










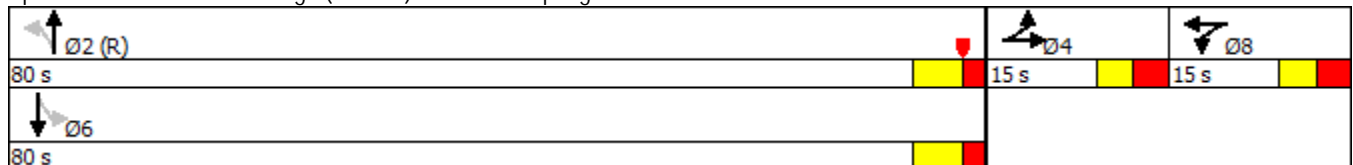

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	5	5	30	5	80	10	1865	20	15	1115	10
Future Volume (veh/h)	15	5	5	30	5	80	10	1865	20	15	1115	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	17	6	0	34	6	16	11	2119	22	17	1267	10
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	36	13	0	72	19	50	380	4130	43	188	4142	33
Arrive On Green	0.03	0.03	0.00	0.04	0.04	0.04	0.80	0.80	0.80	0.80	0.80	0.80
Sat Flow, veh/h	1328	469	0	1774	466	1242	431	5189	54	187	5204	41
Grp Volume(v), veh/h	23	0	0	34	0	22	11	1384	757	17	825	452
Grp Sat Flow(s),veh/h/ln	1796	0	0	1774	0	1707	431	1695	1853	187	1695	1855
Q Serve(g_s), s	1.4	0.0	0.0	2.1	0.0	1.4	0.8	15.5	15.5	3.8	7.2	7.2
Cycle Q Clear(g_c), s	1.4	0.0	0.0	2.1	0.0	1.4	8.0	15.5	15.5	19.3	7.2	7.2
Prop In Lane	0.74		0.00	1.00		0.73	1.00		0.03	1.00		0.02
Lane Grp Cap(c), veh/h	49	0	0	72	0	69	380	2698	1475	188	2698	1476
V/C Ratio(X)	0.47	0.00	0.00	0.47	0.00	0.32	0.03	0.51	0.51	0.09	0.31	0.31
Avail Cap(c_a), veh/h	163	0	0	161	0	155	380	2698	1475	188	2698	1476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	0.0	51.6	0.0	51.3	4.1	3.9	3.9	7.2	3.0	3.0
Incr Delay (d2), s/veh	6.7	0.0	0.0	4.8	0.0	2.6	0.1	0.7	1.3	1.0	0.3	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	0.8	0.0	0.0	1.1	0.0	0.7	0.1	7.4	8.3	0.2	3.4	3.9
LnGrp Delay(d),s/veh	59.4	0.0	0.0	56.4	0.0	53.9	4.3	4.6	5.2	8.2	3.3	3.6
LnGrp LOS	E			E		D	A	A	A	A	A	A
Approach Vol, veh/h		23			56			2152			1294	
Approach Delay, s/veh		59.4			55.4			4.8			3.5	
Approach LOS		E			E			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		92.5		8.0		92.5		9.4				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		74.0		9.0		74.0		9.0				
Max Q Clear Time (g_c+I1), s		17.5		3.4		21.3		4.1				
Green Ext Time (p_c), s		30.3		0.0		29.2		0.0				
<u>Intersection Summary</u>												
HCM 2010 Ctrl Delay			5.5									
HCM 2010 LOS			A									
<u>Notes</u>												

				
Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	80	15	80	15
Maximum Split (%)	72.7%	13.6%	72.7%	13.6%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4	3	4	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	10	40	25
End Time (s)	10	25	10	40
Yield/Force Off (s)	4	19	4	34
Yield/Force Off 170(s)	104	19	104	16
Local Start Time (s)	30	0	30	15
Local Yield (s)	104	9	104	24
Local Yield 170(s)	94	9	94	6

Intersection Summary





Cycle Length 110
Control Type Actuated-Coordinated
Natural Cycle 80
Offset: 10 (9%), Referenced to phase 2:NBTL, Start of Red

Splits and Phases: 8: College (US 287) & Johnson/Spring Park



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	5	10	115	5	80	25	1960	30	45	2690	10
Future Volume (veh/h)	35	5	10	115	5	80	25	1960	30	45	2690	10
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		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	36	5	0	119	5	42	26	2021	30	46	2773	7
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	59	8	0	160	16	134	105	3835	57	178	3891	10
Arrive On Green	0.04	0.04	0.00	0.09	0.09	0.09	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	1567	218	0	1774	176	1482	99	5163	77	204	5237	13
Grp Volume(v), veh/h	41	0	0	119	0	47	26	1327	724	46	1794	986
Grp Sat Flow(s),veh/h/ln	1784	0	0	1774	0	1658	99	1695	1849	204	1695	1860
Q Serve(g_s), s	2.7	0.0	0.0	7.8	0.0	3.2	23.5	19.8	19.9	14.8	34.7	34.8
Cycle Q Clear(g_c), s	2.7	0.0	0.0	7.8	0.0	3.2	58.2	19.8	19.9	34.6	34.7	34.8
Prop In Lane	0.88		0.00	1.00		0.89	1.00		0.04	1.00		0.01
Lane Grp Cap(c), veh/h	67	0	0	160	0	150	105	2519	1374	178	2519	1382
V/C Ratio(X)	0.61	0.00	0.00	0.74	0.00	0.31	0.25	0.53	0.53	0.26	0.71	0.71
Avail Cap(c_a), veh/h	134	0	0	163	0	152	105	2519	1374	178	2519	1382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.9	0.0	0.0	53.2	0.0	51.1	24.4	6.5	6.5	13.8	8.4	8.4
Incr Delay (d2), s/veh	8.6	0.0	0.0	16.5	0.0	1.2	5.6	0.8	1.5	3.5	1.7	3.2
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	1.5	0.0	0.0	4.6	0.0	1.5	0.8	9.5	10.6	1.0	16.6	18.7
LnGrp Delay(d),s/veh	65.5	0.0	0.0	69.7	0.0	52.3	29.9	7.3	8.0	17.3	10.2	11.6
LnGrp LOS	E			E		D	C	A	A	B	B	B
Approach Vol, veh/h		41			166			2077			2826	
Approach Delay, s/veh		65.5			64.8			7.8			10.8	
Approach LOS		E			E			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		94.6		9.5		94.6		15.8				
Change Period (Y+Rc), s		6.5		6.0		6.5		6.0				
Max Green Setting (Gmax), s		83.5		8.0		83.5		10.0				
Max Q Clear Time (g_c+I1), s		60.2		4.7		36.8		9.8				
Green Ext Time (p_c), s		22.1		0.0		42.4		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				11.8								
HCM 2010 LOS				B								
Notes												

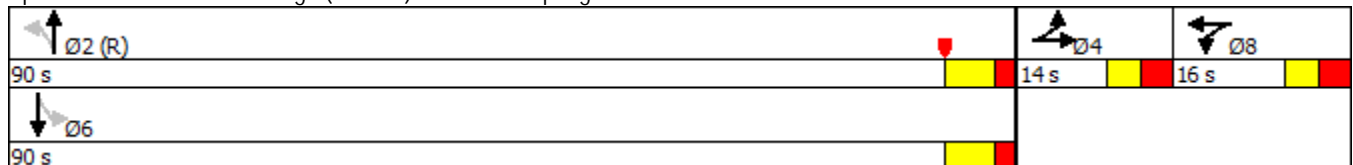
Traffic Impact Study Appendix
Timing Report, Sorted By Phase

				
Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	90	14	90	16
Maximum Split (%)	75.0%	11.7%	75.0%	13.3%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4.5	3	4.5	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	114.5	84.5	114.5	98.5
End Time (s)	84.5	98.5	84.5	114.5
Yield/Force Off (s)	78	92.5	78	108.5
Yield/Force Off 170(s)	68	92.5	68	90.5
Local Start Time (s)	36.5	6.5	36.5	20.5
Local Yield (s)	0	14.5	0	30.5
Local Yield 170(s)	110	14.5	110	12.5

Intersection Summary

Cycle Length 120
Control Type Actuated-Coordinated
Natural Cycle 100
Offset: 78 (65%), Referenced to phase 2:NBTL, Start of Yellow

Splits and Phases: 8: College (US 287) & Johnson/Spring Park



Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔ ↑↑↑	↑↑↑		↔ ↑↑↑	↑↑↑	
Traffic Vol, veh/h	5	0	10	5	0	5	10	1885	5	5	1140	5
Future Vol, veh/h	5	0	10	5	0	5	10	1885	5	5	1140	5
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	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	0	11	6	0	6	11	2142	6	6	1295	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2190	3480	651	2698	3481	1074	1301	0	0	2148	0	0
Stage 1	1310	1310	-	2168	2168	-	-	-	-	-	-	-
Stage 2	880	2170	-	530	1313	-	-	-	-	-	-	-
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	48	6	352	23	6	185	279	-	-	105	-	-
Stage 1	121	227	-	29	85	-	-	-	-	-	-	-
Stage 2	279	84	-	457	226	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	43	5	352	21	5	185	279	-	-	105	-	-
Mov Cap-2 Maneuver	43	5	-	21	5	-	-	-	-	-	-	-
Stage 1	116	214	-	28	82	-	-	-	-	-	-	-
Stage 2	260	81	-	417	213	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	46.3	136	0.1	0.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	279	-	-	104	38	105	-	-
HCM Lane V/C Ratio	0.041	-	-	0.164	0.299	0.054	-	-
HCM Control Delay (s)	18.4	-	-	46.3	136	41.2	-	-
HCM Lane LOS	C	-	-	E	F	E	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	1	0.2	-	-

