Appendix M – Synchro intersection LOS analysis data sheets

HCM 2010 AWSC
7: Towne Centre Blvd & 1200 South 3/28/2016

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	WBU	WBL	WBR	SBU	SBL	SBR	NEU	NEL	NER
Traffic Vol, veh/h	0	138	135	0	168	42	0	66	94
Future Vol, veh/h	0	138	135	0	168	42	0	66	94
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	150	147	0	183	46	0	72	102
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	10.2	10.9	10.5
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	160	138	135	168	21	21
LT Vol	66	138	0	168	0	0
Through Vol	0	0	0	0	0	0
RT Vol	94	0	135	0	21	21
Lane Flow Rate	174	150	147	183	23	23
Geometry Grp	7	8	8	7	7	7
Degree of Util (X)	0.271	0.259	0.204	0.316	0.032	0.021
Departure Headway (Hd)	5.61	6.204	4.999	6.224	5.014	3.266
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	633	573	709	572	705	1072
Service Time	3.407	4	2.795	4.02	2.81	1.06
HCM Lane V/C Ratio	0.275	0.262	0.207	0.32	0.033	0.021
HCM Control Delay	10.5	11.2	9.1	11.9	8	6.1
HCM Lane LOS	B	B	A	B	A	A
HCM 95th-tile Q	1.1	1	0.8	1.3	0.1	0.1

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HCM 2010 AWSC
7: Towne Centre Blvd & 1200 South 3/28/2016

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Movement	WBU	WBL	WBR	SBU	SBL	SBR	NEU	NEL	NER
Traffic Vol, veh/h	0	138	139	0	172	42	0	70	98
Future Vol, veh/h	0	138	139	0	172	42	0	70	98
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	150	151	0	187	46	0	76	107
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	10.2	11.2	10.7
HCM LOS	B	B	B

Lane	NELn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	42%	100%	0%	100%	0%	0%
Vol Thru, %	0%	0%	0%	0%	0%	0%
Vol Right, %	58%	0%	100%	0%	100%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	168	138	139	172	21	21
LT Vol	70	138	0	172	0	0
Through Vol	0	0	0	0	0	0
RT Vol	98	0	139	0	21	21
Lane Flow Rate	183	150	151	187	23	23
Geometry Grp	7	8	8	7	7	7
Degree of Util (X)	0.286	0.264	0.212	0.33	0.032	0.021
Departure Headway (Hd)	5.752	6.346	5.15	6.358	5.153	3.404
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	628	569	701	568	699	1058
Service Time	3.452	4.055	2.85	4.064	2.853	1.104
HCM Lane V/C Ratio	0.291	0.264	0.215	0.329	0.033	0.022
HCM Control Delay	10.7	11.3	9.2	12.2	8	6.2
HCM Lane LOS	B	B	A	B	A	A
HCM 95th-tile Q	1.2	1.1	0.8	1.4	0.1	0.1

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HCM 2010 AWSC
7: Towne Centre Blvd & 1200 South 3/28/2016

Intersection	
Intersection Delay, s/veh	11.2
Intersection LOS	B

Movement	WBU	WBL	WBR	SBU	SBL	SBR	NEU	NEL	NER
Traffic Vol, veh/h	0	152	149	0	186	46	0	73	104
Future Vol, veh/h	0	152	149	0	186	46	0	73	104
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	165	162	0	202	50	0	79	113
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	10.8	11.7	11.2
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	177	152	149	186	23	23
LT Vol	73	152	0	186	0	0
Through Vol	0	0	0	0	0	0
RT Vol	104	0	149	0	23	23
Lane Flow Rate	192	165	162	202	25	25
Geometry Grp	7	8	8	7	7	7
Degree of Util (X)	0.313	0.296	0.236	0.363	0.036	0.024
Departure Headway (Hd)	5.861	6.457	5.251	6.467	5.255	3.504
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	616	558	685	558	682	1021
Service Time	3.584	4.18	2.974	4.191	2.979	1.227
HCM Lane V/C Ratio	0.312	0.296	0.236	0.362	0.037	0.024
HCM Control Delay	11.2	11.9	9.6	12.8	8.2	6.3
HCM Lane LOS	B	B	A	B	A	A
HCM 95th-tile Q	1.3	1.2	0.9	1.6	0.1	0.1

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HCM 2010 AWSC
7: Towne Centre Blvd & 1200 South 3/28/2016

Intersection	
Intersection Delay, s/veh	11.4
Intersection LOS	B

Movement	WBU	WBL	WBR	SBU	SBL	SBR	NEU	NEL	NER
Traffic Vol, veh/h	0	152	153	0	190	46	0	77	108
Future Vol, veh/h	0	152	153	0	190	46	0	77	108
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	165	166	0	207	50	0	84	117
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	10.8	12	11.5
HCM LOS	B	B	B

