APPENDIX P

YEAR 2030 TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS – *CALTRANS FACILITIES ANALYSIS (HCM METHODOLOGY)*

APPENDIX P-I

YEAR 2030 WITHOUT PROJECT TRAFFIC CONDITIONS – *CALTRANS INTERSECTION ANALYSIS (HCM METHODOLOGY)*

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑		↰	✣	↱	↰↰	↑↑	↱
Volume (vph)	0	1438	1300	520	1894	0	130	0	789	430	590	20
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		0.91	0.88	0.97	0.91		0.95	0.91	0.95	0.97	0.95	1.00
Frt		1.00	0.85	1.00	1.00		1.00	0.85	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4893	2682	3303	4893		1573	1354	1408	3303	3406	1524
Flt Permitted		1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4893	2682	3303	4893		1573	1354	1408	3303	3406	1524
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1514	1368	547	1994	0	137	0	831	453	621	21
RTOR Reduction (vph)	0	0	298	0	0	0	0	218	218	0	0	16
Lane Group Flow (vph)	0	1514	1070	547	1994	0	123	203	206	453	621	5
Heavy Vehicles (%)	0%	6%	6%	6%	6%	0%	9%	0%	9%	6%	6%	6%
Turn Type			Perm	Prot			Split		Perm	Split		Perm
Protected Phases		2		1	6		8	8		4	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		40.0	40.0	17.0	61.0		17.2	17.2	17.2	29.8	29.8	29.8
Effective Green, g (s)		40.0	40.0	17.0	61.0		17.2	17.2	17.2	29.8	29.8	29.8
Actuated g/C Ratio		0.33	0.33	0.14	0.51		0.14	0.14	0.14	0.25	0.25	0.25
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1631	894	468	2487		225	194	202	820	846	378
v/s Ratio Prot		0.31		c0.17	0.41		0.08	c0.15		0.14	c0.18	
v/s Ratio Perm			c0.40						0.15			0.00
v/c Ratio		0.93	1.20	1.17	0.80		0.55	1.05	1.02	0.55	0.73	0.01
Uniform Delay, d1		38.6	40.0	51.5	24.5		47.8	51.4	51.4	39.3	41.5	34.0
Progression Factor		0.49	0.23	0.65	0.36		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.2	89.7	91.6	2.0		2.7	78.0	69.1	0.8	3.3	0.0
Delay (s)		20.2	99.0	125.2	10.7		50.5	129.4	120.5	40.1	44.8	34.0
Level of Service		C	F	F	B		D	F	F	D	D	C
Approach Delay (s)		57.6			35.4			115.5			42.6	
Approach LOS		E			D			F			D	

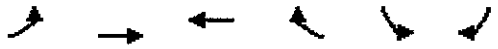
Intersection Summary				
HCM Average Control Delay	55.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	86.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	2628	0	0	1910	430	700	420	630	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	0.97	0.91			0.81	0.81	0.81	0.81				
Frt	1.00	1.00			1.00	0.85	1.00	0.93				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (prot)	3303	4893			5788	1234	1341	5200				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (perm)	3303	4893			5788	1234	1341	5200				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	2766	0	0	2011	453	737	442	663	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	96	0	1	0	0	0	0
Lane Group Flow (vph)	42	2766	0	0	2054	312	383	1458	0	0	0	0
Heavy Vehicles (%)	6%	6%	0%	0%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Prot					Perm	Split					
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	4.8	73.2			64.4	64.4	38.8	38.8				
Effective Green, g (s)	4.8	73.2			64.4	64.4	38.8	38.8				
Actuated g/C Ratio	0.04	0.61			0.54	0.54	0.32	0.32				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	132	2985			3106	662	434	1681				
v/s Ratio Prot	0.01	c0.57			0.35		c0.29	0.28				
v/s Ratio Perm						0.25						
v/c Ratio	0.32	0.93			0.66	0.47	0.88	1.45dr				
Uniform Delay, d1	56.0	21.0			20.0	17.2	38.4	38.2				
Progression Factor	0.74	0.41			0.31	0.10	1.00	1.00				
Incremental Delay, d2	0.6	3.1			0.8	1.7	18.6	5.0				
Delay (s)	42.0	11.8			6.9	3.3	57.1	43.2				
Level of Service	D	B			A	A	E	D				
Approach Delay (s)		12.3			6.3			46.1			0.0	
Approach LOS		B			A			D			A	

Intersection Summary					
HCM Average Control Delay	19.0	HCM Level of Service		B	
HCM Volume to Capacity ratio	0.91				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		8.0	
Intersection Capacity Utilization	79.3%	ICU Level of Service		D	
Analysis Period (min)	15				