Intersection

Int Delay, s/veh 6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕ ↑↑↑	↑↑↑		↕ ↑↑↑	↑↑↑	
Traffic Vol, veh/h	5	0	30	5	0	5	10	2005	5	5	2805	5
Future Vol, veh/h	5	0	30	5	0	5	10	2005	5	5	2805	5
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	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	31	5	0	5	10	2067	5	5	2892	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3752	4998	1448	3257	4997	1036	2897	0	0	2072	0	0
Stage 1	2905	2905	-	2090	2090	-	-	-	-	-	-	-
Stage 2	847	2093	-	1167	2907	-	-	-	-	-	-	-
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	~ 5	1	103	10	1	196	43	-	-	115	-	-
Stage 1	8	35	-	33	93	-	-	-	-	-	-	-
Stage 2	293	92	-	185	35	-	-	-	-	-	-	-
Platoon blocked, %							-	-	-	-	-	-
Mov Cap-1 Maneuver	~ 4	1	103	6	1	196	43	-	-	115	-	-
Mov Cap-2 Maneuver	~ 4	1	-	6	1	-	-	-	-	-	-	-
Stage 1	6	33	-	25	71	-	-	-	-	-	-	-
Stage 2	219	71	-	124	33	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	\$ 645.7			\$ 615.3			0.6			0.1		
HCM LOS	F			F								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	43	-	-	23	12	115	-	-
HCM Lane V/C Ratio	0.24	-	-	1.569	0.859	0.045	-	-
HCM Control Delay (s)	113.3	-	-	\$ 645.7	\$ 615.3	37.8	-	-
HCM Lane LOS	F	-	-	F	F	E	-	-
HCM 95th %tile Q(veh)	0.8	-	-	4.6	1.9	0.1	-	-





Notes

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

APPENDIX F

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary

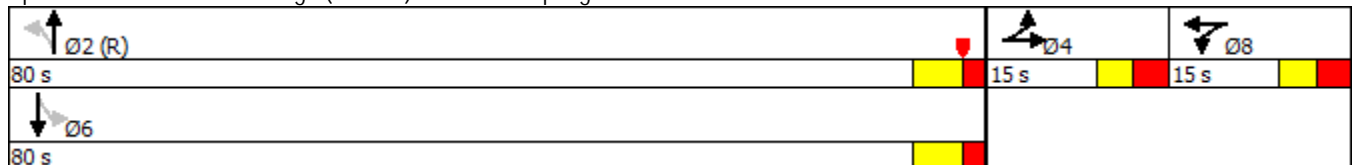
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	0	21	25	1	68	15	1637	18	15	983	19
Future Volume (veh/h)	57	0	21	25	1	68	15	1637	18	15	983	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	65	0	0	28	1	2	17	1860	19	17	1117	21
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	0	0	57	19	37	416	4024	41	222	3985	75
Arrive On Green	0.06	0.00	0.00	0.03	0.03	0.03	0.78	0.78	0.78	0.78	0.78	0.78
Sat Flow, veh/h	1774	0	0	1774	574	1149	492	5190	53	241	5139	97
Grp Volume(v), veh/h	65	0	0	28	0	3	17	1215	664	17	737	401
Grp Sat Flow(s),veh/h/ln	1774	0	0	1774	0	1723	492	1695	1853	241	1695	1845
Q Serve(g_s), s	3.9	0.0	0.0	1.7	0.0	0.2	1.1	13.8	13.8	2.9	6.9	6.9
Cycle Q Clear(g_c), s	3.9	0.0	0.0	1.7	0.0	0.2	8.0	13.8	13.8	16.7	6.9	6.9
Prop In Lane	1.00		0.00	1.00		0.67	1.00		0.03	1.00		0.05
Lane Grp Cap(c), veh/h	99	0	0	57	0	56	416	2629	1437	222	2629	1431
V/C Ratio(X)	0.65	0.00	0.00	0.49	0.00	0.05	0.04	0.46	0.46	0.08	0.28	0.28
Avail Cap(c_a), veh/h	161	0	0	161	0	157	416	2629	1437	222	2629	1431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.9	0.0	0.0	52.3	0.0	51.6	4.7	4.3	4.3	7.3	3.5	3.5
Incr Delay (d2), s/veh	7.1	0.0	0.0	6.3	0.0	0.4	0.2	0.6	1.1	0.7	0.3	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	2.1	0.0	0.0	0.9	0.0	0.1	0.2	6.6	7.4	0.2	3.3	3.6
LnGrp Delay(d),s/veh	58.0	0.0	0.0	58.7	0.0	52.0	4.9	4.9	5.4	7.9	3.8	4.0
LnGrp LOS	E			E		D	A	A	A	A	A	A
Approach Vol, veh/h		65			31			1896			1155	
Approach Delay, s/veh		58.0			58.0			5.1			4.0	
Approach LOS		E			E			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		90.3		11.2		90.3		8.6				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		74.0		9.0		74.0		9.0				
Max Q Clear Time (g_c+I1), s		15.8		5.9		18.7		3.7				
Green Ext Time (p_c), s		24.1		0.0		23.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			6.3									
HCM 2010 LOS			A									
Notes												








				
Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	80	15	80	15
Maximum Split (%)	72.7%	13.6%	72.7%	13.6%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4	3	4	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	10	40	25
End Time (s)	10	25	10	40
Yield/Force Off (s)	4	19	4	34
Yield/Force Off 170(s)	104	19	104	16
Local Start Time (s)	30	0	30	15
Local Yield (s)	104	9	104	24
Local Yield 170(s)	94	9	94	6

Intersection Summary

Cycle Length 110
Control Type Actuated-Coordinated
Natural Cycle 80
Offset: 10 (9%), Referenced to phase 2:NBTL, Start of Red

Splits and Phases: 8: College (US 287) & Johnson/Spring Park







							
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	89	28	78	17	1880	17	1139
v/c Ratio	0.44	0.21	0.42	0.06	0.50	0.14	0.30
Control Delay	17.3	51.2	20.5	5.8	6.9	8.9	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	51.2	20.5	5.8	6.9	8.9	5.4
Queue Length 50th (ft)	0	19	5	3	182	3	88
Queue Length 95th (ft)	46	47	48	11	251	14	127
Internal Link Dist (ft)	516		684		725		859
Turn Bay Length (ft)		275		90		75	
Base Capacity (vph)	237	160	213	303	3784	121	3780
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.17	0.37	0.06	0.50	0.14	0.30
Intersection Summary							

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	0	27	102	3	70	57	1725	28	39	2367	90
Future Volume (veh/h)	79	0	27	102	3	70	57	1725	28	39	2367	90
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		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	81	0	0	105	3	19	59	1778	28	40	2440	90
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	116	0	0	146	19	118	118	3727	59	209	3639	133
Arrive On Green	0.07	0.00	0.00	0.08	0.08	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1774	0	0	1774	227	1438	127	5157	81	259	5035	185
Grp Volume(v), veh/h	81	0	0	105	0	22	59	1169	637	40	1638	892
Grp Sat Flow(s),veh/h/ln	1774	0	0	1774	0	1665	127	1695	1848	259	1695	1829
Q Serve(g_s), s	5.4	0.0	0.0	6.9	0.0	1.5	55.1	17.5	17.5	9.3	31.1	31.7
Cycle Q Clear(g_c), s	5.4	0.0	0.0	6.9	0.0	1.5	86.7	17.5	17.5	26.8	31.1	31.7
Prop In Lane	1.00		0.00	1.00		0.86	1.00		0.04	1.00		0.10
Lane Grp Cap(c), veh/h	116	0	0	146	0	137	118	2450	1336	209	2450	1322
V/C Ratio(X)	0.70	0.00	0.00	0.72	0.00	0.16	0.50	0.48	0.48	0.19	0.67	0.67
Avail Cap(c_a), veh/h	133	0	0	163	0	153	118	2450	1336	209	2450	1322
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	0.0	0.0	53.7	0.0	51.2	32.8	7.0	7.0	12.7	8.9	9.0
Incr Delay (d2), s/veh	12.5	0.0	0.0	12.7	0.0	0.5	14.3	0.7	1.2	2.0	1.5	2.8
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	3.0	0.0	0.0	3.9	0.0	0.7	2.4	8.3	9.3	0.8	14.8	16.9
LnGrp Delay(d),s/veh	67.4	0.0	0.0	66.4	0.0	51.7	47.1	7.7	8.3	14.7	10.4	11.8
LnGrp LOS	E			E		D	D	A	A	B	B	B
Approach Vol, veh/h		81			127			1865			2570	
Approach Delay, s/veh		67.4			63.8			9.1			10.9	
Approach LOS		E			E			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		92.2		12.9		92.2		14.9				
Change Period (Y+Rc), s		6.5		6.0		6.5		6.0				
Max Green Setting (Gmax), s		83.5		8.0		83.5		10.0				
Max Q Clear Time (g_c+I1), s		88.7		7.4		33.7		8.9				
Green Ext Time (p_c), s		0.0		0.0		43.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				12.6								
HCM 2010 LOS				B								
Notes												

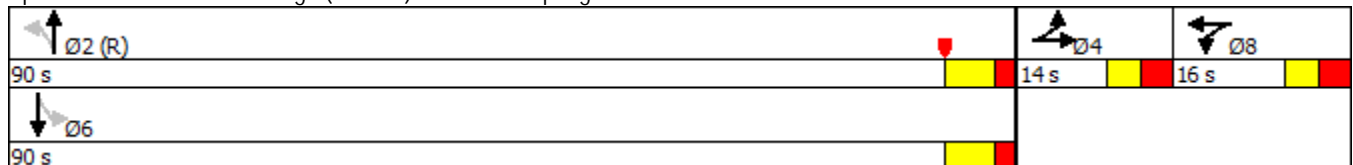
Traffic Impact Study Appendix
Timing Report, Sorted By Phase








				
Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	90	14	90	16
Maximum Split (%)	75.0%	11.7%	75.0%	13.3%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4.5	3	4.5	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	114.5	84.5	114.5	98.5
End Time (s)	84.5	98.5	84.5	114.5
Yield/Force Off (s)	78	92.5	78	108.5
Yield/Force Off 170(s)	68	92.5	68	90.5
Local Start Time (s)	36.5	6.5	36.5	20.5
Local Yield (s)	0	14.5	0	30.5
Local Yield 170(s)	110	14.5	110	12.5

Intersection Summary

Cycle Length 120
Control Type Actuated-Coordinated
Natural Cycle 90
Offset: 78 (65%), Referenced to phase 2:NBTL, Start of Yellow

