Control Delay	61.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	83.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background + Project PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Background + Project PM.syn
12/01/2017

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	71	128	347	113	136	387	18	315	9	149	20	11
Future Volume (vph)	71	128	347	113	136	387	18	315	9	149	20	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	0.98			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.96		1.00	0.99		1.00	0.86			0.88
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1782	3411		1770	3548		3467	1571			3089
Flt Permitted		0.50	1.00		0.95	1.00		0.95	1.00			0.89
Satd. Flow (perm)		935	3411		1770	3548		3467	1571			2781
Peak-hour factor, PHF	0.93	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92
Adj. Flow (vph)	76	139	373	122	146	416	20	339	10	160	22	12
RTOR Reduction (vph)	0	0	34	0	0	3	0	0	112	0	0	133
Lane Group Flow (vph)	0	215	461	0	146	433	0	339	58	0	0	48
Confl. Peds. (#/hr)				3	5			3		5		
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	2%	1%	2%	2%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2										
Actuated Green, G (s)		30.1	30.1		10.8	44.4		11.6	22.6			7.0
Effective Green, g (s)		30.1	30.1		10.3	44.4		11.6	22.6			7.0
Actuated g/C Ratio		0.40	0.40		0.14	0.59		0.15	0.30			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		375	1368		243	2100		536	473			259
v/s Ratio Prot			0.14		c0.08	0.12		c0.10	0.04			
v/s Ratio Perm		c0.23										c0.02
v/c Ratio		0.57	0.34		0.60	0.21		0.63	0.12			0.18
Uniform Delay, d1		17.5	15.5		30.4	7.1		29.7	19.0			31.4
Progression Factor		1.00	1.00		0.90	1.23		1.00	1.00			1.00
Incremental Delay, d2		6.2	0.7		2.8	0.2		1.8	0.1			0.3
Delay (s)		23.7	16.2		30.3	9.0		31.5	19.1			31.7
Level of Service		C	B		C	A		C	B			C
Approach Delay (s)			18.5			14.3			27.4			31.7
Approach LOS			B			B			C			C
Intersection Summary												
HCM 2000 Control Delay			20.7									C
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			75.0									16.0
Intersection Capacity Utilization			51.6%									A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Background + Project PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	135
Future Volume (vph)	135
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	147
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Background + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↔	↕↕			↕	↕		↕↕	
Traffic Volume (vph)	0	458	58	106	438	0	103	0	93	0	0	0
Future Volume (vph)	0	458	58	106	438	0	103	0	93	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	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)		3465		1752	3574			1744	1542			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3465		1752	3574			1390	1542			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	515	65	119	492	0	116	0	104	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	91	0	0	0
Lane Group Flow (vph)	0	572	0	119	492	0	0	116	13	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8				4
Permitted Phases							8		8		4	
Actuated Green, G (s)		46.4		7.6	57.5			9.5	9.5			
Effective Green, g (s)		46.4		7.1	57.5			9.5	9.5			
Actuated g/C Ratio		0.62		0.09	0.77			0.13	0.13			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2143		165	2740			176	195			
v/s Ratio Prot		c0.17		c0.07	0.14							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.27		0.72	0.18			0.66	0.07			
Uniform Delay, d1		6.5		33.0	2.4			31.2	28.8			
Progression Factor		0.71		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		12.3	0.1			6.6	0.1			
Delay (s)		5.0		45.3	2.5			37.8	28.9			
Level of Service		A		D	A			D	C			
Approach Delay (s)		5.0			10.8			33.6			0.0	
Approach LOS		A			B			C			A	
Intersection Summary												
HCM 2000 Control Delay				12.0				HCM 2000 Level of Service			B	
HCM 2000 Volume to Capacity ratio				0.38								
Actuated Cycle Length (s)				75.0				Sum of lost time (s)			12.0	
Intersection Capacity Utilization				40.5%				ICU Level of Service			A	
Analysis Period (min)				15								
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center Pl & Rio Rd

Background + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↓	↑↑			↓	↑		↑↓	
Traffic Volume (veh/h)	0	458	58	106	438	0	103	0	93	0	0	0
Future Volume (veh/h)	0	458	58	106	438	0	103	0	93	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	515	65	119	492	0	116	0	104	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	2052	258	139	2794	0	253	0	174	0	212	0
Arrive On Green	0.00	0.86	0.86	0.08	0.78	0.00	0.11	0.00	0.11	0.00	0.00	0.00
Sat Flow, veh/h	0	3255	398	1757	3668	0	1404	0	1558	0	1900	0
Grp Volume(v), veh/h	0	287	293	119	492	0	116	0	104	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1790	1757	1787	0	1404	0	1558	0	1900	0
Q Serve(g_s), s	0.0	2.1	2.1	5.0	2.6	0.0	6.0	0.0	4.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.1	2.1	5.0	2.6	0.0	6.0	0.0	4.8	0.0	0.0	0.0
Prop In Lane	0.00		0.22	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1148	1162	139	2794	0	253	0	174	0	212	0
V/C Ratio(X)	0.00	0.25	0.25	0.85	0.18	0.00	0.46	0.00	0.60	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1148	1162	328	2794	0	470	0	415	0	507	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.9	1.9	34.1	2.1	0.0	32.3	0.0	31.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	5.5	0.1	0.0	0.5	0.0	1.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.1	1.2	2.7	1.3	0.0	2.4	0.0	2.1	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	2.4	2.4	39.6	2.2	0.0	32.7	0.0	32.9	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		580			611			220			0	
Approach Delay, s/veh		2.4			9.5			32.8			0.0	
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	52.7		12.4		62.6		12.4				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	14.5	29.0		20.0		47.0		20.0				
Max Q Clear Time (g_c+I1), s	7.0	4.1		0.0		4.6		8.0				
Green Ext Time (p_c), s	0.0	9.1		0.0		10.7		0.5				

Intersection Summary

HCM 2010 Ctrl Delay	10.2
HCM 2010 LOS	B

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Background + Project PM.syn
12/12/2017

Intersection

Intersection Delay, s/veh	17.8
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↑↑	↑		↑	↑		↓	↑
Traffic Vol, veh/h	0	431	24	0	27	14	6	23	427
Future Vol, veh/h	0	431	24	0	27	14	6	23	427
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	484	27	0	30	16	7	26	480
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	14.7	10.4	21.5
HCM LOS	B	B	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	216	216	24	27	14	29	427
LT Vol	216	216	0	0	0	29	0
Through Vol	0	0	24	27	0	0	0
RT Vol	0	0	0	0	14	0	427
Lane Flow Rate	242	242	27	30	16	33	480
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.458	0.456	0.034	0.062	0.029	0.061	0.737
Departure Headway (Hd)	6.81	6.775	4.544	7.396	6.676	6.731	5.53
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	530	533	786	482	534	531	652
Service Time	4.551	4.517	2.284	5.169	4.449	4.479	3.278
HCM Lane V/C Ratio	0.457	0.454	0.034	0.062	0.03	0.062	0.736
HCM Control Delay	15.2	15.1	7.4	10.7	9.7	9.9	22.3
HCM Lane LOS	C	C	A	B	A	A	C
HCM 95th-tile Q	2.4	2.4	0.1	0.2	0.1	0.2	6.4

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Background + Project PM.syn
12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	219	0	174	62	20	26	182	1454	4	17	1381	205
Future Volume (vph)	219	0	174	62	20	26	182	1454	4	17	1381	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1458		1715	1662		1805	3573		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1458		1715	1662		1805	3573		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	179	64	21	27	188	1499	4	18	1424	211
RTOR Reduction (vph)	0	149	0	0	25	0	0	0	0	0	0	98
Lane Group Flow (vph)	203	53	0	57	30	0	188	1503	0	18	1424	113
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	14.7	14.7		5.3	5.3		11.1	48.1		2.7	39.7	39.7
Effective Green, g (s)	14.9	14.9		5.5	5.5		10.8	49.0		2.4	40.6	40.6
Actuated g/C Ratio	0.17	0.17		0.06	0.06		0.12	0.56		0.03	0.46	0.46
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	288	247		107	104		222	1994		49	1652	732
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.10	0.42		0.01	c0.40	
v/s Ratio Perm												0.07
v/c Ratio	0.70	0.22		0.53	0.29		0.85	0.75		0.37	0.86	0.15
Uniform Delay, d1	34.4	31.4		39.9	39.3		37.7	14.8		42.0	21.1	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.9	0.5		6.4	2.1		24.6	1.9		4.6	5.2	0.2
Delay (s)	42.3	31.9		46.3	41.3		62.3	16.7		46.6	26.3	13.8
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		37.1			43.8			21.7			24.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	87.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Background + Project PM.syn
12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	219	0	174	62	20	26	182	1454	4	17	1381	205
Future Volume (veh/h)	219	0	174	62	20	26	182	1454	4	17	1381	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1817	1900	1900	1900	1900	1881	1900	1881	1900	1881	1863
Adj Flow Rate, veh/h	202	33	179	56	32	27	188	1499	4	18	1424	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	0	1	1	2
Cap, veh/h	306	42	226	147	76	64	219	1937	5	45	1549	686
Arrive On Green	0.17	0.17	0.17	0.08	0.08	0.08	0.12	0.53	0.52	0.03	0.43	0.00
Sat Flow, veh/h	1792	244	1321	1810	942	794	1810	3657	10	1810	3574	1583
Grp Volume(v), veh/h	202	0	212	56	0	59	188	732	771	18	1424	0
Grp Sat Flow(s),veh/h/ln	1792	0	1565	1810	0	1736	1810	1787	1879	1810	1787	1583
Q Serve(g_s), s	8.7	0.0	10.8	2.4	0.0	2.7	8.4	27.0	27.0	0.8	31.1	0.0
Cycle Q Clear(g_c), s	8.7	0.0	10.8	2.4	0.0	2.7	8.4	27.0	27.0	0.8	31.1	0.0
Prop In Lane	1.00		0.84	1.00		0.46	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	306	0	267	147	0	141	219	947	996	45	1549	686
V/C Ratio(X)	0.66	0.00	0.79	0.38	0.00	0.42	0.86	0.77	0.77	0.40	0.92	0.00
Avail Cap(c_a), veh/h	385	0	337	157	0	151	241	947	996	153	1641	727
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.1	0.0	33.0	36.1	0.0	36.2	35.7	15.5	15.5	39.7	22.1	0.0
Incr Delay (d2), s/veh	3.3	0.0	10.5	2.3	0.0	2.8	23.6	4.5	4.3	5.5	8.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	5.4	1.3	0.0	1.4	5.7	14.4	15.1	0.5	17.1	0.0
LnGrp Delay(d),s/veh	35.4	0.0	43.5	38.4	0.0	39.0	59.3	20.0	19.8	45.3	30.9	0.0
LnGrp LOS	D		D	D		D	E	B	B	D	C	
Approach Vol, veh/h		414			115			1691			1442	
Approach Delay, s/veh		39.5			38.7			24.2			31.1	
Approach LOS		D			D			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.1	14.0	39.9		10.7	6.1	47.8
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 18	11.3	37.1		7.0	7.3	41.1
Max Q Clear Time (g_c+I1), s		12.8	10.4	33.1		4.7	2.8	29.0
Green Ext Time (p_c), s		1.0	0.0	1.9		0.1	0.0	11.8

Intersection Summary			
HCM 2010 Ctrl Delay		29.1	
HCM 2010 LOS		C	

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Background + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	869	18	26	18	6	54	10	1722	19	55	1544	493
Future Volume (vph)	869	18	26	18	6	54	10	1722	19	55	1544	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Flt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1729		1715	1761	1524	1805	3530		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1729		1715	1761	1524	1805	3530		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	27	18	6	55	10	1757	19	56	1576	503
RTOR Reduction (vph)	0	20	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	25	0	12	12	3	10	1776	0	56	1576	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	38.1	38.1		6.6	6.6	6.6	1.5	72.5		6.3	77.8	141.4
Effective Green, g (s)	38.7	38.7		6.8	6.8	6.8	1.2	73.4		6.5	78.7	141.4
Actuated g/C Ratio	0.27	0.27		0.05	0.05	0.05	0.01	0.52		0.05	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	948	473		82	84	73	15	1832		82	1989	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	c0.50		c0.03	0.44	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.94	0.05		0.15	0.14	0.04	0.67	0.97		0.68	0.79	0.31
Uniform Delay, d1	50.1	37.9		64.5	64.5	64.2	69.9	32.9		66.4	24.9	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.2	0.1		1.4	1.4	0.4	75.9	14.5		20.9	2.6	0.5
Delay (s)	66.3	37.9		65.9	65.9	64.5	145.8	47.4		87.4	27.5	0.5
Level of Service	E	D		E	E	E	F	D		F	C	A
Approach Delay (s)		65.0			64.9			48.0			22.7	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Background + Project PM.syn
12/01/2017

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	145	1	12	4	0	4	6	443	0	1	438	82
Future Vol, veh/h	145	1	12	4	0	4	6	443	0	1	438	82
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	159	1	13	4	0	4	7	487	0	1	481	90

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	802	1042	302	756	1087	256	579	0	0	492	0	0
Stage 1	537	537	-	505	505	-	-	-	-	-	-	-
Stage 2	265	505	-	251	582	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	275	232	677	301	218	749	1005	-	-	1082	-	-
Stage 1	496	526	-	523	544	-	-	-	-	-	-	-
Stage 2	717	544	-	737	502	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	267	227	668	288	213	741	998	-	-	1075	-	-
Mov Cap-2 Maneuver	267	227	-	288	213	-	-	-	-	-	-	-
Stage 1	488	522	-	516	536	-	-	-	-	-	-	-
Stage 2	701	536	-	715	498	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37	13.9	0.1	0
HCM LOS	E	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WB Ln1	SBL	SBT	SBR
Capacity (veh/h)	998	-	279	415	1075	-	-	-
HCM Lane V/C Ratio	0.007	-	0.622	0.021	0.001	-	-	-
HCM Control Delay (s)	8.6	0	37	13.9	8.4	0	-	-
HCM Lane LOS	A	A	-	E	B	A	A	-
HCM 95th %tile Q(veh)	0	-	3.8	0.1	0	-	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Background + Project PM.syn
12/01/2017

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗			↔		↔		
Traffic Vol, veh/h	108	445	16	6	419	29	10	6	4	6	3	115
Future Vol, veh/h	108	445	16	6	419	29	10	6	4	6	3	115
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	115	473	17	6	446	31	11	6	4	6	3	122

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	481	0	0	507	0	0	979	1222	279	965	1215	255
Stage 1	-	-	-	-	-	-	729	729	-	478	478	-
Stage 2	-	-	-	-	-	-	250	493	-	487	737	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1085	-	-	1068	-	-	207	181	724	212	183	744
Stage 1	-	-	-	-	-	-	385	431	-	543	559	-
Stage 2	-	-	-	-	-	-	738	550	-	536	428	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1073	-	-	1053	-	-	151	158	704	184	160	733
Mov Cap-2 Maneuver	-	-	-	-	-	-	151	158	-	184	160	-
Stage 1	-	-	-	-	-	-	339	379	-	483	554	-
Stage 2	-	-	-	-	-	-	601	545	-	461	377	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0.1	27.4	12.8
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	182	1073	-	-	1053	-	-	595
HCM Lane V/C Ratio	0.117	0.107	-	-	0.006	-	-	0.222
HCM Control Delay (s)	27.4	8.8	-	-	8.4	-	-	12.8
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.4	-	-	0	-	-	0.8

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Background + Project PM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	992	115	15	630	140	34
Future Volume (vph)	992	115	15	630	140	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1750	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1750	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1067	124	16	677	151	37
RTOR Reduction (vph)	0	45	0	0	10	0
Lane Group Flow (vph)	1067	79	16	677	178	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	48.6	48.6	0.7	53.5	12.1	
Effective Green, g (s)	48.6	48.6	0.7	53.5	12.1	
Actuated g/C Ratio	0.64	0.64	0.01	0.70	0.16	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1194	994	16	1302	276	
v/s Ratio Prot	c0.57		0.01	c0.36	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.89	0.08	1.00	0.52	0.64	
Uniform Delay, d1	11.8	5.4	37.9	5.4	30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.0	0.0	225.0	0.4	3.8	
Delay (s)	20.8	5.4	262.9	5.9	34.0	
Level of Service	C	A	F	A	C	
Approach Delay (s)	19.2			11.8	34.0	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	15.1
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Background + Project PM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↑	↑	↑	↑		
Traffic Volume (veh/h)	992	115	15	630	140	34		
Future Volume (veh/h)	992	115	15	630	140	34		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1870	1900		
Adj Flow Rate, veh/h	1067	124	16	677	151	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	1	1	0	2	0	0		
Cap, veh/h	1248	1039	28	1372	199	0		
Arrive On Green	0.66	0.66	0.02	0.74	0.11	0.00		
Sat Flow, veh/h	1881	1566	1810	1863	1770	0		
Grp Volume(V), veh/h	1067	124	16	677	152	0		
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1781	0		
Q Serve(g_s), s	31.9	2.1	0.6	10.9	6.0	0.0		
Cycle Q Clear(g_c), s	31.9	2.1	0.6	10.9	6.0	0.0		
Prop In Lane		1.00	1.00		0.99	0.00		
Lane Grp Cap(c), veh/h	1248	1039	28	1372	200	0		
V/C Ratio(X)	0.86	0.12	0.58	0.49	0.76	0.00		
Avail Cap(c_a), veh/h	1379	1148	100	1577	444	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	9.5	4.4	35.3	3.9	31.1	0.0		
Incr Delay (d2), s/veh	5.3	0.1	7.0	0.3	2.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	18.1	0.9	0.4	5.6	3.0	0.0		
LnGrp Delay(d),s/veh	14.7	4.5	42.3	4.3	33.3	0.0		
LnGrp LOS	B	A	D	A	C			
Approach Vol, veh/h	1191			693	152			
Approach Delay, s/veh	13.7			5.2	33.3			
Approach LOS	B			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.3	54.3				59.6		12.6
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	52.9				61.1		18.0
Max Q Clear Time (g_c+I1), s	2.6	33.9				12.9		8.0
Green Ext Time (p_c), s	0.0	14.0				25.8		0.1
Intersection Summary								
HCM 2010 Ctrl Delay			12.2					
HCM 2010 LOS			B					
Notes								

Synchro 9 Report

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Background + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	57	934	27	16	560	19	27	1	28	14	2	46
Future Vol, veh/h	57	934	27	16	560	19	27	1	28	14	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	64	1049	30	18	629	21	30	1	31	16	2	52
Major/Minor												
Conflicting Flow All	Major1	Major2	Minor1	Minor2								
Stage 1	651	0	0	1049	0	0	1855	1865	1049	1854	1854	640
Stage 2	-	-	-	-	-	-	1178	1178	-	676	676	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	945	-	-	671	-	-	57	74	279	57	75	479
Stage 1	-	-	-	-	-	-	235	267	-	446	456	-
Stage 2	-	-	-	-	-	-	446	450	-	235	267	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	945	-	-	671	-	-	46	67	279	46	68	479
Mov Cap-2 Maneuver	-	-	-	-	-	-	46	67	-	46	68	-
Stage 1	-	-	-	-	-	-	219	249	-	416	444	-
Stage 2	-	-	-	-	-	-	385	438	-	194	249	-
Approach												
HCM Control Delay, s	EB	WB	NB	SB								
HCM LOS	0.5	0.3	97.9	40.8								
			F	E								
Minor Lane/Major Mvmt												
Capacity (veh/h)	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2		
HCM Lane V/C Ratio	0.669	0.113	0.068	-	-	0.027	-	-	0.375	0.108		
HCM Control Delay (s)	176.3	19.5	9.1	-	-	10.5	-	-	119.4	13.4		
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B		
HCM 95th %tile Q(veh)	2.6	0.4	0.2	-	-	0.1	-	-	1.3	0.4		

Synchro 9 Report

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Background + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	↕
Traffic Vol, veh/h	39	1	7	669	497	40
Future Vol, veh/h	39	1	7	669	497	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	41	1	7	704	523	42

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	1242	523	523	0	- 0
Stage 1	523	-	-	-	-
Stage 2	719	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	195	558	1054	-	-
Stage 1	599	-	-	-	-
Stage 2	486	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	193	558	1054	-	-
Mov Cap-2 Maneuver	193	-	-	-	-
Stage 1	599	-	-	-	-
Stage 2	481	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.3	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1054	-	196	-	-
HCM Lane V/C Ratio	0.007	-	0.215	-	-
HCM Control Delay (s)	8.4	0	28.3	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Background + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	↕
Traffic Vol, veh/h	27	58	446	43	30	479
Future Vol, veh/h	27	58	446	43	30	479
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	28	61	469	45	32	504

Major/Minor	Minor1	Major1	Major2	Major2	Major2
Conflicting Flow All	1071	503	0	0	521 0
Stage 1	498	-	-	-	-
Stage 2	573	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1 -
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2 -
Pot Cap-1 Maneuver	247	573	-	-	1056 -
Stage 1	615	-	-	-	-
Stage 2	568	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	234	568	-	-	1052 -
Mov Cap-2 Maneuver	234	-	-	-	-
Stage 1	612	-	-	-	-
Stage 2	541	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	391	1052	-
HCM Lane V/C Ratio	-	-	0.229	0.03	-
HCM Control Delay (s)	-	-	16.9	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Background + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	14	121	131	387	350	28
Future Vol, veh/h	14	121	131	387	350	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	133	144	425	385	31

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	1106	393	389	0	0
Stage 1	389	-	-	-	-
Stage 2	717	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-
Pot Cap-1 Maneuver	235	658	1181	-	-
Stage 1	689	-	-	-	-
Stage 2	487	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	205	654	1177	-	-
Mov Cap-2 Maneuver	205	-	-	-	-
Stage 1	687	-	-	-	-
Stage 2	426	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1177	-	533	-	-
HCM Lane V/C Ratio	0.122	-	0.278	-	-
HCM Control Delay (s)	8.5	-	14.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Background + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 3.7						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	27	136	109	292	236	17
Future Vol, veh/h	27	136	109	292	236	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	145	116	311	251	18

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	813	270	274	0	0
Stage 1	265	-	-	-	-
Stage 2	548	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-
Pot Cap-1 Maneuver	351	769	1295	-	-
Stage 1	784	-	-	-	-
Stage 2	583	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	317	763	1290	-	-
Mov Cap-2 Maneuver	317	-	-	-	-
Stage 1	781	-	-	-	-
Stage 2	528	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	2.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1290	-	619	-	-
HCM Lane V/C Ratio	0.09	-	0.28	-	-
HCM Control Delay (s)	8.1	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background + Project PM.syn
12/01/2017

Intersection

Intersection Delay, s/veh 9.8
Intersection LOS A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	2	1	121	0	3	0	0	0	138	171	3
Future Vol, veh/h	0	2	1	121	0	3	0	0	0	138	171	3
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0
Mvmt Flow	0	2	1	133	0	3	0	0	0	152	188	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.4	8.5	10.8
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	44%	2%	100%	1%
Vol Thru, %	55%	1%	0%	99%
Vol Right, %	1%	98%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	312	124	3	135
LT Vol	138	2	3	1
Through Vol	171	1	0	134
RT Vol	3	121	0	0
Lane Flow Rate	343	136	3	148
Geometry Grp	1	1	1	1
Degree of Util (X)	0.427	0.168	0.005	0.189
Departure Headway (Hd)	4.482	4.436	5.403	4.594
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	802	808	660	780
Service Time	2.51	2.469	3.452	2.628
HCM Lane V/C Ratio	0.428	0.168	0.005	0.19
HCM Control Delay	10.8	8.4	8.5	8.7
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.2	0.6	0	0.7

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background + Project PM.syn
12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	134	0
Future Vol, veh/h	0	1	134	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	147	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.7
HCM LOS	A

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Background + Project Saturday.syn
12/01/2017

	↖	↗	↑	↘	↙	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖↖	↑	↘	↙↙	↓
Traffic Volume (vph)	0	886	745	80	941	795
Future Volume (vph)	0	886	745	80	941	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Flt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	913	768	82	970	820
RTOR Reduction (vph)	0	164	0	12	0	0
Lane Group Flow (vph)	0	749	768	70	970	820
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		16.2	22.5	22.5	16.2	48.5
Effective Green, g (s)		17.1	23.4	23.4	17.1	48.5
Actuated g/C Ratio		0.35	0.48	0.48	0.35	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1002	907	779	1222	1881
v/s Ratio Prot		0.26	c0.41		c0.28	0.44
v/s Ratio Perm				0.04		
v/c Ratio		0.75	0.85	0.09	0.79	0.44
Uniform Delay, d1		13.8	11.0	6.8	14.1	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		3.5	7.6	0.1	4.1	0.7
Delay (s)		17.3	18.5	6.8	18.2	0.7
Level of Service		B	B	A	B	A
Approach Delay (s)	17.3		17.4			10.2
Approach LOS	B		B			B
Intersection Summary						
HCM 2000 Control Delay		13.7			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.82				
Actuated Cycle Length (s)		48.5			Sum of lost time (s)	8.0
Intersection Capacity Utilization		76.9%			ICU Level of Service	D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Background + Project Saturday.syn
12/01/2017

	↖	→	↘	↙	←	↗	↘	↑	↙	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↘	↙↙	↖↖		↖	↘	↘	↖	↘	↖
Traffic Volume (vph)	25	737	260	480	659	3	211	17	456	2	17	14
Future Volume (vph)	25	737	260	480	659	3	211	17	456	2	17	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1717	1575		1891	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1717	1575		1891	1615
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)	27	784	277	511	701	3	224	18	485	2	18	15
RTOR Reduction (vph)	0	0	180	0	0	0	0	0	92	0	0	15
Lane Group Flow (vph)	27	784	97	511	704	0	121	121	393	0	20	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1				1		1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.7	21.2	21.2	12.7	32.2		7.9	7.9	20.6		1.0	1.0
Effective Green, g (s)	2.2	22.2	22.2	13.3	33.2		9.7	9.7	21.8		2.0	2.0
Actuated g/C Ratio	0.03	0.35	0.35	0.21	0.53		0.15	0.15	0.34		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	62	1255	559	729	1894		260	263	543		59	51
v/s Ratio Prot	0.01	c0.22		0.15	0.20		0.07	0.07	c0.15		c0.01	
v/s Ratio Perm			0.06						0.10			0.00
v/c Ratio	0.44	0.62	0.17	0.70	0.37		0.47	0.46	0.72		0.34	0.01
Uniform Delay, d1	29.9	17.0	14.2	23.1	8.8		24.4	24.4	18.1		30.0	29.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.7	0.1	2.5	0.0		0.5	0.5	4.0		1.2	0.0
Delay (s)	31.7	17.7	14.2	25.6	8.9		24.9	24.8	22.1		31.2	29.7
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		17.2			15.9			23.0			30.5	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			18.2								HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			63.2								Sum of lost time (s)	16.1
Intersection Capacity Utilization			62.1%								ICU Level of Service	B
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary Background + Project Saturday.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	25	737	260	480	659	3	211	17	456	2	17	14
Future Volume (veh/h)	25	737	260	480	659	3	211	17	456	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	784	277	511	701	3	237	0	485	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	54	963	429	619	1535	7	1079	0	727	6	58	56
Arrive On Green	0.03	0.27	0.27	0.18	0.42	0.40	0.30	0.00	0.28	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1593	3476	3686	16	3583	0	1561	189	1701	1615
Grp Volume(V), veh/h	27	784	277	511	343	361	237	0	485	20	0	15
Grp Sat Flow(S),veh/h/ln	1810	1787	1593	1738	1805	1897	1792	0	1561	1891	0	1615
Q Serve(g_s), s	1.1	15.1	11.3	10.4	10.1	10.1	3.7	0.0	17.8	0.8	0.0	0.7
Cycle Q Clear(g_c), s	1.1	15.1	11.3	10.4	10.1	10.1	3.7	0.0	17.8	0.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	54	963	429	619	752	790	1079	0	727	65	0	56
V/C Ratio(X)	0.50	0.81	0.65	0.83	0.46	0.46	0.22	0.00	0.67	0.31	0.00	0.27
Avail Cap(c_a), veh/h	135	1056	471	679	752	790	1642	0	972	103	0	88
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	25.2	23.8	29.2	15.5	15.5	19.3	0.0	15.4	34.8	0.0	34.7
Incr Delay (d2), s/veh	2.6	4.1	1.8	6.9	0.2	0.2	0.0	0.0	0.4	1.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.0	5.2	5.6	5.0	5.2	1.8	0.0	7.7	0.4	0.0	0.3
LnGrp Delay(d),s/veh	37.9	29.3	25.7	36.1	15.7	15.7	19.3	0.0	15.8	35.7	0.0	35.7
LnGrp LOS	D	C	C	D	B	B	B		B	D		D
Approach Vol, veh/h		1088			1215			722			35	
Approach Delay, s/veh		28.6			24.3			17.0			35.7	
Approach LOS		C			C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	34.7		26.2	17.1	23.9		6.5				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 14	20.8		3.0				
Max Q Clear Time (g_c+I1), s	3.1	12.1		19.8	12.4	17.1		2.8				
Green Ext Time (p_c), s	0.0	3.9		0.4	0.1	1.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay		24.2										
HCM 2010 LOS		C										
Notes												

HCM Signalized Intersection Capacity Analysis Background + Project Saturday.syn
 3: SR 1 & Rio Rd 12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↔	↕	↕	↔	↕	↔	↔	↕
Traffic Volume (vph)	133	386	69	8	205	386	321	71	373	181	304	437
Future Volume (vph)	133	386	69	8	205	386	321	71	373	181	304	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3506			1795	1881	1556	1805	1863	1590	3502	1838
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3506			675	1881	1556	1805	1863	1590	3502	1838
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	134	390	70	8	207	390	324	72	377	183	307	441
RTOR Reduction (vph)	0	17	0	0	0	0	230	0	0	128	0	5
Lane Group Flow (vph)	134	443	0	0	215	390	95	72	377	55	307	491
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.5	20.6			11.5	23.6	23.6	6.1	23.5	23.5	9.5	26.9
Effective Green, g (s)	8.2	20.8			11.2	23.8	23.8	5.8	24.4	24.4	9.2	27.8
Actuated g/C Ratio	0.10	0.25			0.14	0.29	0.29	0.07	0.30	0.30	0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	179	893			92	548	453	128	557	475	394	626
v/s Ratio Prot	0.07	0.13				c0.21		0.04	0.20		c0.09	c0.27
v/s Ratio Perm					c0.32		0.06			0.03		
v/c Ratio	0.75	0.50			2.34	0.71	0.21	0.56	0.68	0.12	0.78	0.78
Uniform Delay, d1	35.7	25.9			35.2	25.8	21.8	36.7	25.1	20.8	35.2	24.2
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.7	0.5			634.1	4.5	0.3	5.6	3.4	0.1	9.4	6.6
Delay (s)	51.4	26.4			669.3	30.3	22.1	42.2	28.5	20.9	44.6	30.8
Level of Service	D	C			F	C	C	D	C	C	D	C
Approach Delay (s)		32.1				175.3			27.9			36.1
Approach LOS		C				F			C			D
Intersection Summary												
HCM 2000 Control Delay						77.3						
HCM 2000 Volume to Capacity ratio						1.02						
Actuated Cycle Length (s)						81.6			Sum of lost time (s)		16.0	
Intersection Capacity Utilization						74.3%			ICU Level of Service		D	
Analysis Period (min)						15						
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background + Project Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Background + Project Saturday.syn
12/01/2017

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	84	200	258	160	157	339	29	298	13	156	27	16
Future Volume (vph)	84	200	258	160	157	339	29	298	13	156	27	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frbp, ped/bikes		1.00	0.99		1.00	1.00		1.00	0.97			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.94		1.00	0.99		1.00	0.86			0.88
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1780	3370		1787	3560		3467	1567			3087
Flt Permitted		0.52	1.00		0.95	1.00		0.95	1.00			0.89
Satd. Flow (perm)		978	3370		1787	3560		3467	1567			2774
Peak-hour factor, PHF	0.95	0.92	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.95	0.92
Adj. Flow (vph)	88	217	272	168	165	357	32	314	14	164	29	17
RTOR Reduction (vph)	0	0	89	0	0	5	0	0	120	0	0	191
Lane Group Flow (vph)	0	305	351	0	165	384	0	314	58	0	0	64
Confl. Peds. (#/hr)				5	9			5		9		
Confl. Bikes (#/hr)				11						11		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	2%	1%	2%	1%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2										
Actuated Green, G (s)		41.6	41.6		12.8	57.9		12.4	24.1			7.7
Effective Green, g (s)		41.6	41.6		12.3	57.9		12.4	24.1			7.7
Actuated g/C Ratio		0.46	0.46		0.14	0.64		0.14	0.27			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		452	1557		244	2290		477	419			237
v/s Ratio Prot			0.10		c0.09	0.11		c0.09	0.04			
v/s Ratio Perm	c0.31											c0.02
v/c Ratio	0.67	0.23			0.68	0.17		0.66	0.14			0.27
Uniform Delay, d1	18.9	14.5			37.0	6.4		36.8	25.1			38.5
Progression Factor	1.00	1.00			0.98	1.44		1.00	1.00			1.00
Incremental Delay, d2	7.8	0.3			5.7	0.2		2.5	0.2			0.6
Delay (s)	26.8	14.9			41.9	9.4		39.3	25.2			39.1
Level of Service		C	B		D	A		D	C			D
Approach Delay (s)			19.7			19.1			34.2			39.1
Approach LOS			B			B			C			D

Intersection Summary

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Background + Project Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	192
Future Volume (vph)	192
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	209
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center Pl & Rio Rd

Background + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↑	↑		↔	
Traffic Volume (vph)	0	399	42	109	447	0	78	0	70	0	0	0
Future Volume (vph)	0	399	42	109	447	0	78	0	70	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.95			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3548		1805	3574			1794	1525			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3548		1805	3574			1430	1525			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	438	46	120	491	0	86	0	77	0	0	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	69	0	0	0
Lane Group Flow (vph)	0	479	0	120	491	0	0	86	8	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8				4
Permitted Phases							8		8		4	
Actuated Green, G (s)		60.3		9.4	73.2			8.8	8.8			
Effective Green, g (s)		60.3		8.9	73.2			8.8	8.8			
Actuated g/C Ratio		0.67		0.10	0.81			0.10	0.10			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2377		178	2906			139	149			
v/s Ratio Prot		c0.14		c0.07	0.14							
v/s Ratio Perm								c0.06	0.00			
v/c Ratio		0.20		0.67	0.17			0.62	0.05			
Uniform Delay, d1		5.7		39.2	1.8			39.0	36.8			
Progression Factor		0.94		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.7	0.1			5.7	0.1			
Delay (s)		5.5		46.8	1.9			44.6	36.9			
Level of Service		A		D	A			D	D			
Approach Delay (s)		5.5			10.8			41.0			0.0	
Approach LOS		A			B			D			A	

Intersection Summary

HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	32.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center Pl & Rio Rd

Background + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↓	↑↑			↓	↑		↑↓	
Traffic Volume (veh/h)	0	399	42	109	447	0	78	0	70	0	0	0
Future Volume (veh/h)	0	399	42	109	447	0	78	0	70	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	438	46	120	491	0	86	0	77	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	2320	242	141	2959	0	200	0	126	0	158	0
Arrive On Green	0.00	0.47	0.47	0.08	0.83	0.00	0.08	0.00	0.08	0.00	0.00	0.00
Sat Flow, veh/h	0	3385	344	1810	3668	0	1440	0	1516	0	1900	0
Grp Volume(v), veh/h	0	239	245	120	491	0	86	0	77	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1828	1810	1787	0	1440	0	1516	0	1900	0
Q Serve(g_s), s	0.0	6.9	7.0	5.9	2.5	0.0	5.2	0.0	4.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	6.9	7.0	5.9	2.5	0.0	5.2	0.0	4.4	0.0	0.0	0.0
Prop In Lane	0.00		0.19	1.00		0.00	1.00		1.00	0.00	0.00	0.00
Lane Grp Cap(c), veh/h	0	1273	1289	141	2959	0	200	0	126	0	158	0
V/C Ratio(X)	0.00	0.19	0.19	0.85	0.17	0.00	0.43	0.00	0.61	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1273	1289	402	2959	0	464	0	404	0	507	0
HCM Platoon Ratio	1.00	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	0.97	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	8.8	8.8	41.0	1.5	0.0	40.2	0.0	39.8	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	5.3	0.1	0.0	0.5	0.0	1.8	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	3.6	3.1	1.2	0.0	2.1	0.0	1.9	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	9.1	9.2	46.2	1.7	0.0	40.8	0.0	41.6	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		D		D			
Approach Vol, veh/h		484			611			163			0	
Approach Delay, s/veh		9.1			10.4			41.2			0.0	
Approach LOS		A			B			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.0	67.5		11.5		78.5		11.5				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	20.5	34.0		24.0		58.0		24.0				
Max Q Clear Time (g_c+1), s	7.9	9.0		0.0		4.5		7.2				
Green Ext Time (p_c), s	0.0	8.5		0.0		10.3		0.4				

Intersection Summary

HCM 2010 Ctrl Delay	13.9
HCM 2010 LOS	B

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Background + Project Saturday.syn
12/12/2017

Intersection

Intersection Delay, s/veh	15.7
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBL	WBR	SBU	SBL	SBR
Lane Configurations		↑↑	↑			↑	↑	↓	↑
Traffic Vol, veh/h	0	328	22	0	26	11	2	19	455
Future Vol, veh/h	0	328	22	0	26	11	2	19	455
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	353	24	0	28	12	2	20	489
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	12.3	9.9	18.7
HCM LOS	B	A	C

Lane

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	164	164	22	26	11	21	455
LT Vol	164	164	0	0	0	21	0
Through Vol	0	0	22	26	0	0	0
RT Vol	0	0	0	0	11	0	455
Lane Flow Rate	176	176	24	28	12	23	489
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.327	0.326	0.029	0.054	0.021	0.04	0.702
Departure Headway (Hd)	6.672	6.654	4.425	6.991	6.431	6.362	5.162
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	540	540	807	511	555	566	705
Service Time	4.412	4.395	2.164	4.752	4.192	4.062	2.862
HCM Lane V/C Ratio	0.326	0.326	0.03	0.055	0.022	0.041	0.694
HCM Control Delay	12.6	12.6	7.3	10.2	9.3	9.3	19.1
HCM Lane LOS	B	B	A	B	A	A	C
HCM 95th-tile Q	1.4	1.4	0.1	0.2	0.1	0.1	5.8

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Background + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	271	7	193	42	11	9	216	1335	7	5	1501	289
Future Volume (vph)	271	7	193	42	11	9	216	1335	7	5	1501	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1563		1715	1683		1787	3569		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1563		1715	1683		1787	3569		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	195	42	11	9	218	1348	7	5	1516	292
RTOR Reduction (vph)	0	161	0	0	9	0	0	0	0	0	0	128
Lane Group Flow (vph)	247	68	0	31	22	0	218	1355	0	5	1516	164
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.2	15.2		3.9	3.9		11.4	51.7		1.3	41.6	41.6
Effective Green, g (s)	15.4	15.4		4.1	4.1		11.1	52.6		1.0	42.5	42.5
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.12	0.59		0.01	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	293	270		78	77		222	2106		20	1704	753
v/s Ratio Prot	c0.15	0.04		c0.02	0.01		c0.12	0.38		0.00	c0.42	
v/s Ratio Perm												0.10
v/c Ratio	0.84	0.25		0.40	0.29		0.98	0.64		0.25	0.89	0.22
Uniform Delay, d1	35.7	31.9		41.3	41.1		38.9	12.1		43.7	21.2	13.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.7	0.6		4.5	2.9		55.0	0.8		6.5	6.5	0.3
Delay (s)	55.4	32.4		45.8	43.9		93.9	12.9		50.2	27.6	13.9
Level of Service	E	C		D	D		F	B		D	C	B
Approach Delay (s)		44.3			44.9			24.1			25.5	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Background + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	271	7	193	42	11	9	216	1335	7	5	1501	289
Future Volume (veh/h)	271	7	193	42	11	9	216	1335	7	5	1501	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1898	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	238	57	195	31	26	9	218	1348	7	5	1516	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	318	67	229	120	89	31	226	2065	11	10	1594	720
Arrive On Green	0.18	0.18	0.17	0.07	0.07	0.06	0.13	0.57	0.56	0.01	0.45	0.00
Sat Flow, veh/h	1792	378	1292	1810	1342	465	1792	3644	19	1810	3574	1615
Grp Volume(v), veh/h	238	0	252	31	0	35	218	661	694	5	1516	0
Grp Sat Flow(s),veh/h/ln	1792	0	1670	1810	0	1807	1792	1786	1877	1810	1787	1615
Q Serve(g_s), s	11.0	0.0	12.7	1.4	0.0	1.6	10.5	22.1	22.1	0.2	35.5	0.0
Cycle Q Clear(g_c), s	11.0	0.0	12.7	1.4	0.0	1.6	10.5	22.1	22.1	0.2	35.5	0.0
Prop In Lane	1.00		0.77	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	318	0	296	120	0	120	226	1012	1064	10	1594	720
V/C Ratio(X)	0.75	0.00	0.85	0.26	0.00	0.29	0.96	0.65	0.65	0.48	0.95	0.00
Avail Cap(c_a), veh/h	342	0	319	150	0	149	226	1012	1064	146	1610	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	34.8	38.6	0.0	38.7	37.8	13.0	13.0	43.1	23.2	0.0
Incr Delay (d2), s/veh	8.7	0.0	18.8	1.6	0.0	1.9	49.1	1.9	1.8	31.1	12.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	0.0	7.4	0.8	0.0	0.9	8.3	11.3	11.9	0.2	20.3	0.0
LnGrp Delay(d),s/veh	42.6	0.0	53.6	40.2	0.0	40.6	86.9	14.8	14.7	74.3	36.0	0.0
LnGrp LOS	D		D	D		D	F	B	B	E	D	
Approach Vol, veh/h		490			66			1573				1521
Approach Delay, s/veh		48.3			40.4			24.8				36.1
Approach LOS		D			D			C				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.4	15.0	42.8		9.8	4.5	53.3				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 16	11.3	38.3		7.0	7.3	42.3				
Max Q Clear Time (g_c+I1), s		14.7	12.5	37.5		3.6	2.2	24.1				
Green Ext Time (p_c), s		0.5	0.0	0.4		0.1	0.0	17.5				

