

## **Appendix G**

# HCM Unsignalized Intersection Capacity Analysis

## 11: Valencia Road & Mountain Eagle

6/30/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗	↘	
Volume (veh/h)	5	696	256	33	92	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	757	278	36	100	10
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	314				667	139
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	314				667	139
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				74	99
cM capacity (veh/h)	1236				388	880

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	258	504	139	139	36	110
Volume Left	5	0	0	0	0	100
Volume Right	0	0	0	0	36	10
cSH	1236	1700	1700	1700	1700	408
Volume to Capacity	0.00	0.30	0.08	0.08	0.02	0.27
Queue Length 95th (ft)	0	0	0	0	0	27
Control Delay (s)	0.2	0.0	0.0	0.0	0.0	17.0
Lane LOS	A					C
Approach Delay (s)	0.1		0.0			17.0
Approach LOS						C

Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			35.0%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 15: Valencia Road & Vahalla Road

6/30/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑	↑		↑	
Volume (vph)	0	818	0	0	374	0	0	9	0	0	32	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		1.00			1.00			1.00			1.00	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		3388			3231			1783			1783	
Flt Permitted		1.00			1.00			1.00			1.00	
Satd. Flow (perm)		3388			3231			1783			1783	
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	889	0	0	407	0	0	10	0	0	35	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	889	0	0	407	0	0	10	0	0	35	0
Heavy Vehicles (%)	3%	3%	3%	3%	8%	3%	3%	3%	3%	3%	3%	3%
Turn Type							Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases							2		2	6		
Actuated Green, G (s)		24.3			24.3			27.7			27.7	
Effective Green, g (s)		24.3			24.3			27.7			27.7	
Actuated g/C Ratio		0.40			0.40			0.46			0.46	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1372			1309			823			823	
v/s Ratio Prot		c0.26			0.13			0.01			c0.02	
v/s Ratio Perm												
v/c Ratio		0.65			0.31			0.01			0.04	
Uniform Delay, d1		14.4			12.2			8.7			8.9	
Progression Factor		1.00			0.62			1.00			1.00	
Incremental Delay, d2		1.1			0.1			0.0			0.1	
Delay (s)		15.5			7.6			8.8			9.0	
Level of Service		B			A			A			A	
Approach Delay (s)		15.5			7.6			8.8			9.0	
Approach LOS		B			A			A			A	

### Intersection Summary

HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 18: Valencia Road & Iberia Road

6/30/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑		↑↓			↑	
Volume (vph)	6	1070	9	37	399	46	11	48	4	96	2	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95			0.95	1.00		1.00			1.00	
Frt		1.00			1.00	0.85		0.99			0.99	
Flt Protected		1.00			1.00	1.00		0.99			0.96	
Satd. Flow (prot)		3383			3230	1516		1754			1693	
Flt Permitted		0.95			0.82	1.00		0.96			0.72	
Satd. Flow (perm)		3224			2661	1516		1697			1280	
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)	7	1163	10	40	434	50	12	52	4	104	2	5
RTOR Reduction (vph)	0	1	0	0	0	24	0	3	0	0	3	0
Lane Group Flow (vph)	0	1179	0	0	474	26	0	65	0	0	108	0
Heavy Vehicles (%)	3%	3%	3%	3%	8%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		31.3			31.3	31.3		20.7			20.7	
Effective Green, g (s)		31.3			31.3	31.3		20.7			20.7	
Actuated g/C Ratio		0.52			0.52	0.52		0.34			0.34	
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)		1682			1388	791		585			442	
v/s Ratio Prot												
v/s Ratio Perm		c0.37			0.18	0.02		0.04			c0.08	
v/c Ratio		0.70			0.34	0.03		0.11			0.25	
Uniform Delay, d1		10.8			8.4	7.0		13.4			14.1	
Progression Factor		0.23			1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.3			0.1	0.0		0.4			1.3	
Delay (s)		3.8			8.5	7.0		13.8			15.4	
Level of Service		A			A	A		B			B	
Approach Delay (s)		3.8			8.4			13.8			15.4	
Approach LOS		A			A			B			B	