Lane	NELn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	42%	100%	0%	100%	0%	0%
Vol Thru, %	0%	0%	0%	0%	0%	0%
Vol Right, %	58%	0%	100%	0%	100%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	185	152	153	190	23	23
LT Vol	77	152	0	190	0	0
Through Vol	0	0	0	0	0	0
RT Vol	108	0	153	0	23	23
Lane Flow Rate	201	165	166	207	25	25
Geometry Grp	7	8	8	7	7	7
Degree of Util (X)	0.329	0.299	0.245	0.373	0.037	0.025
Departure Headway (Hd)	5.893	6.505	5.298	6.507	5.294	3.543
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	611	553	679	553	677	1009
Service Time	3.622	4.233	3.026	4.234	3.021	1.269
HCM Lane V/C Ratio	0.329	0.298	0.244	0.374	0.037	0.025
HCM Control Delay	11.5	12	9.7	13.1	8.2	6.4
HCM Lane LOS	B	B	A	B	A	A
HCM 95th-tile Q	1.4	1.2	1	1.7	0.1	0.1

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HCM 2010 Signalized Intersection Summary
3: University Ave & Towne Centre Drive/East Bay Blvd

3/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	85	298	385	164	116	314	885	63	94	1613	93
Future Volume (veh/h)	61	85	298	385	164	116	314	885	63	94	1613	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), 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	66	92	324	418	178	126	341	962	68	102	1753	101
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
Cap, veh/h	352	804	360	352	804	360	404	1695	528	534	1888	588
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
Sat Flow, veh/h	3442	3539	1583	3442	3539	1583	3442	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	66	92	324	418	178	126	341	962	68	102	1753	101
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1721	1770	1583	1721	1695	1583	1721	1695	1583
Q Serve(g_s), s	2.3	2.7	26.2	13.5	5.4	8.8	12.8	20.5	3.9	2.9	37.7	2.5
Cycle Q Clear(g_c), s	2.3	2.7	26.2	13.5	5.4	8.8	12.8	20.5	3.9	2.9	37.7	2.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	804	360	352	804	360	404	1695	528	534	1888	588
V/C Ratio(X)	0.19	0.11	0.90	1.19	0.22	0.35	0.84	0.57	0.13	0.19	0.93	0.17
Avail Cap(c_a), 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.2	40.5	49.5	59.3	41.5	42.8	57.1	36.2	30.6	39.4	15.5	11.0
Incr Delay (d2), s/veh	1.2	0.3	27.9	109.4	0.6	2.7	18.9	1.4	0.5	0.8	9.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.4	14.2	11.8	2.7	4.1	7.2	9.8	1.8	1.4	18.6	1.2
LnGrp Delay(d),s/veh	55.4	40.7	77.4	168.6	42.1	45.5	76.0	37.6	31.2	40.2	25.1	11.6
LnGrp LOS	E	D	E	F	D	D	E	D	C	D	C	B
Approach Vol, veh/h		482			722			1371			1956	
Approach Delay, s/veh		67.4			116.0			46.8			25.2	
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
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 Setting (Gmax), s	20.5	44.0	13.5	30.0	15.5	49.0	13.5	30.0
Max Q Clear Time (g_c+I1), s	4.9	22.5	15.5	28.2	14.8	39.7	4.3	10.8
Green Ext Time (p_c), s	0.2	18.4	0.0	0.7	0.1	8.6	0.1	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	50.7
HCM 2010 LOS	D

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Opening Day Conditions 1/25/2016 Baseline
Rob Sanders

Synchro 9 Classroom Report
Page 1

HCM 2010 Signalized Intersection Summary
3: University Ave & Towne Centre Drive/East Bay Blvd

3/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	85	298	385	164	121	314	904	63	102	1645	103
Future Volume (veh/h)	61	85	298	385	164	121	314	904	63	102	1645	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), 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	66	92	324	418	178	132	341	983	68	111	1788	112
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
Cap, veh/h	352	804	360	352	804	360	404	1695	528	534	1888	588
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
Sat Flow, veh/h	3442	3539	1583	3442	3539	1583	3442	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	66	92	324	418	178	132	341	983	68	111	1788	112
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1721	1770	1583	1721	1695	1583	1721	1695	1583
Q Serve(g_s), s	2.3	2.7	26.2	13.5	5.4	9.3	12.8	21.1	3.9	3.1	40.3	2.8
Cycle Q Clear(g_c), s	2.3	2.7	26.2	13.5	5.4	9.3	12.8	21.1	3.9	3.1	40.3	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	804	360	352	804	360	404	1695	528	534	1888	588
V/C Ratio(X)	0.19	0.11	0.90	1.19	0.22	0.37	0.84	0.58	0.13	0.21	0.95	0.19
Avail Cap(c_a), 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.2	40.5	49.5	59.3	41.5	43.0	57.1	36.4	30.6	39.5	15.9	11.1
Incr Delay (d2), s/veh	1.2	0.3	27.9	109.4	0.6	2.9	18.9	1.5	0.5	0.9	11.5	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.4	14.2	11.8	2.7	4.4	7.2	10.1	1.8	1.5	19.9	1.3
LnGrp Delay(d),s/veh	55.4	40.7	77.4	168.6	42.1	45.9	76.0	37.8	31.2	40.4	27.4	11.8
LnGrp LOS	E	D	E	F	D	D	E	D	C	D	C	B
Approach Vol, veh/h		482			728			1392			2011	
Approach Delay, s/veh		67.4			115.4			46.8			27.2	
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
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 Setting (Gmax), s	20.5	44.0	13.5	30.0	15.5	49.0	13.5	30.0
Max Q Clear Time (g_c+I1), s	5.1	23.1	15.5	28.2	14.8	42.3	4.3	11.3
Green Ext Time (p_c), s	0.3	18.2	0.0	0.7	0.1	6.3	0.1	3.2