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



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↰	↱↱
Volume (vph)	0	2184	1548	0	151	761
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.91	0.91		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		4893	4893		1703	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		4893	4893		1703	2682
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2299	1629	0	159	801
RTOR Reduction (vph)	0	0	0	0	0	24
Lane Group Flow (vph)	0	2299	1629	0	159	777
Heavy Vehicles (%)	0%	6%	6%	0%	6%	6%
Turn Type						Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		72.1	72.1		39.9	39.9
Effective Green, g (s)		72.1	72.1		39.9	39.9
Actuated g/C Ratio		0.60	0.60		0.33	0.33
Clearance Time (s)		4.0	4.0		4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2940	2940		566	892
v/s Ratio Prot		c0.47	0.33		0.09	
v/s Ratio Perm						c0.29
v/c Ratio		0.78	0.55		0.28	0.87
Uniform Delay, d1		18.0	14.3		29.5	37.6
Progression Factor		0.42	0.72		1.00	1.00
Incremental Delay, d2		1.4	0.7		0.3	9.3
Delay (s)		9.0	11.0		29.8	46.9
Level of Service		A	B		C	D
Approach Delay (s)		9.0	11.0		44.1	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑↑			↑↑↑↑	↰↰↰	↱
Volume (vph)	1961	0	0	1570	367	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.81			0.86	0.97	0.91
Frt	1.00			1.00	0.94	0.85
Flt Protected	1.00			1.00	0.97	1.00
Satd. Flow (prot)	7259			6166	3184	1386
Flt Permitted	1.00			1.00	0.97	1.00
Satd. Flow (perm)	7259			6166	3184	1386
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2064	0	0	1653	386	514
RTOR Reduction (vph)	0	0	0	0	2	2
Lane Group Flow (vph)	2064	0	0	1653	610	286
Heavy Vehicles (%)	6%	0%	0%	6%	6%	6%
Turn Type						Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	79.7			79.7	32.3	32.3
Effective Green, g (s)	79.7			79.7	32.3	32.3
Actuated g/C Ratio	0.66			0.66	0.27	0.27
Clearance Time (s)	4.0			4.0	4.0	4.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	4821			4095	857	373
v/s Ratio Prot	c0.28			0.27	0.19	
v/s Ratio Perm						c0.21
v/c Ratio	0.43			0.40	0.71	0.77
Uniform Delay, d1	9.5			9.2	39.6	40.4
Progression Factor	0.47			0.36	1.00	1.00
Incremental Delay, d2	0.2			0.0	2.8	9.1
Delay (s)	4.6			3.3	42.4	49.5
Level of Service	A			A	D	D
Approach Delay (s)	4.6			3.3	44.7	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	12.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1906	1110	770	2417	0	200	0	207	520	150	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	0.88	0.97	0.91		0.95	0.91	0.95	0.97	0.95	
Frt		1.00	0.85	1.00	1.00		1.00	0.92	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (prot)		4893	2682	3303	4893		1573	1421	1408	3303	3406	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (perm)		4893	2682	3303	4893		1573	1421	1408	3303	3406	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2006	1168	811	2544	0	211	0	218	547	158	0
RTOR Reduction (vph)	0	0	513	0	0	0	0	36	118	0	0	0
Lane Group Flow (vph)	0	2006	655	811	2544	0	148	108	19	547	158	0
Heavy Vehicles (%)	0%	6%	6%	6%	6%	0%	9%	0%	9%	6%	6%	6%
Turn Type			Perm	Prot			Split		Perm	Split		Perm
Protected Phases		2		1	6		8	8		4	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		40.0	40.0	21.0	65.0		16.4	16.4	16.4	26.6	26.6	
Effective Green, g (s)		40.0	40.0	21.0	65.0		16.4	16.4	16.4	26.6	26.6	
Actuated g/C Ratio		0.33	0.33	0.18	0.54		0.14	0.14	0.14	0.22	0.22	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1631	894	578	2650		215	194	192	732	755	
v/s Ratio Prot		c0.41		c0.25	0.52		c0.09	0.08		c0.17	0.05	
v/s Ratio Perm			0.24						0.01			
v/c Ratio		1.23	0.73	1.40	0.96		0.69	0.56	0.10	0.75	0.21	
Uniform Delay, d1		40.0	35.3	49.5	26.3		49.4	48.4	45.3	43.6	38.1	
Progression Factor		0.58	0.26	0.79	0.61		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		104.0	0.5	182.4	1.4		8.8	3.4	0.2	4.2	0.1	
Delay (s)		127.3	9.8	221.3	17.4		58.2	51.8	45.5	47.7	38.3	
Level of Service		F	A	F	B		E	D	D	D	D	
Approach Delay (s)		84.1			66.7			52.0			45.6	
Approach LOS		F			E			D			D	

