

# HCM Unsignalized Intersection Capacity Analysis

## 1: Red Rock Diner N & SH 133

11/16/2012



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕	↕	
Volume (veh/h)	0	51	0	735	640	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	62	0	1266	1102	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						739
pX, platoon unblocked						
vC, conflicting volume	1736	552	1103			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1736	552	1103			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	87	100			
cM capacity (veh/h)	77	472	617			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	62	633	633	735	369
Volume Left	0	0	0	0	0
Volume Right	62	0	0	0	1
cSH	472	1700	1700	1700	1700
Volume to Capacity	0.13	0.37	0.37	0.43	0.22
Queue Length 95th (ft)	11	0	0	0	0
Control Delay (s)	13.8	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	13.8	0.0	0.0		
Approach LOS	B				

Intersection Summary					
Average Delay			0.4		
Intersection Capacity Utilization	37.6%		ICU Level of Service	A	
Analysis Period (min)	15				

# HCM Unsignalized Intersection Capacity Analysis

## 3: Cowen Dr & SH 133

11/16/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	0	2	23	4	111	32	630	67	91	594	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	5	0	2	40	7	191	39	1085	115	157	1023	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				None
Median storage veh								2				
Upstream signal (ft)								1039				1029
pX, platoon unblocked	0.95	0.95		0.95	0.95	0.95				0.95		
vC, conflicting volume	2156	2619	516	1991	2508	542	1032			1200		
vC1, stage 1 conf vol	1341	1341		1163	1163							
vC2, stage 2 conf vol	815	1279		827	1345							
vCu, unblocked vol	2108	2598	516	1933	2480	403	1032			1098		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	100	72	93	66	94			73		
cM capacity (veh/h)	59	65	499	142	105	560	657			587		

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3
Volume Total	5	2	40	198	39	542	542	115	157	682	350
Volume Left	5	0	40	0	39	0	0	0	157	0	0
Volume Right	0	2	0	191	0	0	0	115	0	0	9
cSH	59	499	142	487	657	1700	1700	1700	587	1700	1700
Volume to Capacity	0.08	0.00	0.28	0.41	0.06	0.32	0.32	0.07	0.27	0.40	0.21
Queue Length 95th (ft)	7	0	27	49	5	0	0	0	27	0	0
Control Delay (s)	71.7	12.3	39.8	17.4	10.8	0.0	0.0	0.0	13.4	0.0	0.0
Lane LOS	F	B	E	C	B				B		
Approach Delay (s)	51.9		21.1		0.3				1.8		
Approach LOS	F		C								

### Intersection Summary

Average Delay	3.0
Intersection Capacity Utilization	55.8%
ICU Level of Service	B
Analysis Period (min)	15

# HCM Unsignalized Intersection Capacity Analysis

## 4: Cold Well Banker & SH 133

11/16/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↗			↕↖
Volume (veh/h)	0	0	718	4	0	619
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	1237	5	0	1066
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)			729			
pX, platoon unblocked	0.87	0.87			0.87	
vC, conflicting volume	1772	621			1241	
vC1, stage 1 conf vol	1239					
vC2, stage 2 conf vol	533					
vCu, unblocked vol	1594	275			986	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	251	626			598	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	824	417	533	533
Volume Left	0	0	0	0	0
Volume Right	0	0	5	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.48	0.25	0.31	0.31
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	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				

Intersection Summary					
Average Delay			0.0		
Intersection Capacity Utilization			34.2%	ICU Level of Service	A
Analysis Period (min)			15		

# HCM Unsignalized Intersection Capacity Analysis

## 5: The Alpine & SH 133

11/16/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕↗			↕↗
Volume (veh/h)	0	14	708	12	0	610
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	17	1219	15	0	1051
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL		TWLTL	
Median storage veh			2		2	
Upstream signal (ft)			349			
pX, platoon unblocked	0.86	0.86			0.86	
vC, conflicting volume	1752	617			1234	
vC1, stage 1 conf vol	1227					
vC2, stage 2 conf vol	525					
vCu, unblocked vol	1548	227			945	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			100	
cM capacity (veh/h)	260	662			610	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	17	813	421	525	525
Volume Left	0	0	0	0	0
Volume Right	17	0	15	0	0
cSH	662	1700	1700	1700	1700
Volume to Capacity	0.03	0.48	0.25	0.31	0.31
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	10.6	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.6	0.0		0.0	
Approach LOS	B				

