Existing Plus Project Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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		0.91		1.00	0.91					0.95	0.91	0.95
Frt		0.98		1.00	1.00					1.00	0.95	0.85
Flt Protected		1.00		0.95	1.00					0.95	0.97	1.00
Satd. Flow (prot)		4984		1770	5085					1681	1564	1504
Flt Permitted		1.00		0.95	1.00					0.95	0.97	1.00
Satd. Flow (perm)		4984		1770	5085					1681	1564	1504
Volume (vph)	0	1752	268	388	932	0	0	0	0	396	0	399
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)	0	1904	291	422	1013	0	0	0	0	430	0	434
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	13	153
Lane Group Flow (vph)	0	2178	0	422	1013	0	0	0	0	248	248	202
Turn Type				Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases												4
Actuated Green, G (s)		57.2		29.7	90.9					21.1	21.1	21.1
Effective Green, g (s)		57.2		29.7	90.9					21.1	21.1	21.1
Actuated g/C Ratio		0.48		0.25	0.76					0.18	0.18	0.18
Clearance Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2376		438	3852					296	275	264
v/s Ratio Prot		c0.44		c0.24	0.20					0.15	c0.16	
v/s Ratio Perm												0.13
v/c Ratio		0.92		0.96	0.26					0.84	0.90	0.76
Uniform Delay, d1		29.2		44.6	4.4					47.8	48.4	47.1
Progression Factor		1.00		0.26	0.57					1.00	1.00	1.00
Incremental Delay, d2		7.0		15.4	0.1					18.3	30.0	12.3
Delay (s)		36.2		27.2	2.6					66.1	78.4	59.4
Level of Service		D		C	A					E	E	E
Approach Delay (s)		36.2			9.8			0.0			67.1	
Approach LOS		D			A			A			E	

Intersection Summary			
HCM Average Control Delay	33.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	1.00	0.91			0.91		0.95	0.91	0.95			
Frt	1.00	1.00			0.95		1.00	0.90	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.98	1.00			
Satd. Flow (prot)	1770	5085			4847		1681	1505	1504			
Flt Permitted	0.95	1.00			1.00		0.95	0.98	1.00			
Satd. Flow (perm)	1770	5085			4847		1681	1505	1504			
Volume (vph)	690	1458	0	0	1135	514	185	0	259	0	0	0
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)	750	1585	0	0	1234	559	201	0	282	0	0	0
RTOR Reduction (vph)	0	0	0	0	66	0	0	54	69	0	0	0
Lane Group Flow (vph)	750	1585	0	0	1727	0	139	118	103	0	0	0
Turn Type	Prot						Split		Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases									8			
Actuated Green, G (s)	50.0	98.2			44.2		13.8	13.8	13.8			
Effective Green, g (s)	50.0	98.2			44.2		13.8	13.8	13.8			
Actuated g/C Ratio	0.42	0.82			0.37		0.12	0.12	0.12			
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)	738	4161			1785		193	173	173			
v/s Ratio Prot	c0.42	0.31			c0.36		c0.08	0.08				
v/s Ratio Perm									0.07			
v/c Ratio	1.02	0.38			0.97		0.72	0.68	0.60			
Uniform Delay, d1	35.0	2.9			37.2		51.2	51.0	50.4			
Progression Factor	0.14	0.15			1.00		1.00	1.00	1.00			
Incremental Delay, d2	24.7	0.1			14.9		12.4	10.6	5.4			
Delay (s)	29.7	0.5			52.0		63.6	61.6	55.9			
Level of Service	C	A			D		E	E	E			
Approach Delay (s)		9.9			52.0			60.1			0.0	
Approach LOS		A			D			E			A	

Intersection Summary			
HCM Average Control Delay	31.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱	↰	↑↑					↰		↱
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		0.91	1.00	1.00	0.95					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5085	1583	1770	3539					1770		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	1770	3539					1770		1583
Volume (vph)	0	932	480	194	746	0	0	0	0	146	0	424
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)	0	1013	522	211	811	0	0	0	0	159	0	461
RTOR Reduction (vph)	0	0	323	0	0	0	0	0	0	0	0	141
Lane Group Flow (vph)	0	1013	199	211	811	0	0	0	0	159	0	320
Turn Type			Perm	Prot						custom		custom
Protected Phases		2		1	6							
Permitted Phases			2							4		4
Actuated Green, G (s)		24.8	24.8	12.6	41.4					15.6		15.6
Effective Green, g (s)		24.8	24.8	12.6	41.4					15.6		15.6
Actuated g/C Ratio		0.38	0.38	0.19	0.64					0.24		0.24
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1940	604	343	2254					425		380
v/s Ratio Prot		c0.20		c0.12	0.23							
v/s Ratio Perm			0.13							0.09		c0.20
v/c Ratio		0.52	0.33	0.62	0.36					0.37		0.84
Uniform Delay, d1		15.5	14.2	24.0	5.6					20.6		23.5
Progression Factor		1.00	1.00	0.18	0.24					1.00		1.00
Incremental Delay, d2		1.0	1.5	2.4	0.3					0.6		15.5
Delay (s)		16.5	15.7	6.8	1.6					21.2		39.1
Level of Service		B	B	A	A					C		D
Approach Delay (s)		16.2			2.7			0.0			34.5	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1770		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1770	3539			3539	1583	1770		1583			
Volume (vph)	473	605	0	0	580	144	360	0	195	0	0	0
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)	514	658	0	0	630	157	391	0	212	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	116	0	0	160	0	0	0
Lane Group Flow (vph)	514	658	0	0	630	41	391	0	52	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6							
Permitted Phases						6	8		8			
Actuated Green, G (s)	20.3	41.2			16.9	16.9	15.8		15.8			
Effective Green, g (s)	20.3	41.2			16.9	16.9	15.8		15.8			
Actuated g/C Ratio	0.31	0.63			0.26	0.26	0.24		0.24			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	553	2243			920	412	430		385			
v/s Ratio Prot	c0.29	0.19			c0.18							
v/s Ratio Perm						0.03	c0.22		0.03			
v/c Ratio	0.93	0.29			0.68	0.10	0.91		0.13			
Uniform Delay, d1	21.7	5.4			21.7	18.3	23.9		19.2			
Progression Factor	0.31	0.14			1.00	1.00	1.00		1.00			
Incremental Delay, d2	20.1	0.3			4.1	0.5	22.7		0.2			
Delay (s)	26.7	1.1			25.8	18.7	46.6		19.4			
Level of Service	C	A			C	B	D		B			
Approach Delay (s)		12.3			24.4			37.0			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	274	159	161	51	57	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	298	173	175	55	62	217
Pedestrians			100			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			8			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	230				1071	203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	230				1071	203
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	78				64	74
cM capacity (veh/h)	1337				174	838

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	298	173	230	279
Volume Left	298	0	0	62
Volume Right	0	0	55	217
cSH	1337	1700	1700	454
Volume to Capacity	0.22	0.10	0.14	0.62
Queue Length 95th (ft)	21	0	0	101
Control Delay (s)	8.5	0.0	0.0	24.8
Lane LOS	A			C
Approach Delay (s)	5.4		0.0	24.8
Approach LOS				C

Intersection Summary			
Average Delay	9.6		
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	8	15	16	177	184	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	16	17	192	200	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	435	208	215			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	435	208	215			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	571	833	1355			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	25	210	215
Volume Left	9	17	0
Volume Right	16	0	15
cSH	718	1355	1700
Volume to Capacity	0.03	0.01	0.13
Queue Length 95th (ft)	3	1	0
Control Delay (s)	10.2	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	10.2	0.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.75	1.00	1.00	0.73	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1397	1863	1583	1369	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	123	31	131	13	11	16	75	175	16	49	384	118
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)	134	34	142	14	12	17	82	190	17	53	417	128
RTOR Reduction (vph)	0	0	113	0	0	14	0	0	8	0	0	62
Lane Group Flow (vph)	134	34	29	14	12	3	82	190	9	53	417	66
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	10.8	10.8	10.8	10.8	10.8	10.8	2.8	27.8	27.8	2.2	27.2	27.2
Effective Green, g (s)	10.8	10.8	10.8	10.8	10.8	10.8	2.8	27.8	27.8	2.2	27.2	27.2
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.05	0.53	0.53	0.04	0.52	0.52
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	286	381	324	280	381	324	94	981	833	74	960	815
v/s Ratio Prot		0.02			0.01		c0.05	0.10		0.03	c0.22	
v/s Ratio Perm	c0.10		0.02	0.01		0.00			0.01			0.04
v/c Ratio	0.47	0.09	0.09	0.05	0.03	0.01	0.87	0.19	0.01	0.72	0.43	0.08
Uniform Delay, d1	18.5	17.0	17.0	16.9	16.8	16.7	24.8	6.6	6.0	25.0	8.0	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.1	0.1	0.1	0.0	0.0	53.6	0.1	0.0	27.9	0.3	0.0
Delay (s)	19.7	17.1	17.1	17.0	16.8	16.8	78.4	6.7	6.0	52.9	8.3	6.5
Level of Service	B	B	B	B	B	B	E	A	A	D	A	A
Approach Delay (s)		18.2			16.8			27.0			11.9	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	52.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
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	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	1863	1583	1770	1863	1769	
Flt Permitted	1.00	1.00	0.51	1.00	0.95	
Satd. Flow (perm)	1863	1583	949	1863	1769	
Volume (vph)	359	161	8	262	120	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	390	175	9	285	130	4
RTOR Reduction (vph)	0	63	0	0	3	0
Lane Group Flow (vph)	390	112	9	285	131	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	34.8	34.8	34.8	34.8	11.6	
Effective Green, g (s)	34.8	34.8	34.8	34.8	11.6	
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.21	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1192	1013	607	1192	377	
v/s Ratio Prot	c0.21			0.15	c0.07	
v/s Ratio Perm		0.07	0.01			
v/c Ratio	0.33	0.11	0.01	0.24	0.35	
Uniform Delay, d1	4.5	3.8	3.6	4.2	18.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.0	0.0	0.1	0.6	
Delay (s)	4.6	3.8	3.6	4.3	18.7	
Level of Service	A	A	A	A	B	
Approach Delay (s)	4.4			4.3	18.7	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	32.5%	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												
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	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.96	1.00
Satd. Flow (prot)	1770	1845	1615	1805	1845	1583		1843			1783	1583
Flt Permitted	0.95	1.00	1.00	0.57	1.00	1.00		0.89			0.71	1.00
Satd. Flow (perm)	1770	1845	1615	1092	1845	1583		1671			1323	1583
Volume (vph)	107	280	10	4	301	73	15	22	4	108	8	92
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)	116	304	11	4	327	79	16	24	4	117	9	100
RTOR Reduction (vph)	0	0	4	0	0	40	0	3	0	0	0	79
Lane Group Flow (vph)	116	304	7	4	327	39	0	41	0	0	126	21
Heavy Vehicles (%)	2%	3%	0%	0%	3%	2%	0%	0%	0%	2%	0%	2%
Turn Type	Prot		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases			4	8		8	2			6		6
Actuated Green, G (s)	4.6	36.0	36.0	27.4	27.4	27.4		11.9			11.9	11.9
Effective Green, g (s)	4.6	36.0	36.0	27.4	27.4	27.4		11.9			11.9	11.9
Actuated g/C Ratio	0.08	0.64	0.64	0.49	0.49	0.49		0.21			0.21	0.21
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	146	1188	1040	535	904	776		356			282	337
v/s Ratio Prot	c0.07	0.16			c0.18							
v/s Ratio Perm			0.00	0.00		0.02		0.02			c0.10	0.01
v/c Ratio	0.79	0.26	0.01	0.01	0.36	0.05		0.11			0.45	0.06
Uniform Delay, d1	25.2	4.2	3.6	7.3	8.8	7.4		17.8			19.1	17.6
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	0.1	0.0	0.0	0.2	0.0		0.1			1.1	0.1
Delay (s)	50.2	4.4	3.6	7.3	9.1	7.5		17.9			20.3	17.6
Level of Service	D	A	A	A	A	A		B			C	B
Approach Delay (s)		16.7			8.8			17.9			19.1	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			4%			0%			0%	
Volume (veh/h)	49	708	0	0	627	756	33	0	669	0	0	0
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
Hourly flow rate (vph)	53	770	0	0	682	822	36	0	727	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					428							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	1503			770			1968	2379	770	2696	1968	1092
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1571			770			2099	2565	770	2924	2099	1105
tC, single (s)	4.1			4.1			7.1	6.5	6.5	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.6	3.5	4.0	3.3
p0 queue free %	86			100			0	100	0	0	100	100
cM capacity (veh/h)	370			854			30	20	361	0	40	228