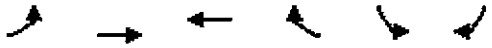
Intersection Summary			
HCM Average Control Delay	71.1	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	2575	0	0	2792	950	860	1680	360	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	0.97	0.91			0.81	0.81	0.81	0.81				
Frt	1.00	1.00			0.99	0.85	1.00	0.98				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (prot)	3303	4893			5727	1234	1341	5483				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (perm)	3303	4893			5727	1234	1341	5483				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	2711	0	0	2939	1000	905	1768	379	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	17	0	1	0	0	0	0
Lane Group Flow (vph)	53	2711	0	0	3226	683	606	2445	0	0	0	0
Heavy Vehicles (%)	6%	6%	0%	0%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Prot					Perm	Split					
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	4.8	66.0			57.2	57.2	46.0	46.0				
Effective Green, g (s)	4.8	66.0			57.2	57.2	46.0	46.0				
Actuated g/C Ratio	0.04	0.55			0.48	0.48	0.38	0.38				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	132	2691			2730	588	514	2102				
v/s Ratio Prot	0.02	c0.55			c0.56		c0.45	0.45				
v/s Ratio Perm						0.55						
v/c Ratio	0.40	1.01			1.18	1.16	1.18	1.16				
Uniform Delay, d1	56.2	27.0			31.4	31.4	37.0	37.0				
Progression Factor	0.69	0.39			0.33	0.33	1.00	1.00				
Incremental Delay, d2	0.2	7.2			82.2	74.4	99.3	79.2				
Delay (s)	39.1	17.7			92.6	84.7	136.3	116.2				
Level of Service	D	B			F	F	F	F				
Approach Delay (s)		18.1			91.2			120.2			0.0	
Approach LOS		B			F			F			A	

Intersection Summary			
HCM Average Control Delay	79.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↰	↱↑
Volume (vph)	0	2207	2387	0	195	584
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.91	0.91		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		4893	4893		1703	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		4893	4893		1703	2682
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2323	2513	0	205	615
RTOR Reduction (vph)	0	0	0	0	0	5
Lane Group Flow (vph)	0	2323	2513	0	205	610
Heavy Vehicles (%)	0%	6%	6%	0%	6%	6%
Turn Type						Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		79.9	79.9		32.1	32.1
Effective Green, g (s)		79.9	79.9		32.1	32.1
Actuated g/C Ratio		0.67	0.67		0.27	0.27
Clearance Time (s)		4.0	4.0		4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3258	3258		456	717
v/s Ratio Prot		0.47	c0.51		0.12	
v/s Ratio Perm						c0.23
v/c Ratio		0.71	0.77		0.45	0.85
Uniform Delay, d1		12.8	13.8		36.6	41.7
Progression Factor		0.43	0.32		1.00	1.00
Incremental Delay, d2		0.6	1.3		0.7	9.5
Delay (s)		6.1	5.7		37.3	51.2
Level of Service		A	A		D	D
Approach Delay (s)		6.1	5.7		47.7	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	12.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑			↑↑↑↑	↰↰	↱
Volume (vph)	1798	0	0	2884	305	453
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.81			0.86	0.97	0.91
Frt	1.00			1.00	0.94	0.85
Flt Protected	1.00			1.00	0.97	1.00
Satd. Flow (prot)	7259			6166	3170	1386
Flt Permitted	1.00			1.00	0.97	1.00
Satd. Flow (perm)	7259			6166	3170	1386
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1893	0	0	3036	321	477
RTOR Reduction (vph)	0	0	0	0	16	16
Lane Group Flow (vph)	1893	0	0	3036	529	237
Heavy Vehicles (%)	6%	0%	0%	6%	6%	6%
Turn Type						Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	85.2			85.2	26.8	26.8
Effective Green, g (s)	85.2			85.2	26.8	26.8
Actuated g/C Ratio	0.71			0.71	0.22	0.22
Clearance Time (s)	4.0			4.0	4.0	4.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	5154			4378	708	310
v/s Ratio Prot	0.26			c0.49	0.17	
v/s Ratio Perm						c0.17
v/c Ratio	0.37			0.69	0.75	0.77
Uniform Delay, d1	6.8			9.9	43.4	43.7
Progression Factor	1.61			0.66	1.00	1.00
Incremental Delay, d2	0.1			0.1	4.3	10.8
Delay (s)	11.1			6.7	47.8	54.4
Level of Service	B			A	D	D
Approach Delay (s)	11.1			6.7	49.9	
Approach LOS	B			A	D	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX P-II

