
























HCM Signalized Intersection Capacity Analysis

1: Woodruff Road & Roper Mountain Road

2035 AM

7/6/2011

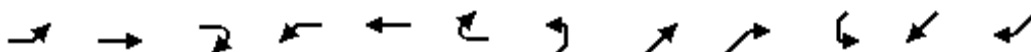
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	192	614	339	348	362	59	420	1317	261	263	1386	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Flt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3255		1719	3438	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.38	1.00		0.24	1.00	1.00	0.10	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	696	3255		426	3438	1538	182	3438	1538	3335	3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	213	682	377	387	402	66	467	1463	290	292	1540	166
RTOR Reduction (vph)	0	25	0	0	0	55	0	0	111	0	0	71
Lane Group Flow (vph)	213	1034	0	387	402	11	467	1463	179	292	1540	95
Turn Type	pm+pt			pm+pt		Perm	Perm		Perm	Prot		Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)	26.0	16.0		28.0	17.0	17.0	46.0	46.0	46.0	6.0	57.0	57.0
Effective Green, g (s)	26.0	16.0		28.0	17.0	17.0	46.0	46.0	46.0	6.0	57.0	57.0
Actuated g/C Ratio	0.26	0.16		0.28	0.17	0.17	0.46	0.46	0.46	0.06	0.57	0.57
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.3	5.5		4.3	5.5	5.5	4.9	4.9	4.9	4.3	4.9	4.9
Lane Grp Cap (vph)	283	521		262	584	261	84	1581	707	200	1960	877
v/s Ratio Prot	0.08	c0.32		c0.16	0.12			0.43		c0.09	0.45	
v/s Ratio Perm	0.12			0.25		0.01	c2.57		0.12			0.06
v/c Ratio	0.75	1.98		1.48	0.69	0.04	5.56	0.93	0.25	1.46	0.79	0.11
Uniform Delay, d1	31.5	42.0		33.2	39.0	34.7	27.0	25.4	16.5	47.0	16.7	9.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.05	0.76	0.72
Incremental Delay, d2	11.8	449.8		234.2	4.7	0.2	2077.6	10.7	0.9	213.5	0.8	0.1
Delay (s)	43.3	491.8		267.4	43.7	34.9	2104.6	36.1	17.4	263.0	13.5	7.1
Level of Service	D	F		F	D	C	F	D	B	F	B	A
Approach Delay (s)		416.7			144.3			468.8			49.5	
Approach LOS		F			F			F			D	
Intersection Summary												
HCM Average Control Delay			282.6			HCM Level of Service			F			
HCM Volume to Capacity ratio			3.97									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			21.0			
Intersection Capacity Utilization			127.0%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Woodruff Road & Costco Driveway

2035 AM

7/6/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	29	1186	40	90	888	46	40	2	86	12	2	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	3421		1719	3438	1538	1719	1544		1719	1810	1538
Flt Permitted	0.24	1.00		0.20	1.00	1.00	0.76	1.00		0.69	1.00	1.00
Satd. Flow (perm)	437	3421		361	3438	1538	1369	1544		1255	1810	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	1318	44	100	987	51	44	2	96	13	2	20
RTOR Reduction (vph)	0	2	0	0	0	16	0	87	0	0	0	17
Lane Group Flow (vph)	32	1360	0	100	987	35	44	11	0	13	2	3
Turn Type	pm+pt			Perm		Perm	Perm			Perm		pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Actuated Green, G (s)	95.7	95.7		82.8	82.8	82.8	11.3	11.3		11.3	11.3	17.7
Effective Green, g (s)	95.7	95.7		82.8	82.8	82.8	11.3	11.3		11.3	11.3	17.7
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69	0.09	0.09		0.09	0.09	0.15
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5		6.5	6.5	6.5
Vehicle Extension (s)	4.3	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	4.3
Lane Grp Cap (vph)	417	2728		249	2372	1061	129	145		118	170	310
v/s Ratio Prot	0.00	c0.40			0.29			0.01			0.00	0.00
v/s Ratio Perm	0.06			0.28		0.02	c0.03			0.01		0.00
v/c Ratio	0.08	0.50		0.40	0.42	0.03	0.34	0.08		0.11	0.01	0.01
Uniform Delay, d1	3.5	4.1		8.0	8.1	5.9	50.9	49.6		49.7	49.3	43.7
Progression Factor	1.00	1.00		0.16	0.21	0.05	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.7		4.2	0.5	0.1	3.9	0.6		1.0	0.1	0.0
Delay (s)	3.6	4.7		5.5	2.2	0.4	54.7	50.1		50.8	49.4	43.7
Level of Service	A	A		A	A	A	D	D		D	D	D
Approach Delay (s)		4.7			2.4			51.6			46.6	
Approach LOS		A			A			D			D	

Intersection Summary

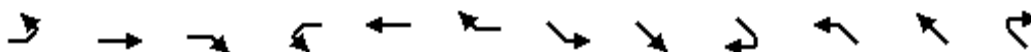
HCM Average Control Delay	6.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Green Heron Road & Woodruff Road

2035 AM

7/6/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	↕
Volume (vph)	6	2	42	2	2	10	14	909	73	87	1267	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0	5.0	6.3	6.3		6.3	6.3	6.3
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt		0.89			1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected		0.99			0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1595			1765	1538	1719	3400		1719	3438	1538
Flt Permitted		0.96			0.89	1.00	0.18	1.00		0.25	1.00	1.00
Satd. Flow (perm)		1539			1612	1538	319	3400		460	3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	2	47	2	2	11	16	1010	81	97	1408	7
RTOR Reduction (vph)	0	44	0	0	0	10	0	4	0	0	0	1
Lane Group Flow (vph)	0	12	0	0	4	1	16	1087	0	97	1408	6
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		8			4			2			6	
Permitted Phases	8			4		4	2			6		6
Actuated Green, G (s)		8.3			8.3	8.3	100.4	100.4		100.4	100.4	100.4
Effective Green, g (s)		8.3			8.3	8.3	100.4	100.4		100.4	100.4	100.4
Actuated g/C Ratio		0.07			0.07	0.07	0.84	0.84		0.84	0.84	0.84
Clearance Time (s)		5.0			5.0	5.0	6.3	6.3		6.3	6.3	6.3
Vehicle Extension (s)		4.3			4.3	4.3	5.5	5.5		5.5	5.5	5.5
Lane Grp Cap (vph)		106			111	106	267	2845		385	2876	1287
v/s Ratio Prot								0.32			c0.41	
v/s Ratio Perm		c0.01			0.00	0.00	0.05			0.21		0.00
v/c Ratio		0.12			0.04	0.01	0.06	0.38		0.25	0.49	0.00
Uniform Delay, d1		52.4			52.1	52.0	1.7	2.4		2.0	2.7	1.6
Progression Factor		1.00			1.00	1.00	0.98	0.98		0.09	0.11	0.00
Incremental Delay, d2		0.8			0.2	0.0	0.4	0.3		1.2	0.5	0.0
Delay (s)		53.2			52.3	52.1	2.0	2.6		1.4	0.8	0.0
Level of Service		D			D	D	A	A		A	A	A
Approach Delay (s)		53.2			52.1			2.6			0.8	
Approach LOS		D			D			A			A	

Intersection Summary





















HCM Average Control Delay	2.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: Woodruff Industrial Lane & Woodruff Road

2035 AM

7/6/2011




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	55	7	93	33	7	4	19	811	123	250	1301	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.86		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1558		1719	1719		1719	3370		1719	3417	
Flt Permitted	0.69	1.00		0.68	1.00		0.14	1.00		0.19	1.00	
Satd. Flow (perm)	1240	1558		1226	1719		246	3370		336	3417	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	61	8	103	37	8	4	21	901	137	278	1446	62
RTOR Reduction (vph)	0	93	0	0	4	0	0	8	0	0	2	0
Lane Group Flow (vph)	61	18	0	37	8	0	21	1030	0	278	1506	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	15.6	11.6		13.6	10.6		68.6	65.9		87.4	78.7	
Effective Green, g (s)	15.6	11.6		13.6	10.6		68.6	65.9		87.4	78.7	
Actuated g/C Ratio	0.13	0.10		0.11	0.09		0.57	0.55		0.73	0.66	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	5.5		4.3	5.5	
Lane Grp Cap (vph)	177	151		151	152		174	1851		423	2241	
v/s Ratio Prot	c0.01	0.01		0.01	0.00		0.00	0.31		c0.08	c0.44	
v/s Ratio Perm	c0.03			0.02			0.07			0.39		
v/c Ratio	0.34	0.12		0.25	0.05		0.12	0.56		0.66	0.67	
Uniform Delay, d1	47.1	49.5		48.2	50.1		12.0	17.6		10.5	12.7	
Progression Factor	1.00	1.00		1.00	1.00		0.63	0.87		1.10	0.80	
Incremental Delay, d2	1.8	0.6		1.3	0.2		0.5	1.1		3.5	1.3	
Delay (s)	48.9	50.1		49.5	50.4		8.1	16.4		15.1	11.5	
Level of Service	D	D		D	D		A	B		B	B	
Approach Delay (s)		49.7			49.7			16.2			12.1	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM Average Control Delay			16.2			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			67.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: I-85 SB Ramps & Woodruff Road

2035 AM












7/6/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	0	0	570	0	346	0	813	124	712	1261	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0		5.0		6.3	6.3	6.5	6.1	
Lane Util. Factor				0.97		0.88		0.95	1.00	1.00	0.95	
Frt				1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected				0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)				3335		2707		3438	1538	1719	3438	
Flt Permitted				0.95		1.00		1.00	1.00	0.10	1.00	
Satd. Flow (perm)				3335		2707		3438	1538	186	3438	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	633	0	384	0	903	138	791	1401	0
RTOR Reduction (vph)	0	0	0	0	0	120	0	0	96	0	0	0
Lane Group Flow (vph)	0	0	0	633	0	264	0	903	42	791	1401	0
Turn Type				custom		custom			Perm	pm+pt		
Protected Phases								2		1	6	
Permitted Phases				4		4			2	6		
Actuated Green, G (s)				22.0		22.0		32.2	32.2	86.9	86.9	
Effective Green, g (s)				22.0		22.0		32.2	32.2	86.9	86.9	
Actuated g/C Ratio				0.18		0.18		0.27	0.27	0.72	0.72	
Clearance Time (s)				5.0		5.0		6.3	6.3	6.5	6.1	
Vehicle Extension (s)				4.3		4.3		4.3	4.3	4.3	4.3	
Lane Grp Cap (vph)				611		496		923	413	748	2490	
v/s Ratio Prot								0.26		c0.42	0.41	
v/s Ratio Perm				c0.19		0.10			0.03	c0.34		
v/c Ratio				1.04		0.53		0.98	0.10	1.06	0.56	
Uniform Delay, d1				49.0		44.3		43.6	33.0	31.1	7.7	
Progression Factor				1.00		1.00		0.61	0.48	1.25	0.64	
Incremental Delay, d2				46.0		1.6		22.9	0.4	43.2	0.6	
Delay (s)				95.0		45.9		49.7	16.3	82.0	5.5	
Level of Service				F		D		D	B	F	A	
Approach Delay (s)		0.0			76.5			45.2			33.1	
Approach LOS		A			E			D			C	
Intersection Summary												
HCM Average Control Delay			46.5			HCM Level of Service				D		
HCM Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			11.5			
Intersection Capacity Utilization			94.4%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: I-85 NB Ramps & Woodruff Road

2035 AM
7/6/2011





















						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	489	816	1128	255	0	1484
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.5	6.5		6.5
Lane Util. Factor	0.97	1.00	0.95	1.00		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	3335	1538	3438	1538		3438
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	3335	1538	3438	1538		3438
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	543	907	1253	283	0	1649
RTOR Reduction (vph)	0	144	0	157	0	0
Lane Group Flow (vph)	543	763	1253	126	0	1649
Turn Type	Perm		Perm			
Protected Phases	3		2			2 4
Permitted Phases		3		2		
Actuated Green, G (s)	36.4	36.4	53.5	53.5		71.5
Effective Green, g (s)	36.4	36.4	53.5	53.5		64.5
Actuated g/C Ratio	0.30	0.30	0.45	0.45		0.54
Clearance Time (s)	5.6	5.6	6.5	6.5		
Vehicle Extension (s)	4.3	4.3	4.3	4.3		
Lane Grp Cap (vph)	1012	467	1533	686		1848
v/s Ratio Prot	0.16		0.36			c0.48
v/s Ratio Perm		c0.50		0.08		
v/c Ratio	0.54	1.63	0.82	0.18		0.89
Uniform Delay, d1	34.8	41.8	29.0	20.1		24.7
Progression Factor	1.00	1.00	0.84	2.82		0.47
Incremental Delay, d2	0.8	295.3	0.5	0.1		5.2
Delay (s)	35.6	337.1	24.7	56.6		16.7
Level of Service	D	F	C	E		B
Approach Delay (s)	224.2		30.6			16.7
Approach LOS	F		C			B
Intersection Summary						
HCM Average Control Delay			86.2	HCM Level of Service		F
HCM Volume to Capacity ratio			1.16			
Actuated Cycle Length (s)			120.0	Sum of lost time (s)		18.6
Intersection Capacity Utilization			91.8%	ICU Level of Service		F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: Carolina Point Pkwy & Woodruff Road

2035 AM

7/6/2011

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	109	67	139	0	0	0	0	1683	261	196	1375	904
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00					0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538					3438	1538	1719	3438	1538
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1719	1810	1538					3438	1538	166	3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	121	74	154	0	0	0	0	1870	290	218	1528	1004
RTOR Reduction (vph)	0	0	42	0	0	0	0	0	57	0	0	76
Lane Group Flow (vph)	121	74	112	0	0	0	0	1870	233	218	1528	928
Turn Type	custom		Perm						Perm	Perm		
Protected Phases	4	4						2 3 6			2 3 6	
Permitted Phases	4		4						2 3 6	2 3 6		2 3 6
Actuated Green, G (s)	11.0	11.0	11.0					96.4	96.4	96.4	96.4	96.4
Effective Green, g (s)	11.0	11.0	11.0					96.4	96.4	96.4	96.4	96.4
Actuated g/C Ratio	0.09	0.09	0.09					0.80	0.80	0.80	0.80	0.80
Clearance Time (s)	7.0	7.0	7.0									
Vehicle Extension (s)	4.3	4.3	4.3									
Lane Grp Cap (vph)	158	166	141					2762	1236	133	2762	1236
v/s Ratio Prot	0.07	0.04						0.54			0.44	
v/s Ratio Perm			c0.07						0.15	c1.31		0.60
v/c Ratio	0.77	0.45	0.80					0.68	0.19	1.64	0.55	0.75
Uniform Delay, d1	53.2	51.6	53.4					5.1	2.7	11.8	4.2	5.9
Progression Factor	1.00	1.00	1.00					0.36	0.23	1.98	2.14	3.07
Incremental Delay, d2	21.3	3.0	27.9					0.1	0.0	290.7	0.0	0.3
Delay (s)	74.6	54.6	81.3					1.9	0.7	314.0	9.0	18.2
Level of Service	E	D	F					A	A	F	A	B
Approach Delay (s)		73.3			0.0			1.7			36.5	
Approach LOS		E			A			A			D	
Intersection Summary												
HCM Average Control Delay			24.7			HCM Level of Service				C		
HCM Volume to Capacity ratio			1.56									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				13.5		
Intersection Capacity Utilization			80.1%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Woodruff Road & Market Point Drive

2035 AM

7/6/2011






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	258	1417	147	34	2178	86	100	2	48	39	2	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	5.8	6.1	6.1	5.8	5.8	5.8	6.1	5.8	5.8	5.8
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538	1719	3438	1538	1719	1810	1538	3335	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538	1719	3438	1538	1719	1810	1538	3335	3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	287	1574	163	38	2420	96	111	2	53	43	2	219
RTOR Reduction (vph)	0	0	56	0	0	16	0	0	42	0	0	122
Lane Group Flow (vph)	287	1574	107	38	2420	80	111	2	11	43	2	97
Turn Type	Prot	pm+ov		Prot	pm+ov		Prot	pm+ov		Prot	Perm	
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.9	71.3	78.5	10.5	72.9	77.5	7.2	9.8	20.3	4.6	7.2	7.2
Effective Green, g (s)	8.9	71.3	78.5	10.5	72.9	77.5	7.2	9.8	20.3	4.6	7.2	7.2
Actuated g/C Ratio	0.07	0.59	0.65	0.09	0.61	0.65	0.06	0.08	0.17	0.04	0.06	0.06
Clearance Time (s)	6.1	6.1	5.8	6.1	6.1	5.8	5.8	5.8	6.1	5.8	5.8	5.8
Vehicle Extension (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Lane Grp Cap (vph)	247	2043	1006	150	2089	993	103	148	260	128	206	92
v/s Ratio Prot	c0.09	0.46	0.01	0.02	c0.70	0.00	c0.06	0.00	c0.00	0.01	0.00	
v/s Ratio Perm			0.06			0.05			0.00			c0.06
v/c Ratio	1.16	0.77	0.11	0.25	1.16	0.08	1.08	0.01	0.04	0.34	0.01	1.05
Uniform Delay, d1	55.5	18.2	7.7	51.1	23.5	7.9	56.4	50.7	41.7	56.2	53.0	56.4
Progression Factor	0.99	0.98	1.98	0.80	0.54	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	99.8	2.0	0.1	0.1	71.9	0.0	111.2	0.1	0.1	2.5	0.0	108.7
Delay (s)	154.6	19.8	15.4	41.0	84.5	6.5	167.6	50.7	41.8	58.7	53.1	165.1
Level of Service	F	B	B	D	F	A	F	D	D	E	D	F
Approach Delay (s)		38.6			80.9			126.0			146.9	
Approach LOS		D			F			F			F	
Intersection Summary												
HCM Average Control Delay			68.8				HCM Level of Service			E		
HCM Volume to Capacity ratio			1.22									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			29.9		
Intersection Capacity Utilization			94.8%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

9: Woodruff Road & Garlington Road

2035 AM

7/6/2011


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	314	1024	166	147	1539	661	360	346	94	199	160	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.1		5.2	6.1		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.95		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	3366		1719	3283		1719	1752		1719	1810	1538
Flt Permitted	0.07	1.00		0.09	1.00		0.38	1.00		0.21	1.00	1.00
Satd. Flow (perm)	125	3366		166	3283		690	1752		385	1810	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	349	1138	184	163	1710	734	400	384	104	221	178	443
RTOR Reduction (vph)	0	11	0	0	40	0	0	8	0	0	0	148
Lane Group Flow (vph)	349	1311	0	163	2404	0	400	480	0	221	178	295
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	69.9	58.1		67.5	56.9		32.6	21.8		26.6	18.8	18.8
Effective Green, g (s)	69.9	58.1		67.5	56.9		32.6	21.8		26.6	18.8	18.8
Actuated g/C Ratio	0.58	0.48		0.56	0.47		0.27	0.18		0.22	0.16	0.16
Clearance Time (s)	5.2	6.1		5.2	6.1		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	4.3		4.3	4.3	4.3
Lane Grp Cap (vph)	230	1630		231	1557		280	318		172	284	241
v/s Ratio Prot	c0.15	0.39		0.06	0.73		c0.13	c0.27		0.08	0.10	
v/s Ratio Perm	c0.74			0.33			0.26			0.20		0.19
v/c Ratio	1.52	0.80		0.71	1.54		1.43	1.51		1.28	0.63	1.22
Uniform Delay, d1	38.9	26.1		20.1	31.6		42.1	49.1		44.6	47.3	50.6
Progression Factor	1.80	0.28		1.15	0.90		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	247.8	3.0		1.0	245.1		212.3	244.7		164.9	5.2	131.3
Delay (s)	317.8	10.4		24.1	273.6		254.4	293.8		209.4	52.5	181.9
Level of Service	F	B		C	F		F	F		F	D	F
Approach Delay (s)		74.6			258.0			276.1			161.8	
Approach LOS		E			F			F			F	
Intersection Summary												
HCM Average Control Delay		196.2			HCM Level of Service			F				
HCM Volume to Capacity ratio		1.48										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			15.6				
Intersection Capacity Utilization		134.1%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Woodruff Road & I-385 SB Ramps

