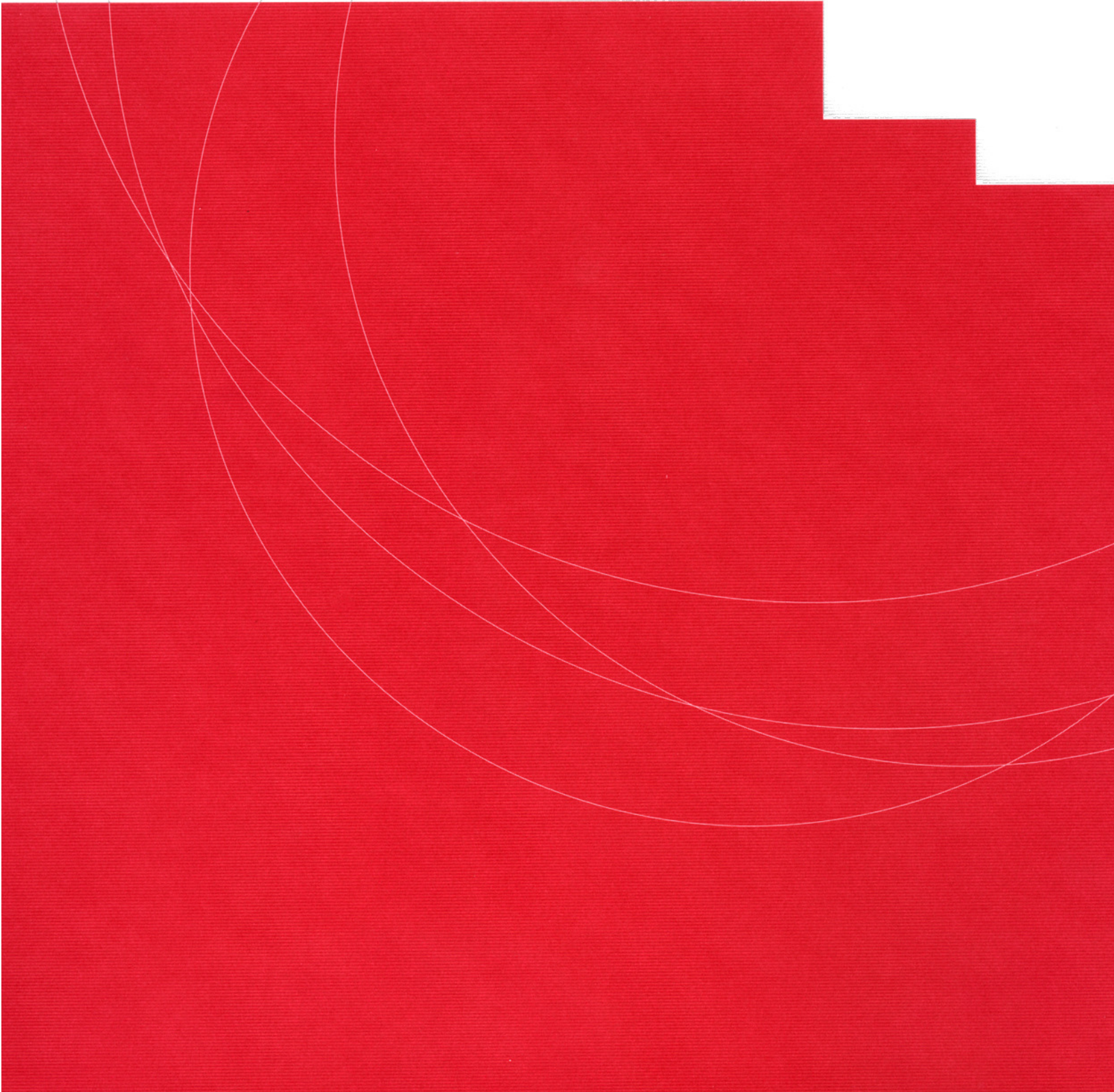


Appendix D
Capacity Analysis Reports (Synchro)