Intersection Summary			
HCM 2010 Ctrl Delay		32.9	
HCM 2010 LOS		C	

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Background + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔		↔	↔	↔
Traffic Volume (vph)	390	10	29	23	11	34	41	1525	27	40	1821	557
Future Volume (vph)	390	10	29	23	11	34	41	1525	27	40	1821	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1667		1715	1771	1584	1805	3564		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1667		1715	1771	1584	1805	3564		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	30	24	11	35	42	1572	28	41	1877	574
RTOR Reduction (vph)	0	25	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	15	0	17	18	2	42	1599	0	41	1877	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.8	15.8		6.6	6.6	6.6	4.6	62.8		4.5	63.2	107.6
Effective Green, g (s)	16.4	16.4		6.8	6.8	6.8	4.3	63.7		4.7	64.1	107.6
Actuated g/C Ratio	0.15	0.15		0.06	0.06	0.06	0.04	0.59		0.04	0.60	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	523	254		108	111	100	72	2109		78	2129	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.45		0.02	c0.53	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.77	0.06		0.16	0.16	0.02	0.58	0.76		0.53	0.88	0.37
Uniform Delay, d1	43.8	39.0		47.7	47.7	47.3	50.8	16.3		50.4	18.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	0.2		1.2	1.2	0.2	11.5	1.9		6.3	5.0	0.7
Delay (s)	51.3	39.2		48.9	48.9	47.4	62.2	18.2		56.6	23.6	0.7
Level of Service	D	D		D	D	D	E	B		E	C	A
Approach Delay (s)		50.2			48.2			19.3			18.8	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	107.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC

Background + Project Saturday.syn
12/01/2017

9: Carmel Rancho Blvd & Clocktower PI

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	124	0	14	1	0	0	6	338	0	0	456	94
Future Vol, veh/h	124	0	14	1	0	0	6	338	0	0	456	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	141	0	16	1	0	0	7	384	0	0	518	107

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	778	970	313	657	1023	192	625	0	0	384	0	0
Stage 1	572	572	-	398	398	-	-	-	-	-	-	-
Stage 2	206	398	-	259	625	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	286	255	689	354	238	823	966	-	-	1186	-	-
Stage 1	472	508	-	605	606	-	-	-	-	-	-	-
Stage 2	777	606	-	729	480	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	284	253	689	343	236	823	966	-	-	1186	-	-
Mov Cap-2 Maneuver	284	253	-	343	236	-	-	-	-	-	-	-
Stage 1	468	508	-	600	601	-	-	-	-	-	-	-
Stage 2	770	601	-	712	480	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.1	15.5	0.2	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	966	-	-	302	343	1186	-	-
HCM Lane V/C Ratio	0.007	-	-	0.519	0.003	-	-	-
HCM Control Delay (s)	8.8	0	-	29.1	15.5	0	-	-
HCM Lane LOS	A	A	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.8	0	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Background + Project Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖		↖	↖			↕		↕		
Traffic Vol, veh/h	131	338	12	5	445	31	7	0	6	6	1	104
Future Vol, veh/h	131	338	12	5	445	31	7	0	6	6	1	104
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	142	367	13	5	484	34	8	0	7	7	1	113

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	521	0	0	388	0	0	924	1199	206	991	1188	267
Stage 1	-	-	-	-	-	-	667	667	-	515	515	-
Stage 2	-	-	-	-	-	-	257	532	-	476	673	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1048	-	-	1182	-	-	227	187	807	203	190	737
Stage 1	-	-	-	-	-	-	419	460	-	516	538	-
Stage 2	-	-	-	-	-	-	731	529	-	544	457	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1045	-	-	1174	-	-	169	159	796	178	162	732
Mov Cap-2 Maneuver	-	-	-	-	-	-	169	159	-	178	162	-
Stage 1	-	-	-	-	-	-	360	395	-	444	534	-
Stage 2	-	-	-	-	-	-	612	525	-	463	392	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0.1	19.3	12.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	266	1045	-	-	1174	-	-	610
HCM Lane V/C Ratio	0.053	0.136	-	-	0.005	-	-	0.198
HCM Control Delay (s)	19.3	9	-	-	8.1	-	-	12.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	0.7

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Background + Project Saturday.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	796	122	32	773	128	20
Future Volume (vph)	796	122	32	773	128	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1785	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1785	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	847	130	34	822	136	21
RTOR Reduction (vph)	0	59	0	0	8	0
Lane Group Flow (vph)	847	71	34	822	149	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	30.9	30.9	1.2	36.3	9.6	
Effective Green, g (s)	30.9	30.9	1.2	36.3	9.6	
Actuated g/C Ratio	0.54	0.54	0.02	0.64	0.17	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1023	858	36	1202	301	
v/s Ratio Prot	c0.45		0.02	c0.44	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.83	0.08	0.94	0.68	0.49	
Uniform Delay, d1	10.7	6.2	27.8	6.6	21.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.8	0.1	125.7	1.7	0.5	
Delay (s)	16.5	6.2	153.5	8.3	21.9	
Level of Service	B	A	F	A	C	
Approach Delay (s)	15.2			14.0	21.9	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	56.8	Sum of lost time (s)	15.1
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Background + Project Saturday.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↓	↑	↓	↓		
Traffic Volume (veh/h)	796	122	32	773	128	20		
Future Volume (veh/h)	796	122	32	773	128	20		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	0.98	1.00	1.00	1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900		
Adj Flow Rate, veh/h	847	130	34	822	136	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Percent Heavy Veh, %	1	0	4	1	0	0		
Cap, veh/h	1109	930	51	1305	199	0		
Arrive On Green	0.59	0.59	0.03	0.69	0.11	0.00		
Sat Flow, veh/h	1881	1579	1740	1881	1797	0		
Grp Volume(V), veh/h	847	130	34	822	137	0		
Grp Sat Flow(s),veh/h/ln	1881	1579	1740	1881	1810	0		
Q Serve(g_s), s	18.8	2.1	1.1	13.3	4.1	0.0		
Cycle Q Clear(g_c), s	18.8	2.1	1.1	13.3	4.1	0.0		
Prop In Lane	1.00	1.00	1.00	0.99	0.00	0.00		
Lane Grp Cap(c), veh/h	1109	930	51	1305	201	0		
V/C Ratio(X)	0.76	0.14	0.67	0.63	0.68	0.00		
Avail Cap(c_a), veh/h	1277	1071	125	1553	583	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	8.6	5.1	26.8	4.6	23.9	0.0		
Incr Delay (d2), s/veh	2.6	0.1	5.4	0.7	1.5	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	10.4	0.9	0.6	6.9	2.1	0.0		
LnGrp Delay(d),s/veh	11.2	5.2	32.2	5.4	25.4	0.0		
LnGrp LOS	B	A	C	A	C			
Approach Vol, veh/h	977			856	137			
Approach Delay, s/veh	10.4			6.4	25.4			
Approach LOS	B			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.8	39.3				45.2		10.7
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	37.9				46.1		18.0
Max Q Clear Time (g_c+I1), s	3.1	20.8				15.3		6.1
Green Ext Time (p_c), s	0.0	12.1				18.2		0.1

Intersection Summary

HCM 2010 Ctrl Delay	9.7
HCM 2010 LOS	A

Notes

Synchro 9 Report

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HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Background + Project Saturday.syn
12/01/2017

Intersection

Int Delay, s/veh 4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Traffic Vol, veh/h	58	725	34	14	683	17	35	0	40	10	0	40
Future Vol, veh/h	58	725	34	14	683	17	35	0	40	10	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	62	771	36	15	727	18	37	0	43	11	0	43

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	745	0	0	771
Stage 1	-	-	-	895
Stage 2	-	-	-	765
Critical Hdwy	4.1	-	-	4.1
Critical Hdwy Stg 1	-	-	-	6.1
Critical Hdwy Stg 2	-	-	-	6.1
Follow-up Hdwy	2.2	-	-	2.2
Pot Cap-1 Maneuver	872	-	-	853
Stage 1	-	-	-	338
Stage 2	-	-	-	399
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	872	-	-	853
Mov Cap-2 Maneuver	-	-	-	65
Stage 1	-	-	-	314
Stage 2	-	-	-	352

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	62.9	25.8
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	65	403	872	-	-	853	-	-	65	422
HCM Lane V/C Ratio	0.573	0.106	0.071	-	-	0.017	-	-	0.164	0.101
HCM Control Delay (s)	117.6	15	9.4	-	-	9.3	-	-	70.9	14.5
HCM Lane LOS	F	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	2.4	0.4	0.2	-	-	0.1	-	-	0.5	0.3

Synchro 9 Report

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HCM 2010 TWSC
13: SR 1 & Ribera Rd

Background + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.1						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	↕
Traffic Vol, veh/h	42	4	5	578	671	43
Future Vol, veh/h	42	4	5	578	671	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	44	4	5	608	706	45

Major/Minor	Minor2	Major1	Major2	Minor1	Major1	Major2
Conflicting Flow All	1325	706	706	0	-	0
Stage 1	706	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	174	439	902	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	541	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	173	439	902	-	-	-
Mov Cap-2 Maneuver	173	-	-	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	537	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	31.6	0.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	902	-	183	-	-
HCM Lane V/C Ratio	0.006	-	0.265	-	-
HCM Control Delay (s)	9	0	31.6	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0	-	1	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Background + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.4						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	↕
Traffic Vol, veh/h	34	37	408	41	28	415
Future Vol, veh/h	34	37	408	41	28	415
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	35	38	421	42	29	428

Major/Minor	Minor1	Major1	Major2	Minor1	Major1	Major2
Conflicting Flow All	940	454	0	0	469	0
Stage 1	448	-	-	-	-	-
Stage 2	492	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	295	610	-	-	1103	-
Stage 1	648	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	282	604	-	-	1097	-
Mov Cap-2 Maneuver	282	-	-	-	-	-
Stage 1	645	-	-	-	-	-
Stage 2	594	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.4	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	390	1097	-
HCM Lane V/C Ratio	-	-	0.188	0.026	-
HCM Control Delay (s)	-	-	16.4	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Background + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↕	↕	
Traffic Vol, veh/h	10	90	74	347	342	16
Future Vol, veh/h	10	90	74	347	342	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	96	79	369	364	17

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	912	386	375	0	0
Stage 1	375	-	-	-	-
Stage 2	537	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-
Pot Cap-1 Maneuver	307	660	1183	-	-
Stage 1	699	-	-	-	-
Stage 2	590	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	281	648	1172	-	-
Mov Cap-2 Maneuver	281	-	-	-	-
Stage 1	693	-	-	-	-
Stage 2	545	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.7	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1172	-	573	-	-
HCM Lane V/C Ratio	0.067	-	0.186	-	-
HCM Control Delay (s)	8.3	-	12.7	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Background + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 3.6						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↕	↕	
Traffic Vol, veh/h	20	126	109	264	225	8
Future Vol, veh/h	20	126	109	264	225	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	140	121	293	250	9

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	804	268	266	0	0
Stage 1	261	-	-	-	-
Stage 2	543	-	-	-	-
Critical Hdwy	6.4	6.2	4.11	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.209	-	-
Pot Cap-1 Maneuver	355	776	1304	-	-
Stage 1	787	-	-	-	-
Stage 2	586	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	318	767	1296	-	-
Mov Cap-2 Maneuver	318	-	-	-	-
Stage 1	782	-	-	-	-
Stage 2	528	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	2.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1296	-	643	-	-
HCM Lane V/C Ratio	0.093	-	0.252	-	-
HCM Control Delay (s)	8.1	-	12.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1	-	-

HCM 2010 AWSC

17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background + Project Saturday.syn

12/01/2017

Intersection

Intersection Delay, s/veh 9.6
Intersection LOS A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	0	1	110	0	3	0	0	0	175	105	4
Future Vol, veh/h	0	0	1	110	0	3	0	0	0	175	105	4
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0
Mvmt Flow	0	0	1	126	0	3	0	0	0	201	121	5
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.2	8.4	10.6
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	62%	0%	100%	0%
Vol Thru, %	37%	1%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	284	111	3	120
LT Vol	175	0	3	0
Through Vol	105	1	0	120
RT Vol	4	110	0	0
Lane Flow Rate	326	128	3	138
Geometry Grp	1	1	1	1
Degree of Util (X)	0.408	0.155	0.005	0.175
Departure Headway (Hd)	4.495	4.37	5.333	4.568
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	800	820	670	785
Service Time	2.521	2.399	3.375	2.599
HCM Lane V/C Ratio	0.407	0.156	0.004	0.176
HCM Control Delay	10.6	8.2	8.4	8.6
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2	0.5	0	0.6

HCM 2010 AWSC

17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Background + Project Saturday.syn

12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	120	0
Future Vol, veh/h	0	0	120	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	138	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.6
HCM LOS	A

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Cumulative AM.syn
12/01/2017

	↖	↗	↕	↙	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖↖	↕	↖	↙↙	↗
Traffic Volume (vph)	0	1108	571	92	990	809
Future Volume (vph)	0	1108	571	92	990	809
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Flt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1274	656	106	1138	930
RTOR Reduction (vph)	0	142	0	22	0	0
Lane Group Flow (vph)	0	1132	656	84	1138	930
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		33.2	28.8	28.8	33.2	71.8
Effective Green, g (s)		34.1	29.7	29.7	34.1	71.8
Actuated g/C Ratio		0.47	0.41	0.41	0.47	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1323	763	648	1614	1810
v/s Ratio Prot		c0.41	c0.36		0.33	0.51
v/s Ratio Perm				0.05		
v/c Ratio		0.86	0.86	0.13	0.71	0.51
Uniform Delay, d1		16.7	19.2	13.0	14.9	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		6.1	9.8	0.1	1.6	1.0
Delay (s)		22.7	28.9	13.2	16.5	1.0
Level of Service		C	C	B	B	A
Approach Delay (s)	22.7		26.7			9.6
Approach LOS	C		C			A
Intersection Summary						
HCM 2000 Control Delay		16.8			HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio		0.86				
Actuated Cycle Length (s)		71.8		Sum of lost time (s)		8.0
Intersection Capacity Utilization		75.5%		ICU Level of Service		D
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Cumulative AM.syn
12/01/2017

	↖	→	↘	↙	←	↗	↖	↗	↕	↙	↘	↓
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↖	↖	↙↙	↖↖		↖	↖	↖	↙	↘	↗
Traffic Volume (vph)	7	826	248	381	961	10	106	3	250	9	17	41
Future Volume (vph)	7	826	248	381	961	10	106	3	250	9	17	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Fltpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1564	3433	3530		1698	1708	1560		1733	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1564	3433	3530		1698	1708	1560		1733	1555
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	9	1059	318	488	1232	13	136	4	321	12	22	53
RTOR Reduction (vph)	0	0	144	0	0	0	0	0	68	0	0	50
Lane Group Flow (vph)	9	1059	174	488	1245	0	71	69	253	0	34	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)				1					1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	0.7	29.3	29.3	9.7	38.3		5.0	5.0	14.7		2.2	2.2
Effective Green, g (s)	1.2	30.3	30.3	10.3	39.3		6.8	6.8	15.9		3.2	3.2
Actuated g/C Ratio	0.02	0.45	0.45	0.15	0.59		0.10	0.10	0.24		0.05	0.05
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	32	1610	711	530	2083		173	174	372		83	74
v/s Ratio Prot	0.00	c0.30		c0.14	0.35		0.04	0.04	c0.11		c0.02	
v/s Ratio Perm			0.11						0.06			0.00
v/c Ratio	0.28	0.66	0.24	0.92	0.60		0.41	0.40	0.68		0.41	0.03
Uniform Delay, d1	32.3	14.1	11.1	27.7	8.6		28.0	28.0	23.0		30.8	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.7	0.1	21.2	0.3		0.6	0.5	4.1		1.2	0.1
Delay (s)	34.0	14.9	11.2	48.9	9.0		28.6	28.5	27.1		32.0	30.3
Level of Service	C	B	B	D	A		C	C	C		C	C
Approach Delay (s)		14.1			20.2			27.5			31.0	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			66.6		Sum of lost time (s)				16.1			
Intersection Capacity Utilization			53.9%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Cumulative AM.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	7	826	248	381	961	10	106	3	250	9	17	41
Future Volume (veh/h)	7	826	248	381	961	10	106	3	250	9	17	41
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s,veh/h/ln)	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1763	1863
Adj Flow Rate, veh/h	9	1059	318	488	1232	13	139	0	321	12	22	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	30	1212	535	491	1675	18	823	0	552	35	64	90
Arrive On Green	0.02	0.34	0.34	0.14	0.47	0.45	0.23	0.00	0.21	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3585	38	3583	0	1545	611	1121	1575
Grp Volume(V), veh/h	9	1059	318	488	608	637	139	0	321	34	0	53
Grp Sat Flow(s,veh/h/ln)	1810	1770	1563	1721	1768	1854	1792	0	1545	1733	0	1575
Q Serve(g_s), s	0.3	19.7	11.8	9.9	19.6	19.6	2.2	0.0	11.9	1.3	0.0	2.3
Cycle Q Clear(c_c), s	0.3	19.7	11.8	9.9	19.6	19.6	2.2	0.0	11.9	1.3	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.35		1.00
Lane Grp Cap(c), veh/h	30	1212	535	491	826	867	823	0	552	99	0	90
V/C Ratio(X)	0.31	0.87	0.59	0.99	0.74	0.74	0.17	0.00	0.58	0.34	0.00	0.59
Avail Cap(c_a), veh/h	116	1323	584	491	826	867	1727	0	942	99	0	90
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.1	21.6	19.0	30.0	15.2	15.2	21.6	0.0	18.4	31.8	0.0	32.3
Incr Delay (d2), s/veh	2.1	5.9	0.8	39.0	3.0	2.9	0.0	0.0	0.4	0.8	0.0	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.6	5.2	7.3	10.1	10.6	1.1	0.0	5.1	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.2	27.5	19.8	69.0	18.2	18.1	21.7	0.0	18.8	32.6	0.0	39.1
LnGrp LOS	D	C	B	E	B	B	C		B	C		D
Approach Vol, veh/h		1386			1733			460			87	
Approach Delay, s/veh		25.8			32.5			19.6			36.5	
Approach LOS		C			C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	36.8		20.1	14.0	28.0		8.0				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 9.4	25.2		3.0				
Max Q Clear Time (g_c+I1), s	2.3	21.6		13.9	11.9	21.7		4.3				
Green Ext Time (p_c), s	0.0	4.9		0.3	0.0	1.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay		28.4										
HCM 2010 LOS		C										
Notes												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
 3: SR 1 & Rio Rd

Cumulative AM.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	200	293	26	6	97	278	170	38	294	66	273	469
Future Volume (vph)	200	293	26	6	97	278	170	38	294	66	273	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3494			1702	1827	1547	1752	1881	1590	3433	1773
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3494			583	1827	1547	1752	1881	1590	3433	1773
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	215	315	28	7	104	299	183	41	316	71	294	504
RTOR Reduction (vph)	0	8	0	0	0	0	137	0	0	49	0	5
Lane Group Flow (vph)	215	335	0	0	111	299	46	41	316	22	294	571
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases							6					
Actuated Green, G (s)	9.5	16.0			12.6	19.1	19.1	4.3	22.9	22.9	9.4	28.0
Effective Green, g (s)	9.2	16.2			12.3	19.3	19.3	4.0	23.8	23.8	9.1	28.9
Actuated g/C Ratio	0.12	0.21			0.16	0.25	0.25	0.05	0.31	0.31	0.12	0.37
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	202	731			92	455	385	90	578	488	403	662
v/s Ratio Prot	0.13	0.10			c0.16			0.02	0.17		c0.09	c0.32
v/s Ratio Perm					c0.19		0.03			0.01		
v/c Ratio	1.06	0.46			1.21	0.66	0.12	0.46	0.55	0.04	0.73	0.86
Uniform Delay, d1	34.1	26.8			32.6	26.1	22.5	35.6	22.3	18.8	33.0	22.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	81.4	0.5			159.5	3.6	0.2	3.6	1.2	0.0	6.5	11.5
Delay (s)	115.5	27.3			192.1	29.6	22.6	39.3	23.5	18.9	39.5	33.9
Level of Service	F	C			F	C	C	D	C	B	D	C
Approach Delay (s)		61.3				57.9		24.2				35.8
Approach LOS		E				E		C				D
Intersection Summary												
HCM 2000 Control Delay		44.9										
HCM 2000 Volume to Capacity ratio		0.89										
Actuated Cycle Length (s)		77.4							16.0			
Intersection Capacity Utilization		75.0%										
Analysis Period (min)		15										
c Critical Lane Group												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Cumulative AM.syn
12/01/2017

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔
Traffic Volume (vph)	61	399	77	106	326	152	69
Future Volume (vph)	61	399	77	106	326	152	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1770	3413		1687	3438	3367	1495
Flt Permitted	0.98	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1817	3413		1687	3438	3367	1495
Peak-hour factor, PHF	0.92	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	66	438	85	116	358	167	76
RTOR Reduction (vph)	0	22	0	0	0	0	67
Lane Group Flow (vph)	66	501	0	116	358	167	9
Confl. Bikes (#/hr)			1				
Heavy Vehicles (%)	2%	3%	3%	7%	5%	4%	8%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.6	26.4		6.2	28.0	5.9	5.9
Effective Green, g (s)	4.1	26.4		5.7	28.0	5.9	5.9
Actuated g/C Ratio	0.08	0.53		0.11	0.56	0.12	0.12
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	148	1802		192	1925	397	176
v/s Ratio Prot		c0.15		c0.07	0.10	c0.05	
v/s Ratio Perm	0.04						0.01
v/c Ratio	0.45	0.28		0.60	0.19	0.42	0.05
Uniform Delay, d1	21.9	6.5		21.1	5.4	20.5	19.6
Progression Factor	1.00	1.00		1.41	0.76	1.00	1.00
Incremental Delay, d2	0.8	0.4		3.6	0.2	0.3	0.0
Delay (s)	22.6	6.9		33.3	4.3	20.7	19.6
Level of Service	C	A		C	A	C	B
Approach Delay (s)		8.7			11.4	20.4	
Approach LOS		A			B	C	

Intersection Summary

HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	33.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	381	87	53	405	0	27	0	29	0	0	0
Future Volume (vph)	0	381	87	53	405	0	27	0	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Fr		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)		3397		1805	3471			1552	1367			
Flt Permitted		1.00		0.95	1.00			0.98	1.00			
Satd. Flow (perm)		3397		1805	3471			1594	1367			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	448	102	62	476	0	32	0	34	0	0	0
RTOR Reduction (vph)	0	23	0	0	0	0	0	0	31	0	0	0
Lane Group Flow (vph)	0	527	0	62	476	0	0	32	3	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		30.7		3.7	37.9			4.1	4.1			
Effective Green, g (s)		30.7		3.2	37.9			4.1	4.1			
Actuated g/C Ratio		0.61		0.06	0.76			0.08	0.08			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2085		115	2631			130	112			
v/s Ratio Prot		c0.16		c0.03	0.14							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.25		0.54	0.18			0.25	0.02			
Uniform Delay, d1		4.4		22.7	1.7			21.5	21.1			
Progression Factor		0.33		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.3		2.4	0.2			0.4	0.0			
Delay (s)		1.7		25.1	1.8			21.9	21.1			
Level of Service		A		C	A			C	C			
Approach Delay (s)		1.7			4.5			21.5		0.0		
Approach LOS		A			A			C		A		

Intersection Summary			
HCM 2000 Control Delay	4.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (veh/h)	0	381	87	53	405	0	27	0	29	0	0	0
Future Volume (veh/h)	0	381	87	53	405	0	27	0	29	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	448	102	62	476	0	32	0	34	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	15	0	0	0	0
Cap, veh/h	0	1923	435	65	2749	0	203	0	66	0	91	0
Arrive On Green	0.00	0.90	0.90	0.04	0.79	0.00	0.05	0.00	0.05	0.00	0.00	0.00
Sat Flow, veh/h	0	2938	643	1810	3563	0	1237	0	1383	0	1900	0
Grp Volume(v), veh/h	0	275	275	62	476	0	32	0	34	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1733	1810	1736	0	1237	0	1383	0	1900	0
Q Serve(g_s), s	0.0	1.0	1.0	1.7	1.7	0.0	1.3	0.0	1.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	1.0	1.0	1.7	1.7	0.0	1.3	0.0	1.2	0.0	0.0	0.0
Prop In Lane	0.00		0.37	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1186	1171	65	2749	0	203	0	66	0	91	0
V/C Ratio(X)	0.00	0.23	0.23	0.95	0.17	0.00	0.16	0.00	0.51	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1186	1171	181	2749	0	540	0	443	0	608	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	0.97	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.9	0.9	24.0	1.3	0.0	23.3	0.0	23.2	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.5	20.9	0.1	0.0	0.1	0.0	2.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.6	0.6	1.2	0.8	0.0	0.4	0.0	0.5	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	1.3	1.3	45.0	1.4	0.0	23.4	0.0	25.5	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		550			538			66			0	
Approach Delay, s/veh		1.3			6.4			24.5			0.0	
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	5.8	37.8		6.4		43.6		6.4				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	5.5	17.0		16.0		26.0		16.0				
Max Q Clear Time (g_c+I1), s	3.7	3.0		0.0		3.7		3.3				
Green Ext Time (p_c), s	0.0	6.5		0.0		8.3		0.1				

Intersection Summary			
HCM 2010 Ctrl Delay	5.0		
HCM 2010 LOS	A		

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Cumulative AM.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	11.8								
Intersection LOS	B								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↔↔	↑		↑	↔↔		↔↔	↑
Traffic Vol, veh/h	0	225	45	0	54	37	5	24	336
Future Vol, veh/h	0	225	45	0	54	37	5	24	336
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	256	51	0	61	42	5	27	382
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB			SB		
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB						WB		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	10.6			9.6			13.3		
HCM LOS	B			A			B		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	113	113	45	54	37	29	336		
LT Vol	113	113	0	0	0	29	0		
Through Vol	0	0	45	54	0	0	0		
RT Vol	0	0	0	0	37	0	336		
Lane Flow Rate	128	128	51	61	42	33	382		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.234	0.231	0.061	0.11	0.067	0.057	0.54		
Departure Headway (Hd)	6.579	6.493	4.267	6.473	5.76	6.323	5.087		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	546	554	838	554	621	570	714		
Service Time	4.314	4.228	2.001	4.218	3.505	4.023	2.787		
HCM Lane V/C Ratio	0.234	0.231	0.061	0.11	0.068	0.058	0.535		
HCM Control Delay	11.3	11.2	7.3	10	8.9	9.4	13.6		
HCM Lane LOS	B	B	A	A	A	A	B		
HCM 95th-tile Q	0.9	0.9	0.2	0.4	0.2	0.2	3.3		

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Cumulative AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔↔		↔	↔↔	↔
Traffic Volume (vph)	144	50	111	151	43	63	140	1246	48	18	1523	113
Future Volume (vph)	144	50	111	151	43	63	140	1246	48	18	1523	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Fr	1.00	0.90		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1506		1665	1649		1770	3471		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1506		1665	1649		1770	3471		1805	3471	1568
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)	157	54	121	164	47	68	152	1354	52	20	1655	123
RTOR Reduction (vph)	0	73	0	0	40	0	0	3	0	0	0	56
Lane Group Flow (vph)	141	118	0	143	96	0	152	1403	0	20	1655	67
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	12.7	12.7		7.8	7.8		8.3	48.0		2.8	42.5	42.5
Effective Green, g (s)	12.9	12.9		8.0	8.0		8.0	48.9		2.5	43.4	43.4
Actuated g/C Ratio	0.15	0.15		0.09	0.09		0.09	0.55		0.03	0.49	0.49
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	243	220		150	149		160	1922		51	1706	770
v/s Ratio Prot	c0.08	0.08		c0.09	0.06		c0.09	0.40		0.01	c0.48	
v/s Ratio Perm												0.04
v/c Ratio	0.58	0.54		0.95	0.64		0.95	0.73		0.39	0.97	0.09
Uniform Delay, d1	35.2	34.9		40.0	38.8		40.0	14.8		42.2	21.8	11.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	2.8		59.5	10.2		55.6	1.7		4.9	15.4	0.1
Delay (s)	38.9	37.8		99.4	49.0		95.6	16.4		47.1	37.2	12.0
Level of Service	D	D		F	D		F	B		D	D	B
Approach Delay (s)		38.3			74.8			24.1			35.6	
Approach LOS		D			E			C			D	
Intersection Summary												
HCM 2000 Control Delay	34.1			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	88.3			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												

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Cumulative AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	144	50	111	151	43	63	140	1246	48	18	1523	113
Future Volume (veh/h)	144	50	111	151	43	63	140	1246	48	18	1523	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.85	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	121	140	81	68	152	1354	52	20	1655	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	283	77	173	162	80	67	163	1842	71	50	1635	739
Arrive On Green	0.16	0.16	0.16	0.09	0.09	0.09	0.09	0.54	0.53	0.03	0.47	0.00
Sat Flow, veh/h	1757	479	1073	1757	873	733	1774	3439	132	1810	3471	1568
Grp Volume(V), veh/h	157	0	175	140	0	149	152	690	716	20	1655	0
Grp Sat Flow(S),veh/h/ln	1757	0	1552	1757	0	1605	1774	1754	1816	1810	1736	1568
Q Serve(g_s), s	7.2	0.0	9.3	6.8	0.0	8.0	7.4	26.2	26.3	0.9	41.0	0.0
Cycle Q Clear(c_c), s	7.2	0.0	9.3	6.8	0.0	8.0	7.4	26.2	26.3	0.9	41.0	0.0
Prop In Lane	1.00		0.69	1.00		0.46	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	283	0	250	162	0	148	163	940	973	50	1635	739
V/C Ratio(X)	0.55	0.00	0.70	0.87	0.00	1.01	0.93	0.73	0.74	0.40	1.01	0.00
Avail Cap(c_a), veh/h	343	0	303	162	0	148	163	940	973	146	1635	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.6	0.0	34.6	39.0	0.0	39.6	39.2	15.5	15.5	41.6	23.0	0.0
Incr Delay (d2), s/veh	2.0	0.0	6.0	36.7	0.0	76.7	50.8	3.4	3.4	5.2	25.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.4	5.0	0.0	6.7	5.9	13.5	14.0	0.5	25.3	0.0
LnGrp Delay(d),s/veh	35.7	0.0	40.6	75.7	0.0	116.3	90.0	18.9	18.9	46.8	48.2	0.0
LnGrp LOS	D		D	E		F	F	B	B	D	F	F
Approach Vol, veh/h		332			289			1558			1675	
Approach Delay, s/veh		38.3			96.6			25.8			48.2	
Approach LOS		D			F			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.0	12.0	45.0		12.0	6.4	50.6				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 17	8.3	40.1		7.8	7.3	41.1				
Max Q Clear Time (g_c+I1), s		11.3	9.4	43.0		10.0	2.9	28.3				
Green Ext Time (p_c), s		0.9	0.0	0.0		0.0	0.0	12.5				
Intersection Summary												
HCM 2010 Ctrl Delay		41.9										
HCM 2010 LOS		D										
Notes												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Cumulative AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	382	4	25	34	14	44	37	1396	16	71	1781	774
Future Volume (vph)	382	4	25	34	14	44	37	1396	16	71	1781	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1588	1752	3533		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1588	1752	3533		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	37	15	48	41	1534	18	78	1957	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	0	0	0	0	0
Lane Group Flow (vph)	420	8	0	26	26	3	41	1552	0	78	1957	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.3	16.3		7.2	7.2	7.2	6.3	71.4		7.2	72.8	120.0
Effective Green, g (s)	16.9	16.9		7.4	7.4	7.4	6.0	72.3		7.4	73.7	120.0
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.60		0.06	0.61	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	483	215		105	104	97	87	2128		101	2131	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.44		c0.05	c0.56	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.87	0.04		0.25	0.25	0.03	0.47	0.73		0.77	0.92	0.54
Uniform Delay, d1	50.5	44.5		53.6	53.7	52.9	55.5	16.9		55.5	20.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.2	0.1		2.1	2.2	0.2	4.0	1.6		29.9	7.2	1.3
Delay (s)	66.7	44.6		55.8	55.8	53.1	59.4	18.5		85.3	27.7	1.3
Level of Service	E	D		E	E	D	E	B		F	C	A
Approach Delay (s)		65.2			54.5			19.5			21.5	
Approach LOS		E			D			B			C	
Intersection Summary												
HCM 2000 Control Delay		25.4			HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)					16.0		
Intersection Capacity Utilization		83.2%			ICU Level of Service					E		
Analysis Period (min)		15										
c Critical Lane Group												

Synchro 9 Report

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Cumulative AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 0.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	20	0	10	0	0	0	7	247	2	8	368	74
Future Vol, veh/h	20	0	10	0	0	0	7	247	2	8	368	74
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	23	0	11	0	0	0	8	284	2	9	423	85

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	648	792	260	537	833	149	511	0	0	289	0	0
Stage 1	487	487	-	304	304	-	-	-	-	-	-	-
Stage 2	161	305	-	233	529	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	340	324	674	431	307	877	1065	-	-	1284	-	-
Stage 1	510	554	-	686	667	-	-	-	-	-	-	-
Stage 2	802	666	-	755	530	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	333	316	671	415	300	873	1062	-	-	1281	-	-
Mov Cap-2 Maneuver	333	316	-	415	300	-	-	-	-	-	-	-
Stage 1	504	547	-	678	659	-	-	-	-	-	-	-
Stage 2	793	658	-	733	523	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	14.8			0			0.2			0.1		
HCM LOS	B			A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1062	-	-	400	-	1281	-	-
HCM Lane V/C Ratio	0.008	-	-	0.086	-	0.007	-	-
HCM Control Delay (s)	8.4	0	-	14.8	0	7.8	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	-	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Cumulative AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕		↕	↕		↕			↕		
Traffic Vol, veh/h	124	265	17	3	376	11	18	2	4	1	2	64
Future Vol, veh/h	124	265	17	3	376	11	18	2	4	1	2	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	143	305	20	3	432	13	21	2	5	1	2	74

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	445	0	0	324	0	0	823	1051	162	884	1054	222
Stage 1	-	-	-	-	-	-	599	599	-	445	445	-
Stage 2	-	-	-	-	-	-	224	452	-	439	609	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1091	-	-	1247	-	-	269	229	861	243	228	758
Stage 1	-	-	-	-	-	-	460	494	-	567	578	-
Stage 2	-	-	-	-	-	-	764	574	-	572	488	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1091	-	-	1247	-	-	216	199	861	215	198	758
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	199	-	215	198	-
Stage 1	-	-	-	-	-	-	400	429	-	493	577	-
Stage 2	-	-	-	-	-	-	685	573	-	492	424	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.7			0.1			21.6			11		
HCM LOS	C			C			C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	245	1091	-	-	1247	-	-	676
HCM Lane V/C Ratio	0.113	0.131	-	-	0.003	-	-	0.114
HCM Control Delay (s)	21.6	8.8	-	-	7.9	-	-	11
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0.4	-	-	0	-	-	0.4

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative AM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	665	116	23	922	79	20
Future Volume (vph)	665	116	23	922	79	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1756	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1756	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	700	122	24	971	83	21
RTOR Reduction (vph)	0	52	0	0	15	0
Lane Group Flow (vph)	700	70	24	971	89	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	31.9	31.9	0.7	36.8	7.7	
Effective Green, g (s)	31.9	31.9	0.7	36.8	7.7	
Actuated g/C Ratio	0.58	0.58	0.01	0.66	0.14	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1062	894	22	1249	244	
v/s Ratio Prot	0.38		0.01	0.52	0.05	
v/s Ratio Perm		0.05				
v/c Ratio	0.66	0.08	1.09	0.78	0.36	
Uniform Delay, d1	8.0	5.2	27.3	6.5	21.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.0	221.9	3.2	0.3	
Delay (s)	9.6	5.3	249.3	9.7	22.0	
Level of Service	A	A	F	A	C	
Approach Delay (s)	9.0			15.5	22.0	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	15.1
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative AM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↑	↑	↑	↑		
Traffic Volume (veh/h)	665	116	23	922	79	20		
Future Volume (veh/h)	665	116	23	922	79	20		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1877	1900		
Adj Flow Rate, veh/h	700	122	24	971	83	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Percent Heavy Veh, %	3	4	0	1	0	0		
Cap, veh/h	1043	878	41	1260	207	0		
Arrive On Green	0.57	0.57	0.02	0.67	0.12	0.00		
Sat Flow, veh/h	1845	1553	1810	1881	1768	0		
Grp Volume(V), veh/h	700	122	24	971	84	0		
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1789	0		
Q Serve(g_s), s	13.6	1.9	0.7	18.0	2.2	0.0		
Cycle Q Clear(g_c), s	13.6	1.9	0.7	18.0	2.2	0.0		
Prop In Lane		1.00			0.99	0.00		
Lane Grp Cap(c), veh/h	1043	878	41	1260	210	0		
V/C Ratio(X)	0.67	0.14	0.59	0.77	0.40	0.00		
Avail Cap(c_a), veh/h	1185	997	141	1510	629	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	7.8	5.2	24.8	5.8	20.9	0.0		
Incr Delay (d2), s/veh	1.4	0.1	4.9	2.2	0.5	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	7.2	0.8	0.4	10.0	1.1	0.0		
LnGrp Delay(d),s/veh	9.2	5.3	29.7	8.0	21.4	0.0		
LnGrp LOS	A	A	C	A	C			
Approach Vol, veh/h	822			995	84			
Approach Delay, s/veh	8.6			8.5	21.4			
Approach LOS	A			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	35.4				40.7		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	32.9				41.1		18.0
Max Q Clear Time (g_c+I1), s	2.7	15.6				20.0		4.2
Green Ext Time (p_c), s	0.0	12.3				14.3		0.1

Intersection Summary			
HCM 2010 Ctrl Delay		9.1	
HCM 2010 LOS		A	

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Cumulative AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.4												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔		↔	↔
Traffic Vol, veh/h	27	565	28	29	921	8	11	1	13	14	0	47
Future Vol, veh/h	27	565	28	29	921	8	11	1	13	14	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	30	621	31	32	1012	9	12	1	14	15	0	52

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	1021	0	0	621	0	0	1760	1765	621	1761	1760	1016
Stage 1	-	-	-	-	-	-	680	680	-	1080	1080	-
Stage 2	-	-	-	-	-	-	1080	1085	-	681	680	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.1	7.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	6.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.5	4.9	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	688	-	-	955	-	-	67	49	491	67	85	291
Stage 1	-	-	-	-	-	-	444	330	-	267	297	-
Stage 2	-	-	-	-	-	-	267	198	-	444	454	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	688	-	-	955	-	-	52	45	491	60	79	291
Mov Cap-2 Maneuver	-	-	-	-	-	-	52	45	-	60	79	-
Stage 1	-	-	-	-	-	-	425	316	-	255	287	-
Stage 2	-	-	-	-	-	-	212	191	-	411	434	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	53.9	34.8
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	51	491	688	-	-	955	-	-	60	291
HCM Lane V/C Ratio	0.259	0.029	0.043	-	-	0.033	-	-	0.256	0.177
HCM Control Delay (s)	98.6	12.6	10.5	-	-	8.9	-	-	84.5	20
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.9	0.1	0.1	-	-	0.1	-	-	0.9	0.6

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Cumulative AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 0.8						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	37	0	1	361	548	39
Future Vol, veh/h	37	0	1	361	548	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	-	0
Grade, %	0	-	-	0	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	42	0	1	406	616	44

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1024	616	616	0	-	0
Stage 1	616	-	-	-	-	-
Stage 2	408	-	-	-	-	-
Critical Hdwy	6.43	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	260	494	974	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	669	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	260	494	974	-	-	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	668	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	974	-	260	-	-
HCM Lane V/C Ratio	0.001	-	0.16	-	-
HCM Control Delay (s)	8.7	0	21.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Cumulative AM.syn
12/01/2017

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	14	93	326	20	22	417
Future Vol, veh/h	14	93	326	20	22	417
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	18	122	429	26	29	549

Major/Minor	Minor1	Major1	Major2	Minor2	Major2
Conflicting Flow All	1063	456	0	0	462
Stage 1	449	-	-	-	-
Stage 2	614	-	-	-	-
Critical Hdwy	6.4	6.21	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.309	-	-	2.2
Pot Cap-1 Maneuver	249	606	-	-	1110
Stage 1	647	-	-	-	-
Stage 2	544	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	237	599	-	-	1104
Mov Cap-2 Maneuver	237	-	-	-	-
Stage 1	643	-	-	-	-
Stage 2	520	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 499	1104	-
HCM Lane V/C Ratio	-	- 0.282	0.026	-
HCM Control Delay (s)	-	- 15	8.3	0
HCM Lane LOS	-	- C	A	A
HCM 95th %tile Q(veh)	-	- 1.1	0.1	-

Synchro 9 Report

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Cumulative AM.syn
12/01/2017

Intersection						
Int Delay, s/veh	5.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔		↔
Traffic Vol, veh/h	17	155	173	239	264	21
Future Vol, veh/h	17	155	173	239	264	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	209	234	323	357	28

Major/Minor	Minor2	Major1	Major2	Minor2	Major2
Conflicting Flow All	1156	365	361	0	-
Stage 1	361	-	-	-	-
Stage 2	795	-	-	-	-
Critical Hdwy	6.4	6.23	4.14	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.236	-	-
Pot Cap-1 Maneuver	219	678	1187	-	-
Stage 1	710	-	-	-	-
Stage 2	448	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	175	673	1183	-	-
Mov Cap-2 Maneuver	175	-	-	-	-
Stage 1	708	-	-	-	-
Stage 2	358	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.2	3.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1183	- 525	-	-
HCM Lane V/C Ratio	0.198	- 0.443	-	-
HCM Control Delay (s)	8.8	- 17.2	-	-
HCM Lane LOS	A	- C	-	-
HCM 95th %tile Q(veh)	0.7	- 2.2	-	-