2035 AM

7/6/2011



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1105	212	91	1642	0	0	0	0	1184	0	705
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6		6.6	6.6					5.7		5.7
Lane Util. Factor		0.95		1.00	0.95					0.97		1.00
Frt		0.98		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		3355		1719	3438					3335		1538
Flt Permitted		1.00		0.07	1.00					0.95		1.00
Satd. Flow (perm)		3355		133	3438					3335		1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1228	236	101	1824	0	0	0	0	1316	0	783
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	0	1451	0	101	1824	0	0	0	0	1316	0	779
Turn Type				pm+pt						Prot		custom
Protected Phases		2		1	6					4		
Permitted Phases				6								4
Actuated Green, G (s)		47.8		58.4	58.4					49.3		49.3
Effective Green, g (s)		47.8		58.4	58.4					49.3		49.3
Actuated g/C Ratio		0.40		0.49	0.49					0.41		0.41
Clearance Time (s)		6.6		6.6	6.6					5.7		5.7
Vehicle Extension (s)		4.3		4.3	4.3					4.3		4.3
Lane Grp Cap (vph)		1336		118	1673					1370		632
v/s Ratio Prot		0.43		0.03	c0.53					0.39		
v/s Ratio Perm				0.39								c0.51
v/c Ratio		1.09		0.86	1.09					0.96		1.23
Uniform Delay, d1		36.1		28.0	30.8					34.4		35.4
Progression Factor		0.64		1.83	0.76					1.00		1.00
Incremental Delay, d2		44.1		6.0	41.8					16.0		118.4
Delay (s)		67.3		57.3	65.1					50.2		153.6
Level of Service		E		E	E					D		F
Approach Delay (s)		67.3			64.7			0.0			88.8	
Approach LOS		E			E			A			F	
Intersection Summary												
HCM Average Control Delay			74.6			HCM Level of Service				E		
HCM Volume to Capacity ratio			1.16									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			12.3			
Intersection Capacity Utilization			181.3%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Woodruff Road & I-385 NB Ramps

2035 AM

7/6/2011





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	861	1428	0	0	989	903	744	0	361	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1			6.1	6.1	5.0		5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1719	3438			3438	1538	1719		1538			
Flt Permitted	0.10	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	172	3438			3438	1538	1719		1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	957	1587	0	0	1099	1003	827	0	401	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	383	0	0	27	0	0	0
Lane Group Flow (vph)	957	1587	0	0	1099	620	827	0	374	0	0	0
Turn Type	pm+pt				Perm		Prot	custom				
Protected Phases	5	2			6		8					
Permitted Phases	2					6			8			
Actuated Green, G (s)	75.9	75.9			35.9	35.9	33.0		33.0			
Effective Green, g (s)	75.9	75.9			35.9	35.9	33.0		33.0			
Actuated g/C Ratio	0.63	0.63			0.30	0.30	0.28		0.28			
Clearance Time (s)	6.1	6.1			6.1	6.1	5.0		5.0			
Vehicle Extension (s)	4.3	4.3			4.3	4.3	4.3		4.3			
Lane Grp Cap (vph)	546	2175			1029	460	473		423			
v/s Ratio Prot	c0.50	0.46			0.32		c0.48					
v/s Ratio Perm	c0.61					0.40			0.24			
v/c Ratio	1.75	0.73			1.07	1.35	1.75		0.88			
Uniform Delay, d1	36.1	15.0			42.0	42.0	43.5		41.7			
Progression Factor	0.99	1.17			0.57	1.29	1.00		1.00			
Incremental Delay, d2	339.4	0.2			38.1	161.2	345.5		19.9			
Delay (s)	375.0	17.7			62.2	215.2	389.0		61.6			
Level of Service	F	B			E	F	F		E			
Approach Delay (s)		152.1			135.2			282.1			0.0	
Approach LOS		F			F			F			A	
Intersection Summary												
HCM Average Control Delay		173.2			HCM Level of Service			F				
HCM Volume to Capacity ratio		1.70										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			11.1				
Intersection Capacity Utilization		181.3%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: Woodruff Road & Commercial Drive

2035 AM

7/6/2011



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	165	1492	132	31	1683	62	121	7	10	111	29	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.5		5.5	5.5		5.3	5.4		5.4	5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.91		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	3396		1719	3420		1719	1652		1719	1605	
Flt Permitted	0.05	1.00		0.09	1.00		0.36	1.00		0.75	1.00	
Satd. Flow (perm)	97	3396		171	3420		649	1652		1348	1605	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	183	1658	147	34	1870	69	134	8	11	123	32	98
RTOR Reduction (vph)	0	6	0	0	2	0	0	9	0	0	88	0
Lane Group Flow (vph)	183	1799	0	34	1937	0	134	10	0	123	42	0
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	5	2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.1	85.1		69.3	69.3		24.0	24.0		12.4	12.4	
Effective Green, g (s)	85.1	85.1		69.3	69.3		24.0	24.0		12.4	12.4	
Actuated g/C Ratio	0.71	0.71		0.58	0.58		0.20	0.20		0.10	0.10	
Clearance Time (s)	5.3	5.5		5.5	5.5		5.3	5.4		5.4	5.4	
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	4.3		4.3	4.3	
Lane Grp Cap (vph)	211	2408		99	1975		186	330		139	166	
v/s Ratio Prot	0.08	c0.53			c0.57		c0.04	0.01			0.03	
v/s Ratio Perm	0.54			0.20			0.11			c0.09		
v/c Ratio	0.87	0.75		0.34	0.98		0.72	0.03		0.88	0.25	
Uniform Delay, d1	39.5	10.8		13.4	24.7		43.7	38.6		53.1	49.5	
Progression Factor	1.14	0.70		0.19	0.25		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.1	1.4		6.3	12.8		14.2	0.1		45.1	1.3	
Delay (s)	66.3	8.9		8.9	19.0		57.9	38.7		98.2	50.8	
Level of Service	E	A		A	B		E	D		F	D	
Approach Delay (s)		14.2			18.9			55.5			73.8	
Approach LOS		B			B			E			E	
Intersection Summary												
HCM Average Control Delay			21.2			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			21.7			
Intersection Capacity Utilization			85.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: Woodruff Road & Smith Hines Road

2035 AM

7/6/2011




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	1371	234	177	1667	2	105	2	148	2	2	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.98		1.00	1.00			0.92			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1719	3363		1719	3438			1634			1667	
Flt Permitted	0.09	1.00		0.10	1.00			0.86			0.89	
Satd. Flow (perm)	170	3363		189	3438			1438			1495	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	1523	260	197	1852	2	117	2	164	2	2	4
RTOR Reduction (vph)	0	11	0	0	0	0	0	41	0	0	4	0
Lane Group Flow (vph)	9	1772	0	197	1854	0	0	242	0	0	4	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	2			6			8			4		
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	96.7	96.7		97.0	97.0			12.0			12.0	
Effective Green, g (s)	96.7	96.7		97.0	97.0			12.0			12.0	
Actuated g/C Ratio	0.81	0.81		0.81	0.81			0.10			0.10	
Clearance Time (s)	6.3	6.3		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	4.3	4.3		4.3	4.3			4.3			4.3	
Lane Grp Cap (vph)	137	2710		153	2779			144			150	
v/s Ratio Prot	0.53			0.54								
v/s Ratio Perm	0.05			c1.04				c0.17			0.00	
v/c Ratio	0.07	0.65		1.29	0.67			1.68			0.03	
Uniform Delay, d1	2.4	4.8		11.5	4.8			54.0			48.7	
Progression Factor	0.05	0.05		1.37	0.57			1.00			1.00	
Incremental Delay, d2	0.6	0.8		134.0	0.1			333.3			0.1	
Delay (s)	0.7	1.1		149.7	2.8			387.3			48.9	
Level of Service	A	A		F	A			F			D	
Approach Delay (s)	1.1			16.9				387.3			48.9	
Approach LOS	A			B				F			D	
Intersection Summary												
HCM Average Control Delay	35.5			HCM Level of Service			D					
HCM Volume to Capacity ratio	1.33											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			11.0					
Intersection Capacity Utilization	107.2%			ICU Level of Service			G					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: Woodruff Road & Walmart Driveway

2035 AM

7/6/2011






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	2055	24	20	4623	118	70	4	35	120	2	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3		6.3	6.3		5.0	5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.86			0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	
Satd. Flow (prot)	1719	3432		1719	3425		1719	1563			1711	
Flt Permitted	0.05	1.00		0.05	1.00		0.77	1.00			0.72	
Satd. Flow (perm)	85	3432		92	3425		1389	1563			1281	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	34	2283	27	22	5137	131	78	4	39	133	2	13
RTOR Reduction (vph)	0	1	0	0	1	0	0	9	0	0	3	0
Lane Group Flow (vph)	34	2309	0	22	5267	0	78	34	0	0	145	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	88.9	88.9		78.8	78.8		19.8	19.8			19.8	
Effective Green, g (s)	88.9	88.9		78.8	78.8		19.8	19.8			19.8	
Actuated g/C Ratio	0.74	0.74		0.66	0.66		0.17	0.17			0.17	
Clearance Time (s)	6.3	6.3		6.3	6.3		5.0	5.0			5.0	
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	4.3			4.3	
Lane Grp Cap (vph)	115	2543		60	2249		229	258			211	
v/s Ratio Prot	0.01	c0.67			c1.54			0.02				
v/s Ratio Perm	0.21			0.24			0.06				c0.11	
v/c Ratio	0.30	0.91		0.37	2.34		0.34	0.13			0.69	
Uniform Delay, d1	32.0	12.3		9.3	20.6		44.3	42.8			47.2	
Progression Factor	1.01	0.95		0.57	0.50		1.00	1.00			1.00	
Incremental Delay, d2	1.9	5.3		1.6	603.9		1.4	0.4			10.0	
Delay (s)	34.4	17.0		6.8	614.2		45.7	43.1			57.2	
Level of Service	C	B		A	F		D	D			E	
Approach Delay (s)		17.2			611.7			44.8			57.2	
Approach LOS		B			F			D			E	
Intersection Summary												
HCM Average Control Delay			416.3			HCM Level of Service			F			
HCM Volume to Capacity ratio			2.00									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			17.6			
Intersection Capacity Utilization			155.1%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Woodruff Road & Verdin Road

2035 AM

7/6/2011




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	58	1061	29	134	2960	77	479	352	39	67	285	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3		6.3	6.3		5.2	5.0	5.0	5.2	5.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3424		1719	3425		1719	1810	1538	1719	1739	
Flt Permitted	0.06	1.00		0.17	1.00		0.19	1.00	1.00	0.53	1.00	
Satd. Flow (perm)	101	3424		302	3425		341	1810	1538	961	1739	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	64	1179	32	149	3289	86	532	391	43	74	317	112
RTOR Reduction (vph)	0	2	0	0	2	0	0	0	30	0	3	0
Lane Group Flow (vph)	64	1209	0	149	3373	0	532	391	13	74	426	0
Turn Type	Perm			Perm			pm+pt			Perm	Perm	
Protected Phases	2			6			3		8		4	
Permitted Phases	2			6			8			8	4	
Actuated Green, G (s)	71.7	71.7		71.7	71.7		37.0	37.0	37.0	15.8	15.8	
Effective Green, g (s)	71.7	71.7		71.7	71.7		37.0	37.0	37.0	15.8	15.8	
Actuated g/C Ratio	0.60	0.60		0.60	0.60		0.31	0.31	0.31	0.13	0.13	
Clearance Time (s)	6.3	6.3		6.3	6.3		5.2	5.0	5.0	5.2	5.2	
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	4.3	4.3	4.3	4.3	
Lane Grp Cap (vph)	60	2046		180	2046		287	558	474	127	229	
v/s Ratio Prot		0.35			c0.98		c0.24	0.22			0.25	
v/s Ratio Perm	0.63			0.49			c0.33		0.01	0.08		
v/c Ratio	1.07	0.59		0.83	1.65		1.85	0.70	0.03	0.58	1.86	
Uniform Delay, d1	24.1	15.0		19.2	24.1		36.6	36.6	29.0	49.0	52.1	
Progression Factor	1.02	1.11		0.75	0.76		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	97.6	0.6		4.1	292.1		397.3	4.4	0.0	8.5	404.2	
Delay (s)	122.2	17.3		18.5	310.5		433.9	41.0	29.0	57.5	456.3	
Level of Service	F	B		B	F		F	D	C	E	F	
Approach Delay (s)		22.6			298.1			256.9			397.6	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM Average Control Delay	243.7			HCM Level of Service			F					
HCM Volume to Capacity ratio	1.69											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			11.5					
Intersection Capacity Utilization	172.8%			ICU Level of Service			H					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Woodruff Road & Butler Road

2035 AM

7/6/2011



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	1007	74	759	2693	2	231	40	555	32	42	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3		6.3	6.3			5.0	6.3	5.0	5.0	
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt		0.99		1.00	1.00			1.00	0.85	1.00	0.97	
Flt Protected		1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)		3402		1719	3438			1735	1538	1719	1751	
Flt Permitted		0.75		0.08	1.00			0.72	1.00	0.21	1.00	
Satd. Flow (perm)		2546		141	3438			1294	1538	381	1751	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	1119	82	843	2992	2	257	44	617	36	47	13
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	17	0	3	0
Lane Group Flow (vph)	0	1204	0	843	2994	0	0	301	600	36	57	0
Turn Type	Perm			pm+pt			Perm		pm+ov		Perm	
Protected Phases		2		1	6			8	1		4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)		50.7		89.7	89.7			19.0	51.7	19.0	19.0	
Effective Green, g (s)		50.7		89.7	89.7			19.0	51.7	19.0	19.0	
Actuated g/C Ratio		0.42		0.75	0.75			0.16	0.43	0.16	0.16	
Clearance Time (s)		6.3		6.3	6.3			5.0	6.3	5.0	5.0	
Vehicle Extension (s)		4.3		4.3	4.3			4.3	4.3	4.3	4.3	
Lane Grp Cap (vph)		1076		535	2570			205	663	60	277	
v/s Ratio Prot				c0.43	0.87				0.25		0.03	
v/s Ratio Perm		0.47		c0.75				c0.23	0.14	0.09		
v/c Ratio		1.12		1.58	1.16			1.47	0.90	0.60	0.20	
Uniform Delay, d1		34.6		36.6	15.1			50.5	31.9	47.0	43.9	
Progression Factor		0.83		1.15	0.94			1.00	1.00	1.00	1.00	
Incremental Delay, d2		64.5		259.9	74.7			235.4	16.3	18.9	0.6	
Delay (s)		93.3		302.1	88.9			285.9	48.2	65.8	44.5	
Level of Service		F		F	F			F	D	E	D	
Approach Delay (s)		93.3			135.7			126.1			52.5	
Approach LOS		F			F			F			D	
Intersection Summary												
HCM Average Control Delay			124.5			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.51									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			11.3			
Intersection Capacity Utilization			141.1%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: Woodruff Road & Bell Road

2035 AM

7/6/2011
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	1572	128	40	3801	24	198	2	48	20	2	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		6.2	6.2			5.4			5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.97			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1719	3399		1719	3435			1695			1600	
Flt Permitted	0.05	1.00		0.07	1.00			0.61			0.95	
Satd. Flow (perm)	82	3399		134	3435			1082			1537	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	1747	142	44	4223	27	220	2	53	22	2	94
RTOR Reduction (vph)	0	5	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	39	1884	0	44	4250	0	0	267	0	0	118	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	2			6			8			4		
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	88.8	88.8		88.8	88.8			19.6			19.6	
Effective Green, g (s)	88.8	88.8		88.8	88.8			19.6			19.6	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.16			0.16	
Clearance Time (s)	6.2	6.2		6.2	6.2			5.4			5.4	
Vehicle Extension (s)	4.3	4.3		4.3	4.3			4.3			4.3	
Lane Grp Cap (vph)	61	2515		99	2542			177			251	
v/s Ratio Prot	0.55			c1.24								
v/s Ratio Perm	0.48			0.33				c0.25			0.08	
v/c Ratio	0.64	0.75		0.44	1.67			1.51			0.47	
Uniform Delay, d1	7.7	9.1		6.0	15.6			50.2			45.5	
Progression Factor	0.75	0.68		0.58	0.69			1.00			1.00	
Incremental Delay, d2	17.3	0.8		1.3	302.5			256.9			2.2	
Delay (s)	23.1	7.0		4.8	313.3			307.1			47.7	
Level of Service	C	A		A	F			F			D	
Approach Delay (s)	7.3			310.1				307.1			47.7	
Approach LOS	A			F				F			D	
Intersection Summary												
HCM Average Control Delay	217.1			HCM Level of Service			F					
HCM Volume to Capacity ratio	1.64											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			11.6					
Intersection Capacity Utilization	136.2%			ICU Level of Service			H					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

18: Woodruff Road & SC 14

2035 AM

7/6/2011
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	215	851	131	72	2101	284	525	546	188	188	326	454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	5.0	6.3	6.3		5.0	5.0	6.3	5.0	5.0	6.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3438	1538	1719	3377		1719	1810	1538	1719	1810	1538
Flt Permitted	0.08	1.00	1.00	0.19	1.00		0.17	1.00	1.00	0.22	1.00	1.00
Satd. Flow (perm)	140	3438	1538	344	3377		315	1810	1538	402	1810	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	239	946	146	80	2334	316	583	607	209	209	362	504
RTOR Reduction (vph)	0	0	60	0	9	0	0	0	34	0	0	3
Lane Group Flow (vph)	239	946	86	80	2641	0	583	607	175	209	362	501
Turn Type	pm+pt		pm+ov	pm+pt			pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases	2		2	6			8		8	4		4
Actuated Green, G (s)	61.4	51.7	70.7	59.4	50.7		42.0	29.0	37.7	26.0	18.0	27.7
Effective Green, g (s)	61.4	51.7	70.7	59.4	50.7		42.0	29.0	37.7	26.0	18.0	27.7
Actuated g/C Ratio	0.51	0.43	0.59	0.49	0.42		0.35	0.24	0.31	0.22	0.15	0.23
Clearance Time (s)	6.3	6.3	5.0	6.3	6.3		5.0	5.0	6.3	5.0	5.0	6.3
Vehicle Extension (s)	4.3	4.3	4.3	4.3	4.3		4.3	4.3	4.3	4.3	4.3	4.3
Lane Grp Cap (vph)	199	1481	906	270	1427		333	437	483	175	272	355
v/s Ratio Prot	0.10	0.28	0.02	0.02	c0.78		c0.28	0.34	0.03	0.08	0.20	c0.11
v/s Ratio Perm	0.52		0.04	0.13			c0.34		0.09	0.18		0.21
v/c Ratio	1.20	0.64	0.09	0.30	1.85		1.75	1.39	0.36	1.19	1.33	1.41
Uniform Delay, d1	35.3	26.8	10.7	17.8	34.6		34.3	45.5	31.8	44.9	51.0	46.1
Progression Factor	1.12	1.05	1.91	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	116.4	1.3	0.0	1.0	385.7		350.0	188.7	0.7	130.0	171.9	201.0
Delay (s)	155.9	29.5	20.5	18.8	420.3		384.3	234.2	32.6	174.9	222.9	247.1
Level of Service	F	C	C	B	F		F	F	C	F	F	F
Approach Delay (s)		51.2			408.5			266.6			224.9	
Approach LOS		D			F			F			F	
Intersection Summary												
HCM Average Control Delay			275.2			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.73									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			17.6			
Intersection Capacity Utilization			144.1%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

