

HCM Unsignalized Intersection Capacity Analysis

UNM Gibson Commercial District

1: Gibson & West Road

2011 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2338	30	14	1017	7	15	0	21	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	2461	32	15	1071	7	16	0	22	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1078			2493			2863	3584	836	1946	3596	361
vC1, stage 1 conf vol							2477	2477		1104	1104	
vC2, stage 2 conf vol							386	1107		842	2493	
vCu, unblocked vol	1078			2493			2863	3584	836	1946	3596	361
tC, single (s)	4.1			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			41	100	93	100	100	100
cM capacity (veh/h)	643			175			27	45	310	124	34	636
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1			
Volume Total	984	984	524	15	428	428	221	38	0			
Volume Left	0	0	0	15	0	0	0	16	0			
Volume Right	0	0	32	0	0	0	7	22	0			
cSH	1700	1700	1700	175	1700	1700	1700	57	1700			
Volume to Capacity	0.58	0.58	0.31	0.08	0.25	0.25	0.13	0.66	0.00			
Queue Length 95th (ft)	0	0	0	7	0	0	0	69	0			
Control Delay (s)	0.0	0.0	0.0	27.4	0.0	0.0	0.0	148.5	0.0			
Lane LOS				D				F	A			
Approach Delay (s)	0.0			0.4				148.5	0.0			
Approach LOS								F	A			
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			55.8%			ICU Level of Service			B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

3: Gibson & University

UNM Gibson Commercial District
2011 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Volume (vph)	170	2164	29	25	962	118	59	28	51	153	19	81
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
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	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	0.90		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)	1752	5036	1568	1736	4988	1553	1752	1666		1687	1776	1509
Flt Permitted	0.19	1.00	1.00	0.14	1.00	1.00	0.54	1.00		0.70	1.00	1.00
Satd. Flow (perm)	346	5036	1568	250	4988	1553	1000	1666		1246	1776	1509
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	183	2327	31	27	1034	127	63	30	55	165	20	87
RTOR Reduction (vph)	0	0	11	0	0	62	0	48	0	0	0	69
Lane Group Flow (vph)	183	2327	20	27	1034	65	63	37	0	165	20	18
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	3%	3%	3%	7%	7%	7%
Turn Type	pm+pt		pm+ov	pm+pt		pm+ov	pm+pt			pm+pt		pm+ov
Protected Phases	7	4	5	3	8	1	5	2		1	6	7
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	41.0	35.6	42.2	30.6	29.2	33.6	14.7	8.1		10.3	5.9	13.7
Effective Green, g (s)	41.0	35.6	42.2	30.6	29.2	33.6	14.7	8.1		10.3	5.9	13.7
Actuated g/C Ratio	0.63	0.54	0.64	0.47	0.45	0.51	0.22	0.12		0.16	0.09	0.21
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)	384	2737	1106	149	2224	891	300	206		226	160	408
v/s Ratio Prot	c0.06	c0.46	0.00	0.00	0.21	0.00	c0.02	0.02		c0.05	0.01	0.01
v/s Ratio Perm	0.24		0.01	0.08		0.04	0.03			c0.07		0.01
v/c Ratio	0.48	0.85	0.02	0.18	0.46	0.07	0.21	0.18		0.73	0.12	0.04
Uniform Delay, d1	6.3	12.7	4.2	11.6	12.7	8.1	20.5	25.7		25.9	27.4	20.7
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	0.9	2.7	0.0	0.6	0.2	0.0	0.4	0.4		11.5	0.4	0.0
Delay (s)	7.2	15.4	4.2	12.2	12.8	8.1	20.8	26.1		37.3	27.8	20.7
Level of Service	A	B	A	B	B	A	C	C		D	C	C
Approach Delay (s)		14.7			12.3			23.9			31.3	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay			15.4			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			65.5			Sum of lost time (s)				20.0		
Intersection Capacity Utilization			70.3%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

4: East Road & University

UNM Gibson Commercial District
2011 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	1	0	2	0	316	6	16	253	0
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	0	1	0	2	0	340	6	17	272	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)												
pX, platoon unblocked												
vC, conflicting volume	478	653	136	513	649	173	272				346	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	478	653	136	513	649	173	272				346	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.2				4.2	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.3				2.2	
p0 queue free %	100	100	100	100	100	100	100				99	
cM capacity (veh/h)	464	380	888	439	381	840	1253				1202	
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4		
Volume Total	0	0	3	0	227	120	17	136	136	0		
Volume Left	0	0	1	0	0	0	17	0	0	0		
Volume Right	0	0	2	0	0	6	0	0	0	0		
cSH	1700	1700	644	1700	1700	1700	1202	1700	1700	1700		
Volume to Capacity	0.00	0.00	0.01	0.00	0.13	0.07	0.01	0.08	0.08	0.00		
Queue Length 95th (ft)	0	0	0	0	0	0	1	0	0	0		
Control Delay (s)	0.0	0.0	10.6	0.0	0.0	0.0	8.0	0.0	0.0	0.0		
Lane LOS	A	A	B				A					
Approach Delay (s)	0.0	10.6		0.0	0.5							
Approach LOS	A	B										
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			23.3%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