YEAR 2030 WITH PROJECT TRAFFIC CONDITIONS – *CALTRANS INTERSECTION ANALYSIS (HCM METHODOLOGY)*

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑		↰	✣	↱	↰↰	↑↑	↱
Volume (vph)	0	1470	1300	520	1900	0	130	0	810	430	590	20
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		0.91	0.88	0.97	0.91		0.95	0.91	0.95	0.97	0.95	1.00
Frt		1.00	0.85	1.00	1.00		1.00	0.85	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4893	2682	3303	4893		1573	1354	1408	3303	3406	1524
Flt Permitted		1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4893	2682	3303	4893		1573	1354	1408	3303	3406	1524
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1547	1368	547	2000	0	137	0	853	453	621	21
RTOR Reduction (vph)	0	0	278	0	0	0	0	217	217	0	0	16
Lane Group Flow (vph)	0	1547	1090	547	2000	0	123	215	218	453	621	5
Heavy Vehicles (%)	0%	6%	6%	6%	6%	0%	9%	0%	9%	6%	6%	6%
Turn Type			Perm	Prot			Split		Perm	Split		Perm
Protected Phases		2		1	6		8	8		4	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		41.0	41.0	17.0	62.0		16.2	16.2	16.2	29.8	29.8	29.8
Effective Green, g (s)		41.0	41.0	17.0	62.0		16.2	16.2	16.2	29.8	29.8	29.8
Actuated g/C Ratio		0.34	0.34	0.14	0.52		0.13	0.13	0.13	0.25	0.25	0.25
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1672	916	468	2528		212	183	190	820	846	378
v/s Ratio Prot		0.32		c0.17	0.41		0.08	c0.16		0.14	c0.18	
v/s Ratio Perm			c0.41						0.15			0.00
v/c Ratio		0.93	1.19	1.17	0.79		0.58	1.17	1.15	0.55	0.73	0.01
Uniform Delay, d1		38.0	39.5	51.5	23.7		48.7	51.9	51.9	39.3	41.5	34.0
Progression Factor		0.46	0.21	0.65	0.35		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.2	86.3	91.6	1.9		4.0	121.3	110.3	0.8	3.3	0.0
Delay (s)		18.6	94.6	125.0	10.1		52.7	173.2	162.2	40.1	44.8	34.0
Level of Service		B	F	F	B		D	F	F	D	D	C
Approach Delay (s)		54.3			34.7			153.4			42.6	
Approach LOS		D			C			F			D	

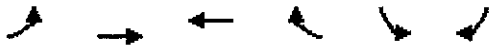
Intersection Summary				
HCM Average Control Delay	59.0	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.05			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	88.1%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	2680	0	0	1920	430	700	420	630	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	0.97	0.91			0.81	0.81	0.81	0.81				
Frt	1.00	1.00			1.00	0.85	1.00	0.93				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (prot)	3303	4893			5789	1234	1341	5200				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (perm)	3303	4893			5789	1234	1341	5200				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	2821	0	0	2021	453	737	442	663	0	0	0
RTOR Reduction (vph)	0	0	0	0	2	96	0	1	0	0	0	0
Lane Group Flow (vph)	42	2821	0	0	2064	312	383	1458	0	0	0	0
Heavy Vehicles (%)	6%	6%	0%	0%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Prot					Perm	Split					
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	4.8	73.2			64.4	64.4	38.8	38.8				
Effective Green, g (s)	4.8	73.2			64.4	64.4	38.8	38.8				
Actuated g/C Ratio	0.04	0.61			0.54	0.54	0.32	0.32				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	132	2985			3107	662	434	1681				
v/s Ratio Prot	0.01	c0.58			0.36		c0.29	0.28				
v/s Ratio Perm						0.25						
v/c Ratio	0.32	0.95			0.66	0.47	0.88	1.45dr				
Uniform Delay, d1	56.0	21.5			20.0	17.2	38.4	38.2				
Progression Factor	0.74	0.41			0.31	0.10	1.00	1.00				
Incremental Delay, d2	0.6	3.8			0.8	1.6	18.6	5.0				
Delay (s)	42.2	12.7			6.9	3.3	57.1	43.2				
Level of Service	D	B			A	A	E	D				
Approach Delay (s)		13.1			6.3			46.1			0.0	
Approach LOS		B			A			D			A	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