Synchro 9 Report

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Cumulative AM.syn
12/01/2017

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	28	115	125	125	169	92
Future Vol, veh/h	28	115	125	125	169	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	137	149	149	201	110

Major/Minor	Minor2	Major1	Major2	Major3	Major4
Conflicting Flow All	713	270	318	0	0
Stage 1	263	-	-	-	-
Stage 2	450	-	-	-	-
Critical Hdwy	6.44	6.22	4.12	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-
Follow-up Hdwy	3.536	3.318	2.218	-	-
Pot Cap-1 Maneuver	395	769	1242	-	-
Stage 1	776	-	-	-	-
Stage 2	638	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	343	760	1235	-	-
Mov Cap-2 Maneuver	343	-	-	-	-
Stage 1	771	-	-	-	-
Stage 2	558	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	4.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1235	-	614	-	-
HCM Lane V/C Ratio	0.12	-	0.277	-	-
HCM Control Delay (s)	8.3	-	13.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	-	-

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative AM.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	9												
Intersection LOS	A												

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	1	0	67	0	4	0	0	0	66	89	1
Future Vol, veh/h	0	1	0	67	0	4	0	0	0	66	89	1
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0
Mvmt Flow	0	1	0	86	0	5	0	0	0	85	114	1
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.9	8.3	9.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	42%	1%	100%	0%
Vol Thru, %	57%	0%	0%	100%
Vol Right, %	1%	99%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	156	68	4	194
LT Vol	66	1	4	0
Through Vol	89	0	0	194
RT Vol	1	67	0	0
Lane Flow Rate	200	87	5	249
Geometry Grp	1	1	1	1
Degree of Util (X)	0.258	0.105	0.007	0.299
Departure Headway (Hd)	4.649	4.328	5.229	4.329
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	774	828	684	831
Service Time	2.669	2.353	3.261	2.347
HCM Lane V/C Ratio	0.258	0.105	0.007	0.3
HCM Control Delay	9.3	7.9	8.3	9.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0	1.3

HCM 2010 AWSC

17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative AM.syn

12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↔	
Traffic Vol, veh/h	0	0	194	0
Future Vol, veh/h	0	0	194	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	249	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.2
HCM LOS	A

HCM Signalized Intersection Capacity Analysis

1: SR 1 & Carmel Valley Rd

Cumulative PM.syn

12/01/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↔↔	↑	↔	↔↔	↑
Traffic Volume (vph)	0	960	911	132	1021	716
Future Volume (vph)	0	960	911	132	1021	716
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	990	939	136	1053	738
RTOR Reduction (vph)	0	138	0	7	0	0
Lane Group Flow (vph)	0	852	939	129	1053	738
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		26.2	42.0	42.0	26.2	78.0
Effective Green, g (s)		27.1	42.9	42.9	27.1	78.0
Actuated g/C Ratio		0.35	0.55	0.55	0.35	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		977	1014	845	1192	1881
v/s Ratio Prot		0.30	c0.51		c0.31	0.39
v/s Ratio Perm				0.08		
v/c Ratio		0.87	0.93	0.15	0.88	0.39
Uniform Delay, d1		23.8	16.1	8.6	24.0	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		9.2	13.9	0.1	8.4	0.6
Delay (s)		33.0	30.0	8.7	32.4	0.6
Level of Service		C	C	A	C	A
Approach Delay (s)	33.0		27.3			19.3
Approach LOS	C		C			B

Intersection Summary

HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

Cumulative PM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	5	↔	↔	↔	6	↔	↔
Traffic Volume (vph)	26	883	245	404	688	5	264	21	565	6	8	7
Future Volume (vph)	26	883	245	404	688	5	264	21	565	6	8	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1731	1590		1733	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1731	1590		1733	1580
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)	28	960	266	439	748	5	287	23	614	7	9	8
RTOR Reduction (vph)	0	0	142	0	0	0	0	0	74	0	0	8
Lane Group Flow (vph)	28	960	124	439	753	0	155	155	540	0	16	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4		5	8		8
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	26.0	26.0	11.2	35.4		9.1	9.1	20.3		1.0	1.0
Effective Green, g (s)	2.3	27.0	27.0	11.8	36.4		10.9	10.9	21.5		2.0	2.0
Actuated g/C Ratio	0.03	0.40	0.40	0.17	0.54		0.16	0.16	0.32		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1411	644	604	1919		276	278	504		51	46
v/s Ratio Prot	0.02	c0.27		0.13	0.21		0.09	0.09	c0.19		c0.01	
v/s Ratio Perm			0.08						0.15			0.00
v/c Ratio	0.46	0.68	0.19	0.73	0.39		0.56	0.56	1.07		0.31	0.01
Uniform Delay, d1	32.1	16.8	13.2	26.4	9.2		26.2	26.2	23.1		32.2	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	1.1	0.1	3.7	0.0		1.6	1.4	60.3		1.3	0.0
Delay (s)	34.1	17.9	13.3	30.1	9.2		27.8	27.6	83.4		33.5	31.9
Level of Service	C	B	B	C	A		C	C	F		C	C
Approach Delay (s)		17.3			16.9			64.7			32.9	
Approach LOS		B			B			E			C	

Intersection Summary

HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	67.7	Sum of lost time (s)	16.1
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary

Cumulative PM.syn

2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	5	↔	↔	↔	6	↔	↔
Traffic Volume (veh/h)	26	883	245	404	688	5	264	21	565	6	8	7
Future Volume (veh/h)	26	883	245	404	688	5	264	21	565	6	8	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1881	1881	1900	1771	1900
Adj Flow Rate, veh/h	28	960	266	439	748	5	303	0	614	7	9	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	52	1004	457	477	1423	10	1327	0	783	20	26	43
Arrive On Green	0.03	0.28	0.28	0.14	0.39	0.38	0.37	0.00	0.35	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3640	24	3619	0	1598	758	975	1587
Grp Volume(v), veh/h	28	960	266	439	367	386	303	0	614	16	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1733	0	1587
Q Serve(g_s), s	1.3	22.9	12.2	10.7	13.6	13.6	5.0	0.0	27.4	0.8	0.0	0.4
Cycle Q Clear(g_c), s	1.3	22.9	12.2	10.7	13.6	13.6	5.0	0.0	27.4	0.8	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.44		1.00
Lane Grp Cap(c), veh/h	52	1004	457	477	699	734	1327	0	783	47	0	43
V/C Ratio(X)	0.54	0.96	0.58	0.92	0.53	0.53	0.23	0.00	0.78	0.34	0.00	0.19
Avail Cap(c_a), veh/h	118	1004	457	477	699	734	1421	0	824	81	0	74
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.2	30.3	26.4	36.7	20.1	20.1	18.8	0.0	18.2	41.1	0.0	41.0
Incr Delay (d2), s/veh	3.3	18.6	1.2	22.9	0.4	0.3	0.0	0.0	4.3	1.6	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	13.8	5.6	6.6	6.7	7.0	2.5	0.0	12.8	0.4	0.0	0.2
LnGrp Delay(d),s/veh	44.5	48.9	27.7	59.6	20.4	20.4	18.9	0.0	22.4	42.7	0.0	41.7
LnGrp LOS	D	D	C	E	C	C	B		C	D		D
Approach Vol, veh/h		1254			1192		917			24		
Approach Delay, s/veh		44.3			34.9		21.3			42.4		
Approach LOS		D			C		C			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	37.6		35.5	15.8	28.4		6.3				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 11	23.4		3.0				
Max Q Clear Time (g_c+I1), s	3.3	15.6		29.4	12.7	24.9		2.8				
Green Ext Time (p_c), s	0.0	4.4		0.3	0.0	0.0		0.0				

Intersection Summary

HCM 2010 Ctrl Delay	34.7
HCM 2010 LOS	C

Notes

Synchro 9 Report

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↔	↕	↕	↔	↕	↕	↔	↕
Traffic Volume (vph)	115	347	70	12	149	381	304	78	625	187	216	439
Future Volume (vph)	115	347	70	12	149	381	304	78	625	187	216	439
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3460			1742	1863	1560	1805	1827	1555	3502	1845
Flt Permitted	0.95	1.00			0.40	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3460			733	1863	1560	1805	1827	1555	3502	1845
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	119	358	72	12	154	393	313	80	644	193	223	453
RTOR Reduction (vph)	0	20	0	0	0	0	198	0	0	130	0	5
Lane Group Flow (vph)	119	410	0	0	166	393	115	80	644	63	223	511
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.3	22.2			10.3	24.2	24.2	6.3	27.0	27.0	9.3	30.0
Effective Green, g (s)	8.0	22.4			10.0	24.4	24.4	6.0	27.9	27.9	9.0	30.9
Actuated g/C Ratio	0.09	0.26			0.12	0.29	0.29	0.07	0.33	0.33	0.11	0.36
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	164	908			85	532	446	126	597	508	369	668
v/s Ratio Prot	0.07	0.12				c0.21		0.04	c0.35		c0.06	c0.28
v/s Ratio Perm					c0.23		0.07			0.04		
v/c Ratio	0.73	0.45			1.95	0.74	0.26	0.63	1.08	0.12	0.60	0.76
Uniform Delay, d1	37.6	26.3			37.6	27.6	23.5	38.6	28.7	20.1	36.4	24.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	0.4			468.5	5.5	0.4	10.0	59.9	0.1	2.8	5.4
Delay (s)	52.3	26.7			506.2	33.1	23.8	48.6	88.6	20.3	39.2	29.4
Level of Service	D	C			F	C	C	D	F	C	D	C
Approach Delay (s)		32.3				119.8			70.7			32.3
Approach LOS		C				F			E			C
Intersection Summary												
HCM 2000 Control Delay		68.6			HCM 2000 Level of Service				E			
HCM 2000 Volume to Capacity ratio		1.03										
Actuated Cycle Length (s)		85.3			Sum of lost time (s)				16.0			
Intersection Capacity Utilization		80.7%			ICU Level of Service				D			
Analysis Period (min)		15										
c Critical Lane Group												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative PM.syn
12/01/2017

Movement	SBR
Lane Configurations	↕
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	0.95
Satd. Flow (prot)	1752
Flt Permitted	0.95
Satd. Flow (perm)	1752
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	Prot
Protected Phases	7
Permitted Phases	
Actuated Green, G (s)	27.0
Effective Green, g (s)	27.9
Actuated g/C Ratio	0.33
Clearance Time (s)	4.9
Vehicle Extension (s)	3.5
Lane Grp Cap (vph)	369
v/s Ratio Prot	c0.06
v/s Ratio Perm	
v/c Ratio	0.60
Uniform Delay, d1	20.1
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	39.2
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Cumulative PM.syn
12/01/2017

	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Movement							
Lane Configurations	↔	↔		↔	↔	↔	↔
Traffic Volume (vph)	71	432	113	143	456	315	157
Future Volume (vph)	71	432	113	143	456	315	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3432		1770	3574	3467	1552
Flt Permitted	0.91	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	1727	3432		1770	3574	3467	1552
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	76	465	122	154	490	339	169
RTOR Reduction (vph)	0	38	0	0	0	0	138
Lane Group Flow (vph)	76	549	0	154	490	339	31
Confl. Peds. (#/hr)			3	5		3	5
Heavy Vehicles (%)	0%	2%	0%	2%	1%	1%	2%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	4.9	22.2		7.1	24.4	9.2	9.2
Effective Green, g (s)	4.4	22.2		6.6	24.4	9.2	9.2
Actuated g/C Ratio	0.09	0.44		0.13	0.49	0.18	0.18
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	151	1523		233	1744	637	285
v/s Ratio Prot		c0.16		c0.09	0.14	c0.10	
v/s Ratio Perm	0.04						0.02
v/c Ratio	0.50	0.36		0.66	0.28	0.53	0.11
Uniform Delay, d1	21.8	9.2		20.6	7.6	18.5	17.0
Progression Factor	1.00	1.00		1.32	0.75	1.00	1.00
Incremental Delay, d2	1.0	0.7		5.3	0.4	0.4	0.1
Delay (s)	22.7	9.9		32.4	6.1	18.9	17.0
Level of Service	C	A		C	A	B	B
Approach Delay (s)		11.3			12.4	18.3	
Approach LOS		B			B	B	
Intersection Summary							
HCM 2000 Control Delay		13.7			HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio		0.44					
Actuated Cycle Length (s)		50.0			Sum of lost time (s)		12.0
Intersection Capacity Utilization		42.5%			ICU Level of Service		A
Analysis Period (min)		15					
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative PM.syn
12/01/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations		↔		↔	↔			↔	↔		↔	↔
Traffic Volume (vph)	0	531	58	109	496	0	103	0	98	0	0	0
Future Volume (vph)	0	531	58	109	496	0	103	0	98	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3476		1752	3574			1749	1546			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3476		1752	3574			1394	1546			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	597	65	122	557	0	116	0	110	0	0	0
RTOR Reduction (vph)	0	12	0	0	0	0	0	0	93	0	0	0
Lane Group Flow (vph)	0	650	0	122	557	0	0	116	17	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6	6	2	2	0	2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8				4
Permitted Phases							8		8		4	
Actuated Green, G (s)		24.7		6.2	34.4			7.6	7.6			
Effective Green, g (s)		24.7		5.7	34.4			7.6	7.6			
Actuated g/C Ratio		0.49		0.11	0.69			0.15	0.15			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		1717		199	2458			211	234			
v/s Ratio Prot		c0.19		c0.07	0.16							
v/s Ratio Perm								c0.08	0.01			
v/c Ratio		0.38		0.61	0.23			0.55	0.07			
Uniform Delay, d1		7.9		21.1	2.9			19.6	18.2			
Progression Factor		0.44		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.6		3.9	0.2			1.6	0.0			
Delay (s)		4.1		25.0	3.1			21.2	18.2			
Level of Service		A		C	A			C	B			
Approach Delay (s)		4.1			7.0			19.7			0.0	
Approach LOS		A			A			B			A	
Intersection Summary												
HCM 2000 Control Delay				7.6			HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio				0.45								
Actuated Cycle Length (s)				50.0			Sum of lost time (s)		12.0			
Intersection Capacity Utilization				42.7%			ICU Level of Service		A			
Analysis Period (min)				15								
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center Pl & Rio Rd

Cumulative PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↓	↑↑			↓	↑		↑↓	
Traffic Volume (veh/h)	0	531	58	109	496	0	103	0	98	0	0	0
Future Volume (veh/h)	0	531	58	109	496	0	103	0	98	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	597	65	122	557	0	116	0	110	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	1799	196	139	2566	0	315	0	190	0	232	0
Arrive On Green	0.00	1.00	1.00	0.08	0.72	0.00	0.12	0.00	0.12	0.00	0.00	0.00
Sat Flow, veh/h	0	3312	350	1757	3668	0	1405	0	1560	0	1900	0
Grp Volume(V), veh/h	0	328	334	122	557	0	116	0	110	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1770	1799	1757	1787	0	1405	0	1560	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.4	2.6	0.0	4.0	0.0	3.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.4	2.6	0.0	4.0	0.0	3.3	0.0	0.0	0.0
Prop In Lane	0.00		0.19	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	989	1006	139	2566	0	315	0	190	0	232	0
V/C Ratio(X)	0.00	0.33	0.33	0.88	0.22	0.00	0.37	0.00	0.58	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	989	1006	211	2566	0	594	0	499	0	608	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	22.8	2.4	0.0	21.0	0.0	20.7	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.8	16.5	0.2	0.0	0.3	0.0	1.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	2.3	1.3	0.0	1.5	0.0	1.5	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.8	0.8	39.3	2.6	0.0	21.3	0.0	21.8	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		C			
Approach Vol, veh/h		662			679			226			0	
Approach Delay, s/veh		0.8			9.1			21.5			0.0	
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	7.9	32.0		10.1		39.9		10.1				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	6.5	16.0		16.0		26.0		16.0				
Max Q Clear Time (g_c+I1), s	5.4	2.0		0.0		4.6		6.0				
Green Ext Time (p_c), s	0.0	7.6		0.0		9.8		0.4				

Intersection Summary

HCM 2010 Ctrl Delay	7.4
HCM 2010 LOS	A

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Cumulative PM.syn
12/12/2017

Intersection

Intersection Delay, s/veh	18.1
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↑↑	↑		↑	↑		↓	↑
Traffic Vol, veh/h	0	422	70	0	51	31	6	51	422
Future Vol, veh/h	0	422	70	0	51	31	6	51	422
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2	0	0	0	0	2
Mvmt Flow	0	474	79	0	57	35	7	57	474
Number of Lanes	0	2	1	0	1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	14.7	10.9	22.9
HCM LOS	B	B	C

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	211	211	70	51	31	57	422
LT Vol	211	211	0	0	0	57	0
Through Vol	0	0	70	51	0	0	0
RT Vol	0	0	0	0	31	0	422
Lane Flow Rate	237	237	79	57	35	64	474
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.464	0.462	0.104	0.121	0.066	0.124	0.759
Departure Headway (Hd)	7.049	7.014	4.778	7.577	6.856	6.967	5.764
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	510	512	746	470	519	513	626
Service Time	4.81	4.775	2.538	5.368	4.647	4.73	3.527
HCM Lane V/C Ratio	0.465	0.463	0.106	0.121	0.067	0.125	0.757
HCM Control Delay	15.8	15.7	8.1	11.4	10.1	10.7	24.5
HCM Lane LOS	C	C	A	B	B	B	C
HCM 95th-tile Q	2.4	2.4	0.3	0.4	0.2	0.4	6.9

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Cumulative PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	219	0	176	62	20	26	180	1635	4	17	1521	205
Future Volume (vph)	219	0	176	62	20	26	180	1635	4	17	1521	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1457		1715	1662		1805	3573		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1457		1715	1662		1805	3573		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	181	64	21	27	186	1686	4	18	1568	211
RTOR Reduction (vph)	0	152	0	0	25	0	0	0	0	0	0	90
Lane Group Flow (vph)	203	52	0	57	30	0	186	1690	0	18	1568	121
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	14.2	14.2		5.4	5.4		10.4	49.9		2.7	42.2	42.2
Effective Green, g (s)	14.4	14.4		5.6	5.6		10.1	50.8		2.4	43.1	43.1
Actuated g/C Ratio	0.16	0.16		0.06	0.06		0.11	0.57		0.03	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	274	235		107	104		204	2034		48	1726	764
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.10	0.47		0.01	c0.44	
v/s Ratio Perm												0.08
v/c Ratio	0.74	0.22		0.53	0.29		0.91	0.83		0.38	0.91	0.16
Uniform Delay, d1	35.6	32.5		40.5	39.9		39.1	15.7		42.7	21.2	12.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.6	0.6		6.4	2.1		39.2	3.3		4.9	7.7	0.2
Delay (s)	46.2	33.1		46.9	42.0		78.4	19.0		47.5	28.9	13.1
Level of Service	D	C		D	D		E	B		D	C	B
Approach Delay (s)		39.6			44.5			24.9			27.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	89.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Cumulative PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↔		↔	↔	↔
Traffic Volume (veh/h)	219	0	176	62	20	26	180	1635	4	17	1521	205
Future Volume (veh/h)	219	0	176	62	20	26	180	1635	4	17	1521	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	1881	1817	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	204	31	181	56	32	27	186	1686	4	18	1568	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	296	38	220	140	73	62	207	2009	5	45	1643	728
Arrive On Green	0.17	0.17	0.16	0.08	0.08	0.08	0.11	0.55	0.54	0.02	0.46	0.00
Sat Flow, veh/h	1792	228	1333	1810	941	794	1810	3658	9	1810	3574	1583
Grp Volume(v), veh/h	204	0	212	56	0	59	186	823	867	18	1568	0
Grp Sat Flow(s),veh/h/ln	1792	0	1562	1810	0	1735	1810	1787	1880	1810	1787	1583
Q Serve(g_s), s	9.4	0.0	11.5	2.6	0.0	2.8	8.9	33.6	33.7	0.9	36.9	0.0
Cycle Q Clear(g_c), s	9.4	0.0	11.5	2.6	0.0	2.8	8.9	33.6	33.7	0.9	36.9	0.0
Prop In Lane	1.00		0.85	1.00		0.46	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	296	0	258	140	0	134	207	982	1033	45	1643	728
V/C Ratio(X)	0.69	0.00	0.82	0.40	0.00	0.44	0.90	0.84	0.84	0.40	0.95	0.00
Avail Cap(c_a), veh/h	332	0	290	149	0	143	207	982	1033	145	1661	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.4	0.0	35.3	38.4	0.0	38.5	38.2	16.5	16.5	41.9	22.7	0.0
Incr Delay (d2), s/veh	5.6	0.0	16.2	2.6	0.0	3.2	36.0	6.9	6.6	5.6	13.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.0	6.1	1.4	0.0	1.5	6.5	18.4	19.2	0.5	21.0	0.0
LnGrp Delay(d),s/veh	39.9	0.0	51.5	41.0	0.0	41.7	74.1	23.4	23.1	47.5	35.7	0.0
LnGrp LOS	D		D	D		D	E	C	C	D	D	
Approach Vol, veh/h		416			115			1876				1586
Approach Delay, s/veh		45.9			41.3			28.3				35.8
Approach LOS		D			D			C				D

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		18.4	14.0	44.2		10.8	6.2	52.0
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9
Max Green Setting (Gmax), s		* 16	10.3	39.7		7.0	7.3	42.7
Max Q Clear Time (g_c+I1), s		13.5	10.9	38.9		4.8	2.9	35.7
Green Ext Time (p_c), s		0.6	0.0	0.4		0.1	0.0	7.0

Intersection Summary			
HCM 2010 Ctrl Delay		33.5	
HCM 2010 LOS		C	

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Cumulative PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔		↔	↔	↔
Traffic Volume (vph)	869	18	23	17	6	54	6	1910	17	55	1690	493
Future Volume (vph)	869	18	23	17	6	54	6	1910	17	55	1690	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Flt	1.00	0.92		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1740		1715	1761	1524	1805	3532		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1740		1715	1761	1524	1805	3532		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	23	17	6	55	6	1949	17	56	1724	503
RTOR Reduction (vph)	0	17	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	24	0	11	12	3	6	1966	0	56	1724	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	36.2	36.2		6.6	6.6	6.6	1.5	74.5		6.2	79.7	141.4
Effective Green, g (s)	36.8	36.8		6.8	6.8	6.8	1.2	75.4		6.4	80.6	141.4
Actuated g/C Ratio	0.26	0.26		0.05	0.05	0.05	0.01	0.53		0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	902	452		82	84	73	15	1883		81	2037	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.00	c0.56		c0.03	0.48	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.98	0.05		0.13	0.14	0.04	0.40	1.04		0.69	0.85	0.31
Uniform Delay, d1	52.0	39.2		64.5	64.5	64.2	69.7	33.0		66.5	25.3	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.9	0.1		1.3	1.4	0.4	16.6	33.2		22.5	3.8	0.5
Delay (s)	77.8	39.3		65.8	65.9	64.5	86.3	66.2		89.0	29.1	0.5
Level of Service	E	D		E	E	E	F	E		F	C	A
Approach Delay (s)		76.1			64.9			66.3			24.3	
Approach LOS		E			E			E			C	

Intersection Summary			
HCM 2000 Control Delay	49.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Synchro 9 Report

HCM 2010 TWSC

9: Carmel Rancho Blvd & Clocktower PI

Cumulative PM.syn
12/01/2017

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔		↔	↔	↔
Traffic Vol, veh/h	104	1	18	4	0	4	10	447	0	1	455	42
Future Vol, veh/h	104	1	18	4	0	4	10	447	0	1	455	42
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	114	1	20	4	0	4	11	491	0	1	500	46

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	809	1051	289	779	1074	259	554	0	0	496	0	0
Stage 1	533	533	-	518	518	-	-	-	-	-	-	-
Stage 2	276	518	-	261	556	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	272	229	690	289	222	746	1026	-	-	1078	-	-
Stage 1	498	528	-	514	536	-	-	-	-	-	-	-
Stage 2	707	536	-	727	516	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	264	223	681	273	216	738	1019	-	-	1071	-	-
Mov Cap-2 Maneuver	264	223	-	273	216	-	-	-	-	-	-	-
Stage 1	487	524	-	504	526	-	-	-	-	-	-	-
Stage 2	688	526	-	699	512	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.8	14.2	0.3	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WB Ln1	SBL	SBT	SBR
Capacity (veh/h)	1019	-	290	399	1071	-	-	-
HCM Lane V/C Ratio	0.011	-	0.466	0.022	0.001	-	-	-
HCM Control Delay (s)	8.6	0.1	27.8	14.2	8.4	0	-	-
HCM Lane LOS	A	A	-	D	B	A	A	-
HCM 95th %tile Q(veh)	0	-	2.3	0.1	0	-	-	-

Synchro 9 Report

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Cumulative PM.syn
12/01/2017

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕		↖	↗	
Traffic Vol, veh/h	149	482	16	6	438	29	10	6	4	6	3	157
Future Vol, veh/h	149	482	16	6	438	29	10	6	4	6	3	157
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	159	513	17	6	466	31	11	6	4	6	3	167

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	501	0	0	547	0	0	1115	1369	299	1092	1362	265
Stage 1	-	-	-	-	-	-	855	855	-	498	498	-
Stage 2	-	-	-	-	-	-	260	514	-	594	864	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1067	-	-	1033	-	-	165	148	703	172	149	733
Stage 1	-	-	-	-	-	-	323	378	-	528	548	-
Stage 2	-	-	-	-	-	-	728	539	-	463	374	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1055	-	-	1018	-	-	107	123	683	142	124	723
Mov Cap-2 Maneuver	-	-	-	-	-	-	107	123	-	142	124	-
Stage 1	-	-	-	-	-	-	270	316	-	447	543	-
Stage 2	-	-	-	-	-	-	547	534	-	377	313	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0.1	36.6	13.8
HCM LOS			E	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	135	1055	-	-	1018	-	-	585
HCM Lane V/C Ratio	0.158	0.15	-	-	0.006	-	-	0.302
HCM Control Delay (s)	36.6	9	-	-	8.6	-	-	13.8
HCM Lane LOS	E	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.5	-	-	0	-	-	1.3

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative PM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	1000	111	16	641	136	36
Future Volume (vph)	1000	111	16	641	136	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1748	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1748	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1075	119	17	689	146	39
RTOR Reduction (vph)	0	43	0	0	11	0
Lane Group Flow (vph)	1075	76	17	689	174	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	49.4	49.4	1.4	55.0	11.9	
Effective Green, g (s)	49.4	49.4	1.4	55.0	11.9	
Actuated g/C Ratio	0.63	0.63	0.02	0.71	0.15	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1194	994	32	1317	267	
v/s Ratio Prot	c0.57		0.01	c0.37	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.90	0.08	0.53	0.52	0.65	
Uniform Delay, d1	12.1	5.4	37.9	5.3	31.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.6	0.0	8.2	0.4	4.3	
Delay (s)	21.7	5.5	46.1	5.7	35.3	
Level of Service	C	A	D	A	D	
Approach Delay (s)	20.1			6.7	35.3	
Approach LOS	C			A	D	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	15.1
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative PM.syn
12/01/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↑	↑	↑	↑	↑		
Traffic Volume (veh/h)	1000	111	16	641	136	36		
Future Volume (veh/h)	1000	111	16	641	136	36		
Number	2	12	1	6	3	18		
Initial Q (Ob), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1870	1900		
Adj Flow Rate, veh/h	1075	119	17	689	146	0		
Adj No. of Lanes	1	1	1	1	0	0		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93		
Percent Heavy Veh, %	1	1	0	2	0	0		
Cap, veh/h	1252	1043	29	1378	194	0		
Arrive On Green	0.67	0.67	0.02	0.74	0.11	0.00		
Sat Flow, veh/h	1881	1566	1810	1863	1770	0		
Grp Volume(V), veh/h	1075	119	17	689	147	0		
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1782	0		
Q Serve(g_s), s	32.2	2.0	0.7	11.0	5.8	0.0		
Cycle Q Clear(g_c), s	32.2	2.0	0.7	11.0	5.8	0.0		
Prop In Lane		1.00	1.00		0.99	0.00		
Lane Grp Cap(c), veh/h	1252	1043	29	1378	195	0		
V/C Ratio(X)	0.86	0.11	0.59	0.50	0.75	0.00		
Avail Cap(c_a), veh/h	1376	1145	100	1573	443	0		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	9.4	4.4	35.4	3.9	31.3	0.0		
Incr Delay (d2), s/veh	5.5	0.1	6.8	0.4	2.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	18.3	0.9	0.4	5.7	3.0	0.0		
LnGrp Delay(d),s/veh	14.9	4.4	42.2	4.2	33.5	0.0		
LnGrp LOS	B	A	D	A	C			
Approach Vol, veh/h	1194			706	147			
Approach Delay, s/veh	13.8			5.2	33.5			
Approach LOS	B			A	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	54.6				59.9		12.4
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	52.9				61.1		18.0
Max Q Clear Time (g_c+I1), s	2.7	34.2				13.0		7.8
Green Ext Time (p_c), s	0.0	13.9				26.2		0.1
Intersection Summary								
HCM 2010 Ctrl Delay			12.3					
HCM 2010 LOS			B					
Notes								

Synchro 9 Report

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Cumulative PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	57	947	24	16	575	19	24	1	28	14	2	46
Future Vol, veh/h	57	947	24	16	575	19	24	1	28	14	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	64	1064	27	18	646	21	27	1	31	16	2	52
Major/Minor												
Conflicting Flow All	667	0	0	1064	0	0	1886	1895	1064	1886	1885	657
Stage 1	-	-	-	-	-	-	1192	1192	-	693	693	-
Stage 2	-	-	-	-	-	-	694	703	-	1193	1192	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	932	-	-	662	-	-	54	70	273	54	71	468
Stage 1	-	-	-	-	-	-	230	263	-	437	448	-
Stage 2	-	-	-	-	-	-	436	443	-	230	263	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	932	-	-	662	-	-	43	63	273	44	64	468
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	63	-	44	64	-
Stage 1	-	-	-	-	-	-	214	245	-	407	436	-
Stage 2	-	-	-	-	-	-	375	431	-	189	245	-
Approach												
HCM Control Delay, s	0.5			0.3			94.9			42.8		
HCM LOS							F			E		
Minor Lane/Major Mvmt												
Capacity (veh/h)	44	273	932	-	-	662	-	-	46	468		
HCM Lane V/C Ratio	0.638	0.115	0.069	-	-	0.027	-	-	0.391	0.11		
HCM Control Delay (s)	179	19.9	9.1	-	-	10.6	-	-	126.6	13.6		
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B		
HCM 95th %tile Q(veh)	2.4	0.4	0.2	-	-	0.1	-	-	1.4	0.4		

Synchro 9 Report

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Cumulative PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕			↕	↕	↕
Traffic Vol, veh/h	37	1	7	852	621	37
Future Vol, veh/h	37	1	7	852	621	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	39	1	7	897	654	39

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	1566	654	654	0	0
Stage 1	654	-	-	-	-
Stage 2	912	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	124	470	943	-	-
Stage 1	521	-	-	-	-
Stage 2	395	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	122	470	943	-	-
Mov Cap-2 Maneuver	122	-	-	-	-
Stage 1	521	-	-	-	-
Stage 2	389	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	47.3	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	943	-	124	-	-
HCM Lane V/C Ratio	0.008	-	0.323	-	-
HCM Control Delay (s)	8.8	0	47.3	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0	-	1.3	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Cumulative PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.4						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕			↕
Traffic Vol, veh/h	21	58	417	36	30	456
Future Vol, veh/h	21	58	417	36	30	456
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	22	61	439	38	32	480

Major/Minor	Minor1	Major1	Major2	Major2	Major2
Conflicting Flow All	1013	469	0	0	483
Stage 1	464	-	-	-	-
Stage 2	549	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	267	598	-	-	1090
Stage 1	637	-	-	-	-
Stage 2	583	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	254	593	-	-	1085
Mov Cap-2 Maneuver	254	-	-	-	-
Stage 1	634	-	-	-	-
Stage 2	557	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	438	1085	-
HCM Lane V/C Ratio	-	-	0.19	0.029	-
HCM Control Delay (s)	-	-	15.1	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Cumulative PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↔	
Traffic Vol, veh/h	14	114	124	371	338	28
Future Vol, veh/h	14	114	124	371	338	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	125	136	408	371	31

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	1059	379	375	0	0
Stage 1	375	-	-	-	-
Stage 2	684	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-
Pot Cap-1 Maneuver	251	670	1195	-	-
Stage 1	699	-	-	-	-
Stage 2	505	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	221	666	1191	-	-
Mov Cap-2 Maneuver	221	-	-	-	-
Stage 1	697	-	-	-	-
Stage 2	446	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.9	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1191	-	546	-	-
HCM Lane V/C Ratio	0.114	-	0.258	-	-
HCM Control Delay (s)	8.4	-	13.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	1	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Cumulative PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 3.5						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↔	
Traffic Vol, veh/h	27	128	101	284	232	17
Future Vol, veh/h	27	128	101	284	232	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	136	107	302	247	18

Major/Minor	Minor2	Major1	Major2	Major2	Major2
Conflicting Flow All	783	266	270	0	0
Stage 1	261	-	-	-	-
Stage 2	522	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-
Pot Cap-1 Maneuver	365	773	1299	-	-
Stage 1	787	-	-	-	-
Stage 2	599	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	332	767	1294	-	-
Mov Cap-2 Maneuver	332	-	-	-	-
Stage 1	784	-	-	-	-
Stage 2	547	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1294	-	624	-	-
HCM Lane V/C Ratio	0.083	-	0.264	-	-
HCM Control Delay (s)	8	-	12.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	-	-

HCM 2010 AWSC

Cumulative PM.syn

17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

12/01/2017

Intersection

Intersection Delay, s/veh 9.6
Intersection LOS A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations			↕				↕				↕	
Traffic Vol, veh/h	0	2	1	111	0	3	0	0	0	128	173	3
Future Vol, veh/h	0	2	1	111	0	3	0	0	0	128	173	3
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0
Mvmt Flow	0	2	1	122	0	3	0	0	0	141	190	3
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.3	8.5	10.6
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	42%	2%	100%	1%
Vol Thru, %	57%	1%	0%	99%
Vol Right, %	1%	97%	0%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	304	114	3	141
LT Vol	128	2	3	1
Through Vol	173	1	0	140
RT Vol	3	111	0	0
Lane Flow Rate	334	125	3	155
Geometry Grp	1	1	1	1
Degree of Util (X)	0.414	0.154	0.005	0.196
Departure Headway (Hd)	4.457	4.427	5.378	4.555
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	808	809	664	787
Service Time	2.484	2.459	3.423	2.586
HCM Lane V/C Ratio	0.413	0.155	0.005	0.197
HCM Control Delay	10.6	8.3	8.5	8.7
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2	0.5	0	0.7

HCM 2010 AWSC

Cumulative PM.syn

17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	140	0
Future Vol, veh/h	0	1	140	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	154	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.7
HCM LOS	A

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Cumulative Saturday.syn
12/01/2017

	↖	↗	↑	↘	↙	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↖↖	↑	↘	↙↙	↓
Traffic Volume (vph)	0	907	905	83	968	911
Future Volume (vph)	0	907	905	83	968	911
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Flt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	935	933	86	998	939
RTOR Reduction (vph)	0	138	0	7	0	0
Lane Group Flow (vph)	0	797	933	79	998	939
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		20.2	33.4	33.4	20.2	63.4
Effective Green, g (s)		21.1	34.3	34.3	21.1	63.4
Actuated g/C Ratio		0.33	0.54	0.54	0.33	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		945	1017	873	1153	1881
v/s Ratio Prot		0.28	c0.50		c0.29	0.50
v/s Ratio Perm				0.05		
v/c Ratio		0.84	0.92	0.09	0.87	0.50
Uniform Delay, d1		19.6	13.3	7.0	19.8	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		7.5	12.8	0.1	7.4	0.9
Delay (s)		27.1	26.0	7.1	27.3	0.9
Level of Service		C	C	A	C	A
Approach Delay (s)	27.1		24.4			14.5
Approach LOS	C		C			B
Intersection Summary						
HCM 2000 Control Delay		20.1			HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio		0.90				
Actuated Cycle Length (s)		63.4			Sum of lost time (s)	8.0
Intersection Capacity Utilization		86.0%			ICU Level of Service	E
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Cumulative Saturday.syn
12/01/2017

	↖	→	↘	↙	←	↗	↖	↗	↑	↘	↙	↓	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↖↖	↘	↙↙	↖↖		↖	↖	↘	↙	↘	↖	↖
Traffic Volume (vph)	25	766	261	432	684	3	208	15	409	2	15	14	
Future Volume (vph)	25	766	261	432	684	3	208	15	409	2	15	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Flt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00	
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1715	1575		1890	1615	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.99	1.00	
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1715	1575		1890	1615	
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)	27	815	278	460	728	3	221	16	435	2	16	15	
RTOR Reduction (vph)	0	0	177	0	0	0	0	0	93	0	0	15	
Lane Group Flow (vph)	27	815	101	460	731	0	117	120	342	0	18	0	
Confl. Peds. (#/hr)			1	1			1		1				
Confl. Bikes (#/hr)			1				1		1				
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm	
Protected Phases	1	6		5	2		4	4	5	8	8		
Permitted Phases			6						4			8	
Actuated Green, G (s)	1.6	21.7	21.7	11.6	31.7		7.8	7.8	19.4		1.0	1.0	
Effective Green, g (s)	2.1	22.7	22.7	12.2	32.7		9.6	9.6	20.6		2.0	2.0	
Actuated g/C Ratio	0.03	0.36	0.36	0.20	0.52		0.15	0.15	0.33		0.03	0.03	
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0	
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	60	1298	578	676	1887		260	263	519		60	51	
v/s Ratio Prot	0.01	c0.23		c0.13	0.20		0.07	0.07	c0.13		c0.01		
v/s Ratio Perm			0.06						0.09			0.00	
v/c Ratio	0.45	0.63	0.17	0.68	0.39		0.45	0.46	0.66		0.30	0.01	
Uniform Delay, d1	29.6	16.4	13.5	23.3	8.9		24.0	24.1	17.9		29.6	29.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.7	0.1	2.3	0.0		0.5	0.5	2.3		1.0	0.0	
Delay (s)	31.6	17.1	13.6	25.6	9.0		24.5	24.5	20.3		30.6	29.3	
Level of Service	C	B	B	C	A		C	C	C		C	C	
Approach Delay (s)		16.6			15.4			21.8			30.0		
Approach LOS		B			B			C			C		
Intersection Summary													
HCM 2000 Control Delay			17.4								B		
HCM 2000 Volume to Capacity ratio			0.62										
Actuated Cycle Length (s)			62.5						16.1				
Intersection Capacity Utilization			59.9%						B				
Analysis Period (min)			15										
c Critical Lane Group													

HCM 2010 Signalized Intersection Summary
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Cumulative Saturday.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	25	766	261	432	684	3	208	15	409	2	15	14
Future Volume (veh/h)	25	766	261	432	684	3	208	15	409	2	15	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	815	278	460	728	3	232	0	435	2	16	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	55	1022	455	578	1549	6	1012	0	677	7	58	56
Arrive On Green	0.03	0.29	0.29	0.17	0.42	0.41	0.28	0.00	0.27	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1593	3476	3687	15	3583	0	1561	210	1680	1615
Grp Volume(V), veh/h	27	815	278	460	356	375	232	0	435	18	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1593	1738	1805	1897	1792	0	1561	1890	0	1615
Q Serve(g_s), s	1.0	14.6	10.5	8.8	9.9	9.9	3.4	0.0	15.2	0.6	0.0	0.6
Cycle Q Clear(c_c), s	1.0	14.6	10.5	8.8	9.9	9.9	3.4	0.0	15.2	0.6	0.0	0.6
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.11		1.00
Lane Grp Cap(c), veh/h	55	1022	455	578	758	797	1012	0	677	66	0	56
V/C Ratio(X)	0.49	0.80	0.61	0.80	0.47	0.47	0.23	0.00	0.64	0.27	0.00	0.27
Avail Cap(c_a), veh/h	143	1144	510	701	796	837	1746	0	997	109	0	93
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.1	22.9	21.4	27.8	14.5	14.5	19.1	0.0	15.5	32.6	0.0	32.6
Incr Delay (d2), s/veh	2.4	3.2	1.0	4.2	0.2	0.2	0.0	0.0	0.4	0.8	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.6	4.7	4.6	4.9	5.1	1.7	0.0	6.5	0.4	0.0	0.3
LnGrp Delay(d),s/veh	35.5	26.1	22.4	32.0	14.7	14.7	19.1	0.0	15.9	33.5	0.0	33.6
LnGrp LOS	D	C	C	C	B	B	B		B	C		C
Approach Vol, veh/h		1120			1191			667			33	
Approach Delay, s/veh		25.4			21.4			17.0			33.5	
Approach LOS		C			C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	33.1		23.6	15.5	23.8		6.4				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 13	21.2		3.0				
Max Q Clear Time (g_c+I1), s	3.0	11.9		17.2	10.8	16.6		2.6				
Green Ext Time (p_c), s	0.0	4.1		0.4	0.1	2.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay		22.1										
HCM 2010 LOS		C										
Notes												