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	823	1503	763
Volume Left	53	0	36
Volume Right	0	822	727
cSH	370	1700	237
Volume to Capacity	0.14	0.88	3.22
Queue Length 95th (ft)	12	0	Err
Control Delay (s)	5.1	0.0	Err
Lane LOS	A		F
Approach Delay (s)	5.1	0.0	Err
Approach LOS			F

Intersection Summary			
Average Delay	2471.2		
Intersection Capacity Utilization	129.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		4%			-4%			0%			0%	
Volume (veh/h)	0	86	25	573	87	0	0	0	0	671	0	76
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
Hourly flow rate (vph)	0	93	27	623	95	0	0	0	0	729	0	83
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	95			121			1530	1447	107	1447	1461	95
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			121			1530	1447	107	1447	1461	95
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100			55			100	100	100	0	100	91
cM capacity (veh/h)	1512			1373			57	72	952	66	71	962

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	121	717	812
Volume Left	0	623	729
Volume Right	27	0	83
cSH	1700	1373	73
Volume to Capacity	0.07	0.45	11.10
Queue Length 95th (ft)	0	61	Err
Control Delay (s)	0.0	9.1	Err
Lane LOS		A	F
Approach Delay (s)	0.0	9.1	Err
Approach LOS			F

Intersection Summary			
Average Delay	4924.4		
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	23	0	128	30	5	0	0	80	8	0	0
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
Hourly flow rate (vph)	0	25	0	139	33	5	0	0	87	9	0	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	25	177	87	9
Volume Left (vph)	0	139	0	9
Volume Right (vph)	0	5	87	0
Hadj (s)	0.03	0.17	-0.57	0.22
Departure Headway (s)	4.3	4.3	3.8	4.7
Degree Utilization, x	0.03	0.21	0.09	0.01
Capacity (veh/h)	804	819	893	723
Control Delay (s)	7.5	8.4	7.2	7.7
Approach Delay (s)	7.5	8.4	7.2	7.7
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.0		
HCM Level of Service	A		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	421	173	99	213	0	0	0	0	122	0	255
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
Hourly flow rate (vph)	0	458	188	108	232	0	0	0	0	133	0	277
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												6
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	232			458			998	998	552	998	904	232
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232			458			998	998	552	998	904	232
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	100	100	36	100	66
cM capacity (veh/h)	1336			1103			135	220	534	206	250	808

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	646	108	232	410
Volume Left	0	108	0	133
Volume Right	188	0	0	277
cSH	1700	1103	1700	636
Volume to Capacity	0.38	0.10	0.14	0.64
Queue Length 95th (ft)	0	8	0	117
Control Delay (s)	0.0	8.6	0.0	24.0
Lane LOS		A		C
Approach Delay (s)	0.0	2.7		24.0
Approach LOS				C

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	282	261	82	178	134	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	307	284	89	193	146	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						6
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			307		678	307
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			307		678	307
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		62	93
cM capacity (veh/h)			1254		388	733

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	307	284	89	193	197
Volume Left	0	0	89	0	146
Volume Right	0	284	0	0	51
cSH	1700	1700	1254	1700	524
Volume to Capacity	0.18	0.17	0.07	0.11	0.38
Queue Length 95th (ft)	0	0	6	0	43
Control Delay (s)	0.0	0.0	8.1	0.0	17.3
Lane LOS			A		C
Approach Delay (s)	0.0		2.6		17.3
Approach LOS					C

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3972	1615	1805	3589	1583	1805	1723		1770	1863	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3972	1615	1805	3589	1583	1805	1723		1770	1863	2787
Volume (vph)	993	284	36	10	302	96	88	10	17	96	10	993
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)	1079	309	39	11	328	104	96	11	18	104	11	1079
RTOR Reduction (vph)	0	0	18	0	0	83	0	16	0	0	0	907
Lane Group Flow (vph)	1079	309	21	11	328	21	96	13	0	104	11	172
Heavy Vehicles (%)	2%	3%	0%	0%	14%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	30.3	45.9	45.9	1.1	16.7	16.7	7.0	8.0		12.3	13.3	13.3
Effective Green, g (s)	30.3	45.9	45.9	1.1	16.7	16.7	7.0	8.0		12.3	13.3	13.3
Actuated g/C Ratio	0.36	0.55	0.55	0.01	0.20	0.20	0.08	0.10		0.15	0.16	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1249	2189	890	24	720	317	152	165		261	297	445
v/s Ratio Prot	c0.31	0.08		0.01	c0.09		c0.05	0.01		c0.06	0.01	
v/s Ratio Perm			0.01			0.01						c0.06
v/c Ratio	0.86	0.14	0.02	0.46	0.46	0.07	0.63	0.08		0.40	0.04	0.39
Uniform Delay, d1	24.6	9.1	8.5	40.8	29.3	27.0	36.9	34.3		32.1	29.6	31.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	0.0	0.0	13.2	0.5	0.1	8.3	0.2		1.0	0.1	0.6
Delay (s)	31.0	9.1	8.5	54.0	29.8	27.1	45.2	34.5		33.2	29.6	31.9
Level of Service	C	A	A	D	C	C	D	C		C	C	C
Approach Delay (s)		25.7			29.7			42.7			32.0	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	29.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	83.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	26	26	26	176	182	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	28	28	191	198	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				332		
pX, platoon unblocked						
vC, conflicting volume	460	113	226			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	460	113	226			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	98			
cM capacity (veh/h)	519	918	1340			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	28	28	28	191	132	94
Volume Left	28	0	28	0	0	0
Volume Right	0	28	0	0	0	28
cSH	519	918	1340	1700	1700	1700
Volume to Capacity	0.05	0.03	0.02	0.11	0.08	0.06
Queue Length 95th (ft)	4	2	2	0	0	0
Control Delay (s)	12.3	9.0	7.7	0.0	0.0	0.0
Lane LOS	B	A	A			
Approach Delay (s)	10.7		1.0		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	22.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	17	18	18	184	190	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	20	20	200	207	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				542		
pX, platoon unblocked						
vC, conflicting volume	455	112	225			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	455	112	225			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	98	99			
cM capacity (veh/h)	526	919	1341			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	18	20	20	200	138	87
Volume Left	18	0	20	0	0	0
Volume Right	0	20	0	0	0	18
cSH	526	919	1341	1700	1700	1700
Volume to Capacity	0.04	0.02	0.01	0.12	0.08	0.05
Queue Length 95th (ft)	3	2	1	0	0	0
Control Delay (s)	12.1	9.0	7.7	0.0	0.0	0.0
Lane LOS	B	A	A			
Approach Delay (s)	10.5		0.7		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	22.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	17	17	184	190	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	18	18	200	207	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				842		
pX, platoon unblocked						
vC, conflicting volume	448	211	216			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	448	211	216			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	560	829	1353			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	10	18	218	216
Volume Left	10	0	18	0
Volume Right	0	18	0	10
cSH	560	829	1353	1700
Volume to Capacity	0.02	0.02	0.01	0.13
Queue Length 95th (ft)	1	2	1	0
Control Delay (s)	11.5	9.4	0.8	0.0
Lane LOS	B	A	A	
Approach Delay (s)	10.2		0.8	0.0
Approach LOS	B			

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	9	9	184	190	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	10	10	200	207	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				1052		
pX, platoon unblocked						
vC, conflicting volume	431	211	216			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	431	211	216			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	577	829	1353			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	10	10	210	216
Volume Left	10	0	10	0
Volume Right	0	10	0	10
cSH	577	829	1353	1700
Volume to Capacity	0.02	0.01	0.01	0.13
Queue Length 95th (ft)	1	1	1	0
Control Delay (s)	11.3	9.4	0.4	0.0
Lane LOS	B	A	A	
Approach Delay (s)	10.4		0.4	0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
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		0.91		1.00	0.91					0.95	0.91	0.95
Frt		0.99		1.00	1.00					1.00	0.97	0.85
Flt Protected		1.00		0.95	1.00					0.95	0.96	1.00
Satd. Flow (prot)		5020		1770	5085					1681	1583	1504
Flt Permitted		1.00		0.95	1.00					0.95	0.96	1.00
Satd. Flow (perm)		5020		1770	5085					1681	1583	1504
Volume (vph)	0	1630	154	153	1123	0	0	0	0	360	0	240
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)	0	1772	167	166	1221	0	0	0	0	391	0	261
RTOR Reduction (vph)	0	17	0	0	0	0	0	0	0	0	15	57
Lane Group Flow (vph)	0	1922	0	166	1221	0	0	0	0	209	209	162
Turn Type				Prot						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases												4
Actuated Green, G (s)		28.3		7.0	39.3					12.7	12.7	12.7
Effective Green, g (s)		28.3		7.0	39.3					12.7	12.7	12.7
Actuated g/C Ratio		0.47		0.12	0.65					0.21	0.21	0.21
Clearance Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2368		207	3331					356	335	318
v/s Ratio Prot		c0.38		c0.09	0.24					0.12	c0.13	
v/s Ratio Perm												0.11
v/c Ratio		0.81		0.80	0.37					0.59	0.62	0.51
Uniform Delay, d1		13.6		25.8	4.7					21.3	21.5	20.9
Progression Factor		1.00		1.54	0.65					1.00	1.00	1.00
Incremental Delay, d2		3.2		9.7	0.2					2.5	3.6	1.4
Delay (s)		16.7		49.3	3.2					23.8	25.1	22.3
Level of Service		B		D	A					C	C	C
Approach Delay (s)		16.7			8.7			0.0			23.7	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM Average Control Delay	15.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.5%	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												
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	1.00	0.91			0.91		0.95	0.91	0.95			
Frt	1.00	1.00			0.96		1.00	1.00	0.85			
Flt Protected	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (prot)	1770	5085			4865		1681	1610	1504			
Flt Permitted	0.95	1.00			1.00		0.95	0.95	1.00			
Satd. Flow (perm)	1770	5085			4865		1681	1610	1504			
Volume (vph)	910	1080	0	0	1133	460	143	0	53	0	0	0
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)	989	1174	0	0	1232	500	155	0	58	0	0	0
RTOR Reduction (vph)	0	0	0	0	57	0	0	0	53	0	0	0
Lane Group Flow (vph)	989	1174	0	0	1675	0	78	77	5	0	0	0
Turn Type	Prot						Split		Perm			
Protected Phases	5	2			6		8	8				
Permitted Phases									8			
Actuated Green, G (s)	50.0	101.1			47.1		10.9	10.9	10.9			
Effective Green, g (s)	50.0	101.1			47.1		10.9	10.9	10.9			
Actuated g/C Ratio	0.42	0.84			0.39		0.09	0.09	0.09			
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0	4.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0			
Lane Grp Cap (vph)	738	4284			1910		153	146	137			
v/s Ratio Prot	c0.56	0.23			c0.34		0.05	c0.05				
v/s Ratio Perm									0.00			
v/c Ratio	1.34	0.27			0.88		0.51	0.53	0.04			
Uniform Delay, d1	35.0	1.9			33.8		52.0	52.1	49.8			
Progression Factor	0.63	1.29			1.00		1.00	1.00	1.00			
Incremental Delay, d2	158.2	0.1			6.1		2.7	3.4	0.1			
Delay (s)	180.3	2.6			39.8		54.7	55.5	49.9			
Level of Service	F	A			D		D	E	D			
Approach Delay (s)		83.8			39.8			53.7			0.0	
Approach LOS		F			D			D			A	