19: E Parkins Mill Road & US 276

2035 AM

7/6/2011

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Volume (vph)	142	135	67	182	31	139	131	1888	101	114	1648	120			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900			
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0			
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.97	0.91	1.00			
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	1719	3268		3335	1810	1538	1719	4940	1538	3335	4940	1538			
Flt Permitted	0.73	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	1330	3268		3335	1810	1538	1719	4940	1538	3335	4940	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90			
Adj. Flow (vph)	158	150	74	202	34	154	146	2098	112	127	1831	133			
RTOR Reduction (vph)	0	57	0	0	0	139	0	0	44	0	0	45			
Lane Group Flow (vph)	158	167	0	202	34	15	146	2098	68	127	1831	88			
Turn Type	pm+pt			Prot		Perm		Prot		Perm		Prot		Perm	
Protected Phases	3			8		7		4		1		6		5	
Permitted Phases	8					4				6		5		2	
Actuated Green, G (s)	19.8	9.8		10.7	10.5	10.5	13.6	56.0	56.0	7.8	50.2	50.2			
Effective Green, g (s)	19.8	9.8		10.7	10.5	10.5	13.6	56.0	56.0	7.8	50.2	50.2			
Actuated g/C Ratio	0.19	0.09		0.10	0.10	0.10	0.13	0.53	0.53	0.07	0.48	0.48			
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0			
Vehicle Extension (s)	4.3	4.9		4.3	4.9	4.9	4.3	4.9	4.9	4.3	4.9	4.9			
Lane Grp Cap (vph)	287	304		339	180	153	222	2627	818	247	2355	733			
v/s Ratio Prot	0.05	0.05		c0.06	0.02		c0.08	c0.42		0.04	0.37				
v/s Ratio Perm	c0.05					0.01			0.04			0.06			
v/c Ratio	0.55	0.55		0.60	0.19	0.10	0.66	0.80	0.08	0.51	0.78	0.12			
Uniform Delay, d1	38.2	45.6		45.2	43.5	43.1	43.6	20.1	12.1	46.9	22.9	15.3			
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	3.1	3.4		3.6	1.0	0.6	8.0	2.0	0.1	2.7	1.9	0.1			
Delay (s)	41.3	49.1		48.8	44.5	43.7	51.6	22.1	12.2	49.7	24.9	15.4			
Level of Service	D	D		D	D	D	D	C	B	D	C	B			
Approach Delay (s)	45.9			46.4				23.5				25.8			
Approach LOS	D			D				C				C			

Intersection Summary

HCM Average Control Delay	27.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	105.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

20: Duvall Drive & US 276

2035 AM
7/6/2011


























Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	459	129	1592	305	138	1661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3		6.3	6.3
Lane Util. Factor	1.00	1.00	0.91		1.00	0.91
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1719	1538	4821		1719	4940
Flt Permitted	0.95	1.00	1.00		0.10	1.00
Satd. Flow (perm)	1719	1538	4821		182	4940
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	510	143	1769	339	153	1846
RTOR Reduction (vph)	0	17	43	0	0	0
Lane Group Flow (vph)	510	126	2065	0	153	1846
Turn Type	Perm				Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	13.0	13.0	39.7		39.7	39.7
Effective Green, g (s)	13.0	13.0	39.7		39.7	39.7
Actuated g/C Ratio	0.20	0.20	0.61		0.61	0.61
Clearance Time (s)	6.0	6.0	6.3		6.3	6.3
Vehicle Extension (s)	4.9	4.9	4.9		4.9	4.9
Lane Grp Cap (vph)	344	308	2945		111	3017
v/s Ratio Prot	c0.30		0.43			0.37
v/s Ratio Perm		0.08			c0.84	
v/c Ratio	1.48	0.41	0.70		1.38	0.61
Uniform Delay, d1	26.0	22.7	8.6		12.6	7.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	232.2	1.8	1.0		216.7	0.5
Delay (s)	258.2	24.4	9.6		229.3	8.4
Level of Service	F	C	A		F	A
Approach Delay (s)	207.0		9.6			25.3
Approach LOS	F		A			C
Intersection Summary						
HCM Average Control Delay			43.3		HCM Level of Service	D
HCM Volume to Capacity ratio			1.40			
Actuated Cycle Length (s)			65.0		Sum of lost time (s)	12.3
Intersection Capacity Utilization			91.8%		ICU Level of Service	F
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

23: US 276 & Millennium Blvd

2035 AM
7/6/2011





















												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	137	1603	283	33	2233	77	96	101	83	6	20	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5	6.5	4.5	6.5	6.5	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	3438	1538	1719	3438	1538	3335	3206		1719	1810	2707
Flt Permitted	0.04	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.62	1.00	1.00
Satd. Flow (perm)	75	3438	1538	136	3438	1538	3335	3206		1129	1810	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	152	1781	314	37	2481	86	107	112	92	7	22	58
RTOR Reduction (vph)	0	0	100	0	0	23	0	81	0	0	0	16
Lane Group Flow (vph)	152	1781	214	37	2481	63	107	123	0	7	22	42
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot			pm+pt		pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	104.1	96.1	96.1	98.2	93.4	93.4	8.0	16.2		9.4	8.8	16.8
Effective Green, g (s)	104.1	96.1	96.1	98.2	93.4	93.4	8.0	16.2		9.4	8.8	16.8
Actuated g/C Ratio	0.74	0.68	0.68	0.70	0.66	0.66	0.06	0.12		0.07	0.06	0.12
Clearance Time (s)	4.0	6.5	6.5	4.5	6.5	6.5	6.0	6.0		6.0	6.0	4.0
Vehicle Extension (s)	4.3	4.9	4.9	4.3	4.9	4.9	4.3	6.4		4.3	6.4	4.3
Lane Grp Cap (vph)	149	2348	1050	149	2282	1021	190	369		78	113	323
v/s Ratio Prot	c0.06	0.52		0.01	c0.72		c0.03	c0.04		0.00	0.01	0.01
v/s Ratio Perm	0.69		0.14	0.16		0.04				0.01		0.01
v/c Ratio	1.02	0.76	0.20	0.25	1.09	0.06	0.56	0.33		0.09	0.19	0.13
Uniform Delay, d1	51.6	14.7	8.2	13.1	23.6	8.3	64.6	57.3		61.5	62.6	55.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	79.1	1.7	0.2	1.4	47.4	0.1	5.1	1.7		0.8	2.6	0.3
Delay (s)	130.8	16.4	8.4	14.4	71.0	8.3	69.7	58.9		62.3	65.2	55.7
Level of Service	F	B	A	B	E	A	E	E		E	E	E
Approach Delay (s)		23.0			68.2			62.6			58.6	
Approach LOS		C			E			E			E	
Intersection Summary												
HCM Average Control Delay			48.3			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			140.7			Sum of lost time (s)				20.5		
Intersection Capacity Utilization			92.5%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: Pelham Road & The Parkway

2035 AM

7/6/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	275	1294	1254	0	2248	1068	0	0	0	379	695	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	5.8		5.8	5.3				5.3	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00		0.95	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538		3438	1538				1719	1810	1538
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538		3438	1538				1719	1810	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	306	1438	1393	0	2498	1187	0	0	0	421	772	221
RTOR Reduction (vph)	0	0	9	0	0	1	0	0	0	0	0	100
Lane Group Flow (vph)	306	1438	1384	0	2498	1186	0	0	0	421	772	121
Turn Type	Prot		Perm	Perm		custom				Perm		Perm
Protected Phases	5	2			6	4					4	
Permitted Phases			2	6		6				4		4
Actuated Green, G (s)	9.2	79.2	79.2		64.2	98.9				34.7	34.7	34.7
Effective Green, g (s)	9.2	79.2	79.2		64.2	98.9				34.7	34.7	34.7
Actuated g/C Ratio	0.07	0.63	0.63		0.51	0.79				0.28	0.28	0.28
Clearance Time (s)	5.8	5.8	5.8		5.8	5.3				5.3	5.3	5.3
Vehicle Extension (s)	4.3	4.3	4.3		4.3	4.3				4.3	4.3	4.3
Lane Grp Cap (vph)	245	2178	974		1766	1217				477	502	427
v/s Ratio Prot	0.09	0.42			0.73	0.27					c0.43	
v/s Ratio Perm			c0.90			0.50				0.24		0.08
v/c Ratio	1.25	0.66	1.42		1.41	0.97				0.88	1.54	0.28
Uniform Delay, d1	57.9	14.4	22.9		30.4	11.9				43.2	45.1	35.4
Progression Factor	1.00	1.00	1.00		0.94	1.07				1.00	1.00	1.00
Incremental Delay, d2	141.3	1.6	195.4		186.8	3.7				17.9	251.9	0.6
Delay (s)	199.2	16.0	218.3		215.4	16.5				61.1	297.0	36.0
Level of Service	F	B	F		F	B				E	F	D
Approach Delay (s)		123.7			151.3			0.0			186.0	
Approach LOS		F			F			A			F	
Intersection Summary												
HCM Average Control Delay			146.8			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.46									
Actuated Cycle Length (s)			125.0			Sum of lost time (s)				11.1		
Intersection Capacity Utilization			190.4%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

25: Pelham Road & I-85 SB off ramp

2035 AM
7/6/2011









Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑	↑↑
Volume (vph)	0	1673	1531	0	998	1785
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.6		5.3	5.3
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3438	3438		1719	2707
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3438	3438		1719	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1859	1701	0	1109	1983
RTOR Reduction (vph)	0	0	0	0	0	3
Lane Group Flow (vph)	0	1859	1701	0	1109	1980
Turn Type					Perm	
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		51.4	51.4		62.7	62.7
Effective Green, g (s)		51.4	51.4		62.7	62.7
Actuated g/C Ratio		0.41	0.41		0.50	0.50
Clearance Time (s)		5.6	5.6		5.3	5.3
Vehicle Extension (s)		4.3	4.3		4.3	4.3
Lane Grp Cap (vph)		1414	1414		862	1358
v/s Ratio Prot		c0.54	0.49		0.65	
v/s Ratio Perm						c0.73
v/c Ratio		1.31	1.20		1.29	1.46
Uniform Delay, d1		36.8	36.8		31.1	31.1
Progression Factor		0.96	0.88		1.00	1.00
Incremental Delay, d2		145.2	96.3		137.7	210.3
Delay (s)		180.4	128.7		168.9	241.4
Level of Service		F	F		F	F
Approach Delay (s)		180.4	128.7		215.4	
Approach LOS		F	F		F	
Intersection Summary						
HCM Average Control Delay			183.4	HCM Level of Service		F
HCM Volume to Capacity ratio			1.39			
Actuated Cycle Length (s)			125.0	Sum of lost time (s)		10.9
Intersection Capacity Utilization			163.4%	ICU Level of Service		H
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

26: Pelham Road & I-85 NB off ramp




















2035 AM
7/6/2011

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↔	↔
Volume (vph)	1540	0	0	782	1192	1268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8			5.8	5.0	5.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3438			3438	3335	1538
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3438			3438	3335	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1711	0	0	869	1324	1409
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1711	0	0	869	1324	1409
Turn Type					Perm	
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	44.2			44.2	70.0	70.0
Effective Green, g (s)	44.2			44.2	70.0	70.0
Actuated g/C Ratio	0.35			0.35	0.56	0.56
Clearance Time (s)	5.8			5.8	5.0	5.0
Vehicle Extension (s)	4.3			4.3	4.3	4.3
Lane Grp Cap (vph)	1216			1216	1868	861
v/s Ratio Prot	c0.50			0.25	0.40	
v/s Ratio Perm						c0.92
v/c Ratio	1.41			0.71	0.71	1.64
Uniform Delay, d1	40.4			34.9	20.1	27.5
Progression Factor	0.69			1.19	1.00	1.00
Incremental Delay, d2	183.6			1.8	1.4	291.5
Delay (s)	211.5			43.4	21.5	319.0
Level of Service	F			D	C	F
Approach Delay (s)	211.5			43.4	174.8	
Approach LOS	F			D	F	
Intersection Summary						
HCM Average Control Delay		165.1		HCM Level of Service		F
HCM Volume to Capacity ratio		1.55				
Actuated Cycle Length (s)		125.0		Sum of lost time (s)		10.8
Intersection Capacity Utilization		182.5%		ICU Level of Service		H
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

27: Pelham Road & Boland Court

2035 AM
7/6/2011






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	1933	830	157	1185	10	438	2	164	35	3	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7		6.7	6.7			6.3	6.3		6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.95		1.00	1.00			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.97	
Satd. Flow (prot)	1719	3283		1719	3434			1724	1538		1682	
Flt Permitted	0.20	1.00		0.06	1.00			0.72	1.00		0.15	
Satd. Flow (perm)	353	3283		100	3434			1305	1538		259	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	2148	922	174	1317	11	487	2	182	39	3	18
RTOR Reduction (vph)	0	38	0	0	0	0	0	0	88	0	12	0
Lane Group Flow (vph)	50	3032	0	174	1328	0	0	489	94	0	48	0
Turn Type	Perm			pm+pt			Perm			Perm	Perm	
Protected Phases	2			1		6	8			8		4
Permitted Phases	2			6			8			8	4	
Actuated Green, G (s)	65.4	65.4		82.3	82.3			29.7	29.7		29.7	
Effective Green, g (s)	65.4	65.4		82.3	82.3			29.7	29.7		29.7	
Actuated g/C Ratio	0.52	0.52		0.66	0.66			0.24	0.24		0.24	
Clearance Time (s)	6.7	6.7		6.7	6.7			6.3	6.3		6.3	
Vehicle Extension (s)	4.9	4.9		4.3	4.9			4.3	4.3		4.3	
Lane Grp Cap (vph)	185	1718		198	2261			310	365		62	
v/s Ratio Prot	c0.92			c0.07		0.39	c0.37		0.06	0.18		
v/s Ratio Perm	0.14			0.51			1.58		0.26	0.77		
v/c Ratio	0.27	1.76		0.88	0.59			1.58	0.26		0.77	
Uniform Delay, d1	16.5	29.8		40.3	11.9			47.6	38.7		44.5	
Progression Factor	1.30	1.26		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.3	344.4		33.9	1.1			274.8	0.6		47.1	
Delay (s)	21.8	382.0		74.1	13.0			322.5	39.3		91.6	
Level of Service	C	F		E	B			F	D		F	
Approach Delay (s)	376.2			20.1			245.7			91.6		
Approach LOS	F			C			F			F		
Intersection Summary												
HCM Average Control Delay			256.7		HCM Level of Service				F			
HCM Volume to Capacity ratio			1.63									
Actuated Cycle Length (s)			125.0		Sum of lost time (s)				19.7			
Intersection Capacity Utilization			136.1%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Forsythia Dr & E Butler Road

2035 AM

7/6/2011


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	0	22	22	0	166	3	1372	16	58	1240	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.88		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1719	1538		1584		1719	3432		1719	3432	
Flt Permitted		0.77	1.00		0.96		0.25	1.00		0.25	1.00	
Satd. Flow (perm)		1393	1538		1532		450	3432		450	3432	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	30	0	24	24	0	184	3	1524	18	64	1378	16
RTOR Reduction (vph)	0	0	4	0	2	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	30	20	0	206	0	3	1540	0	64	1392	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		11.4	11.4		11.4		16.1	16.1		16.1	16.1	
Effective Green, g (s)		11.4	11.4		11.4		16.1	16.1		16.1	16.1	
Actuated g/C Ratio		0.29	0.29		0.29		0.41	0.41		0.41	0.41	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.3	4.3		4.3		4.3	4.3		4.3	4.3	
Lane Grp Cap (vph)		402	444		442		183	1399		183	1399	
v/s Ratio Prot							c0.45				0.41	
v/s Ratio Perm		0.02	0.01		c0.13		0.01			0.14		
v/c Ratio		0.07	0.04		0.47		0.02	1.10		0.35	1.00	
Uniform Delay, d1		10.2	10.1		11.5		7.0	11.7		8.1	11.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.1		1.2		0.1	56.7		1.8	22.8	
Delay (s)		10.3	10.2		12.8		7.0	68.4		9.9	34.4	
Level of Service		B	B		B		A	E		A	C	
Approach Delay (s)		10.3			12.8			68.3			33.4	
Approach LOS		B			B			E			C	
Intersection Summary												
HCM Average Control Delay			48.2			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			39.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			74.9%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: E Butler Road & I-385 SB Ramps

2035 AM

7/6/2011





















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	1476	91	251	1003	0	783	0	344	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Flt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3408		1719	3438			1719	1538			
Flt Permitted		1.00		0.07	1.00			0.95	1.00			
Satd. Flow (perm)		3408		127	3438			1719	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1640	101	279	1114	0	870	0	382	0	0	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	39	0	0	0
Lane Group Flow (vph)	0	1737	0	279	1114	0	0	870	343	0	0	0
Turn Type				pm+pt			Perm		Perm			
Protected Phases				1	6			4				
Permitted Phases		2		6			4		4			
Actuated Green, G (s)		51.0		68.0	68.0			50.0	50.0			
Effective Green, g (s)		51.0		68.0	68.0			50.0	50.0			
Actuated g/C Ratio		0.39		0.52	0.52			0.38	0.38			
Clearance Time (s)		6.0		6.0	6.0			6.0	6.0			
Vehicle Extension (s)		4.3		4.3	4.3			4.3	4.3			
Lane Grp Cap (vph)		1337		201	1798			661	592			
v/s Ratio Prot				c0.12	0.32							
v/s Ratio Perm		0.51		c0.61				0.51	0.22			
v/c Ratio		1.30		1.39	0.62			1.32	0.58			
Uniform Delay, d1		39.5		40.2	21.9			40.0	31.7			
Progression Factor		1.00		1.00	1.00			1.00	1.00			
Incremental Delay, d2		140.4		202.3	0.8			152.8	1.8			
Delay (s)		179.9		242.5	22.7			192.8	33.5			
Level of Service		F		F	C			F	C			
Approach Delay (s)		179.9			66.7			144.2			0.0	
Approach LOS		F			E			F			A	
Intersection Summary												
HCM Average Control Delay			133.7			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.32									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			116.0%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