Splits and Phases: 8: College (US 287) & Johnson/Spring Park























							
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	109	105	75	59	1807	40	2533
v/c Ratio	0.57	0.66	0.38	1.02	0.52	0.33	0.73
Control Delay	28.6	72.2	24.9	151.6	8.5	15.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.6	72.2	24.9	151.6	8.5	15.7	11.8
Queue Length 50th (ft)	17	79	14	-47	213	11	393
Queue Length 95th (ft)	75	#155	62	#95	246	37	446
Internal Link Dist (ft)	413		682		592		1570
Turn Bay Length (ft)		275		90		75	
Base Capacity (vph)	208	167	205	58	3506	121	3491
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.63	0.37	1.02	0.52	0.33	0.73

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary
 eb It

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	0	21	25	1	68	15	1637	18	15	983	19
Future Volume (veh/h)	57	0	21	25	1	68	15	1637	18	15	983	19
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		0.99	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	1788	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	65	0	0	28	1	2	17	1860	19	17	1117	21
Adj No. of Lanes	1	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	98	107	0	57	19	37	416	4018	41	222	3978	75
Arrive On Green	0.06	0.00	0.00	0.03	0.03	0.03	0.77	0.77	0.77	0.77	0.77	0.77
Sat Flow, veh/h	1703	1863	0	1774	574	1149	492	5190	53	241	5139	97
Grp Volume(v), veh/h	65	0	0	28	0	3	17	1215	664	17	737	401
Grp Sat Flow(s),veh/h/ln	1703	1863	0	1774	0	1723	492	1695	1853	241	1695	1845
Q Serve(g_s), s	4.1	0.0	0.0	1.7	0.0	0.2	1.1	13.9	13.9	2.9	6.9	6.9
Cycle Q Clear(g_c), s	4.1	0.0	0.0	1.7	0.0	0.2	8.0	13.9	13.9	16.8	6.9	6.9
Prop In Lane	1.00		0.00	1.00		0.67	1.00		0.03	1.00		0.05
Lane Grp Cap(c), veh/h	98	107	0	57	0	56	416	2624	1435	222	2624	1428
V/C Ratio(X)	0.67	0.00	0.00	0.49	0.00	0.05	0.04	0.46	0.46	0.08	0.28	0.28
Avail Cap(c_a), veh/h	155	169	0	161	0	157	416	2624	1435	222	2624	1428
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.8	0.0	0.0	52.3	0.0	51.6	4.7	4.4	4.4	7.3	3.6	3.6
Incr Delay (d2), s/veh	7.6	0.0	0.0	6.3	0.0	0.4	0.2	0.6	1.1	0.7	0.3	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	2.1	0.0	0.0	0.9	0.0	0.1	0.2	6.6	7.4	0.2	3.3	3.7
LnGrp Delay(d),s/veh	58.4	0.0	0.0	58.7	0.0	52.0	4.9	5.0	5.5	8.0	3.9	4.1
LnGrp LOS	E			E		D	A	A	A	A	A	A
Approach Vol, veh/h		65			31			1896			1155	
Approach Delay, s/veh		58.4			58.0			5.1			4.0	
Approach LOS		E			E			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		90.1		11.3		90.1		8.6				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		74.0		9.0		74.0		9.0				
Max Q Clear Time (g_c+I1), s		15.9		6.1		18.8		3.7				
Green Ext Time (p_c), s		24.1		0.0		23.7		0.0				
<u>Intersection Summary</u>												
HCM 2010 Ctrl Delay			6.3									
HCM 2010 LOS			A									
<u>Notes</u>												

Traffic Impact Study Appendix
 Timing Report, Sorted By Phase
 eb It

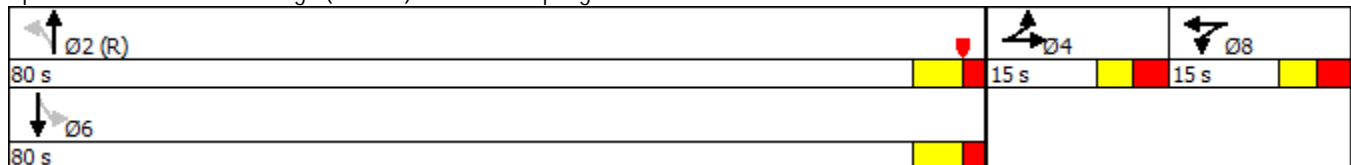


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	80	15	80	15
Maximum Split (%)	72.7%	13.6%	72.7%	13.6%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4	3	4	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	10	40	25
End Time (s)	10	25	10	40
Yield/Force Off (s)	4	19	4	34
Yield/Force Off 170(s)	104	19	104	16
Local Start Time (s)	30	0	30	15
Local Yield (s)	104	9	104	24
Local Yield 170(s)	94	9	94	6

Intersection Summary

Cycle Length 110
 Control Type Actuated-Coordinated
 Natural Cycle 80
 Offset: 10 (9%), Referenced to phase 2:NBTL, Start of Red









Splits and Phases: 8: College (US 287) & Johnson/Spring Park



Traffic Impact Study Appendix

Queues

eb It

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	24	28	78	17	1880	17	1139
v/c Ratio	0.51	0.08	0.21	0.42	0.06	0.51	0.15	0.31
Control Delay	62.0	0.5	51.2	20.5	6.2	7.7	9.5	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	0.5	51.2	20.5	6.2	7.7	9.5	5.9
Queue Length 50th (ft)	44	0	19	5	3	209	4	101
Queue Length 95th (ft)	88	0	47	48	11	251	14	127
Internal Link Dist (ft)		516		684		725		859
Turn Bay Length (ft)	50		275		90		75	
Base Capacity (vph)	139	314	160	213	295	3713	117	3708
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.08	0.17	0.37	0.06	0.51	0.15	0.31

Intersection Summary

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary
 eb It

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	0	27	102	3	70	57	1725	28	39	2367	90
Future Volume (veh/h)	79	0	27	102	3	70	57	1725	28	39	2367	90
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		0.99	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	1788	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	81	0	0	105	3	19	59	1778	28	40	2440	90
Adj No. of Lanes	1	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	125	0	146	19	118	118	3719	59	209	3631	133
Arrive On Green	0.07	0.00	0.00	0.08	0.08	0.08	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	1703	1863	0	1774	227	1438	127	5157	81	259	5035	185
Grp Volume(v), veh/h	81	0	0	105	0	22	59	1169	637	40	1638	892
Grp Sat Flow(s),veh/h/ln	1703	1863	0	1774	0	1665	127	1695	1848	259	1695	1829
Q Serve(g_s), s	5.6	0.0	0.0	6.9	0.0	1.5	54.7	17.6	17.6	9.3	31.3	31.9
Cycle Q Clear(g_c), s	5.6	0.0	0.0	6.9	0.0	1.5	86.5	17.6	17.6	26.9	31.3	31.9
Prop In Lane	1.00		0.00	1.00		0.86	1.00		0.04	1.00		0.10
Lane Grp Cap(c), veh/h	115	125	0	146	0	137	118	2444	1333	209	2444	1319
V/C Ratio(X)	0.71	0.00	0.00	0.72	0.00	0.16	0.50	0.48	0.48	0.19	0.67	0.68
Avail Cap(c_a), veh/h	128	140	0	163	0	153	118	2444	1333	209	2444	1319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.8	0.0	0.0	53.7	0.0	51.2	33.2	7.1	7.1	12.9	9.0	9.1
Incr Delay (d2), s/veh	14.5	0.0	0.0	12.7	0.0	0.5	14.4	0.7	1.2	2.0	1.5	2.8
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	3.1	0.0	0.0	3.9	0.0	0.7	2.4	8.3	9.3	0.8	14.8	16.9
LnGrp Delay(d),s/veh	69.3	0.0	0.0	66.4	0.0	51.7	47.7	7.8	8.4	14.9	10.5	11.9
LnGrp LOS	E			E		D	D	A	A	B	B	B
Approach Vol, veh/h		81			127			1865			2570	
Approach Delay, s/veh		69.3			63.8			9.3			11.1	
Approach LOS		E			E			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		92.0		13.1		92.0		14.9				
Change Period (Y+Rc), s		6.5		6.0		6.5		6.0				
Max Green Setting (Gmax), s		83.5		8.0		83.5		10.0				
Max Q Clear Time (g_c+I1), s		88.5		7.6		33.9		8.9				
Green Ext Time (p_c), s		0.0		0.0		42.8		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				12.8								
HCM 2010 LOS				B								
Notes												

Traffic Impact Study Appendix
 Timing Report, Sorted By Phase
 eb It

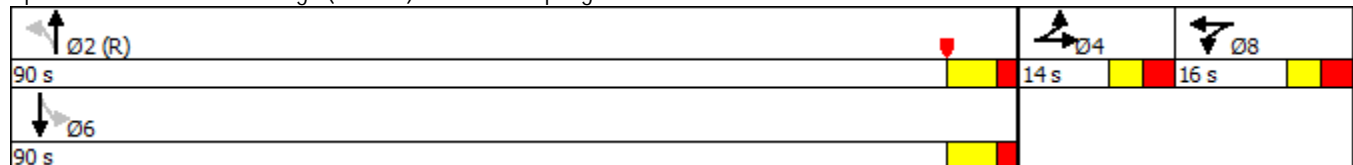


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	90	14	90	16
Maximum Split (%)	75.0%	11.7%	75.0%	13.3%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4.5	3	4.5	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	114.5	84.5	114.5	98.5
End Time (s)	84.5	98.5	84.5	114.5
Yield/Force Off (s)	78	92.5	78	108.5
Yield/Force Off 170(s)	68	92.5	68	90.5
Local Start Time (s)	36.5	6.5	36.5	20.5
Local Yield (s)	0	14.5	0	30.5
Local Yield 170(s)	110	14.5	110	12.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	100
Offset: 78 (65%), Referenced to phase 2:NBTL, Start of Yellow	