Intersection Summary					
Average Delay			0.1		
Intersection Capacity Utilization		40.8%		ICU Level of Service	A
Analysis Period (min)		15			

# HCM Signalized Intersection Capacity Analysis

## 6: Village Rd & SH 133

11/16/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↗	↖	↕	↗	↖	↕	↗
Volume (vph)	7	0	20	38	1	58	16	657	43	59	538	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5	4.5	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.90			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1625			1742	1553	1736	3471	1553	1736	3471	1553
Flt Permitted		0.91			0.71	1.00	0.30	1.00	1.00	0.23	1.00	1.00
Satd. Flow (perm)		1492			1294	1553	545	3471	1553	422	3471	1553
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	110%	110%	110%	155%	155%	155%	110%	155%	155%	155%	155%	110%
Adj. Flow (vph)	9	0	24	65	2	100	20	1132	74	102	927	28
RTOR Reduction (vph)	0	21	0	0	0	44	0	0	21	0	0	8
Lane Group Flow (vph)	0	12	0	0	67	56	20	1132	53	102	927	20
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)		7.6			7.6	7.6	42.9	42.9	42.9	42.9	42.9	42.9
Effective Green, g (s)		7.6			7.6	7.6	42.9	42.9	42.9	42.9	42.9	42.9
Actuated g/C Ratio		0.13			0.13	0.13	0.71	0.71	0.71	0.71	0.71	0.71
Clearance Time (s)		4.5			4.5	4.5	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)		3.5			3.5	3.5	0.2	0.2	0.2	0.2	0.2	0.2
Lane Grp Cap (vph)		189			164	197	390	2482	1110	302	2482	1110
v/s Ratio Prot								c0.33			0.27	
v/s Ratio Perm		0.01			c0.05	0.04	0.04		0.03	0.24		0.01
v/c Ratio		0.06			0.41	0.29	0.05	0.46	0.05	0.34	0.37	0.02
Uniform Delay, d1		23.1			24.1	23.7	2.5	3.6	2.5	3.2	3.3	2.5
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	0.87	0.77	0.54
Incremental Delay, d2		0.2			2.0	0.9	0.2	0.6	0.1	2.5	0.4	0.0
Delay (s)		23.2			26.1	24.7	2.8	4.2	2.6	5.3	2.9	1.4
Level of Service		C			C	C	A	A	A	A	A	A
Approach Delay (s)		23.2			25.3			4.1			3.1	
Approach LOS		C			C			A			A	

### Intersection Summary

HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 7: Dolores Way & SH 133

11/16/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕↗			↕↗	
Volume (veh/h)	0	0	5	0	0	1	0	705	0	0	585	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	9	0	0	1	0	1214	0	0	1008	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage (veh)											2	
Upstream signal (ft)											786	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1620	2226	508	1727	2230	607	1016			1214		
vC1, stage 1 conf vol	1012	1012		1214	1214							
vC2, stage 2 conf vol	608	1214		512	1016							
vCu, unblocked vol	1510	2164	309	1625	2169	607	858			1214		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	100			100		
cM capacity (veh/h)	247	198	630	179	198	434	709			559		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	9	1	809	405	672	344
Volume Left	0	0	0	0	0	0
Volume Right	9	1	0	0	0	9
cSH	630	434	1700	1700	1700	1700
Volume to Capacity	0.01	0.00	0.48	0.24	0.40	0.20
Queue Length 95th (ft)	1	0	0	0	0	0
Control Delay (s)	10.8	13.3	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	10.8	13.3	0.0		0.0	
Approach LOS	B	B				

Intersection Summary		
Average Delay		0.0
Intersection Capacity Utilization	40.2%	ICU Level of Service
Analysis Period (min)		15
		A

HCM Unsignalized Intersection Capacity Analysis  
 8: Industry Way & SH 133

11/16/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	55	0	50	9	0	30	82	620	25	25	500	78
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	95	0	86	11	0	37	141	1068	31	31	861	134
Approach Volume (veh/h)	181				48		1240				1026	
Crossing Volume (veh/h)	903			1304#			125			152		
High Capacity (veh/h)	674				484		1256				1229	
High v/c (veh/h)	0.27				0.10		0.99				0.83	
Low Capacity (veh/h)	527				365		1044				1020	
Low v/c (veh/h)	0.34				0.13		1.19				1.01	
<b>Intersection Summary</b>												
Maximum v/c High			0.99									
Maximum v/c Low			1.19									
Intersection Capacity Utilization			78.6%		ICU Level of Service				D			
# Crossing flow exceeds 1200, method is not applicable												