31: E Butler Road & I-385 NB Ramps

2035 AM

7/6/2011
























												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		 			 							
Volume (vph)	580	1679	0	0	1229	719	0	0	0	25	0	426
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0				6.0		6.0
Lane Util. Factor	1.00	0.95			0.95	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1719	3438			3438	1538				1719		1538
Flt Permitted	0.08	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	142	3438			3438	1538				1719		1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	644	1866	0	0	1366	799	0	0	0	28	0	473
RTOR Reduction (vph)	0	0	0	0	0	339	0	0	0	0	0	18
Lane Group Flow (vph)	644	1866	0	0	1366	460	0	0	0	28	0	455
Turn Type	pm+pt				custom				custom			custom
Protected Phases	5	2										8
Permitted Phases	2				6	6				8		
Actuated Green, G (s)	86.0	86.0			45.0	45.0				32.0		32.0
Effective Green, g (s)	86.0	86.0			45.0	45.0				32.0		32.0
Actuated g/C Ratio	0.66	0.66			0.35	0.35				0.25		0.25
Clearance Time (s)	6.0	6.0			6.0	6.0				6.0		6.0
Vehicle Extension (s)	4.3	4.3			4.3	4.3				4.3		4.3
Lane Grp Cap (vph)	519	2274			1190	532				423		379
v/s Ratio Prot	c0.33	0.54										c0.30
v/s Ratio Perm	c0.49				0.40	0.30				0.02		
v/c Ratio	1.24	0.82			1.15	0.87				0.07		1.20
Uniform Delay, d1	40.7	16.3			42.5	39.7				37.6		49.0
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	124.0	2.7			76.7	14.4				0.1		112.9
Delay (s)	164.7	19.0			119.2	54.1				37.7		161.9
Level of Service	F	B			F	D				D		F
Approach Delay (s)		56.4			95.2			0.0			154.9	
Approach LOS		E			F			A			F	
Intersection Summary												
HCM Average Control Delay			82.1				HCM Level of Service			F		
HCM Volume to Capacity ratio			1.20									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			116.0%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Frontage Road & Roper Mountain Road

2035 AM

7/6/2011




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	4	99	151	111	23	18	848	1234	1042	99	1751	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1645		1633	1665	1538	1719	3438	1538	1719	3427	
Flt Permitted	0.95	1.00		0.95	0.97	1.00	0.09	1.00	1.00	0.20	1.00	
Satd. Flow (perm)	1719	1645		1633	1665	1538	157	3438	1538	358	3427	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	110	168	123	26	20	942	1371	1158	110	1946	41
RTOR Reduction (vph)	0	55	0	0	0	19	0	0	140	0	1	0
Lane Group Flow (vph)	4	223	0	74	75	1	942	1371	1018	110	1986	0
Turn Type	Split			Split		Perm	pm+pt		Perm	Perm		
Protected Phases	4	4		8	8		5	2			6	
Permitted Phases						8	2		2	6		
Actuated Green, G (s)	7.0	7.0		4.0	4.0	4.0	71.0	71.0	71.0	40.0	40.0	
Effective Green, g (s)	7.0	7.0		4.0	4.0	4.0	71.0	71.0	71.0	40.0	40.0	
Actuated g/C Ratio	0.07	0.07		0.04	0.04	0.04	0.71	0.71	0.71	0.40	0.40	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	4.9	4.9		4.9	4.9	4.9	4.3	4.9	4.9	4.9	4.9	
Lane Grp Cap (vph)	120	115		65	67	62	502	2441	1092	143	1371	
v/s Ratio Prot	0.00	c0.14		c0.05	0.05		c0.47	0.40			0.58	
v/s Ratio Perm						0.00	c0.86		0.66	0.31		
v/c Ratio	0.03	1.94		1.14	1.12	0.01	1.88	0.56	0.93	0.77	1.45	
Uniform Delay, d1	43.3	46.5		48.0	48.0	46.1	31.2	7.0	12.4	26.0	30.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.99	0.99	1.26	1.00	1.00	
Incremental Delay, d2	0.2	453.3		154.3	146.3	0.2	395.1	0.1	1.9	32.1	205.9	
Delay (s)	43.6	499.8		202.3	194.3	46.3	426.0	7.0	17.6	58.1	235.9	
Level of Service	D	F		F	F	D	F	A	B	E	F	
Approach Delay (s)		493.3			180.3			124.3			226.6	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			178.8			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.77									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			134.7%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: I-385 NB Ramps & Roper Mountain Road

2035 AM

7/6/2011




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	1061	0	1506	265	1618	0	0	1551	462
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.95	0.95	0.88	0.97	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1633	1633	2707	3335	3438			3438	1538
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1633	1633	2707	3335	3438			3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1179	0	1673	294	1798	0	0	1723	513
RTOR Reduction (vph)	0	0	0	0	0	10	0	0	0	0	0	224
Lane Group Flow (vph)	0	0	0	589	590	1663	294	1798	0	0	1723	289
Turn Type				Perm		Perm	Prot					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				36.0	36.0	36.0	7.0	52.0			39.0	39.0
Effective Green, g (s)				36.0	36.0	36.0	7.0	52.0			39.0	39.0
Actuated g/C Ratio				0.36	0.36	0.36	0.07	0.52			0.39	0.39
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				4.9	4.9	4.9	4.3	4.9			4.9	4.9
Lane Grp Cap (vph)				588	588	975	233	1788			1341	600
v/s Ratio Prot							0.09	c0.52			c0.50	
v/s Ratio Perm				0.36	0.36	c0.61						0.19
v/c Ratio				1.00	1.00	1.71	1.26	1.01			1.28	0.48
Uniform Delay, d1				32.0	32.0	32.0	46.5	24.0			30.5	22.9
Progression Factor				1.00	1.00	1.00	1.45	0.59			0.67	0.64
Incremental Delay, d2				37.5	38.0	321.8	121.1	7.8			128.7	0.3
Delay (s)				69.5	70.0	353.8	188.5	21.9			149.0	14.9
Level of Service				E	E	F	F	C			F	B
Approach Delay (s)		0.0			236.4			45.3			118.2	
Approach LOS		A			F			D			F	
Intersection Summary												
HCM Average Control Delay			143.9			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.49									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			146.5%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Roper Mountain Road & I-385 SB Ramps

2035 AM

7/6/2011

























												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	1065	380	979	1633	0	818	0	458	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.4	6.4	5.8	6.4		6.1	6.1	6.1			
Lane Util. Factor		0.91	1.00	1.00	0.95		0.95	0.95	0.88			
Frt		1.00	0.85	1.00	1.00		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.95	1.00			
Satd. Flow (prot)		4940	1538	1719	3438		1633	1633	2707			
Flt Permitted		1.00	1.00	0.14	1.00		0.95	0.95	1.00			
Satd. Flow (perm)		4940	1538	245	3438		1633	1633	2707			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1183	422	1088	1814	0	909	0	509	0	0	0
RTOR Reduction (vph)	0	0	279	0	0	0	0	0	47	0	0	0
Lane Group Flow (vph)	0	1183	143	1088	1814	0	454	455	462	0	0	0
Turn Type		Perm		pm+pt			Perm		Perm			
Protected Phases		2		1		6		4		4		
Permitted Phases				6				4		4		
Actuated Green, G (s)		31.6	31.6	70.2	69.6		17.9	17.9	17.9			
Effective Green, g (s)		31.6	31.6	70.2	69.6		17.9	17.9	17.9			
Actuated g/C Ratio		0.32	0.32	0.70	0.70		0.18	0.18	0.18			
Clearance Time (s)		6.4	6.4	5.8	6.4		6.1	6.1	6.1			
Vehicle Extension (s)		4.9	4.9	4.3	4.9		4.9	4.9	4.9			
Lane Grp Cap (vph)		1561	486	647	2393		292	292	485			
v/s Ratio Prot		0.24		c0.54	0.53							
v/s Ratio Perm			0.09	c0.64			0.28	0.28	0.17			
v/c Ratio		0.76	0.29	1.68	0.76		1.55	1.56	0.95			
Uniform Delay, d1		30.8	25.8	24.0	9.8		41.0	41.0	40.6			
Progression Factor		0.38	0.50	0.77	0.48		1.00	1.00	1.00			
Incremental Delay, d2		2.9	1.3	307.3	0.2		265.9	267.4	29.7			
Delay (s)		14.7	14.2	325.8	4.9		306.9	308.4	70.3			
Level of Service		B	B	F	A		F	F	E			
Approach Delay (s)		14.6			125.2			222.5			0.0	
Approach LOS		B			F			F			A	
Intersection Summary												
HCM Average Control Delay		118.5		HCM Level of Service			F					
HCM Volume to Capacity ratio		1.62										
Actuated Cycle Length (s)		100.0		Sum of lost time (s)			11.9					
Intersection Capacity Utilization		146.5%		ICU Level of Service			H					
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

37: Roper Mountain Road & Congaree Road

2035 AM











7/6/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		  			 						 	
Volume (vph)	439	1127	2	6	1471	614	316	4	325	2	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	6.4			6.4	6.4	6.1	6.1			6.1	6.1
Lane Util. Factor	1.00	0.91			0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00			1.00	0.85	1.00	0.85			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00			0.98	1.00
Satd. Flow (prot)	1719	4939			3437	1538	1719	1541			1780	1538
Flt Permitted	0.07	1.00			0.95	1.00	0.75	1.00			0.72	1.00
Satd. Flow (perm)	136	4939			3257	1538	1364	1541			1303	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	488	1252	2	7	1634	682	351	4	361	2	4	2
RTOR Reduction (vph)	0	0	0	0	0	313	0	220	0	0	0	2
Lane Group Flow (vph)	488	1254	0	0	1641	369	351	145	0	0	6	0
Turn Type	pm+pt			Perm		Perm	Perm			Perm		Perm
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		8
Actuated Green, G (s)	68.6	68.6			47.6	47.6	18.9	18.9			18.9	18.9
Effective Green, g (s)	68.6	68.6			47.6	47.6	18.9	18.9			18.9	18.9
Actuated g/C Ratio	0.69	0.69			0.48	0.48	0.19	0.19			0.19	0.19
Clearance Time (s)	5.8	6.4			6.4	6.4	6.1	6.1			6.1	6.1
Vehicle Extension (s)	4.3	4.9			4.9	4.9	4.9	4.9			4.9	4.9
Lane Grp Cap (vph)	334	3388			1550	732	258	291			246	291
v/s Ratio Prot	c0.22	0.25						0.09				
v/s Ratio Perm	c0.78				0.50	0.24	c0.26				0.00	0.00
v/c Ratio	1.46	0.37			1.06	0.50	1.36	0.50			0.02	0.00
Uniform Delay, d1	33.3	6.6			26.2	18.1	40.5	36.3			33.0	32.9
Progression Factor	0.55	2.23			0.89	0.42	1.00	1.00			1.00	1.00
Incremental Delay, d2	215.1	0.1			35.3	1.4	185.3	2.7			0.1	0.0
Delay (s)	233.3	14.9			58.7	8.9	225.8	39.0			33.1	32.9
Level of Service	F	B			E	A	F	D			C	C
Approach Delay (s)		76.1			44.1			130.6			33.1	
Approach LOS		E			D			F			C	
Intersection Summary												
HCM Average Control Delay		68.6			HCM Level of Service			E				
HCM Volume to Capacity ratio		1.38										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			11.9				
Intersection Capacity Utilization		105.8%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

21: Frontage Rd & US 276










2035 AM
7/6/2011

						
Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	166	27	103	2092	2557	92
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	184	30	114	2324	2841	102
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					1010	
pX, platoon unblocked	0.44	0.44	0.44			
vC, conflicting volume	4283	1472	2943			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5918	0	2871			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	94	0			
cM capacity (veh/h)	0	473	53			
Direction, Lane #	WB 1	SE 1	SE 2	SE 3	NW 1	NW 2
Volume Total	214	114	1162	1162	1894	1049
Volume Left	184	114	0	0	0	0
Volume Right	30	0	0	0	0	102
cSH	0	53	1700	1700	1700	1700
Volume to Capacity	Err	2.15	0.68	0.68	1.11	0.62
Queue Length 95th (ft)	Err	285	0	0	0	0
Control Delay (s)	Err	696.8	0.0	0.0	0.0	0.0
Lane LOS	F	F				
Approach Delay (s)	Err	32.7			0.0	
Approach LOS	F					
Intersection Summary						
Average Delay			Err			
Intersection Capacity Utilization			100.2%		ICU Level of Service	G
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

22: US 276 & St Josephs Dr

2035 AM
7/6/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	1899	359	342	1397	610	124
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2110	399	380	1552	678	138
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				862		
pX, platoon unblocked					0.37	
vC, conflicting volume			2509		3846	1254
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2509		5256	1254
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			0		0	13
cM capacity (veh/h)			170		0	159
Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	
Volume Total	1407	1102	897	1035	816	
Volume Left	0	0	380	0	678	
Volume Right	0	399	0	0	138	
cSH	1700	1700	170	1700	0	
Volume to Capacity	0.83	0.65	2.24	0.61	Err	
Queue Length 95th (ft)	0	0	772	0	Err	
Control Delay (s)	0.0	0.0	619.6	0.0	Err	
Lane LOS			F		F	
Approach Delay (s)	0.0		287.8		Err	
Approach LOS					F	
Intersection Summary						
Average Delay			Err			
Intersection Capacity Utilization			163.8%		ICU Level of Service	H
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

29: Rothwell Dr & E Butler Road

2035 AM
7/6/2011













Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	8	2	6	1559	1310	37
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	2	7	1732	1456	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		5				
Median type				TWLTL	TWLTL	
Median storage (veh)				2	2	
Upstream signal (ft)				1175	379	
pX, platoon unblocked	0.77	0.77	0.77			
vC, conflicting volume	2356	748	1497			
vC1, stage 1 conf vol	1476					
vC2, stage 2 conf vol	879					
vCu, unblocked vol	822	76	1048			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	100	99			
cM capacity (veh/h)	227	740	495			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	11	7	866	866	970	526
Volume Left	9	7	0	0	0	0
Volume Right	2	0	0	0	0	41
cSH	284	495	1700	1700	1700	1700
Volume to Capacity	0.04	0.01	0.51	0.51	0.57	0.31
Queue Length 95th (ft)	3	1	0	0	0	0
Control Delay (s)	19.2	12.4	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	19.2	0.0			0.0	
Approach LOS	C					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			53.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

32: New Commerce Ct & E Butler Road

2035 AM
7/6/2011




















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	75	81	2075	30	50	1873
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	83	90	2306	33	56	2081
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)			371			
pX, platoon unblocked	0.56	0.56			0.56	
vC, conflicting volume	3474	1169			2339	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3849	0			1816	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	85			69	
cM capacity (veh/h)	1	600			180	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	173	1537	802	56	1041	1041
Volume Left	83	0	0	56	0	0
Volume Right	90	0	33	0	0	0
cSH	2	1700	1700	180	1700	1700
Volume to Capacity	87.94	0.90	0.47	0.31	0.61	0.61
Queue Length 95th (ft)	Err	0	0	31	0	0
Control Delay (s)	Err	0.0	0.0	33.8	0.0	0.0
Lane LOS	F			D		
Approach Delay (s)	Err	0.0		0.9		
Approach LOS	F					
Intersection Summary						
Average Delay		373.2				
Intersection Capacity Utilization		74.1%		ICU Level of Service		D
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

33: E Butler Road & Brookfield Pkwy

2035 AM

7/6/2011
























													
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR	
Lane Configurations													
Volume (veh/h)	134	1992	30	23	1876	25	2	0	19	28	0	14	
Sign Control	Free				Free				Stop				
Grade	0%				0%				0%				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	149	2213	33	26	2084	28	2	0	21	31	0	16	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None				None								
Median storage (veh)													
Upstream signal (ft)	939												
pX, platoon unblocked				0.56			0.56			0.56			
vC, conflicting volume	2112			2247			3569			4694			
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	2112			1653			4018			6029			
tC, single (s)	4.2			4.2			7.6			6.6			
tC, 2 stage (s)													
tF (s)	2.2			2.2			3.5			4.0			
p0 queue free %	39			88			0			100			
cM capacity (veh/h)	245			209			0			0			
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SE 1	SE 2	NW 1	NW 2				
Volume Total	149	1476	771	1068	1070	2	21	31	16				
Volume Left	149	0	0	26	0	2	0	31	0				
Volume Right	0	0	33	0	28	0	21	0	16				
cSH	245	1700	1700	209	1700	0	217	0	601				
Volume to Capacity	0.61	0.87	0.45	0.12	0.63	10.17	0.10	196.32	0.03				
Queue Length 95th (ft)	89	0	0	10	0	Err	8	Err	2				
Control Delay (s)	40.0	0.0	0.0	8.2	0.0	Err	23.4	Err	11.1				
Lane LOS	E			A		F	C	F	B				
Approach Delay (s)	2.5			4.1			973.5			6669.7			
Approach LOS							F			F			
Intersection Summary													
Average Delay	75.7												
Intersection Capacity Utilization	126.2%			ICU Level of Service						H			
Analysis Period (min)	15												

HCM Signalized Intersection Capacity Analysis

1: Woodruff Road & Roper Mountain Road

2035 PM

7/6/2011

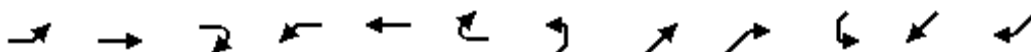
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	458	515	77	202	889	633	58	755	177	726	755	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Flt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3371		1719	3438	1538	1719	3438	1538	3335	3438	1538
Flt Permitted	0.15	1.00		0.29	1.00	1.00	0.34	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	278	3371		532	3438	1538	608	3438	1538	3335	3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	509	572	86	224	988	703	64	839	197	807	839	117
RTOR Reduction (vph)	0	12	0	0	0	300	0	0	132	0	0	64
Lane Group Flow (vph)	509	646	0	224	988	403	64	839	65	807	839	53
Turn Type	pm+pt			pm+pt		Perm	Perm		Perm	Prot		Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)	43.0	27.4		33.6	22.0	22.0	22.0	22.0	22.0	18.0	45.0	45.0
Effective Green, g (s)	43.0	27.4		33.6	22.0	22.0	22.0	22.0	22.0	18.0	45.0	45.0
Actuated g/C Ratio	0.43	0.27		0.34	0.22	0.22	0.22	0.22	0.22	0.18	0.45	0.45
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	6.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	4.3	5.5		4.3	5.5	5.5	4.9	4.9	4.9	4.3	4.9	4.9
Lane Grp Cap (vph)	365	924		316	756	338	134	756	338	600	1547	692
v/s Ratio Prot	c0.24	0.19		0.08	0.29			c0.24		c0.24	0.24	
v/s Ratio Perm	c0.36			0.16		0.26	0.11		0.04			0.03
v/c Ratio	1.39	0.70		0.71	1.31	1.19	0.48	1.11	0.19	1.34	0.54	0.08
Uniform Delay, d1	28.1	32.6		25.6	39.0	39.0	34.0	39.0	31.8	41.0	20.0	15.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.77	0.58	0.22
Incremental Delay, d2	193.5	3.2		7.9	147.6	112.6	11.7	67.1	1.3	156.3	0.1	0.0
Delay (s)	221.6	35.8		33.5	186.6	151.6	45.7	106.1	33.0	187.9	11.8	3.4
Level of Service	F	D		C	F	F	D	F	C	F	B	A
Approach Delay (s)		116.9			155.8			89.5			91.8	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay		116.9			HCM Level of Service			F				
HCM Volume to Capacity ratio		1.26										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		109.0%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Woodruff Road & Costco Driveway

