

Appendix B: Existing conditions Synchro intersection level-of-service (LOS) analysis

HCM 2010 Signalized Intersection Capacity Analysis
 6: UNIVERSITY AVE. AT I200 SOUTH.

UNIV AT I200

2/17/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑↑↑	↗	↖	↑↑↑	↗
Traffic Volume (veh/h)	86	20	130	65	32	33	78	1112	41	60	1769	139
Future Volume (veh/h)	86	20	130	65	32	33	78	1112	41	60	1769	139
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	93	22	141	71	35	36	85	1209	45	65	1923	151
Adj No. of Lanes	1	1	1	0	1	1	1	3	1	1	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	238	381	324	225	102	324	259	2928	912	450	2928	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.16	1.00	1.00	0.08	0.58	0.58
Ln Grp Delay, s/veh	57.4	42.5	50.1	47.8	0.0	43.4	17.4	0.4	0.1	8.8	20.3	13.5
Ln Grp LOS	E	D	D	D		D	B	A	A	A	C	B
Approach Vol, veh/h		256			142			1339			2139	
Approach Delay, s/veh		52.1			46.7			1.5			19.4	
Approach LOS		D			D			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Case No	1.1	3.0		5.0	1.1	3.0		7.0
Phs Duration (G+Y+Rc), s	15.0	82.0		35.0	15.0	82.0		35.0
Change Period (Y+Rc), s	4.5	6.0		8.0	4.5	6.0		8.0
Max Green (Gmax), s	10.5	76.0		27.0	10.5	76.0		27.0
Max Allow Headway (MAH), s	2.8	4.1		3.5	2.8	4.1		3.5
Max Q Clear (g_c+I1), s	3.7	2.0		19.3	4.2	36.1		10.7
Green Ext Time (g_e), s	0.0	38.3		0.6	0.0	27.0		0.9
Prob of Phs Call (p_c)	1.00	1.00		1.00	1.00	1.00		1.00
Prob of Max Out (p_x)	0.00	0.00		0.00	0.00	0.00		0.00

Left-Turn Movement Data								
Assigned Mvmt		1			7	5		3
Mvmt Sat Flow, veh/h		1774			1324	1774		878

Through Movement Data								
Assigned Mvmt			2		4	6		8
Mvmt Sat Flow, veh/h			5085		1863	5085		501

Right-Turn Movement Data								
Assigned Mvmt			12		14	16		18
Mvmt Sat Flow, veh/h			1583		1583	1583		1583

Left Lane Group Data									
Assigned Mvmt							0	0	3
Lane Assignment (P/L/T)			1	0	0	7	5		L+T

	↙	↖	↑	↗	↘	↓			
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations	↖↗	↖	↑		↗↖	↘↗			
Traffic Volume (veh/h)	309	166	29	317	187	39			
Future Volume (veh/h)	309	166	29	317	187	39			
Number	3	18	2	12	1	6			
Initial Q, veh	0	0	0	0	0	0			
Ped-Bike Adj (A_pbT)	1.00	1.00		1.00	1.00				
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	336	0	32	0	203	42			
Adj No. of Lanes	2	1	1	0	2	2			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	2			
Opposing Right Turn Influence	Yes				Yes				
Cap, veh/h	491	226	734	0	329	2167			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00			
Prop Arrive On Green	0.14	0.00	0.39	0.00	0.10	0.61			
Ln Grp Delay, s/veh	20.6	0.0	9.3	0.0	22.0	3.7			
Ln Grp LOS	C		A		C	A			
Approach Vol, veh/h	336		32			245			
Approach Delay, s/veh	20.6		9.3			18.9			
Approach LOS	C		A			B			
Timer:		1	2	3	4	5	6	7	8
Assigned Phs		1	2	8			6		
Case No		2.0	8.0	9.0			4.0		
Phs Duration (G+Y+Rc), s		10.7	25.3	13.0			36.0		
Change Period (Y+Rc), s		6.0	6.0	6.0			6.0		
Max Green (Gmax), s		6.0	18.0	18.0			30.0		
Max Allow Headway (MAH), s		2.8	4.2	2.8			4.2		
Max Q Clear (g_c+I1), s		4.8	2.5	6.5			2.2		
Green Ext Time (g_e), s		0.0	0.2	0.5			0.2		
Prob of Phs Call (p_c)		0.94	1.00	0.99			1.00		
Prob of Max Out (p_x)		1.00	0.00	0.00			0.00		
Left-Turn Movement Data									
Assigned Mvmt		1	5	3					
Mvmt Sat Flow, veh/h		3442	0	3442					
Through Movement Data									
Assigned Mvmt			2	8			6		
Mvmt Sat Flow, veh/h			1863	0			3632		
Right-Turn Movement Data									
Assigned Mvmt			12	18			16		
Mvmt Sat Flow, veh/h			0	1583			0		
Left Lane Group Data									
Assigned Mvmt		1	5	3	0	0	0	0	0
Lane Assignment		(T)	(T)	(T)	(T)	(T)	(T)	(T)	(T)

HCM 2010 Signalized Intersection Capacity Analysis **UNIV AT TOWN**
 3: UNIVERSITY AVE. AT TOWNE CENTRE DR. / EAST BAY BLVD.