HCM Signalized Intersection Capacity Analysis

11: Home Road & SR 4

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↕		↖	↗	
Volume (vph)	20	77	10	21	100	162	14	110	14	267	313	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			5%				0%
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.91		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1831		1726	1648		1645	3232		1752	3443	
Flt Permitted	0.55	1.00		0.69	1.00		0.52	1.00		0.66	1.00	
Satd. Flow (perm)	1018	1831		1261	1648		899	3232		1226	3443	
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)	22	86	11	23	111	180	16	122	16	297	348	46
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	97	0	23	291	0	16	138	0	297	394	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	7%	7%	7%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.9	11.9		11.9	11.9		15.1	15.1		15.1	15.1	
Effective Green, g (s)	13.9	13.9		13.9	13.9		17.1	17.1		17.1	17.1	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.44	0.44		0.44	0.44	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	363	653		449	587		394	1417		538	1510	
v/s Ratio Prot		0.05			c0.18			0.04			0.11	
v/s Ratio Perm	0.02			0.02			0.02			c0.24		
v/c Ratio	0.06	0.15		0.05	0.50		0.04	0.10		0.55	0.26	
Uniform Delay, d1	8.3	8.5		8.2	9.8		6.3	6.4		8.1	6.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.0	0.7		0.2	0.1		4.0	0.4	
Delay (s)	8.3	8.6		8.3	10.5		6.5	6.6		12.2	7.4	
Level of Service	A	A		A	B		A	A		B	A	
Approach Delay (s)		8.6			10.3			6.5			9.4	
Approach LOS		A			B			A			A	

Intersection Summary

HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	39.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

38: Woeber Mustard Mfg & Urbana

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	2	243	0	34	7	208	45	47	305	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	10	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Fr _t		0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Fl _t Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1478		1652	1478		1770	3539	1583	1770	3538	
Fl _t Permitted		1.00		0.76	1.00		0.55	1.00	1.00	0.57	1.00	
Satd. Flow (perm)		1478		1315	1478		1019	3539	1583	1059	3538	
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	2	270	0	38	8	231	50	52	339	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2	0	270	38	0	8	231	50	52	340	0
Turn Type	Perm			Perm			pm+pt			Perm	pm+pt	
Protected Phases		4			8		5	2			1	6
Permitted Phases	4			8			2		2		6	
Actuated Green, G (s)		14.9		14.9	14.9		13.3	12.5	12.5	15.3	13.5	
Effective Green, g (s)		16.9		16.9	16.9		17.3	14.5	14.5	19.3	15.5	
Actuated g/C Ratio		0.36		0.36	0.36		0.37	0.31	0.31	0.41	0.33	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		529		471	529		418	1087	486	490	1162	
v/s Ratio Prot		0.00			0.03		0.00	0.07		c0.01	c0.10	
v/s Ratio Perm				c0.21			0.01		0.03	0.03		
v/c Ratio		0.00		0.57	0.07		0.02	0.21	0.10	0.11	0.29	
Uniform Delay, d ₁		9.7		12.2	10.0		9.5	12.1	11.7	8.5	11.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d ₂		0.0		1.7	0.1		0.0	0.1	0.1	0.1	0.1	
Delay (s)		9.7		13.9	10.0		9.5	12.2	11.8	8.6	11.9	
Level of Service		A		B	B		A	B	B	A	B	
Approach Delay (s)		9.7			13.4			12.1			11.5	
Approach LOS		A			B			B			B	

Intersection Summary

HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	47.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