2035 PM

7/6/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	21	1239	137	305	1811	65	151	6	324	59	4	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	3387		1719	3438	1538	1719	1543		1719	1810	1538
Flt Permitted	0.04	1.00		0.17	1.00	1.00	0.76	1.00		0.35	1.00	1.00
Satd. Flow (perm)	81	3387		303	3438	1538	1366	1543		629	1810	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	1377	152	339	2012	72	168	7	360	66	4	53
RTOR Reduction (vph)	0	7	0	0	0	14	0	99	0	0	0	16
Lane Group Flow (vph)	23	1522	0	339	2012	58	168	268	0	66	4	37
Turn Type	pm+pt			Perm		Perm	Perm			Perm		pm+ov
Protected Phases	5	2			6			8			4	5
Permitted Phases	2			6		6	8			4		4
Actuated Green, G (s)	95.5	95.5		82.6	82.6	82.6	11.5	11.5		11.5	11.5	17.9
Effective Green, g (s)	95.5	95.5		82.6	82.6	82.6	11.5	11.5		11.5	11.5	17.9
Actuated g/C Ratio	0.80	0.80		0.69	0.69	0.69	0.10	0.10		0.10	0.10	0.15
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	6.5	6.5		6.5	6.5	6.5
Vehicle Extension (s)	4.3	5.5		5.5	5.5	5.5	5.5	5.5		5.5	5.5	4.3
Lane Grp Cap (vph)	152	2695		209	2366	1059	131	148		60	173	313
v/s Ratio Prot	0.01	c0.45			0.59			c0.17			0.00	0.01
v/s Ratio Perm	0.11			c1.12		0.04	0.12			0.10		0.02
v/c Ratio	0.15	0.56		1.62	0.85	0.06	1.28	1.81		1.10	0.02	0.12
Uniform Delay, d1	16.0	4.5		18.7	14.1	6.1	54.2	54.2		54.2	49.2	44.2
Progression Factor	1.00	1.00		0.53	0.42	0.29	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.9		297.5	3.4	0.1	172.9	388.9		146.4	0.1	0.3
Delay (s)	16.7	5.4		307.5	9.4	1.9	227.2	443.2		200.7	49.3	44.5
Level of Service	B	A		F	A	A	F	F		F	D	D
Approach Delay (s)		5.6			50.9			375.3			128.4	
Approach LOS		A			D			F			F	

Intersection Summary

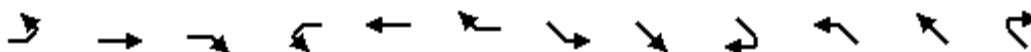
HCM Average Control Delay	75.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	112.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

3: Green Heron Road & Woodruff Road

2035 PM

7/6/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	↕
Volume (vph)	35	2	97	20	4	135	113	2125	18	4	1656	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0	5.0	6.3	6.3		6.3	6.3	6.3
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frt		0.90			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99			0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1611			1736	1538	1719	3434		1719	3438	1538
Flt Permitted		0.90			0.42	1.00	0.10	1.00		0.04	1.00	1.00
Satd. Flow (perm)		1473			767	1538	177	3434		74	3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	2	108	22	4	150	126	2361	20	4	1840	4
RTOR Reduction (vph)	0	19	0	0	0	48	0	1	0	0	0	1
Lane Group Flow (vph)	0	130	0	0	26	102	126	2380	0	4	1840	3
Turn Type	Perm			Perm		Perm	Perm			Perm		Perm
Protected Phases		8			4			2			6	
Permitted Phases	8			4		4	2			6		6
Actuated Green, G (s)		11.0			11.0	11.0	97.7	97.7		97.7	97.7	97.7
Effective Green, g (s)		11.0			11.0	11.0	97.7	97.7		97.7	97.7	97.7
Actuated g/C Ratio		0.09			0.09	0.09	0.81	0.81		0.81	0.81	0.81
Clearance Time (s)		5.0			5.0	5.0	6.3	6.3		6.3	6.3	6.3
Vehicle Extension (s)		4.3			4.3	4.3	5.5	5.5		5.5	5.5	5.5
Lane Grp Cap (vph)		135			70	141	144	2796		60	2799	1252
v/s Ratio Prot								0.69			0.54	
v/s Ratio Perm		c0.09			0.03	0.07	c0.71			0.05		0.00
v/c Ratio		0.96			0.37	0.72	0.88	0.85		0.07	0.66	0.00
Uniform Delay, d1		54.3			51.2	53.0	7.2	6.8		2.2	4.5	2.1
Progression Factor		1.00			1.00	1.00	0.97	0.95		1.99	2.62	1.92
Incremental Delay, d2		66.0			5.2	18.3	42.1	3.0		0.2	0.1	0.0
Delay (s)		120.3			56.4	71.3	49.1	9.4		4.5	11.8	4.0
Level of Service		F			E	E	D	A		A	B	A
Approach Delay (s)		120.3			69.1			11.4			11.8	
Approach LOS		F			E			B			B	

Intersection Summary

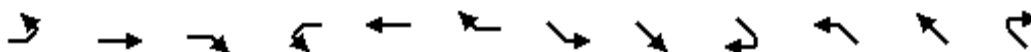
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.3
Intersection Capacity Utilization	113.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: Woodruff Industrial Lane & Woodruff Road

2035 PM

7/6/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	232	52	427	313	47	45	85	2037	120	346	1387	374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1568		1719	1676		1719	3409		1719	3328	
Flt Permitted	0.59	1.00		0.22	1.00		0.07	1.00		0.07	1.00	
Satd. Flow (perm)	1064	1568		402	1676		132	3409		121	3328	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	258	58	474	348	52	50	94	2263	133	384	1541	416
RTOR Reduction (vph)	0	68	0	0	29	0	0	4	0	0	21	0
Lane Group Flow (vph)	258	464	0	348	73	0	94	2392	0	384	1937	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	34.0	21.0		28.0	18.0		60.0	55.0		70.0	60.0	
Effective Green, g (s)	34.0	21.0		28.0	18.0		60.0	55.0		70.0	60.0	
Actuated g/C Ratio	0.28	0.18		0.23	0.15		0.50	0.46		0.58	0.50	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	5.5		4.3	5.5	
Lane Grp Cap (vph)	372	274		204	251		132	1562		204	1664	
v/s Ratio Prot	0.08	c0.30		c0.14	0.04		0.03	0.70		c0.16	0.58	
v/s Ratio Perm	0.12			0.26			0.33			c0.95		
v/c Ratio	0.69	1.69		1.71	0.29		0.71	1.53		1.88	1.16	
Uniform Delay, d1	36.8	49.5		43.3	45.3		27.3	32.5		38.2	30.0	
Progression Factor	1.00	1.00		1.00	1.00		1.17	0.83		0.96	0.94	
Incremental Delay, d2	6.2	327.9		337.7	1.0		9.7	240.8		408.1	78.1	
Delay (s)	43.0	377.4		381.0	46.4		41.6	267.8		444.7	106.1	
Level of Service	D	F		F	D		D	F		F	F	
Approach Delay (s)		268.2			305.1			259.2			161.6	
Approach LOS		F			F			F			F	

Intersection Summary


















HCM Average Control Delay	226.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	145.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

5: I-85 SB Ramps & Woodruff Road

2035 PM












7/6/2011

																		
Movement	WBL2	WBL	WBR	SEL	SET	SER	NWL	NWT	NWR	NEL	NER							
Lane Configurations																		
Volume (vph)	541	0	340	0	2366	411	1007	1767	0	0	0							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900							
Total Lost time (s)	5.0		5.0		6.3	6.3	6.5	6.1										
Lane Util. Factor	0.97		0.88		0.95	1.00	1.00	0.95										
Frt	1.00		0.85		1.00	0.85	1.00	1.00										
Flt Protected	0.95		1.00		1.00	1.00	0.95	1.00										
Satd. Flow (prot)	3335		2707		3438	1538	1719	3438										
Flt Permitted	0.95		1.00		1.00	1.00	0.07	1.00										
Satd. Flow (perm)	3335		2707		3438	1538	118	3438										
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90							
Adj. Flow (vph)	601	0	378	0	2629	457	1119	1963	0	0	0							
RTOR Reduction (vph)	0	0	68	0	0	109	0	0	0	0	0							
Lane Group Flow (vph)	601	0	310	0	2629	348	1119	1963	0	0	0							
Turn Type	custom		custom		Perm		pm+pt											
Protected Phases					2		1		6									
Permitted Phases	4		4		2		6											
Actuated Green, G (s)	11.0		11.0		54.7		97.9		97.9									
Effective Green, g (s)	11.0		11.0		54.7		97.9		97.9									
Actuated g/C Ratio	0.09		0.09		0.46		0.82		0.82									
Clearance Time (s)	5.0		5.0		6.3		6.5		6.1									
Vehicle Extension (s)	4.3		4.3		4.3		4.3		4.3									
Lane Grp Cap (vph)	306		248		1567		583		2805									
v/s Ratio Prot					0.76		c0.58		0.57									
v/s Ratio Perm	c0.18		0.11				0.23		c0.98									
v/c Ratio	1.96		1.25		1.68		0.50		1.92		0.70							
Uniform Delay, d1	54.5		54.5		32.6		23.0		37.4		4.7							
Progression Factor	1.00		1.00		0.52		0.28		0.91		0.84							
Incremental Delay, d2	445.5		141.2		305.2		0.2		414.3		0.1							
Delay (s)	500.0		195.7		322.3		6.6		448.2		4.1							
Level of Service	F		F		F		A		F		A							
Approach Delay (s)			382.5		275.6				165.4		0.0							
Approach LOS			F		F				F		A							
Intersection Summary																		
HCM Average Control Delay			242.7		HCM Level of Service		F											
HCM Volume to Capacity ratio			1.86															
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		11.5											
Intersection Capacity Utilization			150.3%		ICU Level of Service		H											
Analysis Period (min)			15															
c Critical Lane Group																		

HCM Signalized Intersection Capacity Analysis

6: I-85 NB Ramps & Woodruff Road

2035 PM
7/6/2011





















						
Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	753	823	1359	1548	0	2021
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	6.5	6.5		6.5
Lane Util. Factor	0.97	1.00	0.95	1.00		0.95
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	3335	1538	3438	1538		3438
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	3335	1538	3438	1538		3438
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	837	914	1510	1720	0	2246
RTOR Reduction (vph)	0	158	0	632	0	0
Lane Group Flow (vph)	837	756	1510	1088	0	2246
Turn Type	Perm		Perm			
Protected Phases	3		2			2 4
Permitted Phases		3		2		
Actuated Green, G (s)	37.4	37.4	50.5	50.5		70.5
Effective Green, g (s)	37.4	37.4	50.5	50.5		63.5
Actuated g/C Ratio	0.31	0.31	0.42	0.42		0.53
Clearance Time (s)	5.6	5.6	6.5	6.5		
Vehicle Extension (s)	4.3	4.3	4.3	4.3		
Lane Grp Cap (vph)	1039	479	1447	647		1819
v/s Ratio Prot	0.25		0.44			c0.65
v/s Ratio Perm		c0.49		c0.71		
v/c Ratio	0.81	1.58	1.04	1.68		1.23
Uniform Delay, d1	38.0	41.3	34.8	34.8		28.2
Progression Factor	1.00	1.00	1.59	5.82		1.31
Incremental Delay, d2	5.0	270.5	22.0	307.4		108.7
Delay (s)	43.0	311.8	77.4	509.8		145.6
Level of Service	D	F	E	F		F
Approach Delay (s)	183.3		307.7			145.6
Approach LOS	F		F			F
Intersection Summary						
HCM Average Control Delay			227.2	HCM Level of Service		F
HCM Volume to Capacity ratio			1.58			
Actuated Cycle Length (s)			120.0	Sum of lost time (s)		18.6
Intersection Capacity Utilization			101.3%	ICU Level of Service		G
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

7: Carolina Point Pkwy & Woodruff Road

2035 PM

7/6/2011

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	136	188	119	0	0	0	0	2035	147	30	1885	1477
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0					6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	1.00	1.00					0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85					1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00					1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	1810	1538					3438	1538	1719	3438	1538
Flt Permitted	0.95	1.00	1.00					1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1719	1810	1538					3438	1538	77	3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	151	209	132	0	0	0	0	2261	163	33	2094	1641
RTOR Reduction (vph)	0	0	19	0	0	0	0	0	35	0	0	18
Lane Group Flow (vph)	151	209	113	0	0	0	0	2261	128	33	2094	1623
Turn Type	custom		Perm						Perm	Perm		
Protected Phases	4	4						2 3 6			2 3 6	
Permitted Phases	4		4						2 3 6	2 3 6		2 3 6
Actuated Green, G (s)	13.0	13.0	13.0					94.4	94.4	94.4	94.4	94.4
Effective Green, g (s)	13.0	13.0	13.0					94.4	94.4	94.4	94.4	94.4
Actuated g/C Ratio	0.11	0.11	0.11					0.79	0.79	0.79	0.79	0.79
Clearance Time (s)	7.0	7.0	7.0									
Vehicle Extension (s)	4.3	4.3	4.3									
Lane Grp Cap (vph)	186	196	167					2705	1210	61	2705	1210
v/s Ratio Prot	0.09	c0.12						0.66			0.61	
v/s Ratio Perm			0.07						0.08	0.43		c1.06
v/c Ratio	0.81	1.07	0.68					0.84	0.11	0.54	0.77	1.34
Uniform Delay, d1	52.3	53.5	51.5					8.0	3.0	4.8	7.0	12.8
Progression Factor	1.00	1.00	1.00					0.44	0.10	0.93	0.63	1.33
Incremental Delay, d2	24.5	83.0	11.9					0.2	0.0	1.2	0.1	154.1
Delay (s)	76.8	136.5	63.4					3.8	0.3	5.7	4.5	171.2
Level of Service	E	F	E					A	A	A	A	F
Approach Delay (s)		98.5			0.0			3.5			77.1	
Approach LOS		F			A			A			E	
Intersection Summary												
HCM Average Control Delay			52.0			HCM Level of Service				D		
HCM Volume to Capacity ratio			1.32									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				13.5		
Intersection Capacity Utilization			112.6%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

8: Woodruff Road & Market Point Drive

2035 PM

7/6/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	742	1260	152	109	2612	233	239	42	107	336	42	541
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1	5.8	6.1	6.1	5.8	5.8	5.8	6.1	5.8	5.8	5.8
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	0.95	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538	1719	3438	1538	1719	1810	1538	3335	3438	1538
Satd. Flow (perm)	3335	3438	1538	1719	3438	1538	1719	1810	1538	3335	3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	824	1400	169	121	2902	259	266	47	119	373	47	601
RTOR Reduction (vph)	0	0	66	0	0	36	0	0	22	0	0	201
Lane Group Flow (vph)	824	1400	103	121	2902	223	266	47	97	373	47	400
Turn Type	Prot	pm+ov		Prot	pm+ov		Prot	pm+ov		Prot	Perm	
Protected Phases	5	2	3	1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	15.9	59.8	70.0	15.0	58.9	73.5	10.2	6.8	21.8	14.6	11.2	11.2
Effective Green, g (s)	15.9	59.8	70.0	15.0	58.9	73.5	10.2	6.8	21.8	14.6	11.2	11.2
Actuated g/C Ratio	0.13	0.50	0.58	0.12	0.49	0.61	0.08	0.06	0.18	0.12	0.09	0.09
Clearance Time (s)	6.1	6.1	5.8	6.1	6.1	5.8	5.8	5.8	6.1	5.8	5.8	5.8
Vehicle Extension (s)	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Lane Grp Cap (vph)	442	1713	897	215	1687	942	146	103	279	406	321	144
v/s Ratio Prot	c0.25	0.41	0.01	0.07	c0.84	0.03	c0.15	0.03	0.04	0.11	0.01	
v/s Ratio Perm			0.06			0.12			0.02			c0.26
v/c Ratio	1.86	0.82	0.11	0.56	1.72	0.24	1.82	0.46	0.35	0.92	0.15	2.78
Uniform Delay, d1	52.0	25.5	11.2	49.4	30.6	10.5	54.9	54.8	42.9	52.1	50.0	54.4
Progression Factor	1.24	0.95	1.62	0.77	0.61	0.16	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	393.4	2.4	0.0	0.4	324.3	0.0	395.4	5.0	1.2	25.9	0.3	818.2
Delay (s)	457.8	26.6	18.1	38.5	343.0	1.7	450.3	59.8	44.1	78.1	50.3	872.6
Level of Service	F	C	B	D	F	A	F	E	D	E	D	F
Approach Delay (s)	174.5			304.8			295.9			544.5		
Approach LOS	F			F			F			F		

Intersection Summary






















HCM Average Control Delay	294.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	23.8
Intersection Capacity Utilization	133.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

9: Woodruff Road & Garlington Road

2035 PM

7/6/2011


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	259	1184	260	238	2315	234	379	214	169	478	395	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.1		5.2	6.1		5.2	5.2		5.2	5.2	5.2
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	3345		1719	3391		1719	1690		1719	1810	1538
Flt Permitted	0.07	1.00		0.07	1.00		0.24	1.00		0.19	1.00	1.00
Satd. Flow (perm)	125	3345		127	3391		431	1690		348	1810	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	288	1316	289	264	2572	260	421	238	188	531	439	289
RTOR Reduction (vph)	0	16	0	0	6	0	0	24	0	0	0	94
Lane Group Flow (vph)	288	1589	0	264	2826	0	421	402	0	531	439	195
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	66.7	57.9		64.7	56.9		28.6	16.8		36.6	20.8	20.8
Effective Green, g (s)	66.7	57.9		64.7	56.9		28.6	16.8		36.6	20.8	20.8
Actuated g/C Ratio	0.56	0.48		0.54	0.47		0.24	0.14		0.31	0.17	0.17
Clearance Time (s)	5.2	6.1		5.2	6.1		5.2	5.2		5.2	5.2	5.2
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	4.3		4.3	4.3	4.3
Lane Grp Cap (vph)	186	1614		172	1608		229	237		287	314	267
v/s Ratio Prot	c0.11	0.48		0.10	c0.83		0.18	0.24		c0.24	0.24	
v/s Ratio Perm	0.75			0.73			0.26			c0.32		0.13
v/c Ratio	1.55	0.98		1.53	1.76		1.84	1.70		1.85	1.40	0.73
Uniform Delay, d1	36.2	30.6		33.7	31.6		42.7	51.6		36.9	49.6	46.9
Progression Factor	1.29	0.65		1.27	0.75		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	262.2	14.1		243.4	341.0		393.8	330.7		395.8	197.4	10.6
Delay (s)	308.9	33.9		286.2	364.8		436.5	382.3		432.7	247.0	57.5
Level of Service	F	C		F	F		F	F		F	F	E
Approach Delay (s)		75.8			358.1			409.2			281.8	
Approach LOS		E			F			F			F	
Intersection Summary												
HCM Average Control Delay	275.3			HCM Level of Service			F					
HCM Volume to Capacity ratio	1.82											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			21.7					
Intersection Capacity Utilization	151.9%			ICU Level of Service			H					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Woodruff Road & I-385 SB Ramps