HCM Signalized Intersection Capacity Analysis
 3: SR 1 & Rio Rd

Cumulative Saturday.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↔	↕	↕	↔	↕	↔	↔	↕
Traffic Volume (vph)	134	329	70	8	189	332	290	72	565	160	286	571
Future Volume (vph)	134	329	70	8	189	332	290	72	565	160	286	571
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frbp, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3489			1794	1881	1555	1805	1863	1590	3502	1847
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3489			681	1881	1555	1805	1863	1590	3502	1847
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	135	332	71	8	191	335	293	73	571	162	289	577
RTOR Reduction (vph)	0	23	0	0	0	0	211	0	0	107	0	4
Lane Group Flow (vph)	135	380	0	0	199	335	82	73	571	55	289	628
Confl. Peds. (#/hr)	5		5	4	4			4	5		4	4
Confl. Bikes (#/hr)			8					1				
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.3	18.2			11.4	21.3	21.3	6.3	27.0	27.0	9.3	30.0
Effective Green, g (s)	8.0	18.4			11.1	21.5	21.5	6.0	27.9	27.9	9.0	30.9
Actuated g/C Ratio	0.10	0.22			0.13	0.26	0.26	0.07	0.34	0.34	0.11	0.37
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	173	779			91	490	405	131	630	538	382	692
v/s Ratio Prot	0.08	0.11				c0.18		0.04	0.31		c0.08	c0.34
v/s Ratio Perm					c0.29		0.05			0.03		
v/c Ratio	0.78	0.49			2.19	0.68	0.20	0.56	0.91	0.10	0.76	0.91
Uniform Delay, d1	36.3	27.9			35.7	27.4	23.8	36.9	26.0	18.7	35.6	24.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.0	0.6			568.3	4.1	0.3	5.1	17.0	0.1	8.3	15.9
Delay (s)	56.4	28.5			604.0	31.5	24.0	42.0	43.0	18.8	43.9	40.3
Level of Service	E	C			F	C	C	D	D	B	D	D
Approach Delay (s)		35.5				166.6			38.0			41.5
Approach LOS		D				F			D			D
Intersection Summary												
HCM 2000 Control Delay						73.0						E
HCM 2000 Volume to Capacity ratio						1.04						
Actuated Cycle Length (s)						82.4						16.0
Intersection Capacity Utilization						78.9%						D
Analysis Period (min)						15						
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Cumulative Saturday.syn
12/01/2017

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↕
Traffic Volume (vph)	84	362	160	163	430	298	164
Future Volume (vph)	84	362	160	163	430	298	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	0.97	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1805	3421		1787	3610	3467	1532
Flt Permitted	0.43	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	817	3421		1787	3610	3467	1532
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	88	381	168	172	453	314	173
RTOR Reduction (vph)	0	67	0	0	0	0	144
Lane Group Flow (vph)	88	482	0	172	453	314	29
Confl. Peds. (#/hr)			5	9		5	9
Confl. Bikes (#/hr)			11				11
Heavy Vehicles (%)	0%	0%	0%	1%	0%	1%	1%
Turn Type	custom	NA		Prot	NA	Prot	Perm
Protected Phases		2		1	6	3	
Permitted Phases	5						3
Actuated Green, G (s)	9.8	26.4		7.8	24.4	9.3	9.3
Effective Green, g (s)	9.3	26.4		7.3	24.4	9.3	9.3
Actuated g/C Ratio	0.17	0.48		0.13	0.44	0.17	0.17
Clearance Time (s)	3.5	4.0		3.5	4.0	4.0	4.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	2.0
Lane Grp Cap (vph)	138	1642		237	1601	586	259
v/s Ratio Prot		c0.14		0.10	0.13	c0.09	
v/s Ratio Perm	c0.11						0.02
v/c Ratio	0.64	0.29		0.73	0.28	0.54	0.11
Uniform Delay, d1	21.3	8.7		22.9	9.7	20.9	19.4
Progression Factor	1.00	1.00		0.82	0.91	1.00	1.00
Incremental Delay, d2	6.9	0.5		8.9	0.4	0.5	0.1
Delay (s)	28.2	9.1		27.7	9.3	21.4	19.4
Level of Service	C	A		C	A	C	B
Approach Delay (s)		11.7			14.4	20.7	
Approach LOS		B			B	C	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑			↗	↗		↔	
Traffic Volume (vph)	0	484	42	112	515	0	78	0	75	0	0	0
Future Volume (vph)	0	484	42	112	515	0	78	0	75	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.96			
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3558		1805	3574			1796	1537			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3558		1805	3574			1432	1537			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	532	46	123	566	0	86	0	82	0	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	72	0	0	0
Lane Group Flow (vph)	0	570	0	123	566	0	86	10	0	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		30.2		6.4	40.1			6.9	6.9			
Effective Green, g (s)		30.2		5.9	40.1			6.9	6.9			
Actuated g/C Ratio		0.55		0.11	0.73			0.13	0.13			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)	1953		193	2605			179	192				
v/s Ratio Prot	c0.16		c0.07	0.16								
v/s Ratio Perm							c0.06	0.01				
v/c Ratio	0.29		0.64	0.22			0.48	0.05				
Uniform Delay, d1	6.7		23.5	2.4			22.4	21.2				
Progression Factor	0.65		1.00	1.00			1.00	1.00				
Incremental Delay, d2	0.4		5.0	0.2			0.7	0.0				
Delay (s)	4.7		28.5	2.6			23.1	21.2				
Level of Service	A		C	A			C	C				
Approach Delay (s)	4.7			7.2			22.2			0.0		
Approach LOS	A			A			C			A		
Intersection Summary												
HCM 2000 Control Delay			8.0		HCM 2000 Level of Service				A			
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			55.0		Sum of lost time (s)				12.0			
Intersection Capacity Utilization			35.3%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↖	↑↑			↗	↗		↔	
Traffic Volume (veh/h)	0	484	42	112	515	0	78	0	75	0	0	0
Future Volume (veh/h)	0	484	42	112	515	0	78	0	75	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s),veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	532	46	123	566	0	86	0	82	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	2050	177	143	2726	0	263	0	140	0	175	0
Arrive On Green	0.00	1.00	1.00	0.08	0.76	0.00	0.09	0.00	0.09	0.00	0.00	0.00
Sat Flow, veh/h	0	3450	289	1810	3668	0	1440	0	1522	0	1900	0
Grp Volume(v), veh/h	0	286	292	123	566	0	86	0	82	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1839	1810	1787	0	1440	0	1522	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	3.7	2.5	0.0	3.2	0.0	2.8	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	3.7	2.5	0.0	3.2	0.0	2.8	0.0	0.0	0.0
Prop In Lane	0.00		0.16	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1103	1124	143	2726	0	263	0	140	0	175	0
V/C Ratio(X)	0.00	0.26	0.26	0.86	0.21	0.00	0.33	0.00	0.59	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1103	1124	296	2726	0	550	0	443	0	553	0
HCM Platoon Ratio	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.95	0.95	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	25.0	1.8	0.0	24.1	0.0	24.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	5.7	0.2	0.0	0.3	0.0	1.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	2.1	1.2	0.0	1.3	0.0	1.2	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.5	0.5	30.8	2.0	0.0	24.4	0.0	25.4	0.0	0.0	0.0
LnGrp LOS		A	A	C	A		C		C			
Approach Vol, veh/h		578			689			168				0
Approach Delay, s/veh		0.5			7.1			24.9				0.0
Approach LOS		A			A			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	8.3	37.6		9.1		45.9		9.1				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	9.5	18.0		16.0		31.0		16.0				
Max Q Clear Time (g_c+1), s	5.7	2.0		0.0		4.5		5.2				
Green Ext Time (p_c), s	0.0	8.0		0.0		10.4		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay					6.6							
HCM 2010 LOS					A							

Synchro 9 Report

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Cumulative Saturday.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	15.4								
Intersection LOS	C								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↔↔	↕		↕	↔↔		↔↔	↕
Traffic Vol, veh/h	0	315	63	0	47	27	2	45	443
Future Vol, veh/h	0	315	63	0	47	27	2	45	443
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	339	68	0	51	29	2	48	476
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB					
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB						WB		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	12			10.3			18.8		
HCM LOS	B			B			C		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	158	158	63	47	27	47	443		
LT Vol	158	158	0	0	0	47	0		
Through Vol	0	0	63	47	0	0	0		
RT Vol	0	0	0	0	27	0	443		
Lane Flow Rate	169	169	68	51	29	51	476		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.322	0.321	0.087	0.1	0.053	0.091	0.703		
Departure Headway (Hd)	6.848	6.831	4.598	7.103	6.542	6.516	5.314		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	525	527	777	503	546	550	681		
Service Time	4.592	4.574	2.341	4.865	4.304	4.258	3.056		
HCM Lane V/C Ratio	0.322	0.321	0.088	0.101	0.053	0.093	0.699		
HCM Control Delay	12.8	12.8	7.8	10.7	9.7	9.9	19.7		
HCM Lane LOS	B	B	A	B	A	A	C		
HCM 95th-tile Q	1.4	1.4	0.3	0.3	0.2	0.3	5.8		

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Cumulative Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔↔		↔	↔↔	↔
Traffic Volume (vph)	271	7	190	42	11	9	211	1525	7	5	1649	289
Future Volume (vph)	271	7	190	42	11	9	211	1525	7	5	1649	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Fr	1.00	0.87		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1564		1715	1683		1787	3570		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1564		1715	1683		1787	3570		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	192	42	11	9	213	1540	7	5	1666	292
RTOR Reduction (vph)	0	159	0	0	9	0	0	0	0	0	0	116
Lane Group Flow (vph)	247	67	0	31	22	0	213	1547	0	5	1666	176
Confl. Bikes (#/hr)							3					3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.3	15.3		3.9	3.9		10.4	51.5		1.3	42.4	42.4
Effective Green, g (s)	15.5	15.5		4.1	4.1		10.1	52.4		1.0	43.3	43.3
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.11	0.59		0.01	0.49	0.49
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	295	272		79	77		202	2101		20	1738	768
v/s Ratio Prot	c0.15	0.04		c0.02	0.01		c0.12	0.43		0.00	c0.47	
v/s Ratio Perm												0.11
v/c Ratio	0.84	0.25		0.39	0.29		1.05	0.74		0.25	0.96	0.23
Uniform Delay, d1	35.5	31.7		41.2	41.0		39.5	13.3		43.6	22.0	13.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	18.7	0.6		4.3	2.9		78.4	1.6		6.5	13.2	0.3
Delay (s)	54.2	32.3		45.6	43.9		117.9	14.8		50.1	35.2	13.5
Level of Service	D	C		D	D		F	B		D	D	B
Approach Delay (s)		43.7			44.7			27.3			32.0	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay				31.5			HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio				0.91								
Actuated Cycle Length (s)				89.0			Sum of lost time (s)			16.0		
Intersection Capacity Utilization				87.4%			ICU Level of Service			E		
Analysis Period (min)				15								
c Critical Lane Group												

Synchro 9 Report

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Cumulative Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	271	7	190	42	11	9	211	1525	7	5	1649	289
Future Volume (veh/h)	271	7	190	42	11	9	211	1525	7	5	1649	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(veh/h/ln)	1881	1898	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	236	59	192	31	26	9	213	1540	7	5	1666	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	317	70	226	120	89	31	205	2070	9	10	1639	741
Arrive On Green	0.18	0.18	0.17	0.07	0.07	0.06	0.11	0.57	0.56	0.01	0.46	0.00
Sat Flow, veh/h	1792	393	1279	1810	1342	465	1792	3647	17	1810	3574	1615
Grp Volume(v), veh/h	236	0	251	31	0	35	213	754	793	5	1666	0
Grp Sat Flow(s),veh/h/ln	1792	0	1672	1810	0	1807	1792	1786	1877	1810	1787	1615
Q Serve(g_s), s	10.9	0.0	12.7	1.4	0.0	1.6	10.0	27.6	27.6	0.2	40.0	0.0
Cycle Q Clear(g_c), s	10.9	0.0	12.7	1.4	0.0	1.6	10.0	27.6	27.6	0.2	40.0	0.0
Prop In Lane	1.00		0.76	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	317	0	296	120	0	120	205	1014	1065	10	1639	741
V/C Ratio(X)	0.74	0.00	0.85	0.26	0.00	0.29	1.04	0.74	0.74	0.48	1.02	0.00
Avail Cap(c_a), veh/h	345	0	322	149	0	149	205	1014	1065	145	1639	741
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	34.8	38.7	0.0	38.8	38.6	14.1	14.1	43.2	23.6	0.0
Incr Delay (d2), s/veh	8.2	0.0	18.1	1.6	0.0	1.9	72.8	3.4	3.2	31.0	26.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.0	7.3	0.8	0.0	0.9	9.1	14.4	15.1	0.2	25.6	0.0
LnGrp Delay(d),s/veh	42.2	0.0	52.9	40.3	0.0	40.7	111.5	17.5	17.4	74.3	50.0	0.0
LnGrp LOS	D		D	D		D	F	B	B	E	F	F
Approach Vol, veh/h		487			66			1760			1671	
Approach Delay, s/veh		47.7			40.5			28.8			50.1	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.4	14.0	44.0		9.8	4.5	53.5				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 17	10.3	39.1		7.0	7.3	42.1				
Max Q Clear Time (g_c+I1), s		14.7	12.0	42.0		3.6	2.2	29.6				
Green Ext Time (p_c), s		0.6	0.0	0.0		0.1	0.0	12.3				
Intersection Summary												
HCM 2010 Ctrl Delay		40.2										
HCM 2010 LOS		D										
Notes												

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Cumulative Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	390	10	23	21	11	34	36	1724	25	40	1979	557
Future Volume (vph)	390	10	23	21	11	34	36	1724	25	40	1979	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1681		1715	1774	1583	1805	3566		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1681		1715	1774	1583	1805	3566		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97		0.97	0.97	0.97	0.97	0.97		0.97	0.97	0.97
Adj. Flow (vph)	402	10	24	22	11	35	37	1777	26	41	2040	574
RTOR Reduction (vph)	0	21	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	13	0	16	17	2	37	1802	0	41	2040	574
Confl. Bikes (#/hr)				2		2				2		2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.2	16.2		6.7	6.7	6.7	4.7	73.2		6.1	75.1	120.1
Effective Green, g (s)	16.8	16.8		6.9	6.9	6.9	4.4	74.1		6.3	76.0	120.1
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.04	0.62		0.05	0.63	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	480	235		98	101	90	66	2200		94	2261	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.51		0.02	c0.57	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.84	0.06		0.16	0.17	0.02	0.56	0.82		0.44	0.90	0.37
Uniform Delay, d1	50.3	44.8		53.9	53.9	53.4	56.9	17.8		55.2	18.9	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.1	0.2		1.4	1.4	0.2	10.4	2.8		3.2	5.8	0.7
Delay (s)	63.4	45.0		55.2	55.2	53.6	67.3	20.6		58.4	24.7	0.7
Level of Service	E	D		E	E	D	E	C		E	C	A
Approach Delay (s)		61.9			54.4			21.6			20.0	
Approach LOS		E			D			C			C	
Intersection Summary												
HCM 2000 Control Delay		24.7				HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		120.1				Sum of lost time (s)				16.0		
Intersection Capacity Utilization		79.2%				ICU Level of Service				D		
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Cumulative Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	66	0	20	1	0	0	10	337	0	0	464	30
Future Vol, veh/h	66	0	20	1	0	0	10	337	0	0	464	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	75	0	23	1	0	0	11	383	0	0	527	34

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	758	950	281	670	967	191	561	0	0	383	0	0
Stage 1	544	544	-	406	406	-	-	-	-	-	-	-
Stage 2	214	406	-	264	561	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	296	262	722	347	256	825	1020	-	-	1187	-	-
Stage 1	491	522	-	598	601	-	-	-	-	-	-	-
Stage 2	768	601	-	724	513	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	293	258	722	332	252	825	1020	-	-	1187	-	-
Mov Cap-2 Maneuver	293	258	-	332	252	-	-	-	-	-	-	-
Stage 1	484	522	-	590	593	-	-	-	-	-	-	-
Stage 2	757	593	-	701	513	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	19.8			15.9			0.3			0		
HCM LOS	C			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1020	-	-	340	332	1187	-	-
HCM Lane V/C Ratio	0.011	-	-	0.287	0.003	-	-	-
HCM Control Delay (s)	8.6	0.1	-	19.8	15.9	0	-	-
HCM Lane LOS	A	A	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Cumulative Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	
Traffic Vol, veh/h	193	366	12	5	454	31	7	0	6	6	1	166
Future Vol, veh/h	193	366	12	5	454	31	7	0	6	6	1	166
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	210	398	13	5	493	34	8	0	7	7	1	180

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	531	0	0	419	0	0	1094	1374	221	1151	1363	272
Stage 1	-	-	-	-	-	-	832	832	-	525	525	-
Stage 2	-	-	-	-	-	-	262	542	-	626	838	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1040	-	-	1151	-	-	171	147	789	155	149	732
Stage 1	-	-	-	-	-	-	334	387	-	509	533	-
Stage 2	-	-	-	-	-	-	726	523	-	443	384	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1037	-	-	1143	-	-	106	116	779	128	117	727
Mov Cap-2 Maneuver	-	-	-	-	-	-	106	116	-	128	117	-
Stage 1	-	-	-	-	-	-	265	307	-	405	529	-
Stage 2	-	-	-	-	-	-	541	519	-	348	304	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	3.2			0.1			27.2			13.5		
HCM LOS	C			D			D			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	176	1037	-	-	1143	-	-	610
HCM Lane V/C Ratio	0.08	0.202	-	-	0.005	-	-	0.308
HCM Control Delay (s)	27.2	9.3	-	-	8.2	-	-	13.5
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.8	-	-	0	-	-	1.3

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative Saturday.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (vph)	795	117	33	767	122	22
Future Volume (vph)	795	117	33	767	122	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1782	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1782	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	846	124	35	816	130	23
RTOR Reduction (vph)	0	56	0	0	9	0
Lane Group Flow (vph)	846	68	35	816	144	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	31.8	31.8	1.3	37.3	9.7	
Effective Green, g (s)	31.8	31.8	1.3	37.3	9.7	
Actuated g/C Ratio	0.55	0.55	0.02	0.64	0.17	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1033	866	38	1211	298	
v/s Ratio Prot	c0.45		0.02	c0.43	c0.08	
v/s Ratio Perm		0.04				
v/c Ratio	0.82	0.08	0.92	0.67	0.48	
Uniform Delay, d1	10.7	6.1	28.2	6.5	21.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.3	0.0	113.1	1.6	0.5	
Delay (s)	16.0	6.2	141.3	8.0	22.3	
Level of Service	B	A	F	A	C	
Approach Delay (s)	14.8			13.5	22.3	
Approach LOS	B			B	C	

Intersection Summary					
HCM 2000 Control Delay	14.8		HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.76				
Actuated Cycle Length (s)	57.9		Sum of lost time (s)	15.1	
Intersection Capacity Utilization	59.0%		ICU Level of Service	B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative Saturday.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (veh/h)	795	117	33	767	122	22
Future Volume (veh/h)	795	117	33	767	122	22
Number	2	12	1	6	3	18
Initial Q (Ob), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	846	124	35	816	130	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	1110	931	52	1309	194	0
Arrive On Green	0.59	0.59	0.03	0.70	0.11	0.00
Sat Flow, veh/h	1881	1579	1740	1881	1796	0
Grp Volume(V), veh/h	846	124	35	816	131	0
Grp Sat Flow(s),veh/h/ln	1881	1579	1740	1881	1810	0
Q Serve(g_s), s	18.6	1.9	1.1	12.9	3.9	0.0
Cycle Q Clear(g_c), s	18.6	1.9	1.1	12.9	3.9	0.0
Prop In Lane	1.00	1.00	1.00	0.99	0.99	0.00
Lane Grp Cap(c), veh/h	1110	931	52	1309	196	0
V/C Ratio(X)	0.76	0.13	0.67	0.62	0.67	0.00
Avail Cap(c_a), veh/h	1284	1077	125	1562	587	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.5	5.1	26.7	4.5	23.8	0.0
Incr Delay (d2), s/veh	2.5	0.1	5.4	0.7	1.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	0.8	0.6	6.8	2.0	0.0
LnGrp Delay(d),s/veh	11.0	5.1	32.0	5.2	25.3	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	970			851	131	
Approach Delay, s/veh	10.3			6.3	25.3	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.9	39.2				45.0		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	37.9				46.1		18.0
Max Q Clear Time (g_c+I1), s	3.1	20.6				14.9		5.9
Green Ext Time (p_c), s	0.0	12.2				18.1		0.1

Intersection Summary					
HCM 2010 Ctrl Delay			9.6		
HCM 2010 LOS			A		

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Cumulative Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 3.5												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔		↔	↔
Traffic Vol, veh/h	58	731	29	14	683	17	30	0	40	10	0	40
Future Vol, veh/h	58	731	29	14	683	17	30	0	40	10	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	62	778	31	15	727	18	32	0	43	11	0	43

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	745	0	0	778
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.1	-	-	4.1
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2
Pot Cap-1 Maneuver	872	-	-	848
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	872	-	-	848
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	53.7	25.8
HCM LOS	F	F	F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	65	400	872	-	-	848	-	-	65	422
HCM Lane V/C Ratio	0.491	0.106	0.071	-	-	0.018	-	-	0.164	0.101
HCM Control Delay (s)	105.1	15.1	9.4	-	-	9.3	-	-	70.9	14.5
HCM Lane LOS	F	C	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	2	0.4	0.2	-	-	0.1	-	-	0.5	0.3

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Cumulative Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.4						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	38	4	5	755	791	39
Future Vol, veh/h	38	4	5	755	791	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	-	0
Grade, %	0	-	-	0	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	40	4	5	795	833	41

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1638	833	833
Stage 1	833	-	-
Stage 2	805	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	112	372	809
Stage 1	430	-	-
Stage 2	443	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	111	372	809
Mov Cap-2 Maneuver	111	-	-
Stage 1	430	-	-
Stage 2	438	-	-

Approach	EB	NB	SB
HCM Control Delay, s	52.1	0.1	0
HCM LOS	F	F	F

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	809	-	119	-	-
HCM Lane V/C Ratio	0.007	-	0.372	-	-
HCM Control Delay (s)	9.5	0	52.1	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.5	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Cumulative Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.3						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	24	37	366	32	28	371
Future Vol, veh/h	24	37	366	32	28	371
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	25	38	377	33	29	382

Major/Minor	Minor1	Major1	Major2	Minor2	Major2
Conflicting Flow All	846	406	0	0	416
Stage 1	400	-	-	-	-
Stage 2	446	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	335	649	-	-	1154
Stage 1	681	-	-	-	-
Stage 2	649	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	321	643	-	-	1148
Mov Cap-2 Maneuver	321	-	-	-	-
Stage 1	678	-	-	-	-
Stage 2	625	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	461	1148	-
HCM Lane V/C Ratio	-	-	0.136	0.025	-
HCM Control Delay (s)	-	-	14	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Cumulative Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	10	79	63	323	317	16
Future Vol, veh/h	10	79	63	323	317	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	84	67	344	337	17

Major/Minor	Minor2	Major1	Major2	Minor2	Major2
Conflicting Flow All	836	359	348	0	0
Stage 1	348	-	-	-	-
Stage 2	488	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-
Pot Cap-1 Maneuver	340	683	1211	-	-
Stage 1	719	-	-	-	-
Stage 2	621	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	315	671	1200	-	-
Mov Cap-2 Maneuver	315	-	-	-	-
Stage 1	712	-	-	-	-
Stage 2	581	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1200	-	595	-	-
HCM Lane V/C Ratio	0.056	-	0.159	-	-
HCM Control Delay (s)	8.2	-	12.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Cumulative Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	20	114	98	251	212	8
Future Vol, veh/h	20	114	98	251	212	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	127	109	279	236	9
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	751	254	251	0	0	
Stage 1	247	-	-	-	-	
Stage 2	504	-	-	-	-	
Critical Hdwy	6.4	6.2	4.11	-	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.209	-	-	
Pot Cap-1 Maneuver	381	790	1320	-	-	
Stage 1	799	-	-	-	-	
Stage 2	611	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	345	781	1312	-	-	
Mov Cap-2 Maneuver	345	-	-	-	-	
Stage 1	794	-	-	-	-	
Stage 2	557	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	12.1	2.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1312	-	657	-	-	
HCM Lane V/C Ratio	0.083	-	0.227	-	-	
HCM Control Delay (s)	8	-	12.1	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.9	-	-	

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative Saturday.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	9.4												
Intersection LOS	A												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Lane Configurations			↕				↕				↕		
Traffic Vol, veh/h	0	0	1	94	0	3	0	0	0	161	106	4	
Future Vol, veh/h	0	0	1	94	0	3	0	0	0	161	106	4	
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0	
Mvmt Flow	0	0	1	108	0	3	0	0	0	185	122	5	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach	EB			WB				NB					
Opposing Approach	WB			EB				SB					
Opposing Lanes	1			1				1					
Conflicting Approach Left	SB			NB				EB					
Conflicting Lanes Left	1			1				1					
Conflicting Approach Right	NB			SB				WB					
Conflicting Lanes Right	1			1				1					
HCM Control Delay	8			8.3				10.3					
HCM LOS	A			A				B					
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	59%	0%	100%	0%									
Vol Thru, %	39%	1%	0%	100%									
Vol Right, %	1%	99%	0%	0%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	271	95	3	123									
LT Vol	161	0	3	0									
Through Vol	106	1	0	123									
RT Vol	4	94	0	0									
Lane Flow Rate	311	109	3	141									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0.387	0.131	0.005	0.177									
Departure Headway (Hd)	4.469	4.334	5.269	4.502									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	810	827	678	797									
Service Time	2.469	2.364	3.31	2.529									
HCM Lane V/C Ratio	0.384	0.132	0.004	0.177									
HCM Control Delay	10.3	8	8.3	8.5									
HCM Lane LOS	B	A	A	A									
HCM 95th-tile Q	1.8	0.4	0	0.6									

Synchro 9 Report

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative Saturday.syn
12/01/2017

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	123	0
Future Vol, veh/h	0	0	123	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	141	0
Number of Lanes	0	0	1	0
Approach			SB	
Opposing Approach			NB	
Opposing Lanes			1	
Conflicting Approach Left			WB	
Conflicting Lanes Left			1	
Conflicting Approach Right			EB	
Conflicting Lanes Right			1	
HCM Control Delay			8.5	
HCM LOS			A	

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Cumulative + Project AM.syn
12/01/2017

	↙	↘	↑	↗	↖	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗↘	↑	↗	↖↗	↑
Traffic Volume (vph)	0	1108	576	92	990	817
Future Volume (vph)	0	1108	576	92	990	817
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Flt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2787	1845	1568	3400	1810
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2787	1845	1568	3400	1810
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0	1274	662	106	1138	939
RTOR Reduction (vph)	0	150	0	19	0	0
Lane Group Flow (vph)	0	1124	662	87	1138	939
Heavy Vehicles (%)	0%	2%	3%	3%	3%	5%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		32.3	29.2	29.2	32.3	71.3
Effective Green, g (s)		33.2	30.1	30.1	33.2	71.3
Actuated g/C Ratio		0.47	0.42	0.42	0.47	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		1297	778	661	1583	1810
v/s Ratio Prot		c0.40	c0.36		0.33	0.52
v/s Ratio Perm				0.06		
v/c Ratio		0.87	0.85	0.13	0.72	0.52
Uniform Delay, d1		17.1	18.6	12.6	15.3	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		6.7	9.1	0.1	1.8	1.1
Delay (s)		23.8	27.6	12.7	17.1	1.1
Level of Service		C	C	B	B	A
Approach Delay (s)	23.8		25.6			9.9
Approach LOS	C		C			A
Intersection Summary						
HCM 2000 Control Delay			17.1		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.86			
Actuated Cycle Length (s)			71.3		Sum of lost time (s)	8.0
Intersection Capacity Utilization			75.7%		ICU Level of Service	D
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd
 Cumulative + Project AM.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	7	824	250	399	954	10	108	3	260	9	18	41	
Future Volume (vph)	7	824	250	399	954	10	108	3	260	9	18	41	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	1.00	1.00	0.85	1.00	1.00	0.85	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.98	1.00	0.98	1.00	
Satd. Flow (prot)	1805	3539	1564	3433	3530	1698	1708	1560	1737	1555	1737	1555	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.98	1.00	0.98	1.00	
Satd. Flow (perm)	1805	3539	1564	3433	3530	1698	1708	1560	1737	1555	1737	1555	
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	
Adj. Flow (vph)	9	1056	321	512	1223	13	138	4	333	12	23	53	
RTOR Reduction (vph)	0	0	146	0	0	0	0	0	68	0	0	50	
Lane Group Flow (vph)	9	1056	175	512	1236	0	72	70	265	0	35	3	
Confl. Peds. (#/hr)				1		1	1		1	1		1	
Confl. Bikes (#/hr)				1					1				
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%	
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm	
Protected Phases	1	6		5	2		4	4	5	8	8		
Permitted Phases			6						4			8	
Actuated Green, G (s)	0.7	29.2	29.2	9.7	38.2		5.1	5.1	14.8		2.2	2.2	
Effective Green, g (s)	1.2	30.2	30.2	10.3	39.2		6.9	6.9	16.0		3.2	3.2	
Actuated g/C Ratio	0.02	0.45	0.45	0.15	0.59		0.10	0.10	0.24		0.05	0.05	
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0	
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	32	1604	709	530	2077		175	176	374		83	74	
v/s Ratio Prot	0.00	c0.30		c0.15	0.35		0.04	0.04	c0.11		c0.02		
v/s Ratio Perm			0.11						0.06			0.00	
v/c Ratio	0.28	0.66	0.25	0.97	0.59		0.41	0.40	0.71		0.42	0.03	
Uniform Delay, d1	32.3	14.2	11.2	28.0	8.7		27.9	27.9	23.2		30.8	30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.8	0.1	30.2	0.3		0.6	0.5	5.0		1.3	0.1	
Delay (s)	34.0	14.9	11.3	58.1	9.0		28.5	28.4	28.2		32.1	30.3	
Level of Service	C	B	B	E	A		C	C	C		C	C	
Approach Delay (s)		14.2			23.4			28.3			31.0		
Approach LOS		B			C			C			C		
Intersection Summary													
HCM 2000 Control Delay		20.7		HCM 2000 Level of Service					C				
HCM 2000 Volume to Capacity ratio		0.70											
Actuated Cycle Length (s)		66.6		Sum of lost time (s)					16.1				
Intersection Capacity Utilization		54.5%		ICU Level of Service					A				
Analysis Period (min)		15											
c Critical Lane Group													

Synchro 9 Report

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HCM 2010 Signalized Intersection Summary
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd
 Cumulative + Project AM.syn
 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↔↔	↔	↔↔	↔↔	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (veh/h)	7	824	250	399	954	10	108	3	260	9	18	41	
Future Volume (veh/h)	7	824	250	399	954	10	108	3	260	9	18	41	
Number	1	6	16	5	2	12	7	4	14	3	8	18	
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj Sat Flow(s),veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863	
Adj Flow Rate, veh/h	9	1056	321	512	1223	13	141	0	333	12	23	53	
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2	
Cap, veh/h	29	1203	531	487	1662	18	845	0	560	34	65	89	
Arrive On Green	0.02	0.34	0.34	0.14	0.46	0.45	0.24	0.00	0.22	0.06	0.06	0.06	
Sat Flow, veh/h	1810	3539	1563	3442	3584	38	3583	0	1545	596	1141	1575	
Grp Volume(v), veh/h	9	1056	321	512	603	633	141	0	333	35	0	53	
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1737	0	1575	
Q Serve(g_s), s	0.3	19.9	12.1	10.0	19.6	19.7	2.2	0.0	12.4	1.4	0.0	2.3	
Cycle Q Clear(g_c), s	0.3	19.9	12.1	10.0	19.6	19.7	2.2	0.0	12.4	1.4	0.0	2.3	
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00	
Lane Grp Cap(c), veh/h	29	1203	531	487	820	860	845	0	560	98	0	89	
V/C Ratio(X)	0.31	0.88	0.60	1.05	0.74	0.74	0.17	0.00	0.59	0.36	0.00	0.60	
Avail Cap(c_a), veh/h	115	1311	579	487	820	860	1712	0	934	98	0	89	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	
Uniform Delay (d), s/veh	34.4	22.0	19.4	30.4	15.4	15.5	21.5	0.0	18.4	32.1	0.0	32.6	
Incr Delay (d2), s/veh	2.2	6.2	0.9	55.2	3.1	2.9	0.0	0.0	0.4	0.8	0.0	7.3	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.2	10.7	5.3	8.4	10.2	10.7	1.1	0.0	5.4	0.7	0.0	1.2	
LnGrp Delay(d),s/veh	36.5	28.2	20.3	85.6	18.5	18.4	21.5	0.0	18.8	32.9	0.0	39.9	
LnGrp LOS	D	C	C	F	B	B	C		B	C		D	
Approach Vol, veh/h		1386			1748		474				88		
Approach Delay, s/veh		26.4			38.1		19.6				37.1		
Approach LOS		C			D		B				D		
Timer	1	2	3	4	5	6	7	8					
Assigned Phs	1	2		4	5	6		8					
Phs Duration (G+Y+Rc), s	5.2	36.8		20.7	14.0	28.0		8.0					
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0					
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 9.4	25.2		3.0					
Max Q Clear Time (g_c+I1), s	2.3	21.7		14.4	12.0	21.9		4.3					
Green Ext Time (p_c), s	0.0	4.9		0.3	0.0	1.2		0.0					
Intersection Summary													
HCM 2010 Ctrl Delay		31.3											
HCM 2010 LOS		C											
Notes													

Synchro 9 Report

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HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↔	↕	↕	↔	↕	↔	↔	↕
Traffic Volume (vph)	199	308	26	6	100	287	175	38	294	71	282	468
Future Volume (vph)	199	308	26	6	100	287	175	38	294	71	282	468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1703	3496			1702	1827	1547	1752	1881	1590	3433	1773
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1703	3496			583	1827	1547	1752	1881	1590	3433	1773
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	214	331	28	7	108	309	188	41	316	76	303	503
RTOR Reduction (vph)	0	8	0	0	0	0	140	0	0	53	0	5
Lane Group Flow (vph)	214	351	0	0	115	309	48	41	316	23	303	570
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	9.5	16.4			12.6	19.5	19.5	4.3	22.8	22.8	9.5	28.0
Effective Green, g (s)	9.2	16.6			12.3	19.7	19.7	4.0	23.7	23.7	9.2	28.9
Actuated g/C Ratio	0.12	0.21			0.16	0.25	0.25	0.05	0.30	0.30	0.12	0.37
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	201	745			92	462	391	90	573	484	405	658
v/s Ratio Prot	0.13	0.10				c0.17		0.02	0.17		c0.09	c0.32
v/s Ratio Perm					c0.20		0.03			0.01		
v/c Ratio	1.06	0.47			1.25	0.67	0.12	0.46	0.55	0.05	0.75	0.87
Uniform Delay, d1	34.3	26.8			32.8	26.1	22.4	35.8	22.6	19.1	33.2	22.7
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	81.7	0.6			175.3	3.8	0.2	3.6	1.3	0.0	7.4	11.8
Delay (s)	116.0	27.3			208.0	29.9	22.6	39.5	23.9	19.1	40.6	34.4
Level of Service	F	C			F	C	C	D	C	B	D	C
Approach Delay (s)		60.4				61.1			24.5			36.6
Approach LOS		E				E			C			D
Intersection Summary												
HCM 2000 Control Delay		46.0			HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		77.8			Sum of lost time (s)				16.0			
Intersection Capacity Utilization		75.3%			ICU Level of Service				D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project AM.syn
12/01/2017

Movement	SBR
Lane Configurations	↕
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	1.00
Satd. Flow (prot)	1703
Flt Permitted	1.00
Satd. Flow (perm)	1703
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	Prot
Protected Phases	7
Permitted Phases	
Actuated Green, G (s)	9.5
Effective Green, g (s)	9.2
Actuated g/C Ratio	0.12
Clearance Time (s)	3.7
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	405
v/s Ratio Prot	c0.09
v/s Ratio Perm	
v/c Ratio	0.75
Uniform Delay, d1	33.2
Progression Factor	1.00
Incremental Delay, d2	7.4
Delay (s)	40.6
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Cumulative + Project AM.syn
12/01/2017

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	61	62	366	77	106	310	6	152	3	69	5	2
Future Volume (vph)	61	62	366	77	106	310	6	152	3	69	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00	1.00			1.00
Frt		1.00	0.97		1.00	1.00		1.00	0.86			0.87
Flt Protected		0.95	1.00		0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)		1770	3406		1687	3430		3367	1509			3077
Flt Permitted		0.54	1.00		0.95	1.00		0.95	1.00			0.91
Satd. Flow (perm)		1012	3406		1687	3430		3367	1509			2828
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.91	0.91	0.92	0.91	0.92	0.91	0.92	0.92
Adj. Flow (vph)	66	67	402	85	116	341	7	167	3	76	5	2
RTOR Reduction (vph)	0	0	17	0	0	1	0	0	59	0	0	34
Lane Group Flow (vph)	0	133	470	0	116	347	0	167	20	0	0	9
Confl. Bikes (#/hr)				1								
Heavy Vehicles (%)	2%	2%	3%	3%	7%	5%	2%	4%	2%	8%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2										
Actuated Green, G (s)		33.8	33.8		9.0	46.3		7.9	15.7			3.8
Effective Green, g (s)		33.8	33.8		8.5	46.3		7.9	15.7			3.8
Actuated g/C Ratio		0.48	0.48		0.12	0.66		0.11	0.22			0.05
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		488	1644		204	2268		379	338			153
v/s Ratio Prot			c0.14		c0.07	0.10		c0.05	c0.01			
v/s Ratio Perm		0.13										0.00
v/c Ratio		0.27	0.29		0.57	0.15		0.44	0.06			0.06
Uniform Delay, d1		10.8	10.9		29.0	4.5		29.0	21.3			31.4
Progression Factor		1.00	1.00		0.93	0.86		1.00	1.00			1.00
Incremental Delay, d2		1.4	0.4		2.2	0.1		0.3	0.1			0.2
Delay (s)		12.2	11.3		29.1	4.0		29.3	21.4			31.6
Level of Service		B	B		C	A		C	C			C
Approach Delay (s)			11.5			10.3			26.8			31.6
Approach LOS			B			B			C			C
Intersection Summary												
HCM 2000 Control Delay			14.4									B
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			70.0									16.0
Intersection Capacity Utilization			39.4%									A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Cumulative + Project AM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	36
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	353	87	53	395	0	27	0	29	0	0	0
Future Volume (vph)	0	353	87	53	395	0	27	0	29	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		0.99		1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Fr		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)		3389		1805	3471			1548	1362			
Flt Permitted		1.00		0.95	1.00			0.89	1.00			
Satd. Flow (perm)		3389		1805	3471			1448	1362			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	0	415	102	62	465	0	32	0	34	0	0	0
RTOR Reduction (vph)	0	15	0	0	0	0	0	0	32	0	0	0
Lane Group Flow (vph)	0	502	0	62	465	0	0	32	2	0	0	0
Confl. Peds. (#/hr)			3	4		2	3		4	2		1
Heavy Vehicles (%)	0%	3%	2%	0%	4%	0%	15%	0%	15%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)		49.7		4.3	57.5			4.5	4.5			
Effective Green, g (s)		49.7		3.8	57.5			4.5	4.5			
Actuated g/C Ratio		0.71		0.05	0.82			0.06	0.06			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2406		97	2851			93	87			
v/s Ratio Prot		c0.15		c0.03	0.13							
v/s Ratio Perm								c0.02	0.00			
v/c Ratio		0.21		0.64	0.16			0.34	0.03			
Uniform Delay, d1		3.5		32.4	1.3			31.3	30.7			
Progression Factor		0.62		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		9.7	0.1			0.8	0.0			
Delay (s)		2.3		42.2	1.4			32.1	30.7			
Level of Service		A		D	A			C	C			
Approach Delay (s)		2.3			6.2			31.4		0.0		
Approach LOS		A			A			C		A		

Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	29.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (veh/h)	0	353	87	53	395	0	27	0	29	0	0	0
Future Volume (veh/h)	0	353	87	53	395	0	27	0	29	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1848	1900	1900	1827	1900	1900	1652	1652	1900	1900	1900
Adj Flow Rate, veh/h	0	415	102	62	465	0	32	0	34	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	3	3	0	4	4	0	15	0	0	0	0
Cap, veh/h	0	2101	512	67	2931	0	154	0	57	0	78	0
Arrive On Green	0.00	1.00	1.00	0.04	0.84	0.00	0.04	0.00	0.04	0.00	0.00	0.00
Sat Flow, veh/h	0	2892	682	1810	3563	0	1234	0	1375	0	1900	0
Grp Volume(v), veh/h	0	259	258	62	465	0	32	0	34	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1756	1726	1810	1736	0	1234	0	1375	0	1900	0
Q Serve(g_s), s	0.0	0.0	0.0	2.4	1.7	0.0	1.8	0.0	1.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	2.4	1.7	0.0	1.8	0.0	1.7	0.0	0.0	0.0
Prop In Lane	0.00		0.40	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1317	1295	67	2931	0	154	0	57	0	78	0
V/C Ratio(X)	0.00	0.20	0.20	0.93	0.16	0.00	0.21	0.00	0.60	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1317	1295	259	2931	0	455	0	393	0	543	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.97	0.97	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	33.6	1.0	0.0	33.0	0.0	33.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	18.0	0.1	0.0	0.2	0.0	3.7	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	1.5	0.8	0.0	0.6	0.0	0.7	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	0.3	0.4	51.6	1.1	0.0	33.3	0.0	36.7	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		C		D			
Approach Vol, veh/h		517			527			66			0	
Approach Delay, s/veh		0.3			7.0			35.0			0.0	
Approach LOS		A			A			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		8
Phs Duration (G+Y+Rc), s	6.6	56.5		6.9		63.1		6.9
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s	10.5	28.0		20.0		42.0		20.0
Max Q Clear Time (g_c+1), s	4.4	2.0		0.0		3.7		3.8
Green Ext Time (p_c), s	0.0	8.5		0.0		9.6		0.1