# HCM Unsignalized Intersection Capacity Analysis

## 9: Crystal River Access 1 & SH 133

11/16/2012



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕	↕	↘
Volume (veh/h)	0	0	0	722	540	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	1243	930	4
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	1554	467	934			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1554	467	934			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	102	537	716			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	0	622	622	620	314	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	4	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.00	0.37	0.37	0.36	0.18	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	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					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			34.3%		ICU Level of Service	A
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis  
 10: Crystal River Access 2 & SH 133

11/16/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	18	13	12	8	17	33	0	703	35	29	508	25
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	14	13	10	19	40	0	1211	43	35	875	28
Approach Volume (veh/h)		48			69			1254			938	
Crossing Volume (veh/h)		920			1231#			70			29	
High Capacity (veh/h)		665			515			1311			1354	
High v/c (veh/h)		0.07			0.13			0.96			0.69	
Low Capacity (veh/h)		519			391			1094			1133	
Low v/c (veh/h)		0.09			0.18			1.15			0.83	
<b>Intersection Summary</b>												
Maximum v/c High											0.96	
Maximum v/c Low											1.15	
Intersection Capacity Utilization											60.3%	
											ICU Level of Service	
												B
# Crossing flow exceeds 1200, method is not applicable												

HCM Unsignalized Intersection Capacity Analysis  
 12: Crystal River Access 3 & SH 133



















11/16/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	78	5	4	2	0	9	84	677	8	10	509	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	87	6	4	2	0	11	93	1166	10	12	877	9
Approach Volume (veh/h)		97			13			1269			898	
Crossing Volume (veh/h)		891			1346#			104			96	
High Capacity (veh/h)		680			467			1276			1285	
High v/c (veh/h)		0.14			0.03			0.99			0.70	
Low Capacity (veh/h)		533			351			1063			1070	
Low v/c (veh/h)		0.18			0.04			1.19			0.84	
<b>Intersection Summary</b>												
Maximum v/c High											0.99	
Maximum v/c Low											1.19	
Intersection Capacity Utilization											75.1%	
											ICU Level of Service	
												D
# Crossing flow exceeds 1200, method is not applicable												

HCM Unsignalized Intersection Capacity Analysis  
 15: Crystal River Access 4 & SH 133

11/16/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	48	0	0	17	0	727	12	4	449	91
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	53	0	0	21	0	1252	15	5	773	101
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)								581				
pX, platoon unblocked												
vC, conflicting volume	1480	2100	437	1709	2144	633	874			1267		
vC1, stage 1 conf vol	834	834		1259	1259							
vC2, stage 2 conf vol	647	1267		450	884							
vCu, unblocked vol	1480	2100	437	1709	2144	633	874			1267		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	91	100	100	95	100			99		
cM capacity (veh/h)	255	195	562	166	195	417	755			534		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	<b>SB 3</b>					
Volume Total	53	21	835	432	5	516	359					
Volume Left	0	0	0	0	5	0	0					
Volume Right	53	21	0	15	0	0	101					
cSH	562	417	1700	1700	534	1700	1700					
Volume to Capacity	0.09	0.05	0.49	0.25	0.01	0.30	0.21					
Queue Length 95th (ft)	8	4	0	0	1	0	0					
Control Delay (s)	12.1	14.1	0.0	0.0	11.8	0.0	0.0					
Lane LOS	B	B			B							
Approach Delay (s)	12.1	14.1	0.0		0.1							
Approach LOS	B	B										
<b>Intersection Summary</b>												
Average Delay			0.4									
Intersection Capacity Utilization			41.6%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 16: Remax & SH 133