2035 PM

7/6/2011





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1209	622	261	2060	0	0	0	0	1187	0	727
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.6		6.6	6.6					5.7		5.7
Lane Util. Factor		0.95		1.00	0.95					0.97		1.00
Frt		0.95		1.00	1.00					1.00		0.85
Flt Protected		1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)		3263		1719	3438					3335		1538
Flt Permitted		1.00		0.07	1.00					0.95		1.00
Satd. Flow (perm)		3263		121	3438					3335		1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1343	691	290	2289	0	0	0	0	1319	0	808
RTOR Reduction (vph)	0	54	0	0	0	0	0	0	0	0	0	3
Lane Group Flow (vph)	0	1980	0	290	2289	0	0	0	0	1319	0	805
Turn Type				pm+pt						Prot		custom
Protected Phases		2		1	6					4		
Permitted Phases				6								4
Actuated Green, G (s)		53.4		69.4	69.4					38.3		38.3
Effective Green, g (s)		53.4		69.4	69.4					38.3		38.3
Actuated g/C Ratio		0.44		0.58	0.58					0.32		0.32
Clearance Time (s)		6.6		6.6	6.6					5.7		5.7
Vehicle Extension (s)		4.3		4.3	4.3					4.3		4.3
Lane Grp Cap (vph)		1452		195	1988					1064		491
v/s Ratio Prot		0.61		0.12	c0.67					0.40		
v/s Ratio Perm				c0.75								c0.52
v/c Ratio		1.36		1.49	1.15					1.24		1.64
Uniform Delay, d1		33.3		37.6	25.3					40.9		40.9
Progression Factor		1.08		1.61	0.55					1.02		1.02
Incremental Delay, d2		163.9		221.7	68.7					115.9		297.1
Delay (s)		200.0		282.2	82.6					157.8		338.9
Level of Service		F		F	F					F		F
Approach Delay (s)		200.0			105.0			0.0			226.6	
Approach LOS		F			F			A			F	
Intersection Summary												
HCM Average Control Delay			172.0			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.50									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				12.3		
Intersection Capacity Utilization			203.4%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Woodruff Road & I-385 NB Ramps

2035 PM

7/6/2011





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Volume (vph)	686	1710	0	0	1559	963	762	0	361	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.1	6.1			6.1	6.1	5.0		5.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	1.00		1.00			
Frt	1.00	1.00			1.00	0.85	1.00		0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (prot)	1719	3438			3438	1538	1719		1538			
Flt Permitted	0.08	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	139	3438			3438	1538	1719		1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	762	1900	0	0	1732	1070	847	0	401	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	383	0	0	14	0	0	0
Lane Group Flow (vph)	762	1900	0	0	1732	687	847	0	387	0	0	0
Turn Type	pm+pt					Perm	Prot		custom			
Protected Phases	5	2			6		8					
Permitted Phases	2					6			8			
Actuated Green, G (s)	76.9	76.9			45.9	45.9	32.0		32.0			
Effective Green, g (s)	76.9	76.9			45.9	45.9	32.0		32.0			
Actuated g/C Ratio	0.64	0.64			0.38	0.38	0.27		0.27			
Clearance Time (s)	6.1	6.1			6.1	6.1	5.0		5.0			
Vehicle Extension (s)	4.3	4.3			4.3	4.3	4.3		4.3			
Lane Grp Cap (vph)	417	2203			1315	588	458		410			
v/s Ratio Prot	c0.38	0.55			0.50		c0.49					
v/s Ratio Perm	c0.79					0.45			0.25			
v/c Ratio	1.83	0.86			1.32	1.17	1.85		0.94			
Uniform Delay, d1	39.2	17.3			37.1	37.1	44.0		43.1			
Progression Factor	0.83	1.19			0.77	0.57	1.00		1.00			
Incremental Delay, d2	373.2	0.5			143.2	77.7	390.6		30.8			
Delay (s)	405.8	21.0			171.9	98.8	434.6		73.9			
Level of Service	F	C			F	F	F		E			
Approach Delay (s)		131.1			144.0			318.7			0.0	
Approach LOS		F			F			F			A	
Intersection Summary												
HCM Average Control Delay		171.4			HCM Level of Service			F				
HCM Volume to Capacity ratio		1.78										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			11.1				
Intersection Capacity Utilization		203.4%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

12: Woodruff Road & Commercial Drive

2035 PM

7/6/2011



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1767	64	15	2066	78	296	28	15	134	18	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.5		5.5	5.5		5.3	5.4		5.4	5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.95		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	3420		1719	3419		1719	1713		1719	1566	
Flt Permitted	0.06	1.00		0.06	1.00		0.25	1.00		0.73	1.00	
Satd. Flow (perm)	105	3420		114	3419		455	1713		1313	1566	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	267	1963	71	17	2296	87	329	31	17	149	20	178
RTOR Reduction (vph)	0	2	0	0	2	0	0	13	0	0	131	0
Lane Group Flow (vph)	267	2032	0	17	2381	0	329	35	0	149	67	0
Turn Type	pm+pt			Perm			pm+pt			Perm		
Protected Phases	5	2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	79.5	79.5		63.5	63.5		29.6	29.6		10.6	10.6	
Effective Green, g (s)	79.5	79.5		63.5	63.5		29.6	29.6		10.6	10.6	
Actuated g/C Ratio	0.66	0.66		0.53	0.53		0.25	0.25		0.09	0.09	
Clearance Time (s)	5.3	5.5		5.5	5.5		5.3	5.4		5.4	5.4	
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	4.3		4.3	4.3	
Lane Grp Cap (vph)	213	2266		60	1809		257	423		116	138	
v/s Ratio Prot	c0.11	0.59			c0.70		c0.15	0.02			0.04	
v/s Ratio Perm	0.72			0.15			c0.17			0.11		
v/c Ratio	1.25	0.90		0.28	1.32		1.28	0.08		1.28	0.48	
Uniform Delay, d1	41.1	16.8		15.6	28.2		42.2	34.8		54.7	52.1	
Progression Factor	1.36	0.52		0.78	0.69		1.00	1.00		1.00	1.00	
Incremental Delay, d2	130.6	2.9		3.8	143.5		152.5	0.1		178.3	4.2	
Delay (s)	186.6	11.8		16.1	163.0		194.7	34.9		233.0	56.3	
Level of Service	F	B		B	F		F	C		F	E	
Approach Delay (s)		32.1			162.0			174.3			132.2	
Approach LOS		C			F			F			F	
Intersection Summary												
HCM Average Control Delay		105.8			HCM Level of Service			F				
HCM Volume to Capacity ratio		1.28										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			16.1				
Intersection Capacity Utilization		118.0%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

13: Woodruff Road & Smith Hines Road

2035 PM

7/6/2011




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	1812	89	86	1904	2	240	2	190	7	2	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3		6.0	6.0			5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.94			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1719	3414		1719	3438			1656			1632	
Flt Permitted	0.05	1.00		0.05	1.00			0.81			0.90	
Satd. Flow (perm)	85	3414		85	3438			1383			1493	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	17	2013	99	96	2116	2	267	2	211	8	2	17
RTOR Reduction (vph)	0	3	0	0	0	0	0	18	0	0	14	0
Lane Group Flow (vph)	17	2109	0	96	2118	0	0	462	0	0	13	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	2			6			8			4		
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	84.7	84.7		85.0	85.0			24.0			24.0	
Effective Green, g (s)	84.7	84.7		85.0	85.0			24.0			24.0	
Actuated g/C Ratio	0.71	0.71		0.71	0.71			0.20			0.20	
Clearance Time (s)	6.3	6.3		6.0	6.0			5.0			5.0	
Vehicle Extension (s)	4.3	4.3		4.3	4.3			4.3			4.3	
Lane Grp Cap (vph)	60	2410		60	2435			277			299	
v/s Ratio Prot	0.62			0.62								
v/s Ratio Perm	0.20			c1.13				c0.33			0.01	
v/c Ratio	0.28	0.88		1.60	0.87			1.67			0.04	
Uniform Delay, d1	6.5	13.6		17.5	13.3			48.0			38.7	
Progression Factor	0.07	0.06		0.49	0.37			1.00			1.00	
Incremental Delay, d2	4.5	1.9		277.0	0.4			315.3			0.1	
Delay (s)	5.0	2.8		285.5	5.4			363.3			38.8	
Level of Service	A	A		F	A			F			D	
Approach Delay (s)	2.8			17.6				363.3			38.8	
Approach LOS	A			B				F			D	
Intersection Summary												
HCM Average Control Delay	45.4			HCM Level of Service			D					
HCM Volume to Capacity ratio	1.61											
Actuated Cycle Length (s)	120.0			Sum of lost time (s)			11.0					
Intersection Capacity Utilization	112.3%			ICU Level of Service			H					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

14: Woodruff Road & Walmart Driveway

2035 PM

7/6/2011























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	2216	195	32	3306	61	530	10	8	56	2	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3		6.3	6.3		5.0	5.0			5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.93			0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1719	3396		1719	3429		1719	1687			1651	
Flt Permitted	0.06	1.00		0.06	1.00		0.67	1.00			0.85	
Satd. Flow (perm)	100	3396		110	3429		1203	1687			1436	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	36	2462	217	36	3673	68	589	11	9	62	2	59
RTOR Reduction (vph)	0	6	0	0	1	0	0	4	0	0	28	0
Lane Group Flow (vph)	36	2673	0	36	3740	0	589	16	0	0	95	0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	75.7	75.7		65.8	65.8		33.0	33.0			33.0	
Effective Green, g (s)	75.7	75.7		65.8	65.8		33.0	33.0			33.0	
Actuated g/C Ratio	0.63	0.63		0.55	0.55		0.28	0.28			0.28	
Clearance Time (s)	6.3	6.3		6.3	6.3		5.0	5.0			5.0	
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	4.3			4.3	
Lane Grp Cap (vph)	112	2142		60	1880		331	464			395	
v/s Ratio Prot	0.01	c0.79			c1.09			0.01				
v/s Ratio Perm	0.19			0.33			c0.49				0.07	
v/c Ratio	0.32	1.25		0.60	1.99		1.78	0.04			0.24	
Uniform Delay, d1	28.1	22.1		18.2	27.1		43.5	31.8			33.8	
Progression Factor	1.25	0.93		1.10	1.09		1.00	1.00			1.00	
Incremental Delay, d2	1.6	114.2		19.8	446.2		362.8	0.0			0.5	
Delay (s)	36.7	134.8		39.8	475.6		406.3	31.9			34.3	
Level of Service	D	F		D	F		F	C			C	
Approach Delay (s)		133.5			471.5			394.0			34.3	
Approach LOS		F			F			F			C	
Intersection Summary												
HCM Average Control Delay			330.5			HCM Level of Service				F		
HCM Volume to Capacity ratio			1.94									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			17.6			
Intersection Capacity Utilization			138.8%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Woodruff Road & Verdin Road

2035 PM

7/6/2011




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	144	2702	61	90	1748	105	363	292	179	77	311	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3		6.3	6.3		5.2	5.0	5.0	5.2	5.2	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	3427		1719	3409		1719	1810	1538	1719	1692	
Flt Permitted	0.06	1.00		0.06	1.00		0.15	1.00	1.00	0.56	1.00	
Satd. Flow (perm)	102	3427		102	3409		276	1810	1538	1021	1692	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	160	3002	68	100	1942	117	403	324	199	86	346	266
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	1	0	11	0
Lane Group Flow (vph)	160	3069	0	100	2055	0	403	324	198	86	601	0
Turn Type	Perm			Perm			pm+pt			Perm	Perm	
Protected Phases	2			6			3		8		4	
Permitted Phases	2			6			8			8	4	
Actuated Green, G (s)	70.7	70.7		70.7	70.7		38.0	38.0	38.0	20.8	20.8	
Effective Green, g (s)	70.7	70.7		70.7	70.7		38.0	38.0	38.0	20.8	20.8	
Actuated g/C Ratio	0.59	0.59		0.59	0.59		0.32	0.32	0.32	0.17	0.17	
Clearance Time (s)	6.3	6.3		6.3	6.3		5.2	5.0	5.0	5.2	5.2	
Vehicle Extension (s)	4.3	4.3		4.3	4.3		4.3	4.3	4.3	4.3	4.3	
Lane Grp Cap (vph)	60	2019		60	2008		229	573	487	177	293	
v/s Ratio Prot	0.90			0.60			c0.17	0.18		c0.36		
v/s Ratio Perm	c1.56			0.98			0.38		0.13	0.08		
v/c Ratio	2.67	1.52		1.67	1.02		1.76	0.57	0.41	0.49	2.05	
Uniform Delay, d1	24.6	24.6		24.6	24.6		35.8	34.1	32.2	44.8	49.6	
Progression Factor	0.35	0.34		0.67	0.66		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	764.6	234.8		306.6	13.4		359.2	1.7	0.9	3.3	485.1	
Delay (s)	773.3	243.3		323.1	29.6		395.0	35.8	33.0	48.1	534.7	
Level of Service	F	F		F	C		F	D	C	D	F	
Approach Delay (s)	269.5			43.2			191.6			474.8		
Approach LOS	F			D			F			F		
Intersection Summary												
HCM Average Control Delay			210.0		HCM Level of Service				F			
HCM Volume to Capacity ratio			2.44									
Actuated Cycle Length (s)			120.0		Sum of lost time (s)				16.7			
Intersection Capacity Utilization			171.7%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

16: Woodruff Road & Butler Road

2035 PM

7/6/2011



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	2394	167	528	1677	26	264	28	652	443	552	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3		6.3	6.3			5.0	6.3	5.0	5.0	
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00	1.00	1.00	
Frt		0.99		1.00	1.00			1.00	0.85	1.00	0.97	
Flt Protected		1.00		0.95	1.00			0.96	1.00	0.95	1.00	
Satd. Flow (prot)		3403		1719	3430			1731	1538	1719	1753	
Flt Permitted		0.73		0.06	1.00			0.11	1.00	0.35	1.00	
Satd. Flow (perm)		2501		117	3430			191	1538	640	1753	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	32	2660	186	587	1863	29	293	31	724	492	613	160
RTOR Reduction (vph)	0	4	0	0	1	0	0	0	0	0	8	0
Lane Group Flow (vph)	0	2874	0	587	1891	0	0	324	724	492	765	0
Turn Type	Perm			pm+pt			Perm		pm+ov		Perm	
Protected Phases		2		1	6			8	1		4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)		55.7		72.7	72.7			36.0	46.7	36.0	36.0	
Effective Green, g (s)		55.7		72.7	72.7			36.0	46.7	36.0	36.0	
Actuated g/C Ratio		0.46		0.61	0.61			0.30	0.39	0.30	0.30	
Clearance Time (s)		6.3		6.3	6.3			5.0	6.3	5.0	5.0	
Vehicle Extension (s)		4.3		4.3	4.3			4.3	4.3	4.3	4.3	
Lane Grp Cap (vph)		1161		214	2078			57	599	192	526	
v/s Ratio Prot				c0.24	0.55				0.11		0.44	
v/s Ratio Perm		1.15		c1.42				c1.69	0.36	0.77		
v/c Ratio		2.48		2.74	0.91			5.68	1.21	2.56	1.45	
Uniform Delay, d1		32.1		39.3	20.8			42.0	36.6	42.0	42.0	
Progression Factor		1.21		1.00	1.07			1.00	1.00	1.00	1.00	
Incremental Delay, d2		664.1		785.5	0.8			2145.5	108.9	718.2	215.1	
Delay (s)		702.9		824.9	23.0			2187.5	145.6	760.2	257.1	
Level of Service		F		F	C			F	F	F	F	
Approach Delay (s)		702.9			212.9			776.9			452.8	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			513.4			HCM Level of Service				F		
HCM Volume to Capacity ratio			3.62									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			11.3			
Intersection Capacity Utilization			192.3%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

17: Woodruff Road & Bell Road

2035 PM

7/6/2011
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	3418	156	53	2464	16	209	2	58	21	2	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.2	6.2		6.2	6.2			5.4			5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.97			0.89	
Flt Protected	0.95	1.00		0.95	1.00			0.96			0.99	
Satd. Flow (prot)	1719	3416		1719	3435			1691			1600	
Flt Permitted	0.05	1.00		0.05	1.00			0.62			0.95	
Satd. Flow (perm)	82	3416		82	3435			1081			1532	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	107	3798	173	59	2738	18	232	2	64	23	2	98
RTOR Reduction (vph)	0	3	0	0	0	0	0	1	0	0	5	0
Lane Group Flow (vph)	107	3968	0	59	2756	0	0	297	0	0	118	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases	2			6			8			4		
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	87.8	87.8		87.8	87.8			20.6			20.6	
Effective Green, g (s)	87.8	87.8		87.8	87.8			20.6			20.6	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.17			0.17	
Clearance Time (s)	6.2	6.2		6.2	6.2			5.4			5.4	
Vehicle Extension (s)	4.3	4.3		4.3	4.3			4.3			4.3	
Lane Grp Cap (vph)	60	2499		60	2513			186			263	
v/s Ratio Prot	1.16			0.80								
v/s Ratio Perm	c1.30			0.72				c0.27			0.08	
v/c Ratio	1.78	1.59		0.98	1.10			1.60			0.45	
Uniform Delay, d1	16.1	16.1		15.4	16.1			49.7			44.6	
Progression Factor	0.52	0.50		0.89	0.97			1.00			1.00	
Incremental Delay, d2	358.5	264.8		94.7	48.8			292.7			1.9	
Delay (s)	366.9	272.9		108.4	64.3			342.4			46.5	
Level of Service	F	F		F	E			F			D	
Approach Delay (s)	275.3			65.3				342.4			46.5	
Approach LOS	F			E				F			D	
Intersection Summary												
HCM Average Control Delay			193.4	HCM Level of Service			F					
HCM Volume to Capacity ratio			1.75									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)			11.6					
Intersection Capacity Utilization			131.0%	ICU Level of Service			H					
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