Intersection Summary	
HCM 2010 Ctrl Delay	51.3
HCM 2010 LOS	D

Educational Use Only

Opening Day 2017 (with new trips) 1/25/2016 Baseline
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Synchro 9 Classroom Report
Page 1

HCM 2010 Signalized Intersection Summary
3: University Ave & Towne Centre Drive/East Bay Blvd

3/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	93	329	425	181	128	347	978	70	104	1780	102
Future Volume (veh/h)	68	93	329	425	181	128	347	978	70	104	1780	102
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), 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	74	101	358	462	197	139	377	1063	76	113	1935	111
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
Cap, veh/h	352	804	360	352	804	360	404	1695	528	534	1888	588
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
Sat Flow, veh/h	3442	3539	1583	3442	3539	1583	3442	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	74	101	358	462	197	139	377	1063	76	113	1935	111
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1721	1770	1583	1721	1695	1583	1721	1695	1583
Q Serve(g_s), s	2.6	3.0	29.8	13.5	6.0	9.8	14.3	23.3	4.4	3.2	49.0	2.8
Cycle Q Clear(g_c), s	2.6	3.0	29.8	13.5	6.0	9.8	14.3	23.3	4.4	3.2	49.0	2.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	804	360	352	804	360	404	1695	528	534	1888	588
V/C Ratio(X)	0.21	0.13	0.99	1.31	0.24	0.39	0.93	0.63	0.14	0.21	1.03	0.19
Avail Cap(c_a), 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	40.6	50.9	59.3	41.7	43.2	57.7	37.1	30.8	39.5	17.0	11.0
Incr Delay (d2), s/veh	1.4	0.3	46.2	159.6	0.7	3.1	30.7	1.8	0.6	0.9	27.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.5	17.6	14.2	3.0	4.6	8.5	11.1	2.0	1.6	26.8	1.3
LnGrp Delay(d),s/veh	55.7	40.9	97.1	218.8	42.5	46.3	88.4	38.9	31.4	40.4	44.4	11.8
LnGrp LOS	E	D	F	F	D	D	F	D	C	D	F	B
Approach Vol, veh/h		533			798			1516			2159	
Approach Delay, s/veh		80.7			145.2			50.8			42.5	
Approach LOS		F			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
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 Setting (Gmax), s	20.5	44.0	13.5	30.0	15.5	49.0	13.5	30.0
Max Q Clear Time (g_c+I1), s	5.2	25.3	15.5	31.8	16.3	51.0	4.6	11.8
Green Ext Time (p_c), s	0.3	17.1	0.0	0.0	0.0	0.0	0.1	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	65.4
HCM 2010 LOS	E

Educational Use Only

Five Years 2022 (base trips only) 1/25/2016 Baseline
Rob Sanders

Synchro 9 Classroom Report
Page 1

HCM 2010 Signalized Intersection Summary
3: University Ave & Towne Centre Drive/East Bay Blvd