26: Eagle City Road & Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↷	↷	↶	↷	↷
Volume (vph)	55	61	29	19	117	71	18	210	7	77	516	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.95		1.00	0.94		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1791		1787	1775		1752	3504	1567	1805	3508	
Flt Permitted	0.63	1.00		0.53	1.00		0.34	1.00	1.00	0.55	1.00	
Satd. Flow (perm)	1180	1791		992	1775		621	3504	1567	1052	3508	
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	68	32	21	130	79	20	233	8	86	573	133
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	61	100	0	21	209	0	20	233	8	86	706	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type	Perm			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	10.8	10.8		17.7	17.7		22.0	21.1	21.1	26.4	23.3	
Effective Green, g (s)	12.8	12.8		19.7	19.7		26.0	23.1	23.1	30.4	25.3	
Actuated g/C Ratio	0.21	0.21		0.33	0.33		0.43	0.39	0.39	0.51	0.42	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	252	383		365	584		324	1351	604	598	1482	
v/s Ratio Prot		0.06		0.00	c0.12		0.00	0.07		c0.01	c0.20	
v/s Ratio Perm	0.05			0.02			0.02		0.01	0.06		
v/c Ratio	0.24	0.26		0.06	0.36		0.06	0.17	0.01	0.14	0.48	
Uniform Delay, d1	19.5	19.6		13.8	15.3		9.8	12.1	11.4	7.7	12.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.4		0.1	0.4		0.1	0.3	0.0	0.1	1.1	
Delay (s)	20.0	20.0		13.9	15.7		9.9	12.4	11.4	7.8	13.6	
Level of Service	C	B		B	B		A	B	B	A	B	
Approach Delay (s)		20.0			15.5			12.2			13.0	
Approach LOS		B			B			B			B	

Intersection Summary

HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 19: Villa Road & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	148	50	60	5	55	16	63	221	4	2	320	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	13	12	10	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		0.97		1.00	1.00		1.00	0.95	
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1773	1669		1717		1805	1895		1805	1807	
Flt Permitted	0.95	1.00	1.00		1.00		0.23	1.00		0.60	1.00	
Satd. Flow (perm)	1805	1773	1669		1717		440	1895		1148	1807	
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)	164	56	67	6	61	18	70	246	4	2	356	172
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	164	56	67	0	85	0	70	250	0	2	528	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Split		Perm	Split			pm+pt			pm+pt		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4				2			6		
Actuated Green, G (s)	12.0	12.0	12.0		7.6		39.8	35.2		32.6	31.6	
Effective Green, g (s)	14.0	14.0	14.0		9.6		43.8	37.2		36.6	33.6	
Actuated g/C Ratio	0.18	0.18	0.18		0.12		0.55	0.47		0.46	0.42	
Clearance Time (s)	6.0	6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	317	311	293		207		354	883		551	761	
v/s Ratio Prot	c0.09	0.03			c0.05		c0.02	0.13		0.00	c0.29	
v/s Ratio Perm			0.04				0.09			0.00		
v/c Ratio	0.52	0.18	0.23		0.41		0.20	0.28		0.00	0.69	
Uniform Delay, d1	29.8	28.0	28.3		32.5		10.8	13.1		11.7	18.9	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.3	0.4		1.3		0.3	0.8		0.0	5.2	
Delay (s)	31.3	28.3	28.7		33.8		11.1	13.9		11.7	24.1	
Level of Service	C	C	C		C		B	B		B	C	
Approach Delay (s)		30.1			33.8			13.3			24.0	
Approach LOS		C			C			B			C	

Intersection Summary

HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	79.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

41: Emmanuel Way & Middle Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↰	↰		↰	↰
Volume (vph)	94	49	210	116	94	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	10	10
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.95		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1652	1478	1773		1652	1739
Flt Permitted	0.95	1.00	1.00		0.39	1.00
Satd. Flow (perm)	1652	1478	1773		683	1739
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	104	54	233	129	104	356
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	104	54	362	0	104	356
Turn Type		Perm			pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	6.7	6.7	18.4		28.8	28.8
Effective Green, g (s)	8.7	8.7	20.4		30.8	30.8
Actuated g/C Ratio	0.18	0.18	0.43		0.65	0.65
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	303	271	761		573	1128
v/s Ratio Prot	c0.06		c0.20		0.02	c0.20
v/s Ratio Perm		0.04			0.09	
v/c Ratio	0.34	0.20	0.48		0.18	0.32
Uniform Delay, d1	16.9	16.4	9.7		3.7	3.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	0.4	0.5		0.2	0.2
Delay (s)	17.6	16.8	10.2		3.8	3.9
Level of Service	B	B	B		A	A
Approach Delay (s)	17.3		10.2			3.8
Approach LOS	B		B			A