18: Woodruff Road & SC 14

2035 PM

7/6/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	223	1837	517	142	1214	105	264	393	77	288	586	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	5.0	6.3	6.3		5.0	5.0	6.3	5.0	5.0	6.3
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3438	1538	1719	3397		1719	1810	1538	1719	1810	1538
Flt Permitted	0.08	1.00	1.00	0.09	1.00		0.15	1.00	1.00	0.15	1.00	1.00
Satd. Flow (perm)	146	3438	1538	155	3397		278	1810	1538	268	1810	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	248	2041	574	158	1349	117	293	437	86	320	651	186
RTOR Reduction (vph)	0	0	22	0	5	0	0	0	11	0	0	16
Lane Group Flow (vph)	248	2041	552	158	1461	0	293	437	75	320	651	170
Turn Type	pm+pt		pm+ov	pm+pt			pm+pt		pm+ov	pm+pt		pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases	2		2	6			8		8	4		4
Actuated Green, G (s)	60.4	49.7	62.7	54.4	46.7		39.0	26.0	33.7	41.0	27.0	37.7
Effective Green, g (s)	60.4	49.7	62.7	54.4	46.7		39.0	26.0	33.7	41.0	27.0	37.7
Actuated g/C Ratio	0.50	0.41	0.52	0.45	0.39		0.32	0.22	0.28	0.34	0.22	0.31
Clearance Time (s)	6.3	6.3	5.0	6.3	6.3		5.0	5.0	6.3	5.0	5.0	6.3
Vehicle Extension (s)	4.3	4.3	4.3	4.3	4.3		4.3	4.3	4.3	4.3	4.3	4.3
Lane Grp Cap (vph)	214	1424	804	171	1322		246	392	432	261	407	483
v/s Ratio Prot	c0.10	c0.59	0.07	0.06	0.43		0.13	0.24	0.01	c0.14	c0.36	0.03
v/s Ratio Perm	0.48		0.28	0.36			0.26		0.04	0.28		0.08
v/c Ratio	1.16	1.43	0.69	0.92	1.10		1.19	1.11	0.17	1.23	1.60	0.35
Uniform Delay, d1	35.8	35.1	21.3	28.6	36.6		34.9	47.0	32.6	33.4	46.5	31.7
Progression Factor	1.11	0.59	1.02	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	76.6	195.4	0.3	47.9	58.7		118.9	80.3	0.3	130.8	281.1	0.7
Delay (s)	116.3	215.9	21.9	76.5	95.3		153.9	127.3	32.9	164.2	327.6	32.4
Level of Service	F	F	C	E	F		F	F	C	F	F	C
Approach Delay (s)		168.4			93.5			126.9			235.0	
Approach LOS		F			F			F			F	

Intersection Summary
























HCM Average Control Delay	156.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.6
Intersection Capacity Utilization	122.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

19: E Parkins Mill Road & US 276

2035 PM

7/6/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	162	90	137	98	112	210	1553	266	115	1940	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.91	1.00	0.97	0.91	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	3254		3335	1810	1538	1719	4940	1538	3335	4940	1538
Flt Permitted	0.67	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1213	3254		3335	1810	1538	1719	4940	1538	3335	4940	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	162	180	100	152	109	124	233	1726	296	128	2156	351
RTOR Reduction (vph)	0	72	0	0	0	113	0	0	126	0	0	105
Lane Group Flow (vph)	162	208	0	152	109	11	233	1726	170	128	2156	246
Turn Type	pm+pt			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8					4			6			2
Actuated Green, G (s)	16.0	9.0		7.0	9.0	9.0	17.1	60.6	60.6	7.8	51.3	51.3
Effective Green, g (s)	16.0	9.0		7.0	9.0	9.0	17.1	60.6	60.6	7.8	51.3	51.3
Actuated g/C Ratio	0.15	0.09		0.07	0.09	0.09	0.16	0.57	0.57	0.07	0.49	0.49
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	4.3	4.9		4.3	4.9	4.9	4.3	4.9	4.9	4.3	4.9	4.9
Lane Grp Cap (vph)	218	278		221	155	131	279	2840	884	247	2404	749
v/s Ratio Prot	c0.05	c0.06		0.05	0.06		c0.14	0.35		0.04	c0.44	
v/s Ratio Perm	0.06					0.01			0.11			0.16
v/c Ratio	0.74	0.75		0.69	0.70	0.08	0.84	0.61	0.19	0.52	0.90	0.33
Uniform Delay, d1	42.0	47.1		48.1	46.9	44.4	42.8	14.6	10.7	47.0	24.6	16.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.1	12.3		9.7	16.4	0.5	20.1	0.5	0.2	2.8	5.2	0.5
Delay (s)	56.1	59.4		57.8	63.3	44.9	62.9	15.2	10.9	49.8	29.8	17.1
Level of Service	E	E		E	E	D	E	B	B	D	C	B
Approach Delay (s)		58.2			55.2			19.5			29.1	
Approach LOS		E			E			B			C	
Intersection Summary												
HCM Average Control Delay			29.3				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			105.4				Sum of lost time (s)			21.0		
Intersection Capacity Utilization			79.9%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

20: Duvall Drive & US 276

2035 PM
7/6/2011



























Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (vph)	520	205	1668	499	190	1509
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.3		6.3	6.3
Lane Util. Factor	1.00	1.00	0.91		1.00	0.91
Frt	1.00	0.85	0.97		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1719	1538	4769		1719	4940
Flt Permitted	0.95	1.00	1.00		0.10	1.00
Satd. Flow (perm)	1719	1538	4769		178	4940
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	578	228	1853	554	211	1677
RTOR Reduction (vph)	0	15	83	0	0	0
Lane Group Flow (vph)	578	213	2324	0	211	1677
Turn Type	Perm			Perm		
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	12.0	12.0	40.7		40.7	40.7
Effective Green, g (s)	12.0	12.0	40.7		40.7	40.7
Actuated g/C Ratio	0.18	0.18	0.63		0.63	0.63
Clearance Time (s)	6.0	6.0	6.3		6.3	6.3
Vehicle Extension (s)	4.9	4.9	4.9		4.9	4.9
Lane Grp Cap (vph)	317	284	2986		111	3093
v/s Ratio Prot	c0.34		0.49			0.34
v/s Ratio Perm		0.14			c1.19	
v/c Ratio	1.82	0.75	0.78		1.90	0.54
Uniform Delay, d1	26.5	25.1	8.9		12.1	6.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	382.7	12.1	1.5		437.1	0.3
Delay (s)	409.2	37.2	10.4		449.3	7.2
Level of Service	F	D	B		F	A
Approach Delay (s)	303.9		10.4			56.6
Approach LOS	F		B			E
Intersection Summary						
HCM Average Control Delay			73.9		HCM Level of Service	E
HCM Volume to Capacity ratio			1.88			
Actuated Cycle Length (s)			65.0		Sum of lost time (s)	12.3
Intersection Capacity Utilization			101.0%		ICU Level of Service	G
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

23: US 276 & Millennium Blvd

2035 PM

7/6/2011





















												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	126	2355	157	33	1711	14	118	71	92	84	28	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5	6.5	4.5	6.5	6.5	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95		1.00	1.00	0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1719	3438	1538	1719	3438	1538	3335	3147		1719	1810	2707
Flt Permitted	0.05	1.00	1.00	0.04	1.00	1.00	0.95	1.00		1.00	1.00	1.00
Satd. Flow (perm)	99	3438	1538	79	3438	1538	3335	3147		1810	1810	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	140	2617	174	37	1901	16	131	79	102	93	31	76
RTOR Reduction (vph)	0	0	36	0	0	5	0	77	0	0	0	44
Lane Group Flow (vph)	140	2617	138	37	1901	11	131	104	0	93	31	32
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot			pm+pt		pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases	2		2	6		6				4		4
Actuated Green, G (s)	102.1	94.1	94.1	96.0	91.3	91.3	8.0	6.0		10.0	4.0	12.0
Effective Green, g (s)	102.1	94.1	94.1	96.0	91.3	91.3	8.0	6.0		10.0	4.0	12.0
Actuated g/C Ratio	0.76	0.70	0.70	0.72	0.68	0.68	0.06	0.04		0.07	0.03	0.09
Clearance Time (s)	4.0	6.5	6.5	4.5	6.5	6.5	6.0	6.0		6.0	6.0	4.0
Vehicle Extension (s)	4.3	4.9	4.9	4.3	4.9	4.9	4.3	6.4		4.3	6.4	4.3
Lane Grp Cap (vph)	172	2418	1082	114	2346	1049	199	141		131	54	243
v/s Ratio Prot	c0.05	c0.76		0.01	0.55		c0.04	c0.03		0.03	0.02	0.01
v/s Ratio Perm	0.57		0.09	0.22		0.01				0.02		0.00
v/c Ratio	0.81	1.08	0.13	0.32	0.81	0.01	0.66	0.73		0.71	0.57	0.13
Uniform Delay, d1	33.5	19.9	6.5	34.5	15.1	6.8	61.6	63.1		60.5	64.1	56.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	26.4	45.1	0.1	2.6	2.5	0.0	8.9	24.8		17.9	28.0	0.4
Delay (s)	59.9	64.9	6.6	37.1	17.6	6.8	70.5	87.9		78.4	92.1	56.5
Level of Service	E	E	A	D	B	A	E	F		E	F	E
Approach Delay (s)		61.2			17.9			80.6			72.2	
Approach LOS		E			B			F			E	
Intersection Summary												
HCM Average Control Delay			47.1			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			133.8			Sum of lost time (s)				14.0		
Intersection Capacity Utilization			98.8%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

24: Pelham Road & The Parkway

2035 PM

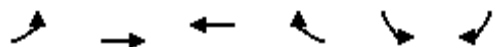
7/6/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1117	877	0	1264	1009	0	0	0	395	643	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	5.8	5.8		5.8	5.3				5.3	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00		0.95	1.00				1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538		3438	1538				1719	1810	1538
Flt Permitted	0.95	1.00	1.00		1.00	1.00				0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538		3438	1538				1719	1810	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	267	1241	974	0	1404	1121	0	0	0	439	714	394
RTOR Reduction (vph)	0	0	34	0	0	3	0	0	0	0	0	122
Lane Group Flow (vph)	267	1241	940	0	1404	1118	0	0	0	439	714	272
Turn Type	Prot		Perm	Perm		custom				Perm		Perm
Protected Phases	5	2			6	4					4	
Permitted Phases			2	6		6				4		4
Actuated Green, G (s)	10.5	69.2	69.2		52.9	97.6				44.7	44.7	44.7
Effective Green, g (s)	10.5	69.2	69.2		52.9	97.6				44.7	44.7	44.7
Actuated g/C Ratio	0.08	0.55	0.55		0.42	0.78				0.36	0.36	0.36
Clearance Time (s)	5.8	5.8	5.8		5.8	5.3				5.3	5.3	5.3
Vehicle Extension (s)	4.3	4.3	4.3		4.3	4.3				4.3	4.3	4.3
Lane Grp Cap (vph)	280	1903	851		1455	1201				615	647	550
v/s Ratio Prot	0.08	0.36			0.41	0.33					c0.39	
v/s Ratio Perm			c0.61			0.39				0.26		0.18
v/c Ratio	0.95	0.65	1.10		0.96	0.93				0.71	1.10	0.49
Uniform Delay, d1	57.0	19.5	27.9		35.1	11.0				34.6	40.1	31.3
Progression Factor	1.00	1.00	1.00		0.74	0.81				1.00	1.00	1.00
Incremental Delay, d2	41.4	1.8	63.6		5.9	3.9				4.4	67.2	1.1
Delay (s)	98.4	21.2	91.5		31.8	12.8				39.0	107.3	32.4
Level of Service	F	C	F		C	B				D	F	C
Approach Delay (s)		57.1			23.4			0.0			68.9	
Approach LOS		E			C			A			E	
Intersection Summary												
HCM Average Control Delay			46.9				HCM Level of Service			D		
HCM Volume to Capacity ratio			1.10									
Actuated Cycle Length (s)			125.0				Sum of lost time (s)			11.1		
Intersection Capacity Utilization			137.2%				ICU Level of Service			H		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

25: Pelham Road & I-85 SB off ramp

2035 PM
7/6/2011









Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↙	↗↗
Volume (vph)	0	1512	1816	0	681	457
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.6		5.3	5.3
Lane Util. Factor		0.95	0.95		1.00	0.88
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3438	3438		1719	2707
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3438	3438		1719	2707
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1680	2018	0	757	508
RTOR Reduction (vph)	0	0	0	0	0	5
Lane Group Flow (vph)	0	1680	2018	0	757	503
Turn Type					Perm	
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		65.4	65.4		48.7	48.7
Effective Green, g (s)		65.4	65.4		48.7	48.7
Actuated g/C Ratio		0.52	0.52		0.39	0.39
Clearance Time (s)		5.6	5.6		5.3	5.3
Vehicle Extension (s)		4.3	4.3		4.3	4.3
Lane Grp Cap (vph)		1799	1799		670	1055
v/s Ratio Prot		0.49	c0.59		c0.44	
v/s Ratio Perm						0.19
v/c Ratio		0.93	1.12		1.13	0.48
Uniform Delay, d1		27.8	29.8		38.1	28.6
Progression Factor		0.88	1.00		1.00	1.00
Incremental Delay, d2		8.2	57.7		76.3	0.5
Delay (s)		32.7	87.6		114.5	29.1
Level of Service		C	F		F	C
Approach Delay (s)		32.7	87.6		80.2	
Approach LOS		C	F		F	
Intersection Summary						
HCM Average Control Delay			67.1		HCM Level of Service	E
HCM Volume to Capacity ratio			1.13			
Actuated Cycle Length (s)			125.0		Sum of lost time (s)	10.9
Intersection Capacity Utilization			142.1%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

26: Pelham Road & I-85 NB off ramp

2035 PM
7/6/2011




















						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑			↑↑	↔	↔
Volume (vph)	812	0	0	815	1791	983
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8			5.8	5.0	5.0
Lane Util. Factor	0.95			0.95	0.97	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3438			3438	3335	1538
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	3438			3438	3335	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	902	0	0	906	1990	1092
RTOR Reduction (vph)	0	0	0	0	0	4
Lane Group Flow (vph)	902	0	0	906	1990	1088
Turn Type					Perm	
Protected Phases	2			6	8	
Permitted Phases						8
Actuated Green, G (s)	33.2			33.2	81.0	81.0
Effective Green, g (s)	33.2			33.2	81.0	81.0
Actuated g/C Ratio	0.27			0.27	0.65	0.65
Clearance Time (s)	5.8			5.8	5.0	5.0
Vehicle Extension (s)	4.3			4.3	4.3	4.3
Lane Grp Cap (vph)	913			913	2161	997
v/s Ratio Prot	0.26			c0.26	0.60	
v/s Ratio Perm						c0.71
v/c Ratio	0.99			0.99	0.92	1.09
Uniform Delay, d1	45.7			45.8	19.2	22.0
Progression Factor	1.17			0.80	1.00	1.00
Incremental Delay, d2	11.9			18.5	7.2	56.9
Delay (s)	65.3			54.9	26.4	78.9
Level of Service	E			D	C	E
Approach Delay (s)	65.3			54.9	45.0	
Approach LOS	E			D	D	
Intersection Summary						
HCM Average Control Delay			50.6		HCM Level of Service	D
HCM Volume to Capacity ratio			1.06			
Actuated Cycle Length (s)			125.0		Sum of lost time (s)	10.8
Intersection Capacity Utilization			181.2%		ICU Level of Service	H
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

27: Pelham Road & Boland Court

2035 PM

7/6/2011






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	77	1169	549	368	1580	26	321	23	362	36	16	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	6.7		6.7	6.7			6.3	6.3		6.3	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.95		1.00	1.00			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1719	3273		1719	3430			1729	1538		1671	
Flt Permitted	0.10	1.00		0.07	1.00			0.67	1.00		0.41	
Satd. Flow (perm)	174	3273		119	3430			1218	1538		695	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	86	1299	610	409	1756	29	357	26	402	40	18	44
RTOR Reduction (vph)	0	45	0	0	1	0	0	0	234	0	21	0
Lane Group Flow (vph)	86	1864	0	409	1784	0	0	383	168	0	81	0
Turn Type	Perm			pm+pt			Perm			Perm	Perm	
Protected Phases	2			1		6	8			8		4
Permitted Phases	2			6			8			8	4	
Actuated Green, G (s)	54.3	54.3		81.3	81.3			30.7	30.7		30.7	
Effective Green, g (s)	54.3	54.3		81.3	81.3			30.7	30.7		30.7	
Actuated g/C Ratio	0.43	0.43		0.65	0.65			0.25	0.25		0.25	
Clearance Time (s)	6.7	6.7		6.7	6.7			6.3	6.3		6.3	
Vehicle Extension (s)	4.9	4.9		4.3	4.9			4.3	4.3		4.3	
Lane Grp Cap (vph)	76	1422		337	2231			299	378		171	
v/s Ratio Prot	c0.57			c0.20		0.52						
v/s Ratio Perm	0.49			0.59				c0.31	0.11		0.12	
v/c Ratio	1.13	1.31		1.21	0.80			1.28	0.44		0.47	
Uniform Delay, d1	35.4	35.4		42.8	15.9			47.1	39.9		40.2	
Progression Factor	0.67	0.68		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	73.9	140.5		120.4	3.1			149.6	1.3		3.2	
Delay (s)	97.5	164.4		163.1	19.0			196.8	41.3		43.5	
Level of Service	F	F		F	B			F	D		D	
Approach Delay (s)	161.5			45.9				117.1			43.5	
Approach LOS	F			D				F			D	
Intersection Summary												
HCM Average Control Delay			102.3		HCM Level of Service				F			
HCM Volume to Capacity ratio			1.29									
Actuated Cycle Length (s)			125.0		Sum of lost time (s)				19.7			
Intersection Capacity Utilization			112.3%		ICU Level of Service				H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Forsythia Dr & E Butler Road

2035 PM

7/6/2011


















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	0	6	48	0	139	9	947	23	111	1392	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.90		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1719	1538		1607		1719	3426		1719	3430	
Flt Permitted		0.76	1.00		0.91		0.25	1.00		0.25	1.00	
Satd. Flow (perm)		1381	1538		1477		450	3426		450	3430	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	19	0	7	53	0	154	10	1052	26	123	1547	26
RTOR Reduction (vph)	0	0	2	0	15	0	0	4	0	0	2	0
Lane Group Flow (vph)	0	19	5	0	192	0	10	1074	0	123	1571	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		11.2	11.2		11.2		16.1	16.1		16.1	16.1	
Effective Green, g (s)		11.2	11.2		11.2		16.1	16.1		16.1	16.1	
Actuated g/C Ratio		0.28	0.28		0.28		0.41	0.41		0.41	0.41	
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.3	4.3		4.3		4.3	4.3		4.3	4.3	
Lane Grp Cap (vph)		394	438		421		184	1404		184	1405	
v/s Ratio Prot								0.31			c0.46	
v/s Ratio Perm		0.01	0.00		c0.13		0.02			0.27		
v/c Ratio		0.05	0.01		0.46		0.05	0.77		0.67	1.12	
Uniform Delay, d1		10.2	10.1		11.5		7.0	10.0		9.4	11.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1	0.0		1.2		0.2	2.8		10.2	63.2	
Delay (s)		10.3	10.1		12.8		7.2	12.8		19.6	74.8	
Level of Service		B	B		B		A	B		B	E	
Approach Delay (s)		10.2			12.8			12.7			70.8	
Approach LOS		B			B			B			E	
Intersection Summary												
HCM Average Control Delay			45.4			HCM Level of Service				D		
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			39.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			75.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