Intersection Summary			
HCM 2010 Ctrl Delay		5.6	
HCM 2010 LOS		A	

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Cumulative + Project AM.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	11.9								
Intersection LOS	B								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↑↑	↑		↑	↑		↑	↑
Traffic Vol, veh/h	0	227	45	0	55	37	5	24	340
Future Vol, veh/h	0	227	45	0	55	37	5	24	340
Peak Hour Factor	0.92	0.88	0.88	0.92	0.88	0.88	0.92	0.88	0.88
Heavy Vehicles, %	2	5	0	2	0	0	2	0	3
Mvmt Flow	0	258	51	0	63	42	5	27	386
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB			SB		
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB						WB		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	10.6			9.7			13.5		
HCM LOS	B			A			B		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	114	114	45	55	37	29	340		
LT Vol	114	114	0	0	0	29	0		
Through Vol	0	0	45	55	0	0	0		
RT Vol	0	0	0	0	37	0	340		
Lane Flow Rate	129	129	51	62	42	33	386		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.236	0.233	0.061	0.113	0.068	0.058	0.547		
Departure Headway (Hd)	6.601	6.515	4.288	6.495	5.782	6.337	5.101		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	544	552	834	551	618	568	711		
Service Time	4.336	4.25	2.022	4.239	3.526	4.037	2.801		
HCM Lane V/C Ratio	0.237	0.234	0.061	0.113	0.068	0.058	0.543		
HCM Control Delay	11.4	11.2	7.3	10.1	9	9.4	13.8		
HCM Lane LOS	B	B	A	B	A	A	B		
HCM 95th-tile Q	0.9	0.9	0.2	0.4	0.2	0.2	3.3		

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Cumulative + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	144	50	114	151	43	63	142	1249	48	18	1528	113
Future Volume (vph)	144	50	114	151	43	63	142	1249	48	18	1528	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.94		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1665	1504		1665	1649		1770	3471		1805	3471	1568
Flt Permitted	0.95	1.00		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1665	1504		1665	1649		1770	3471		1805	3471	1568
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)	157	54	124	164	47	68	154	1358	52	20	1661	123
RTOR Reduction (vph)	0	74	0	0	40	0	0	3	0	0	0	56
Lane Group Flow (vph)	141	120	0	143	96	0	154	1407	0	20	1661	67
Confl. Peds. (#/hr)			46	46					46			
Heavy Vehicles (%)	3%	2%	2%	3%	0%	0%	2%	3%	0%	0%	4%	3%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases	4											
Actuated Green, G (s)	12.7	12.7		7.8	7.8		8.3	48.0		2.8	42.5	42.5
Effective Green, g (s)	12.9	12.9		8.0	8.0		8.0	48.9		2.5	43.4	43.4
Actuated g/C Ratio	0.15	0.15		0.09	0.09		0.09	0.55		0.03	0.49	0.49
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	243	219		150	149		160	1922		51	1706	770
v/s Ratio Prot	c0.08	0.08		c0.09	0.06		c0.09	0.41		0.01	c0.48	
v/s Ratio Perm												0.04
v/c Ratio	0.58	0.55		0.95	0.64		0.96	0.73		0.39	0.97	0.09
Uniform Delay, d1	35.2	35.0		40.0	38.8		40.0	14.8		42.2	21.9	11.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	3.1		59.5	10.2		59.6	1.7		4.9	16.0	0.1
Delay (s)	38.9	38.1		99.4	49.0		99.6	16.5		47.1	37.9	12.0
Level of Service	D	D		F	D		F	B		D	D	B
Approach Delay (s)		38.4			74.8			24.6			36.2	
Approach LOS		D			E			C			D	
Intersection Summary												
HCM 2000 Control Delay	34.6			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	88.3			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	83.3%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Cumulative + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	144	50	114	151	43	63	142	1249	48	18	1528	113
Future Volume (veh/h)	144	50	114	151	43	63	142	1249	48	18	1528	113
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.91	1.00		0.85	1.00		0.96	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1861	1900	1845	1891	1900	1863	1847	1900	1900	1827	1845
Adj Flow Rate, veh/h	157	54	124	140	81	68	154	1358	52	20	1661	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	3	0	0	2	3	3	0	4	3
Cap, veh/h	285	76	175	161	80	67	163	1840	70	50	1634	738
Arrive On Green	0.16	0.16	0.16	0.09	0.09	0.09	0.09	0.54	0.52	0.03	0.47	0.00
Sat Flow, veh/h	1757	470	1080	1757	872	732	1774	3439	131	1810	3471	1568
Grp Volume(V), veh/h	157	0	178	140	0	149	154	692	718	20	1661	0
Grp Sat Flow(s),veh/h/ln	1757	0	1551	1757	0	1605	1774	1754	1816	1810	1736	1568
Q Serve(g_s), s	7.2	0.0	9.5	6.9	0.0	8.0	7.5	26.4	26.5	0.9	41.0	0.0
Cycle Q Clear(g_c), s	7.2	0.0	9.5	6.9	0.0	8.0	7.5	26.4	26.5	0.9	41.0	0.0
Prop In Lane	1.00		0.70	1.00		0.46	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	285	0	251	161	0	147	163	939	972	50	1634	738
V/C Ratio(X)	0.55	0.00	0.71	0.87	0.00	1.01	0.95	0.74	0.74	0.40	1.02	0.00
Avail Cap(c_a), veh/h	343	0	303	161	0	147	163	939	972	145	1634	738
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.6	0.0	34.6	39.0	0.0	39.6	39.3	15.5	15.6	41.7	23.1	0.0
Incr Delay (d2), s/veh	2.0	0.0	6.5	36.9	0.0	77.1	54.4	3.5	3.4	5.2	26.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.5	5.0	0.0	6.7	6.1	13.6	14.1	0.5	25.5	0.0
LnGrp Delay(d),s/veh	35.6	0.0	41.1	76.0	0.0	116.7	93.7	19.0	19.0	46.9	49.6	0.0
LnGrp LOS	D		D	E		F	F	B	B	D	F	F
Approach Vol, veh/h		335			289			1564			1681	
Approach Delay, s/veh		38.5			97.0			26.4			49.6	
Approach LOS		D			F			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.1	12.0	45.0		12.0	6.4	50.6				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 17	8.3	40.1		7.8	7.3	41.1				
Max Q Clear Time (g_c+I1), s		11.5	9.5	43.0		10.0	2.9	28.5				
Green Ext Time (p_c), s		0.9	0.0	0.0		0.0	0.0	12.3				
Intersection Summary												
HCM 2010 Ctrl Delay		42.8										
HCM 2010 LOS		D										
Notes												

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Cumulative + Project AM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	382	4	26	35	14	44	38	1397	17	71	1784	774
Future Volume (vph)	382	4	26	35	14	44	38	1397	17	71	1784	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1588	1752	3533		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1588	1752	3533		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	29	38	15	48	42	1535	19	78	1960	851
RTOR Reduction (vph)	0	25	0	0	0	45	0	0	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	42	1554	0	78	1960	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.3	16.3		7.3	7.3	7.3	6.3	71.4		7.2	72.8	120.1
Effective Green, g (s)	16.9	16.9		7.5	7.5	7.5	6.0	72.3		7.4	73.7	120.1
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.60		0.06	0.61	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	483	215		107	106	99	87	2126		101	2129	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.44		c0.05	c0.56	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.87	0.04		0.25	0.25	0.03	0.48	0.73		0.77	0.92	0.54
Uniform Delay, d1	50.5	44.6		53.6	53.6	52.9	55.5	17.0		55.5	20.6	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.2	0.1		2.1	2.1	0.2	4.2	1.6		29.9	7.5	1.3
Delay (s)	66.7	44.7		55.8	55.7	53.1	59.7	18.6		85.4	28.1	1.3
Level of Service	E	D		E	E	D	E	B		F	C	A
Approach Delay (s)		65.1			54.5			19.7			21.7	
Approach LOS		E			D			B			C	
Intersection Summary												
HCM 2000 Control Delay		25.6				HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		120.1				Sum of lost time (s)				16.0		
Intersection Capacity Utilization		83.2%				ICU Level of Service				E		
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Cumulative + Project AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 0.9												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	29	0	10	0	0	0	7	251	2	8	372	93
Future Vol, veh/h	29	0	10	0	0	0	7	251	2	8	372	93
Conflicting Peds, #/hr	3	0	3	3	0	3	3	0	3	3	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	10	0	25	0	0	0	0	4	0	0	2	1
Mvmt Flow	33	0	11	0	0	0	8	289	2	9	428	107

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	665	812	273	544	865	151	537	0	0	294	0	0
Stage 1	502	502	-	309	309	-	-	-	-	-	-	-
Stage 2	163	310	-	235	556	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.5	7.4	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4	3.55	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	330	315	660	426	294	875	1041	-	-	1279	-	-
Stage 1	500	545	-	682	663	-	-	-	-	-	-	-
Stage 2	800	663	-	753	516	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	324	308	657	410	287	871	1038	-	-	1276	-	-
Mov Cap-2 Maneuver	324	308	-	410	287	-	-	-	-	-	-	-
Stage 1	494	538	-	674	655	-	-	-	-	-	-	-
Stage 2	791	655	-	731	510	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	16			0			0.2			0.1		
HCM LOS	C			A								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1038	-	-	372	-	1276	-	-
HCM Lane V/C Ratio	0.008	-	-	0.121	-	0.007	-	-
HCM Control Delay (s)	8.5	0	-	16	0	7.8	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	-	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Cumulative + Project AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.2												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕		↕	↕		↕	↕		↕	↕	
Traffic Vol, veh/h	94	267	17	3	381	11	18	2	4	1	2	49
Future Vol, veh/h	94	267	17	3	381	11	18	2	4	1	2	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	4	0	0	3	0	0	0	0	0	0	10
Mvmt Flow	108	307	20	3	438	13	21	2	5	1	2	56

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	451	0	0	326	0	0	760	990	163	822	994	225
Stage 1	-	-	-	-	-	-	533	533	-	451	451	-
Stage 2	-	-	-	-	-	-	227	457	-	371	543	-
Critical Hdwy	4.2	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.25	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.4
Pot Cap-1 Maneuver	1085	-	-	1245	-	-	299	248	859	269	247	754
Stage 1	-	-	-	-	-	-	503	528	-	563	574	-
Stage 2	-	-	-	-	-	-	761	571	-	627	523	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1085	-	-	1245	-	-	253	223	859	245	222	754
Mov Cap-2 Maneuver	-	-	-	-	-	-	253	223	-	245	222	-
Stage 1	-	-	-	-	-	-	453	475	-	507	573	-
Stage 2	-	-	-	-	-	-	700	570	-	559	471	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.2			0.1			19.1			10.9		
HCM LOS	C			C			C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	283	1085	-	-	1245	-	-	666
HCM Lane V/C Ratio	0.097	0.1	-	-	0.003	-	-	0.09
HCM Control Delay (s)	19.1	8.7	-	-	7.9	-	-	10.9
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.3	-	-	0	-	-	0.3

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative + Project AM.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (vph)	670	117	23	931	80	20
Future Volume (vph)	670	117	23	931	80	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1845	1553	1805	1881	1757	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1845	1553	1805	1881	1757	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	705	123	24	980	84	21
RTOR Reduction (vph)	0	52	0	0	15	0
Lane Group Flow (vph)	705	71	24	980	90	0
Heavy Vehicles (%)	3%	4%	0%	1%	0%	6%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	32.4	32.4	0.7	37.3	7.7	
Effective Green, g (s)	32.4	32.4	0.7	37.3	7.7	
Actuated g/C Ratio	0.58	0.58	0.01	0.67	0.14	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1069	900	22	1255	242	
v/s Ratio Prot	0.38		0.01	0.52	0.05	
v/s Ratio Perm		0.05				
v/c Ratio	0.66	0.08	1.09	0.78	0.37	
Uniform Delay, d1	8.0	5.2	27.6	6.5	21.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.0	221.9	3.3	0.4	
Delay (s)	9.6	5.2	249.5	9.8	22.3	
Level of Service	A	A	F	A	C	
Approach Delay (s)	8.9			15.5	22.3	
Approach LOS	A			B	C	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	15.1
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative + Project AM.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (veh/h)	670	117	23	931	80	20
Future Volume (veh/h)	670	117	23	931	80	20
Number	2	12	1	6	3	18
Initial Q (Ob), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1827	1900	1881	1877	1900
Adj Flow Rate, veh/h	705	123	24	980	84	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	4	0	1	0	0
Cap, veh/h	1048	882	41	1264	206	0
Arrive On Green	0.57	0.57	0.02	0.67	0.12	0.00
Sat Flow, veh/h	1845	1553	1810	1881	1768	0
Grp Volume(V), veh/h	705	123	24	980	85	0
Grp Sat Flow(s),veh/h/ln	1845	1553	1810	1881	1789	0
Q Serve(g_s), s	13.8	1.9	0.7	18.4	2.3	0.0
Cycle Q Clear(g_c), s	13.8	1.9	0.7	18.4	2.3	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1048	882	41	1264	208	0
V/C Ratio(X)	0.67	0.14	0.59	0.78	0.41	0.00
Avail Cap(c_a), veh/h	1178	991	140	1500	625	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	7.8	5.2	24.9	5.8	21.1	0.0
Incr Delay (d2), s/veh	1.4	0.1	4.9	2.4	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.3	0.8	0.4	10.1	1.1	0.0
LnGrp Delay(d),s/veh	9.2	5.3	29.8	8.2	21.6	0.0
LnGrp LOS	A	A	C	A	C	
Approach Vol, veh/h	828			1004	85	
Approach Delay, s/veh	8.6			8.7	21.6	
Approach LOS	A			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	35.7				41.0		10.5
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	32.9				41.1		18.0
Max Q Clear Time (g_c+I1), s	2.7	15.8				20.4		4.3
Green Ext Time (p_c), s	0.0	12.4				14.3		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	9.2
HCM 2010 LOS	A

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Cumulative + Project AM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.6												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔		↔	↔
Traffic Vol, veh/h	27	569	29	29	929	8	12	1	13	14	0	47
Future Vol, veh/h	27	569	29	29	929	8	12	1	13	14	0	47
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	3	4	3	1	0	0	100	0	0	0	0
Mvmt Flow	30	625	32	32	1021	9	13	1	14	15	0	52

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	1030	0	0	625
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.1	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.227
Pot Cap-1 Maneuver	682	-	-	952
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	682	-	-	952
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	59.5	35.8
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	49	488	682	-	-	952	-	-	58	288
HCM Lane V/C Ratio	0.292	0.029	0.044	-	-	0.033	-	-	0.265	0.179
HCM Control Delay (s)	106.3	12.6	10.5	-	-	8.9	-	-	88.1	20.2
HCM Lane LOS	F	B	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	1	0.1	0.1	-	-	0.1	-	-	0.9	0.6

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Cumulative + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 0.8						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	38	0	1	365	551	39
Future Vol, veh/h	38	0	1	365	551	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	3	0	0	3	5	3
Mvmt Flow	43	0	1	410	619	44

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1031	619	619
Stage 1	619	-	-
Stage 2	412	-	-
Critical Hdwy	6.43	6.2	4.1
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.43	-	-
Follow-up Hdwy	3.527	3.3	2.2
Pot Cap-1 Maneuver	257	492	971
Stage 1	535	-	-
Stage 2	666	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	257	492	971
Mov Cap-2 Maneuver	257	-	-
Stage 1	535	-	-
Stage 2	665	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	971	-	257	-	-
HCM Lane V/C Ratio	0.001	-	0.166	-	-
HCM Control Delay (s)	8.7	0	21.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Cumulative + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.1						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕			↕
Traffic Vol, veh/h	16	93	334	21	22	428
Future Vol, veh/h	16	93	334	21	22	428
Conflicting Peds, #/hr	7	7	0	7	7	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	1	5	0	0	3
Mvmt Flow	21	122	439	28	29	563

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1088	467	0 0 474 0
Stage 1	460	-	- - - -
Stage 2	628	-	- - - -
Critical Hdwy	6.4	6.21	- - 4.1 -
Critical Hdwy Stg 1	5.4	-	- - - -
Critical Hdwy Stg 2	5.4	-	- - - -
Follow-up Hdwy	3.5	3.309	- - 2.2 -
Pot Cap-1 Maneuver	241	598	- - 1099 -
Stage 1	640	-	- - - -
Stage 2	536	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	229	591	- - 1093 -
Mov Cap-2 Maneuver	229	-	- - - -
Stage 1	636	-	- - - -
Stage 2	512	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 480 1093	-	-
HCM Lane V/C Ratio	-	- 0.299 0.026	-	-
HCM Control Delay (s)	-	- 15.7 8.4	0	-
HCM Lane LOS	-	- C A A	-	-
HCM 95th %tile Q(veh)	-	- 1.2 0.1	-	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Cumulative + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh 5.2						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↕	↕	↕
Traffic Vol, veh/h	17	157	174	244	273	21
Future Vol, veh/h	17	157	174	244	273	21
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	3	4	4	3	0
Mvmt Flow	23	212	235	330	369	28

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1177	377	373 0 - 0
Stage 1	373	-	- - - -
Stage 2	804	-	- - - -
Critical Hdwy	6.4	6.23	4.14 - -
Critical Hdwy Stg 1	5.4	-	- - - -
Critical Hdwy Stg 2	5.4	-	- - - -
Follow-up Hdwy	3.5	3.327	2.236 - -
Pot Cap-1 Maneuver	213	667	1175 - -
Stage 1	701	-	- - - -
Stage 2	444	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	169	663	1171 - -
Mov Cap-2 Maneuver	169	-	- - - -
Stage 1	699	-	- - - -
Stage 2	354	-	- - - -

Approach	EB	NB	SB
HCM Control Delay, s	17.7	3.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1171	- 516	-	-
HCM Lane V/C Ratio	0.201	- 0.456	-	-
HCM Control Delay (s)	8.8	- 17.7	-	-
HCM Lane LOS	A	- C	-	-
HCM 95th %tile Q(veh)	0.7	- 2.4	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Cumulative + Project AM.syn
12/01/2017

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	28	118	127	128	175	92
Future Vol, veh/h	28	118	127	128	175	92
Conflicting Peds, #/hr	4	7	7	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	4	2	2	6	4	0
Mvmt Flow	33	140	151	152	208	110
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	729	277	325	0	0	
Stage 1	270	-	-	-	-	
Stage 2	459	-	-	-	-	
Critical Hdwy	6.44	6.22	4.12	-	-	
Critical Hdwy Stg 1	5.44	-	-	-	-	
Critical Hdwy Stg 2	5.44	-	-	-	-	
Follow-up Hdwy	3.536	3.318	2.218	-	-	
Pot Cap-1 Maneuver	387	762	1235	-	-	
Stage 1	771	-	-	-	-	
Stage 2	632	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	335	753	1228	-	-	
Mov Cap-2 Maneuver	335	-	-	-	-	
Stage 1	767	-	-	-	-	
Stage 2	551	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	13.3	4.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1228	-	608	-	-	
HCM Lane V/C Ratio	0.123	-	0.286	-	-	
HCM Control Delay (s)	8.3	-	13.3	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.4	-	1.2	-	-	

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative + Project AM.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	9												
Intersection LOS	A												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Lane Configurations			↕				↕				↕		
Traffic Vol, veh/h	0	1	0	71	0	4	0	0	0	68	90	1	
Future Vol, veh/h	0	1	0	71	0	4	0	0	0	68	90	1	
Peak Hour Factor	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	0.92	0.78	0.78	0.78	
Heavy Vehicles, %	2	0	0	10	2	0	0	0	2	12	0	0	
Mvmt Flow	0	1	0	91	0	5	0	0	0	87	115	1	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach	EB			WB				NB					
Opposing Approach	WB			EB				SB					
Opposing Lanes	1			1				1					
Conflicting Approach Left	SB			NB				EB					
Conflicting Lanes Left	1			1				1					
Conflicting Approach Right	NB			SB				WB					
Conflicting Lanes Right	1			1				1					
HCM Control Delay	7.9			8.3				9.4					
HCM LOS	A			A				A					
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	43%	1%	100%	0%									
Vol Thru, %	57%	0%	0%	100%									
Vol Right, %	1%	99%	0%	0%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	159	72	4	196									
LT Vol	68	1	4	0									
Through Vol	90	0	0	196									
RT Vol	1	71	0	0									
Lane Flow Rate	204	92	5	251									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0.264	0.111	0.007	0.303									
Departure Headway (Hd)	4.666	4.345	5.254	4.347									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	771	825	681	829									
Service Time	2.686	2.37	3.287	2.364									
HCM Lane V/C Ratio	0.265	0.112	0.007	0.303									
HCM Control Delay	9.4	7.9	8.3	9.2									
HCM Lane LOS	A	A	A	A									
HCM 95th-tile Q	1.1	0.4	0	1.3									

Synchro 9 Report

Synchro 9 Report

HCM 2010 AWSC

Cumulative + Project AM.syn

17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

12/01/2017

Intersection

Intersection Delay, s/veh
Intersection LOS

Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	196	0
Future Vol, veh/h	0	0	196	0
Peak Hour Factor	0.92	0.78	0.78	0.78
Heavy Vehicles, %	2	0	0	0
Mvmt Flow	0	0	251	0
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	9.2
HCM LOS	A

HCM Signalized Intersection Capacity Analysis

Cumulative + Project PM.syn

1: SR 1 & Carmel Valley Rd

12/01/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↕↕	↑	↕	↕↕	↑
Traffic Volume (vph)	0	960	938	132	1021	739
Future Volume (vph)	0	960	938	132	1021	739
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2814	1845	1538	3433	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2814	1845	1538	3433	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	990	967	136	1053	762
RTOR Reduction (vph)	0	138	0	6	0	0
Lane Group Flow (vph)	0	852	967	130	1053	762
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	0%	1%	3%	5%	2%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		25.2	43.0	43.0	25.2	78.0
Effective Green, g (s)		26.1	43.9	43.9	26.1	78.0
Actuated g/C Ratio		0.33	0.56	0.56	0.33	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		941	1038	865	1148	1881
v/s Ratio Prot		0.30	c0.52		c0.31	0.41
v/s Ratio Perm				0.08		
v/c Ratio		0.90	0.93	0.15	0.92	0.41
Uniform Delay, d1		24.8	15.7	8.1	24.9	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		12.4	14.5	0.1	11.8	0.7
Delay (s)		37.2	30.2	8.2	36.7	0.7
Level of Service		D	C	A	D	A
Approach Delay (s)		37.2		27.5		21.6
Approach LOS		D		C		C

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Cumulative + Project PM.syn

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↖↗	↗	↖↗	↖↗	↖↗	↖	↗	↗	↖	↗	↗
Traffic Volume (vph)	26	877	251	446	681	5	270	22	610	6	10	7
Future Volume (vph)	26	877	251	446	681	5	270	22	610	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99		1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Fr t	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Fl t Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1731	1590		1727	1580
Fl t Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1731	1590		1727	1580
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)	28	953	273	485	740	5	293	24	663	7	11	8
RTOR Reduction (vph)	0	0	147	0	0	0	0	0	74	0	0	8
Lane Group Flow (vph)	28	953	126	485	745	0	158	159	589	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4		5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	26.0	26.0	11.8	36.0		9.2	9.2	21.0		1.1	1.1
Effective Green, g (s)	2.3	27.0	27.0	12.4	37.0		11.0	11.0	22.2		2.1	2.1
Actuated g/C Ratio	0.03	0.39	0.39	0.18	0.54		0.16	0.16	0.32		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	60	1394	636	627	1928		275	277	515		52	48
v/s Ratio Prot	0.02	c0.27		0.14	0.21		0.09	0.09	c0.21		c0.01	
v/s Ratio Perm			0.08						0.16			0.00
v/c Ratio	0.47	0.68	0.20	0.77	0.39		0.57	0.57	1.14		0.35	0.01
Uniform Delay, d1	32.5	17.2	13.6	26.7	9.2		26.6	26.6	23.1		32.5	32.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	1.1	0.1	5.4	0.0		1.8	1.8	85.4		1.5	0.0
Delay (s)	34.6	18.3	13.7	32.1	9.2		28.4	28.4	108.6		34.0	32.2
Level of Service	C	B	B	C	A		C	C	F		C	C
Approach Delay (s)		17.7			18.2			82.6			33.4	
Approach LOS		B			B			F			C	

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	16.1
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Synchro 9 Report

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HCM 2010 Signalized Intersection Summary
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd

Cumulative + Project PM.syn

12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↖↗	↗	↖↗	↖↗	↖↗	↖	↗	↗	↖	↗	↗
Traffic Volume (veh/h)	26	877	251	446	681	5	270	22	610	6	10	7
Future Volume (veh/h)	26	877	251	446	681	5	270	22	610	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1881	1900	1881	1900	1760
Adj Flow Rate, veh/h	28	953	273	485	740	5	310	0	663	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	51	961	438	480	1384	9	1384	0	810	18	29	43
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.38	0.00	0.37	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3640	25	3619	0	1598	671	1055	1586
Grp Volume(v), veh/h	28	953	273	485	363	382	310	0	663	18	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1727	0	1586
Q Serve(g_s), s	1.4	23.7	13.1	12.2	14.0	14.0	5.1	0.0	30.9	0.9	0.0	0.4
Cycle Q Clear(g_c), s	1.4	23.7	13.1	12.2	14.0	14.0	5.1	0.0	30.9	0.9	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	51	961	438	480	679	713	1384	0	810	47	0	43
V/C Ratio(X)	0.55	0.99	0.62	1.01	0.53	0.53	0.22	0.00	0.82	0.38	0.00	0.18
Avail Cap(c_a), veh/h	115	961	438	480	679	713	1384	0	810	78	0	72
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.4	32.1	28.2	38.1	21.3	21.3	18.4	0.0	18.4	42.3	0.0	42.0
Incr Delay (d2), s/veh	3.4	27.0	2.1	43.9	0.4	0.4	0.0	0.0	6.2	1.9	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	15.1	6.1	8.7	6.9	7.3	2.5	0.0	15.0	0.5	0.0	0.2
LnGrp Delay(d),s/veh	45.8	59.1	30.3	82.1	21.8	21.7	18.5	0.0	24.6	44.1	0.0	42.8
LnGrp LOS	D	E	C	F	C	C	B		C	D		D
Approach Vol, veh/h		1254			1230		973				26	
Approach Delay, s/veh		52.5			45.5		22.7				43.7	
Approach LOS		D			D		C				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	37.6		37.8	16.2	28.0		6.4				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	23.0		3.0				
Max Q Clear Time (g_c+I1), s	3.4	16.0		32.9	14.2	25.7		2.9				
Green Ext Time (p_c), s	0.0	4.3		0.0	0.0	0.0		0.0				

Intersection Summary	
HCM 2010 Ctrl Delay	41.6
HCM 2010 LOS	D

Notes

Synchro 9 Report

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HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	114	389	69	12	166	426	335	77	622	205	241	437
Future Volume (vph)	114	389	69	12	166	426	335	77	622	205	241	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3471			1745	1863	1559	1805	1827	1555	3502	1844
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3471			668	1863	1559	1805	1827	1555	3502	1844
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	118	401	71	12	171	439	345	79	641	211	248	451
RTOR Reduction (vph)	0	17	0	0	0	0	194	0	0	143	0	5
Lane Group Flow (vph)	118	455	0	0	183	439	151	79	641	68	248	509
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.3	22.7			11.3	25.7	25.7	6.2	26.9	26.9	9.3	30.0
Effective Green, g (s)	8.0	22.9			11.0	25.9	25.9	5.9	27.8	27.8	9.0	30.9
Actuated g/C Ratio	0.09	0.26			0.13	0.30	0.30	0.07	0.32	0.32	0.10	0.36
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	161	916			84	556	465	122	585	498	363	657
v/s Ratio Prot	0.07	0.13			c0.27	c0.24		0.04	c0.35		c0.07	c0.28
v/s Ratio Perm					c0.27	0.10		0.04				
v/c Ratio	0.73	0.50			2.18	0.79	0.33	0.65	1.10	0.14	0.68	0.77
Uniform Delay, d1	38.3	27.0			37.9	27.9	23.6	39.4	29.5	20.9	37.5	24.8
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.8	0.5			567.4	7.6	0.5	11.2	66.0	0.1	5.2	5.9
Delay (s)	54.1	27.5			605.2	35.5	24.1	50.6	95.5	21.1	42.7	30.7
Level of Service	D	C			F	D	C	D	F	C	D	C
Approach Delay (s)		32.8				139.2			74.8			34.6
Approach LOS		C				F			E			C
Intersection Summary												
HCM 2000 Control Delay		76.9			HCM 2000 Level of Service				E			
HCM 2000 Volume to Capacity ratio		1.09										
Actuated Cycle Length (s)		86.7			Sum of lost time (s)				16.0			
Intersection Capacity Utilization		82.7%			ICU Level of Service				E			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	0.97
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.98
Flt Protected	0.95
Satd. Flow (prot)	1844
Flt Permitted	1.00
Satd. Flow (perm)	1844
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	Prot
Protected Phases	7
Permitted Phases	4
Actuated Green, G (s)	30.0
Effective Green, g (s)	30.9
Actuated g/C Ratio	0.36
Clearance Time (s)	4.9
Vehicle Extension (s)	3.5
Lane Grp Cap (vph)	657
v/s Ratio Prot	c0.28
v/s Ratio Perm	
v/c Ratio	0.77
Uniform Delay, d1	24.8
Progression Factor	1.00
Incremental Delay, d2	5.9
Delay (s)	30.7
Level of Service	C
Approach Delay (s)	34.6
Approach LOS	C
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Cumulative + Project PM.syn
12/01/2017

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	71	128	389	113	143	414	18	315	9	157	20	11
Future Volume (vph)	71	128	389	113	143	414	18	315	9	157	20	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			4.0
Lane Util. Factor	1.00	0.95			1.00	0.95		0.97	1.00			0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	0.98			1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			1.00
Frt	1.00	0.97			1.00	0.99		1.00	0.86			0.88
Flt Protected	0.95	1.00			0.95	1.00		0.95	1.00			0.99
Satd. Flow (prot)	1782	3422			1770	3550		3467	1570			3089
Flt Permitted	0.48	1.00			0.95	1.00		0.95	1.00			0.89
Satd. Flow (perm)	909	3422			1770	3550		3467	1570			2773
Peak-hour factor, PHF	0.93	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92
Adj. Flow (vph)	76	139	418	122	154	445	20	339	10	169	22	12
RTOR Reduction (vph)	0	0	28	0	0	2	0	0	120	0	0	134
Lane Group Flow (vph)	0	215	512	0	154	463	0	339	59	0	0	47
Confl. Peds. (#/hr)				3	5			3		5		
Heavy Vehicles (%)	0%	2%	2%	0%	2%	1%	2%	1%	2%	2%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2										
Actuated Green, G (s)		33.9	33.9		11.5	48.9		12.1	23.1			7.0
Effective Green, g (s)		33.9	33.9		11.0	48.9		12.1	23.1			7.0
Actuated g/C Ratio		0.42	0.42		0.14	0.61		0.15	0.29			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		385	1450		243	2169		524	453			242
v/s Ratio Prot			0.15		c0.09	0.13		c0.10	0.04			
v/s Ratio Perm		c0.24										c0.02
v/c Ratio		0.56	0.35		0.63	0.21		0.65	0.13			0.19
Uniform Delay, d1		17.4	15.6		32.6	7.0		31.9	21.0			33.9
Progression Factor		1.00	1.00		0.91	1.24		1.00	1.00			1.00
Incremental Delay, d2		5.7	0.7		3.9	0.2		2.1	0.1			0.4
Delay (s)		23.1	16.3		33.4	8.9		34.0	21.2			34.3
Level of Service		C	B		C	A		C	C			C
Approach Delay (s)			18.2			15.0			29.6			34.3
Approach LOS			B			B			C			C
Intersection Summary												
HCM 2000 Control Delay			21.5									C
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			80.0									16.0
Intersection Capacity Utilization			52.7%									A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Crossroads Blvd & Rio Rd

Cumulative + Project PM.syn
12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	135
Future Volume (vph)	135
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	147
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	508	58	109	472	0	103	0	98	0	0	0
Future Volume (vph)	0	508	58	109	472	0	103	0	98	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	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)		3471		1752	3574			1746	1544			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3471		1752	3574			1392	1544			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	571	65	122	530	0	116	0	110	0	0	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	95	0	0	0
Lane Group Flow (vph)	0	629	0	122	530	0	0	116	15	0	0	0
Confl. Peds. (#/hr)	2		6	6		2	6		6	2		2
Heavy Vehicles (%)	0%	2%	2%	3%	1%	0%	2%	0%	2%	0%	0%	0%
Turn Type	NA		Prot	NA		Perm	NA	Perm				
Protected Phases	2		1	6			8	8			4	
Permitted Phases						8		8		4		
Actuated Green, G (s)	49.4		8.1	61.0			11.0	11.0				
Effective Green, g (s)	49.4		7.6	61.0			11.0	11.0				
Actuated g/C Ratio	0.62		0.09	0.76			0.14	0.14				
Clearance Time (s)	4.0		3.5	4.0			4.0	4.0				
Vehicle Extension (s)	2.0		1.0	5.0			2.0	2.0				
Lane Grp Cap (vph)	2143		166	2725			191	212				
v/s Ratio Prot	c0.18		c0.07	0.15								
v/s Ratio Perm							c0.08	0.01				
v/c Ratio	0.29		0.73	0.19			0.61	0.07				
Uniform Delay, d1	7.1		35.2	2.6			32.5	30.1				
Progression Factor	0.74		1.00	1.00			1.00	1.00				
Incremental Delay, d2	0.3		13.5	0.2			3.7	0.1				
Delay (s)	5.6		48.7	2.8			36.2	30.1				
Level of Service	A		D	A			D	C				
Approach Delay (s)	5.6			11.4			33.2			0.0		
Approach LOS	A			B			C			A		

Intersection Summary			
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (veh/h)	0	508	58	109	472	0	103	0	98	0	0	0
Future Volume (veh/h)	0	508	58	109	472	0	103	0	98	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s), veh/h/ln	0	1863	1900	1845	1881	1900	1900	1863	1863	1900	1900	1900
Adj Flow Rate, veh/h	0	571	65	122	530	0	116	0	110	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	2	2	3	1	1	0	0	2	0	0	0
Cap, veh/h	0	2107	239	143	2821	0	245	0	172	0	210	0
Arrive On Green	0.00	0.88	0.88	0.08	0.79	0.00	0.11	0.00	0.11	0.00	0.00	0.00
Sat Flow, veh/h	0	3296	364	1757	3668	0	1404	0	1558	0	1900	0
Grp Volume(V), veh/h	0	315	321	122	530	0	116	0	110	0	0	0
Grp Sat Flow(s), veh/h/ln	0	1770	1797	1757	1787	0	1404	0	1558	0	1900	0
Q Serve(g_s), s	0.0	2.3	2.3	5.5	2.9	0.0	6.4	0.0	5.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	2.3	2.3	5.5	2.9	0.0	6.4	0.0	5.4	0.0	0.0	0.0
Prop In Lane	0.00		0.20	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1164	1182	143	2821	0	245	0	172	0	210	0
V/C Ratio(X)	0.00	0.27	0.27	0.85	0.19	0.00	0.47	0.00	0.64	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1164	1182	351	2821	0	476	0	428	0	523	0
HCM Platoon Ratio	1.00	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.94	0.94	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	1.9	1.9	36.3	2.1	0.0	34.5	0.0	34.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	5.4	0.1	0.0	0.5	0.0	1.5	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.2	1.3	2.9	1.5	0.0	2.5	0.0	2.4	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	2.4	2.4	41.6	2.2	0.0	35.0	0.0	35.5	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		D		D			
Approach Vol, veh/h		636			652			226			0	
Approach Delay, s/veh		2.4			9.6			35.3			0.0	
Approach LOS		A			A			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.5	56.6		12.8		67.2		12.8				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	16.5	30.0		22.0		50.0		22.0				
Max Q Clear Time (g_c+1), s	7.5	4.3		0.0		4.9		8.4				
Green Ext Time (p_c), s	0.0	10.1		0.0		12.1		0.5				

Intersection Summary			
HCM 2010 Ctrl Delay		10.4	
HCM 2010 LOS		B	

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Cumulative + Project PM.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	19.6								
Intersection LOS	C								

Movement	EBU	EBL	EBT	WBU	WBL	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↔↔	↑			↑	↔		↔	↑
Traffic Vol, veh/h	0	437	72	0		54	31	6	51	435
Future Vol, veh/h	0	437	72	0		54	31	6	51	435
Peak Hour Factor	0.92	0.89	0.89	0.92		0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	2	0	2		0	0	0	0	2
Mvmt Flow	0	491	81	0		61	35	7	57	489
Number of Lanes	0	2	1	0		1	1	0	1	1

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	2	3	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	2	3
HCM Control Delay	15.3	11.2	25.4
HCM LOS	C	B	D

Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	219	219	72	54	31	57	435
LT Vol	219	219	0	0	0	57	0
Through Vol	0	0	72	54	0	0	0
RT Vol	0	0	0	0	31	0	435
Lane Flow Rate	246	246	81	61	35	64	489
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.486	0.484	0.109	0.13	0.067	0.125	0.792
Departure Headway (Hd)	7.128	7.093	4.855	7.691	6.969	7.04	5.837
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	503	506	733	463	510	507	616
Service Time	4.892	4.858	2.619	5.49	4.768	4.809	3.605
HCM Lane V/C Ratio	0.489	0.486	0.111	0.132	0.069	0.126	0.794
HCM Control Delay	16.5	16.4	8.2	11.7	10.3	10.8	27.3
HCM Lane LOS	C	C	A	B	B	B	D
HCM 95th-tile Q	2.6	2.6	0.4	0.4	0.2	0.4	7.7

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Cumulative + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔↔		↔	↔↔	↔
Traffic Volume (vph)	219	0	185	62	20	26	189	1651	4	17	1534	205
Future Volume (vph)	219	0	185	62	20	26	189	1651	4	17	1534	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Fr	1.00	0.87		1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1456		1715	1662		1805	3573		1805	3574	1583
Flt Permitted	0.95	0.99		0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1456		1715	1662		1805	3573		1805	3574	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	226	0	191	64	21	27	195	1702	4	18	1581	211
RTOR Reduction (vph)	0	160	0	0	25	0	0	0	0	0	0	90
Lane Group Flow (vph)	203	54	0	57	30	0	195	1706	0	18	1581	121
Confl. Peds. (#/hr)			7	7			7		7			
Heavy Vehicles (%)	1%	0%	5%	0%	0%	0%	0%	1%	0%	0%	1%	2%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	14.4	14.4		5.4	5.4		10.4	49.4		2.7	41.7	41.7
Effective Green, g (s)	14.6	14.6		5.6	5.6		10.1	50.3		2.4	42.6	42.6
Actuated g/C Ratio	0.16	0.16		0.06	0.06		0.11	0.57		0.03	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	278	239		108	104		205	2021		48	1712	758
v/s Ratio Prot	c0.12	0.04		c0.03	0.02		c0.11	0.48		0.01	c0.44	
v/s Ratio Perm												0.08
v/c Ratio	0.73	0.23		0.53	0.29		0.95	0.84		0.38	0.92	0.16
Uniform Delay, d1	35.3	32.3		40.4	39.7		39.2	16.0		42.5	21.6	13.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.8	0.6		5.9	2.1		48.8	3.7		4.9	9.1	0.2
Delay (s)	45.0	32.8		46.3	41.8		88.0	19.7		47.4	30.7	13.2
Level of Service	D	C		D	D		F	B		D	C	B
Approach Delay (s)		38.8			44.1			26.7			28.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	88.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	84.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Cumulative + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	219	0	185	62	20	26	189	1651	4	17	1534	205
Future Volume (veh/h)	219	0	185	62	20	26	189	1651	4	17	1534	205
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(veh/h/ln)	1881	1817	1900	1900	1900	1900	1900	1881	1900	1900	1881	1863
Adj Flow Rate, veh/h	208	24	191	56	32	27	195	1702	4	18	1581	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	0	0	0	0	0	0	1	1	0	1	2
Cap, veh/h	301	29	232	140	73	61	207	1999	5	45	1634	724
Arrive On Green	0.17	0.17	0.17	0.08	0.08	0.08	0.11	0.55	0.54	0.02	0.46	0.00
Sat Flow, veh/h	1792	173	1379	1810	941	794	1810	3658	9	1810	3574	1583
Grp Volume(V), veh/h	208	0	215	56	0	59	195	831	875	18	1581	0
Grp Sat Flow(s,veh/h/ln)	1792	0	1553	1810	0	1735	1810	1787	1880	1810	1787	1583
Q Serve(g_s), s	9.6	0.0	11.7	2.6	0.0	2.8	9.4	34.5	34.5	0.9	37.7	0.0
Cycle Q Clear(g_c), s	9.6	0.0	11.7	2.6	0.0	2.8	9.4	34.5	34.5	0.9	37.7	0.0
Prop In Lane	1.00		0.89	1.00		0.46	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	301	0	261	140	0	134	207	977	1027	45	1634	724
V/C Ratio(X)	0.69	0.00	0.82	0.40	0.00	0.44	0.94	0.85	0.85	0.40	0.97	0.00
Avail Cap(c_a), veh/h	344	0	298	149	0	143	207	977	1027	145	1634	724
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.2	0.0	35.2	38.4	0.0	38.6	38.5	16.8	16.8	42.0	23.1	0.0
Incr Delay (d2), s/veh	5.3	0.0	15.7	2.6	0.0	3.2	46.5	7.7	7.4	5.6	15.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	6.2	1.4	0.0	1.5	7.3	18.9	19.8	0.5	21.9	0.0
LnGrp Delay(d),s/veh	39.6	0.0	51.0	41.0	0.0	41.8	85.0	24.5	24.2	47.6	38.5	0.0
LnGrp LOS	D		D	D		D	F	C	C	D	D	
Approach Vol, veh/h		423			115			1901			1599	
Approach Delay, s/veh		45.4			41.4			30.6			38.6	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		18.7	14.0	44.0		10.8	6.2	51.8				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 17	10.3	39.1		7.0	7.3	42.1				
Max Q Clear Time (g_c+I1), s		13.7	11.4	39.7		4.8	2.9	36.5				
Green Ext Time (p_c), s		0.7	0.0	0.0		0.1	0.0	5.5				