### Intersection Summary

HCM Average Control Delay	6.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 27: Valencia Road & Wade Road

6/30/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑		↑		↑			
Volume (vph)	0	2371	53	182	382	0	67	0	620	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0		4.0			
Lane Util. Factor		0.95	1.00	0.97	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)		3388	1516	3286	3231		1694		1516			
Flt Permitted		1.00	1.00	0.06	1.00		0.95		1.00			
Satd. Flow (perm)		3388	1516	192	3231		1694		1516			
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	2577	58	198	415	0	73	0	674	0	0	0
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	91	0	0	0
Lane Group Flow (vph)	0	2577	44	198	415	0	73	0	583	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	8%	3%	3%	3%	3%	3%	3%	3%
Turn Type			Perm	pm+pt			Prot		custom			
Protected Phases		4!		3	8		5		8!			
Permitted Phases			4	8								
Actuated Green, G (s)		68.0	68.0	77.8	77.8		4.2		77.8			
Effective Green, g (s)		68.0	68.0	77.8	77.8		4.2		77.8			
Actuated g/C Ratio		0.76	0.76	0.86	0.86		0.05		0.86			
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)		2560	1145	365	2793		79		1310			
v/s Ratio Prot		c0.76		0.03	0.13		c0.04		c0.38			
v/s Ratio Perm			0.03	0.43								
v/c Ratio		1.01	0.04	0.54	0.15		0.92		0.44			
Uniform Delay, d1		11.0	2.8	35.4	0.9		42.7		1.3			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		19.4	0.1	1.6	0.0		75.4		0.2			
Delay (s)		30.4	2.8	37.1	1.0		118.1		1.6			
Level of Service		C	A	D	A		F		A			
Approach Delay (s)		29.8			12.6			13.0			0.0	
Approach LOS		C			B			B			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			24.0		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				8.0			
Intersection Capacity Utilization			110.6%		ICU Level of Service				H			
Analysis Period (min)			15									
! Phase conflict between lane groups.												
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 32: Valencia Road & Camino Verde

6/30/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑	↘	↙	↘
Volume (vph)	505	1370	283	59	349	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.7	5.7	5.3	5.3	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)	1694	3388	3231	1516	1694	1516
Flt Permitted	0.56	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1006	3388	3231	1516	1694	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	549	1489	308	64	379	161
RTOR Reduction (vph)	0	0	0	32	0	81
Lane Group Flow (vph)	549	1489	308	32	379	80
Heavy Vehicles (%)	3%	3%	8%	3%	3%	3%
Turn Type	pm+pt			pm+ov		pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	35.5	33.8	15.1	30.3	15.2	29.9
Effective Green, g (s)	35.5	33.8	15.1	30.3	15.2	29.9
Actuated g/C Ratio	0.59	0.56	0.25	0.50	0.25	0.50
Clearance Time (s)	4.0	5.7	5.7	5.3	5.3	4.0
Vehicle Extension (s)	1.0	3.0	3.0	1.0	1.0	1.0
Lane Grp Cap (vph)	764	1909	813	899	429	857
v/s Ratio Prot	0.18	c0.44	0.10	0.01	c0.22	0.02
v/s Ratio Perm	0.25			0.01		0.03
v/c Ratio	0.72	0.78	0.38	0.04	0.88	0.09
Uniform Delay, d1	9.6	10.2	18.6	7.5	21.5	7.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	3.2	1.3	0.0	18.4	0.0
Delay (s)	12.3	13.4	19.9	7.5	40.0	7.9
Level of Service	B	B	B	A	D	A
Approach Delay (s)		13.1	17.8		30.4	
Approach LOS		B	B		C	