Splits and Phases: 8: College (US 287) & Johnson/Spring Park



Traffic Impact Study Appendix

Queues




















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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	28	105	75	59	1807	40	2533
v/c Ratio	0.72	0.14	0.67	0.38	1.04	0.52	0.34	0.73
Control Delay	86.8	1.6	74.4	25.2	154.1	8.8	16.3	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.8	1.6	74.4	25.2	154.1	8.8	16.3	12.2
Queue Length 50th (ft)	62	0	80	14	~47	213	11	393
Queue Length 95th (ft)	#143	0	#155	62	#95	246	37	446
Internal Link Dist (ft)		413		682		592		1570
Turn Bay Length (ft)	50		275		90		75	
Base Capacity (vph)	115	195	162	201	57	3476	118	3461
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.14	0.65	0.37	1.04	0.52	0.34	0.73






Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary
 NB Arrow

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	0	21	25	1	68	15	1637	18	15	983	19
Future Volume (veh/h)	57	0	21	25	1	68	15	1637	18	15	983	19
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		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	65	0	0	28	1	2	17	1860	19	17	1117	21
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	0	0	57	19	37	421	4024	41	222	3675	69
Arrive On Green	0.06	0.00	0.00	0.03	0.03	0.03	0.02	0.78	0.78	0.72	0.72	0.72
Sat Flow, veh/h	1774	0	0	1774	574	1149	1774	5190	53	241	5139	97
Grp Volume(v), veh/h	65	0	0	28	0	3	17	1215	664	17	737	401
Grp Sat Flow(s),veh/h/ln	1774	0	0	1774	0	1723	1774	1695	1853	241	1695	1845
Q Serve(g_s), s	3.9	0.0	0.0	1.7	0.0	0.2	0.3	13.8	13.8	2.9	8.7	8.7
Cycle Q Clear(g_c), s	3.9	0.0	0.0	1.7	0.0	0.2	0.3	13.8	13.8	10.1	8.7	8.7
Prop In Lane	1.00		0.00	1.00		0.67	1.00		0.03	1.00		0.05
Lane Grp Cap(c), veh/h	99	0	0	57	0	56	421	2629	1437	222	2425	1320
V/C Ratio(X)	0.65	0.00	0.00	0.49	0.00	0.05	0.04	0.46	0.46	0.08	0.30	0.30
Avail Cap(c_a), veh/h	161	0	0	161	0	157	492	2629	1437	222	2425	1320
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.9	0.0	0.0	52.3	0.0	51.6	3.8	4.3	4.3	7.3	5.7	5.7
Incr Delay (d2), s/veh	7.1	0.0	0.0	6.3	0.0	0.4	0.0	0.6	1.1	0.7	0.3	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	2.1	0.0	0.0	0.9	0.0	0.1	0.1	6.6	7.4	0.2	4.1	4.6
LnGrp Delay(d),s/veh	58.0	0.0	0.0	58.7	0.0	52.0	3.9	4.9	5.4	7.9	6.0	6.3
LnGrp LOS	E			E		D	A	A	A	A	A	A
Approach Vol, veh/h		65			31			1896			1155	
Approach Delay, s/veh		58.0			58.0			5.1			6.1	
Approach LOS		E			E			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		90.3		11.2	6.6	83.7		8.6				
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s		74.0		9.0	6.0	63.0		9.0				
Max Q Clear Time (g_c+I1), s		15.8		5.9	2.3	12.1		3.7				
Green Ext Time (p_c), s		23.5		0.0	0.0	22.4		0.0				
<u>Intersection Summary</u>												
HCM 2010 Ctrl Delay			7.1									
HCM 2010 LOS			A									
<u>Notes</u>												

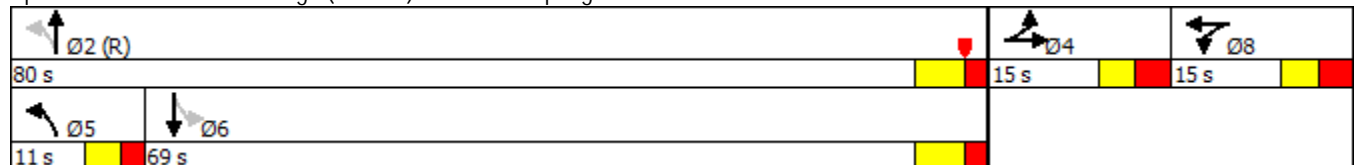
Traffic Impact Study Appendix
 Timing Report, Sorted By Phase
 NB Arrow

					
Phase Number	2	4	5	6	8
Movement	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	Max	None
Maximum Split (s)	80	15	11	69	15
Maximum Split (%)	72.7%	13.6%	10.0%	62.7%	13.6%
Minimum Split (s)	23.5	10	11	23.5	31
Yellow Time (s)	4	3	3	4	3
All-Red Time (s)	2	3	2	2	3
Minimum Initial (s)	10	4	4	10	4
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7			7	7
Flash Dont Walk (s)	10			10	18
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	30	0	30	41	15
End Time (s)	0	15	41	0	30
Yield/Force Off (s)	104	9	36	104	24
Yield/Force Off 170(s)	94	9	36	94	6
Local Start Time (s)	30	0	30	41	15
Local Yield (s)	104	9	36	104	24
Local Yield 170(s)	94	9	36	94	6

Intersection Summary








Cycle Length 110
 Control Type Actuated-Coordinated
 Natural Cycle 80
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Red

Splits and Phases: 8: College (US 287) & Johnson/Spring Park























Traffic Impact Study Appendix






Queues
NB Arrow

							
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	89	28	78	17	1880	17	1139
v/c Ratio	0.38	0.20	0.40	0.05	0.49	0.13	0.32
Control Delay	6.6	49.8	18.2	4.9	6.7	12.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	49.8	18.2	4.9	6.7	12.1	7.7
Queue Length 50th (ft)	0	19	3	3	182	3	88
Queue Length 95th (ft)	12	46	45	10	251	19	176
Internal Link Dist (ft)	516		684		725		859
Turn Bay Length (ft)		275		90		75	
Base Capacity (vph)	283	167	223	362	3800	129	3600
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.17	0.35	0.05	0.49	0.13	0.32
Intersection Summary							

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary
 NB Arrow

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	0	27	102	3	70	57	1725	28	39	2367	90
Future Volume (veh/h)	79	0	27	102	3	70	57	1725	28	39	2367	90
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		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	81	0	0	105	3	19	59	1778	28	40	2440	90
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	116	0	0	146	19	118	166	3727	59	209	3285	120
Arrive On Green	0.07	0.00	0.00	0.08	0.08	0.08	0.04	0.72	0.72	0.65	0.65	0.65
Sat Flow, veh/h	1774	0	0	1774	227	1438	1774	5157	81	259	5035	185
Grp Volume(v), veh/h	81	0	0	105	0	22	59	1169	637	40	1638	892
Grp Sat Flow(s),veh/h/ln	1774	0	0	1774	0	1665	1774	1695	1848	259	1695	1829
Q Serve(g_s), s	5.4	0.0	0.0	6.9	0.0	1.5	1.2	17.5	17.5	9.3	39.0	39.7
Cycle Q Clear(g_c), s	5.4	0.0	0.0	6.9	0.0	1.5	1.2	17.5	17.5	18.3	39.0	39.7
Prop In Lane	1.00		0.00	1.00		0.86	1.00		0.04	1.00		0.10
Lane Grp Cap(c), veh/h	116	0	0	146	0	137	166	2450	1336	209	2212	1194
V/C Ratio(X)	0.70	0.00	0.00	0.72	0.00	0.16	0.35	0.48	0.48	0.19	0.74	0.75
Avail Cap(c_a), veh/h	133	0	0	163	0	153	204	2450	1336	209	2212	1194
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	0.0	0.0	53.7	0.0	51.2	18.9	7.0	7.0	12.7	14.0	14.2
Incr Delay (d2), s/veh	12.5	0.0	0.0	12.7	0.0	0.5	1.3	0.7	1.2	2.0	2.3	4.3
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	3.0	0.0	0.0	3.9	0.0	0.7	1.3	8.3	9.3	0.8	18.7	21.3
LnGrp Delay(d),s/veh	67.4	0.0	0.0	66.4	0.0	51.7	20.2	7.7	8.3	14.7	16.3	18.5
LnGrp LOS	E			E		D	C	A	A	B	B	B
Approach Vol, veh/h		81			127			1865			2570	
Approach Delay, s/veh		67.4			63.8			8.3			17.0	
Approach LOS		E			E			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		92.2		12.9	8.4	83.8		14.9				
Change Period (Y+Rc), s		6.5		6.0	5.0	6.5		6.0				
Max Green Setting (Gmax), s		83.5		8.0	6.0	72.5		10.0				
Max Q Clear Time (g_c+I1), s		19.5		7.4	3.2	41.7		8.9				
Green Ext Time (p_c), s		47.7		0.0	0.0	26.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			15.7									
HCM 2010 LOS			B									
Notes												

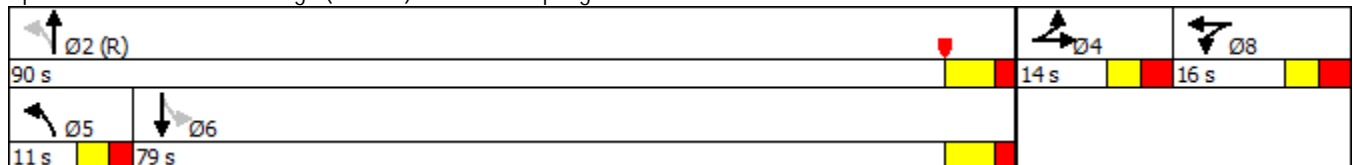
Traffic Impact Study Appendix
 Timing Report, Sorted By Phase
 NB Arrow

					
Phase Number	2	4	5	6	8
Movement	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	Max	None
Maximum Split (s)	90	14	11	79	16
Maximum Split (%)	75.0%	11.7%	9.2%	65.8%	13.3%
Minimum Split (s)	23.5	10	11	23.5	31
Yellow Time (s)	4.5	3	3	4.5	3
All-Red Time (s)	2	3	2	2	3
Minimum Initial (s)	10	4	4	10	4
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7			7	7
Flash Dont Walk (s)	10			10	18
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36.5	6.5	36.5	47.5	20.5
End Time (s)	6.5	20.5	47.5	6.5	36.5
Yield/Force Off (s)	0	14.5	42.5	0	30.5
Yield/Force Off 170(s)	110	14.5	42.5	110	12.5
Local Start Time (s)	36.5	6.5	36.5	47.5	20.5
Local Yield (s)	0	14.5	42.5	0	30.5
Local Yield 170(s)	110	14.5	42.5	110	12.5