11/16/2012

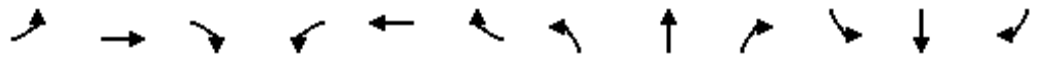


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								↑↑			↑↑	
Volume (veh/h)	0	0	0	0	0	0	0	730	0	0	450	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	0	0	0	0	0	1257	0	0	775	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage (veh)											2	
Upstream signal (ft)								240				
pX, platoon unblocked												
vC, conflicting volume	1412	2041	396	1645	2049	629	792			1257		
vC1, stage 1 conf vol	784	784		1257	1257							
vC2, stage 2 conf vol	629	1257		388	792							
vCu, unblocked vol	1412	2041	396	1645	2049	629	792			1257		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	280	204	598	170	203	420	811			538		
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>								
Volume Total	838	419	517	275								
Volume Left	0	0	0	0								
Volume Right	0	0	0	17								
cSH	1700	1700	1700	1700								
Volume to Capacity	0.49	0.25	0.30	0.16								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.0	0.0	0.0	0.0								
Lane LOS												
Approach Delay (s)	0.0		0.0									
Approach LOS												
<b>Intersection Summary</b>												
Average Delay			0.0									
Intersection Capacity Utilization			34.6%		ICU Level of Service						A	
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

## 17: Main Street & SH 133

11/16/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	181	61	63	54	44	173	86	380	50	114	288	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		5.5	5.5	5.5	4.0	5.5	5.5	4.0	5.5	5.5
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
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1688		1736	1827	1553	1736	1827	1553	1736	1827	1553
Flt Permitted	0.55	1.00		0.62	1.00	1.00	0.31	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	999	1688		1141	1827	1553	563	1827	1553	276	1827	1553
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	155%	155%	155%	155%	155%	155%	155%	155%	155%	155%	155%	155%
Adj. Flow (vph)	312	105	108	93	76	298	148	654	86	196	496	86
RTOR Reduction (vph)	0	42	0	0	0	208	0	0	51	0	0	51
Lane Group Flow (vph)	312	171	0	93	76	90	148	654	35	196	496	35
Turn Type	pm+pt			Perm		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	21.7	21.7		13.6	13.6	13.6	33.9	28.8	28.8	33.9	28.8	28.8
Effective Green, g (s)	21.7	21.7		13.6	13.6	13.6	33.9	28.8	28.8	33.9	28.8	28.8
Actuated g/C Ratio	0.31	0.31		0.19	0.19	0.19	0.48	0.41	0.41	0.48	0.41	0.41
Clearance Time (s)	4.0	5.5		5.5	5.5	5.5	4.0	5.5	5.5	4.0	5.5	5.5
Vehicle Extension (s)	3.0	2.0		2.0	2.0	2.0	3.0	0.2	0.2	3.0	0.2	0.2
Lane Grp Cap (vph)	350	519		220	352	299	355	745	634	238	745	634
v/s Ratio Prot	c0.05	0.10			0.04		0.03	c0.36		c0.06	0.27	
v/s Ratio Perm	c0.22			0.08		0.06	0.17		0.02	0.34		0.02
v/c Ratio	0.89	0.33		0.42	0.22	0.30	0.42	0.88	0.06	0.82	0.67	0.06
Uniform Delay, d1	23.7	18.8		25.0	24.0	24.4	11.3	19.3	12.7	14.0	17.0	12.7
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	23.5	0.1		0.5	0.1	0.2	0.8	11.1	0.0	20.1	1.8	0.0
Delay (s)	47.2	19.0		25.5	24.1	24.6	12.1	30.3	12.7	34.0	18.7	12.7
Level of Service	D	B		C	C	C	B	C	B	C	B	B
Approach Delay (s)		35.7			24.7			25.6			21.9	
Approach LOS		D			C			C			C	



















### Intersection Summary

HCM Average Control Delay	26.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 18: City Market & SH 133

11/16/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	31	0	0	1	0	500	2	0	353	39
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	38	0	0	1	0	861	2	0	608	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)								1154				341
pX, platoon unblocked	0.77	0.77	0.77	0.77	0.77		0.77					
vC, conflicting volume	1040	1472	608	1508	1518	432	656			864		
vC1, stage 1 conf vol	608	608		862	862							
vC2, stage 2 conf vol	432	864		646	656							
vCu, unblocked vol	902	1463	342	1511	1523	432	403			864		
tC, single (s)	7.6	6.6	7.0	7.6	6.6	7.0	4.2			4.2		
tC, 2 stage (s)	6.6	5.6		6.6	5.6							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	92	100	100	100	100			100		
cM capacity (veh/h)	399	299	499	250	291	566	876			762		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>						
Volume Total	38	1	574	289	608	48						
Volume Left	0	0	0	0	0	0						
Volume Right	38	1	0	2	0	48						
cSH	499	566	1700	1700	1700	1700						
Volume to Capacity	0.08	0.00	0.34	0.17	0.36	0.03						
Queue Length 95th (ft)	6	0	0	0	0	0						
Control Delay (s)	12.8	11.4	0.0	0.0	0.0	0.0						
Lane LOS	B	B										
Approach Delay (s)	12.8	11.4	0.0		0.0							
Approach LOS	B	B										
<b>Intersection Summary</b>												
Average Delay			0.3									
Intersection Capacity Utilization			38.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 19: Crystal Valley MH & SH 133