### Intersection Summary

HCM Average Control Delay	16.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 38: Valencia Road & Casino del Sol

6/30/2011

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↖	↗
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						12
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %						
				100	100	100
cM capacity (veh/h)						
				1614	1020	1081
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0				0.0	0.0
Approach LOS						A
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 40: Valencia Road & Ignacio Baumea

6/30/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↖↑	↖	↗
Volume (veh/h)	1655	41	113	525	39	121
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1799	45	123	571	42	132
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						10
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1843		2330	899
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1843		2330	899
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			62		0	53
cM capacity (veh/h)			322		19	280

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	899	899	45	313	380	174
Volume Left	0	0	0	123	0	42
Volume Right	0	0	45	0	0	132
cSH	1700	1700	1700	322	1700	75
Volume to Capacity	0.53	0.53	0.03	0.38	0.22	2.33
Queue Length 95th (ft)	0	0	0	43	0	410
Control Delay (s)	0.0	0.0	0.0	15.0	0.0	728.6
Lane LOS				B	F	
Approach Delay (s)	0.0			6.8	728.6	
Approach LOS					F	

Intersection Summary						
Average Delay			48.5			
Intersection Capacity Utilization			76.9%	ICU Level of Service	D	
Analysis Period (min)			15			



# HCM Signalized Intersection Capacity Analysis

## 44: Valencia Road & Mark Road

6/30/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	152	1038	103	98	808	182	189	568	446	206	246	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.2		4.0	5.2		4.0	5.7		4.0	5.7	5.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	0.95	0.95
Frt	1.00	0.99		1.00	0.97		1.00	0.93		1.00	0.99	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1694	3342		1694	3295		1694	1665		1694	1680	1440
Flt Permitted	0.18	1.00		0.08	1.00		0.30	1.00		0.18	1.00	1.00
Satd. Flow (perm)	316	3342		148	3295		535	1665		316	1680	1440
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)	165	1128	112	107	878	198	205	617	485	224	267	160
RTOR Reduction (vph)	0	7	0	0	18	0	0	22	0	0	2	117
Lane Group Flow (vph)	165	1233	0	107	1058	0	205	1080	0	224	281	27
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	57.7	53.7		66.7	58.7		44.1	33.4		27.6	22.6	22.6
Effective Green, g (s)	57.7	53.7		66.7	58.7		44.1	33.4		27.6	22.6	22.6
Actuated g/C Ratio	0.48	0.45		0.56	0.49		0.37	0.28		0.23	0.19	0.19
Clearance Time (s)	4.0	5.2		4.0	5.2		4.0	5.7		4.0	5.7	5.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	1.0		3.0	1.0	1.0
Lane Grp Cap (vph)	198	1496		198	1612		349	463		130	316	271
v/s Ratio Prot	c0.03	0.37		c0.04	0.32		0.08	c0.65		c0.07	0.17	
v/s Ratio Perm	c0.37			0.26			0.14			0.32		0.02
v/c Ratio	0.83	0.82		0.54	0.66		0.59	2.33		1.72	0.89	0.10
Uniform Delay, d1	26.9	29.0		20.2	23.1		39.5	43.3		54.5	47.5	40.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	24.9	5.3		3.0	2.1		2.5	606.0		355.6	24.7	0.1
Delay (s)	51.7	34.3		23.2	25.2		42.0	649.3		410.0	72.2	40.3
Level of Service	D	C		C	C		D	F		F	E	D
Approach Delay (s)		36.4			25.0			554.1			181.4	
Approach LOS		D			C			F			F	

### Intersection Summary

HCM Average Control Delay	203.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.7
Intersection Capacity Utilization	121.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Unsignalized Intersection Capacity Analysis