Intersection Summary			
HCM Average Control Delay	63.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.5%	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												
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		0.91	1.00	1.00	0.95					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		5085	1583	1770	3539					1770		1583
Flt Permitted		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (perm)		5085	1583	1770	3539					1770		1583
Volume (vph)	0	710	352	168	644	0	0	0	0	98	0	377
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)	0	772	383	183	700	0	0	0	0	107	0	410
RTOR Reduction (vph)	0	0	220	0	0	0	0	0	0	0	0	191
Lane Group Flow (vph)	0	772	163	183	700	0	0	0	0	107	0	219
Turn Type			Perm	Prot						custom		custom
Protected Phases		2		1	6							
Permitted Phases			2							4		4
Actuated Green, G (s)		27.6	27.6	12.6	44.2					12.8		12.8
Effective Green, g (s)		27.6	27.6	12.6	44.2					12.8		12.8
Actuated g/C Ratio		0.42	0.42	0.19	0.68					0.20		0.20
Clearance Time (s)		4.0	4.0	4.0	4.0					4.0		4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		2159	672	343	2407					349		312
v/s Ratio Prot		c0.15		c0.10	0.20							
v/s Ratio Perm			0.10							0.06		c0.14
v/c Ratio		0.36	0.24	0.53	0.29					0.31		0.70
Uniform Delay, d1		12.7	12.0	23.6	4.1					22.3		24.3
Progression Factor		1.00	1.00	0.21	0.23					1.00		1.00
Incremental Delay, d2		0.5	0.9	1.4	0.2					0.5		7.0
Delay (s)		13.1	12.8	6.3	1.2					22.8		31.3
Level of Service		B	B	A	A					C		C
Approach Delay (s)		13.0			2.2			0.0			29.5	
Approach LOS		B			A			A			C	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.7%	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												
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	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1770	3539			3539	1583	1770		1583			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	1770	3539			3539	1583	1770		1583			
Volume (vph)	375	433	0	0	469	116	343	0	190	0	0	0
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)	408	471	0	0	510	126	373	0	207	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	88	0	0	158	0	0	0
Lane Group Flow (vph)	408	471	0	0	510	38	373	0	49	0	0	0
Turn Type	Prot					Perm	custom		custom			
Protected Phases	5	2			6							
Permitted Phases						6	8		8			
Actuated Green, G (s)	18.1	41.5			19.4	19.4	15.5		15.5			
Effective Green, g (s)	18.1	41.5			19.4	19.4	15.5		15.5			
Actuated g/C Ratio	0.28	0.64			0.30	0.30	0.24		0.24			
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0		4.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	493	2260			1056	472	422		377			
v/s Ratio Prot	c0.23	0.13			c0.14							
v/s Ratio Perm						0.02	c0.21		0.03			
v/c Ratio	0.83	0.21			0.48	0.08	0.88		0.13			
Uniform Delay, d1	22.0	4.9			18.7	16.4	23.9		19.5			
Progression Factor	0.36	0.30			1.00	1.00	1.00		1.00			
Incremental Delay, d2	10.5	0.2			1.6	0.3	19.2		0.2			
Delay (s)	18.4	1.6			20.3	16.7	43.1		19.6			
Level of Service	B	A			C	B	D		B			
Approach Delay (s)		9.4			19.6			34.7			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	182	164	162	48	57	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	198	178	176	52	62	218
Pedestrians			100			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			8			
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	228				876	202
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	228				876	202
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	85				75	74
cM capacity (veh/h)	1340				249	839

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	198	178	228	280
Volume Left	198	0	0	62
Volume Right	0	0	52	218
cSH	1340	1700	1700	551
Volume to Capacity	0.15	0.10	0.13	0.51
Queue Length 95th (ft)	13	0	0	72
Control Delay (s)	8.2	0.0	0.0	18.1
Lane LOS	A			C
Approach Delay (s)	4.3		0.0	18.1
Approach LOS				C

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	18	19	150	154	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	20	21	163	167	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	377	173	178			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	377	173	178			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	98	99			
cM capacity (veh/h)	615	871	1398			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	29	184	178
Volume Left	10	21	0
Volume Right	20	0	11
cSH	765	1398	1700
Volume to Capacity	0.04	0.01	0.10
Queue Length 95th (ft)	3	1	0
Control Delay (s)	9.9	1.0	0.0
Lane LOS	A	A	
Approach Delay (s)	9.9	1.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	31.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.75	1.00	1.00	0.75	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1393	1863	1583	1389	1863	1583	1770	1863	1583	1770	1863	1583
Volume (vph)	116	17	117	13	14	18	94	286	19	31	328	116
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)	126	18	127	14	15	20	102	311	21	34	357	126
RTOR Reduction (vph)	0	0	102	0	0	16	0	0	9	0	0	60
Lane Group Flow (vph)	126	18	25	14	15	4	102	311	12	34	357	66
Turn Type	Perm		Perm	Perm		Perm	Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	11.5	11.5	11.5	11.5	11.5	11.5	3.9	33.1	33.1	1.1	30.3	30.3
Effective Green, g (s)	11.5	11.5	11.5	11.5	11.5	11.5	3.9	33.1	33.1	1.1	30.3	30.3
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.07	0.57	0.57	0.02	0.53	0.53
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	278	371	316	277	371	316	120	1069	908	34	978	831
v/s Ratio Prot		0.01			0.01		c0.06	c0.17		0.02	c0.19	
v/s Ratio Perm	c0.09		0.02	0.01		0.00			0.01			0.04
v/c Ratio	0.45	0.05	0.08	0.05	0.04	0.01	0.85	0.29	0.01	1.00	0.37	0.08
Uniform Delay, d1	20.3	18.7	18.8	18.7	18.6	18.5	26.6	6.3	5.3	28.3	8.0	6.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.1	0.1	0.1	0.0	0.0	39.8	0.2	0.0	154.3	0.2	0.0
Delay (s)	21.5	18.7	18.9	18.8	18.7	18.6	66.4	6.4	5.3	182.6	8.3	6.8
Level of Service	C	B	B	B	B	B	E	A	A	F	A	A
Approach Delay (s)		20.1			18.7			20.5			19.4	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	57.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
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	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	1.00	1.00	0.95	1.00	0.95	
Satd. Flow (prot)	1863	1583	1770	1863	1765	
Flt Permitted	1.00	1.00	0.60	1.00	0.95	
Satd. Flow (perm)	1863	1583	1110	1863	1765	
Volume (vph)	244	120	6	228	153	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	265	130	7	248	166	10
RTOR Reduction (vph)	0	54	0	0	6	0
Lane Group Flow (vph)	265	76	7	248	170	0
Turn Type		Perm	Perm			
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	27.8	27.8	27.8	27.8	11.8	
Effective Green, g (s)	27.8	27.8	27.8	27.8	11.8	
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.25	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1088	925	648	1088	438	
v/s Ratio Prot	c0.14			0.13	c0.10	
v/s Ratio Perm		0.05	0.01			
v/c Ratio	0.24	0.08	0.01	0.23	0.39	
Uniform Delay, d1	4.8	4.3	4.1	4.8	14.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.0	0.0	0.1	0.6	
Delay (s)	4.9	4.4	4.2	4.9	15.5	
Level of Service	A	A	A	A	B	
Approach Delay (s)	4.7			4.8	15.5	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	7.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	47.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	28.5%	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												
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	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96			0.95	1.00
Satd. Flow (prot)	1770	1845	1615	1805	1845	1583		1815			1776	1583
Flt Permitted	0.95	1.00	1.00	0.59	1.00	1.00		0.78			0.72	1.00
Satd. Flow (perm)	1770	1845	1615	1115	1845	1583		1486			1339	1583
Volume (vph)	69	259	15	1	330	59	14	1	0	94	2	79
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)	75	282	16	1	359	64	15	1	0	102	2	86
RTOR Reduction (vph)	0	0	5	0	0	29	0	0	0	0	0	69
Lane Group Flow (vph)	75	282	11	1	359	35	0	16	0	0	104	17
Heavy Vehicles (%)	2%	3%	0%	0%	3%	2%	0%	0%	0%	2%	0%	2%
Turn Type	Prot		Perm	Perm		Perm	Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases			4	8		8	2			6		6
Actuated Green, G (s)	4.0	37.8	37.8	29.8	29.8	29.8		11.2			11.2	11.2
Effective Green, g (s)	4.0	37.8	37.8	29.8	29.8	29.8		11.2			11.2	11.2
Actuated g/C Ratio	0.07	0.66	0.66	0.52	0.52	0.52		0.20			0.20	0.20
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	124	1224	1071	583	965	828		292			263	311
v/s Ratio Prot	c0.04	0.15			c0.19							
v/s Ratio Perm			0.01	0.00		0.02		0.01			c0.08	0.01
v/c Ratio	0.60	0.23	0.01	0.00	0.37	0.04		0.05			0.40	0.05
Uniform Delay, d1	25.7	3.8	3.3	6.5	8.1	6.6		18.6			20.0	18.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	8.1	0.1	0.0	0.0	0.2	0.0		0.1			1.0	0.1
Delay (s)	33.8	3.9	3.3	6.5	8.3	6.7		18.7			20.9	18.7
Level of Service	C	A	A	A	A	A		B			C	B
Approach Delay (s)		9.9			8.0			18.7			19.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	38.7%	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												
Sign Control		Free			Free			Stop			Stop	
Grade		-4%			4%			0%			0%	
Volume (veh/h)	76	812	0	0	707	906	22	0	677	0	0	0
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
Hourly flow rate (vph)	83	883	0	0	768	985	24	0	736	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)					428							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	1753			883			2309	2801	883	3045	2309	1261
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1841			883			2461	3011	883	3283	2461	1291
tC, single (s)	4.1			4.1			7.1	6.5	6.5	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.6	3.5	4.0	3.3
p0 queue free %	72			100			0	100	0	0	100	100
cM capacity (veh/h)	295			775			15	9	309	0	20	180

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	965	1753	760
Volume Left	83	0	24
Volume Right	0	985	736
cSH	295	1700	189
Volume to Capacity	0.28	1.03	4.02
Queue Length 95th (ft)	28	0	Err
Control Delay (s)	13.5	0.0	Err
Lane LOS	B		F
Approach Delay (s)	13.5	0.0	Err
Approach LOS			F

Intersection Summary			
Average Delay	2187.9		
Intersection Capacity Utilization	155.6%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		4%			-4%			0%			0%	
Volume (veh/h)	0	85	11	623	106	0	0	0	0	803	0	44
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
Hourly flow rate (vph)	0	92	12	677	115	0	0	0	0	873	0	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	115			104			1616	1568	98	1568	1574	115
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			104			1616	1568	98	1568	1574	115
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100			51			100	100	100	0	100	95
cM capacity (veh/h)	1486			1393			49	58	963	52	57	937

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	104	792	921
Volume Left	0	677	873
Volume Right	12	0	48
cSH	1700	1393	55
Volume to Capacity	0.06	0.49	16.80
Queue Length 95th (ft)	0	69	Err
Control Delay (s)	0.0	9.3	Err
Lane LOS		A	F
Approach Delay (s)	0.0	9.3	Err
Approach LOS			F

Intersection Summary			
Average Delay	5069.3		
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	20	0	105	41	4	0	0	74	2	0	0
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
Hourly flow rate (vph)	0	22	0	114	45	4	0	0	80	2	0	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	22	163	80	2
Volume Left (vph)	0	114	0	2
Volume Right (vph)	0	4	80	0
Hadj (s)	0.03	0.16	-0.57	0.22
Departure Headway (s)	4.3	4.2	3.8	4.6
Degree Utilization, x	0.03	0.19	0.08	0.00
Capacity (veh/h)	817	830	909	733
Control Delay (s)	7.4	8.3	7.1	7.6
Approach Delay (s)	7.4	8.3	7.1	7.6
Approach LOS	A	A	A	A

Intersection Summary			
Delay	7.8		
HCM Level of Service	A		
Intersection Capacity Utilization	26.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	488	80	40	260	0	0	0	0	121	0	208
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
Hourly flow rate (vph)	0	530	87	43	283	0	0	0	0	132	0	226
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												6
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	283			530			943	943	574	943	900	283
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	283			530			943	943	574	943	900	283
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	100	44	100	70
cM capacity (veh/h)	1280			1037			165	251	518	235	267	756

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	617	43	283	358
Volume Left	0	43	0	132
Volume Right	87	0	0	226
cSH	1700	1037	1700	638
Volume to Capacity	0.36	0.04	0.17	0.56
Queue Length 95th (ft)	0	3	0	87
Control Delay (s)	0.0	8.6	0.0	21.5
Lane LOS		A		C
Approach Delay (s)	0.0	1.1		21.5
Approach LOS				C

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	221	388	81	210	90	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	240	422	88	228	98	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						6
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			240		645	240
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			240		645	240
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		76	99
cM capacity (veh/h)			1326		408	799