Intersection Summary








Cycle Length 120
 Control Type Actuated-Coordinated
 Natural Cycle 120
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow

Splits and Phases: 8: College (US 287) & Johnson/Spring Park



Traffic Impact Study Appendix

Queues
NB Arrow

							
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	109	105	75	59	1807	40	2533
v/c Ratio	0.48	0.61	0.36	0.39	0.52	0.33	0.81
Control Delay	12.8	67.8	23.5	16.6	8.5	20.6	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	67.8	23.5	16.6	8.5	20.6	19.6
Queue Length 50th (ft)	0	78	13	12	213	14	541
Queue Length 95th (ft)	38	#155	61	41	246	45	614
Internal Link Dist (ft)	413		682		592		1570
Turn Bay Length (ft)		275		90		75	
Base Capacity (vph)	251	177	216	154	3506	122	3132
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.59	0.35	0.38	0.52	0.33	0.81

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔ ↑↑↑			↔ ↑↑↑		
Traffic Vol, veh/h	1	0	14	0	0	0	11	1669	1	0	1026	3
Future Vol, veh/h	1	0	14	0	0	0	11	1669	1	0	1026	3
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	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	16	0	0	0	13	1897	1	0	1166	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1952	3091	585	2388	3091	949	1169	0	0	1898	0	0
Stage 1	1168	1168	-	1922	1922	-	-	-	-	-	-	-
Stage 2	784	1923	-	466	1169	-	-	-	-	-	-	-
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	68	12	389	36	12	224	324	-	-	141	-	-
Stage 1	152	266	-	44	113	-	-	-	-	-	-	-
Stage 2	320	113	-	499	265	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	66	12	389	33	12	224	324	-	-	141	-	-
Mov Cap-2 Maneuver	66	12	-	33	12	-	-	-	-	-	-	-
Stage 1	146	266	-	42	108	-	-	-	-	-	-	-
Stage 2	307	108	-	479	265	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18	0	0.1	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	324	-	-	293	-	141	-	-
HCM Lane V/C Ratio	0.039	-	-	0.058	-	-	-	-
HCM Control Delay (s)	16.6	-	-	18	0	0	-	-
HCM Lane LOS	C	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-	0	-	-

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕ ↑↑↑			↕ ↑↑↑		
Traffic Vol, veh/h	1	0	34	0	0	1	14	1808	1	1	2489	6
Future Vol, veh/h	1	0	34	0	0	1	14	1808	1	1	2489	6
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	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	35	0	0	1	14	1864	1	1	2566	6





Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3345	4465	1286	2921	4467	932	2572	0	0	1865	0	0
Stage 1	2571	2571	-	1893	1893	-	-	-	-	-	-	-
Stage 2	774	1894	-	1028	2574	-	-	-	-	-	-	-
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	9	1	133	16	1	230	64	-	-	146	-	-
Stage 1	15	52	-	46	117	-	-	-	-	-	-	-
Stage 2	324	117	-	226	52	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	7	1	133	10	1	230	64	-	-	146	-	-
Mov Cap-2 Maneuver	7	1	-	10	1	-	-	-	-	-	-	-
Stage 1	12	52	-	36	91	-	-	-	-	-	-	-
Stage 2	252	91	-	165	52	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	71.8	20.7	0.6	0
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	64	-	-	88	230	146	-	-
HCM Lane V/C Ratio	0.226	-	-	0.41	0.004	0.007	-	-
HCM Control Delay (s)	76.9	-	-	71.8	20.7	29.8	-	-
HCM Lane LOS	F	-	-	F	C	D	-	-
HCM 95th %tile Q(veh)	0.8	-	-	1.7	0	0	-	-

APPENDIX G

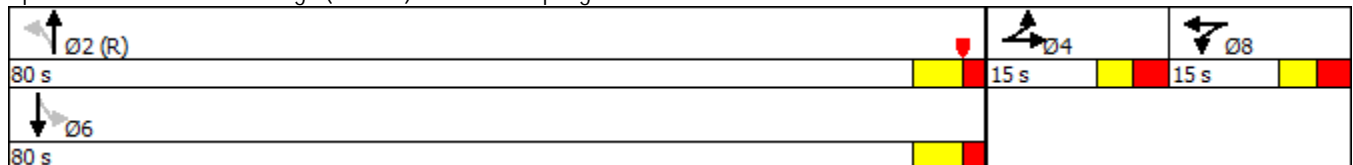
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	5	20	30	5	80	15	1865	20	15	1115	20
Future Volume (veh/h)	60	5	20	30	5	80	15	1865	20	15	1115	20
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	68	6	0	34	6	16	17	2119	22	17	1267	22
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	9	0	72	19	50	357	3950	41	177	3918	68
Arrive On Green	0.06	0.06	0.00	0.04	0.04	0.04	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	1637	144	0	1774	466	1242	426	5189	54	187	5148	89
Grp Volume(v), veh/h	74	0	0	34	0	22	17	1384	757	17	834	455
Grp Sat Flow(s),veh/h/ln	1781	0	0	1774	0	1707	426	1695	1853	187	1695	1847
Q Serve(g_s), s	4.5	0.0	0.0	2.1	0.0	1.4	1.4	18.1	18.2	4.5	8.6	8.6
Cycle Q Clear(g_c), s	4.5	0.0	0.0	2.1	0.0	1.4	10.0	18.1	18.2	22.6	8.6	8.6
Prop In Lane	0.92		0.00	1.00		0.73	1.00		0.03	1.00		0.05
Lane Grp Cap(c), veh/h	111	0	0	72	0	69	357	2580	1410	177	2580	1406
V/C Ratio(X)	0.67	0.00	0.00	0.47	0.00	0.32	0.05	0.54	0.54	0.10	0.32	0.32
Avail Cap(c_a), veh/h	162	0	0	161	0	155	357	2580	1410	177	2580	1406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.5	0.0	0.0	51.6	0.0	51.3	5.8	5.3	5.3	9.9	4.2	4.2
Incr Delay (d2), s/veh	6.8	0.0	0.0	4.8	0.0	2.6	0.3	0.8	1.5	1.1	0.3	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	2.4	0.0	0.0	1.1	0.0	0.7	0.2	8.6	9.6	0.3	4.1	4.5
LnGrp Delay(d),s/veh	57.3	0.0	0.0	56.4	0.0	53.9	6.0	6.1	6.8	11.0	4.5	4.8
LnGrp LOS	E			E		D	A	A	A	B	A	A
Approach Vol, veh/h		74			56			2158			1306	
Approach Delay, s/veh		57.3			55.4			6.3			4.7	
Approach LOS		E			E			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		88.7		11.8		88.7		9.4				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		74.0		9.0		74.0		9.0				
Max Q Clear Time (g_c+I1), s		20.2		6.5		24.6		4.1				
Green Ext Time (p_c), s		30.0		0.0		28.6		0.0				
<u>Intersection Summary</u>												
HCM 2010 Ctrl Delay				7.5								
HCM 2010 LOS				A								
<u>Notes</u>												








				
Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	80	15	80	15
Maximum Split (%)	72.7%	13.6%	72.7%	13.6%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4	3	4	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	40	10	40	25
End Time (s)	10	25	10	40
Yield/Force Off (s)	4	19	4	34
Yield/Force Off 170(s)	104	19	104	16
Local Start Time (s)	30	0	30	15
Local Yield (s)	104	9	104	24
Local Yield 170(s)	94	9	94	6

Intersection Summary

Cycle Length 110
Control Type Actuated-Coordinated
Natural Cycle 90
Offset: 10 (9%), Referenced to phase 2:NBTL, Start of Red





Splits and Phases: 8: College (US 287) & Johnson/Spring Park



							
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	34	97	17	2142	17	1290
v/c Ratio	0.61	0.25	0.53	0.08	0.62	0.24	0.38
Control Delay	59.5	51.6	32.8	6.8	10.1	16.2	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	51.6	32.8	6.8	10.1	16.2	7.3
Queue Length 50th (ft)	59	23	26	4	270	4	124
Queue Length 95th (ft)	112	53	76	12	310	19	149
Internal Link Dist (ft)	516		684		725		859
Turn Bay Length (ft)		275		90		75	
Base Capacity (vph)	167	160	203	224	3431	72	3427
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.21	0.48	0.08	0.62	0.24	0.38
Intersection Summary							