## 11: Valencia Road & Mountain Eagle

6/30/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↗	↘	
Volume (veh/h)	21	369	746	169	34	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	401	811	184	37	5
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	995				1057	405
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	995				1057	405
tC, single (s)	4.2				6.9	7.0
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				83	99
cM capacity (veh/h)	685				211	592
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	157	267	405	405	184	42
Volume Left	23	0	0	0	0	37
Volume Right	0	0	0	0	184	5
cSH	685	1700	1700	1700	1700	230
Volume to Capacity	0.03	0.16	0.24	0.24	0.11	0.18
Queue Length 95th (ft)	3	0	0	0	0	16
Control Delay (s)	1.8	0.0	0.0	0.0	0.0	24.1
Lane LOS	A					C
Approach Delay (s)	0.7		0.0			24.1
Approach LOS						C
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			35.9%		ICU Level of Service	A
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

## 15: Valencia Road & Vahalla Road

6/30/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑	↑		↑↓	
Volume (vph)	0	483	0	0	896	0	0	24	0	0	7	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frt		1.00			1.00			1.00			1.00	
Flt Protected		1.00			1.00			1.00			1.00	
Satd. Flow (prot)		3388			3231			1783			1783	
Flt Permitted		1.00			1.00			1.00			1.00	
Satd. Flow (perm)		3388			3231			1783			1783	
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	525	0	0	974	0	0	26	0	0	8	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	525	0	0	974	0	0	26	0	0	8	0
Heavy Vehicles (%)	3%	3%	3%	3%	8%	3%	3%	3%	3%	3%	3%	3%
Turn Type							Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases							2		2	6		
Actuated Green, G (s)		24.4			24.4			17.6			17.6	
Effective Green, g (s)		24.4			24.4			17.6			17.6	
Actuated g/C Ratio		0.49			0.49			0.35			0.35	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1653			1577			628			628	
v/s Ratio Prot		0.15			c0.30			c0.01			0.00	
v/s Ratio Perm												
v/c Ratio		0.32			0.62			0.04			0.01	
Uniform Delay, d1		7.8			9.4			10.7			10.5	
Progression Factor		1.00			0.46			1.00			1.00	
Incremental Delay, d2		0.1			0.5			0.1			0.0	
Delay (s)		7.9			4.8			10.8			10.6	
Level of Service		A			A			B			B	
Approach Delay (s)		7.9			4.8			10.8			10.6	
Approach LOS		A			A			B			B	

### Intersection Summary

HCM Average Control Delay	6.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 18: Valencia Road & Iberia Road

6/30/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑	↑		↑↓			↑	
Volume (vph)	9	695	3	91	1175	149	3	5	31	49	0	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0		4.0			4.0	
Lane Util. Factor		0.95			0.95	1.00		1.00			1.00	
Frt		1.00			1.00	0.85		0.89			0.99	
Flt Protected		1.00			1.00	1.00		1.00			0.96	
Satd. Flow (prot)		3384			3230	1516		1583			1688	
Flt Permitted		0.94			0.84	1.00		0.98			0.72	
Satd. Flow (perm)		3172			2725	1516		1560			1277	
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)	10	755	3	99	1277	162	3	5	34	53	0	4
RTOR Reduction (vph)	0	1	0	0	0	55	0	28	0	0	3	0
Lane Group Flow (vph)	0	767	0	0	1376	107	0	14	0	0	54	0
Heavy Vehicles (%)	3%	3%	3%	3%	8%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)		33.1			33.1	33.1		8.9			8.9	
Effective Green, g (s)		33.1			33.1	33.1		8.9			8.9	
Actuated g/C Ratio		0.66			0.66	0.66		0.18			0.18	
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)		2100			1804	1004		278			227	
v/s Ratio Prot												
v/s Ratio Perm		0.24			c0.50	0.07		0.01			c0.04	
v/c Ratio		0.37			0.76	0.11		0.05			0.24	
Uniform Delay, d1		3.8			5.8	3.1		17.0			17.6	
Progression Factor		1.41			0.83	1.33		1.00			1.00	
Incremental Delay, d2		0.1			1.7	0.0		0.3			2.4	
Delay (s)		5.4			6.5	4.1		17.4			20.1	
Level of Service		A			A	A		B			C	
Approach Delay (s)		5.4			6.2			17.4			20.1	
Approach LOS		A			A			B			C	