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	240	422	88	228	109
Volume Left	0	0	88	0	98
Volume Right	0	422	0	0	11
cSH	1700	1700	1326	1700	453
Volume to Capacity	0.14	0.25	0.07	0.13	0.24
Queue Length 95th (ft)	0	0	5	0	23
Control Delay (s)	0.0	0.0	7.9	0.0	15.9
Lane LOS			A		C
Approach Delay (s)	0.0		2.2		15.9
Approach LOS					C

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00		1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3972	1615	1805	3589	1583	1805	1650		1770	1863	2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3972	1615	1805	3589	1583	1805	1650		1770	1863	2787
Volume (vph)	1297	152	20	42	261	120	60	10	72	119	10	1292
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)	1410	165	22	46	284	130	65	11	78	129	11	1404
RTOR Reduction (vph)	0	0	11	0	0	110	0	67	0	0	0	980
Lane Group Flow (vph)	1410	165	11	46	284	20	65	22	0	129	11	424
Heavy Vehicles (%)	2%	3%	0%	0%	14%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	41.7	51.3	51.3	5.2	14.8	14.8	7.1	14.2		11.6	18.7	18.7
Effective Green, g (s)	41.7	51.3	51.3	5.2	14.8	14.8	7.1	14.2		11.6	18.7	18.7
Actuated g/C Ratio	0.42	0.52	0.52	0.05	0.15	0.15	0.07	0.14		0.12	0.19	0.19
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1456	2073	843	95	540	238	130	238		209	354	530
v/s Ratio Prot	c0.41	0.04		0.03	c0.08		0.04	0.01		c0.07	0.01	
v/s Ratio Perm			0.01			0.01						c0.15
v/c Ratio	0.97	0.08	0.01	0.48	0.53	0.08	0.50	0.09		0.62	0.03	0.80
Uniform Delay, d1	27.7	11.7	11.3	45.2	38.5	35.9	43.9	36.5		41.2	32.4	38.0
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	16.4	0.0	0.0	3.8	0.9	0.1	3.0	0.2		5.3	0.0	8.5
Delay (s)	44.1	11.7	11.3	49.1	39.4	36.1	46.9	36.6		46.6	32.5	46.5
Level of Service	D	B	B	D	D	D	D	D		D	C	D
Approach Delay (s)		40.3			39.5			41.0			46.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	42.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	98.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	33	32	32	97	143	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	35	35	105	155	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				332		
pX, platoon unblocked						
vC, conflicting volume	348	96	191			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	348	96	191			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	96	97			
cM capacity (veh/h)	607	942	1380			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	36	35	35	105	104	88
Volume Left	36	0	35	0	0	0
Volume Right	0	35	0	0	0	36
cSH	607	942	1380	1700	1700	1700
Volume to Capacity	0.06	0.04	0.03	0.06	0.06	0.05
Queue Length 95th (ft)	5	3	2	0	0	0
Control Delay (s)	11.3	9.0	7.7	0.0	0.0	0.0
Lane LOS	B	A	A			
Approach Delay (s)	10.2		1.9		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	21.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	22	22	22	108	154	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	24	24	117	167	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				542		
pX, platoon unblocked						
vC, conflicting volume	345	96	191			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	345	96	191			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	97	98			
cM capacity (veh/h)	615	942	1380			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	24	24	24	117	112	80
Volume Left	24	0	24	0	0	0
Volume Right	0	24	0	0	0	24
cSH	615	942	1380	1700	1700	1700
Volume to Capacity	0.04	0.03	0.02	0.07	0.07	0.05
Queue Length 95th (ft)	3	2	1	0	0	0
Control Delay (s)	11.1	8.9	7.7	0.0	0.0	0.0
Lane LOS	B	A	A			
Approach Delay (s)	10.0		1.3		0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	21.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	11	22	22	108	154	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	24	24	117	167	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				842		
pX, platoon unblocked						
vC, conflicting volume	339	173	179			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	339	173	179			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	98			
cM capacity (veh/h)	646	870	1396			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	12	24	141	179
Volume Left	12	0	24	0
Volume Right	0	24	0	12
cSH	646	870	1396	1700
Volume to Capacity	0.02	0.03	0.02	0.11
Queue Length 95th (ft)	1	2	1	0
Control Delay (s)	10.7	9.3	1.4	0.0
Lane LOS	B	A	A	
Approach Delay (s)	9.7		1.4	0.0
Approach LOS	A			

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	11	11	11	108	154	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	12	12	117	167	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				1052		
pX, platoon unblocked						
vC, conflicting volume	315	173	179			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	315	173	179			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	672	870	1396			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	12	12	129	179
Volume Left	12	0	12	0
Volume Right	0	12	0	12
cSH	672	870	1396	1700
Volume to Capacity	0.02	0.01	0.01	0.11
Queue Length 95th (ft)	1	1	1	0
Control Delay (s)	10.5	9.2	0.8	0.0
Lane LOS	B	A	A	
Approach Delay (s)	9.8		0.8	0.0
Approach LOS	A			

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM 2000 **HCM 2000**
Basic Freeway Segr **Basic Freeway Segments**
Capacity Analysis **Capacity Analysis**

Jurisdiction CalTrans
Analysis Year
Analyst Fehr & Peers

Agency or Company
Date 6/12/2009
Project Description Knighton and Churn Creek Commons

General Information **Existing plus Project**

	Weekday	Generation 2439
	Saturday	3155

Flow Rate Calculation

	Freeway/ Direction	From/To	Analysis Time Period	% Distribution	No Project	Volume (vph)	PHF	Lanes	HOV Lane?	HOV Lane Volume	Terrain	Grade %	Length (mi)	Truck/ Bus %	RV %	E_T	E_R	f_{HV}	f_P	Flow Rate v_p (pcphpl)
1013	I-5 NB	North Street - Balls Ferry Road / Riverside Avenue	PM	0.125	1986	2,204	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,258
1011	I-5 NB	Riverside Avenue / Knighton Road	PM	0.175	2009	2,366	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,350
1009	I-5 NB	Knighton Road / S Bonneview Road	PM	0.205	2059	2,469	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,409
1007	I-5 NB	Bonnyview Road / Cypress Avenue	PM	0.125	2049	2,531	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,444
1005	I-5 NB	Cypress Avenue / CA Highway 44	PM	0.125	2693	3,291	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,878
1006	I-5 SB	CA Highway 44 / Cypress Avenue	PM	0.125	2596	2,895	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,652
1008	I-5 SB	Cypress Avenue / Bonnyview Road	PM	0.125	2235	2,756	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,573
1010	I-5 SB	S Bonneview Road / Knighton Road	PM	0.205	2503	2,860	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,632
1012	I-5 SB	Knighton Road / Riverside Avenue	PM	0.175	2406	2,711	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,547
1014	I-5 SB	Riverside Avenue / North Street-Balls Ferry Road	PM	0.125	2659	2,606	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,487
2013	I-5 NB	North Street - Balls Ferry Road / Riverside Avenue	Saturday	0.125	1802.12942	2,260	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,290
2011	I-5 NB	Riverside Avenue / Knighton Road	Saturday	0.175	1823	2,629	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,500
2009	I-5 NB	Knighton Road / S Bonneview Road	Saturday	0.205	2043	2,912	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,662
2007	I-5 NB	Bonnyview Road / Cypress Avenue	Saturday	0.125	2395	2,870	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,638
2005	I-5 NB	Cypress Avenue / CA Highway 44	Saturday	0.125	2027	4,044	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	2,308
2006	I-5 SB	CA Highway 44 / Cypress Avenue	Saturday	0.125	1701	2,288	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,306
2008	I-5 SB	Cypress Avenue / Bonnyview Road	Saturday	0.125	2142	1,995	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,138
2010	I-5 SB	S Bonneview Road / Knighton Road	Saturday	0.205	1592	2,040	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,164
2012	I-5 SB	Knighton Road / Riverside Avenue	Saturday	0.175	1448	1,827	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,043
2014	I-5 SB	Riverside Avenue / North Street-Balls Ferry Road	Saturday	0.125	1600.26268	1,618	0.92	2	No	0	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	923

HCM 2000 Basic Freeway Segments Capacity Analysis | **HCM 2000 Basic Freeway Segments Capacity Analysis**

General Information		**Existing plus Project**		*Speed Calculation*												*Results*	
	Freeway/ Direction	From/To	Analysis Time Period	BFFS (mph)	Lane Width (ft)	f_{LW}	R. Shoulder Width (ft)	f_{LC}	f_N	IC Density (per mi)	f_{ID}	Calculated FFS (mph)	Measured FFS (mph)	FFS (mph)	S (mph)	Density, D (pcplpm)	Level of Service
1013	I-5 NB	North Street - Balls Ferry Road / Riverside Avenue	PM										65.0	65.0	65.0	19.3	C
1011	I-5 NB	Riverside Avenue / Knighton Road	PM										65.0	65.0	65.0	20.8	C
1009	I-5 NB	Knighton Road / S Bonneview Road	PM										65.0	65.0	65.0	21.7	C
1007	I-5 NB	Bonnyview Road / Cypress Avenue	PM										65.0	65.0	65.0	22.2	C
1005	I-5 NB	Cypress Avenue / CA Highway 44	PM										65.0	65.0	63.1	29.7	D
1006	I-5 SB	CA Highway 44 / Cypress Avenue	PM										65.0	65.0	64.7	25.5	C
1008	I-5 SB	Cypress Avenue / Bonnyview Road	PM										65.0	65.0	64.9	24.2	C
1010	I-5 SB	S Bonneview Road / Knighton Road	PM										65.0	65.0	64.8	25.2	C
1012	I-5 SB	Knighton Road / Riverside Avenue	PM										65.0	65.0	65.0	23.8	C
1014	I-5 SB	Riverside Avenue / North Street-Balls Ferry Road	PM										65.0	65.0	65.0	22.9	C
2013	I-5 NB	North Street - Balls Ferry Road / Riverside Avenue	Saturday										65.0	65.0	65.0	19.8	C
2011	I-5 NB	Riverside Avenue / Knighton Road	Saturday										65.0	65.0	65.0	23.1	C
2009	I-5 NB	Knighton Road / S Bonneview Road	Saturday										65.0	65.0	64.7	25.7	C
2007	I-5 NB	Bonnyview Road / Cypress Avenue	Saturday										65.0	65.0	64.8	25.3	C
2005	I-5 NB	Cypress Avenue / CA Highway 44	Saturday										65.0	65.0	53.7	43.0	E
2006	I-5 SB	CA Highway 44 / Cypress Avenue	Saturday										65.0	65.0	65.0	20.1	C
2008	I-5 SB	Cypress Avenue / Bonnyview Road	Saturday										65.0	65.0	65.0	17.5	B
2010	I-5 SB	S Bonneview Road / Knighton Road	Saturday										65.0	65.0	65.0	17.9	B
2012	I-5 SB	Knighton Road / Riverside Avenue	Saturday										65.0	65.0	65.0	16.0	B
2014	I-5 SB	Riverside Avenue / North Street-Balls Ferry Road	Saturday										65.0	65.0	65.0	14.2	B

HCM 2000 HCM 2000
Merge Ramp Junct Merge Ramp Junctions
Capacity Analysis Capacity Analysis

Jurisdiction CalTrans
Analysis Year 0
Analyst Fehr & Peers

Agency or Company 0
Date 6/12/2009
Project Description Knighton and Churn Creek Commons

General Information **Existing plus Project** *Freeway Data* *Freeway Volume Adjustment* *On-Ramp Data*

ID	Freeway/ Direction	On-ramp	Analysis Time Period	Lanes	S_{FF} (mph)	V (vph)	HOV Lane?	HOV Lane Volume	PHF	Terrain	Grade %	Length (mi)	Truck/ Bus %	RV %	E_T	E_R	f_{HV}	f_P	Flow Rate v_p (pcph)	Type	Lanes
1013	I-5 NB	Riverside Avenue	PM	2	0	2,023	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,309	Right	1
1011	I-5 NB	Knighton Road	PM	2	0	1,664	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	1,899	Right	1
1009	I-5 NB	Bonnyview Road	PM	2	0	1,914	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,184	Right	1
1007	I-5 NB	Cypress Avenue	PM	2	0	2,087	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,382	Right	1
1006	I-5 SB	Cypress Avenue	PM	2	0	2,100	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,397	Right	1
1008	I-5 SB	Bonnyview Road	PM	2	0	2,186	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,495	Right	1
1010	I-5 SB	Knighton Road	PM	2	0	2,113	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,412	Right	1
1012	I-5 SB	Riverside Avenue	PM	2	0	2,334	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,664	Right	1
2013	I-5 NB	Riverside Avenue	Saturday	2	0	2,160	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,465	Right	1
2011	I-5 NB	Knighton Road	Saturday	2	0	1,930	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,203	Right	1
2009	I-5 NB	Bonnyview Road	Saturday	2	0	2,379	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,715	Right	1
2007	I-5 NB	Cypress Avenue	Saturday	2	0	2,674	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	3,052	Right	1
2006	I-5 SB	Cypress Avenue	Saturday	2	0	1,688	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	1,927	Right	1
2008	I-5 SB	Bonnyview Road	Saturday	2	0	1,520	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	1,735	Right	1
2010	I-5 SB	Knighton Road	Saturday	2	0	1,193	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	1,362	Right	1
2012	I-5 SB	Riverside Avenue	Saturday	2	0	1,498	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	1,710	Right	1