Intersection Summary

HCM 2010 Ctrl Delay	35.6
HCM 2010 LOS	D

Notes

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Cumulative + Project PM.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	869	18	27	18	6	54	10	1919	19	55	1697	493
Future Volume (vph)	869	18	27	18	6	54	10	1919	19	55	1697	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1727		1715	1761	1524	1805	3531		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1727		1715	1761	1524	1805	3531		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	28	18	6	55	10	1958	19	56	1732	503
RTOR Reduction (vph)	0	21	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	25	0	12	12	3	10	1977	0	56	1732	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	36.2	36.2		6.6	6.6	6.6	1.5	74.5		6.2	79.7	141.4
Effective Green, g (s)	36.8	36.8		6.8	6.8	6.8	1.2	75.4		6.4	80.6	141.4
Actuated g/C Ratio	0.26	0.26		0.05	0.05	0.05	0.01	0.53		0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	902	449		82	84	73	15	1882		81	2037	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	c0.56		c0.03	0.48	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.98	0.06		0.15	0.14	0.04	0.67	1.05		0.69	0.85	0.31
Uniform Delay, d1	52.0	39.3		64.5	64.5	64.2	69.9	33.0		66.5	25.4	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.9	0.1		1.4	1.4	0.4	75.9	35.4		22.5	4.0	0.5
Delay (s)	77.8	39.4		65.9	65.9	64.5	145.8	68.4		89.0	29.3	0.5
Level of Service	E	D		E	E	E	F	E		F	C	A
Approach Delay (s)		76.0			64.9			68.8			24.5	
Approach LOS		E			E			E			C	

Intersection Summary

HCM 2000 Control Delay	50.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	141.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Cumulative + Project PM.syn
12/01/2017

Intersection												
Int Delay, s/veh 6.4												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	146	1	18	4	0	4	10	462	0	1	468	84
Future Vol, veh/h	146	1	18	4	0	4	10	462	0	1	468	84
Conflicting Peds, #/hr	8	0	8	5	0	5	8	0	5	5	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	0	8	0	0	0	0	2	0	0	2	3
Mvmt Flow	160	1	20	4	0	4	11	508	0	1	514	92

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	855	1106	319	803	1152	267	615	0	0	513	0	0
Stage 1	571	571	-	535	535	-	-	-	-	-	-	-
Stage 2	284	535	-	268	617	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	7.06	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.38	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	252	212	659	278	199	737	974	-	-	1063	-	-
Stage 1	473	508	-	502	527	-	-	-	-	-	-	-
Stage 2	699	527	-	720	484	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	244	206	650	262	194	729	968	-	-	1056	-	-
Mov Cap-2 Maneuver	244	206	-	262	194	-	-	-	-	-	-	-
Stage 1	462	504	-	492	516	-	-	-	-	-	-	-
Stage 2	679	516	-	691	480	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	44.7			14.6			0.3			0		
HCM LOS	E			B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	968	-	-	262	385	1056	-	-
HCM Lane V/C Ratio	0.011	-	-	0.692	0.023	0.001	-	-
HCM Control Delay (s)	8.8	0.1	-	44.7	14.6	8.4	0	-
HCM Lane LOS	A	A	-	E	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	4.6	0.1	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Cumulative + Project PM.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕		↕	↕			↕		↕		↕
Traffic Vol, veh/h	109	499	16	6	454	29	10	6	4	6	3	117
Future Vol, veh/h	109	499	16	6	454	29	10	6	4	6	3	117
Conflicting Peds, #/hr	0	0	13	17	0	4	13	0	17	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	1	2	0	0	2	3	0	0	0	0	0	2
Mvmt Flow	116	531	17	6	483	31	11	6	4	6	3	124

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	518	0	0	565	0	0	1057	1319	308	1033	1312	274
Stage 1	-	-	-	-	-	-	788	788	-	515	515	-
Stage 2	-	-	-	-	-	-	269	531	-	518	797	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.32
Pot Cap-1 Maneuver	1051	-	-	1017	-	-	182	158	694	189	160	724
Stage 1	-	-	-	-	-	-	355	405	-	516	538	-
Stage 2	-	-	-	-	-	-	719	529	-	514	401	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1040	-	-	1003	-	-	131	137	674	162	139	714
Mov Cap-2 Maneuver	-	-	-	-	-	-	131	137	-	162	139	-
Stage 1	-	-	-	-	-	-	311	355	-	457	533	-
Stage 2	-	-	-	-	-	-	580	524	-	439	351	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.6			0.1			31.1			13.3		
HCM LOS	D			D			D			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	159	1040	-	-	1003	-	-	566
HCM Lane V/C Ratio	0.134	0.111	-	-	0.006	-	-	0.237
HCM Control Delay (s)	31.1	8.9	-	-	8.6	-	-	13.3
HCM Lane LOS	D	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.4	-	-	0	-	-	0.9

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative + Project PM.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	1027	115	16	665	140	36
Future Volume (vph)	1027	115	16	665	140	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1566	1805	1863	1749	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1566	1805	1863	1749	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1104	124	17	715	151	39
RTOR Reduction (vph)	0	44	0	0	11	0
Lane Group Flow (vph)	1104	80	17	715	179	0
Confl. Bikes (#/hr)		1				
Heavy Vehicles (%)	1%	1%	0%	2%	2%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	52.5	52.5	1.4	58.1	12.2	
Effective Green, g (s)	52.5	52.5	1.4	58.1	12.2	
Actuated g/C Ratio	0.65	0.65	0.02	0.72	0.15	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1216	1012	31	1333	262	
v/s Ratio Prot	c0.59		0.01	c0.38	c0.10	
v/s Ratio Perm		0.05				
v/c Ratio	0.91	0.08	0.55	0.54	0.68	
Uniform Delay, d1	12.3	5.3	39.6	5.3	32.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.1	0.0	10.2	0.5	5.7	
Delay (s)	22.4	5.4	49.8	5.8	38.4	
Level of Service	C	A	D	A	D	
Approach Delay (s)	20.7			6.8	38.4	
Approach LOS	C			A	D	

Intersection Summary					
HCM 2000 Control Delay	17.5		HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.87				
Actuated Cycle Length (s)	81.2		Sum of lost time (s)	15.1	
Intersection Capacity Utilization	73.1%		ICU Level of Service	D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative + Project PM.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	1027	115	16	665	140	36
Future Volume (veh/h)	1027	115	16	665	140	36
Number	2	12	1	6	3	18
Initial Q (Ob), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1881	1900	1863	1870	1900
Adj Flow Rate, veh/h	1104	124	17	715	151	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	0	2	0	0
Cap, veh/h	1258	1047	29	1381	198	0
Arrive On Green	0.67	0.67	0.02	0.74	0.11	0.00
Sat Flow, veh/h	1881	1566	1810	1863	1770	0
Grp Volume(V), veh/h	1104	124	17	715	152	0
Grp Sat Flow(s),veh/h/ln	1881	1566	1810	1863	1782	0
Q Serve(g_s), s	34.9	2.1	0.7	11.9	6.1	0.0
Cycle Q Clear(g_c), s	34.9	2.1	0.7	11.9	6.1	0.0
Prop In Lane		1.00	1.00		0.99	0.00
Lane Grp Cap(c), veh/h	1258	1047	29	1381	199	0
V/C Ratio(X)	0.88	0.12	0.59	0.52	0.76	0.00
Avail Cap(c_a), veh/h	1343	1118	98	1536	433	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	9.8	4.4	36.2	4.0	32.0	0.0
Incr Delay (d2), s/veh	6.8	0.1	6.9	0.4	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.2	0.9	0.4	6.1	3.1	0.0
LnGrp Delay(d),s/veh	16.6	4.5	43.1	4.4	34.3	0.0
LnGrp LOS	B	A	D	A	C	
Approach Vol, veh/h	1228			732	152	
Approach Delay, s/veh	15.4			5.3	34.3	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.4	55.9				61.3		12.8
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	52.9				61.1		18.0
Max Q Clear Time (g_c+I1), s	2.7	36.9				13.9		8.1
Green Ext Time (p_c), s	0.0	12.6				27.4		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	13.3
HCM 2010 LOS	B

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Cumulative + Project PM.syn
12/01/2017

Intersection												
Int Delay, s/veh 5.9												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔	↔	↔	↔
Traffic Vol, veh/h	57	971	27	16	596	19	27	1	28	14	2	46
Future Vol, veh/h	57	971	27	16	596	19	27	1	28	14	2	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	1	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	64	1091	30	18	670	21	30	1	31	16	2	52

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	691	0	0	1091
Stage 1	-	-	-	1219
Stage 2	-	-	-	717
Critical Hdwy	4.1	-	-	4.1
Critical Hdwy Stg 1	-	-	-	6.1
Critical Hdwy Stg 2	-	-	-	6.1
Follow-up Hdwy	2.2	-	-	2.2
Pot Cap-1 Maneuver	913	-	-	647
Stage 1	-	-	-	223
Stage 2	-	-	-	424
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	913	-	-	647
Mov Cap-2 Maneuver	-	-	-	40
Stage 1	-	-	-	207
Stage 2	-	-	-	363

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	126.2	47.4
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	40	264	913	-	-	647	-	-	42	454
HCM Lane V/C Ratio	0.787	0.119	0.07	-	-	0.028	-	-	0.428	0.114
HCM Control Delay (s)	231.8	20.5	9.2	-	-	10.7	-	-	143.9	13.9
HCM Lane LOS	F	C	A	-	-	B	-	-	F	B
HCM 95th %tile Q(veh)	2.9	0.4	0.2	-	-	0.1	-	-	1.5	0.4

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Cumulative + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.3						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	↔
Traffic Vol, veh/h	39	1	7	864	634	40
Future Vol, veh/h	39	1	7	864	634	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	41	1	7	909	667	42

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1591	667	667
Stage 1	667	-	-
Stage 2	924	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	119	462	932
Stage 1	514	-	-
Stage 2	390	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	117	462	932
Mov Cap-2 Maneuver	117	-	-
Stage 1	514	-	-
Stage 2	384	-	-

Approach	EB	NB	SB
HCM Control Delay, s	51	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	932	-	119	-	-
HCM Lane V/C Ratio	0.008	-	0.354	-	-
HCM Control Delay (s)	8.9	0	51	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.4	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Cumulative + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.6						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	27	58	453	43	30	490
Future Vol, veh/h	27	58	453	43	30	490
Conflicting Peds, #/hr	6	5	0	6	5	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	1	3	0	2
Mvmt Flow	28	61	477	45	32	516

Major/Minor	Minor1	Major1	Major2	Minor2	Major2
Conflicting Flow All	1090	510	0	0	528
Stage 1	505	-	-	-	-
Stage 2	585	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	240	567	-	-	1049
Stage 1	610	-	-	-	-
Stage 2	561	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	227	562	-	-	1045
Mov Cap-2 Maneuver	227	-	-	-	-
Stage 1	607	-	-	-	-
Stage 2	534	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 383	1045	-
HCM Lane V/C Ratio	-	- 0.234	0.03	-
HCM Control Delay (s)	-	- 17.2	8.6	0
HCM Lane LOS	-	- C	A	A
HCM 95th %tile Q(veh)	-	- 0.9	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Cumulative + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.9						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔		↔
Traffic Vol, veh/h	14	121	131	394	361	28
Future Vol, veh/h	14	121	131	394	361	28
Conflicting Peds, #/hr	4	4	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	1	0	1	3	0
Mvmt Flow	15	133	144	433	397	31

Major/Minor	Minor2	Major1	Major2	Minor2	Major2
Conflicting Flow All	1126	405	401	0	-
Stage 1	401	-	-	-	-
Stage 2	725	-	-	-	-
Critical Hdwy	6.4	6.21	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.309	2.2	-	-
Pot Cap-1 Maneuver	229	648	1169	-	-
Stage 1	681	-	-	-	-
Stage 2	483	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	199	644	1165	-	-
Mov Cap-2 Maneuver	199	-	-	-	-
Stage 1	679	-	-	-	-
Stage 2	422	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1165	- 523	-	-
HCM Lane V/C Ratio	0.124	- 0.284	-	-
HCM Control Delay (s)	8.5	- 14.6	-	-
HCM Lane LOS	A	- B	-	-
HCM 95th %tile Q(veh)	0.4	- 1.2	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Cumulative + Project PM.syn
12/01/2017

Intersection						
Int Delay, s/veh	3.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	27	136	109	299	247	17
Future Vol, veh/h	27	136	109	299	247	17
Conflicting Peds, #/hr	5	5	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	2	1	1	3	0
Mvmt Flow	29	145	116	318	263	18
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	832	282	286	0	-	0
Stage 1	277	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	342	757	1282	-	-	-
Stage 1	774	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	308	751	1277	-	-	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	771	-	-	-	-	-
Stage 2	524	-	-	-	-	-
Approach	EB		NB		SB	
HCM Control Delay, s	13.3		2.2		0	
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1277	-	607	-	-	-
HCM Lane V/C Ratio	0.091	-	0.286	-	-	-
HCM Control Delay (s)	8.1	-	13.3	-	-	-
HCM Lane LOS	A	-	B	-	-	-
HCM 95th %tile Q(veh)	0.3	-	1.2	-	-	-

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative + Project PM.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	9.9												
Intersection LOS	A												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Lane Configurations			↕				↕				↕		
Traffic Vol, veh/h	0	2	1	121	0	3	0	0	0	138	178	3	
Future Vol, veh/h	0	2	1	121	0	3	0	0	0	138	178	3	
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	
Heavy Vehicles, %	2	0	0	5	2	0	0	0	2	1	1	0	
Mvmt Flow	0	2	1	133	0	3	0	0	0	152	196	3	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach	EB				WB				NB				
Opposing Approach	WB				EB				SB				
Opposing Lanes	1				1				1				
Conflicting Approach Left	SB				NB				EB				
Conflicting Lanes Left	1				1				1				
Conflicting Approach Right	NB				SB				WB				
Conflicting Lanes Right	1				1				1				
HCM Control Delay	8.4				8.5				11				
HCM LOS	A				A				B				
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	43%	2%	100%	1%									
Vol Thru, %	56%	1%	0%	99%									
Vol Right, %	1%	98%	0%	0%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	319	124	3	146									
LT Vol	138	2	3	1									
Through Vol	178	1	0	145									
RT Vol	3	121	0	0									
Lane Flow Rate	351	136	3	160									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0.438	0.17	0.005	0.205									
Departure Headway (Hd)	4.495	4.479	5.451	4.605									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	799	800	654	778									
Service Time	2.527	2.516	3.505	2.642									
HCM Lane V/C Ratio	0.439	0.17	0.005	0.206									
HCM Control Delay	11	8.4	8.5	8.8									
HCM Lane LOS	B	A	A	A									
HCM 95th-tile Q	2.2	0.6	0	0.8									

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative + Project PM.syn
12/01/2017

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	1	145	0
Future Vol, veh/h	0	1	145	0
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	1	159	0
Number of Lanes	0	0	1	0
Approach		SB		
Opposing Approach	NB			
Opposing Lanes	1			
Conflicting Approach Left	WB			
Conflicting Lanes Left	1			
Conflicting Approach Right	EB			
Conflicting Lanes Right	1			
HCM Control Delay	8.8			
HCM LOS	A			

HCM Signalized Intersection Capacity Analysis
1: SR 1 & Carmel Valley Rd

Cumulative + Project Saturday.syn
12/01/2017

	↙	↘	↑	↗	↖	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗↘	↑	↗	↖↗	↑
Traffic Volume (vph)	0	907	942	83	968	948
Future Volume (vph)	0	907	942	83	968	948
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.88	1.00	1.00	0.97	1.00
Flt		0.85	1.00	0.85	1.00	1.00
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		2842	1881	1615	3467	1881
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		2842	1881	1615	3467	1881
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	935	971	86	998	977
RTOR Reduction (vph)	0	138	0	6	0	0
Lane Group Flow (vph)	0	797	971	80	998	977
Heavy Vehicles (%)	0%	0%	1%	0%	1%	1%
Turn Type		Over	NA	Perm	Prot	NA
Protected Phases		3	2		3	Free
Permitted Phases				2		
Actuated Green, G (s)		19.1	34.7	34.7	19.1	63.6
Effective Green, g (s)		20.0	35.6	35.6	20.0	63.6
Actuated g/C Ratio		0.31	0.56	0.56	0.31	1.00
Clearance Time (s)		4.9	4.9	4.9	4.9	
Vehicle Extension (s)		4.5	3.5	3.5	4.5	
Lane Grp Cap (vph)		893	1052	903	1090	1881
v/s Ratio Prot		0.28	c0.52		c0.29	0.52
v/s Ratio Perm				0.05		
v/c Ratio		0.89	0.92	0.09	0.92	0.52
Uniform Delay, d1		20.8	12.8	6.5	21.0	0.0
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		11.7	13.2	0.1	12.1	1.0
Delay (s)		32.5	25.9	6.5	33.1	1.0
Level of Service		C	C	A	C	A
Approach Delay (s)	32.5		24.4			17.2
Approach LOS	C		C			B
Intersection Summary						
HCM 2000 Control Delay			22.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.92			
Actuated Cycle Length (s)			63.6		Sum of lost time (s)	8.0
Intersection Capacity Utilization			88.0%		ICU Level of Service	E
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis Cumulative + Project Saturday.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	25	757	270	500	674	3	217	17	470	2	17	14
Future Volume (vph)	25	757	270	500	674	3	217	17	470	2	17	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (prot)	1805	3574	1593	3467	3607		1698	1716	1575		1891	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (perm)	1805	3574	1593	3467	3607		1698	1716	1575		1891	1615
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)	27	805	287	532	717	3	231	18	500	2	18	15
RTOR Reduction (vph)	0	0	185	0	0	0	0	0	93	0	0	15
Lane Group Flow (vph)	27	805	102	532	720	0	125	124	407	0	20	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)						1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6		5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.7	21.8	21.8	13.2	33.3		8.0	8.0	21.2		1.0	1.0
Effective Green, g (s)	2.2	22.8	22.8	13.8	34.3		9.8	9.8	22.4		2.0	2.0
Actuated g/C Ratio	0.03	0.35	0.35	0.21	0.53		0.15	0.15	0.35		0.03	0.03
Clearance Time (s)	4.6	5.0	5.0	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.3	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1265	563	742	1921		258	261	547		58	50
v/s Ratio Prot	0.01	c0.23		0.15	0.20		0.07	0.07	c0.16		c0.01	
v/s Ratio Perm			0.06						0.10			0.00
v/c Ratio	0.44	0.64	0.18	0.72	0.37		0.48	0.48	0.74		0.34	0.01
Uniform Delay, d1	30.5	17.3	14.4	23.5	8.8		25.0	24.9	18.5		30.6	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.8	0.1	2.8	0.0		0.5	0.5	4.8		1.3	0.0
Delay (s)	32.4	18.1	14.4	26.3	8.8		25.5	25.4	23.3		31.9	30.3
Level of Service	C	B	B	C	A		C	C	C		C	C
Approach Delay (s)		17.5			16.2			24.0			31.2	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		18.7		HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		64.4		Sum of lost time (s)			16.1					
Intersection Capacity Utilization		63.5%		ICU Level of Service			B					
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary Cumulative + Project Saturday.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	25	757	270	500	674	3	217	17	470	2	17	14
Future Volume (veh/h)	25	757	270	500	674	3	217	17	470	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	805	287	532	717	3	244	0	500	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	54	942	420	637	1534	6	1097	0	743	6	58	55
Arrive On Green	0.03	0.26	0.26	0.18	0.42	0.40	0.31	0.00	0.29	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1592	3476	3686	15	3583	0	1562	189	1701	1615
Grp Volume(v), veh/h	27	805	287	532	351	369	244	0	500	20	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1592	1738	1805	1897	1792	0	1562	1891	0	1615
Q Serve(g_s), s	1.1	16.1	12.2	11.1	10.6	10.6	3.8	0.0	18.6	0.8	0.0	0.7
Cycle Q Clear(g_c), s	1.1	16.1	12.2	11.1	10.6	10.6	3.8	0.0	18.6	0.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	54	942	420	637	751	789	1097	0	743	64	0	55
V/C Ratio(X)	0.50	0.85	0.68	0.83	0.47	0.47	0.22	0.00	0.67	0.31	0.00	0.27
Avail Cap(c_a), veh/h	132	1008	449	694	751	789	1611	0	967	101	0	86
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.9	26.3	24.9	29.6	15.9	15.9	19.4	0.0	15.3	35.5	0.0	35.4
Incr Delay (d2), s/veh	2.7	6.4	3.0	7.4	0.2	0.2	0.0	0.0	0.5	1.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.8	5.7	6.0	5.3	5.6	1.9	0.0	8.1	0.4	0.0	0.3
LnGrp Delay(d),s/veh	38.6	32.7	27.9	37.0	16.1	16.1	19.5	0.0	15.9	36.5	0.0	36.4
LnGrp LOS	D	C	C	D	B	B	B		B	D		D
Approach Vol, veh/h		1119			1252		744				35	
Approach Delay, s/veh		31.6			25.0		17.0				36.4	
Approach LOS		C			C		B				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	35.3		27.0	17.8	23.8		6.6				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 14	20.2		3.0				
Max Q Clear Time (g_c+I1), s	3.1	12.6		20.6	13.1	18.1		2.8				
Green Ext Time (p_c), s	0.0	4.1		0.5	0.1	0.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					25.6							
HCM 2010 LOS					C							
Notes												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↔	↕	↕	↔	↕	↔	↔	↕
Traffic Volume (vph)	133	396	69	8	212	395	333	71	561	189	326	568
Future Volume (vph)	133	396	69	8	212	395	333	71	561	189	326	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95			1.00	1.00	1.00	1.00	1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1787	3508			1795	1881	1555	1805	1863	1589	3502	1847
Flt Permitted	0.95	1.00			0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1787	3508			687	1881	1555	1805	1863	1589	3502	1847
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	134	400	70	8	214	399	336	72	567	191	329	574
RTOR Reduction (vph)	0	17	0	0	0	0	204	0	0	129	0	4
Lane Group Flow (vph)	134	453	0	0	222	399	132	72	567	62	329	625
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6			8		
Actuated Green, G (s)	8.3	21.4			11.3	24.4	24.4	6.3	27.0	27.0	9.3	30.0
Effective Green, g (s)	8.0	21.6			11.0	24.6	24.6	6.0	27.9	27.9	9.0	30.9
Actuated g/C Ratio	0.09	0.25			0.13	0.29	0.29	0.07	0.33	0.33	0.11	0.36
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9	4.9	3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5	3.5	3.0	3.5
Lane Grp Cap (vph)	167	886			88	541	447	126	607	518	368	667
v/s Ratio Prot	0.07	0.13				c0.21		0.04	0.30		c0.09	c0.34
v/s Ratio Perm					c0.32		0.08			0.04		
v/c Ratio	0.80	0.51			2.52	0.74	0.29	0.57	0.93	0.12	0.89	0.94
Uniform Delay, d1	38.0	27.4			37.2	27.5	23.7	38.5	27.9	20.2	37.8	26.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.5	0.6			717.6	5.4	0.4	6.1	21.8	0.1	23.0	20.9
Delay (s)	61.5	28.0			754.8	32.9	24.1	44.6	49.7	20.3	60.7	47.3
Level of Service	E	C			F	C	C	D	D	C	E	D
Approach Delay (s)		35.4				197.3			42.5			51.9
Approach LOS		D				F			D			D
Intersection Summary												
HCM 2000 Control Delay		88.2										F
HCM 2000 Volume to Capacity ratio		1.12										
Actuated Cycle Length (s)		85.5				Sum of lost time (s)			16.0			
Intersection Capacity Utilization		81.6%				ICU Level of Service			D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project Saturday.syn
12/01/2017

Movement	SBR
Lane Configurations	↕
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	1.00
Flt Protected	1.00
Satd. Flow (prot)	3502
Flt Permitted	1.00
Satd. Flow (perm)	3502
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

Cumulative + Project Saturday.syn

4: Crossroads Blvd & Rio Rd

12/01/2017

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	84	200	298	160	163	367	29	298	13	164	27	16
Future Volume (vph)	84	200	298	160	163	367	29	298	13	164	27	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0			4.0	4.0		4.0
Lane Util. Factor	1.00	0.95			1.00	0.95			0.97	1.00		0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00			1.00	0.97		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00			1.00	1.00		1.00
Frt	1.00	0.95			1.00	0.99			1.00	0.86		0.88
Flt Protected	0.95	1.00			0.95	1.00			0.95	1.00		0.99
Satd. Flow (prot)	1780	3391			1787	3563			3467	1565		3087
Flt Permitted	0.51	1.00			0.95	1.00			0.95	1.00		0.89
Satd. Flow (perm)		951	3391		1787	3563			3467	1565		2769
Peak-hour factor, PHF	0.95	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92
Adj. Flow (vph)	88	217	314	168	172	386	32	314	14	173	29	17
RTOR Reduction (vph)	0	0	67	0	0	4	0	0	127	0	0	191
Lane Group Flow (vph)	0	305	415	0	172	414	0	314	60	0	0	64
Confl. Peds. (#/hr)				5	9			5			9	
Confl. Bikes (#/hr)				11						11		
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	2%	1%	2%	1%	2%	2%
Turn Type	custom	Perm	NA		Prot	NA		Prot	NA		Perm	NA
Protected Phases			2		1	6		3	8			4
Permitted Phases	5	2										
Actuated Green, G (s)		40.8	40.8		13.6	57.9		12.4	24.1			7.7
Effective Green, g (s)		40.8	40.8		13.1	57.9		12.4	24.1			7.7
Actuated g/C Ratio		0.45	0.45		0.15	0.64		0.14	0.27			0.09
Clearance Time (s)		4.0	4.0		3.5	4.0		4.0	4.0			4.0
Vehicle Extension (s)		2.0	2.0		1.0	2.0		2.0	3.0			3.0
Lane Grp Cap (vph)		431	1537		260	2292		477	419			236
v/s Ratio Prot			0.12		c0.10	0.12		c0.09	0.04			
v/s Ratio Perm		c0.32										c0.02
v/c Ratio		0.71	0.27		0.66	0.18		0.66	0.14			0.27
Uniform Delay, d1		19.8	15.3		36.4	6.5		36.8	25.1			38.5
Progression Factor		1.00	1.00		0.98	1.37		1.00	1.00			1.00
Incremental Delay, d2		9.4	0.4		4.8	0.2		2.5	0.2			0.6
Delay (s)		29.2	15.8		40.2	9.1		39.3	25.3			39.1
Level of Service		C	B		D	A		D	C			D
Approach Delay (s)			21.0			18.2			34.1			39.1
Approach LOS			C			B			C			D
Intersection Summary												
HCM 2000 Control Delay			25.4									C
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			90.0						16.0			
Intersection Capacity Utilization			59.7%									B
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

Cumulative + Project Saturday.syn

4: Crossroads Blvd & Rio Rd

12/01/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	192
Future Volume (vph)	192
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	209
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (vph)	0	447	42	112	481	0	78	0	75	0	0	0
Future Volume (vph)	0	447	42	112	481	0	78	0	75	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0			4.0	4.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Frbp, ped/bikes		1.00		1.00	1.00			1.00	0.95			
Flpb, ped/bikes		1.00		1.00	1.00			0.99	1.00			
Frt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3554		1805	3574			1794	1525			
Flt Permitted		1.00		0.95	1.00			0.76	1.00			
Satd. Flow (perm)		3554		1805	3574			1430	1525			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	0	491	46	123	529	0	86	0	82	0	0	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	74	0	0	0
Lane Group Flow (vph)	0	533	0	123	529	0	86	8	8	0	0	0
Confl. Peds. (#/hr)			2	4			2		4			
Confl. Bikes (#/hr)			10						10			
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%
Turn Type		NA		Prot	NA		Perm	NA	Perm			
Protected Phases		2		1	6			8			4	
Permitted Phases						8			8	4		
Actuated Green, G (s)		60.1		9.6	73.2			8.8	8.8			
Effective Green, g (s)		60.1		9.1	73.2			8.8	8.8			
Actuated g/C Ratio		0.67		0.10	0.81			0.10	0.10			
Clearance Time (s)		4.0		3.5	4.0			4.0	4.0			
Vehicle Extension (s)		2.0		1.0	5.0			2.0	2.0			
Lane Grp Cap (vph)		2373		182	2906			139	149			
v/s Ratio Prot		c0.15		c0.07	0.15							
v/s Ratio Perm								c0.06	0.01			
v/c Ratio		0.22		0.68	0.18			0.62	0.05			
Uniform Delay, d1		5.8		39.0	1.8			39.0	36.8			
Progression Factor		0.92		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.2		7.6	0.1			5.7	0.1			
Delay (s)		5.6		46.6	2.0			44.6	36.9			
Level of Service		A		D	A			D	D			
Approach Delay (s)		5.6			10.4			40.9		0.0		
Approach LOS		A			B			D		A		
Intersection Summary												
HCM 2000 Control Delay			12.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			34.2%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
5: Carmel Center Place/Carmel Center PI & Rio Rd

Cumulative + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑		↔	↑↑			↔	↔		↔	
Traffic Volume (veh/h)	0	447	42	112	481	0	78	0	75	0	0	0
Future Volume (veh/h)	0	447	42	112	481	0	78	0	75	0	0	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.95	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1900	1900	1900	1881	1900	1900	1900	1881	1900	1900	1900
Adj Flow Rate, veh/h	0	491	46	123	529	0	86	0	82	0	0	0
Adj No. of Lanes	0	2	0	1	2	0	0	1	1	0	1	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	0	0	0	1	1	0	0	1	0	0	0
Cap, veh/h	0	2341	219	145	2959	0	200	0	126	0	158	0
Arrive On Green	0.00	0.70	0.70	0.08	0.83	0.00	0.08	0.00	0.08	0.00	0.00	0.00
Sat Flow, veh/h	0	3424	311	1810	3668	0	1440	0	1516	0	1900	0
Grp Volume(v), veh/h	0	265	272	123	529	0	86	0	82	0	0	0
Grp Sat Flow(s),veh/h/ln	0	1805	1835	1810	1787	0	1440	0	1516	0	1900	0
Q Serve(g_s), s	0.0	4.6	4.6	6.0	2.7	0.0	5.2	0.0	4.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.6	4.6	6.0	2.7	0.0	5.2	0.0	4.7	0.0	0.0	0.0
Prop In Lane	0.00		0.17	1.00		0.00	1.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	1269	1291	145	2959	0	200	0	126	0	158	0
V/C Ratio(X)	0.00	0.21	0.21	0.85	0.18	0.00	0.43	0.00	0.65	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	1269	1291	402	2959	0	448	0	387	0	486	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.96	0.96	1.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	4.6	4.7	40.9	1.6	0.0	40.2	0.0	40.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	5.2	0.1	0.0	0.5	0.0	2.1	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.4	2.5	3.2	1.4	0.0	2.1	0.0	2.0	0.0	0.0	0.0
LnGrp Delay(d),s/veh	0.0	5.0	5.0	46.1	1.7	0.0	40.8	0.0	42.1	0.0	0.0	0.0
LnGrp LOS		A	A	D	A		D		D			
Approach Vol, veh/h		537			652			168			0	
Approach Delay, s/veh		5.0			10.1			41.4			0.0	
Approach LOS		A			B			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	11.2	67.3		11.5		78.5		11.5				
Change Period (Y+Rc), s	3.5	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	20.5	35.0		23.0		59.0		23.0				
Max Q Clear Time (g_c+1), s	8.0	6.6		0.0		4.7		7.2				
Green Ext Time (p_c), s	0.0	9.9		0.0		11.5		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay											11.9	
HCM 2010 LOS											B	

Synchro 9 Report

Synchro 9 Report

HCM 2010 AWSC
6: Rio Rd & Carmel Rancho Blvd

Cumulative + Project Saturday.syn
12/12/2017

Intersection									
Intersection Delay, s/veh	17.1								
Intersection LOS	C								
Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Lane Configurations		↔↔	↕		↕	↔↔		↔↔	↕
Traffic Vol, veh/h	0	334	67	0	51	27	2	45	465
Future Vol, veh/h	0	334	67	0	51	27	2	45	465
Peak Hour Factor	0.92	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	1	0	2	0	9	0	0	1
Mvmt Flow	0	359	72	0	55	29	2	48	500
Number of Lanes	0	2	1	0	1	1	0	1	1
Approach	EB			WB			SB		
Opposing Approach	WB			EB			SB		
Opposing Lanes	2			3			0		
Conflicting Approach Left	SB						WB		
Conflicting Lanes Left	2			0			2		
Conflicting Approach Right				SB			EB		
Conflicting Lanes Right	0			2			3		
HCM Control Delay	12.5			10.6			21.6		
HCM LOS	B			B			C		
Lane	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	100%	0%	0%	0%	100%	0%		
Vol Thru, %	0%	0%	100%	100%	0%	0%	0%		
Vol Right, %	0%	0%	0%	0%	100%	0%	100%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	167	167	67	51	27	47	465		
LT Vol	167	167	0	0	0	47	0		
Through Vol	0	0	67	51	0	0	0		
RT Vol	0	0	0	0	27	0	465		
Lane Flow Rate	180	180	72	55	29	51	500		
Geometry Grp	8	8	8	8	8	8	8		
Degree of Util (X)	0.347	0.346	0.094	0.111	0.054	0.093	0.752		
Departure Headway (Hd)	6.963	6.945	4.71	7.267	6.705	6.616	5.414		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	515	517	758	491	532	541	665		
Service Time	4.713	4.696	2.459	5.039	4.476	4.362	3.159		
HCM Lane V/C Ratio	0.35	0.348	0.095	0.112	0.055	0.094	0.752		
HCM Control Delay	13.4	13.4	8	11	9.9	10	22.8		
HCM Lane LOS	B	B	A	B	A	A	C		
HCM 95th-tile Q	1.5	1.5	0.3	0.4	0.2	0.3	6.8		

HCM Signalized Intersection Capacity Analysis
7: SR 1 & Ocean Ave

Cumulative + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↔		↔	↔↔		↔	↔↔		↔	↔↔	↔
Traffic Volume (vph)	271	7	204	42	11	9	223	1546	7	5	1670	289
Future Volume (vph)	271	7	204	42	11	9	223	1546	7	5	1670	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95		0.95	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Fr	1.00	0.87		1.00	0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1698	1562		1715	1683		1787	3570		1805	3574	1579
Flt Permitted	0.95	0.99		0.95	0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1698	1562		1715	1683		1787	3570		1805	3574	1579
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	274	7	206	42	11	9	225	1562	7	5	1687	292
RTOR Reduction (vph)	0	170	0	0	9	0	0	0	0	0	0	115
Lane Group Flow (vph)	247	70	0	31	22	0	225	1569	0	5	1687	177
Confl. Bikes (#/hr)						3						3
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	1%	1%	14%	0%	1%	0%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.2	15.2		3.9	3.9		11.4	51.7		1.3	41.6	41.6
Effective Green, g (s)	15.4	15.4		4.1	4.1		11.1	52.6		1.0	42.5	42.5
Actuated g/C Ratio	0.17	0.17		0.05	0.05		0.12	0.59		0.01	0.48	0.48
Clearance Time (s)	4.2	4.2		4.2	4.2		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.5	3.5		4.0	4.0		3.0	4.5		3.0	4.5	4.5
Lane Grp Cap (vph)	293	269		78	77		222	2107		20	1704	753
v/s Ratio Prot	c0.15	0.04		c0.02	0.01		c0.13	0.44		0.00	c0.47	
v/s Ratio Perm												0.11
v/c Ratio	0.84	0.26		0.40	0.29		1.01	0.74		0.25	0.99	0.24
Uniform Delay, d1	35.7	31.9		41.3	41.1		39.0	13.3		43.7	23.1	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.7	0.6		4.5	2.9		63.9	1.7		6.5	19.4	0.3
Delay (s)	55.4	32.5		45.8	43.9		102.9	15.0		50.2	42.5	14.0
Level of Service	E	C		D	D		F	B		D	D	B
Approach Delay (s)		44.1			44.9			26.0			38.3	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay	34.0			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.93											
Actuated Cycle Length (s)	89.1			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	89.1%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary
7: SR 1 & Ocean Ave

Cumulative + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	271	7	204	42	11	9	223	1546	7	5	1670	289
Future Volume (veh/h)	271	7	204	42	11	9	223	1546	7	5	1670	289
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1898	1900	1900	1900	1900	1881	1880	1900	1900	1881	1900
Adj Flow Rate, veh/h	244	50	206	31	26	9	225	1562	7	5	1687	0
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	0	0	0	0	0	1	1	1	0	1	0
Cap, veh/h	321	58	240	120	89	31	225	2066	9	10	1597	722
Arrive On Green	0.18	0.18	0.18	0.07	0.07	0.06	0.13	0.57	0.56	0.01	0.45	0.00
Sat Flow, veh/h	1792	325	1337	1810	1342	465	1792	3647	16	1810	3574	1615
Grp Volume(V), veh/h	244	0	256	31	0	35	225	765	804	5	1687	0
Grp Sat Flow(S),veh/h/ln	1792	0	1662	1810	0	1807	1792	1786	1877	1810	1787	1615
Q Serve(g_s), s	11.4	0.0	13.1	1.4	0.0	1.6	11.0	28.5	28.5	0.2	39.2	0.0
Cycle Q Clear(q_c), s	11.4	0.0	13.1	1.4	0.0	1.6	11.0	28.5	28.5	0.2	39.2	0.0
Prop In Lane	1.00		0.80	1.00		0.26	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	321	0	298	120	0	119	225	1012	1064	10	1597	722
V/C Ratio(X)	0.76	0.00	0.86	0.26	0.00	0.29	1.00	0.76	0.76	0.48	1.06	0.00
Avail Cap(c_a), veh/h	339	0	315	149	0	148	225	1012	1064	144	1597	722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.2	0.0	35.0	38.9	0.0	39.0	38.4	14.4	14.4	43.5	24.3	0.0
Incr Delay (d2), s/veh	9.6	0.0	20.3	1.6	0.0	1.9	60.4	3.7	3.5	30.8	39.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	7.7	0.8	0.0	0.9	9.1	14.8	15.6	0.2	27.7	0.0
LnGrp Delay(d),s/veh	43.8	0.0	55.4	40.5	0.0	40.9	98.7	18.1	17.9	74.3	63.2	0.0
LnGrp LOS	D		E	D		D	F	B	B	E	F	
Approach Vol, veh/h		500			66			1794			1692	
Approach Delay, s/veh		49.7			40.7			28.1			63.3	
Approach LOS		D			D			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		19.7	15.0	43.2		9.8	4.5	53.7				
Change Period (Y+Rc), s		* 4.2	3.7	4.9		4.2	3.7	4.9				
Max Green Setting (Gmax), s		* 16	11.3	38.3		7.0	7.3	42.3				
Max Q Clear Time (q_c+I1), s		15.1	13.0	41.2		3.6	2.2	30.5				
Green Ext Time (p_c), s		0.4	0.0	0.0		0.1	0.0	11.7				
Intersection Summary												
HCM 2010 Ctrl Delay		45.7										
HCM 2010 LOS		D										
Notes												

Synchro 9 Report

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HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Cumulative + Project Saturday.syn
12/01/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	390	10	29	23	11	34	41	1736	27	40	1990	557
Future Volume (vph)	390	10	29	23	11	34	41	1736	27	40	1990	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1667		1715	1771	1583	1805	3565		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1667		1715	1771	1583	1805	3565		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97		0.97	0.97	0.97	0.97	0.97		0.97	0.97	0.97
Adj. Flow (vph)	402	10	30	24	11	35	42	1790	28	41	2052	574
RTOR Reduction (vph)	0	26	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	14	0	17	18	2	42	1817	0	41	2052	574
Confl. Bikes (#/hr)				2		2				2		2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.2	16.2		6.7	6.7	6.7	6.3	72.6		6.1	72.9	119.5
Effective Green, g (s)	16.8	16.8		6.9	6.9	6.9	6.0	73.5		6.3	73.8	119.5
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.62		0.05	0.62	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	482	234		99	102	91	90	2192		95	2207	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.51		0.02	c0.57	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.83	0.06		0.17	0.18	0.02	0.47	0.83		0.43	0.93	0.37
Uniform Delay, d1	50.0	44.5		53.6	53.6	53.1	55.2	18.1		54.9	20.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.8	0.2		1.4	1.4	0.2	3.8	3.1		3.1	7.9	0.7
Delay (s)	62.8	44.7		55.0	55.0	53.3	59.0	21.1		58.0	28.5	0.7
Level of Service	E	D		E	E	D	E	C		E	C	A
Approach Delay (s)		61.1			54.2			22.0			22.9	
Approach LOS		E			D			C			C	
Intersection Summary												
HCM 2000 Control Delay		26.4										
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		119.5					Sum of lost time (s)			16.0		
Intersection Capacity Utilization		79.5%					ICU Level of Service			D		
Analysis Period (min)		15										
c Critical Lane Group												

Synchro 9 Report

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HCM 2010 TWSC
9: Carmel Rancho Blvd & Clocktower PI

Cumulative + Project Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 4.7												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	126	0	20	1	0	0	10	356	0	0	486	94
Future Vol, veh/h	126	0	20	1	0	0	10	356	0	0	486	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	0	0	0	0	0	0	1	0	0	1	3
Mvmt Flow	143	0	23	1	0	0	11	405	0	0	552	107

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	831	1033	330	703	1086	202	659	0	0	405	0	0
Stage 1	606	606	-	427	427	-	-	-	-	-	-	-
Stage 2	225	427	-	276	659	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	262	234	672	328	218	811	939	-	-	1165	-	-
Stage 1	451	490	-	581	589	-	-	-	-	-	-	-
Stage 2	757	589	-	712	464	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	259	230	672	313	215	811	939	-	-	1165	-	-
Mov Cap-2 Maneuver	259	230	-	313	215	-	-	-	-	-	-	-
Stage 1	444	490	-	572	580	-	-	-	-	-	-	-
Stage 2	746	580	-	688	464	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34.3	16.5	0.3	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	939	-	-	283	313	1165	-	-
HCM Lane V/C Ratio	0.012	-	-	0.586	0.004	-	-	-
HCM Control Delay (s)	8.9	0.1	-	34.3	16.5	0	-	-
HCM Lane LOS	A	A	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	3.4	0	0	-	-

