












HCM Unsignalized Intersection Capacity Analysis

21: Frontage Rd & US 276

2015 AM Woodruff Improvements

7/6/2011










						
Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	125	20	74	1555	1906	72
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)	139	22	82	1728	2118	80
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					1013	
pX, platoon unblocked	0.57	0.57	0.57			
vC, conflicting volume	3186	1099	2198			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3327	0	1592			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	96	63			
cM capacity (veh/h)	2	612	225			
Direction, Lane #	WB 1	SE 1	SE 2	SE 3	NW 1	NW 2
Volume Total	161	82	864	864	1412	786
Volume Left	139	82	0	0	0	0
Volume Right	22	0	0	0	0	80
cSH	2	225	1700	1700	1700	1700
Volume to Capacity	65.40	0.37	0.51	0.51	0.83	0.46
Queue Length 95th (ft)	Err	40	0	0	0	0
Control Delay (s)	Err	30.0	0.0	0.0	0.0	0.0
Lane LOS	F	D				
Approach Delay (s)	Err	1.4			0.0	
Approach LOS	F					
Intersection Summary						
Average Delay		387.0				
Intersection Capacity Utilization		76.3%		ICU Level of Service		D
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

22: US 276 & St Josephs Dr

2015 AM Woodruff Improvements

7/6/2011












						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	1419	261	264	1525	453	98
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)	1577	290	293	1694	503	109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				860		
pX, platoon unblocked					0.51	
vC, conflicting volume			1867		3156	933
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1867		3305	933
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			4		0	58
cM capacity (veh/h)			307		0	262
Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	
Volume Total	1051	816	858	1130	612	
Volume Left	0	0	293	0	503	
Volume Right	0	290	0	0	109	
cSH	1700	1700	307	1700	0	
Volume to Capacity	0.62	0.48	0.96	0.66	3612.25	
Queue Length 95th (ft)	0	0	242	0	Err	
Control Delay (s)	0.0	0.0	78.3	0.0	Err	
Lane LOS			F		F	
Approach Delay (s)	0.0		33.8		Err	
Approach LOS					F	
Intersection Summary						
Average Delay			1385.6			
Intersection Capacity Utilization			138.4%		ICU Level of Service	H
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

29: Rothwell Dr & E Butler Road

2015 AM Woodruff Improvements

7/6/2011











						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	6	1	4	1111	932	27
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	1	4	1234	1036	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		5				
Median type				TWLTL	TWLTL	
Median storage (veh)				2	2	
Upstream signal (ft)				1176	378	
pX, platoon unblocked	0.84	0.86	0.86			
vC, conflicting volume	1677	533	1066			
vC1, stage 1 conf vol	1051					
vC2, stage 2 conf vol	626					
vCu, unblocked vol	694	137	755			
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 %	98	100	99			
cM capacity (veh/h)	358	756	717			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	8	4	617	617	690	375
Volume Left	7	4	0	0	0	0
Volume Right	1	0	0	0	0	30
cSH	417	717	1700	1700	1700	1700
Volume to Capacity	0.02	0.01	0.36	0.36	0.41	0.22
Queue Length 95th (ft)	1	0	0	0	0	0
Control Delay (s)	14.5	10.1	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	14.5	0.0			0.0	
Approach LOS	B					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			40.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

32: New Commerce Ct & E Butler Road

2015 AM Woodruff Improvements

7/6/2011




















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	53	58	1479	21	36	1334
Sign Control	Stop		Free		Free	Free
Grade	0%		0%		0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	59	64	1643	23	40	1482
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)			371			
pX, platoon unblocked	0.79	0.79			0.79	
vC, conflicting volume	2476	833			1667	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2340	272			1321	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	89			90	
cM capacity (veh/h)	21	569			400	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	123	1096	571	40	741	741
Volume Left	59	0	0	40	0	0
Volume Right	64	0	23	0	0	0
cSH	42	1700	1700	400	1700	1700
Volume to Capacity	2.93	0.64	0.34	0.10	0.44	0.44
Queue Length 95th (ft)	339	0	0	8	0	0
Control Delay (s)	1072.0	0.0	0.0	15.0	0.0	0.0
Lane LOS	F			C		
Approach Delay (s)	1072.0	0.0		0.4		
Approach LOS	F					
Intersection Summary						
Average Delay		40.1				
Intersection Capacity Utilization		54.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

33: E Butler Road & Brookfield Pkwy

2015 AM Woodruff Improvements

7/6/2011

															
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR			
Lane Configurations															
Volume (veh/h)	96	1420	21	17	1337	18	1	0	13	20	0	10			
Sign Control	Free				Free				Stop		Stop				
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)	107	1578	23	19	1486	20	1	0	14	22	0	11			
Pedestrians															
Lane Width (ft)															
Walking Speed (ft/s)															
Percent Blockage															
Right turn flare (veh)															
Median type	None				None										
Median storage veh															
Upstream signal (ft)	939														
pX, platoon unblocked				0.81					0.81	0.81			0.81		
vC, conflicting volume	1506				1601				2547	3348	753	2598	3346	801	
vC1, stage 1 conf vol															
vC2, stage 2 conf vol															
vCu, unblocked vol	1506				1274				2441	3429	753	2504	3427	287	
tC, single (s)	4.2				4.2				7.6	6.6	7.0	7.6	6.6	7.0	
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 %	75				96				88	100	96	0	100	98	
cM capacity (veh/h)	426				425				10	4	346	8	4	568	
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SE 1	SE 2	NW 1	NW 2						
Volume Total	107	1052	549	762	763	1	14	22	11						
Volume Left	107	0	0	19	0	1	0	22	0						
Volume Right	0	0	23	0	20	0	14	0	11						
cSH	426	1700	1700	425	1700	10	346	8	568						
Volume to Capacity	0.25	0.62	0.32	0.04	0.45	0.12	0.04	2.65	0.02						
Queue Length 95th (ft)	24	0	0	3	0	8	3	97	1						
Control Delay (s)	16.2	0.0	0.0	1.4	0.0	422.9	15.9	1608.5	11.5						
Lane LOS	C				A				F	C	F	B			
Approach Delay (s)	1.0				0.7				44.9						
Approach LOS							E				F				
Intersection Summary															
Average Delay				12.0											
Intersection Capacity Utilization				94.2%		ICU Level of Service				F					
Analysis Period (min)				15											