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary

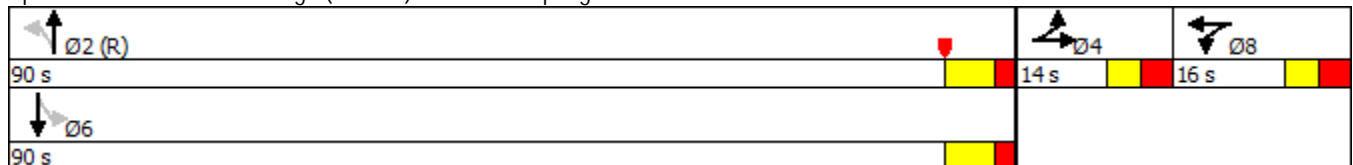
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	5	25	115	5	80	55	1960	30	45	2690	90
Future Volume (veh/h)	80	5	25	115	5	80	55	1960	30	45	2690	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	82	5	0	119	5	42	57	2021	30	46	2773	90
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	116	7	0	160	16	134	92	3672	54	167	3600	116
Arrive On Green	0.07	0.07	0.00	0.09	0.09	0.09	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	1677	102	0	1774	176	1482	91	5163	77	204	5061	163
Grp Volume(v), veh/h	87	0	0	119	0	47	57	1327	724	46	1849	1014
Grp Sat Flow(s),veh/h/ln	1779	0	0	1774	0	1658	91	1695	1849	204	1695	1833
Q Serve(g_s), s	5.7	0.0	0.0	7.8	0.0	3.2	42.4	22.3	22.3	16.6	41.5	42.9
Cycle Q Clear(g_c), s	5.7	0.0	0.0	7.8	0.0	3.2	85.4	22.3	22.3	38.9	41.5	42.9
Prop In Lane	0.94		0.00	1.00		0.89	1.00		0.04	1.00		0.09
Lane Grp Cap(c), veh/h	123	0	0	160	0	150	92	2411	1315	167	2411	1304
V/C Ratio(X)	0.71	0.00	0.00	0.74	0.00	0.31	0.62	0.55	0.55	0.28	0.77	0.78
Avail Cap(c_a), veh/h	133	0	0	163	0	152	92	2411	1315	167	2411	1304
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	0.0	53.2	0.0	51.1	48.1	8.2	8.2	17.5	11.0	11.2
Incr Delay (d2), s/veh	14.3	0.0	0.0	16.5	0.0	1.2	27.4	0.9	1.7	4.0	2.4	4.6
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	3.3	0.0	0.0	4.6	0.0	1.5	2.6	10.6	11.9	1.1	20.1	23.1
LnGrp Delay(d),s/veh	69.0	0.0	0.0	69.7	0.0	52.3	75.4	9.1	9.9	21.5	13.4	15.8
LnGrp LOS	E			E		D	E	A	A	C	B	B
Approach Vol, veh/h		87			166			2108			2909	
Approach Delay, s/veh		69.0			64.8			11.2			14.4	
Approach LOS		E			E			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		90.9		13.3		90.9		15.8				
Change Period (Y+Rc), s		6.5		6.0		6.5		6.0				
Max Green Setting (Gmax), s		83.5		8.0		83.5		10.0				
Max Q Clear Time (g_c+I1), s		87.4		7.7		44.9		9.8				
Green Ext Time (p_c), s		0.0		0.0		36.5		0.0				
<u>Intersection Summary</u>												
HCM 2010 Ctrl Delay			15.6									
HCM 2010 LOS			B									
<u>Notes</u>												








				
Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	90	14	90	16
Maximum Split (%)	75.0%	11.7%	75.0%	13.3%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4.5	3	4.5	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	114.5	84.5	114.5	98.5
End Time (s)	84.5	98.5	84.5	114.5
Yield/Force Off (s)	78	92.5	78	108.5
Yield/Force Off 170(s)	68	92.5	68	90.5
Local Start Time (s)	36.5	6.5	36.5	20.5
Local Yield (s)	0	14.5	0	30.5
Local Yield 170(s)	110	14.5	110	12.5

Intersection Summary

Cycle Length 120
Control Type Actuated-Coordinated
Natural Cycle 110
Offset: 78 (65%), Referenced to phase 2:NBTL, Start of Yellow

Splits and Phases: 8: College (US 287) & Johnson/Spring Park



							
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	119	87	57	2052	46	2866
v/c Ratio	0.81	0.75	0.47	1.00	0.59	0.55	0.83
Control Delay	89.0	81.4	37.6	145.3	9.8	37.8	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.0	81.4	37.6	145.3	9.8	37.8	15.3
Queue Length 50th (ft)	80	91	33	38	264	15	519
Queue Length 95th (ft)	#185	#184	86	#91	302	#87	589
Internal Link Dist (ft)	413		682		592		1570
Turn Bay Length (ft)		275		90		75	
Base Capacity (vph)	139	162	189	57	3463	84	3452
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.73	0.46	1.00	0.59	0.55	0.83





Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary
 EB LT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	5	20	30	5	80	15	1865	20	15	1115	20
Future Volume (veh/h)	60	5	20	30	5	80	15	1865	20	15	1115	20
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		0.99	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	1788	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	68	6	0	34	6	16	17	2119	22	17	1267	22
Adj No. of Lanes	1	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	103	113	0	72	19	50	358	3957	41	177	3925	68
Arrive On Green	0.06	0.06	0.00	0.04	0.04	0.04	0.76	0.76	0.76	0.76	0.76	0.76
Sat Flow, veh/h	1703	1863	0	1774	466	1242	426	5189	54	187	5148	89
Grp Volume(v), veh/h	68	6	0	34	0	22	17	1384	757	17	834	455
Grp Sat Flow(s),veh/h/ln	1703	1863	0	1774	0	1707	426	1695	1853	187	1695	1847
Q Serve(g_s), s	4.3	0.3	0.0	2.1	0.0	1.4	1.4	18.0	18.0	4.4	8.5	8.5
Cycle Q Clear(g_c), s	4.3	0.3	0.0	2.1	0.0	1.4	10.0	18.0	18.0	22.5	8.5	8.5
Prop In Lane	1.00		0.00	1.00		0.73	1.00		0.03	1.00		0.05
Lane Grp Cap(c), veh/h	103	113	0	72	0	69	358	2585	1413	177	2585	1408
V/C Ratio(X)	0.66	0.05	0.00	0.47	0.00	0.32	0.05	0.54	0.54	0.10	0.32	0.32
Avail Cap(c_a), veh/h	155	169	0	161	0	155	358	2585	1413	177	2585	1408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.5	48.7	0.0	51.6	0.0	51.3	5.7	5.2	5.2	9.8	4.1	4.1
Incr Delay (d2), s/veh	6.9	0.2	0.0	4.8	0.0	2.6	0.3	0.8	1.5	1.1	0.3	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	2.2	0.2	0.0	1.1	0.0	0.7	0.2	8.6	9.6	0.3	4.1	4.5
LnGrp Delay(d),s/veh	57.5	48.9	0.0	56.4	0.0	53.9	5.9	6.0	6.7	10.8	4.4	4.7
LnGrp LOS	E	D		E		D	A	A	A	B	A	A
Approach Vol, veh/h		74			56			2158			1306	
Approach Delay, s/veh		56.8			55.4			6.3			4.6	
Approach LOS		E			E			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		88.9		11.7		88.9		9.4				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		74.0		9.0		74.0		9.0				
Max Q Clear Time (g_c+I1), s		20.0		6.3		24.5		4.1				
Green Ext Time (p_c), s		30.0		0.0		28.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				7.5								
HCM 2010 LOS				A								
Notes												

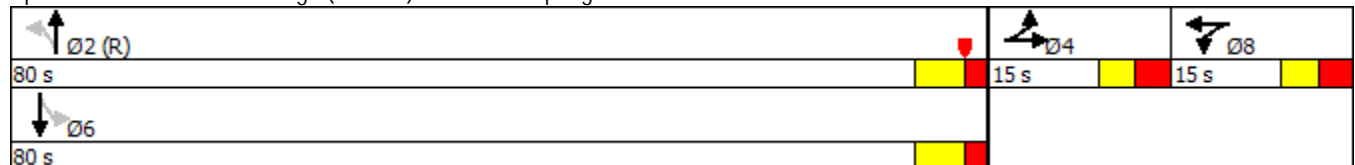
Traffic Impact Study Appendix
 Timing Report, Sorted By Phase
 EB LT

				
Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	80	15	80	15
Maximum Split (%)	72.7%	13.6%	72.7%	13.6%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4	3	4	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	30	0	30	15
End Time (s)	0	15	0	30
Yield/Force Off (s)	104	9	104	24
Yield/Force Off 170(s)	94	9	94	6
Local Start Time (s)	30	0	30	15
Local Yield (s)	104	9	104	24
Local Yield 170(s)	94	9	94	6

Intersection Summary

Cycle Length 110
 Control Type Actuated-Coordinated
 Natural Cycle 90
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Red









Splits and Phases: 8: College (US 287) & Johnson/Spring Park



Traffic Impact Study Appendix

Queues

EB LT

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	68	29	34	97	17	2142	17	1290
v/c Ratio	0.53	0.18	0.25	0.53	0.07	0.60	0.22	0.36
Control Delay	63.0	24.4	51.6	32.8	6.7	9.2	15.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	24.4	51.6	32.8	6.7	9.2	15.0	6.7
Queue Length 50th (ft)	46	4	23	26	4	270	4	124
Queue Length 95th (ft)	91	32	53	76	12	310	18	149
Internal Link Dist (ft)		516		684		725		859
Turn Bay Length (ft)	50		275		90		75	
Base Capacity (vph)	139	168	160	203	233	3546	76	3542
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.17	0.21	0.48	0.07	0.60	0.22	0.36

Intersection Summary

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary
 EB LT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	5	25	115	5	80	55	1960	30	45	2690	90
Future Volume (veh/h)	80	5	25	115	5	80	55	1960	30	45	2690	90
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		0.99	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	1788	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	82	5	0	119	5	42	57	2021	30	46	2773	90
Adj No. of Lanes	1	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	117	128	0	160	16	134	92	3675	55	167	3603	116
Arrive On Green	0.07	0.07	0.00	0.09	0.09	0.09	0.71	0.71	0.71	0.71	0.71	0.71
Sat Flow, veh/h	1703	1863	0	1774	176	1482	91	5163	77	204	5061	163
Grp Volume(v), veh/h	82	5	0	119	0	47	57	1327	724	46	1849	1014
Grp Sat Flow(s),veh/h/ln	1703	1863	0	1774	0	1658	91	1695	1849	204	1695	1833
Q Serve(g_s), s	5.7	0.3	0.0	7.8	0.0	3.2	42.6	22.2	22.3	16.6	41.4	42.8
Cycle Q Clear(g_c), s	5.7	0.3	0.0	7.8	0.0	3.2	85.4	22.2	22.3	38.8	41.4	42.8
Prop In Lane	1.00		0.00	1.00		0.89	1.00		0.04	1.00		0.09
Lane Grp Cap(c), veh/h	117	128	0	160	0	150	92	2414	1316	167	2414	1305
V/C Ratio(X)	0.70	0.04	0.00	0.74	0.00	0.31	0.62	0.55	0.55	0.27	0.77	0.78
Avail Cap(c_a), veh/h	128	140	0	163	0	152	92	2414	1316	167	2414	1305
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.7	52.2	0.0	53.2	0.0	51.1	47.9	8.2	8.2	17.4	10.9	11.1
Incr Delay (d2), s/veh	14.3	0.1	0.0	16.5	0.0	1.2	27.3	0.9	1.7	4.0	2.4	4.6
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	3.1	0.2	0.0	4.6	0.0	1.5	2.6	10.6	11.9	1.1	19.8	23.1
LnGrp Delay(d),s/veh	69.0	52.3	0.0	69.7	0.0	52.3	75.2	9.1	9.8	21.4	13.3	15.7
LnGrp LOS	E	D		E		D	E	A	A	C	B	B
Approach Vol, veh/h		87			166			2108			2909	
Approach Delay, s/veh		68.0			64.8			11.1			14.3	
Approach LOS		E			E			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		90.9		13.2		90.9		15.8				
Change Period (Y+Rc), s		6.5		6.0		6.5		6.0				
Max Green Setting (Gmax), s		83.5		8.0		83.5		10.0				
Max Q Clear Time (g_c+I1), s		87.4		7.7		44.8		9.8				
Green Ext Time (p_c), s		0.0		0.0		36.6		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				15.5								
HCM 2010 LOS				B								
Notes												