General Information **Existing plus Project** *On-Ramp Volume Adjustment*

ID	Freeway/ Direction	On-ramp	Analysis Time Period	S_{FR} (mph)	V_R (vph)	Accel Lane (ft) L_{A1}	L_{A2}	L_{Aeff}	PHF	Terrain	Grade %	Length (mi)	Truck/ Bus %	RV %	E_T	E_R	f_{HV}	f_P	Flow Rate v_p (pcph)
1013	I-5 NB	Riverside Avenue	PM	35.0	343	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	391
1011	I-5 NB	Knighton Road	PM	35.0	805	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	919
1009	I-5 NB	Bonnyview Road	PM	35.0	617	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	704
1007	I-5 NB	Cypress Avenue	PM	35.0	1,204	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,374
1006	I-5 SB	Cypress Avenue	PM	35.0	656	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	749
1008	I-5 SB	Bonnyview Road	PM	35.0	674	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	769
1010	I-5 SB	Knighton Road	PM	35.0	598	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	683
1012	I-5 SB	Riverside Avenue	PM	35.0	272	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	310
2013	I-5 NB	Riverside Avenue	Saturday	35.0	469	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	535
2011	I-5 NB	Knighton Road	Saturday	35.0	982	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,121
2009	I-5 NB	Bonnyview Road	Saturday	35.0	491	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	560
2007	I-5 NB	Cypress Avenue	Saturday	35.0	1,370	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	1,564
2006	I-5 SB	Cypress Avenue	Saturday	35.0	307	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	350
2008	I-5 SB	Bonnyview Road	Saturday	35.0	520	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	593
2010	I-5 SB	Knighton Road	Saturday	35.0	634	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	724
2012	I-5 SB	Riverside Avenue	Saturday	35.0	120	100	0	100	0.92	Level	[illegible]	[illegible]	10.0%	0.0%	1.5	1.2	0.95	1.00	137

HCM 2000 Merge Ramp Junct Capacity Analysis | **HCM 2000 Merge Ramp Junctions Capacity Analysis** | Juri Analy

General Information **Existing plus Project**

Adjacent Upstream Ramp Data

ID	Freeway/ Direction	On-ramp	Analysis Time Period	Exists?	Distance	Volume (vph)	PHF	Terrain	Grade %	Length (mi)	Truck/ Bus %	RV %	E_T	E_R	f_{HV}	f_P	Flow Rate v_p (pcph)
1013	I-5 NB	Riverside Avenue	PM	Off	600	181	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	207
1011	I-5 NB	Knighton Road	PM	Off	1,400	702	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	801
1009	I-5 NB	Bonnyview Road	PM	Off	1,450	555	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	633
1007	I-5 NB	Cypress Avenue	PM	Off	1,650	444	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	507
1006	I-5 SB	Cypress Avenue	PM	Off	1,650	795	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	907
1008	I-5 SB	Bonnyview Road	PM	Off	1,450	570	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	651
1010	I-5 SB	Knighton Road	PM	Off	1,400	747	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	853
1012	I-5 SB	Riverside Avenue	PM	Off	1,150	377	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	430
2013	I-5 NB	Riverside Avenue	Saturday	Off	600	100	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	114
2011	I-5 NB	Knighton Road	Saturday	Off	1,400	699	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	798
2009	I-5 NB	Bonnyview Road	Saturday	Off	1,450	533	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	608
2007	I-5 NB	Cypress Avenue	Saturday	Off	1,650	196	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	224
2006	I-5 SB	Cypress Avenue	Saturday	Off	1,650	600	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	685
2008	I-5 SB	Bonnyview Road	Saturday	Off	1,450	475	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	542
2010	I-5 SB	Knighton Road	Saturday	Off	1,400	847	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	967
2012	I-5 SB	Riverside Avenue	Saturday	Off	1,150	329	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	375

HCM 2000 Merge Ramp Junc Capacity Analysis | **HCM 2000 Merge Ramp Junctions Capacity Analysis** | Juri Analy

General Information **Existing plus Project** | *Adjacent Downstream Ramp Data* | *v_{12} Estimation*

ID	Freeway/ Direction	On-ramp	Analysis Time Period	Exists?	Distance	Volume (vph)	PHF	Terrain	Grade %	Length (mi)	Truck/ Bus %	RV %	E_T	E_R	f_{HV}	f_P	Flow Rate v_p (pcph)	L_{EQ} 25-2	L_{EQ} 25-3	P_{FM} Equations 1	2	3
1013	I-5 NB	Riverside Avenue	PM	No														50	9,487	0.580	0.727	
1011	I-5 NB	Knighton Road	PM	No														76	9,487	0.580	0.776	
1009	I-5 NB	Bonnyview Road	PM	No														91	9,487	0.580	0.778	
1007	I-5 NB	Cypress Avenue	PM	No														276	9,487	0.580	0.779	
1006	I-5 SB	Cypress Avenue	PM	No														146	9,487	0.580	0.787	
1008	I-5 SB	Bonnyview Road	PM	No														171	9,487	0.580	0.773	
1010	I-5 SB	Knighton Road	PM	No														135	9,487	0.580	0.772	
1012	I-5 SB	Riverside Avenue	PM	No														109	9,487	0.580	0.758	
2013	I-5 NB	Riverside Avenue	Saturday	No														115	9,487	0.580	0.723	
2011	I-5 NB	Knighton Road	Saturday	No														184	9,487	0.580	0.769	
2009	I-5 NB	Bonnyview Road	Saturday	No														174	9,487	0.580	0.773	
2007	I-5 NB	Cypress Avenue	Saturday	No														460	9,487	0.580	0.767	
2006	I-5 SB	Cypress Avenue	Saturday	No														-40	9,487	0.580	0.799	
2008	I-5 SB	Bonnyview Road	Saturday	No														-29	9,487	0.580	0.786	
2010	I-5 SB	Knighton Road	Saturday	No														-81	9,487	0.580	0.786	
2012	I-5 SB	Riverside Avenue	Saturday	No														-132	9,487	0.580	0.773	

General Information **Existing plus Project**

ID	Freeway/ Direction	On-ramp	Analysis Time Period	P_{FM}	v_{12} (pcph)
1013	I-5 NB	Riverside Avenue	PM	1.000	2,309
1011	I-5 NB	Knighton Road	PM	1.000	1,899
1009	I-5 NB	Bonnyview Road	PM	1.000	2,184
1007	I-5 NB	Cypress Avenue	PM	1.000	2,382
1006	I-5 SB	Cypress Avenue	PM	1.000	2,397
1008	I-5 SB	Bonnyview Road	PM	1.000	2,495
1010	I-5 SB	Knighton Road	PM	1.000	2,412
1012	I-5 SB	Riverside Avenue	PM	1.000	2,664
2013	I-5 NB	Riverside Avenue	Saturday	1.000	2,465
2011	I-5 NB	Knighton Road	Saturday	1.000	2,203
2009	I-5 NB	Bonnyview Road	Saturday	1.000	2,715
2007	I-5 NB	Cypress Avenue	Saturday	1.000	3,052
2006	I-5 SB	Cypress Avenue	Saturday	1.000	1,927
2008	I-5 SB	Bonnyview Road	Saturday	1.000	1,735
2010	I-5 SB	Knighton Road	Saturday	1.000	1,362
2012	I-5 SB	Riverside Avenue	Saturday	1.000	1,710

HCM 2000 Merge Ramp Junct Capacity Analysis | **HCM 2000 Merge Ramp Junctions Capacity Analysis** | Juri Analy:

General Information **Existing plus Project** | *Capacity Checks*

ID	Freeway/ Direction	On-ramp	Analysis Time Period	v_{Fi} (pcph)	Max v_{Fi} (pcph)	LOS F?	v_{FO} (pcph)	Max v_{FO} (pcph)	LOS F?	v_3, v_{av34} (pcphpl)	v_3, v_{av34} > 2,700?	v_3, v_{av34} >1.5*v_{12}/2?	v_{12a} (pcph)	v_{R12a} (pcph)	Max v_{R12a} (pcph)	LOS F?	v_R (pcph)	Max v_R (pcph)	LOS F?
1013	I-5 NB	Riverside Avenue	PM	2,309	4,500	No	2,700	4,500	No	0	No	No	2,309	2,700	4,600	No	391	2,000	No
1011	I-5 NB	Knighton Road	PM	1,899	4,500	No	2,818	4,500	No	0	No	No	1,899	2,818	4,600	No	919	2,000	No
1009	I-5 NB	Bonnyview Road	PM	2,184	4,500	No	2,889	4,500	No	0	No	No	2,184	2,889	4,600	No	704	2,000	No
1007	I-5 NB	Cypress Avenue	PM	2,382	4,500	No	3,756	4,500	No	0	No	No	2,382	3,756	4,600	No	1,374	2,000	No
1006	I-5 SB	Cypress Avenue	PM	2,397	4,500	No	3,145	4,500	No	0	No	No	2,397	3,145	4,600	No	749	2,000	No
1008	I-5 SB	Bonnyview Road	PM	2,495	4,500	No	3,264	4,500	No	0	No	No	2,495	3,264	4,600	No	769	2,000	No
1010	I-5 SB	Knighton Road	PM	2,412	4,500	No	3,094	4,500	No	0	No	No	2,412	3,094	4,600	No	683	2,000	No
1012	I-5 SB	Riverside Avenue	PM	2,664	4,500	No	2,974	4,500	No	0	No	No	2,664	2,974	4,600	No	310	2,000	No
2013	I-5 NB	Riverside Avenue	Saturday	2,465	4,500	No	3,000	4,500	No	0	No	No	2,465	3,000	4,600	No	535	2,000	No
2011	I-5 NB	Knighton Road	Saturday	2,203	4,500	No	3,323	4,500	No	0	No	No	2,203	3,323	4,600	No	1,121	2,000	No
2009	I-5 NB	Bonnyview Road	Saturday	2,715	4,500	No	3,276	4,500	No	0	No	No	2,715	3,276	4,600	No	560	2,000	No
2007	I-5 NB	Cypress Avenue	Saturday	3,052	4,500	No	4,615	4,500	Yes	0	No	No	3,052	4,615	4,600	Yes	1,564	2,000	No
2006	I-5 SB	Cypress Avenue	Saturday	1,927	4,500	No	2,277	4,500	No	0	No	No	1,927	2,277	4,600	No	350	2,000	No
2008	I-5 SB	Bonnyview Road	Saturday	1,735	4,500	No	2,328	4,500	No	0	No	No	1,735	2,328	4,600	No	593	2,000	No
2010	I-5 SB	Knighton Road	Saturday	1,362	4,500	No	2,085	4,500	No	0	No	No	1,362	2,085	4,600	No	724	2,000	No
2012	I-5 SB	Riverside Avenue	Saturday	1,710	4,500	No	1,847	4,500	No	0	No	No	1,710	1,847	4,600	No	137	2,000	No

HCM 2000 **HCM 2000** Juri
Merge Ramp Junct Merge Ramp Junctions Analy:
Capacity Analysis Capacity Analysis