3/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	93	329	425	181	133	347	999	70	112	1812	112
Future Volume (veh/h)	68	93	329	425	181	133	347	999	70	112	1812	112
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), 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	74	101	358	462	197	145	377	1086	76	122	1970	122
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
Cap, veh/h	352	804	360	352	804	360	404	1695	528	534	1888	588
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
Sat Flow, veh/h	3442	3539	1583	3442	3539	1583	3442	5085	1583	3442	5085	1583
Grp Volume(v), veh/h	74	101	358	462	197	145	377	1086	76	122	1970	122
Grp Sat Flow(s),veh/h/ln	1721	1770	1583	1721	1770	1583	1721	1695	1583	1721	1695	1583
Q Serve(g_s), s	2.6	3.0	29.8	13.5	6.0	10.3	14.3	23.9	4.4	3.5	49.0	3.1
Cycle Q Clear(g_c), s	2.6	3.0	29.8	13.5	6.0	10.3	14.3	23.9	4.4	3.5	49.0	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	804	360	352	804	360	404	1695	528	534	1888	588
V/C Ratio(X)	0.21	0.13	0.99	1.31	0.24	0.40	0.93	0.64	0.14	0.23	1.04	0.21
Avail Cap(c_a), 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
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	40.6	50.9	59.3	41.7	43.4	57.7	37.3	30.8	39.6	17.0	11.1
Incr Delay (d2), s/veh	1.4	0.3	46.2	159.6	0.7	3.3	30.7	1.9	0.6	1.0	33.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.5	17.6	14.2	3.0	4.8	8.5	11.5	2.0	1.7	27.8	1.4
LnGrp Delay(d),s/veh	55.7	40.9	97.1	218.8	42.5	46.7	88.4	39.2	31.4	40.6	50.1	11.9
LnGrp LOS	E	D	F	F	D	D	F	D	C	D	F	B
Approach Vol, veh/h		533			804			1539			2214	
Approach Delay, s/veh		80.7			144.6			50.9			47.5	
Approach LOS		F			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
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 Setting (Gmax), s	20.5	44.0	13.5	30.0	15.5	49.0	13.5	30.0
Max Q Clear Time (g_c+I1), s	5.5	25.9	15.5	31.8	16.3	51.0	4.6	12.3
Green Ext Time (p_c), s	0.3	16.7	0.0	0.0	0.0	0.0	0.1	3.5

Intersection Summary	
HCM 2010 Ctrl Delay	67.3
HCM 2010 LOS	E

Educational Use Only

Five Years 2022 (with new trips) 1/25/2016 Baseline
Rob Sanders

Synchro 9 Classroom Report
Page 1

HCM 2010 Signalized Intersection Summary
4: Towne Centre Blvd & Towne Centre Drive

3/28/2016

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	315	169	30	323	191	40
Future Volume (veh/h)	315	169	30	323	191	40
Number	3	18	2	12	1	6
Initial Q (Qb), 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	342	0	33	0	208	43
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
Cap, veh/h	497	229	732	0	330	2163
Arrive On Green	0.14	0.00	0.39	0.00	0.10	0.61
Sat Flow, veh/h	3442	1583	1863	0	3442	3632
Grp Volume(v), veh/h	342	0	33	0	208	43
Grp Sat Flow(s),veh/h/ln	1721	1583	1863	0	1721	1770
Q Serve(g_s), s	4.6	0.0	0.5	0.0	2.9	0.2
Cycle Q Clear(g_c), s	4.6	0.0	0.5	0.0	2.9	0.2
Prop In Lane	1.00	1.00		0.00	1.00	
Lane Grp Cap(c), veh/h	497	229	732	0	330	2163
V/C Ratio(X)	0.69	0.00	0.05	0.00	0.63	0.02
Avail Cap(c_a), veh/h	1262	581	732	0	421	2163
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	9.2	0.0	21.4	3.8
Incr Delay (d2), s/veh	0.6	0.0	0.1	0.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.3	0.0	1.4	0.1
LnGrp Delay(d),s/veh	20.6	0.0	9.3	0.0	22.1	3.8
LnGrp LOS	C		A		C	A
Approach Vol, veh/h	342		33			251
Approach Delay, s/veh	20.6		9.3			19.0
Approach LOS	C		A			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.7	25.3				36.0		13.1
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	6.0	18.0				30.0		18.0
Max Q Clear Time (g_c+I1), s	4.9	2.5				2.2		6.6
Green Ext Time (p_c), s	0.0	0.2				0.2		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Educational Use Only

HCM 2010 Signalized Intersection Summary
4: Towne Centre Blvd & Towne Centre Drive

3/28/2016

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	321	173	34	323	191	40
Future Volume (veh/h)	321	173	34	323	191	40
Number	3	18	2	12	1	6
Initial Q (Qb), 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	349	0	37	0	208	43
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
Cap, veh/h	505	232	730	0	329	2157
Arrive On Green	0.15	0.00	0.39	0.00	0.10	0.61
Sat Flow, veh/h	3442	1583	1863	0	3442	3632
Grp Volume(v), veh/h	349	0	37	0	208	43
Grp Sat Flow(s),veh/h/ln	1721	1583	1863	0	1721	1770
Q Serve(g_s), s	4.7	0.0	0.6	0.0	2.9	0.2
Cycle Q Clear(g_c), s	4.7	0.0	0.6	0.0	2.9	0.2
Prop In Lane	1.00	1.00		0.00	1.00	
Lane Grp Cap(c), veh/h	505	232	730	0	329	2157
V/C Ratio(X)	0.69	0.00	0.05	0.00	0.63	0.02
Avail Cap(c_a), veh/h	1259	579	730	0	420	2157
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	9.3	0.0	21.4	3.8
Incr Delay (d2), s/veh	0.6	0.0	0.1	0.0	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	0.3	0.0	1.4	0.1
LnGrp Delay(d),s/veh	20.6	0.0	9.4	0.0	22.2	3.8
LnGrp LOS	C		A		C	A
Approach Vol, veh/h	349		37			251
Approach Delay, s/veh	20.6		9.4			19.0
Approach LOS	C		A			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	10.7	25.3				36.0		13.2
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	6.0	18.0				30.0		18.0
Max Q Clear Time (g_c+I1), s	4.9	2.6				2.2		6.7
Green Ext Time (p_c), s	0.0	0.2				0.3		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	19.3
HCM 2010 LOS	B