11/16/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Volume (veh/h)	8	0	1	17	1	23	2	474	20	29	354	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	0	1	21	1	28	2	816	24	35	610	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage (veh)												2
Upstream signal (ft)								863				632
pX, platoon unblocked	0.89	0.89	0.81	0.89	0.89	0.84	0.81			0.84		
vC, conflicting volume	1545	1528	612	1515	1518	829	613			841		
vC1, stage 1 conf vol	682	682		833	833							
vC2, stage 2 conf vol	862	846		682	684							
vCu, unblocked vol	1138	1119	400	1105	1108	698	402			712		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	100	93	100	92	100			95		
cM capacity (veh/h)	252	288	522	301	309	366	925			735		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	11	50	843	35	613
Volume Left	10	21	2	35	0
Volume Right	1	28	24	0	4
cSH	268	334	925	735	1700
Volume to Capacity	0.04	0.15	0.00	0.05	0.36
Queue Length 95th (ft)	3	13	0	4	0
Control Delay (s)	19.0	17.7	0.1	10.1	0.0
Lane LOS	C	C	A	B	
Approach Delay (s)	19.0	17.7	0.1	0.6	
Approach LOS	C	C			

Intersection Summary		
Average Delay		1.0
Intersection Capacity Utilization	51.8%	ICU Level of Service
Analysis Period (min)		15
		A

# HCM Unsignalized Intersection Capacity Analysis

## 20: Alley & SH 133

11/16/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	5	460	0	0	371
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	6	792	0	0	639
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			698			797
pX, platoon unblocked	0.91	0.84			0.84	
vC, conflicting volume	1431	792			792	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1023	655			655	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			100	
cM capacity (veh/h)	236	387			773	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	6	792	639
Volume Left	0	0	0
Volume Right	6	0	0
cSH	387	1700	1700
Volume to Capacity	0.02	0.47	0.38
Queue Length 95th (ft)	1	0	0
Control Delay (s)	14.4	0.0	0.0
Lane LOS	B		
Approach Delay (s)	14.4	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		47.5%	ICU Level of Service A
Analysis Period (min)		15	



HCM Unsignalized Intersection Capacity Analysis  
 21: Euclid Ave & SH 133

11/16/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Volume (veh/h)	4	16	475	6	10	363
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	5	20	818	7	12	625
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			542			953
pX, platoon unblocked	0.88	0.81			0.81	
vC, conflicting volume	1471	822			825	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1093	662			667	
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	95			98	
cM capacity (veh/h)	204	371			739	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	24	825	12	625
Volume Left	5	0	12	0
Volume Right	20	7	0	0
cSH	319	1700	739	1700
Volume to Capacity	0.08	0.49	0.02	0.37
Queue Length 95th (ft)	6	0	1	0
Control Delay (s)	17.2	0.0	10.0	0.0
Lane LOS	C		A	
Approach Delay (s)	17.2	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		49.1%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 23: Wells Fargo & SH 133

11/16/2012



Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations		↗	↗	↗		↗
Volume (veh/h)	0	11	381	8	0	472
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	13	656	10	0	813
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			1223			272
pX, platoon unblocked	0.83	0.89			0.89	
vC, conflicting volume	1469	656			666	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1178	556			567	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	97			100	
cM capacity (veh/h)	174	471			890	

Direction, Lane #	EB 1	SE 1	SE 2	NW 1
Volume Total	13	656	10	813
Volume Left	0	0	0	0
Volume Right	13	0	10	0
cSH	471	1700	1700	1700
Volume to Capacity	0.03	0.39	0.01	0.48
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	12.9	0.0	0.0	0.0
Lane LOS	B			
Approach Delay (s)	12.9	0.0		0.0
Approach LOS	B			

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		41.8%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Signalized Intersection Capacity Analysis