Traffic Impact Study Appendix
 Timing Report, Sorted By Phase
 EB LT

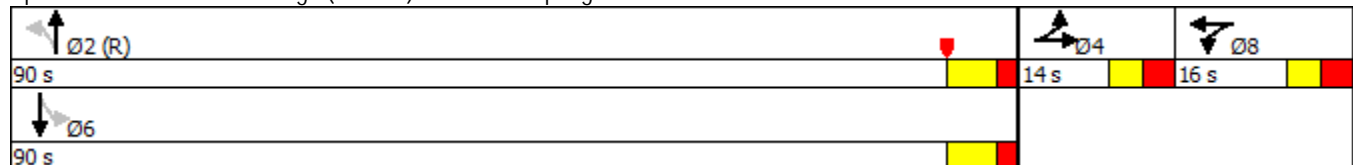


Phase Number	2	4	6	8
Movement	NBTL	EBTL	SBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	Max	None
Maximum Split (s)	90	14	90	16
Maximum Split (%)	75.0%	11.7%	75.0%	13.3%
Minimum Split (s)	23.5	10	23.5	31
Yellow Time (s)	4.5	3	4.5	3
All-Red Time (s)	2	3	2	3
Minimum Initial (s)	10	4	10	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7		7	7
Flash Dont Walk (s)	10		10	18
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	114.5	84.5	114.5	98.5
End Time (s)	84.5	98.5	84.5	114.5
Yield/Force Off (s)	78	92.5	78	108.5
Yield/Force Off 170(s)	68	92.5	68	90.5
Local Start Time (s)	36.5	6.5	36.5	20.5
Local Yield (s)	0	14.5	0	30.5
Local Yield 170(s)	110	14.5	110	12.5

Intersection Summary

Cycle Length 120
 Control Type Actuated-Coordinated
 Natural Cycle 110
 Offset: 78 (65%), Referenced to phase 2:NBTL, Start of Yellow









Splits and Phases: 8: College (US 287) & Johnson/Spring Park



Traffic Impact Study Appendix

Queues

EB LT

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	82	31	119	87	57	2052	46	2866
v/c Ratio	0.73	0.22	0.75	0.47	1.00	0.59	0.55	0.83
Control Delay	87.9	27.1	81.4	37.0	145.3	9.7	37.6	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.9	27.1	81.4	37.0	145.3	9.7	37.6	15.3
Queue Length 50th (ft)	63	4	91	32	38	264	15	519
Queue Length 95th (ft)	#146	36	#184	86	#91	302	#87	589
Internal Link Dist (ft)		413		682		592		1570
Turn Bay Length (ft)	50		275		90		75	
Base Capacity (vph)	115	142	162	190	57	3468	84	3457
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.22	0.73	0.46	1.00	0.59	0.55	0.83






Intersection Summary

- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary
 NB Arrow

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	5	20	30	5	80	15	1865	20	15	1115	20
Future Volume (veh/h)	60	5	20	30	5	80	15	1865	20	15	1115	20
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		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	68	6	0	34	6	16	17	2119	22	17	1267	22
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	9	0	72	19	50	365	3950	41	177	3608	63
Arrive On Green	0.06	0.06	0.00	0.04	0.04	0.04	0.02	0.76	0.76	0.70	0.70	0.70
Sat Flow, veh/h	1637	144	0	1774	466	1242	1774	5189	54	187	5147	89
Grp Volume(v), veh/h	74	0	0	34	0	22	17	1384	757	17	834	455
Grp Sat Flow(s),veh/h/ln	1781	0	0	1774	0	1707	1774	1695	1853	187	1695	1847
Q Serve(g_s), s	4.5	0.0	0.0	2.1	0.0	1.4	0.3	18.1	18.2	4.5	10.7	10.7
Cycle Q Clear(g_c), s	4.5	0.0	0.0	2.1	0.0	1.4	0.3	18.1	18.2	16.0	10.7	10.7
Prop In Lane	0.92		0.00	1.00		0.73	1.00		0.03	1.00		0.05
Lane Grp Cap(c), veh/h	111	0	0	72	0	69	365	2580	1410	177	2376	1294
V/C Ratio(X)	0.67	0.00	0.00	0.47	0.00	0.32	0.05	0.54	0.54	0.10	0.35	0.35
Avail Cap(c_a), veh/h	162	0	0	161	0	155	436	2580	1410	177	2376	1294
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.5	0.0	0.0	51.6	0.0	51.3	4.4	5.3	5.3	9.9	6.5	6.5
Incr Delay (d2), s/veh	6.8	0.0	0.0	4.8	0.0	2.6	0.1	0.8	1.5	1.1	0.4	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	2.4	0.0	0.0	1.1	0.0	0.7	0.1	8.6	9.6	0.3	5.1	5.7
LnGrp Delay(d),s/veh	57.3	0.0	0.0	56.4	0.0	53.9	4.5	6.1	6.8	11.0	6.9	7.3
LnGrp LOS	E			E		D	A	A	A	B	A	A
Approach Vol, veh/h		74			56			2158			1306	
Approach Delay, s/veh		57.3			55.4			6.3			7.1	
Approach LOS		E			E			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		88.7		11.8	6.6	82.1		9.4				
Change Period (Y+Rc), s		6.0		6.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s		74.0		9.0	6.0	63.0		9.0				
Max Q Clear Time (g_c+I1), s		20.2		6.5	2.3	18.0		4.1				
Green Ext Time (p_c), s		29.3		0.0	0.0	26.7		0.0				
<u>Intersection Summary</u>												
HCM 2010 Ctrl Delay				8.4								
HCM 2010 LOS				A								
<u>Notes</u>												

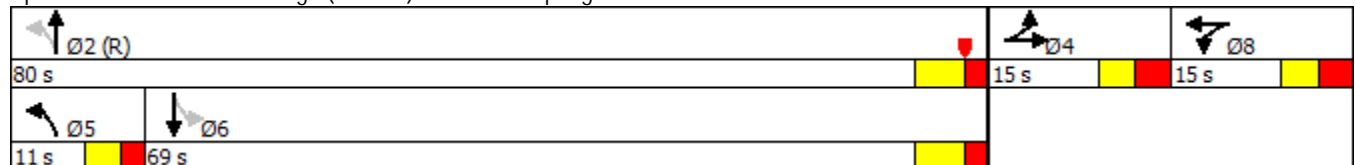
Traffic Impact Study Appendix
 Timing Report, Sorted By Phase
 NB Arrow

					
Phase Number	2	4	5	6	8
Movement	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	Max	None
Maximum Split (s)	80	15	11	69	15
Maximum Split (%)	72.7%	13.6%	10.0%	62.7%	13.6%
Minimum Split (s)	23.5	10	11	23.5	31
Yellow Time (s)	4	3	3	4	3
All-Red Time (s)	2	3	2	2	3
Minimum Initial (s)	10	4	4	10	4
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7			7	7
Flash Dont Walk (s)	10			10	18
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	30	0	30	41	15
End Time (s)	0	15	41	0	30
Yield/Force Off (s)	104	9	36	104	24
Yield/Force Off 170(s)	94	9	36	94	6
Local Start Time (s)	30	0	30	41	15
Local Yield (s)	104	9	36	104	24
Local Yield 170(s)	94	9	36	94	6

Intersection Summary

Cycle Length 110
 Control Type Actuated-Coordinated
 Natural Cycle 90
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Red








Splits and Phases: 8: College (US 287) & Johnson/Spring Park























Traffic Impact Study Appendix

Queues

NB Arrow

							
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	97	34	97	17	2142	17	1290
v/c Ratio	0.61	0.25	0.53	0.06	0.62	0.23	0.40
Control Delay	59.5	51.6	31.8	5.7	10.0	19.8	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	51.6	31.8	5.7	10.0	19.8	10.0
Queue Length 50th (ft)	59	23	24	3	269	4	123
Queue Length 95th (ft)	112	53	74	10	310	24	205
Internal Link Dist (ft)	516		684		725		859
Turn Bay Length (ft)		275		90		75	
Base Capacity (vph)	167	160	205	290	3432	75	3232
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.21	0.47	0.06	0.62	0.23	0.40
Intersection Summary							

Traffic Impact Study Appendix
 HCM 2010 Signalized Intersection Summary
 NB Arrow