### Intersection Summary

HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 27: Valencia Road & Wade Road

6/30/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑	↑↑	↑↑		↑		↑			
Volume (vph)	0	1223	69	1324	1466	0	26	0	245	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0		4.0			
Lane Util. Factor		0.95	1.00	0.97	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)		3388	1516	3286	3231		1694		1516			
Flt Permitted		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3388	1516	3286	3231		1694		1516			
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	1329	75	1439	1593	0	28	0	266	0	0	0
RTOR Reduction (vph)	0	0	43	0	0	0	0	0	59	0	0	0
Lane Group Flow (vph)	0	1329	32	1439	1593	0	28	0	207	0	0	0
Heavy Vehicles (%)	3%	3%	3%	3%	8%	3%	3%	3%	3%	3%	3%	3%
Turn Type			Perm	Prot			Prot		Over			
Protected Phases		4		3	8		5		3			
Permitted Phases			4									
Actuated Green, G (s)		39.3	39.3	46.3	89.6		2.4		46.3			
Effective Green, g (s)		39.3	39.3	46.3	89.6		2.4		46.3			
Actuated g/C Ratio		0.39	0.39	0.46	0.90		0.02		0.46			
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)		1331	596	1521	2895		41		702			
v/s Ratio Prot		c0.39		c0.44	0.49		c0.02		0.14			
v/s Ratio Perm			0.02									
v/c Ratio		1.00	0.05	0.95	0.55		0.68		0.29			
Uniform Delay, d1		30.3	18.8	25.7	1.1		48.4		16.7			
Progression Factor		0.88	0.89	0.75	0.71		1.00		1.00			
Incremental Delay, d2		24.2	0.2	9.7	0.5		37.9		0.2			
Delay (s)		50.8	16.9	28.9	1.3		86.4		16.9			
Level of Service		D	B	C	A		F		B			
Approach Delay (s)		49.0			14.4			23.5			0.0	
Approach LOS		D			B			C			A	

### Intersection Summary

HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 32: Valencia Road & Camino Verde

6/30/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↑↑	↑↑	↗	↗	↗
Volume (vph)	149	529	1056	272	242	812
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.7	5.7	5.3	5.3	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)	1694	3388	3231	1516	1694	1516
Flt Permitted	0.10	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	174	3388	3231	1516	1694	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	162	575	1148	296	263	883
RTOR Reduction (vph)	0	0	0	139	0	8
Lane Group Flow (vph)	162	575	1148	157	263	875
Heavy Vehicles (%)	3%	3%	8%	3%	3%	3%
Turn Type	pm+pt			pm+ov		pm+ov
Protected Phases	5	2	6	4	4	5
Permitted Phases	2			6		4
Actuated Green, G (s)	72.9	72.9	36.9	53.0	16.1	48.1
Effective Green, g (s)	72.9	72.9	36.9	53.0	16.1	48.1
Actuated g/C Ratio	0.73	0.73	0.37	0.53	0.16	0.48
Clearance Time (s)	4.0	5.7	5.7	5.3	5.3	4.0
Vehicle Extension (s)	1.0	3.0	3.0	1.0	1.0	1.0
Lane Grp Cap (vph)	613	2470	1192	803	273	729
v/s Ratio Prot	0.08	0.17	c0.36	0.03	0.16	c0.38
v/s Ratio Perm	0.11			0.07		0.19
v/c Ratio	0.26	0.23	0.96	0.20	0.96	1.20
Uniform Delay, d1	10.1	4.4	30.9	12.3	41.7	25.9
Progression Factor	1.36	0.18	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.1	18.6	0.0	43.9	102.9
Delay (s)	13.7	0.9	49.5	12.4	85.6	128.8
Level of Service	B	A	D	B	F	F
Approach Delay (s)		3.7	41.9		118.9	
Approach LOS		A	D		F	