## 25: SH 133 & Sopris

11/16/2012



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	36	340	33	36	366	7	83	2	52	12	0	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5		5.5	5.5		5.5	5.5	
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		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1827	1553	1736	1823		1736	1561		1736	1553	
Flt Permitted	0.37	1.00	1.00	0.40	1.00		0.71	1.00		0.71	1.00	
Satd. Flow (perm)	670	1827	1553	731	1823		1290	1561		1304	1553	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	110%	155%	110%	110%	155%	110%	110%	110%	110%	155%	155%	155%
Adj. Flow (vph)	44	586	40	44	630	9	101	2	64	21	0	78
RTOR Reduction (vph)	0	0	13	0	1	0	0	55	0	0	67	0
Lane Group Flow (vph)	44	586	27	44	638	0	101	11	0	21	11	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases	2		2	2			4			4		
Actuated Green, G (s)	40.4	40.4	40.4	40.4	40.4		8.6	8.6		8.6	8.6	
Effective Green, g (s)	40.4	40.4	40.4	40.4	40.4		8.6	8.6		8.6	8.6	
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67		0.14	0.14		0.14	0.14	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5		5.5	5.5		5.5	5.5	
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)	451	1230	1046	492	1227		185	224		187	223	
v/s Ratio Prot		0.32			c0.35			0.01			0.01	
v/s Ratio Perm	0.07		0.02	0.06			c0.08			0.02		
v/c Ratio	0.10	0.48	0.03	0.09	0.52		0.55	0.05		0.11	0.05	
Uniform Delay, d1	3.4	4.7	3.3	3.4	4.9		23.9	22.2		22.4	22.2	
Progression Factor	1.00	1.00	1.00	0.30	0.41		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.3	0.0	0.3	1.3		3.3	0.1		0.3	0.1	
Delay (s)	3.9	6.0	3.3	1.3	3.3		27.2	22.3		22.6	22.3	
Level of Service	A	A	A	A	A		C	C		C	C	
Approach Delay (s)		5.7			3.2			25.2			22.3	
Approach LOS		A			A			C			C	

### Intersection Summary

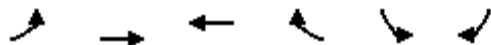
HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 27: SH 133 & 8th Street

11/16/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑	↗	↘	
Volume (veh/h)	0	383	395	29	29	5
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	660	680	35	35	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		532	1156			
pX, platoon unblocked	0.84				0.92	0.84
vC, conflicting volume	716				1340	680
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	570				942	528
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	99
cM capacity (veh/h)	837				266	461

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	660	680	35	42
Volume Left	0	0	0	35
Volume Right	0	0	35	6
cSH	1700	1700	1700	283
Volume to Capacity	0.39	0.40	0.02	0.15
Queue Length 95th (ft)	0	0	0	13
Control Delay (s)	0.0	0.0	0.0	19.9
Lane LOS				C
Approach Delay (s)	0.0	0.0		19.9
Approach LOS				C

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		42.2%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 28: SH 133 & Keator Road

11/16/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩		↩
Volume (veh/h)	383	5	0	415	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	660	6	0	715	0	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	978			710		
pX, platoon unblocked			0.89		0.84	0.89
vC, conflicting volume			666		1377	663
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			563		1061	560
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	99
cM capacity (veh/h)			889		206	467





















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	666	715	6
Volume Left	0	0	0
Volume Right	6	0	6
cSH	1700	1700	467
Volume to Capacity	0.39	0.42	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	12.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	12.8
Approach LOS			B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		41.6%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Signalized Intersection Capacity Analysis

## 29: Thompson Park Access & SH 133

11/16/2012

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	38	8	7	38	0	1	3	385	4	5	409	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0		6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.93			1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00			0.95		0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1736	1698			1735		1736	1827	1553		1826	1553
Flt Permitted	0.71	1.00			0.72		0.33	1.00	1.00		1.00	1.00
Satd. Flow (perm)	1303	1698			1310		610	1827	1553		1818	1553
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	100%	100%	100%	155%	100%	155%	155%	155%	100%	100%	155%	155%
Adj. Flow (vph)	42	9	8	65	0	2	5	663	4	6	704	121
RTOR Reduction (vph)	0	7	0	0	2	0	0	0	1	0	0	38
Lane Group Flow (vph)	42	10	0	0	65	0	5	663	3	0	710	83
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2	2	6			6
Actuated Green, G (s)	7.0	7.0			7.0		41.0	41.0	41.0		41.0	41.0
Effective Green, g (s)	7.0	7.0			7.0		41.0	41.0	41.0		41.0	41.0
Actuated g/C Ratio	0.12	0.12			0.12		0.68	0.68	0.68		0.68	0.68
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0	6.0		6.0	6.0
Lane Grp Cap (vph)	152	198			153		417	1248	1061		1242	1061
v/s Ratio Prot		0.01						0.36				
v/s Ratio Perm	0.03				0.05		0.01	0.00			0.39	0.05
v/c Ratio	0.28	0.05			0.43		0.01	0.53	0.00		0.57	0.08
Uniform Delay, d1	24.2	23.5			24.6		3.0	4.7	3.0		4.9	3.2
Progression Factor	1.00	1.00			1.00		0.36	0.30	0.28		1.00	1.00
Incremental Delay, d2	4.5	0.5			8.5		0.0	1.5	0.0		1.9	0.1
Delay (s)	28.6	24.0			33.1		1.2	2.9	0.8		6.9	3.3
Level of Service	C	C			C		A	A	A		A	A
Approach Delay (s)		27.3			33.1			2.9			6.3	
Approach LOS		C			C			A			A	
<b>Intersection Summary</b>												
HCM Average Control Delay			6.8				HCM Level of Service		A			
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			57.4%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