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	5	25	115	5	80	55	1960	30	45	2690	90
Future Volume (veh/h)	80	5	25	115	5	80	55	1960	30	45	2690	90
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		0.99	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	1824	1863	1824	1863	1937	1824	1863	1863	1824	1863	1863	1824
Adj Flow Rate, veh/h	82	5	0	119	5	42	57	2021	30	46	2773	90
Adj No. of Lanes	0	1	0	1	1	0	1	3	0	1	3	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	116	7	0	160	16	134	143	3672	54	167	3245	104
Arrive On Green	0.07	0.07	0.00	0.09	0.09	0.09	0.04	0.71	0.71	0.64	0.64	0.64
Sat Flow, veh/h	1677	102	0	1774	176	1482	1774	5163	77	204	5061	163
Grp Volume(v), veh/h	87	0	0	119	0	47	57	1327	724	46	1849	1014
Grp Sat Flow(s),veh/h/ln	1779	0	0	1774	0	1658	1774	1695	1849	204	1695	1833
Q Serve(g_s), s	5.7	0.0	0.0	7.8	0.0	3.2	1.2	22.3	22.3	16.6	51.6	53.3
Cycle Q Clear(g_c), s	5.7	0.0	0.0	7.8	0.0	3.2	1.2	22.3	22.3	30.5	51.6	53.3
Prop In Lane	0.94		0.00	1.00		0.89	1.00		0.04	1.00		0.09
Lane Grp Cap(c), veh/h	123	0	0	160	0	150	143	2411	1315	167	2174	1176
V/C Ratio(X)	0.71	0.00	0.00	0.74	0.00	0.31	0.40	0.55	0.55	0.28	0.85	0.86
Avail Cap(c_a), veh/h	133	0	0	163	0	152	181	2411	1315	167	2174	1176
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.6	0.0	0.0	53.2	0.0	51.1	28.1	8.2	8.2	17.5	17.0	17.3
Incr Delay (d2), s/veh	14.3	0.0	0.0	16.5	0.0	1.2	1.8	0.9	1.7	4.0	4.4	8.5
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	3.3	0.0	0.0	4.6	0.0	1.5	1.3	10.6	11.9	1.1	25.2	29.5
LnGrp Delay(d),s/veh	69.0	0.0	0.0	69.7	0.0	52.3	29.8	9.1	9.9	21.5	21.4	25.8
LnGrp LOS	E			E		D	C	A	A	C	C	C
Approach Vol, veh/h		87			166			2108			2909	
Approach Delay, s/veh		69.0			64.8			9.9			22.9	
Approach LOS		E			E			A			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		90.9		13.3	8.4	82.4		15.8				
Change Period (Y+Rc), s		6.5		6.0	5.0	6.5		6.0				
Max Green Setting (Gmax), s		83.5		8.0	6.0	72.5		10.0				
Max Q Clear Time (g_c+I1), s		24.3		7.7	3.2	55.3		9.8				
Green Ext Time (p_c), s		51.6		0.0	0.0	16.4		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			19.8									
HCM 2010 LOS			B									
Notes												

Traffic Impact Study Appendix
 Timing Report, Sorted By Phase
 NB Arrow

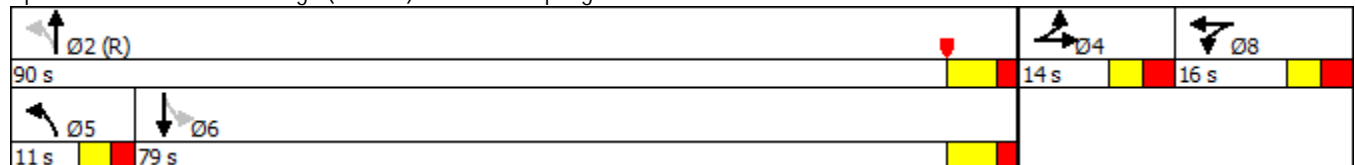


Phase Number	2	4	5	6	8
Movement	NBTL	EBTL	NBL	SBTL	WBTL
Lead/Lag			Lead	Lag	
Lead-Lag Optimize					
Recall Mode	C-Max	None	None	Max	None
Maximum Split (s)	90	14	11	79	16
Maximum Split (%)	75.0%	11.7%	9.2%	65.8%	13.3%
Minimum Split (s)	23.5	10	11	23.5	31
Yellow Time (s)	4.5	3	3	4.5	3
All-Red Time (s)	2	3	2	2	3
Minimum Initial (s)	10	4	4	10	4
Vehicle Extension (s)	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0
Walk Time (s)	7			7	7
Flash Dont Walk (s)	10			10	18
Dual Entry	Yes	Yes	No	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes
Start Time (s)	36.5	6.5	36.5	47.5	20.5
End Time (s)	6.5	20.5	47.5	6.5	36.5
Yield/Force Off (s)	0	14.5	42.5	0	30.5
Yield/Force Off 170(s)	110	14.5	42.5	110	12.5
Local Start Time (s)	36.5	6.5	36.5	47.5	20.5
Local Yield (s)	0	14.5	42.5	0	30.5
Local Yield 170(s)	110	14.5	42.5	110	12.5

Intersection Summary








Cycle Length 120
 Control Type Actuated-Coordinated
 Natural Cycle 150
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Yellow

Splits and Phases: 8: College (US 287) & Johnson/Spring Park



Traffic Impact Study Appendix

Queues
NB Arrow

							
Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	119	87	57	2052	46	2866
v/c Ratio	0.81	0.75	0.46	0.37	0.59	0.53	0.93
Control Delay	89.0	81.4	36.4	15.6	9.8	42.0	26.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.0	81.4	36.4	15.6	9.8	42.0	26.9
Queue Length 50th (ft)	80	91	32	12	264	20	713
Queue Length 95th (ft)	#185	#184	85	38	302	#88	#822
Internal Link Dist (ft)	413		682		592		1570
Turn Bay Length (ft)		275		90		75	
Base Capacity (vph)	139	162	191	154	3463	86	3094
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.73	0.46	0.37	0.59	0.53	0.93

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection

Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕ ↑↑↑	↑↑↑		↕ ↑↑↑	↑↑↑	
Traffic Vol, veh/h	5	0	15	5	0	5	10	1890	5	5	1155	5
Future Vol, veh/h	5	0	15	5	0	5	10	1890	5	5	1155	5
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	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	0	17	6	0	6	11	2148	6	6	1313	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2209	3503	659	2709	3503	1077	1318	0	0	2153	0	0
Stage 1	1327	1327	-	2173	2173	-	-	-	-	-	-	-
Stage 2	882	2176	-	536	1330	-	-	-	-	-	-	-
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	47	6	348	23	6	184	274	-	-	104	-	-
Stage 1	117	223	-	29	84	-	-	-	-	-	-	-
Stage 2	278	84	-	453	222	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	42	5	348	20	5	184	274	-	-	104	-	-
Mov Cap-2 Maneuver	42	5	-	20	5	-	-	-	-	-	-	-
Stage 1	112	210	-	28	81	-	-	-	-	-	-	-
Stage 2	259	81	-	406	209	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	40.8	145.7	0.1	0.2
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	274	-	-	123	36	104	-	-
HCM Lane V/C Ratio	0.041	-	-	0.185	0.316	0.055	-	-
HCM Control Delay (s)	18.7	-	-	40.8	145.7	41.6	-	-
HCM Lane LOS	C	-	-	E	F	E	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	1	0.2	-	-

Intersection

Int Delay, s/veh	9.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕ ↑↑↑			↕ ↑↑↑		
Traffic Vol, veh/h	5	0	35	5	0	5	15	2035	5	5	2820	5
Future Vol, veh/h	5	0	35	5	0	5	15	2035	5	5	2820	5
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	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	0	36	5	0	5	15	2098	5	5	2907	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3790	5054	1456	3304	5054	1052	2912	0	0	2103	0	0
Stage 1	2920	2920	-	2131	2131	-	-	-	-	-	-	-
Stage 2	870	2134	-	1173	2923	-	-	-	-	-	-	-
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	~ 4	1	102	9	1	191	42	-	-	111	-	-
Stage 1	8	34	-	31	88	-	-	-	-	-	-	-
Stage 2	283	88	-	183	34	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	~ 3	1	102	~ 4	1	191	42	-	-	111	-	-
Mov Cap-2 Maneuver	~ 3	1	-	~ 4	1	-	-	-	-	-	-	-
Stage 1	~ 5	32	-	20	57	-	-	-	-	-	-	-
Stage 2	177	57	-	113	32	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	\$ 897.3			\$ 1034.9			1			0.1		
HCM LOS	F			F								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	42	-	-	20	8	111	-	-
HCM Lane V/C Ratio	0.368	-	-	2.062	1.289	0.046	-	-
HCM Control Delay (s)	134.1	-	-	\$ 897.3	\$ 1034.9	39	-	-
HCM Lane LOS	F	-	-	F	F	E	-	-
HCM 95th %tile Q(veh)	1.3	-	-	5.5	2.1	0.1	-	-

Notes

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

APPENDIX H

Traffic Impact Study Appendix

Alternative Compliance Request - LUC 3.2.2 (K)(1)(a)1.a. -
Parking Demand Mitigation for Bike and Pedestrian LOS A
255 Johnson Drive
5/18/2017

This is a request that the decision maker approve an alternative compliance to allow a total of a 5% parking reduction under the Bicycle and Pedestrian LOS A category. This is based on a combination of factors including the site's adjacency to the Spring Creek/Mason Trails which are not permitted to be factored in Bicycle LOS determination, meeting requirements of pedestrian LOS A, the inclusion of three car share spaces, and the creation of an off-site pedestrian connection to the commercial area to the north. Please refer to the attached Pedestrian and Bicycle Level of Service Evaluation by Delich Associates Traffic Engineers for greater detail on evaluation methods.

Please see the text of Section 3.2.2 (K)(1)(a)1.a. below:

3.2.2 (K)(1)(a)1.a. - Parking Demand Mitigation

Multi-family dwellings and mixed-use dwellings within the TOD Overlay Zone may reduce the required minimum number of parking spaces by providing demand mitigation elements as shown in the following table:

Demand Mitigation Strategy**	Parking Requirement Reduction***
Affordable Housing Dwelling Unit for Sale or for Rent (equal to or less than 60% Area Median Income)	50%
Transit Passes for each tenant	10%
Car Share	5 spaces/1 car share
Within 1,000 feet walking distance of MAX Station. (Walking distance shall mean an ADA-compliant, contiguous improved walkway measured from the most remote building entrance to the transit station and contained within a public ROW or pedestrian easement.)	10%
Bicycle & Pedestrian Level of Service A	10%
Off-Site Parking	1:1

Justification for alternative compliance

The proposed plan allows for a total parking mitigation quantity shown in the table below:

		Required Parking	
Total Beds	412	0.75	309
Mitigation Type	Parking Spaces	Mitigation Reduction	Parking Mitigation Quantity
Transit Passes Each Tenant	309	10%	30
Bike Ped LOS A	309	5%	15
Car Share	3	5	15
Total Mitigation			60
Total Required Parking			249
Total Spaces Provided			252*

*excludes 3 car share spaces