

HCM Signalized Intersection Capacity Analysis
 12: Joyland Road & Casino Driveway

Friday Peak Hour
 11/20/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↕	↖↗		↖	↗
Volume (vph)	573	505	405	93	63	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Fr _t	1.00	1.00	0.97		1.00	0.85
Fl _t Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3440		1770	1583
Fl _t Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3440		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	623	549	440	101	68	126
RTOR Reduction (vph)	0	0	29	0	0	72
Lane Group Flow (vph)	623	549	512	0	68	54
Turn Type	Prot					pm+ov
Protected Phases	7	4	8		6	7
Permitted Phases						6
Actuated Green, G (s)	14.5	29.5	10.0		4.1	18.6
Effective Green, g (s)	14.5	29.5	10.0		4.1	18.6
Actuated g/C Ratio	0.33	0.68	0.23		0.09	0.43
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	1142	2395	789		166	857
v/s Ratio Prot	c0.18	0.16	c0.15		c0.04	0.02
v/s Ratio Perm						0.01
v/c Ratio	0.55	0.23	0.65		0.41	0.06
Uniform Delay, d ₁	11.9	2.7	15.2		18.6	7.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d ₂	0.5	0.0	1.9		1.6	0.0
Delay (s)	12.4	2.7	17.1		20.3	7.4
Level of Service	B	A	B		C	A
Approach Delay (s)		7.9	17.1		11.9	
Approach LOS		A	B		B	

Intersection Summary

HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

Friday Peak Hour

15: Joyland Road & *E+ Only Driveway*

11/20/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↘
Volume (veh/h)	0	1078	521	0	0	346
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	1172	566	0	0	376
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)			732			
pX, platoon unblocked						
vC, conflicting volume	566				1152	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	566				1152	283
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	47
cM capacity (veh/h)	1002				191	714

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	586	586	283	283	376
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	376
cSH	1700	1700	1700	1700	714
Volume to Capacity	0.34	0.34	0.17	0.17	0.53
Queue Length 95th (ft)	0	0	0	0	78
Control Delay (s)	0.0	0.0	0.0	0.0	15.5
Lane LOS					C
Approach Delay (s)	0.0		0.0		15.5
Approach LOS					C

Intersection Summary					
Average Delay			2.8		
Intersection Capacity Utilization			42.5%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Signalized Intersection Capacity Analysis
 12: Joyland Road & Casino Driveway

SUN PA-1
 11/20/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖↗	↑↑	↑↗		↖	↗
Volume (vph)	648	417	177	106	83	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		5.0	5.0
Lane Util. Factor	0.97	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.94		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	3539	3340		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	3539	3340		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	704	453	192	115	90	166
RTOR Reduction (vph)	0	0	91	0	0	87
Lane Group Flow (vph)	704	453	216	0	90	79
Turn Type	Prot			pm+ov		
Protected Phases	7	4	8		6	7
Permitted Phases						6
Actuated Green, G (s)	15.9	30.5	9.6		6.4	22.3
Effective Green, g (s)	15.9	30.5	9.6		6.4	22.3
Actuated g/C Ratio	0.34	0.65	0.20		0.14	0.48
Clearance Time (s)	5.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	1164	2301	684		242	921
v/s Ratio Prot	c0.21	0.13	c0.06		c0.05	0.03
v/s Ratio Perm						0.02
v/c Ratio	0.60	0.20	0.32		0.37	0.09
Uniform Delay, d1	12.9	3.3	15.9		18.4	6.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.9	0.0	0.3		1.0	0.0
Delay (s)	13.8	3.3	16.1		19.4	6.8
Level of Service	B	A	B		B	A
Approach Delay (s)		9.7	16.1		11.2	
Approach LOS		A	B		B	

Intersection Summary

HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

15: Joyland Road &

Exit only driveway

SUNDAY

11/20/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↗
Volume (veh/h)	0	1065	330	0	0	356
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	1158	359	0	0	387
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)			741			
pX, platoon unblocked						
vC, conflicting volume	359				938	179
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359				938	179
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	54
cM capacity (veh/h)	1197				263	833
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	579	579	179	179	387	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	387	
cSH	1700	1700	1700	1700	833	
Volume to Capacity	0.34	0.34	0.11	0.11	0.46	
Queue Length 95th (ft)	0	0	0	0	62	
Control Delay (s)	0.0	0.0	0.0	0.0	13.0	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		13.0	
Approach LOS					B	
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			37.8%		ICU Level of Service A	
Analysis Period (min)			15			