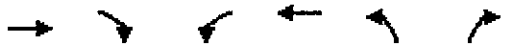
dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↰	↱↱
Volume (vph)	0	2250	1560	0	350	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.91	0.91		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		4893	4893		1703	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		4893	4893		1703	2682
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2368	1642	0	368	789
RTOR Reduction (vph)	0	0	0	0	0	27
Lane Group Flow (vph)	0	2368	1642	0	368	762
Heavy Vehicles (%)	0%	6%	6%	0%	6%	6%
Turn Type						Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		72.9	72.9		39.1	39.1
Effective Green, g (s)		72.9	72.9		39.1	39.1
Actuated g/C Ratio		0.61	0.61		0.33	0.33
Clearance Time (s)		4.0	4.0		4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		2972	2972		555	874
v/s Ratio Prot		c0.48	0.34		0.22	
v/s Ratio Perm						c0.28
v/c Ratio		0.80	0.55		0.66	0.87
Uniform Delay, d1		17.9	13.9		34.8	38.1
Progression Factor		0.44	0.71		1.00	1.00
Incremental Delay, d2		1.7	0.7		3.0	9.5
Delay (s)		9.5	10.5		37.8	47.6
Level of Service		A	B		D	D
Approach Delay (s)		9.5	10.5		44.5	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑↑			↑↑↑↑	↰↰	↱
Volume (vph)	2240	0	0	1670	360	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.81			0.86	0.97	0.91
Frt	1.00			1.00	0.93	0.85
Flt Protected	1.00			1.00	0.97	1.00
Satd. Flow (prot)	7259			6166	3154	1386
Flt Permitted	1.00			1.00	0.97	1.00
Satd. Flow (perm)	7259			6166	3154	1386
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2358	0	0	1758	379	642
RTOR Reduction (vph)	0	0	0	0	1	1
Lane Group Flow (vph)	2358	0	0	1758	693	326
Heavy Vehicles (%)	6%	0%	0%	6%	6%	6%
Turn Type						Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	76.1			76.1	35.9	35.9
Effective Green, g (s)	76.1			76.1	35.9	35.9
Actuated g/C Ratio	0.63			0.63	0.30	0.30
Clearance Time (s)	4.0			4.0	4.0	4.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	4603			3910	944	415
v/s Ratio Prot	c0.32			0.29	0.22	
v/s Ratio Perm						c0.23
v/c Ratio	0.51			0.45	0.73	0.78
Uniform Delay, d1	11.9			11.2	37.8	38.5
Progression Factor	0.44			1.11	1.00	1.00
Incremental Delay, d2	0.3			0.0	3.0	9.4
Delay (s)	5.5			12.5	40.7	47.9
Level of Service	A			B	D	D
Approach Delay (s)	5.5			12.5	43.0	
Approach LOS	A			B	D	

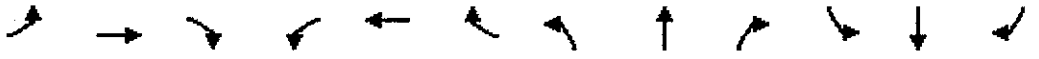
Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱↱	↰↰	↑↑↑		↰	✥	↱	↰↰	↑↑	↱
Volume (vph)	0	1910	1110	770	2440	0	200	0	210	520	150	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.91	0.88	0.97	0.91		0.95	0.91	0.95	0.97	0.95	
Frt		1.00	0.85	1.00	1.00		1.00	0.91	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (prot)		4893	2682	3303	4893		1573	1419	1408	3303	3406	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (perm)		4893	2682	3303	4893		1573	1419	1408	3303	3406	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2011	1168	811	2568	0	211	0	221	547	158	0
RTOR Reduction (vph)	0	0	513	0	0	0	0	39	118	0	0	0
Lane Group Flow (vph)	0	2011	655	811	2568	0	150	106	19	547	158	0
Heavy Vehicles (%)	0%	6%	6%	6%	6%	0%	9%	0%	9%	6%	6%	6%
Turn Type			Perm	Prot			Split		Perm	Split		Perm
Protected Phases		2		1	6		8	8		4	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		40.0	40.0	21.0	65.0		16.4	16.4	16.4	26.6	26.6	
Effective Green, g (s)		40.0	40.0	21.0	65.0		16.4	16.4	16.4	26.6	26.6	
Actuated g/C Ratio		0.33	0.33	0.18	0.54		0.14	0.14	0.14	0.22	0.22	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1631	894	578	2650		215	194	192	732	755	
v/s Ratio Prot		c0.41		c0.25	0.52		c0.10	0.07		c0.17	0.05	
v/s Ratio Perm			0.24						0.01			
v/c Ratio		1.23	0.73	1.40	0.97		0.70	0.55	0.10	0.75	0.21	
Uniform Delay, d1		40.0	35.3	49.5	26.5		49.4	48.3	45.3	43.6	38.1	
Progression Factor		0.53	0.25	0.79	0.61		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		105.4	0.5	182.4	1.7		9.5	3.1	0.2	4.2	0.1	
Delay (s)		126.6	9.3	221.3	17.9		58.9	51.5	45.5	47.7	38.3	
Level of Service		F	A	F	B		E	D	D	D	D	
Approach Delay (s)		83.5			66.7			52.2			45.6	
Approach LOS		F			E			D			D	