30: River Valley Ranch Rd & SH 133

11/16/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	7	13	29	7	176	8	320	126	176	280	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5			5.5		5.5	5.5	5.5	5.0	5.5	5.5
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.90			0.89		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1736	1652			1611		1736	1827	1553	1736	1827	1553
Flt Permitted	0.23	1.00			0.95		0.49	1.00	1.00	0.24	1.00	1.00
Satd. Flow (perm)	415	1652			1535		892	1827	1553	432	1827	1553
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	110%	110%	110%	155%	155%	155%	110%	155%	155%	155%	155%	110%
Adj. Flow (vph)	31	9	16	50	12	303	10	551	217	303	482	17
RTOR Reduction (vph)	0	12	0	0	203	0	0	0	105	0	0	6
Lane Group Flow (vph)	31	13	0	0	162	0	10	551	112	303	482	11
Turn Type	pm+pt			Perm			Perm		Perm	pm+pt		Perm
Protected Phases	7	4			8			2		1		6
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	19.8	19.8			13.6		37.7	37.7	37.7	54.9	54.9	54.9
Effective Green, g (s)	19.8	19.8			13.6		37.7	37.7	37.7	54.9	54.9	54.9
Actuated g/C Ratio	0.23	0.23			0.16		0.44	0.44	0.44	0.64	0.64	0.64
Clearance Time (s)	4.0	5.5			5.5		5.5	5.5	5.5	5.0	5.5	5.5
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)	130	382			244		392	804	683	462	1170	995
v/s Ratio Prot	c0.01	0.01						0.30		c0.09	0.26	
v/s Ratio Perm	0.05				c0.11		0.01		0.07	c0.33		0.01
v/c Ratio	0.24	0.03			0.66		0.03	0.69	0.16	0.66	0.41	0.01
Uniform Delay, d1	26.9	25.5			33.9		13.6	19.2	14.5	10.6	7.5	5.6
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.0			6.7		0.1	4.7	0.5	3.3	1.1	0.0
Delay (s)	27.8	25.6			40.6		13.7	24.0	15.0	14.0	8.6	5.6
Level of Service	C	C			D		B	C	B	B	A	A
Approach Delay (s)		26.8			40.6			21.3			10.6	
Approach LOS		C			D			C			B	

## Intersection Summary

HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	14.5
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

31: SH 133 &

11/16/2012























Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	6	71	396	31	79	262
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	87	682	38	97	451
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)			654			861
pX, platoon unblocked	0.84	0.84			0.84	
vC, conflicting volume	1120	701			720	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1050	554			577	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	78			88	
cM capacity (veh/h)	164	398			827	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2	SB 3	
Volume Total	94	720	97	226	226	
Volume Left	7	0	97	0	0	
Volume Right	87	38	0	0	0	
cSH	358	1700	827	1700	1700	
Volume to Capacity	0.26	0.42	0.12	0.13	0.13	
Queue Length 95th (ft)	26	0	10	0	0	
Control Delay (s)	18.6	0.0	9.9	0.0	0.0	
Lane LOS	C		A			
Approach Delay (s)	18.6	0.0	1.7			
Approach LOS	C					
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			54.4%		ICU Level of Service	A
Analysis Period (min)			15			