HCM 2010 TWSC
10: Via Nona Marie & Rio Rd

Cumulative + Project Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 2.6												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕			↕			↕		
Traffic Vol, veh/h	133	389	12	5	480	31	7	0	6	6	1	106
Future Vol, veh/h	133	389	12	5	480	31	7	0	6	6	1	106
Conflicting Peds, #/hr	0	0	4	8	0	4	4	0	8	4	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	95	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	145	423	13	5	522	34	8	0	7	7	1	115

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	559	0	0	444	0	0	1002	1296	234	1062	1286	286
Stage 1	-	-	-	-	-	-	726	726	-	553	553	-
Stage 2	-	-	-	-	-	-	276	570	-	509	733	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.5	6.5	6.9	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.21	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1015	-	-	1127	-	-	200	164	774	180	166	717
Stage 1	-	-	-	-	-	-	387	433	-	490	518	-
Stage 2	-	-	-	-	-	-	712	509	-	520	429	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1012	-	-	1119	-	-	146	138	764	157	140	712
Mov Cap-2 Maneuver	-	-	-	-	-	-	146	138	-	157	140	-
Stage 1	-	-	-	-	-	-	329	368	-	418	514	-
Stage 2	-	-	-	-	-	-	591	505	-	439	365	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.1	21.4	12.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	233	1012	-	-	1119	-	-	582
HCM Lane V/C Ratio	0.061	0.143	-	-	0.005	-	-	0.211
HCM Control Delay (s)	21.4	9.1	-	-	8.2	-	-	12.8
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.5	-	-	0	-	-	0.8

HCM Signalized Intersection Capacity Analysis
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative + Project Saturday.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (vph)	830	122	33	808	128	22
Future Volume (vph)	830	122	33	808	128	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	4.2	6.4	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	1881	1578	1736	1881	1783	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	1881	1578	1736	1881	1783	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	883	130	35	860	136	23
RTOR Reduction (vph)	0	57	0	0	9	0
Lane Group Flow (vph)	883	73	35	860	150	0
Confl. Bikes (#/hr)		4				1
Heavy Vehicles (%)	1%	0%	4%	1%	0%	0%
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	33.2	33.2	1.3	38.7	9.8	
Effective Green, g (s)	33.2	33.2	1.3	38.7	9.8	
Actuated g/C Ratio	0.56	0.56	0.02	0.65	0.16	
Clearance Time (s)	6.4	6.4	4.2	6.4	4.5	
Vehicle Extension (s)	3.6	3.6	1.0	3.6	2.0	
Lane Grp Cap (vph)	1051	881	37	1225	294	
v/s Ratio Prot	c0.47		0.02	c0.46	c0.08	
v/s Ratio Perm		0.05				
v/c Ratio	0.84	0.08	0.95	0.70	0.51	
Uniform Delay, d1	10.9	6.1	29.0	6.6	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.3	0.0	124.3	1.9	0.5	
Delay (s)	17.2	6.1	153.3	8.6	23.1	
Level of Service	B	A	F	A	C	
Approach Delay (s)	15.8			14.2	23.1	
Approach LOS	B			B	C	

Intersection Summary					
HCM 2000 Control Delay	15.7		HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.79				
Actuated Cycle Length (s)	59.4		Sum of lost time (s)	15.1	
Intersection Capacity Utilization	61.2%		ICU Level of Service	B	
Analysis Period (min)	15				
c Critical Lane Group					

HCM 2010 Signalized Intersection Summary
11: Rancho San Carlos Rd & Carmel Valley Rd

Cumulative + Project Saturday.syn
12/01/2017

	→	↖	↗	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↓	↑	↓	↓
Traffic Volume (veh/h)	830	122	33	808	128	22
Future Volume (veh/h)	830	122	33	808	128	22
Number	2	12	1	6	3	18
Initial Q (Ob), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.98	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1881	1900	1827	1881	1900	1900
Adj Flow Rate, veh/h	883	130	35	860	136	0
Adj No. of Lanes	1	1	1	1	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	0	4	1	0	0
Cap, veh/h	1121	941	52	1316	198	0
Arrive On Green	0.60	0.60	0.03	0.70	0.11	0.00
Sat Flow, veh/h	1881	1579	1740	1881	1797	0
Grp Volume(V), veh/h	883	130	35	860	137	0
Grp Sat Flow(s),veh/h/ln	1881	1579	1740	1881	1810	0
Q Serve(g_s), s	20.4	2.1	1.1	14.5	4.2	0.0
Cycle Q Clear(g_c), s	20.4	2.1	1.1	14.5	4.2	0.0
Prop In Lane	1.00	1.00	1.00	0.99	0.99	0.00
Lane Grp Cap(c), veh/h	1121	941	52	1316	199	0
V/C Ratio(X)	0.79	0.14	0.67	0.65	0.69	0.00
Avail Cap(c_a), veh/h	1247	1046	122	1516	570	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	8.8	5.1	27.5	4.8	24.5	0.0
Incr Delay (d2), s/veh	3.3	0.1	5.5	0.9	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	0.9	0.6	7.5	2.1	0.0
LnGrp Delay(d),s/veh	12.1	5.2	33.0	5.7	26.1	0.0
LnGrp LOS	B	A	C	A	C	
Approach Vol, veh/h	1013			895	137	
Approach Delay, s/veh	11.2			6.8	26.1	
Approach LOS	B			A	C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.9	40.5				46.4		10.8
Change Period (Y+Rc), s	* 4.2	6.4				6.4		4.5
Max Green Setting (Gmax), s	* 4	37.9				46.1		18.0
Max Q Clear Time (g_c+I1), s	3.1	22.4				16.5		6.2
Green Ext Time (p_c), s	0.0	11.6				18.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	10.3
HCM 2010 LOS	B

Notes

HCM 2010 TWSC
12: Valley Greens Dr & Carmel Valley Rd

Cumulative + Project Saturday.syn
12/01/2017

Intersection												
Int Delay, s/veh 4.6												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔	↔		↔	↔
Traffic Vol, veh/h	58	761	34	14	719	17	35	0	40	10	0	40
Future Vol, veh/h	58	761	34	14	719	17	35	0	40	10	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	365	-	-	160	-	-	-	-	0	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	62	810	36	15	765	18	37	0	43	11	0	43

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	783	0	0	810
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.1	-	-	4.1
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2
Pot Cap-1 Maneuver	844	-	-	825
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	844	-	-	825
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.2	77	28.4
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	57	383	844	-	-	825	-	-	57	402
HCM Lane V/C Ratio	0.653	0.111	0.073	-	-	0.018	-	-	0.187	0.106
HCM Control Delay (s)	147.1	15.6	9.6	-	-	9.4	-	-	82.1	15
HCM Lane LOS	F	C	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	2.7	0.4	0.2	-	-	0.1	-	-	0.6	0.4

HCM 2010 TWSC
13: SR 1 & Ribera Rd

Cumulative + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.7						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔		↔
Traffic Vol, veh/h	42	4	5	774	809	43
Future Vol, veh/h	42	4	5	774	809	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	130
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	44	4	5	815	852	45

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1677	852	852
Stage 1	852	-	-
Stage 2	825	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	106	362	795
Stage 1	421	-	-
Stage 2	434	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	105	362	795
Mov Cap-2 Maneuver	105	-	-
Stage 1	421	-	-
Stage 2	429	-	-

Approach	EB	NB	SB
HCM Control Delay, s	59.6	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	795	-	112	-	-
HCM Lane V/C Ratio	0.007	-	0.432	-	-
HCM Control Delay (s)	9.6	0	59.6	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.9	-	-

HCM 2010 TWSC
14: Rio Rd & Atherton Dr

Cumulative + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 1.4						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	34	37	417	41	28	425
Future Vol, veh/h	34	37	417	41	28	425
Conflicting Peds, #/hr	6	6	0	6	6	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	2	0	0	2
Mvmt Flow	35	38	430	42	29	438

Major/Minor	Minor1	Major1	Major2	Minor2	Major2
Conflicting Flow All	959	463	0	0	478
Stage 1	457	-	-	-	-
Stage 2	502	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	288	603	-	-	1095
Stage 1	642	-	-	-	-
Stage 2	612	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	275	597	-	-	1090
Mov Cap-2 Maneuver	275	-	-	-	-
Stage 1	639	-	-	-	-
Stage 2	588	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 383	1090	-
HCM Lane V/C Ratio	-	- 0.191	0.026	-
HCM Control Delay (s)	-	- 16.6	8.4	0
HCM Lane LOS	-	- C	A	A
HCM 95th %tile Q(veh)	-	- 0.7	0.1	-

HCM 2010 TWSC
15: Rio Rd & Lasuen Dr

Cumulative + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh 2.1						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	
Traffic Vol, veh/h	10	90	74	356	352	16
Future Vol, veh/h	10	90	74	356	352	16
Conflicting Peds, #/hr	10	11	11	0	0	10
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Yield
Storage Length	0	-	75	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	3	2	2	1	6
Mvmt Flow	11	96	79	379	374	17

Major/Minor	Minor2	Major1	Major2	Minor2	Major2
Conflicting Flow All	931	396	385	0	-
Stage 1	385	-	-	-	-
Stage 2	546	-	-	-	-
Critical Hdwy	6.4	6.23	4.12	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.327	2.218	-	-
Pot Cap-1 Maneuver	299	651	1173	-	-
Stage 1	692	-	-	-	-
Stage 2	584	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	274	639	1162	-	-
Mov Cap-2 Maneuver	274	-	-	-	-
Stage 1	686	-	-	-	-
Stage 2	539	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1162	- 564	-	-
HCM Lane V/C Ratio	0.068	- 0.189	-	-
HCM Control Delay (s)	8.3	- 12.9	-	-
HCM Lane LOS	A	- B	-	-
HCM 95th %tile Q(veh)	0.2	- 0.7	-	-

HCM 2010 TWSC
16: Rio Rd & Santa Lucia Ave

Cumulative + Project Saturday.syn
12/01/2017

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↑	↑	
Traffic Vol, veh/h	20	126	109	273	235	8
Future Vol, veh/h	20	126	109	273	235	8
Conflicting Peds, #/hr	7	7	7	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	1	1	2	0
Mvmt Flow	22	140	121	303	261	9
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	826	280	277	0	0	
Stage 1	273	-	-	-	-	
Stage 2	553	-	-	-	-	
Critical Hdwy	6.4	6.2	4.11	-	-	
Critical Hdwy Stg 1	5.4	-	-	-	-	
Critical Hdwy Stg 2	5.4	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.209	-	-	
Pot Cap-1 Maneuver	345	764	1292	-	-	
Stage 1	778	-	-	-	-	
Stage 2	580	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	309	755	1284	-	-	
Mov Cap-2 Maneuver	309	-	-	-	-	
Stage 1	773	-	-	-	-	
Stage 2	522	-	-	-	-	
Approach	EB	NB		SB		
HCM Control Delay, s	12.7	2.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1284	-	630	-	-	
HCM Lane V/C Ratio	0.094	-	0.257	-	-	
HCM Control Delay (s)	8.1	-	12.7	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.3	-	1	-	-	

HCM 2010 AWSC
17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative + Project Saturday.syn
12/01/2017

Intersection													
Intersection Delay, s/veh	9.8												
Intersection LOS	A												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	
Lane Configurations			↕				↕				↕		
Traffic Vol, veh/h	0	0	1	110	0	3	0	0	0	175	114	4	
Future Vol, veh/h	0	0	1	110	0	3	0	0	0	175	114	4	
Peak Hour Factor	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	0.92	0.87	0.87	0.87	
Heavy Vehicles, %	2	0	0	1	2	0	0	0	2	2	0	0	
Mvmt Flow	0	0	1	126	0	3	0	0	0	201	131	5	
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	
Approach	EB			WB				NB					
Opposing Approach	WB			EB				SB					
Opposing Lanes	1			1				1					
Conflicting Approach Left	SB			NB				EB					
Conflicting Lanes Left	1			1				1					
Conflicting Approach Right	NB			SB				WB					
Conflicting Lanes Right	1			1				1					
HCM Control Delay	8.3			8.5				10.8					
HCM LOS	A			A				B					
Lane	NBLn1	EBLn1	WBLn1	SBLn1									
Vol Left, %	60%	0%	100%	0%									
Vol Thru, %	39%	1%	0%	100%									
Vol Right, %	1%	99%	0%	0%									
Sign Control	Stop	Stop	Stop	Stop									
Traffic Vol by Lane	293	111	3	130									
LT Vol	175	0	3	0									
Through Vol	114	1	0	130									
RT Vol	4	110	0	0									
Lane Flow Rate	337	128	3	149									
Geometry Grp	1	1	1	1									
Degree of Util (X)	0.422	0.157	0.005	0.19									
Departure Headway (Hd)	4.506	4.417	5.385	4.582									
Convergence, Y/N	Yes	Yes	Yes	Yes									
Cap	798	811	663	781									
Service Time	2.535	2.449	3.431	2.616									
HCM Lane V/C Ratio	0.422	0.158	0.005	0.191									
HCM Control Delay	10.8	8.3	8.5	8.7									
HCM Lane LOS	B	A	A	A									
HCM 95th-tile Q	2.1	0.6	0	0.7									

HCM 2010 AWSC

17: Rio Rd/Junipero St & 13th Ave/Ridgewood Rd

Cumulative + Project Saturday.syn

12/01/2017

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Lane Configurations			↕	
Traffic Vol, veh/h	0	0	130	0
Future Vol, veh/h	0	0	130	0
Peak Hour Factor	0.92	0.87	0.87	0.87
Heavy Vehicles, %	2	0	1	0
Mvmt Flow	0	0	149	0
Number of Lanes	0	0	1	0
Approach				SB
Opposing Approach				NB
Opposing Lanes				1
Conflicting Approach Left				WB
Conflicting Lanes Left				1
Conflicting Approach Right				EB
Conflicting Lanes Right				1
HCM Control Delay				8.7
HCM LOS				A

HCM Signalized Intersection Capacity Analysis

3: SR 1 & Rio Rd

Existing + Project AM - Mitigated.syn

12/12/2017

	↔	→	↘	↙	←	↖	↗	↘	↙	↕	↗	↘	
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Configurations	↔	↕			↕	↕	↕	↕	↕		↕	↕	
Traffic Volume (vph)	198	304	26	6	84	274	155	38	228	68	275	334	
Future Volume (vph)	198	304	26	6	84	274	155	38	228	68	275	334	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95	
Frbp, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99			1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	3496			3303	1827	1548	1752	3447		3433	3345	
Flt Permitted	0.95	1.00			0.51	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1703	3496			1783	1827	1548	1752	3447		3433	3345	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	213	327	28	7	90	295	167	41	245	73	296	359	
RTOR Reduction (vph)	0	7	0	0	0	0	123	0	34	0	0	19	
Lane Group Flow (vph)	213	348	0	0	97	295	44	41	284	0	296	412	
Confl. Peds. (#/hr)	1		3		4		2	3		4	2		
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%	
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2			1	6		3	8		7	4	
Permitted Phases				1			6						
Actuated Green, G (s)	10.5	20.6			8.1	18.2	18.2	4.4	14.5		9.4	19.5	
Effective Green, g (s)	10.2	20.8			7.8	18.4	18.4	4.1	15.4		9.1	20.4	
Actuated g/C Ratio	0.15	0.30			0.11	0.27	0.27	0.06	0.22		0.13	0.30	
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9	
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)	251	1052			201	486	412	103	768		452	987	
v/s Ratio Prot	c0.13	0.10				c0.16		0.02	0.08		c0.09	c0.12	
v/s Ratio Perm					0.05		0.03						
v/c Ratio	0.85	0.33			0.48	0.61	0.11	0.40	0.37		0.65	0.42	
Uniform Delay, d1	28.7	18.7			28.8	22.2	19.2	31.3	22.7		28.5	19.6	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.5	0.2			1.8	2.3	0.1	2.5	0.4		3.4	0.3	
Delay (s)	51.2	19.0			30.6	24.4	19.3	33.8	23.1		31.9	19.9	
Level of Service	D	B			C	C	B	C	C		C	B	
Approach Delay (s)		31.0				24.0		24.3			24.8		
Approach LOS		C				C		C			C		
Intersection Summary													
HCM 2000 Control Delay	26.1		HCM 2000 Level of Service					C					
HCM 2000 Volume to Capacity ratio	0.61												
Actuated Cycle Length (s)	69.1		Sum of lost time (s)					16.0					
Intersection Capacity Utilization	57.6%		ICU Level of Service					B					
Analysis Period (min)	15												
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project AM - Mitigated.syn
12/12/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project PM - Mitigated.syn
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Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔		↔	↕	↔	↔	↕	↔	↔	↕
Traffic Volume (vph)	112	377	69	12	151	417	322	77	424	196	218	307
Future Volume (vph)	112	377	69	12	151	417	322	77	424	196	218	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1752	3469			3391	1863	1560	1805	3309		3502	3479
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1752	3469			1161	1863	1560	1805	3309		3502	3479
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	115	389	71	12	156	430	332	79	437	202	225	316
RTOR Reduction (vph)	0	17	0	0	0	0	220	0	63	0	0	19
Lane Group Flow (vph)	115	443	0	0	168	430	112	79	576	0	225	360
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	7.0	21.4			12.6	27.0	27.0	6.1	20.7		9.4	24.0
Effective Green, g (s)	6.7	21.6			12.3	27.2	27.2	5.8	21.6		9.1	24.9
Actuated g/C Ratio	0.08	0.27			0.15	0.34	0.34	0.07	0.27		0.11	0.31
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	145	929			177	628	526	129	886		395	1074
v/s Ratio Prot	0.07	0.13				c0.23		0.04	c0.17		c0.06	c0.10
v/s Ratio Perm					c0.14		0.07					
v/c Ratio	0.79	0.48			0.95	0.68	0.21	0.61	0.65		0.57	0.34
Uniform Delay, d1	36.3	24.8			33.8	23.0	19.1	36.3	26.2		33.9	21.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	25.0	0.5			52.3	3.2	0.2	8.3	1.8		1.9	0.2
Delay (s)	61.3	25.2			86.1	26.2	19.3	44.6	27.9		35.8	21.7
Level of Service	E	C			F	C	B	D	C		D	C
Approach Delay (s)		32.4				34.6		29.8				26.9
Approach LOS		C				C		C				C
Intersection Summary												
HCM 2000 Control Delay			31.3								C	
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			80.6								16.0	
Intersection Capacity Utilization			69.3%								C	
Analysis Period (min)			15									
c Critical Lane Group												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project PM - Mitigated.syn
12/12/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Existing + Project Saturday - Mitigated.syn
12/12/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	131	385	69	8	197	384	321	71	359	180	304	437
Future Volume (vph)	131	385	69	8	197	384	321	71	359	180	304	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frbp, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1787	3506			3485	1881	1556	1805	3367		3502	3493
Flt Permitted	0.95	1.00			0.30	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1787	3506			1103	1881	1556	1805	3367		3502	3493
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	132	389	70	8	199	388	324	72	363	182	307	441
RTOR Reduction (vph)	0	17	0	0	0	0	226	0	75	0	0	11
Lane Group Flow (vph)	132	442	0	0	207	388	98	72	470	0	307	485
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	9.2	18.2			13.6	22.6	22.6	6.5	17.5		9.5	20.5
Effective Green, g (s)	8.9	18.4			13.3	22.8	22.8	6.2	18.4		9.2	21.4
Actuated g/C Ratio	0.12	0.24			0.18	0.30	0.30	0.08	0.24		0.12	0.28
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	211	856			194	569	471	148	822		427	992
v/s Ratio Prot	0.07	0.13				c0.21		0.04	c0.14		c0.09	c0.14
v/s Ratio Perm					c0.19		0.06					
v/c Ratio	0.63	0.52			1.07	0.68	0.21	0.49	0.57		0.72	0.49
Uniform Delay, d1	31.6	24.6			31.0	23.1	19.5	33.0	25.0		31.8	22.4
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.7	0.6			83.5	3.5	0.3	2.5	1.0		5.7	0.5
Delay (s)	37.3	25.2			114.5	26.6	19.8	35.5	26.0		37.5	22.9
Level of Service	D	C			F	C	B	D	C		D	C
Approach Delay (s)		27.9				44.0			27.1			28.5
Approach LOS		C				D			C			C

Intersection Summary

HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Existing + Project Saturday - Mitigated.syn
 3: SR 1 & Rio Rd 12/12/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis Existing + Project AM - Mitigated.syn
 8: SR 1 & Carpenter St 12/29/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	382	4	25	35	14	44	36	1211	17	71	1590	774
Future Volume (vph)	382	4	25	35	14	44	36	1211	17	71	1590	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.9	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	3539	1578	1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	3539	1578	1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	38	15	48	40	1331	19	78	1747	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	9	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	40	1331	10	78	1747	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6		8				Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.6	52.7	52.7	6.1	54.7	99.2
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.3	53.6	52.7	6.3	55.6	99.2
Actuated g/C Ratio	0.16	0.16		0.07	0.07	0.07	0.04	0.54	0.53	0.06	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9	4.9	4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	560	249		122	121	113	75	1912	838	104	1945	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.38		0.05	c0.50	
v/s Ratio Perm						0.00			0.01			c0.54
v/c Ratio	0.75	0.03		0.22	0.21	0.03	0.53	0.70	0.01	0.75	0.90	0.54
Uniform Delay, d1	39.6	34.9		43.4	43.4	42.8	46.5	16.8	11.0	45.7	19.3	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	0.1		1.6	1.5	0.2	7.1	1.4	0.0	25.8	6.4	1.3
Delay (s)	45.9	35.0		45.0	45.0	43.0	53.6	18.2	11.0	71.4	25.7	1.3
Level of Service	D	D		D	D	D	D	B	B	E	C	A
Approach Delay (s)		45.1			44.1			19.1			19.3	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay			22.3									
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			99.2							16.0		
Intersection Capacity Utilization			78.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Existing + Project PM - Mitigated.syn
12/29/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	869	18	25	18	6	54	10	1645	19	55	1435	493
Future Volume (vph)	869	18	25	18	6	54	10	1645	19	55	1435	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	1732		1715	1761	1524	1805	3539	1442	1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	1732		1715	1761	1524	1805	3539	1442	1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	26	18	6	55	10	1679	19	56	1464	503
RTOR Reduction (vph)	0	19	0	0	0	52	0	0	9	0	0	0
Lane Group Flow (vph)	887	25	0	12	12	3	10	1679	10	56	1464	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6		8				Free
Actuated Green, G (s)	38.6	38.6		6.6	6.6	6.6	1.5	71.6	71.6	6.2	76.8	140.9
Effective Green, g (s)	39.2	39.2		6.8	6.8	6.8	1.2	72.5	71.6	6.4	77.7	140.9
Actuated g/C Ratio	0.28	0.28		0.05	0.05	0.05	0.01	0.51	0.51	0.05	0.55	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9	4.9	4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	964	481		82	84	73	15	1820	732	81	1970	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	c0.47		c0.03	0.41	
v/s Ratio Perm						0.00			0.01			c0.31
v/c Ratio	0.92	0.05		0.15	0.14	0.04	0.67	0.92	0.01	0.69	0.74	0.31
Uniform Delay, d1	49.3	37.2		64.3	64.3	63.9	69.7	31.6	17.2	66.3	24.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.0	0.1		1.4	1.4	0.4	75.9	8.7	0.0	22.5	1.9	0.5
Delay (s)	63.3	37.3		65.7	65.6	64.3	145.5	40.3	17.2	88.7	25.9	0.5
Level of Service	E	D		E	E	E	F	D	B	F	C	A
Approach Delay (s)		62.1			64.7			40.6			21.3	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Existing + Project Saturday - Mitigated.syn
12/29/2017

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	↖	→	↗	↖	→	↗	↖	→	↗	↖	→	↗
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	390	10	28	23	11	34	41	1452	27	40	1719	557
Future Volume (vph)	390	10	28	23	11	34	41	1452	27	40	1719	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1670		1715	1771	1582	1805	3574	1581	1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1670		1715	1771	1582	1805	3574	1581	1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	29	24	11	35	42	1497	28	41	1772	574
RTOR Reduction (vph)	0	24	0	0	0	33	0	12	0	12	0	0
Lane Group Flow (vph)	402	15	0	17	18	2	42	1497	16	41	1772	574
Confl. Bikes (#/hr)			2			2			2		2	
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6		8				Free
Actuated Green, G (s)	15.5	15.5		4.7	4.7	4.7	4.4	53.2	53.2	4.3	53.6	95.6
Effective Green, g (s)	16.1	16.1		4.9	4.9	4.9	4.1	54.1	53.2	4.5	54.5	95.6
Actuated g/C Ratio	0.17	0.17		0.05	0.05	0.05	0.04	0.57	0.56	0.05	0.57	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9	4.9	4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	578	281		87	90	81	77	2022	879	84	2037	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.42		0.02	c0.50	
v/s Ratio Perm						0.00			0.01			c0.37
v/c Ratio	0.70	0.05		0.20	0.20	0.02	0.55	0.74	0.02	0.49	0.87	0.37
Uniform Delay, d1	37.4	33.4		43.5	43.5	43.1	44.8	15.5	9.5	44.4	17.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	0.1		1.9	1.9	0.2	7.7	1.8	0.0	4.4	4.7	0.7
Delay (s)	41.6	33.5		45.4	45.4	43.3	52.5	17.3	9.5	48.8	22.2	0.7
Level of Service	D	C		D	D	D	D	B	A	D	C	A
Approach Delay (s)		40.9			44.3			18.1			17.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	95.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Background + Project AM - Mitigated.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↔	↕↕	↔	↔↕	↕↕	↔	↔	↕	↔	↔	↕	↔	
Traffic Volume (vph)	7	812	247	387	938	10	98	3	242	9	18	41	
Future Volume (vph)	7	812	247	387	938	10	98	3	242	9	18	41	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00	
Satd. Flow (prot)	1805	3539	1567	3433	3530		1698	1708	1560		1737	1555	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	1.00	
Satd. Flow (perm)	1805	3539	1567	3433	3530		1698	1708	1560		1737	1555	
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	
Adj. Flow (vph)	9	1041	317	496	1203	13	126	4	310	12	23	53	
RTOR Reduction (vph)	0	0	83	0	0	0	0	0	67	0	0	50	
Lane Group Flow (vph)	9	1041	234	496	1216	0	66	64	243	0	35	3	
Confl. Peds. (#/hr)				1		1	1		1	1		1	
Confl. Bikes (#/hr)				1					1				
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%	
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm	
Protected Phases	1	6	4	5	2		4	4	5	8	8		
Permitted Phases			6						4			8	
Actuated Green, G (s)	0.8	28.1	34.1	10.5	37.8		6.0	6.0	16.5		2.3	2.3	
Effective Green, g (s)	1.3	29.1	36.1	11.1	38.8		7.8	7.8	17.7		3.3	3.3	
Actuated g/C Ratio	0.02	0.43	0.54	0.16	0.58		0.12	0.12	0.26		0.05	0.05	
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0	
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	34	1530	840	566	2035		196	197	410		85	76	
v/s Ratio Prot	0.00	c0.29	0.03	c0.14	0.34		0.04	0.04	c0.10		c0.02		
v/s Ratio Perm			0.12						0.06			0.00	
v/c Ratio	0.26	0.68	0.28	0.88	0.60		0.34	0.32	0.59		0.41	0.03	
Uniform Delay, d1	32.5	15.4	8.5	27.4	9.2		27.4	27.3	21.7		31.1	30.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	1.0	0.1	13.8	0.3		0.4	0.4	1.5		1.2	0.1	
Delay (s)	34.0	16.4	8.6	41.3	9.5		27.7	27.7	23.2		32.2	30.5	
Level of Service	C	B	A	D	A		C	C	C		C	C	
Approach Delay (s)		14.7			18.7			24.5			31.2		
Approach LOS		B			B			C			C		
Intersection Summary													
HCM 2000 Control Delay	18.2			HCM 2000 Level of Service				B					
HCM 2000 Volume to Capacity ratio	0.69												
Actuated Cycle Length (s)	67.3			Sum of lost time (s)				16.9					
Intersection Capacity Utilization	53.5%			ICU Level of Service				A					
Analysis Period (min)	15												
c Critical Lane Group													

HCM 2010 Signalized Intersection Summary Background + Project AM - Mitigated.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations	↔	↕↕	↔	↔↕	↕↕	↔	↔	↕	↔	↔	↕	↔			
Traffic Volume (veh/h)	7	812	247	387	938	10	98	3	242	9	18	41			
Future Volume (veh/h)	7	812	247	387	938	10	98	3	242	9	18	41			
Number	1	6	16	5	2	12	7	4	14	3	8	18			
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863			
Adj Flow Rate, veh/h	9	1041	317	496	1203	13	129	0	310	12	23	53			
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1			
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78			
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2			
Cap, veh/h	30	1185	855	542	1701	18	792	0	562	34	65	90			
Arrive On Green	0.02	0.33	0.33	0.16	0.47	0.46	0.22	0.00	0.20	0.06	0.06	0.06			
Sat Flow, veh/h	1810	3539	1563	3442	3584	39	3583	0	1545	596	1141	1575			
Grp Volume(v), veh/h	9	1041	317	496	593	623	129	0	310	35	0	53			
Grp Sat Flow(s),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1737	0	1575			
Q Serve(g_s), s	0.3	19.3	8.1	9.9	18.5	18.5	2.0	0.0	11.2	1.4	0.0	2.3			
Cycle Q Clear(q_c), s	0.3	19.3	8.1	9.9	18.5	18.5	2.0	0.0	11.2	1.4	0.0	2.3			
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00			
Lane Grp Cap(c), veh/h	30	1185	855	542	839	880	792	0	562	100	0	90			
V/C Ratio(X)	0.30	0.88	0.37	0.91	0.71	0.71	0.16	0.00	0.55	0.35	0.00	0.59			
Avail Cap(c_a), veh/h	117	1277	896	542	839	880	1735	0	969	100	0	90			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.9	21.9	9.1	28.9	14.5	14.5	22.0	0.0	17.8	31.7	0.0	32.1			
Incr Delay (d2), s/veh	2.1	6.5	0.1	19.8	2.3	2.2	0.0	0.0	0.3	0.8	0.0	6.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.2	10.5	5.1	6.2	9.4	9.9	1.0	0.0	4.7	0.7	0.0	1.2			
LnGrp Delay(d),s/veh	36.1	28.3	9.2	48.7	16.8	16.8	22.0	0.0	18.1	32.4	0.0	38.7			
LnGrp LOS	D	C	A	D	B	B	C		B	C		D			
Approach Vol, veh/h	1367							1712		439			88		
Approach Delay, s/veh	24.0							26.1		19.3			36.2		
Approach LOS	C							C		B			D		
Timer	1	2	3	4	5	6	7	8							
Assigned Phs	1	2	4		5	6	8								
Phs Duration (G+Y+Rc), s	5.2	37.1	19.4		15.0	27.4	8.0								
Change Period (Y+Rc), s	* 4.6	5.0	* 5.8		* 4.6	5.0	5.0								
Max Green Setting (Gmax), s	* 4	30.6	* 32		* 10	24.2	3.0								
Max Q Clear Time (q_c+I1), s	2.3	20.5	13.2		11.9	21.3	4.3								
Green Ext Time (p_c), s	0.0	5.2	0.3		0.0	1.0	0.0								
Intersection Summary															
HCM 2010 Ctrl Delay	24.7							C							
HCM 2010 LOS	C														
Notes															

HCM Signalized Intersection Capacity Analysis Background + Project AM - Mitigated.syn
 3: SR 1 & Rio Rd 12/13/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Configurations													
Traffic Volume (vph)	199	304	26	6	91	277	155	38	232	68	275	334	
Future Volume (vph)	199	304	26	6	91	277	155	38	232	68	275	334	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95	
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99			1.00	1.00	0.85	1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	3496			3302	1827	1548	1752	3449		3433	3345	
Flt Permitted	0.95	1.00			0.54	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1703	3496			1879	1827	1548	1752	3449		3433	3345	
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	
Adj. Flow (vph)	214	327	28	7	98	298	167	41	249	73	296	359	
RTOR Reduction (vph)	0	7	0	0	0	0	122	0	33	0	0	19	
Lane Group Flow (vph)	214	348	0	0	105	298	45	41	289	0	296	412	
Confl. Peds. (#/hr)	1		3		4		2	3		4	2		
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%	
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2			1	6		3	8		7	4	
Permitted Phases				1			6						
Actuated Green, G (s)	10.5	21.1			7.7	18.3	18.3	4.4	14.5		9.4	19.5	
Effective Green, g (s)	10.2	21.3			7.4	18.5	18.5	4.1	15.4		9.1	20.4	
Actuated g/C Ratio	0.15	0.31			0.11	0.27	0.27	0.06	0.22		0.13	0.29	
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9	
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5	
Lane Grp Cap (vph)	251	1076			200	488	413	103	767		451	986	
v/s Ratio Prot	c0.13	c0.10				c0.16		0.02	0.08		c0.09	c0.12	
v/s Ratio Perm					0.06		0.03						
v/c Ratio	0.85	0.32			0.53	0.61	0.11	0.40	0.38		0.66	0.42	
Uniform Delay, d1	28.8	18.4			29.2	22.2	19.1	31.4	22.8		28.6	19.6	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.3	0.2			2.5	2.4	0.1	2.5	0.4		3.4	0.3	
Delay (s)	52.1	18.6			31.7	24.6	19.3	33.9	23.2		32.0	20.0	
Level of Service	D	B			C	C	B	C	C		C	B	
Approach Delay (s)		31.2				24.3			24.4			24.9	
Approach LOS		C				C			C			C	
Intersection Summary													
HCM 2000 Control Delay		26.3			HCM 2000 Level of Service				C				
HCM 2000 Volume to Capacity ratio		0.61											
Actuated Cycle Length (s)		69.2			Sum of lost time (s)				16.0				
Intersection Capacity Utilization		57.8%			ICU Level of Service				B				
Analysis Period (min)		15											
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis Background + Project AM - Mitigated.syn
 3: SR 1 & Rio Rd 12/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis Background + Project AM - Mitigated.syn
 8: SR 1 & Carpenter St 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	382	4	25	35	14	44	37	1301	17	71	1635	774
Future Volume (vph)	382	4	25	35	14	44	37	1301	17	71	1635	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1589	1752	5075		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1589	1752	5075		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	27	38	15	48	41	1430	19	78	1797	851
RTOR Reduction (vph)	0	23	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	41	1448	0	78	1797	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	15.6	15.6		6.9	6.9	6.9	4.5	50.0		7.6	53.6	98.0
Effective Green, g (s)	16.2	16.2		7.1	7.1	7.1	4.2	50.9		7.8	54.5	98.0
Actuated g/C Ratio	0.17	0.17		0.07	0.07	0.07	0.04	0.52		0.08	0.56	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	567	252		124	123	115	75	2635		130	1930	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.29		0.05	c0.52	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.74	0.03		0.22	0.21	0.03	0.55	0.55		0.60	0.93	0.54
Uniform Delay, d1	38.9	34.3		42.8	42.8	42.2	46.0	15.8		43.6	20.0	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.8	0.1		1.5	1.5	0.2	7.9	0.4		7.3	9.1	1.3
Delay (s)	44.7	34.4		44.4	44.3	42.4	53.9	16.3		50.9	29.1	1.3
Level of Service	D	C		D	D	D	D	B		D	C	A
Approach Delay (s)		44.0			43.4			17.3			21.0	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis Background + Project PM - Mitigated.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	26	856	240	425	667	5	264	22	596	6	10	7
Future Volume (vph)	26	856	240	425	667	5	264	22	596	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00		1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95	1.00	0.98
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1732		1590	1727	1580
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95	1.00	0.98
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1732		1590	1727	1580
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)	28	930	261	462	725	5	287	24	648	7	11	8
RTOR Reduction (vph)	0	0	104	0	0	0	0	0	74	0	0	8
Lane Group Flow (vph)	28	930	157	462	730	0	155	156	574	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6	4	5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	25.0	34.2	11.8	35.0		9.2	9.2	21.0		1.0	1.0
Effective Green, g (s)	2.3	26.0	36.2	12.4	36.0		11.0	11.0	22.2		2.0	2.0
Actuated g/C Ratio	0.03	0.39	0.54	0.18	0.53		0.16	0.16	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	61	1365	867	637	1906		279	282	523		51	46
v/s Ratio Prot	0.02	c0.26	0.03	0.13	0.20		0.09	0.09	c0.20		c0.01	
v/s Ratio Perm			0.07						0.16			0.00
v/c Ratio	0.46	0.68	0.18	0.73	0.38		0.56	0.55	1.10		0.35	0.01
Uniform Delay, d1	31.9	17.2	8.0	25.9	9.2		26.0	25.9	22.6		32.1	31.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	1.1	0.0	3.5	0.0		1.4	1.3	68.4		1.5	0.0
Delay (s)	33.9	18.4	8.0	29.4	9.2		27.3	27.3	91.0		33.6	31.8
Level of Service	C	B	A	C	A		C	C	F		C	C
Approach Delay (s)		16.5			17.0			70.3			33.0	
Approach LOS		B			B			E			C	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	67.4	Sum of lost time (s)	16.9
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM 2010 Signalized Intersection Summary Background + Project PM - Mitigated.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	26	856	240	425	667	5	264	22	596	6	10	7
Future Volume (veh/h)	26	856	240	425	667	5	264	22	596	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1881	1881	1900	1900	1881	1881	1900	1760	1900
Adj Flow Rate, veh/h	28	930	261	462	725	5	304	0	648	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	51	956	1035	489	1388	10	1376	0	811	18	29	43
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.38	0.00	0.37	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3639	25	3619	0	1598	671	1055	1587
Grp Volume(V), veh/h	28	930	261	462	356	374	304	0	648	18	0	8
Grp Sat Flow(s),veh/h/ln	1810	1770	1613	1738	1787	1877	1810	0	1598	1727	0	1587
Q Serve(g_s), s	1.3	22.9	6.1	11.6	13.6	13.6	5.0	0.0	29.6	0.9	0.0	0.4
Cycle Q Clear(g_c), s	1.3	22.9	6.1	11.6	13.6	13.6	5.0	0.0	29.6	0.9	0.0	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	51	956	1035	489	682	716	1376	0	811	47	0	43
V/C Ratio(X)	0.55	0.97	0.25	0.94	0.52	0.52	0.22	0.00	0.80	0.38	0.00	0.18
Avail Cap(c_a), veh/h	115	956	1035	489	682	716	1388	0	816	78	0	72
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.3	31.8	6.8	37.5	21.0	21.0	18.5	0.0	18.0	42.1	0.0	41.9
Incr Delay (d2), s/veh	3.4	22.5	0.0	27.0	0.3	0.3	0.0	0.0	5.2	1.9	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	14.1	5.5	7.4	6.7	7.0	2.5	0.0	14.0	0.5	0.0	0.2
LnGrp Delay(d),s/veh	45.6	54.3	6.8	64.5	21.4	21.4	18.5	0.0	23.2	44.0	0.0	42.6
LnGrp LOS	D	D	A	E	C	C	B		C	D		D
Approach Vol, veh/h	1219			1192			952			26		
Approach Delay, s/veh	44.0			38.1			21.7			43.6		
Approach LOS	D			D			C			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	37.6		37.5	16.4	27.8		6.4				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	22.8		3.0				
Max Q Clear Time (g_c+I1), s	3.3	15.6		31.6	13.6	24.9		2.9				
Green Ext Time (p_c), s	0.0	4.3		0.1	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	35.6											
HCM 2010 LOS	D											
Notes												

Synchro 9 Report

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HCM Signalized Intersection Capacity Analysis Background + Project PM - Mitigated.syn
 3: SR 1 & Rio Rd 12/13/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↕	↕	↕	↔	↕	↔	↔	↕
Traffic Volume (vph)	114	378	69	12	159	419	322	77	435	197	218	307
Future Volume (vph)	114	378	69	12	159	419	322	77	435	197	218	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1752	3469			3391	1863	1560	1805	3311		3502	3479
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1752	3469			1161	1863	1560	1805	3311		3502	3479
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	118	390	71	12	164	432	332	79	448	203	225	316
RTOR Reduction (vph)	0	17	0	0	0	0	220	0	61	0	0	19
Lane Group Flow (vph)	118	444	0	0	176	432	112	79	590	0	225	360
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases							6					
Actuated Green, G (s)	7.1	21.6			12.6	27.1	27.1	6.1	21.1		9.4	24.4
Effective Green, g (s)	6.8	21.8			12.3	27.3	27.3	5.8	22.0		9.1	25.3
Actuated g/C Ratio	0.08	0.27			0.15	0.34	0.34	0.07	0.27		0.11	0.31
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	146	931			175	626	524	128	897		392	1083
v/s Ratio Prot	0.07	0.13				c0.23		0.04	c0.18		c0.06	c0.10
v/s Ratio Perm					c0.15		0.07					
v/c Ratio	0.81	0.48			1.01	0.69	0.21	0.62	0.66		0.57	0.33
Uniform Delay, d1	36.6	24.9			34.5	23.3	19.3	36.6	26.3		34.2	21.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	26.9	0.5			69.5	3.4	0.2	8.6	1.8		2.0	0.2
Delay (s)	63.5	25.4			104.0	26.7	19.5	45.2	28.1		36.2	21.7
Level of Service	E	C			F	C	B	D	C		D	C
Approach Delay (s)	33.1				38.6		29.9		27.1			
Approach LOS	C				D		C		C			
Intersection Summary												
HCM 2000 Control Delay	32.9			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.74											
Actuated Cycle Length (s)	81.2			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	69.6%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