General Information **Existing plus Project** *Results* *Speed Estimation*

ID	Freeway/ Direction	On-ramp	Analysis Time Period	Density, D (pcplpm)	Level of Service	Int. Var. M_S	Inf. Area S_R (mph)	Out Lns. S_O (mph)	All vehs. S (mph)
1013	I-5 NB	Riverside Avenue	PM	**25.7**	**C**	0.372	15.6	0.0	15.6
1011	I-5 NB	Knighton Road	PM	**26.4**	**C**	0.379	15.9	0.0	15.9
1009	I-5 NB	Bonnyview Road	PM	**27.1**	**C**	0.384	16.1	0.0	16.1
1007	I-5 NB	Cypress Avenue	PM	**33.5**	**D**	0.481	20.2	0.0	20.2
1006	I-5 SB	Cypress Avenue	PM	**29.0**	**D**	0.405	17.0	0.0	17.0
1008	I-5 SB	Bonnyview Road	PM	**30.0**	**D**	0.416	17.5	0.0	17.5
1010	I-5 SB	Knighton Road	PM	**28.7**	**D**	0.400	16.8	0.0	16.8
1012	I-5 SB	Riverside Avenue	PM	**27.9**	**C**	0.390	16.4	0.0	16.4
2013	I-5 NB	Riverside Avenue	Saturday	**28.0**	**D**	0.392	16.5	0.0	16.5
2011	I-5 NB	Knighton Road	Saturday	**30.3**	**D**	0.422	17.7	0.0	17.7
2009	I-5 NB	Bonnyview Road	Saturday	**30.1**	**D**	0.417	17.5	0.0	17.5
2007	I-5 NB	Cypress Avenue	Saturday	**-**	**F**	0.708	29.7	0.0	29.7
2006	I-5 SB	Cypress Avenue	Saturday	**22.4**	**C**	0.352	14.8	0.0	14.8
2008	I-5 SB	Bonnyview Road	Saturday	**22.7**	**C**	0.354	14.9	0.0	14.9
2010	I-5 SB	Knighton Road	Saturday	**20.8**	**C**	0.345	14.5	0.0	14.5
2012	I-5 SB	Riverside Avenue	Saturday	**19.2**	**B**	0.339	14.2	0.0	14.2

HCM 2000 HCM 2000
Diverge Ramp Jun Diverge Ramp Junctions
Capacity Analysis Capacity Analysis

Jurisdiction CalTrans
Analysis Year 0
Analyst Fehr & Peers

Agency or Company 0
Date 6/12/2009
Project Description Knighton and Churn Creek Commons

General Information **Existing plus Project** *Freeway Data* *Freeway Volume Adjustment*

ID	Freeway/ Direction	Off-ramp	Analysis Time Period	Lanes	S_{FF} (mph)	V (vph)	HOV Lane?	HOV Lane Volume	PHF	Terrain	Grade %	Length (mi)	Truck/ Bus %	RV %	E_T	E_R	f_{HV}	f_P	Flow Rate v_p (pcph)
1013	I-5 NB	Riverside Avenue	PM	2	0	2216	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,529
1011	I-5 NB	Knighton Road	PM	2	0	2423	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,765
1009	I-5 NB	Bonnyview Road	PM	2	0	2547	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,907
1007	I-5 NB	Cypress Avenue	PM	2	0	2554	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,915
1006	I-5 SB	Cypress Avenue	PM	2	0	2910	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	3,321
1008	I-5 SB	Bonnyview Road	PM	2	0	2796	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	3,191
1010	I-5 SB	Knighton Road	PM	2	0	2955	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	3,373
1012	I-5 SB	Riverside Avenue	PM	2	0	2785	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	3,179
2013	I-5 NB	Riverside Avenue	Saturday	2	0	2296	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,620
2011	I-5 NB	Knighton Road	Saturday	2	0	2714	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	3,098
2009	I-5 NB	Bonnyview Road	Saturday	2	0	3025	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	3,452
2007	I-5 NB	Cypress Avenue	Saturday	2	0	2905	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	3,315
2006	I-5 SB	Cypress Avenue	Saturday	2	0	2315	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,642
2008	I-5 SB	Bonnyview Road	Saturday	2	0	2055	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,345
2010	I-5 SB	Knighton Road	Saturday	2	0	2178	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,486
2012	I-5 SB	Riverside Avenue	Saturday	2	0	1936	No	0	0.92	Level	0	0	0.1	0	1.5	1.2	0.95	1	2,210

General Information **Existing plus Project**

ID	Freeway/ Direction	Off-ramp	Analysis Time Period	Effective Flow Rate v_p (pcph)
1013	I-5 NB	Riverside Avenue	PM	2,529
1011	I-5 NB	Knighton Road	PM	2,765
1009	I-5 NB	Bonnyview Road	PM	2,907
1007	I-5 NB	Cypress Avenue	PM	2,915
1006	I-5 SB	Cypress Avenue	PM	3,321
1008	I-5 SB	Bonnyview Road	PM	3,191
1010	I-5 SB	Knighton Road	PM	3,373
1012	I-5 SB	Riverside Avenue	PM	3,179
2013	I-5 NB	Riverside Avenue	Saturday	2,620
2011	I-5 NB	Knighton Road	Saturday	3,098
2009	I-5 NB	Bonnyview Road	Saturday	3,452
2007	I-5 NB	Cypress Avenue	Saturday	3,315
2006	I-5 SB	Cypress Avenue	Saturday	2,642
2008	I-5 SB	Bonnyview Road	Saturday	2,345
2010	I-5 SB	Knighton Road	Saturday	2,486
2012	I-5 SB	Riverside Avenue	Saturday	2,210

General Information **Existing plus Project** *Off-Ramp Data* *Off-Ramp Volume Adjustment*

ID	Freeway/ Direction	Off-ramp	Analysis Time Period	Type	Lanes	S_{FR} (mph)	V_R (vph)	Decel Lane (ft) L_{D1}	L_{D2}	L_{Deff}	PHF	Terrain	Grade %	Length (mi)	Truck/ Bus %	RV %	E_T	E_R	f_{HV}	f_P	Flow Rate v_p (pcph)
1013	I-5 NB	Riverside Avenue	PM	Right	1	45.0	181	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	207
1011	I-5 NB	Knighton Road	PM	Right	1	45.0	624	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	712
1009	I-5 NB	Bonnyview Road	PM	Right	1	45.0	610	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	696
1007	I-5 NB	Cypress Avenue	PM	Right	1	45.0	469	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	535
1006	I-5 SB	Cypress Avenue	PM	Right	1	45.0	795	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	907
1008	I-5 SB	Bonnyview Road	PM	Right	1	45.0	570	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	651
1010	I-5 SB	Knighton Road	PM	Right	1	45.0	742	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	847
1012	I-5 SB	Riverside Avenue	PM	Right	1	45.0	412	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	470
2013	I-5 NB	Riverside Avenue	Saturday	Right	1	45.0	100	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	114
2011	I-5 NB	Knighton Road	Saturday	Right	1	45.0	587	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	670
2009	I-5 NB	Bonnyview Road	Saturday	Right	1	45.0	611	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	697
2007	I-5 NB	Cypress Avenue	Saturday	Right	1	45.0	230	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	263
2006	I-5 SB	Cypress Avenue	Saturday	Right	1	45.0	600	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	685
2008	I-5 SB	Bonnyview Road	Saturday	Right	1	45.0	475	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	542
2010	I-5 SB	Knighton Road	Saturday	Right	1	45.0	843	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	962
2012	I-5 SB	Riverside Avenue	Saturday	Right	1	45.0	378	100	0	100	0.92	Level			10.0%	0.0%	1.5	1.2	0.95	1.00	431

HCM 2000 Diverge Ramp Jun Capacity Analysis **HCM 2000 Diverge Ramp Junctions Capacity Analysis** Juni Analy

General Information **Existing plus Project** *Adjacent Upstream Ramp Data*

ID	Freeway/ Direction	Off-ramp	Analysis Time Period	Exists?	Distance	Volume (vph)	PHF	Terrain	Grade %	Length (mi)	Truck/ Bus %	RV %	E_T	E_R	f_{HV}	f_P	Flow Rate v_p (pcph)
1013	I-5 NB	Riverside Avenue	PM	No													
1011	I-5 NB	Knighton Road	PM	No													
1009	I-5 NB	Bonnyview Road	PM	No													
1007	I-5 NB	Cypress Avenue	PM	No													
1006	I-5 SB	Cypress Avenue	PM	No													
1008	I-5 SB	Bonnyview Road	PM	No													
1010	I-5 SB	Knighton Road	PM	No													
1012	I-5 SB	Riverside Avenue	PM	No													
2013	I-5 NB	Riverside Avenue	Saturday	No													
2011	I-5 NB	Knighton Road	Saturday	No													
2009	I-5 NB	Bonnyview Road	Saturday	No													
2007	I-5 NB	Cypress Avenue	Saturday	No													
2006	I-5 SB	Cypress Avenue	Saturday	No													
2008	I-5 SB	Bonnyview Road	Saturday	No													
2010	I-5 SB	Knighton Road	Saturday	No													
2012	I-5 SB	Riverside Avenue	Saturday	No													

HCM 2000 Diverge Ramp Jun Capacity Analysis | **HCM 2000 Diverge Ramp Junctions Capacity Analysis** | Juri Analy:

General Information **Existing plus Project** | *Adjacent Downstream Ramp Data* | *v_{12} Estimation*

ID	Freeway/ Direction	Off-ramp	Analysis Time Period	Exists?	Distance	Volume (vph)	PHF	Terrain	Grade %	Length (mi)	Truck/ Bus %	RV %	E_T	E_R	f_{HV}	f_P	Flow Rate v_p (pcph)	L_{EQ} 25-13	L_{EQ} 25-14	P_{FD}
1013	I-5 NB	Riverside Avenue	PM	On	600	343	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	5,029	1,150	1.000
1011	I-5 NB	Knighton Road	PM	On	1,400	805	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	7,091	1,429	1.000
1009	I-5 NB	Bonnyview Road	PM	On	1,450	617	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	6,718	1,426	1.000
1007	I-5 NB	Cypress Avenue	PM	On	1,650	1,204	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	5,861	1,328	1.000
1006	I-5 SB	Cypress Avenue	PM	On	1,650	656	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	7,276	1,610	1.000
1008	I-5 SB	Bonnyview Road	PM	On	1,450	674	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	6,010	1,413	1.000
1010	I-5 SB	Knighton Road	PM	On	1,400	598	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	6,777	1,564	1.000
1012	I-5 SB	Riverside Avenue	PM	On	1,150	272	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	5,266	1,305	1.000
2013	I-5 NB	Riverside Avenue	Saturday	On	600	469	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	4,655	1,115	1.000
2011	I-5 NB	Knighton Road	Saturday	On	1,400	982	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	6,248	1,420	1.000
2009	I-5 NB	Bonnyview Road	Saturday	On	1,450	491	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	5,858	1,459	1.000
2007	I-5 NB	Cypress Avenue	Saturday	On	1,650	1,370	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	4,483	1,205	1.000
2006	I-5 SB	Cypress Avenue	Saturday	On	1,650	307	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	7,158	1,404	1.000
2008	I-5 SB	Bonnyview Road	Saturday	On	1,450	520	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	6,814	1,304	1.000
2010	I-5 SB	Knighton Road	Saturday	On	1,400	634	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	10,366	1,595	1.000
2012	I-5 SB	Riverside Avenue	Saturday	On	1,150	120	0.92	Level	4.0%	0.70	10.0%	0.0%	1.5	1.2	0.95	1.00	1,141	6,409	1,240	1.000

General Information **Existing plus Project**

ID	Freeway/ Direction	Off-ramp	Analysis Time Period	v_{12} (pcph)
1013	I-5 NB	Riverside Avenue	PM	2,529
1011	I-5 NB	Knighton Road	PM	2,765
1009	I-5 NB	Bonnyview Road	PM	2,907
1007	I-5 NB	Cypress Avenue	PM	2,915
1006	I-5 SB	Cypress Avenue	PM	3,321
1008	I-5 SB	Bonnyview Road	PM	3,191
1010	I-5 SB	Knighton Road	PM	3,373
1012	I-5 SB	Riverside Avenue	PM	3,179
2013	I-5 NB	Riverside Avenue	Saturday	2,620
2011	I-5 NB	Knighton Road	Saturday	3,098
2009	I-5 NB	Bonnyview Road	Saturday	3,452
2007	I-5 NB	Cypress Avenue	Saturday	3,315
2006	I-5 SB	Cypress Avenue	Saturday	2,642
2008	I-5 SB	Bonnyview Road	Saturday	2,345
2010	I-5 SB	Knighton Road	Saturday	2,486
2012	I-5 SB	Riverside Avenue	Saturday	2,210