Educational Use Only

HCM 2010 Signalized Intersection Summary
4: Towne Centre Blvd & Towne Centre Drive

3/28/2016

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	348	187	33	357	211	44
Future Volume (veh/h)	348	187	33	357	211	44
Number	3	18	2	12	1	6
Initial Q (Qb), 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	378	0	36	0	229	48
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
Cap, veh/h	535	246	712	0	347	2135
Arrive On Green	0.16	0.00	0.38	0.00	0.10	0.60
Sat Flow, veh/h	3442	1583	1863	0	3442	3632
Grp Volume(v), veh/h	378	0	36	0	229	48
Grp Sat Flow(s),veh/h/ln	1721	1583	1863	0	1721	1770
Q Serve(g_s), s	5.2	0.0	0.6	0.0	3.2	0.3
Cycle Q Clear(g_c), s	5.2	0.0	0.6	0.0	3.2	0.3
Prop In Lane	1.00	1.00		0.00	1.00	
Lane Grp Cap(c), veh/h	535	246	712	0	347	2135
V/C Ratio(X)	0.71	0.00	0.05	0.00	0.66	0.02
Avail Cap(c_a), veh/h	1246	573	712	0	415	2135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	9.7	0.0	21.5	4.0
Incr Delay (d2), s/veh	0.6	0.0	0.1	0.0	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.3	0.0	1.6	0.1
LnGrp Delay(d),s/veh	20.6	0.0	9.8	0.0	23.3	4.0
LnGrp LOS	C		A		C	A
Approach Vol, veh/h	378		36			277
Approach Delay, s/veh	20.6		9.8			19.9
Approach LOS	C		A			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.0	25.0				36.0		13.7
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	6.0	18.0				30.0		18.0
Max Q Clear Time (g_c+I1), s	5.2	2.6				2.3		7.2
Green Ext Time (p_c), s	0.0	0.2				0.3		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	19.8
HCM 2010 LOS	B

Educational Use Only

HCM 2010 Signalized Intersection Summary
4: Towne Centre Blvd & Towne Centre Drive

3/28/2016

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	357	191	37	357	211	44
Future Volume (veh/h)	357	191	37	357	211	44
Number	3	18	2	12	1	6
Initial Q (Qb), 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	388	0	40	0	229	48
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
Cap, veh/h	545	251	709	0	346	2128
Arrive On Green	0.16	0.00	0.38	0.00	0.10	0.60
Sat Flow, veh/h	3442	1583	1863	0	3442	3632
Grp Volume(v), veh/h	388	0	40	0	229	48
Grp Sat Flow(s),veh/h/ln	1721	1583	1863	0	1721	1770
Q Serve(g_s), s	5.3	0.0	0.7	0.0	3.2	0.3
Cycle Q Clear(g_c), s	5.3	0.0	0.7	0.0	3.2	0.3
Prop In Lane	1.00	1.00		0.00	1.00	
Lane Grp Cap(c), veh/h	545	251	709	0	346	2128
V/C Ratio(X)	0.71	0.00	0.06	0.00	0.66	0.02
Avail Cap(c_a), veh/h	1242	571	709	0	414	2128
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	9.8	0.0	21.6	4.0
Incr Delay (d2), s/veh	0.7	0.0	0.2	0.0	1.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.4	0.0	1.6	0.1
LnGrp Delay(d),s/veh	20.6	0.0	9.9	0.0	23.4	4.0
LnGrp LOS	C		A		C	A
Approach Vol, veh/h	388		40			277
Approach Delay, s/veh	20.6		9.9			20.1
Approach LOS	C		A			C

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.0	25.0				36.0		13.9
Change Period (Y+Rc), s	6.0	6.0				6.0		6.0
Max Green Setting (Gmax), s	6.0	18.0				30.0		18.0
Max Q Clear Time (g_c+I1), s	5.2	2.7				2.3		7.3
Green Ext Time (p_c), s	0.0	0.2				0.3		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	19.8
HCM 2010 LOS	B