30: E Butler Road & I-385 SB Ramps

2035 PM

7/6/2011





















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	0	1026	105	545	931	0	578	0	589	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0			6.0	6.0			
Lane Util. Factor		0.95		1.00	0.95			1.00	1.00			
Flt		0.99		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		3390		1719	3438			1719	1538			
Flt Permitted		1.00		0.10	1.00			0.95	1.00			
Satd. Flow (perm)		3390		181	3438			1719	1538			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1140	117	606	1034	0	642	0	654	0	0	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	76	0	0	0
Lane Group Flow (vph)	0	1250	0	606	1034	0	0	642	578	0	0	0
Turn Type				pm+pt			Perm		Perm			
Protected Phases				1	6			4				
Permitted Phases		2		6			4		4			
Actuated Green, G (s)		34.0		65.0	65.0			33.0	33.0			
Effective Green, g (s)		34.0		65.0	65.0			33.0	33.0			
Actuated g/C Ratio		0.31		0.59	0.59			0.30	0.30			
Clearance Time (s)		6.0		6.0	6.0			6.0	6.0			
Vehicle Extension (s)		4.3		4.3	4.3			4.3	4.3			
Lane Grp Cap (vph)		1048		457	2032			516	461			
v/s Ratio Prot				c0.30	0.30							
v/s Ratio Perm		0.37		c0.48				0.37	c0.38			
v/c Ratio		1.19		1.33	0.51			1.24	1.25			
Uniform Delay, d1		38.0		33.9	13.2			38.5	38.5			
Progression Factor		1.00		1.00	1.00			1.00	1.00			
Incremental Delay, d2		96.3		161.3	0.3			125.5	131.4			
Delay (s)		134.3		195.2	13.5			164.0	169.9			
Level of Service		F		F	B			F	F			
Approach Delay (s)		134.3			80.6			166.9			0.0	
Approach LOS		F			F			F			A	
Intersection Summary												
HCM Average Control Delay			123.4			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.26									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			108.9%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

31: E Butler Road & I-385 NB Ramps

2035 PM

7/6/2011
























												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		 			 							
Volume (vph)	376	1228	0	0	1417	1062	0	0	0	59	0	309
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0	6.0				6.0		6.0
Lane Util. Factor	1.00	0.95			0.95	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1719	3438			3438	1538				1719		1538
Flt Permitted	0.06	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	113	3438			3438	1538				1719		1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	418	1364	0	0	1574	1180	0	0	0	66	0	343
RTOR Reduction (vph)	0	0	0	0	0	260	0	0	0	0	0	82
Lane Group Flow (vph)	418	1364	0	0	1574	920	0	0	0	66	0	261
Turn Type	pm+pt				custom				custom			custom
Protected Phases	5	2										8
Permitted Phases	2				6	6				8		
Actuated Green, G (s)	82.0	82.0			58.0	58.0				16.0		16.0
Effective Green, g (s)	82.0	82.0			58.0	58.0				16.0		16.0
Actuated g/C Ratio	0.75	0.75			0.53	0.53				0.15		0.15
Clearance Time (s)	6.0	6.0			6.0	6.0				6.0		6.0
Vehicle Extension (s)	4.3	4.3			4.3	4.3				4.3		4.3
Lane Grp Cap (vph)	347	2563			1813	811				250		224
v/s Ratio Prot	c0.20	0.40										c0.17
v/s Ratio Perm	c0.70				0.46	0.60				0.04		
v/c Ratio	1.20	0.53			0.87	1.13				0.26		1.17
Uniform Delay, d1	37.1	5.9			22.7	26.0				41.8		47.0
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	116.3	0.3			5.0	75.7				0.9		111.9
Delay (s)	153.4	6.2			27.6	101.7				42.7		158.9
Level of Service	F	A			C	F				D		F
Approach Delay (s)		40.7			59.4			0.0			140.1	
Approach LOS		D			E			A			F	
Intersection Summary												
HCM Average Control Delay			59.3				HCM Level of Service			E		
HCM Volume to Capacity ratio			1.16									
Actuated Cycle Length (s)			110.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			108.9%				ICU Level of Service			G		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

34: Frontage Road & Roper Mountain Road

2035 PM

7/6/2011




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	20	590	954	80	88	280	1973	304	21	1530	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1719	1547		1633	1649	1538	1719	3438	1538	1719	3425	
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.09	1.00	1.00	0.11	1.00	
Satd. Flow (perm)	1719	1547		1633	1649	1538	168	3438	1538	196	3425	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	22	656	1060	89	98	311	2192	338	23	1700	44
RTOR Reduction (vph)	0	122	0	0	0	22	0	0	116	0	2	0
Lane Group Flow (vph)	44	556	0	572	577	76	311	2192	222	23	1742	0
Turn Type	Split			Split		Perm	pm+pt			Perm	Perm	
Protected Phases	4	4		8	8		5	2			6	
Permitted Phases						8	2		2	6		
Actuated Green, G (s)	14.0	14.0		17.0	17.0	17.0	51.0	51.0	51.0	37.0	37.0	
Effective Green, g (s)	14.0	14.0		17.0	17.0	17.0	51.0	51.0	51.0	37.0	37.0	
Actuated g/C Ratio	0.14	0.14		0.17	0.17	0.17	0.51	0.51	0.51	0.37	0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	4.9	4.9		4.9	4.9	4.9	4.3	4.9	4.9	4.9	4.9	
Lane Grp Cap (vph)	241	217		278	280	261	210	1753	784	73	1267	
v/s Ratio Prot	0.03	c0.36		c0.35	0.35		0.12	c0.64			0.51	
v/s Ratio Perm						0.05	c0.64		0.14	0.12		
v/c Ratio	0.18	2.56		2.06	2.06	0.29	1.48	1.25	0.28	0.32	1.37	
Uniform Delay, d1	38.0	43.0		41.5	41.5	36.2	27.0	24.5	14.0	22.5	31.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.14	1.01	1.10	1.00	1.00	
Incremental Delay, d2	0.7	716.1		488.2	489.5	1.2	218.8	113.2	0.1	11.0	173.8	
Delay (s)	38.7	759.1		529.7	531.0	37.5	249.5	137.9	15.5	33.4	205.3	
Level of Service	D	F		F	F	D	F	F	B	C	F	
Approach Delay (s)		715.2			491.6			135.5			203.1	
Approach LOS		F			F			F			F	
Intersection Summary												
HCM Average Control Delay			284.8	HCM Level of Service			F					
HCM Volume to Capacity ratio			1.75									
Actuated Cycle Length (s)			100.0	Sum of lost time (s)			18.0					
Intersection Capacity Utilization			161.5%	ICU Level of Service			H					
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: I-385 NB Ramps & Roper Mountain Road

2035 PM

7/6/2011













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	687	0	757	536	1800	0	0	2281	793
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	6.0
Lane Util. Factor				0.95	0.95	0.88	0.97	0.95			0.95	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1633	1633	2707	3335	3438			3438	1538
Flt Permitted				0.95	0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)				1633	1633	2707	3335	3438			3438	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	763	0	841	596	2000	0	0	2534	881
RTOR Reduction (vph)	0	0	0	0	0	33	0	0	0	0	0	262
Lane Group Flow (vph)	0	0	0	381	382	808	596	2000	0	0	2534	619
Turn Type				Perm		Perm	Prot					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)				18.0	18.0	18.0	12.0	70.0			52.0	52.0
Effective Green, g (s)				18.0	18.0	18.0	12.0	70.0			52.0	52.0
Actuated g/C Ratio				0.18	0.18	0.18	0.12	0.70			0.52	0.52
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	6.0
Vehicle Extension (s)				4.9	4.9	4.9	4.3	4.9			4.9	4.9
Lane Grp Cap (vph)				294	294	487	400	2407			1788	800
v/s Ratio Prot							c0.18	0.58			c0.74	
v/s Ratio Perm				0.23	0.23	c0.30						0.40
v/c Ratio				1.30	1.30	1.66	1.49	0.83			1.42	0.77
Uniform Delay, d1				41.0	41.0	41.0	44.0	10.8			24.0	19.3
Progression Factor				1.00	1.00	1.00	0.94	1.59			0.80	0.64
Incremental Delay, d2				156.0	157.4	305.8	221.7	0.3			188.1	0.7
Delay (s)				197.0	198.4	346.8	263.1	17.5			207.2	13.1
Level of Service				F	F	F	F	B			F	B
Approach Delay (s)		0.0			275.9			73.9			157.1	
Approach LOS		A			F			E			F	
Intersection Summary												
HCM Average Control Delay			153.8			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.48									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			178.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

36: Roper Mountain Road & I-385 SB Ramps

2035 PM

7/6/2011





















												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations		↑↑↑	↑	↑	↑↑		↑	↑	↑↑			
Volume (vph)	0	1627	1068	1825	1143	0	709	0	533	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.4	6.4	5.8	6.4		6.1	6.1	6.1			
Lane Util. Factor		0.91	1.00	1.00	0.95		0.95	0.95	0.88			
Frt		1.00	0.85	1.00	1.00		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.95	1.00			
Satd. Flow (prot)		4940	1538	1719	3438		1633	1633	2707			
Flt Permitted		1.00	1.00	0.09	1.00		0.95	0.95	1.00			
Satd. Flow (perm)		4940	1538	161	3438		1633	1633	2707			
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1808	1187	2028	1270	0	788	0	592	0	0	0
RTOR Reduction (vph)	0	0	172	0	0	0	0	0	192	0	0	0
Lane Group Flow (vph)	0	1808	1015	2028	1270	0	394	394	400	0	0	0
Turn Type		Perm		pm+pt			Perm		Perm			
Protected Phases		2		1	6			4				
Permitted Phases			2	6			4		4			
Actuated Green, G (s)		38.6	38.6	77.2	76.6		10.9	10.9	10.9			
Effective Green, g (s)		38.6	38.6	77.2	76.6		10.9	10.9	10.9			
Actuated g/C Ratio		0.39	0.39	0.77	0.77		0.11	0.11	0.11			
Clearance Time (s)		6.4	6.4	5.8	6.4		6.1	6.1	6.1			
Vehicle Extension (s)		4.9	4.9	4.3	4.9		4.9	4.9	4.9			
Lane Grp Cap (vph)		1907	594	626	2634		178	178	295			
v/s Ratio Prot		0.37		c1.04	0.37							
v/s Ratio Perm			0.66	c1.46			c0.24	0.24	0.15			
v/c Ratio		0.95	1.71	3.24	0.48		2.21	2.21	1.36			
Uniform Delay, d1		29.7	30.7	26.8	4.3		44.5	44.5	44.5			
Progression Factor		0.66	0.60	1.30	1.14		1.00	1.00	1.00			
Incremental Delay, d2		1.5	319.7	1008.2	0.1		563.9	563.9	181.4			
Delay (s)		21.0	338.0	1043.1	5.0		608.5	608.5	225.9			
Level of Service		C	F	F	A		F	F	F			
Approach Delay (s)		146.6			643.4			444.4			0.0	
Approach LOS		F			F			F			A	
Intersection Summary												
HCM Average Control Delay			413.7			HCM Level of Service			F			
HCM Volume to Capacity ratio			3.03									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			11.9			
Intersection Capacity Utilization			178.6%			ICU Level of Service			H			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

37: Roper Mountain Road & Congaree Road

2035 PM












7/6/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	167	1677	2	10	1061	605	1006	2	519	6	2	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	6.4			6.4	6.4	6.1	6.1			6.1	6.1
Lane Util. Factor	1.00	0.91			0.95	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00			1.00	0.85	1.00	0.85			1.00	0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00			0.96	1.00
Satd. Flow (prot)	1719	4939			3437	1538	1719	1539			1742	1538
Flt Permitted	0.10	1.00			0.89	1.00	0.75	1.00			0.78	1.00
Satd. Flow (perm)	184	4939			3072	1538	1360	1539			1418	1538
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	186	1863	2	11	1179	672	1118	2	577	7	2	13
RTOR Reduction (vph)	0	0	0	0	0	425	0	72	0	0	0	2
Lane Group Flow (vph)	186	1865	0	0	1190	247	1118	507	0	0	9	11
Turn Type	pm+pt			Perm		Perm	Perm			Perm		Perm
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6		6	4			8		8
Actuated Green, G (s)	43.6	43.6			33.6	33.6	43.9	43.9			43.9	43.9
Effective Green, g (s)	43.6	43.6			33.6	33.6	43.9	43.9			43.9	43.9
Actuated g/C Ratio	0.44	0.44			0.34	0.34	0.44	0.44			0.44	0.44
Clearance Time (s)	5.8	6.4			6.4	6.4	6.1	6.1			6.1	6.1
Vehicle Extension (s)	4.3	4.9			4.9	4.9	4.9	4.9			4.9	4.9
Lane Grp Cap (vph)	145	2153			1032	517	597	676			623	675
v/s Ratio Prot	0.05	c0.38						0.33				
v/s Ratio Perm	c0.51				0.39	0.16	c0.82				0.01	0.01
v/c Ratio	1.28	0.87			1.15	0.48	1.87	0.75			0.01	0.02
Uniform Delay, d1	28.2	25.6			33.2	26.3	28.1	23.5			15.8	15.9
Progression Factor	0.91	0.93			0.70	0.46	1.00	1.00			1.00	1.00
Incremental Delay, d2	132.1	0.5			76.9	2.2	399.1	5.4			0.0	0.0
Delay (s)	157.9	24.3			100.3	14.3	427.1	28.9			15.9	15.9
Level of Service	F	C			F	B	F	C			B	B
Approach Delay (s)		36.4			69.3			291.2			15.9	
Approach LOS		D			E			F			B	
Intersection Summary												
HCM Average Control Delay			124.0									F
HCM Volume to Capacity ratio			1.54									
Actuated Cycle Length (s)			100.0								12.5	
Intersection Capacity Utilization			140.2%									H
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

21: Frontage Rd & US 276










2035 PM
7/6/2011

						
Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (veh/h)	69	160	50	2770	2206	71
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	77	178	56	3078	2451	79
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					1009	
pX, platoon unblocked	0.56	0.56	0.56			
vC, conflicting volume	4141	1265	2530			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	5026	0	2165			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	71	58			
cM capacity (veh/h)	0	605	131			
Direction, Lane #	WB 1	SE 1	SE 2	SE 3	NW 1	NW 2
Volume Total	254	56	1539	1539	1634	896
Volume Left	77	56	0	0	0	0
Volume Right	178	0	0	0	0	79
cSH	0	131	1700	1700	1700	1700
Volume to Capacity	712.03	0.42	0.91	0.91	0.96	0.53
Queue Length 95th (ft)	Err	46	0	0	0	0
Control Delay (s)	Err	51.1	0.0	0.0	0.0	0.0
Lane LOS	F	F				
Approach Delay (s)	Err	0.9			0.0	
Approach LOS	F					
Intersection Summary						
Average Delay			430.4			
Intersection Capacity Utilization			96.9%		ICU Level of Service	F
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

22: US 276 & St Josephs Dr

2035 PM
7/6/2011

						
Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (veh/h)	2290	549	113	1784	493	348
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	2544	610	126	1982	548	387
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				861		
pX, platoon unblocked					0.53	
vC, conflicting volume			3154		4092	1577
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			3154		5053	1577
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			0		0	0
cM capacity (veh/h)			92		0	95
Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	
Volume Total	1696	1458	786	1321	934	
Volume Left	0	0	126	0	548	
Volume Right	0	610	0	0	387	
cSH	1700	1700	92	1700	0	
Volume to Capacity	1.00	0.86	1.36	0.78	Err	
Queue Length 95th (ft)	0	0	231	0	Err	
Control Delay (s)	0.0	0.0	298.8	0.0	Err	
Lane LOS			F		F	
Approach Delay (s)	0.0		111.5		Err	
Approach LOS					F	
Intersection Summary						
Average Delay			Err			
Intersection Capacity Utilization			189.5%		ICU Level of Service	H
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

29: Rothwell Dr & E Butler Road

2035 PM
7/6/2011













Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	30	8	2	1101	1518	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	33	9	2	1223	1687	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		5				
Median type				TWLTL	TWLTL	
Median storage (veh)				2	2	
Upstream signal (ft)				1175	377	
pX, platoon unblocked	0.87	0.82	0.82			
vC, conflicting volume	2304	844	1689			
vC1, stage 1 conf vol	1688					
vC2, stage 2 conf vol	616					
vCu, unblocked vol	1285	382	1408			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	98	99			
cM capacity (veh/h)	150	500	383			
Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	42	2	612	612	1124	564
Volume Left	33	2	0	0	0	0
Volume Right	9	0	0	0	0	2
cSH	190	383	1700	1700	1700	1700
Volume to Capacity	0.22	0.01	0.36	0.36	0.66	0.33
Queue Length 95th (ft)	20	0	0	0	0	0
Control Delay (s)	30.7	14.4	0.0	0.0	0.0	0.0
Lane LOS	D	B				
Approach Delay (s)	30.7	0.0			0.0	
Approach LOS	D					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			52.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

32: New Commerce Ct & E Butler Road

2035 PM
7/6/2011




















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	80	91	1531	6	80	2399
Sign Control	Stop		Free		Free	Free
Grade	0%		0%		0%	0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	89	101	1701	7	89	2666
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)			369			
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	3215	854			1708	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3260	402			1436	
tC, single (s)	6.9	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	79			76	
cM capacity (veh/h)	4	487			375	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	190	1134	574	89	1333	1333
Volume Left	89	0	0	89	0	0
Volume Right	101	0	7	0	0	0
cSH	9	1700	1700	375	1700	1700
Volume to Capacity	21.69	0.67	0.34	0.24	0.78	0.78
Queue Length 95th (ft)	Err	0	0	23	0	0
Control Delay (s)	Err	0.0	0.0	17.6	0.0	0.0
Lane LOS	F			C		
Approach Delay (s)	Err	0.0		0.6		
Approach LOS	F					
Intersection Summary						
Average Delay		408.7				
Intersection Capacity Utilization		83.0%		ICU Level of Service		E
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

33: E Butler Road & Brookfield Pkwy

2035 PM

7/6/2011

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (veh/h)	23	1593	6	2	2187	14	3	0	267	25	0	6
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	26	1770	7	2	2430	16	3	0	297	28	0	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	939											
pX, platoon unblocked				0.83			0.83			0.83		
vC, conflicting volume	2446			1777			3385			4270		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2446			1518			3466			4538		
tC, single (s)	4.2			4.2			7.6			6.6		
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5			4.0		
p0 queue free %	86			99			0			100		
cM capacity (veh/h)	180			348			2			1		
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SE 1	SE 2	NW 1	NW 2			
Volume Total	26	1180	597	1217	1231	3	297	28	7			
Volume Left	26	0	0	2	0	3	0	28	0			
Volume Right	0	0	7	0	16	0	297	0	7			
cSH	180	1700	1700	348	1700	2	167	0	458			
Volume to Capacity	0.14	0.69	0.35	0.01	0.72	1.94	1.78	Err	0.01			
Queue Length 95th (ft)	12	0	0	0	0	31	535	Err	1			
Control Delay (s)	28.3	0.0	0.0	0.4	0.0	3685.3	420.1	Err	13.0			
Lane LOS	D			A		F	F	F	B			
Approach Delay (s)	0.4			0.2		456.3		Err				
Approach LOS						F		F				
Intersection Summary												
Average Delay	Err											
Intersection Capacity Utilization	90.8%			ICU Level of Service						E		
Analysis Period (min)	15											