Intersection Summary				
HCM Average Control Delay	70.9	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	94.7%	ICU Level of Service	F	
Analysis Period (min)	15			

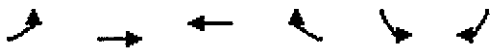
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	2580	0	0	2830	950	860	1680	360	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	0.97	0.91			0.81	0.81	0.81	0.81				
Frt	1.00	1.00			0.99	0.85	1.00	0.98				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (prot)	3303	4893			5728	1234	1341	5483				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (perm)	3303	4893			5728	1234	1341	5483				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	2716	0	0	2979	1000	905	1768	379	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	17	0	1	0	0	0	0
Lane Group Flow (vph)	53	2716	0	0	3266	683	606	2445	0	0	0	0
Heavy Vehicles (%)	6%	6%	0%	0%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Prot					Perm	Split					
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	4.8	66.0			57.2	57.2	46.0	46.0				
Effective Green, g (s)	4.8	66.0			57.2	57.2	46.0	46.0				
Actuated g/C Ratio	0.04	0.55			0.48	0.48	0.38	0.38				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	132	2691			2730	588	514	2102				
v/s Ratio Prot	0.02	c0.56			c0.57		c0.45	0.45				
v/s Ratio Perm						0.55						
v/c Ratio	0.40	1.01			1.20	1.16	1.18	1.16				
Uniform Delay, d1	56.2	27.0			31.4	31.4	37.0	37.0				
Progression Factor	0.69	0.39			0.31	0.31	1.00	1.00				
Incremental Delay, d2	0.2	7.7			88.8	74.4	99.3	79.2				
Delay (s)	39.1	18.2			98.6	84.3	136.3	116.2				
Level of Service	D	B			F	F	F	F				
Approach Delay (s)		18.6			96.1			120.2			0.0	
Approach LOS		B			F			F			A	

Intersection Summary			
HCM Average Control Delay	81.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↰	↱↱
Volume (vph)	0	2190	2430	0	240	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.91	0.91		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		4893	4893		1703	2682
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		4893	4893		1703	2682
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2305	2558	0	253	589
RTOR Reduction (vph)	0	0	0	0	0	6
Lane Group Flow (vph)	0	2305	2558	0	253	583
Heavy Vehicles (%)	0%	6%	6%	0%	6%	6%
Turn Type						Perm
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		81.1	81.1		30.9	30.9
Effective Green, g (s)		81.1	81.1		30.9	30.9
Actuated g/C Ratio		0.68	0.68		0.26	0.26
Clearance Time (s)		4.0	4.0		4.0	4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)		3307	3307		439	691
v/s Ratio Prot		0.47	c0.52		0.15	
v/s Ratio Perm						c0.22
v/c Ratio		0.70	0.77		0.58	0.84
Uniform Delay, d1		11.9	13.2		38.8	42.3
Progression Factor		0.48	0.36		1.00	1.00
Incremental Delay, d2		0.6	1.2		1.8	9.3
Delay (s)		6.2	5.9		40.7	51.5
Level of Service		A	A		D	D
Approach Delay (s)		6.2	5.9		48.3	
Approach LOS		A	A		D	

Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑↑			↑↑↑↑	↰↑↑	↱
Volume (vph)	1850	0	0	3200	290	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	4.0
Lane Util. Factor	0.81			0.86	0.97	0.91
Frt	1.00			1.00	0.93	0.85
Flt Protected	1.00			1.00	0.97	1.00
Satd. Flow (prot)	7259			6166	3157	1386
Flt Permitted	1.00			1.00	0.97	1.00
Satd. Flow (perm)	7259			6166	3157	1386
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1947	0	0	3368	305	505
RTOR Reduction (vph)	0	0	0	0	16	16
Lane Group Flow (vph)	1947	0	0	3368	536	242
Heavy Vehicles (%)	6%	0%	0%	6%	6%	6%
Turn Type						Perm
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	85.6			85.6	26.4	26.4
Effective Green, g (s)	85.6			85.6	26.4	26.4
Actuated g/C Ratio	0.71			0.71	0.22	0.22
Clearance Time (s)	4.0			4.0	4.0	4.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	5178			4398	695	305
v/s Ratio Prot	0.27			c0.55	0.17	
v/s Ratio Perm						c0.17
v/c Ratio	0.38			0.77	0.77	0.79
Uniform Delay, d1	6.7			10.9	44.0	44.2
Progression Factor	1.48			0.90	1.00	1.00
Incremental Delay, d2	0.2			0.1	5.3	13.3
Delay (s)	10.1			9.9	49.3	57.5
Level of Service	B			A	D	E
Approach Delay (s)	10.1			9.9	51.9	
Approach LOS	B			A	D	