Synchro 9 Report

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HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Background + Project PM - Mitigated.syn
12/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Background + Project PM - Mitigated.syn
12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	869	18	26	18	6	54	10	1722	19	55	1544	493
Future Volume (vph)	869	18	26	18	6	54	10	1722	19	55	1544	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1729		1715	1761	1524	1805	5072		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1729		1715	1761	1524	1805	5072		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	27	18	6	55	10	1757	19	56	1576	503
RTOR Reduction (vph)	0	19	0	0	0	52	0	1	0	0	0	0
Lane Group Flow (vph)	887	26	0	12	12	3	10	1775	0	56	1576	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	33.5	33.5		6.5	6.5	6.5	1.5	57.3		6.2	62.5	121.4
Effective Green, g (s)	34.1	34.1		6.7	6.7	6.7	1.2	58.2		6.4	63.4	121.4
Actuated g/C Ratio	0.28	0.28		0.06	0.06	0.06	0.01	0.48		0.05	0.52	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	973	485		94	97	84	17	2431		95	1866	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	0.35		0.03	c0.44	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.91	0.05		0.13	0.12	0.04	0.59	0.73		0.59	0.84	0.31
Uniform Delay, d1	42.2	31.9		54.6	54.6	54.3	59.9	25.3		56.2	24.8	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.9	0.1		1.1	1.0	0.3	42.8	1.4		9.0	4.1	0.5
Delay (s)	55.1	31.9		55.6	55.6	54.6	102.6	26.7		65.2	28.9	0.5
Level of Service	E	C		E	E	D	F	C		E	C	A
Approach Delay (s)		53.9			54.9			27.1			23.2	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.9									C
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			121.4							16.0		
Intersection Capacity Utilization			83.8%									E
Analysis Period (min)			15									
c Critical Lane Group												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis Background + Project Saturday - Mitigated.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (vph)	25	737	260	480	659	3	211	17	456	2	17	14
Future Volume (vph)	25	737	260	480	659	3	211	17	456	2	17	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	1.00
Frbp, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (prot)	1805	3574	1600	3467	3607		1698	1717	1575		1891	1615
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		1.00	1.00
Satd. Flow (perm)	1805	3574	1600	3467	3607		1698	1717	1575		1891	1615
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)	27	784	277	511	701	3	224	18	485	2	18	15
RTOR Reduction (vph)	0	0	87	0	0	0	0	0	92	0	0	15
Lane Group Flow (vph)	27	784	190	511	704	0	121	121	393	0	20	0
Confl. Peds. (#/hr)			1	1			1		1			
Confl. Bikes (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6	4	5	2		4	4	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.6	20.6	28.5	12.8	31.8		7.9	7.9	20.7	1.0	1.0	
Effective Green, g (s)	2.1	21.6	30.5	13.4	32.8		9.7	9.7	21.9	2.0	2.0	
Actuated g/C Ratio	0.03	0.34	0.49	0.21	0.52		0.15	0.15	0.35	0.03	0.03	
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6	5.0	5.0	
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	60	1231	778	740	1886		262	265	550	60	51	
v/s Ratio Prot	0.01	c0.22	0.03	0.15	0.20		0.07	0.07	c0.15	c0.01		
v/s Ratio Perm			0.08						0.10			0.00
v/c Ratio	0.45	0.64	0.24	0.69	0.37		0.46	0.46	0.71	0.33	0.01	
Uniform Delay, d1	29.7	17.3	9.4	22.7	8.9		24.1	24.1	17.7	29.7	29.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.9	0.8	0.1	2.3	0.0		0.5	0.5	3.7	1.2	0.0	
Delay (s)	31.7	18.1	9.4	25.0	8.9		24.6	24.6	21.4	30.9	29.4	
Level of Service	C	B	A	C	A		C	C	C	C	C	
Approach Delay (s)		16.2			15.7			22.4		30.3		
Approach LOS		B			B			C		C		
Intersection Summary												
HCM 2000 Control Delay			17.6			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			62.7			Sum of lost time (s)			16.9			
Intersection Capacity Utilization			62.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary Background + Project Saturday - Mitigated.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	25	737	260	480	659	3	211	17	456	2	17	14
Future Volume (veh/h)	25	737	260	480	659	3	211	17	456	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	784	277	511	701	3	237	0	485	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	54	963	898	619	1535	7	1079	0	727	6	58	56
Arrive On Green	0.03	0.27	0.27	0.18	0.42	0.40	0.30	0.00	0.28	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1593	3476	3686	16	3583	0	1561	189	1701	1615
Grp Volume(v), veh/h	27	784	277	511	343	361	237	0	485	20	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1593	1738	1805	1897	1792	0	1561	1891	0	1615
Q Serve(g_s), s	1.1	15.1	6.8	10.4	10.1	10.1	3.7	0.0	17.8	0.8	0.0	0.7
Cycle Q Clear(g_c), s	1.1	15.1	6.8	10.4	10.1	10.1	3.7	0.0	17.8	0.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	54	963	898	619	752	790	1079	0	727	65	0	56
V/C Ratio(X)	0.50	0.81	0.31	0.83	0.46	0.46	0.22	0.00	0.67	0.31	0.00	0.27
Avail Cap(c_a), veh/h	135	1056	940	679	752	790	1642	0	972	103	0	88
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.2	25.2	8.7	29.2	15.5	15.5	19.3	0.0	15.4	34.8	0.0	34.7
Incr Delay (d2), s/veh	2.6	4.1	0.1	6.9	0.2	0.2	0.0	0.0	0.4	1.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.0	5.0	5.6	5.0	5.2	1.8	0.0	7.7	0.4	0.0	0.3
LnGrp Delay(d),s/veh	37.9	29.3	8.7	36.1	15.7	15.7	19.3	0.0	15.8	35.7	0.0	35.7
LnGrp LOS	D	C	A	D	B	B	B		B	D		D
Approach Vol, veh/h	1088			1215			722			35		
Approach Delay, s/veh	24.3			24.3			17.0			35.7		
Approach LOS	C			C			B			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	6.3	34.7	26.2		17.1	23.9	6.5					
Change Period (Y+Rc), s	* 4.6	5.0	* 5.8		* 4.6	5.0	5.0					
Max Green Setting (Gmax), s	* 5	29.6	* 32		* 14	20.8	3.0					
Max Q Clear Time (g_c+I1), s	3.1	12.1	19.8		12.4	17.1	2.8					
Green Ext Time (p_c), s	0.0	3.9	0.4		0.1	1.7	0.0					
Intersection Summary												
HCM 2010 Ctrl Delay			22.7									
HCM 2010 LOS			C									
Notes												

HCM Signalized Intersection Capacity Analysis Background + Project Saturday - Mitigated.syn
3: SR 1 & Rio Rd 12/13/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	133	386	69	8	205	386	321	71	373	181	304	437
Future Volume (vph)	133	386	69	8	205	386	321	71	373	181	304	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1787	3506			3485	1881	1556	1805	3370		3502	3493
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1787	3506			1193	1881	1556	1805	3370		3502	3493
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	134	390	70	8	207	390	324	72	377	183	307	441
RTOR Reduction (vph)	0	17	0	0	0	0	226	0	70	0	0	11
Lane Group Flow (vph)	134	443	0	0	215	390	98	72	490	0	307	485
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	8.5	18.3			12.6	22.4	22.4	6.2	17.9		9.5	21.2
Effective Green, g (s)	8.2	18.5			12.3	22.6	22.6	5.9	18.8		9.2	22.1
Actuated g/C Ratio	0.11	0.25			0.16	0.30	0.30	0.08	0.25		0.12	0.30
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	195	867			196	568	470	142	847		430	1032
v/s Ratio Prot	0.07	0.13				c0.21		0.04	c0.15		c0.09	c0.14
v/s Ratio Perm					c0.18		0.06					
v/c Ratio	0.69	0.51			1.10	0.69	0.21	0.51	0.58		0.71	0.47
Uniform Delay, d1	32.1	24.3			31.2	23.0	19.4	33.1	24.5		31.5	21.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	9.6	0.6			92.6	3.6	0.3	2.8	1.0		5.5	0.4
Delay (s)	41.7	24.8			123.8	26.6	19.7	35.9	25.6		37.1	22.0
Level of Service	D	C			F	C	B	D	C		D	C
Approach Delay (s)		28.6				46.7			26.7			27.7
Approach LOS		C				D			C			C
Intersection Summary												
HCM 2000 Control Delay		33.7				HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio		0.76										
Actuated Cycle Length (s)		74.8				Sum of lost time (s)			16.0			
Intersection Capacity Utilization		66.9%				ICU Level of Service			C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis Background + Project Saturday - Mitigated.syn
3: SR 1 & Rio Rd 12/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis Background + Project Saturday - Mitigated.syn
8: SR 1 & Carpenter St 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	390	10	29	23	11	34	41	1525	27	40	1821	557	
Future Volume (vph)	390	10	29	23	11	34	41	1525	27	40	1821	557	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	3433	1667		1715	1771	1584	1805	5121		1805	3574	1566	
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	3433	1667		1715	1771	1584	1805	5121		1805	3574	1566	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	402	10	30	24	11	35	42	1572	28	41	1877	574	
RTOR Reduction (vph)	0	25	0	0	0	33	0	1	0	0	0	0	
Lane Group Flow (vph)	402	15	0	17	18	2	42	1599	0	41	1877	574	
Confl. Bikes (#/hr)			2			2			2			2	
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%	
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free	
Protected Phases	2	2		6	6		3	8		7	4		
Permitted Phases						6						Free	
Actuated Green, G (s)	15.8	15.8		6.6	6.6	6.6	4.6	62.7		4.5	63.1	107.5	
Effective Green, g (s)	16.4	16.4		6.8	6.8	6.8	4.3	63.6		4.7	64.0	107.5	
Actuated g/C Ratio	0.15	0.15		0.06	0.06	0.06	0.04	0.59		0.04	0.60	1.00	
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9		
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0		
Lane Grp Cap (vph)	523	254		108	112	100	72	3029		78	2127	1566	
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.31		0.02	c0.53		
v/s Ratio Perm						0.00						c0.37	
v/c Ratio	0.77	0.06		0.16	0.16	0.02	0.58	0.53		0.53	0.88	0.37	
Uniform Delay, d1	43.7	38.9		47.6	47.6	47.2	50.7	13.0		50.3	18.5	0.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2	7.5	0.2		1.2	1.2	0.2	11.5	0.3		6.3	5.1	0.7	
Delay (s)	51.2	39.1		48.8	48.8	47.4	62.2	13.4		56.6	23.6	0.7	
Level of Service	D	D		D	D	D	E	B		E	C	A	
Approach Delay (s)		50.1			48.1			14.6			18.9		
Approach LOS		D			D			B			B		
Intersection Summary													
HCM 2000 Control Delay	20.8		HCM 2000 Level of Service					C					
HCM 2000 Volume to Capacity ratio	0.83												
Actuated Cycle Length (s)	107.5		Sum of lost time (s)					16.0					
Intersection Capacity Utilization	74.8%		ICU Level of Service					D					
Analysis Period (min)	15												
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis Cumulative + Project Saturday - Miti.syn
2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	25	757	270	500	674	3	217	17	470	2	17	14	
Future Volume (vph)	25	757	270	500	674	3	217	17	470	2	17	14	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95		1.00	0.95	1.00	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00		1.00	0.85	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95	0.96	1.00	
Satd. Flow (prot)	1805	3574	1600	3467	3607		1698	1716		1575	1575	1891	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95	0.96	1.00	
Satd. Flow (perm)	1805	3574	1600	3467	3607		1698	1716		1575	1575	1891	
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)	27	805	287	532	717	3	231	18	500	2	18	15	
RTOR Reduction (vph)	0	0	83	0	0	0	0	0	92	0	0	15	
Lane Group Flow (vph)	27	805	204	532	720	0	125	124	408	0	20	0	
Confl. Peds. (#/hr)			1	1			1		1				
Confl. Bikes (#/hr)			1				1		1				
Heavy Vehicles (%)	0%	1%	0%	1%	0%	0%	1%	0%	2%	0%	0%	0%	
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm	
Protected Phases	1	6	4	5	2		4	4	5	8	8		
Permitted Phases			6						4			8	
Actuated Green, G (s)	1.7	21.6	29.6	13.2	33.1		8.0	8.0	21.2		1.0	1.0	
Effective Green, g (s)	2.2	22.6	31.6	13.8	34.1		9.8	9.8	22.4		2.0	2.0	
Actuated g/C Ratio	0.03	0.35	0.49	0.21	0.53		0.15	0.15	0.35		0.03	0.03	
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0	
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0	
Lane Grp Cap (vph)	61	1258	787	745	1915		259	261	549		58	50	
v/s Ratio Prot	0.01	c0.23	0.04	0.15	0.20		0.07	0.07	c0.16		c0.01		
v/s Ratio Perm			0.09						0.10			0.00	
v/c Ratio	0.44	0.64	0.26	0.71	0.38		0.48	0.48	0.74		0.34	0.01	
Uniform Delay, d1	30.4	17.4	9.5	23.4	8.8		24.9	24.9	18.4		30.5	30.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.8	0.1	2.7	0.0		0.5	0.5	4.7		1.3	0.0	
Delay (s)	32.3	18.2	9.6	26.1	8.9		25.4	25.3	23.1		31.8	30.2	
Level of Service	C	B	A	C	A		C	C	C		C	C	
Approach Delay (s)		16.3			16.2			23.8				31.1	
Approach LOS		B			B			C				C	
Intersection Summary													
HCM 2000 Control Delay	18.2		HCM 2000 Level of Service					B					
HCM 2000 Volume to Capacity ratio	0.67												
Actuated Cycle Length (s)	64.2		Sum of lost time (s)					16.9					
Intersection Capacity Utilization	63.5%		ICU Level of Service					B					
Analysis Period (min)	15												
c Critical Lane Group													

HCM 2010 Signalized Intersection Summary Cumulative + Project Saturday - Miti.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	25	757	270	500	674	3	217	17	470	2	17	14
Future Volume (veh/h)	25	757	270	500	674	3	217	17	470	2	17	14
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1881	1900	1900	1881	1884	1863	1900	1900	1900
Adj Flow Rate, veh/h	27	805	287	532	717	3	244	0	500	2	18	15
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	1	0	1	0	0	1	0	2	0	0	0
Cap, veh/h	54	942	897	637	1534	6	1097	0	743	6	58	55
Arrive On Green	0.03	0.26	0.26	0.18	0.42	0.40	0.31	0.00	0.29	0.03	0.03	0.03
Sat Flow, veh/h	1810	3574	1592	3476	3686	15	3583	0	1562	189	1701	1615
Grp Volume(v), veh/h	27	805	287	532	351	369	244	0	500	20	0	15
Grp Sat Flow(s),veh/h/ln	1810	1787	1592	1738	1805	1897	1792	0	1562	1891	0	1615
Q Serve(g_s), s	1.1	16.1	7.3	11.1	10.6	10.6	3.8	0.0	18.6	0.8	0.0	0.7
Cycle Q Clear(g_c), s	1.1	16.1	7.3	11.1	10.6	10.6	3.8	0.0	18.6	0.8	0.0	0.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.10		1.00
Lane Grp Cap(c), veh/h	54	942	897	637	751	789	1097	0	743	64	0	55
V/C Ratio(X)	0.50	0.85	0.32	0.83	0.47	0.47	0.22	0.00	0.67	0.31	0.00	0.27
Avail Cap(c_a), veh/h	132	1008	926	694	751	789	1611	0	967	101	0	86
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.9	26.3	8.9	29.6	15.9	15.9	19.4	0.0	15.3	35.5	0.0	35.4
Incr Delay (d2), s/veh	2.7	6.4	0.1	7.4	0.2	0.2	0.0	0.0	0.5	1.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.8	5.4	6.0	5.3	5.6	1.9	0.0	8.1	0.4	0.0	0.3
LnGrp Delay(d),s/veh	38.6	32.7	9.0	37.0	16.1	16.1	19.5	0.0	15.9	36.5	0.0	36.4
LnGrp LOS	D	C	A	D	B	B	B		B	D		D
Approach Vol, veh/h		1119			1252			744			35	
Approach Delay, s/veh		26.8			25.0			17.0			36.4	
Approach LOS		C			C			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	35.3		27.0	17.8	23.8		6.6				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5	29.6		* 32	* 14	20.2		3.0				
Max Q Clear Time (g_c+I1), s	3.1	12.6		20.6	13.1	18.1		2.8				
Green Ext Time (p_c), s	0.0	4.1		0.5	0.1	0.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay		23.9										
HCM 2010 LOS		C										
Notes												

HCM Signalized Intersection Capacity Analysis Cumulative + Project Saturday - Miti.syn
 3: SR 1 & Rio Rd 12/13/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↕	↕	↕	↔	↕	↔	↔	↕
Traffic Volume (vph)	133	396	69	8	212	395	333	71	561	189	326	568
Future Volume (vph)	133	396	69	8	212	395	333	71	561	189	326	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frbp, ped/bikes	1.00	0.99			1.00	1.00	0.97	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.99	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.96		1.00	0.99
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1787	3508			3483	1881	1556	1805	3409		3502	3510
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1787	3508			1202	1881	1556	1805	3409		3502	3510
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	134	400	70	8	214	399	336	72	567	191	329	574
RTOR Reduction (vph)	0	17	0	0	0	0	212	0	37	0	0	7
Lane Group Flow (vph)	134	453	0	0	222	399	124	72	721	0	329	622
Confl. Peds. (#/hr)	5		5	4	4		4	5		4	4	
Confl. Bikes (#/hr)			8				1					
Heavy Vehicles (%)	1%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	8.4	19.7			12.5	23.8	23.8	6.5	23.3		9.4	26.2
Effective Green, g (s)	8.1	19.9			12.2	24.0	24.0	6.2	24.2		9.1	27.1
Actuated g/C Ratio	0.10	0.24			0.15	0.29	0.29	0.08	0.30		0.11	0.33
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	177	857			180	554	458	137	1013		391	1168
v/s Ratio Prot	0.07	0.13				c0.21		0.04	c0.21		c0.09	c0.18
v/s Ratio Perm					c0.18		0.08					
v/c Ratio	0.76	0.53			1.23	0.72	0.27	0.53	0.71		0.84	0.53
Uniform Delay, d1	35.7	26.7			34.6	25.7	22.0	36.2	25.5		35.4	22.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	16.8	0.7			143.6	4.7	0.4	3.6	2.5		15.0	0.5
Delay (s)	52.5	27.4			178.2	30.4	22.4	39.8	28.0		50.5	22.5
Level of Service	D	C			F	C	C	D	C		D	C
Approach Delay (s)		32.9				61.9		29.0			32.1	
Approach LOS		C				E		C			C	
Intersection Summary												
HCM 2000 Control Delay			40.0								D	
HCM 2000 Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		81.4				Sum of lost time (s)		16.0				
Intersection Capacity Utilization		72.7%				ICU Level of Service		C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project Saturday - Miti.syn
12/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	54
Future Volume (vph)	54
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.99
Adj. Flow (vph)	55
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	5
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Cumulative + Project Saturday - Miti.syn
12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	390	10	29	23	11	34	41	1736	27	40	1990	557
Future Volume (vph)	390	10	29	23	11	34	41	1736	27	40	1990	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frbp, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1667		1715	1771	1583	1805	5123		1805	3574	1566
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1667		1715	1771	1583	1805	5123		1805	3574	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	402	10	30	24	11	35	42	1790	28	41	2052	574
RTOR Reduction (vph)	0	26	0	0	0	33	0	1	0	0	0	0
Lane Group Flow (vph)	402	14	0	17	18	2	42	1817	0	41	2052	574
Confl. Bikes (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.2	16.2		6.7	6.7	6.7	6.3	72.5		6.1	72.8	119.4
Effective Green, g (s)	16.8	16.8		6.9	6.9	6.9	6.0	73.4		6.3	73.7	119.4
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.61		0.05	0.62	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	483	234		99	102	91	90	3149		95	2206	1566
v/s Ratio Prot	c0.12	0.01		0.01	0.01		0.02	0.35		0.02	c0.57	
v/s Ratio Perm						0.00						c0.37
v/c Ratio	0.83	0.06		0.17	0.18	0.02	0.47	0.58		0.43	0.93	0.37
Uniform Delay, d1	49.9	44.5		53.5	53.5	53.1	55.1	13.7		54.8	20.5	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.6	0.2		1.4	1.4	0.2	3.8	0.4		3.1	8.0	0.7
Delay (s)	62.5	44.7		55.0	55.0	53.2	58.9	14.1		57.9	28.6	0.7
Level of Service	E	D		D	D	D	E	B		E	C	A
Approach Delay (s)		60.9			54.1			15.2			23.0	
Approach LOS		E			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			23.9									
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			119.4							16.0		
Intersection Capacity Utilization			79.5%									
Analysis Period (min)			15									
c Critical Lane Group												

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis Cumulative + Project AM - Mitigated.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↑	↔	↔↔	↔↑	10	↔	↔	↔	9	↔	↔
Traffic Volume (vph)	7	824	250	399	954	108	3	260	9	18	41	
Future Volume (vph)	7	824	250	399	954	108	3	260	9	18	41	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95	0.95	0.95	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	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	0.95	1.00	0.98	1.00	1.00	
Satd. Flow (prot)	1805	3539	1568	3433	3530	1698	1708	1559	1737	1555		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	0.95	1.00	0.98	1.00	1.00	
Satd. Flow (perm)	1805	3539	1568	3433	3530	1698	1708	1559	1737	1555		
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	
Adj. Flow (vph)	9	1056	321	512	1223	13	138	4	333	12	23	53
RTOR Reduction (vph)	0	0	90	0	0	0	0	0	67	0	0	50
Lane Group Flow (vph)	9	1056	231	512	1236	0	72	70	266	0	35	3
Confl. Peds. (#/hr)				1		1	1		1	1		1
Confl. Bikes (#/hr)				1					1			
Heavy Vehicles (%)	0%	2%	2%	2%	2%	10%	1%	0%	3%	22%	0%	2%
Turn Type	Prot	NA	pm+ov	Prot	NA	Split	NA	pm+ov	Split	NA	Perm	
Protected Phases	1	6	4	5	2	4	4	5	8	8		
Permitted Phases			6					4			8	
Actuated Green, G (s)	0.7	28.9	35.1	9.5	37.7	6.2	6.2	15.7	2.3	2.3		
Effective Green, g (s)	1.2	29.9	37.1	10.1	38.7	8.0	8.0	16.9	3.3	3.3		
Actuated g/C Ratio	0.02	0.44	0.55	0.15	0.58	0.12	0.12	0.25	0.05	0.05		
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0	5.8	5.8	4.6	5.0	5.0		
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3	1.0	1.0	1.0	1.0	1.0		
Lane Grp Cap (vph)	32	1572	864	515	2029	201	203	391	85	76		
v/s Ratio Prot	0.00	c0.30	0.03	c0.15	0.35	0.04	0.04	c0.10		c0.02		
v/s Ratio Perm			0.12					0.07			0.00	
v/c Ratio	0.28	0.67	0.27	0.99	0.61	0.36	0.34	0.68	0.41	0.03		
Uniform Delay, d1	32.6	14.8	7.9	28.6	9.4	27.3	27.2	22.8	31.1	30.5		
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.8	0.9	0.1	37.9	0.4	0.4	0.4	3.9	1.2	0.1		
Delay (s)	34.4	15.7	8.0	66.5	9.7	27.7	27.6	26.6	32.2	30.5		
Level of Service	C	B	A	E	A	C	C	C	C	C		
Approach Delay (s)		14.0			26.3			26.9		31.2		
Approach LOS		B			C			C		C		
Intersection Summary												
HCM 2000 Control Delay			21.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			67.3			Sum of lost time (s)				16.9		
Intersection Capacity Utilization			54.5%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Synchro 9 Report

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HCM 2010 Signalized Intersection Summary Cumulative + Project AM - Mitigated.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔↑	↔	↔↔	↔↑	10	↔	↔	↔	9	↔	↔
Traffic Volume (veh/h)	7	824	250	399	954	108	3	260	9	18	41	
Future Volume (veh/h)	7	824	250	399	954	108	3	260	9	18	41	
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1861	1900	1881	1882	1845	1900	1767	1863
Adj Flow Rate, veh/h	9	1056	321	512	1223	13	141	0	333	12	23	53
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	0	2	2	2	2	2	1	0	3	0	0	2
Cap, veh/h	29	1203	887	487	1662	18	845	0	560	34	65	89
Arrive On Green	0.02	0.34	0.34	0.14	0.46	0.45	0.24	0.00	0.22	0.06	0.06	0.06
Sat Flow, veh/h	1810	3539	1563	3442	3584	38	3583	0	1545	596	1141	1575
Grp Volume(V), veh/h	9	1056	321	512	603	633	141	0	333	35	0	53
Grp Sat Flow(S),veh/h/ln	1810	1770	1563	1721	1768	1854	1792	0	1545	1737	0	1575
Q Serve(g_s), s	0.3	19.9	8.0	10.0	19.6	19.7	2.2	0.0	12.4	1.4	0.0	2.3
Cycle Q Clear(q_c), s	0.3	19.9	8.0	10.0	19.6	19.7	2.2	0.0	12.4	1.4	0.0	2.3
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.34		1.00
Lane Grp Cap(c), veh/h	29	1203	887	487	820	860	845	0	560	98	0	89
V/C Ratio(X)	0.31	0.88	0.36	1.05	0.74	0.74	0.17	0.00	0.59	0.36	0.00	0.60
Avail Cap(c_a), veh/h	115	1311	935	487	820	860	1712	0	934	98	0	89
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.4	22.0	8.4	30.4	15.4	15.5	21.5	0.0	18.4	32.1	0.0	32.6
Incr Delay (d2), s/veh	2.2	6.2	0.1	55.2	3.1	2.9	0.0	0.0	0.4	0.8	0.0	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.7	5.2	8.4	10.2	10.7	1.1	0.0	5.4	0.7	0.0	1.2
LnGrp Delay(d),s/veh	36.5	28.2	8.5	85.6	18.5	18.4	21.5	0.0	18.8	32.9	0.0	39.9
LnGrp LOS	D	C	A	F	B	B	C		B	C		D
Approach Vol, veh/h		1386			1748			474				88
Approach Delay, s/veh		23.7			38.1			19.6				37.1
Approach LOS		C			D			B				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	36.8		20.7	14.0	28.0		8.0				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 4	30.6		* 32	* 9.4	25.2		3.0				
Max Q Clear Time (q_c+I1), s	2.3	21.7		14.4	12.0	21.9		4.3				
Green Ext Time (p_c), s	0.0	4.9		0.3	0.0	1.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay					30.3							
HCM 2010 LOS					C							
Notes												

Synchro 9 Report

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HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project AM - Mitigated.syn
12/13/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	199	308	26	6	100	287	175	38	294	71	282	468
Future Volume (vph)	199	308	26	6	100	287	175	38	294	71	282	468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85	1.00	0.97		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1703	3496			3301	1827	1547	1752	3467		3433	3369
Flt Permitted	0.95	1.00			0.42	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1703	3496			1448	1827	1547	1752	3467		3433	3369
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	214	331	28	7	108	309	188	41	316	76	303	503
RTOR Reduction (vph)	0	7	0	0	0	0	140	0	24	0	0	12
Lane Group Flow (vph)	214	352	0	0	115	309	48	41	368	0	303	563
Confl. Peds. (#/hr)	1		3		4		2	3		4	2	
Heavy Vehicles (%)	6%	2%	0%	2%	6%	4%	2%	3%	1%	0%	2%	5%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	10.6	19.0			9.9	18.3	18.3	4.3	17.9		9.5	23.1
Effective Green, g (s)	10.3	19.2			9.6	18.5	18.5	4.0	18.8		9.2	24.0
Actuated g/C Ratio	0.14	0.26			0.13	0.25	0.25	0.05	0.26		0.13	0.33
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	240	922			190	464	393	96	895		433	1110
v/s Ratio Prot	c0.13	0.10				c0.17		0.02	0.11		c0.09	c0.17
v/s Ratio Perm					0.08		0.03					
v/c Ratio	0.89	0.38			0.61	0.67	0.12	0.43	0.41		0.70	0.51
Uniform Delay, d1	30.7	21.9			29.8	24.4	20.9	33.3	22.4		30.5	19.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	31.1	0.3			5.4	3.7	0.2	3.0	0.4		4.9	0.4
Delay (s)	61.8	22.3			35.2	28.1	21.1	36.3	22.8		35.4	20.1
Level of Service	E	C			D	C	C	D	C		D	C
Approach Delay (s)		37.0				27.3			24.1			25.4
Approach LOS		D				C			C			C

Intersection Summary

HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project AM - Mitigated.syn
12/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	67
Future Volume (vph)	67
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	72
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	1
Heavy Vehicles (%)	4%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 8: SR 1 & Carpenter St
 Cumulative + Project AM - Mitigated.syn
 12/13/2017

	←			→			←			→		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	382	4	26	35	14	44	38	1397	17	71	1784	774
Future Volume (vph)	382	4	26	35	14	44	38	1397	17	71	1784	774
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.87		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1529		1715	1699	1588	1752	5076		1641	3471	1583
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	1529		1715	1699	1588	1752	5076		1641	3471	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	420	4	29	38	15	48	42	1535	19	78	1960	851
RTOR Reduction (vph)	0	25	0	0	0	45	0	1	0	0	0	0
Lane Group Flow (vph)	420	8	0	27	26	3	42	1553	0	78	1960	851
Confl. Peds. (#/hr)			1	1		1			1			
Heavy Vehicles (%)	2%	25%	4%	0%	7%	0%	3%	2%	0%	10%	4%	2%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	16.3	16.3		7.3	7.3	7.3	6.3	69.8		8.9	72.9	120.2
Effective Green, g (s)	16.9	16.9		7.5	7.5	7.5	6.0	70.7		9.1	73.8	120.2
Actuated g/C Ratio	0.14	0.14		0.06	0.06	0.06	0.05	0.59		0.08	0.61	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	482	214		107	106	99	87	2985		124	2131	1583
v/s Ratio Prot	c0.12	0.01		0.02	0.02		0.02	0.31		0.05	c0.56	
v/s Ratio Perm						0.00						c0.54
v/c Ratio	0.87	0.04		0.25	0.25	0.03	0.48	0.52		0.63	0.92	0.54
Uniform Delay, d1	50.6	44.6		53.7	53.7	52.9	55.6	14.7		53.9	20.6	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.6	0.1		2.1	2.1	0.2	4.2	0.3		9.6	7.3	1.3
Delay (s)	67.2	44.8		55.8	55.7	53.1	59.8	15.0		63.5	27.9	1.3
Level of Service	E	D		E	E	D	E	B		E	C	A
Approach Delay (s)		65.5			54.5			16.2			21.0	
Approach LOS		E			D			B			C	
Intersection Summary												
HCM 2000 Control Delay		24.2		HCM 2000 Level of Service					C			
HCM 2000 Volume to Capacity ratio		0.91										
Actuated Cycle Length (s)		120.2		Sum of lost time (s)				16.0				
Intersection Capacity Utilization		83.2%		ICU Level of Service					E			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd
 Cumulative + Project PM - Mitigated.syn
 12/13/2017

	←			→			←			→		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	26	877	251	446	681	5	270	22	610	6	10	7
Future Volume (vph)	26	877	251	446	681	5	270	22	610	6	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.0	4.8	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95		1.00	0.99	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	0.99	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00		1.00	0.85	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95	0.96	1.00
Satd. Flow (prot)	1805	3539	1615	3467	3570		1715	1731		1590	1727	1579
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96		0.95	0.96	1.00
Satd. Flow (perm)	1805	3539	1615	3467	3570		1715	1731		1590	1727	1579
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)	28	953	273	485	740	5	293	24	663	7	11	8
RTOR Reduction (vph)	0	0	103	0	0	0	0	0	74	0	0	8
Lane Group Flow (vph)	28	953	170	485	745	0	158	159	589	0	18	0
Confl. Peds. (#/hr)	1			1		2	1		1	2		1
Heavy Vehicles (%)	0%	2%	0%	1%	1%	0%	0%	0%	1%	0%	13%	0%
Turn Type	Prot	NA	pm+ov	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	1	6	4	5	2		4	NA	5	8	8	
Permitted Phases			6						4			8
Actuated Green, G (s)	1.8	25.8	35.1	11.8	35.8		9.3	9.3	21.1		1.0	1.0
Effective Green, g (s)	2.3	26.8	37.1	12.4	36.8		11.1	11.1	22.3		2.0	2.0
Actuated g/C Ratio	0.03	0.39	0.54	0.18	0.54		0.16	0.16	0.33		0.03	0.03
Clearance Time (s)	4.6	5.0	5.8	4.6	5.0		5.8	5.8	4.6		5.0	5.0
Vehicle Extension (s)	1.0	1.3	1.0	1.0	1.3		1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	60	1388	877	629	1923		278	281	519		50	46
v/s Ratio Prot	0.02	c0.27	0.03	0.14	0.21		0.09	0.09	c0.21		c0.01	
v/s Ratio Perm			0.08						0.16			0.00
v/c Ratio	0.47	0.69	0.19	0.77	0.39		0.57	0.57	1.13		0.36	0.01
Uniform Delay, d1	32.4	17.3	8.0	26.6	9.2		26.4	26.4	23.0		32.5	32.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.1	1.1	0.0	5.3	0.0		1.6	1.6	82.2		1.6	0.0
Delay (s)	34.5	18.4	8.0	31.9	9.2		28.0	27.9	105.2		34.1	32.2
Level of Service	C	B	A	C	A		C	C	F		C	C
Approach Delay (s)		16.5			18.2			80.2			33.5	
Approach LOS		B			B			F			C	
Intersection Summary												
HCM 2000 Control Delay		35.1		HCM 2000 Level of Service					D			
HCM 2000 Volume to Capacity ratio		0.86										
Actuated Cycle Length (s)		68.3		Sum of lost time (s)				16.9				
Intersection Capacity Utilization		75.5%		ICU Level of Service					D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary Cumulative + Project PM - Mitigated.syn
 2: Carmel Rancho Blvd/Carmel Knolls Dr & Carmel Valley Rd 12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	26	877	251	446	681	5	270	22	610	6	10	7
Future Volume (veh/h)	26	877	251	446	681	5	270	22	610	6	10	7
Number	1	6	16	5	2	12	7	4	14	3	8	18
Initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow(s,veh/h/ln)	1900	1863	1900	1881	1881	1900	1900	1900	1881	1900	1760	1900
Adj Flow Rate, veh/h	28	953	273	485	740	5	310	0	663	7	11	8
Adj No. of Lanes	1	2	1	2	2	0	2	0	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	0	1	1	1	0	0	1	13	13	0
Cap, veh/h	51	961	1041	480	1384	9	1384	0	810	18	29	43
Arrive On Green	0.03	0.27	0.27	0.14	0.38	0.37	0.38	0.00	0.37	0.03	0.03	0.03
Sat Flow, veh/h	1810	3539	1613	3476	3640	25	3619	0	1598	671	1055	1586
Grp Volume(v), veh/h	28	953	273	485	363	382	310	0	663	18	0	8
Grp Sat Flow(s,veh/h/ln)	1810	1770	1613	1738	1787	1877	1810	0	1598	1727	0	1586
Q Serve(g_s), s	1.4	23.7	6.4	12.2	14.0	14.0	5.1	0.0	30.9	0.9	0.0	0.4
Cycle Q Clear(g_c), s	1.4	23.7	6.4	12.2	14.0	14.0	5.1	0.0	30.9	0.9	0.0	0.4
Prop In Lane	1.00		1.00	1.00		0.01	1.00		1.00	0.39		1.00
Lane Grp Cap(c), veh/h	51	961	1041	480	679	713	1384	0	810	47	0	43
V/C Ratio(X)	0.55	0.99	0.26	1.01	0.53	0.53	0.22	0.00	0.82	0.38	0.00	0.18
Avail Cap(c_a), veh/h	115	961	1041	480	679	713	1384	0	810	78	0	72
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.4	32.1	6.7	38.1	21.3	21.3	18.4	0.0	18.4	42.3	0.0	42.0
Incr Delay (d2), s/veh	3.4	27.0	0.0	43.9	0.4	0.4	0.0	0.0	6.2	1.9	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	15.1	5.9	8.7	6.9	7.3	2.5	0.0	15.0	0.5	0.0	0.2
LnGrp Delay(d),s/veh	45.8	59.1	6.8	82.1	21.8	21.7	18.5	0.0	24.6	44.1	0.0	42.8
LnGrp LOS	D	E	A	F	C	C	B		C	D		D
Approach Vol, veh/h		1254			1230			973			26	
Approach Delay, s/veh		47.4			45.5			22.7			43.7	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	37.6		37.8	16.2	28.0		6.4				
Change Period (Y+Rc), s	* 4.6	5.0		* 5.8	* 4.6	5.0		5.0				
Max Green Setting (Gmax), s	* 5.1	29.5		* 32	* 12	23.0		3.0				
Max Q Clear Time (g_c+I1), s	3.4	16.0		32.9	14.2	25.7		2.9				
Green Ext Time (p_c), s	0.0	4.3		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay		39.8										
HCM 2010 LOS		D										
Notes												

HCM Signalized Intersection Capacity Analysis Cumulative + Project PM - Mitigated.syn
 3: SR 1 & Rio Rd 12/13/2017

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	114	389	69	12	166	426	335	77	622	205	241	437
Future Volume (vph)	114	389	69	12	166	426	335	77	622	205	241	437
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95			0.97	1.00	1.00	1.00	0.95		0.97	0.95
Frbp, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00			0.98	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.96		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1752	3471			3388	1863	1560	1805	3343		3502	3504
Flt Permitted	0.95	1.00			0.33	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1752	3471			1179	1863	1560	1805	3343		3502	3504
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	118	401	71	12	171	439	345	79	641	211	248	451
RTOR Reduction (vph)	0	17	0	0	0	0	200	0	35	0	0	12
Lane Group Flow (vph)	118	455	0	0	183	439	145	79	817	0	248	502
Confl. Peds. (#/hr)			13	16	16		3	13		16	3	
Heavy Vehicles (%)	3%	1%	1%	2%	1%	2%	1%	0%	4%	1%	0%	1%
Turn Type	Prot	NA		custom	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	5	2			1	6		3	8		7	4
Permitted Phases				1			6					
Actuated Green, G (s)	9.1	21.9			12.4	25.2	25.2	6.2	25.2		9.3	28.3
Effective Green, g (s)	8.8	22.1			12.1	25.4	25.4	5.9	26.1		9.0	29.2
Actuated g/C Ratio	0.10	0.26			0.14	0.30	0.30	0.07	0.31		0.11	0.34
Clearance Time (s)	3.7	4.2			3.7	4.2	4.2	3.7	4.9		3.7	4.9
Vehicle Extension (s)	3.0	3.5			3.0	3.5	3.5	3.0	3.5		3.0	3.5
Lane Grp Cap (vph)	180	899			167	554	464	124	1022		369	1199
v/s Ratio Prot	0.07	0.13				c0.24		0.04	c0.24		c0.07	c0.14
v/s Ratio Perm					c0.16	0.09						
v/c Ratio	0.66	0.51			1.10	0.79	0.31	0.64	0.80		0.67	0.42
Uniform Delay, d1	36.8	26.9			36.6	27.5	23.2	38.7	27.2		36.7	21.5
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.3	0.5			97.6	7.8	0.5	10.3	4.6		4.8	0.3
Delay (s)	45.1	27.5			134.2	35.4	23.6	48.9	31.8		41.5	21.8
Level of Service	D	C			F	D	C	D	C		D	C
Approach Delay (s)		31.0				49.9		33.2				28.2
Approach LOS		C				D		C				C
Intersection Summary												
HCM 2000 Control Delay		36.6			HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio		0.83										
Actuated Cycle Length (s)		85.3			Sum of lost time (s)				16.0			
Intersection Capacity Utilization		74.1%			ICU Level of Service				D			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
3: SR 1 & Rio Rd

Cumulative + Project PM - Mitigated.syn
12/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.97
Adj. Flow (vph)	63
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Synchro 9 Report

HCM Signalized Intersection Capacity Analysis
8: SR 1 & Carpenter St

Cumulative + Project PM - Mitigated.syn
12/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	869	18	27	18	6	54	10	1919	19	55	1697	493
Future Volume (vph)	869	18	27	18	6	54	10	1919	19	55	1697	493
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	1.00		0.95	0.95	1.00	1.00	0.91		1.00	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	1727		1715	1761	1524	1805	5073		1805	3574	1599
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	1727		1715	1761	1524	1805	5073		1805	3574	1599
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	887	18	28	18	6	55	10	1958	19	56	1732	503
RTOR Reduction (vph)	0	20	0	0	0	52	0	0	0	0	0	0
Lane Group Flow (vph)	887	26	0	12	12	3	10	1977	0	56	1732	503
Heavy Vehicles (%)	1%	0%	0%	0%	0%	6%	0%	2%	12%	0%	1%	1%
Turn Type	Split	NA		Split	NA	Perm	Prot	NA		Prot	NA	Free
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						Free
Actuated Green, G (s)	38.4	38.4		6.6	6.6	6.6	1.5	72.2		6.3	77.5	141.4
Effective Green, g (s)	39.0	39.0		6.8	6.8	6.8	1.2	73.1		6.5	78.4	141.4
Actuated g/C Ratio	0.28	0.28		0.05	0.05	0.05	0.01	0.52		0.05	0.55	1.00
Clearance Time (s)	4.6	4.6		4.2	4.2	4.2	3.7	4.9		4.2	4.9	
Vehicle Extension (s)	4.5	4.5		4.5	4.5	4.5	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	956	476		82	84	73	15	2622		82	1981	1599
v/s Ratio Prot	c0.26	0.01		0.01	0.01		0.01	0.39		c0.03	c0.48	
v/s Ratio Perm						0.00						c0.31
v/c Ratio	0.93	0.05		0.15	0.14	0.04	0.67	0.75		0.68	0.87	0.31
Uniform Delay, d1	49.8	37.6		64.5	64.5	64.2	69.9	27.0		66.4	27.2	0.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.0	0.1		1.4	1.4	0.4	75.9	1.5		20.9	5.0	0.5
Delay (s)	64.8	37.7		65.9	65.9	64.5	145.8	28.5		87.4	32.3	0.5
Level of Service	E	D		E	E	E	F	C		F	C	A
Approach Delay (s)		63.5			64.9			29.1			26.6	
Approach LOS		E			E			C			C	
Intersection Summary												
HCM 2000 Control Delay				34.6	HCM 2000 Level of Service				C			
HCM 2000 Volume to Capacity ratio				0.88								
Actuated Cycle Length (s)				141.4	Sum of lost time (s)				16.0			
Intersection Capacity Utilization				85.0%	ICU Level of Service				E			
Analysis Period (min)				15								
c Critical Lane Group												

Synchro 9 Report