5: Cesar Chavez & University

UNM Gibson Commercial District

2011 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	366	365	152	26	297	86	54	197	34	63	164	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4861		1770	3420		1770	3539	1583	1770	3539	1583
Flt Permitted	0.35	1.00		0.42	1.00		0.64	1.00	1.00	0.62	1.00	1.00
Satd. Flow (perm)	652	4861		787	3420		1191	3539	1583	1155	3539	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	411	410	171	29	334	97	57	210	36	68	178	74
RTOR Reduction (vph)	0	103	0	0	45	0	0	0	28	0	0	48
Lane Group Flow (vph)	411	478	0	29	386	0	57	210	8	68	178	26
Turn Type	pm+pt			pm+pt			pm+pt			pm+ov	pm+pt	pm+ov
Protected Phases	7	4		3	8		5	2	3	1	6	7
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	24.8	18.7		14.6	12.5		10.2	8.1	10.2	10.2	8.1	16.4
Effective Green, g (s)	24.8	18.7		14.6	12.5		10.2	8.1	10.2	10.2	8.1	16.4
Actuated g/C Ratio	0.53	0.40		0.31	0.27		0.22	0.17	0.22	0.22	0.17	0.35
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	541	1934		288	910		284	610	478	278	610	687
v/s Ratio Prot	c0.13	0.10		0.00	0.11		0.01	c0.06	0.00	c0.01	0.05	0.01
v/s Ratio Perm	c0.27			0.03			0.03		0.00	0.04		0.01
v/c Ratio	0.76	0.25		0.10	0.42		0.20	0.34	0.02	0.24	0.29	0.04
Uniform Delay, d1	7.3	9.4		11.4	14.3		14.9	17.1	14.5	15.0	17.0	10.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.1	0.1		0.2	0.3		0.3	0.3	0.0	0.5	0.3	0.0
Delay (s)	13.4	9.5		11.5	14.6		15.2	17.5	14.5	15.4	17.2	10.1
Level of Service	B	A		B	B		B	B	B	B	B	B
Approach Delay (s)		11.1			14.4			16.7			15.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM Average Control Delay			13.3	HCM Level of Service			B					
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			47.0	Sum of lost time (s)			12.0					
Intersection Capacity Utilization			53.5%	ICU Level of Service			A					
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

6: Cesar Chavez & Langham

UNM Gibson Commercial District
2011 AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	386	1023	18	4	418	1	10	0	3	1	0	73
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	449	1190	21	5	486	1	12	0	3	1	0	85
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	Raised			Raised								
Median storage veh	1			1								
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	487			1210			2354	2594	407	1794	2604	163
vC1, stage 1 conf vol							2098	2098		496	496	
vC2, stage 2 conf vol							256	497		1298	2108	
vCu, unblocked vol	487			1210			2354	2594	407	1794	2604	163
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	58			99			56	100	99	99	100	90
cM capacity (veh/h)	1072			572			27	37	593	80	42	853
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	449	476	476	259	5	194	194	98	12	3	1	85
Volume Left	449	0	0	0	5	0	0	0	12	0	1	0
Volume Right	0	0	0	21	0	0	0	1	0	3	0	85
cSH	1072	1700	1700	1700	572	1700	1700	1700	27	593	80	853
Volume to Capacity	0.42	0.28	0.28	0.15	0.01	0.11	0.11	0.06	0.44	0.01	0.01	0.10
Queue Length 95th (ft)	53	0	0	0	1	0	0	0	34	0	1	8
Control Delay (s)	10.8	0.0	0.0	0.0	11.3	0.0	0.0	0.0	220.4	11.1	50.8	9.7
Lane LOS	B				B				F	B	F	A
Approach Delay (s)	2.9				0.1				172.1		10.2	
Approach LOS									F		B	
Intersection Summary												
Average Delay	3.7											
Intersection Capacity Utilization	46.7%			ICU Level of Service					A			
Analysis Period (min)	15											