HCM Signalized Intersection Capacity Analysis  
 32: SH 133 & Crystal Bridge Dr

11/16/2012

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	7	242	7	82	148	35	80	7	6	0	9	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5		5.5			5.5	5.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96			1.00	1.00
Satd. Flow (prot)	1736	1821		1736	1827	1553		1737			1827	1553
Flt Permitted	0.60	1.00		0.38	1.00	1.00		0.75			1.00	1.00
Satd. Flow (perm)	1098	1821		689	1827	1553		1356			1827	1553
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	110%	155%	110%	110%	155%	110%	110%	110%	110%	110%	110%	110%
Adj. Flow (vph)	9	417	9	100	255	43	98	9	7	0	11	123
RTOR Reduction (vph)	0	1	0	0	0	20	0	4	0	0	0	105
Lane Group Flow (vph)	9	425	0	100	255	23	0	110	0	0	11	18
Turn Type	pm+pt			pm+pt		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4			8		8
Actuated Green, G (s)	26.5	25.4		34.7	29.5	29.5		8.2			8.2	8.2
Effective Green, g (s)	26.5	25.4		34.7	29.5	29.5		8.2			8.2	8.2
Actuated g/C Ratio	0.48	0.46		0.63	0.53	0.53		0.15			0.15	0.15
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5		5.5			5.5	5.5
Vehicle Extension (s)	3.5	4.0		3.5	4.0	4.0		3.5			3.5	3.5
Lane Grp Cap (vph)	539	836		531	975	828		201			271	230
v/s Ratio Prot	0.00	c0.23		c0.02	c0.14						0.01	
v/s Ratio Perm	0.01			0.10		0.01		c0.08				0.01
v/c Ratio	0.02	0.51		0.19	0.26	0.03		0.55			0.04	0.08
Uniform Delay, d1	7.5	10.5		4.7	7.0	6.1		21.8			20.2	20.3
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	0.0	0.7		0.2	0.2	0.0		3.3			0.1	0.2
Delay (s)	7.6	11.2		4.9	7.2	6.1		25.2			20.3	20.5
Level of Service	A	B		A	A	A		C			C	C
Approach Delay (s)		11.1			6.5			25.2			20.5	
Approach LOS		B			A			C			C	

Intersection Summary

HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	22.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 33: High School & SH 133

11/16/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	52	206	12	68	86
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	5	64	355	15	83	148
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						763
pX, platoon unblocked						
vC, conflicting volume	676	362			369	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	676	362			369	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	91			93	
cM capacity (veh/h)	386	678			1178	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	68	369	83	148
Volume Left	5	0	83	0
Volume Right	64	15	0	0
cSH	643	1700	1178	1700
Volume to Capacity	0.11	0.22	0.07	0.09
Queue Length 95th (ft)	9	0	6	0
Control Delay (s)	11.3	0.0	8.3	0.0
Lane LOS	B		A	
Approach Delay (s)	11.3	0.0	3.0	
Approach LOS	B			

Intersection Summary			
Average Delay		2.2	
Intersection Capacity Utilization		35.5%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Signalized Intersection Capacity Analysis

## 45: SH 82 & SH 133

11/16/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Volume (vph)	0	440	200	0	400	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		0.85	1.00		1.00	0.85
Flt Protected		1.00	0.95		0.95	1.00
Satd. Flow (prot)		1553	1736		1736	1553
Flt Permitted		1.00	0.76		0.95	1.00
Satd. Flow (perm)		1553	1383		1736	1553
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor (vph)	155%	155%	155%	155%	155%	155%
Adj. Flow (vph)	0	758	344	0	689	577
RTOR Reduction (vph)	0	526	0	0	0	254
Lane Group Flow (vph)	0	232	344	0	689	323
Turn Type		Perm	Perm			Perm
Protected Phases	4			8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)		18.4	18.4		33.6	33.6
Effective Green, g (s)		18.4	18.4		33.6	33.6
Actuated g/C Ratio		0.31	0.31		0.56	0.56
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)		476	424		972	870
v/s Ratio Prot					c0.40	
v/s Ratio Perm		0.15	c0.25			0.21
v/c Ratio		0.49	0.81		0.71	0.37
Uniform Delay, d1		17.0	19.2		9.6	7.3
Progression Factor		1.00	1.00		0.75	0.66
Incremental Delay, d2		0.8	11.2		4.2	1.2
Delay (s)		17.8	30.4		11.4	6.0
Level of Service		B	C		B	A
Approach Delay (s)	17.8			30.4	8.9	
Approach LOS	B			C	A	

### Intersection Summary

HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