General Information **Existing plus Project** *Capacity Checks*

ID	Freeway/ Direction	Off-ramp	Analysis Time Period	v_{Fi} (pcph)	Max v_{Fi} (pcph)	LOS F?	v_3, v_{av34} (pcphpl)	v_3, v_{av34} > 2,700?	v_3, v_{av34} >1.5*v_{12}/2?	v_{12a} (pcph)	Max v_{12} (pcph)	LOS F?	v_{FO} (pcph)	Max v_{FO} (pcph)	LOS F?	v_R (pcph)	Max v_R (pcph)	LOS F?
1013	I-5 NB	Riverside Avenue	PM	2,529	4,500	No	0	No	No	2,529	4,400	No	2,323	4,500	No	207	2,100	No
1011	I-5 NB	Knighton Road	PM	2,765	4,500	No	0	No	No	2,765	4,400	No	2,053	4,500	No	712	2,100	No
1009	I-5 NB	Bonnyview Road	PM	2,907	4,500	No	0	No	No	2,907	4,400	No	2,211	4,500	No	696	2,100	No
1007	I-5 NB	Cypress Avenue	PM	2,915	4,500	No	0	No	No	2,915	4,400	No	2,380	4,500	No	535	2,100	No
1006	I-5 SB	Cypress Avenue	PM	3,321	4,500	No	0	No	No	3,321	4,400	No	2,414	4,500	No	907	2,100	No
1008	I-5 SB	Bonnyview Road	PM	3,191	4,500	No	0	No	No	3,191	4,400	No	2,541	4,500	No	651	2,100	No
1010	I-5 SB	Knighton Road	PM	3,373	4,500	No	0	No	No	3,373	4,400	No	2,526	4,500	No	847	2,100	No
1012	I-5 SB	Riverside Avenue	PM	3,179	4,500	No	0	No	No	3,179	4,400	No	2,708	4,500	No	470	2,100	No
2013	I-5 NB	Riverside Avenue	Saturday	2,620	4,500	No	0	No	No	2,620	4,400	No	2,506	4,500	No	114	2,100	No
2011	I-5 NB	Knighton Road	Saturday	3,098	4,500	No	0	No	No	3,098	4,400	No	2,428	4,500	No	670	2,100	No
2009	I-5 NB	Bonnyview Road	Saturday	3,452	4,500	No	0	No	No	3,452	4,400	No	2,755	4,500	No	697	2,100	No
2007	I-5 NB	Cypress Avenue	Saturday	3,315	4,500	No	0	No	No	3,315	4,400	No	3,053	4,500	No	263	2,100	No
2006	I-5 SB	Cypress Avenue	Saturday	2,642	4,500	No	0	No	No	2,642	4,400	No	1,957	4,500	No	685	2,100	No
2008	I-5 SB	Bonnyview Road	Saturday	2,345	4,500	No	0	No	No	2,345	4,400	No	1,803	4,500	No	542	2,100	No
2010	I-5 SB	Knighton Road	Saturday	2,486	4,500	No	0	No	No	2,486	4,400	No	1,524	4,500	No	962	2,100	No
2012	I-5 SB	Riverside Avenue	Saturday	2,210	4,500	No	0	No	No	2,210	4,400	No	1,778	4,500	No	431	2,100	No

HCM 2000 Diverge Ramp Jun Capacity Analysis **HCM 2000 Diverge Ramp Junctions Capacity Analysis** Juri Analy:

General Information **Existing plus Project** *Results* *Speed Estimation*

ID	Freeway/ Direction	Off-ramp	Analysis Time Period	Density, D (pcplpm)	Level of Service	Int. Var. D_S	Inf. Area S_R (mph)	Out Lns. S_O (mph)	All vehs. S (mph)
1013	I-5 NB	Riverside Avenue	PM	**25.1**	**C**	0.317	13.3	0.0	13.3
1011	I-5 NB	Knighton Road	PM	**27.1**	**C**	0.362	15.2	0.0	15.2
1009	I-5 NB	Bonnyview Road	PM	**28.4**	**D**	0.361	15.1	0.0	15.1
1007	I-5 NB	Cypress Avenue	PM	**28.4**	**D**	0.346	14.5	0.0	14.5
1006	I-5 SB	Cypress Avenue	PM	**31.9**	**D**	0.380	15.9	0.0	15.9
1008	I-5 SB	Bonnyview Road	PM	**30.8**	**D**	0.357	15.0	0.0	15.0
1010	I-5 SB	Knighton Road	PM	**32.4**	**D**	0.374	15.7	0.0	15.7
1012	I-5 SB	Riverside Avenue	PM	**30.7**	**D**	0.340	14.3	0.0	14.3
2013	I-5 NB	Riverside Avenue	Saturday	**25.9**	**C**	0.308	12.9	0.0	12.9
2011	I-5 NB	Knighton Road	Saturday	**30.0**	**D**	0.358	15.0	0.0	15.0
2009	I-5 NB	Bonnyview Road	Saturday	**33.0**	**D**	0.361	15.2	0.0	15.2
2007	I-5 NB	Cypress Avenue	Saturday	**31.9**	**D**	0.322	13.5	0.0	13.5
2006	I-5 SB	Cypress Avenue	Saturday	**26.1**	**C**	0.360	15.1	0.0	15.1
2008	I-5 SB	Bonnyview Road	Saturday	**23.5**	**C**	0.347	14.6	0.0	14.6
2010	I-5 SB	Knighton Road	Saturday	**24.7**	**C**	0.385	16.2	0.0	16.2
2012	I-5 SB	Riverside Avenue	Saturday	**22.4**	**C**	0.337	14.1	0.0	14.1

Leisch Method for Weaving Analysis

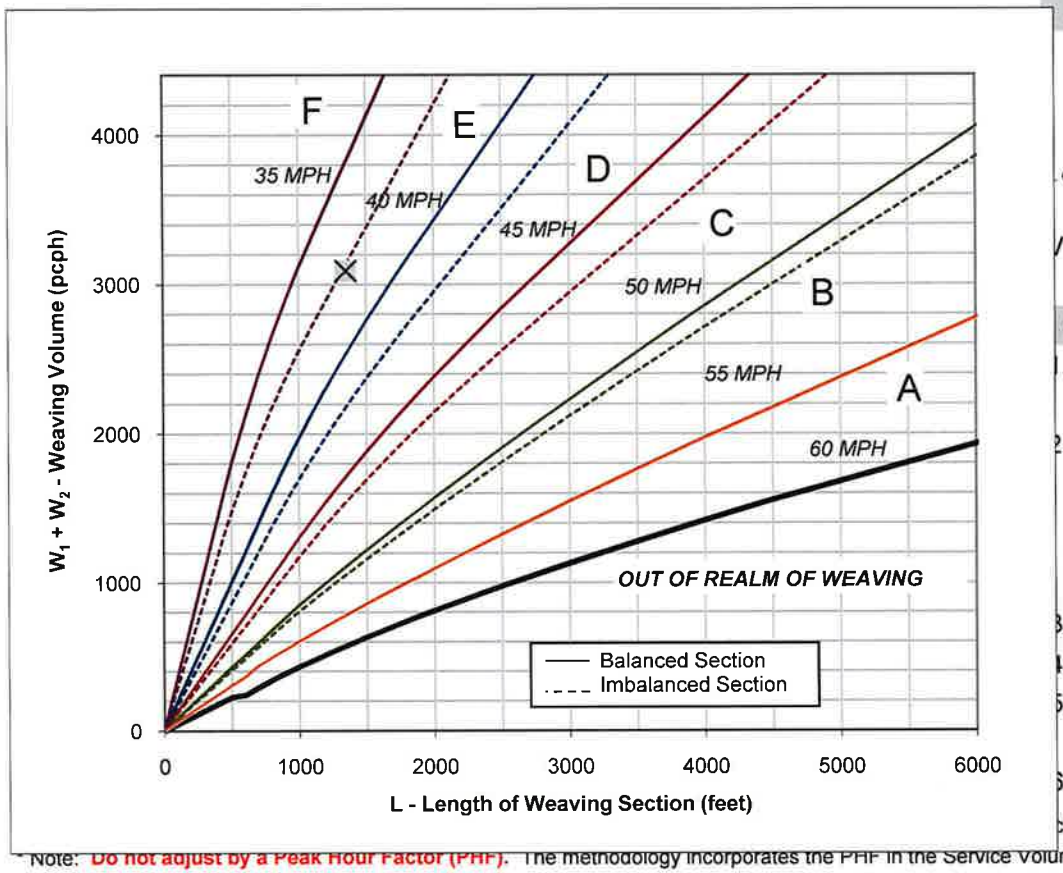
Data Input

Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	1,350

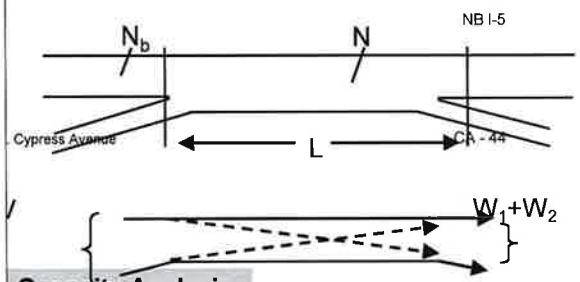
Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	3,291	Volume (vph)*	1,204	Volume (vph)*	1,711
Truck Percentage	20%	Truck Percentage	15%	Truck Percentage	10%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,620	Volume (pcph)	1,294	Volume (pcph)	1,797

Project Information

Project	Knighton & Churn Creek
Scenario	Existing PP Conditions - PM
Freeway	NB I-5
On-ramp	E. Cypress Avenue
Off-ramp	CA - 44



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **N**
   [If optional exit lane, then "Y". Otherwise "N".]
2. In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
   35 MPH and **40 MPH**
   If below the 55 MPH curve, out of the realm of weaving.
   If left of the 30 MPH curve, LOS is F.
3. Interpolated Weaving Speed (S_w, mph) **30.2**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **2,070**
6. Level of Service (LOS) **E**

cluded.

* Note: Do not adjust by a Peak Hour Factor (PHF). The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983; *Highway Design Manual*, California Department of Transportation, July 24, 2009; and Freeway and Interchange Geometric Design Handbook, Institue of Transportation Engineers, 2005.

Leisch Method for Weaving Analysis

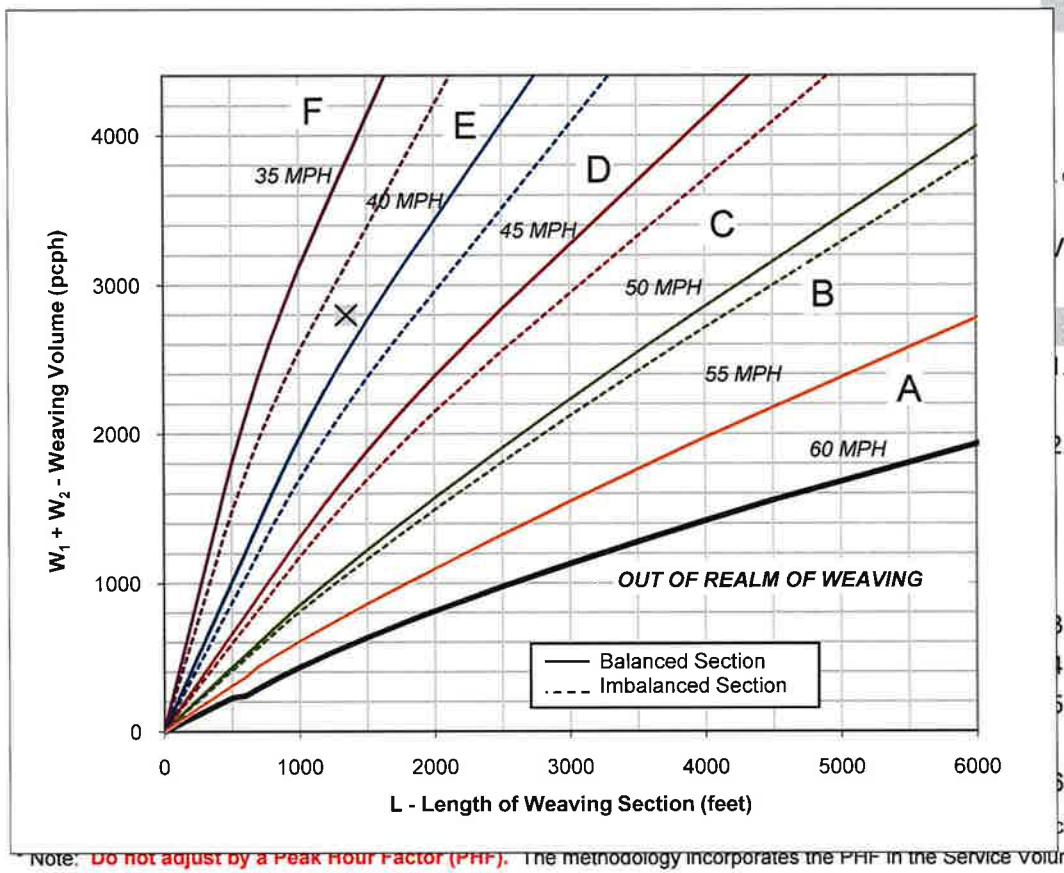
Data Input

Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	1,350

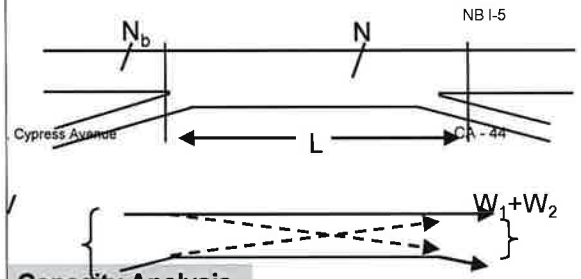
Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	4,044	Volume (vph)*	1,370	Volume (vph)*	1,263
Truck Percentage	20%	Truck Percentage	15%	Truck Percentage	10%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	4,448	Volume (pcph)	1,473	Volume (pcph)	1,326