Educational Use Only

HCM 2010 Signalized Intersection Summary
6: University Ave & 1200 South

3/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	20	133	66	33	34	80	1134	42	61	1804	142
Future Volume (veh/h)	88	20	133	66	33	34	80	1134	42	61	1804	142
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), 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	96	22	145	72	36	37	87	1233	46	66	1961	154
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
Cap, veh/h	236	381	324	224	103	324	255	2928	912	444	2928	912
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
Sat Flow, veh/h	1322	1863	1583	873	505	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	96	22	145	108	0	37	87	1233	46	66	1961	154
Grp Sat Flow(s),veh/h/ln	1322	1863	1583	1378	0	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	8.9	1.3	10.6	7.6	0.0	2.5	2.3	0.0	0.0	1.8	35.1	6.0
Cycle Q Clear(g_c), s	17.8	1.3	10.6	8.9	0.0	2.5	2.3	0.0	0.0	1.8	35.1	6.0
Prop In Lane	1.00		1.00	0.67		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	236	381	324	327	0	324	255	2928	912	444	2928	912
V/C Ratio(X)	0.41	0.06	0.45	0.33	0.00	0.11	0.34	0.42	0.05	0.15	0.67	0.17
Avail Cap(c_a), veh/h	236	381	324	327	0	324	255	2928	912	444	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
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.9	42.3	46.0	45.2	0.0	42.8	14.8	0.0	0.0	8.1	19.3	13.2
Incr Delay (d2), s/veh	5.1	0.3	4.4	2.7	0.0	0.7	3.6	0.4	0.1	0.7	1.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.7	5.0	3.6	0.0	1.2	1.6	0.1	0.0	0.9	16.7	2.7
LnGrp Delay(d),s/veh	58.1	42.5	50.4	47.9	0.0	43.5	18.4	0.4	0.1	8.9	20.6	13.6
LnGrp LOS	E	D	D	D		D	B	A	A	A	C	B
Approach Vol, veh/h		263			145			1366			2181	
Approach Delay, s/veh		52.5			46.8			1.6			19.7	
Approach LOS		D			D			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
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 Setting (Gmax), s	10.5	76.0		27.0	10.5	76.0		27.0
Max Q Clear Time (g_c+I1), s	3.8	2.0		19.8	4.3	37.1		10.9
Green Ext Time (p_c), s	0.0	39.8		0.6	0.0	27.2		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	16.6
HCM 2010 LOS	B

Educational Use Only

Opening Day Conditions 1/25/2016 Baseline
Rob Sanders

Synchro 9 Classroom Report
Page 3

HCM 2010 Signalized Intersection Summary
6: University Ave & 1200 South

3/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	20	143	66	33	34	80	1149	42	61	1823	142
Future Volume (veh/h)	106	20	143	66	33	34	80	1149	42	61	1823	142
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), 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	115	22	155	72	36	37	87	1249	46	66	1982	154
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
Cap, veh/h	236	381	324	223	103	324	253	2928	912	440	2928	912
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
Sat Flow, veh/h	1322	1863	1583	867	502	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	115	22	155	108	0	37	87	1249	46	66	1982	154
Grp Sat Flow(s),veh/h/ln	1322	1863	1583	1369	0	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	10.9	1.3	11.4	7.7	0.0	2.5	2.3	0.0	0.0	1.8	35.8	6.0
Cycle Q Clear(g_c), s	19.8	1.3	11.4	8.9	0.0	2.5	2.3	0.0	0.0	1.8	35.8	6.0
Prop In Lane	1.00		1.00	0.67		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	236	381	324	326	0	324	253	2928	912	440	2928	912
V/C Ratio(X)	0.49	0.06	0.48	0.33	0.00	0.11	0.34	0.43	0.05	0.15	0.68	0.17
Avail Cap(c_a), veh/h	236	381	324	326	0	324	253	2928	912	440	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
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.8	42.3	46.3	45.2	0.0	42.8	15.2	0.0	0.0	8.1	19.5	13.2
Incr Delay (d2), s/veh	7.1	0.3	5.0	2.7	0.0	0.7	3.7	0.5	0.1	0.7	1.3	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.7	5.4	3.6	0.0	1.2	1.6	0.1	0.0	0.9	17.0	2.7
LnGrp Delay(d),s/veh	60.9	42.5	51.3	48.0	0.0	43.5	18.9	0.5	0.1	8.9	20.7	13.6
LnGrp LOS	E	D	D	D		D	B	A	A	A	C	B
Approach Vol, veh/h		292			145			1382			2202	
Approach Delay, s/veh		54.4			46.8			1.6			19.9	
Approach LOS		D			D			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
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 Setting (Gmax), s	10.5	76.0		27.0	10.5	76.0		27.0
Max Q Clear Time (g_c+I1), s	3.8	2.0		21.8	4.3	37.8		10.9
Green Ext Time (p_c), s	0.0	40.6		0.6	0.0	27.2		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	17.1
HCM 2010 LOS	B