### Intersection Summary

HCM Average Control Delay	60.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 38: Valencia Road & Casino del Sol

6/30/2011

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗		↑↑	↖	↗
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						12
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1614		1020	1081
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0				0.0	0.0
Approach LOS						A
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 40: Valencia Road & Ignacio Baumea

6/30/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑	↑
Volume (veh/h)	1218	48	97	710	71	573
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1324	52	105	772	77	623
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						10
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1376		1921	662
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1376		1921	662
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			78		0	0
cM capacity (veh/h)			489		46	402
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	662	662	52	363	514	700
Volume Left	0	0	0	105	0	77
Volume Right	0	0	52	0	0	623
cSH	1700	1700	1700	489	1700	382
Volume to Capacity	0.39	0.39	0.03	0.22	0.30	1.83
Queue Length 95th (ft)	0	0	0	20	0	1139
Control Delay (s)	0.0	0.0	0.0	6.8	0.0	409.4
Lane LOS				A	F	
Approach Delay (s)	0.0			2.8	409.4	
Approach LOS					F	
Intersection Summary						
Average Delay			97.9			
Intersection Capacity Utilization			75.8%	ICU Level of Service	D	
Analysis Period (min)			15			



# HCM Signalized Intersection Capacity Analysis

## 44: Valencia Road & Mark Road

6/30/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	984	46	142	1620	203	214	227	202	156	143	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.2		4.0	5.2		4.0	5.7		4.0	5.7	5.7
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	0.95	0.95
Frt	1.00	0.99		1.00	0.98		1.00	0.93		1.00	0.98	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1694	3365		1694	3331		1694	1657		1694	1659	1440
Flt Permitted	0.07	1.00		0.14	1.00		0.45	1.00		0.25	1.00	1.00
Satd. Flow (perm)	122	3365		246	3331		795	1657		446	1659	1440
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)	124	1070	50	154	1761	221	233	247	220	170	155	182
RTOR Reduction (vph)	0	3	0	0	8	0	0	27	0	0	5	78
Lane Group Flow (vph)	124	1117	0	154	1974	0	233	440	0	170	175	79
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	62.7	58.7		72.8	64.8		38.0	27.3		21.0	16.0	16.0
Effective Green, g (s)	62.7	58.7		72.8	64.8		38.0	27.3		21.0	16.0	16.0
Actuated g/C Ratio	0.52	0.49		0.61	0.54		0.32	0.23		0.18	0.13	0.13
Clearance Time (s)	4.0	5.2		4.0	5.2		4.0	5.7		4.0	5.7	5.7
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	1.0		3.0	1.0	1.0
Lane Grp Cap (vph)	116	1646		271	1799		374	377		130	221	192
v/s Ratio Prot	c0.04	0.33		0.05	c0.59		0.08	c0.27		c0.05	0.11	
v/s Ratio Perm	0.52			0.30			0.11			0.17		0.05
v/c Ratio	1.07	0.68		0.57	1.10		0.62	1.17		1.31	0.79	0.41
Uniform Delay, d1	29.4	23.4		15.4	27.6		38.9	46.3		54.5	50.4	47.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	103.3	2.3		2.7	53.0		3.2	100.2		183.0	16.3	0.5
Delay (s)	132.7	25.7		18.1	80.6		42.1	146.5		237.4	66.7	48.2
Level of Service	F	C		B	F		D	F		F	E	D
Approach Delay (s)		36.4			76.1			111.8			118.2	
Approach LOS		D			E			F			F	

### Intersection Summary

HCM Average Control Delay	75.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9
Intersection Capacity Utilization	106.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			