Project Information

Project	Knighton & Churn Creek
Scenario	Existing PP Conditions - SAT
Freeway	NB I-5
On-ramp	E. Cypress Avenue
Off-ramp	CA - 44



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **N**
   [If optional exit lane, then "Y". Otherwise "N".]
2. In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
   35 MPH and **40 MPH**
   If below the 55 MPH curve, out of the realm of weaving.
   If left of the 30 MPH curve, LOS is F.
3. Interpolated Weaving Speed (S_w, mph) **31.7**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **2,367**
6. Level of Service (LOS) **F**

cluded.

* Note: Do not adjust by a Peak Hour Factor (PHF). The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983; *Highway Design Manual*, California Department of Transportation, July 24, 2009; and Freeway and Interchange Geometric Design Handbook, Institue of Transportation Engineers, 2005.

Leisch Method for Weaving Analysis

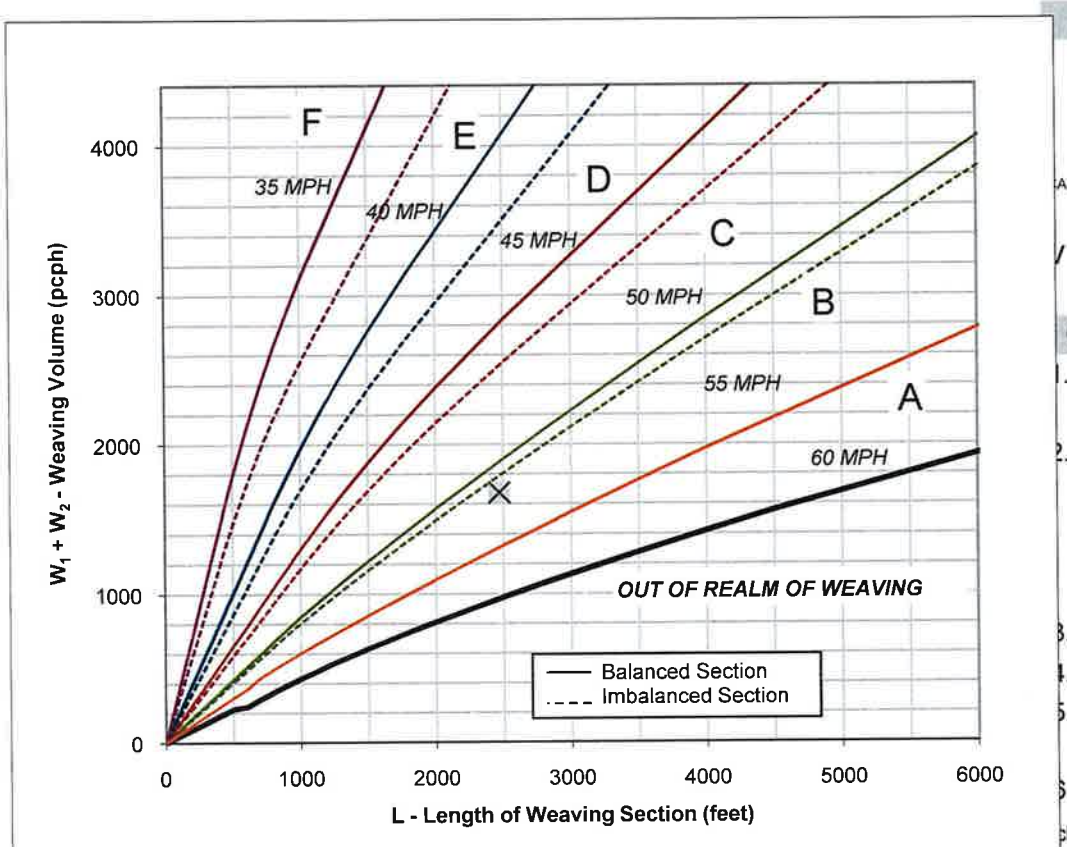
Data Input

Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	2,470

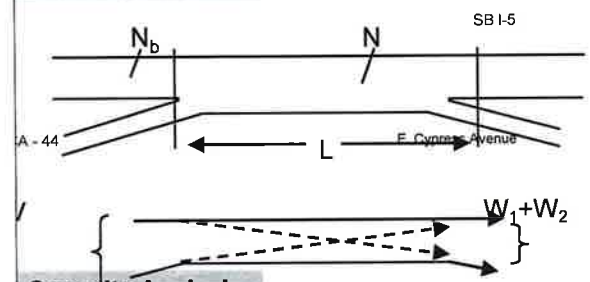
Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	2,895	Volume (vph)*	781	Volume (vph)*	795
Truck Percentage	20%	Truck Percentage	15%	Truck Percentage	10%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	3,185	Volume (pcph)	840	Volume (pcph)	835

Project Information

Project	Knighton & Churn Creek
Scenario	Existing PP Conditions - PM
Freeway	SB I-5
On-ramp	CA - 44
Off-ramp	E. Cypress Avenue



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **N**
   [If optional exit lane, then "Y". Otherwise "N".]
2. In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
   50 MPH and **55 MPH**
   If below the 55 MPH curve, out of the realm of weaving.
   If left of the 30 MPH curve, LOS is F.
3. Interpolated Weaving Speed (S_w, mph) **46.2**
4. Weaving Intensity Factor (k) **1.80**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,283**
6. Level of Service (LOS) **C**

cluded.

Note: Do not adjust by a Peak Hour Factor (PHF). The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983; *Highway Design Manual*, California Department of Transportation, July 24, 2009; and Freeway and Interchange Geometric Design Handbook, Institue of Transportation Engineers, 2005.

Leisch Method for Weaving Analysis

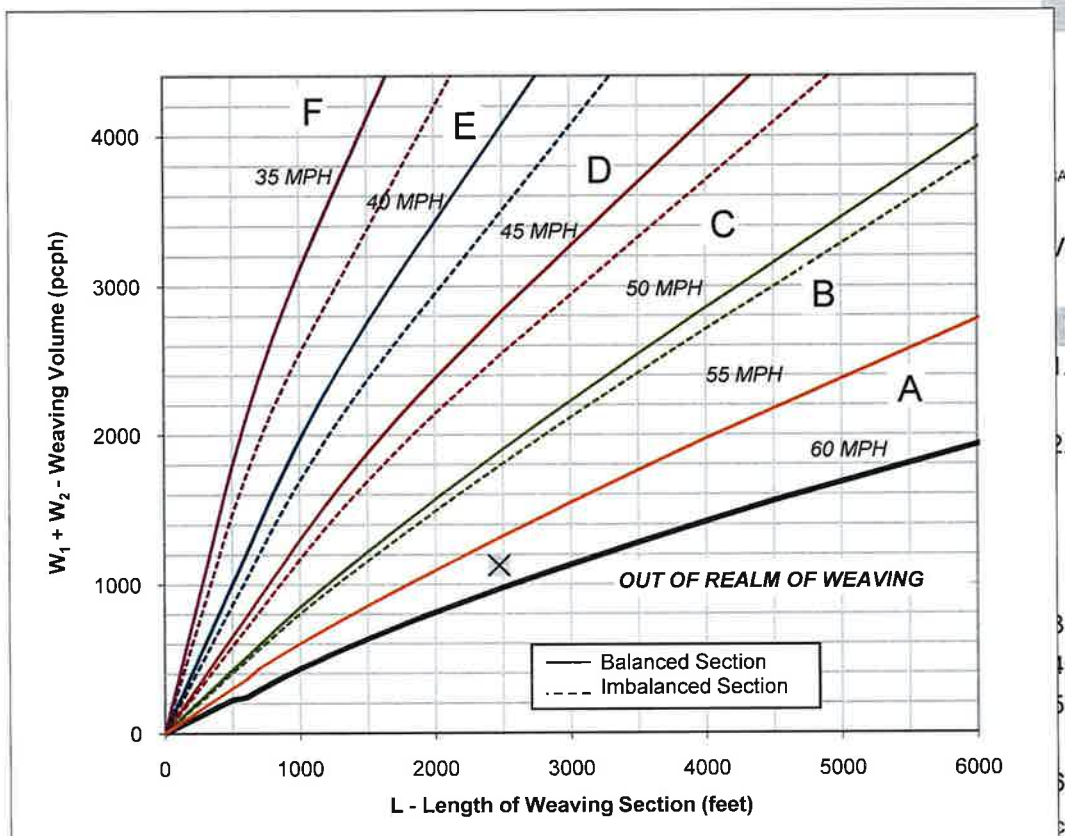
Data Input

Number of Entering Mainline Lanes	N_b	2
Number of Lanes in Weaving Section	N	3
Length of Weaving Section (feet)	L	2,470

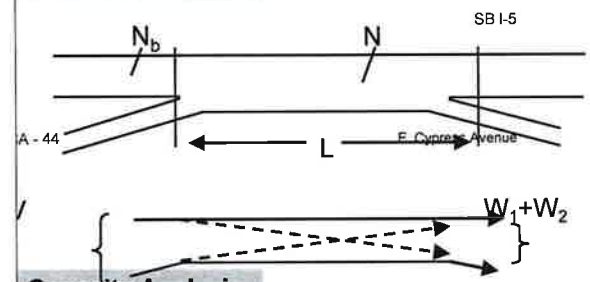
Total Weaving Section (V)		On-ramp to Mainline (W_1)		Mainline to Off-ramp (W_2)	
Volume (vph)*	2,288	Volume (vph)*	462	Volume (vph)*	600
Truck Percentage	20%	Truck Percentage	15%	Truck Percentage	10%
PCE for Trucks	1.5	PCE for Trucks	1.5	PCE for Trucks	1.5
Volume (pcph)	2,517	Volume (pcph)	497	Volume (pcph)	630

Project Information

Project	Knighton & Churn Creek
Scenario	Existing PP Conditions - SAT
Freeway	SB I-5
On-ramp	CA - 44
Off-ramp	E. Cypress Avenue



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **N**
   [If optional exit lane, then "Y". Otherwise "N".]
2. In the Weaving Speed Chart to the left, which two speed curves is the black "x" between?
   55 MPH and **60 MPH**
   If below the 55 MPH curve, out of the realm of weaving.
   If left of the 30 MPH curve, LOS is F.
3. Interpolated Weaving Speed (S_w, mph) **52.6**
4. Weaving Intensity Factor (k) **1.00**
5. Service Volume (SV, pcph)
   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **839**
6. Level of Service (LOS) **B**

cluded.

* Note: Do not adjust by a Peak Hour Factor (PHF). The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections*, Jack E. Leisch & Associates, September 1983; *Highway Design Manual*, California Department of Transportation, July 24, 2009; and Freeway and Interchange Geometric Design Handbook, Institue of Transportation Engineers, 2005.