Intersection Summary			
HCM Average Control Delay	15.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX P-III

YEAR 2030 WITH PROJECT WITH MITIGATION TRAFFIC CONDITIONS – *CALTRANS INTERSECTION ANALYSIS (HCM METHODOLOGY)*

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑↑	↱↱	↰↰	↑↑↑↑		↰	✣	↱	↰↰	↑↑	↱
Volume (vph)	0	1470	1300	520	1900	0	130	0	810	430	590	20
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		0.86	0.88	0.97	0.86		0.95	0.91	0.95	0.97	0.95	1.00
Frt		1.00	0.85	1.00	1.00		1.00	0.85	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		6166	2682	3303	6166		1573	1354	1408	3303	3406	1524
Flt Permitted		1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		6166	2682	3303	6166		1573	1354	1408	3303	3406	1524
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1547	1368	547	2000	0	137	0	853	453	621	21
RTOR Reduction (vph)	0	0	38	0	0	0	0	230	230	0	0	16
Lane Group Flow (vph)	0	1547	1330	547	2000	0	123	202	205	453	621	5
Heavy Vehicles (%)	0%	6%	6%	6%	6%	0%	9%	0%	9%	6%	6%	6%
Turn Type			pm+ov	Prot			Split		Perm	Split		Perm
Protected Phases		2	8	1	6		8	8		4	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		29.0	56.2	18.0	51.0		27.2	27.2	27.2	29.8	29.8	29.8
Effective Green, g (s)		29.0	56.2	18.0	51.0		27.2	27.2	27.2	29.8	29.8	29.8
Actuated g/C Ratio		0.24	0.47	0.15	0.42		0.23	0.23	0.23	0.25	0.25	0.25
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1490	1345	495	2621		357	307	319	820	846	378
v/s Ratio Prot		0.25	c0.22	c0.17	0.32		0.08	0.15		0.14	c0.18	
v/s Ratio Perm			0.27						0.15			0.00
v/c Ratio		1.04	0.99	1.11	0.76		0.34	0.66	0.64	0.55	0.73	0.01
Uniform Delay, d1		45.5	31.6	51.0	29.4		38.9	42.2	42.0	39.3	41.5	34.0
Progression Factor		0.49	0.20	0.62	0.41		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		19.8	5.1	67.7	1.7		0.6	5.0	4.4	0.8	3.3	0.0
Delay (s)		42.2	11.5	99.3	13.6		39.5	47.1	46.3	40.1	44.8	34.0
Level of Service		D	B	F	B		D	D	D	D	D	C
Approach Delay (s)		27.8			32.0			45.8			42.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM Average Control Delay	33.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	2680	0	0	1920	430	700	420	630	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	0.97	0.86			0.76	0.76	0.81	0.81				
Frt	1.00	1.00			0.99	0.85	1.00	0.93				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (prot)	3303	6166			6767	1158	1341	5200				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (perm)	3303	6166			6767	1158	1341	5200				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	2821	0	0	2021	453	737	442	663	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	140	0	1	0	0	0	0
Lane Group Flow (vph)	42	2821	0	0	2106	222	383	1458	0	0	0	0
Heavy Vehicles (%)	6%	6%	0%	0%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Prot					Perm	Split					
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	4.8	66.7			57.9	57.9	45.3	45.3				
Effective Green, g (s)	4.8	66.7			57.9	57.9	45.3	45.3				
Actuated g/C Ratio	0.04	0.56			0.48	0.48	0.38	0.38				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	132	3427			3265	559	506	1963				
v/s Ratio Prot	0.01	c0.46			0.31		c0.29	0.28				
v/s Ratio Perm						0.19						
v/c Ratio	0.32	0.82			0.65	0.40	0.76	1.25dr				
Uniform Delay, d1	56.0	21.8			23.3	19.9	32.6	32.3				
Progression Factor	0.71	0.49			0.33	0.05	1.00	1.00				
Incremental Delay, d2	0.6	1.1			0.7	1.4	6.4	1.6				
Delay (s)	40.6	11.7			8.4	2.5	38.9	33.9				
Level of Service	D	B			A	A	D	C				
Approach Delay (s)		12.1			7.5			34.9			0.0	
Approach LOS		B			A			C			A	