Educational Use Only

Opening Day 2017 (with new trips) 1/25/2016 Baseline
Rob Sanders

Synchro 9 Classroom Report
Page 3

HCM 2010 Signalized Intersection Summary
6: University Ave & 1200 South

3/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	23	146	73	36	37	88	1252	46	68	1992	157
Future Volume (veh/h)	97	23	146	73	36	37	88	1252	46	68	1992	157
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), 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	105	25	159	79	39	40	96	1361	50	74	2165	171
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
Cap, veh/h	223	381	324	221	101	324	236	2928	912	414	2928	912
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
Sat Flow, veh/h	1314	1863	1583	859	492	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	105	25	159	118	0	40	96	1361	50	74	2165	171
Grp Sat Flow(s),veh/h/ln	1314	1863	1583	1352	0	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	10.0	1.4	11.7	8.7	0.0	2.7	2.5	0.0	0.0	2.0	41.5	6.8
Cycle Q Clear(g_c), s	20.1	1.4	11.7	10.1	0.0	2.7	2.5	0.0	0.0	2.0	41.5	6.8
Prop In Lane	1.00		1.00	0.67		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	381	324	322	0	324	236	2928	912	414	2928	912
V/C Ratio(X)	0.47	0.07	0.49	0.37	0.00	0.12	0.41	0.46	0.05	0.18	0.74	0.19
Avail Cap(c_a), veh/h	223	381	324	322	0	324	236	2928	912	414	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
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.5	42.3	46.4	45.8	0.0	42.8	20.3	0.0	0.0	8.2	20.7	13.3
Incr Delay (d2), s/veh	7.0	0.3	5.2	3.2	0.0	0.8	5.1	0.5	0.1	0.9	1.7	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.8	5.6	4.1	0.0	1.3	2.2	0.1	0.0	1.1	19.7	3.1
LnGrp Delay(d),s/veh	61.5	42.7	51.7	49.0	0.0	43.6	25.5	0.5	0.1	9.1	22.4	13.8
LnGrp LOS	E	D	D	D		D	C	A	A	A	C	B
Approach Vol, veh/h		289			158			1507			2410	
Approach Delay, s/veh		54.5			47.6			2.1			21.4	
Approach LOS		D			D			A			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
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 Setting (Gmax), s	10.5	76.0		27.0	10.5	76.0		27.0
Max Q Clear Time (g_c+I1), s	4.0	2.0		22.1	4.5	43.5		12.1
Green Ext Time (p_c), s	0.0	47.6		0.6	0.0	26.3		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

Educational Use Only

HCM 2010 Signalized Intersection Summary
6: University Ave & 1200 South

3/28/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	23	156	73	36	37	88	1267	46	68	2011	157
Future Volume (veh/h)	115	23	156	73	36	37	88	1267	46	68	2011	157
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), 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	125	25	170	79	39	40	96	1377	50	74	2186	171
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
Cap, veh/h	222	381	324	220	100	324	234	2928	912	411	2928	912
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
Sat Flow, veh/h	1314	1863	1583	853	489	1583	1774	5085	1583	1774	5085	1583
Grp Volume(v), veh/h	125	25	170	118	0	40	96	1377	50	74	2186	171
Grp Sat Flow(s),veh/h/ln	1314	1863	1583	1342	0	1583	1774	1695	1583	1774	1695	1583
Q Serve(g_s), s	12.1	1.4	12.6	8.7	0.0	2.7	2.5	0.0	0.0	2.0	42.2	6.8
Cycle Q Clear(g_c), s	22.3	1.4	12.6	10.2	0.0	2.7	2.5	0.0	0.0	2.0	42.2	6.8
Prop In Lane	1.00		1.00	0.67		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	222	381	324	320	0	324	234	2928	912	411	2928	912
V/C Ratio(X)	0.56	0.07	0.52	0.37	0.00	0.12	0.41	0.47	0.05	0.18	0.75	0.19
Avail Cap(c_a), veh/h	222	381	324	320	0	324	234	2928	912	411	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
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.5	42.3	46.8	45.8	0.0	42.8	20.8	0.0	0.0	8.2	20.8	13.3
Incr Delay (d2), s/veh	9.9	0.3	6.0	3.2	0.0	0.8	5.2	0.5	0.1	1.0	1.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	0.8	6.1	4.1	0.0	1.3	2.2	0.1	0.0	1.1	20.1	3.1
LnGrp Delay(d),s/veh	65.4	42.7	52.8	49.0	0.0	43.6	26.0	0.5	0.1	9.1	22.6	13.8
LnGrp LOS	E	D	D	D		D	C	A	A	A	C	B
Approach Vol, veh/h		320			158			1523			2431	
Approach Delay, s/veh		56.9			47.7			2.1			21.6	
Approach LOS		E			D			A			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
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 Setting (Gmax), s	10.5	76.0		27.0	10.5	76.0		27.0
Max Q Clear Time (g_c+I1), s	4.0	2.0		24.3	4.5	44.2		12.2
Green Ext Time (p_c), s	0.0	48.4		0.4	0.0	26.0		1.0