2/17/2016

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↖	↑↑	↗	↖↖	↑↑	↗	↖↖	↑↑↑	↗	↖↖	↑↑↑	↗
Traffic Volume (veh/h)	60	83	292	377	161	114	308	868	62	92	1581	91
Future Volume (veh/h)	60	83	292	377	161	114	308	868	62	92	1581	91
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	65	90	317	410	175	124	335	943	67	100	1718	99
Adj No. of Lanes	2	2	1	2	2	1	2	3	1	2	3	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	352	804	360	352	804	360	404	1695	528	534	1888	588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Prop Arrive On Green	0.10	0.23	0.23	0.10	0.23	0.23	0.12	0.33	0.33	0.31	0.74	0.74
Ln Grp Delay, s/veh	55.4	40.7	74.5	160.0	42.1	45.4	74.5	37.3	31.1	40.2	23.3	11.6
Ln Grp LOS	E	D	E	F	D	D	E	D	C	D	C	B
Approach Vol, veh/h		472			709			1345			1917	
Approach Delay, s/veh		65.4			110.9			46.3			23.6	
Approach LOS		E			F			D			C	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs		1	2	3	4	5	6	7	8			
Case No		2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0			
Phs Duration (G+Y+Rc), s		25.0	51.0	18.0	38.0	20.0	56.0	18.0	38.0			
Change Period (Y+Rc), s		4.5	7.0	4.5	8.0	4.5	7.0	4.5	8.0			
Max Green (Gmax), s		20.5	44.0	13.5	30.0	15.5	49.0	13.5	30.0			
Max Allow Headway (MAH), s		3.8	5.1	3.8	4.5	3.8	5.1	3.8	4.5			
Max Q Clear (g_c+1), s		4.8	22.0	15.5	27.5	14.6	37.4	4.3	10.7			
Green Ext Time (g_e), s		0.2	18.6	0.0	0.9	0.1	10.5	0.1	3.2			
Prob of Phs Call (p_c)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Prob of Max Out (p_x)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Left-Turn Movement Data												
Assigned Mvmt		1		3		5		7				
Mvmt Sat Flow, veh/h		3442		3442		3442		3442				
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			5085		3539		5085		3539			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1583		1583		1583		1583			
Left Lane Group Data												
Assigned Mvmt		1	0	3	0	5	0	7	0			
Lane Assignment		(Prot)		(Prot)		(Prot)		(Prot)				

Intersection									
Intersection Delay, s/veh	10.4								
Intersection LOS	B								
Movement	WBU	WBL	WBR	SBU	SBL	SBR	NEU	NEL	NER
Traffic Vol, veh/h	0	135	132	0	165	41	0	65	92
Future Vol, veh/h	0	135	132	0	165	41	0	65	92
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	147	143	0	179	45	0	71	100
Number of Lanes	0	1	1	0	1	2	0	1	0

Approach	WB	SB	NE
Opposing Approach			
Opposing Lanes	0	0	0
Conflicting Approach Left	NE	WB	SB
Conflicting Lanes Left	1	2	3
Conflicting Approach Right	SB	NE	WB
Conflicting Lanes Right	3	1	2
HCM Control Delay	10.1	10.8	10.4
HCM LOS	B	B	B

Lane	NELn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	41%	100%	0%	100%	0%	0%
Vol Thru, %	0%	0%	0%	0%	0%	0%
Vol Right, %	59%	0%	100%	0%	100%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	157	135	132	165	21	21
LT Vol	65	135	0	165	0	0
Through Vol	0	0	0	0	0	0
RT Vol	92	0	132	0	21	21
Lane Flow Rate	171	147	143	179	22	22
Geometry Grp	7	8	8	7	7	7
Degree of Util (X)	0.265	0.252	0.198	0.309	0.031	0.02
Departure Headway (Hd)	5.586	6.181	4.977	6.2	4.99	3.243
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	637	577	713	576	709	1081
Service Time	3.376	3.972	2.767	3.99	2.78	1.031
HCM Lane V/C Ratio	0.268	0.255	0.201	0.311	0.031	0.02
HCM Control Delay	10.4	11.1	9	11.8	7.9	6.1
HCM Lane LOS	B	B	A	B	A	A
HCM 95th-ile Q	1.1	1	0.7	1.3	0.1	0.1

Educational Use Only