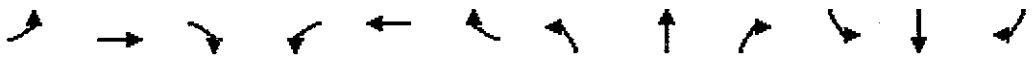
Intersection Summary			
HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1910	1110	770	2440	0	200	0	210	520	150	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.86	0.88	0.97	0.86		0.95	0.91	0.95	0.97	0.95	
Frt		1.00	0.85	1.00	1.00		1.00	0.91	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (prot)		6166	2682	3303	6166		1573	1419	1408	3303	3406	
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00	0.95	1.00	
Satd. Flow (perm)		6166	2682	3303	6166		1573	1419	1408	3303	3406	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	2011	1168	811	2568	0	211	0	221	547	158	0
RTOR Reduction (vph)	0	0	157	0	0	0	0	41	121	0	0	0
Lane Group Flow (vph)	0	2011	1011	811	2568	0	150	104	16	547	158	0
Heavy Vehicles (%)	0%	6%	6%	6%	6%	0%	9%	0%	9%	6%	6%	6%
Turn Type			pm+ov	Prot			Split		Perm	Split		Perm
Protected Phases		2	8	1	6		8	8		4	4	
Permitted Phases			2						8			4
Actuated Green, G (s)		39.0	53.3	29.0	72.0		14.3	14.3	14.3	21.7	21.7	
Effective Green, g (s)		39.0	53.3	29.0	72.0		14.3	14.3	14.3	21.7	21.7	
Actuated g/C Ratio		0.32	0.44	0.24	0.60		0.12	0.12	0.12	0.18	0.18	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		2004	1281	798	3700		187	169	168	597	616	
v/s Ratio Prot		c0.33	c0.09	c0.25	0.42		0.10	0.07		c0.17	0.05	
v/s Ratio Perm			0.28						0.01			
v/c Ratio		1.00	0.79	1.02	0.69		0.80	0.61	0.10	0.92	0.26	
Uniform Delay, d1		40.5	28.5	45.5	16.5		51.5	50.2	47.1	48.3	42.2	
Progression Factor		0.52	0.17	0.56	0.25		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		6.9	0.3	14.0	0.1		21.4	6.4	0.3	18.8	0.2	
Delay (s)		28.0	5.1	39.5	4.2		72.9	56.7	47.4	67.1	42.4	
Level of Service		C	A	D	A		E	E	D	E	D	
Approach Delay (s)		19.6			12.6			59.3			61.6	
Approach LOS		B			B			E			E	

Intersection Summary				
HCM Average Control Delay	22.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	85.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	2580	0	0	2830	950	860	1680	360	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Lane Util. Factor	0.97	0.86			0.76	0.76	0.81	0.81				
Frt	1.00	1.00			0.98	0.85	1.00	0.98				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (prot)	3303	6166			6688	1158	1341	5483				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99				
Satd. Flow (perm)	3303	6166			6688	1158	1341	5483				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	2716	0	0	2979	1000	905	1768	379	0	0	0
RTOR Reduction (vph)	0	0	0	0	17	17	0	1	0	0	0	0
Lane Group Flow (vph)	53	2716	0	0	3372	573	606	2445	0	0	0	0
Heavy Vehicles (%)	6%	6%	0%	0%	6%	6%	9%	9%	9%	0%	0%	0%
Turn Type	Prot					Perm	Split					
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	4.8	64.0			55.2	55.2	48.0	48.0				
Effective Green, g (s)	4.8	64.0			55.2	55.2	48.0	48.0				
Actuated g/C Ratio	0.04	0.53			0.46	0.46	0.40	0.40				
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0				
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0				
Lane Grp Cap (vph)	132	3289			3076	533	536	2193				
v/s Ratio Prot	0.02	c0.44			c0.50		c0.45	0.45				
v/s Ratio Perm						0.49						
v/c Ratio	0.40	0.83			1.10	1.07	1.13	1.12				
Uniform Delay, d1	56.2	23.4			32.4	32.4	36.0	36.0				
Progression Factor	0.60	0.25			0.28	0.29	1.00	1.00				
Incremental Delay, d2	0.7	0.8			43.9	37.5	80.1	58.8				
Delay (s)	34.3	6.6			53.1	47.0	116.1	94.8				
Level of Service	C	A			D	D	F	F				
Approach Delay (s)		7.1			52.2			99.0			0.0	
Approach LOS		A			D			F			A	

Intersection Summary				
HCM Average Control Delay	54.0	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.08			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	87.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group