Intersection Summary	
HCM 2010 Ctrl Delay	18.4
HCM 2010 LOS	B

Educational Use Only

HCM 2010 TWSC
11: University Ave & Eastern Driveway

3/28/2016

Intersection	
Int Delay, s/veh	13.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	18	0	45	13	0	98	34	1054	25	76	2006	26
Future Vol, veh/h	18	0	45	13	0	98	34	1054	25	76	2006	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	0	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	0	49	14	0	107	37	1146	27	83	2180	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2892	3607	1104	2270	3607	586	2209	0	0	1173	0	0
Stage 1	2360	2360	-	1233	1233	-	-	-	-	-	-	-
Stage 2	532	1247	-	1037	2374	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	– 17	5	177	43	5	389	98	-	-	323	-	-
Stage 1	21	67	-	137	247	-	-	-	-	-	-	-
Stage 2	456	244	-	223	66	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	– 7	2	177	18	2	389	98	-	-	323	-	-
Mov Cap-2 Maneuver	– 7	2	-	18	2	-	-	-	-	-	-	-
Stage 1	– 13	50	-	85	154	-	-	-	-	-	-	-
Stage 2	206	152	-	120	49	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 544.4	65.6	1.9	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	98	-	-	7	177	18	389	323	-	-
HCM Lane V/C Ratio	0.377	-	-	2.795	0.276	0.785	0.274	0.256	-	-
HCM Control Delay (s)	62.4	-	-	$ 1823.2	32.9	$ 426.8	17.7	19.9	-	-
HCM Lane LOS	F	-	-	F	D	F	C	C	-	-
HCM 95th %tile Q(veh)	1.5	-	-	3.6	1.1	2.1	1.1	1	-	-

Notes

–: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Educational Use Only

HCM 2010 TWSC
11: University Ave & Eastern Driveway

3/28/2016

Intersection	
Int Delay, s/veh	13.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	18	0	45	13	0	98	34	1054	25	76	2006	26
Future Vol, veh/h	18	0	45	13	0	98	34	1054	25	76	2006	26
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	0	-	0	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	20	0	49	14	0	107	37	1146	27	83	2180	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2892	3607	1104	2270	3607	586	2209	0	0	1173	0	0
Stage 1	2360	2360	-	1233	1233	-	-	-	-	-	-	-
Stage 2	532	1247	-	1037	2374	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
Critical Hdwy Stg 1	7.34	5.54	-	7.34	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	– 17	5	177	43	5	389	98	-	-	323	-	-
Stage 1	21	67	-	137	247	-	-	-	-	-	-	-
Stage 2	456	244	-	223	66	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	– 7	2	177	18	2	389	98	-	-	323	-	-
Mov Cap-2 Maneuver	– 7	2	-	18	2	-	-	-	-	-	-	-
Stage 1	– 13	50	-	85	154	-	-	-	-	-	-	-
Stage 2	206	152	-	120	49	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 544.4	65.6	1.9	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	98	-	-	7	177	18	389	323	-	-
HCM Lane V/C Ratio	0.377	-	-	2.795	0.276	0.785	0.274	0.256	-	-
HCM Control Delay (s)	62.4	-	-	$ 1823.2	32.9	$ 426.8	17.7	19.9	-	-
HCM Lane LOS	F	-	-	F	D	F	C	C	-	-
HCM 95th %tile Q(veh)	1.5	-	-	3.6	1.1	2.1	1.1	1	-	-

Notes

–: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

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HCM 2010 TWSC
14: Northern Driveway & 1200 South 3/12/2016

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	270	4	0	255	0	27
Future Vol, veh/h	270	4	0	255	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	293	4	0	277	0	29

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	298	0	435	149
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	139	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	841	-	568	740
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	840	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	841	-	568	740
Mov Cap-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	840	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	740	-	-	841	-
HCM Lane V/C Ratio	0.04	-	-	-	-
HCM Control Delay (s)	10.1	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

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Five Year Conditions 1/25/2016
Rob Sanders

Synchro 9 Classroom Report
Page 6

HCM 2010 TWSC
14: Northern Driveway & 1200 South

3/12/2016

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	270	4	0	255	0	27
Future Vol, veh/h	270	4	0	255	0	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	293	4	0	277	0	29

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	298	0	435	149
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	139	-
Critical Hdwy	-	-	5.34	-	6.29	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	3.12	-	3.67	3.92
Pot Cap-1 Maneuver	-	-	841	-	568	740
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	840	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	841	-	568	740
Mov Cap-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	840	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	740	-	-	841	-
HCM Lane V/C Ratio	0.04	-	-	-	-
HCM Control Delay (s)	10.1	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

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Opening Day Conditions 1/25/2016 Baseline
Rob Sanders

Synchro 9 Classroom Report
Page 6