Intersection Summary

HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	47.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

21: SR 334 & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	78	63	91	16	98	27	73	176	10	19	308	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.97		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1634		1656	1687		1770	1848		1770	1785	
Flt Permitted	0.67	1.00		0.65	1.00		0.44	1.00		0.63	1.00	
Satd. Flow (perm)	1198	1634		1131	1687		818	1848		1170	1785	
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)	87	70	101	18	109	30	81	196	11	21	342	133
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	87	171	0	18	139	0	81	207	0	21	475	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.0	8.0		8.0	8.0		21.1	21.1		21.1	21.1	
Effective Green, g (s)	10.0	10.0		10.0	10.0		23.1	23.1		23.1	23.1	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.56	0.56		0.56	0.56	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	291	398		275	410		460	1039		658	1003	
v/s Ratio Prot		c0.10			0.08			0.11			c0.27	
v/s Ratio Perm	0.07			0.02			0.10			0.02		
v/c Ratio	0.30	0.43		0.07	0.34		0.18	0.20		0.03	0.47	
Uniform Delay, d1	12.7	13.1		12.0	12.8		4.4	4.4		4.0	5.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.7		0.1	0.5		0.8	0.4		0.1	1.6	
Delay (s)	13.3	13.9		12.1	13.3		5.2	4.9		4.1	7.0	
Level of Service	B	B		B	B		A	A		A	A	
Approach Delay (s)		13.7			13.2			5.0			6.9	
Approach LOS		B			B			A			A	

Intersection Summary

HCM Average Control Delay	8.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	41.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

22: Moorefield Road & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↕	↗		↕			↕			↕		
Volume (vph)	25	113	76	76	122	20	49	47	47	25	116	27	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	12	12	12	12	11	12	12	11	12	
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0		
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00		
Frt		1.00	0.85		0.99			0.96			0.98		
Flt Protected		0.99	1.00		0.98			0.98			0.99		
Satd. Flow (prot)		1864	1599		1826			1726			1784		
Flt Permitted		0.91	1.00		0.83			0.86			0.95		
Satd. Flow (perm)		1709	1599		1551			1517			1703		
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)	28	126	84	84	136	22	54	52	52	28	129	30	
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	0	154	84	0	242	0	0	158	0	0	187	0	
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	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)		11.3	11.3		11.3			18.1			18.1		
Effective Green, g (s)		13.3	13.3		13.3			20.1			20.1		
Actuated g/C Ratio		0.32	0.32		0.32			0.49			0.49		
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0		
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0		
Lane Grp Cap (vph)		549	514		498			737			827		
v/s Ratio Prot													
v/s Ratio Perm		0.09	0.05		0.16			0.10			0.11		
v/c Ratio		0.28	0.16		0.49			0.21			0.23		
Uniform Delay, d1		10.5	10.1		11.3			6.1			6.2		
Progression Factor		1.00	1.00		1.00			1.00			1.00		
Incremental Delay, d2		0.3	0.2		0.7			0.7			0.6		
Delay (s)		10.8	10.2		12.0			6.8			6.8		
Level of Service		B	B		B			A			A		
Approach Delay (s)		10.6			12.0			6.8			6.8		
Approach LOS		B			B			A			A		
Intersection Summary													
HCM Average Control Delay			9.4									HCM Level of Service	A
HCM Volume to Capacity ratio			0.33										
Actuated Cycle Length (s)			41.4									Sum of lost time (s)	8.0
Intersection Capacity Utilization			41.0%									ICU Level of Service	A
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

44: Providence & Derr Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↕↘		↙	↕↘
Volume (vph)	103	44	257	16	17	439
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	12	11	11	11	11
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.96		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1957		3391		1711	3421
Flt Permitted	0.97		1.00		0.57	1.00
Satd. Flow (perm)	1957		3391		1020	3421
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	114	49	286	18	19	488
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	163	0	304	0	19	488
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	6.0		7.0		7.0	7.0
Effective Green, g (s)	8.0		9.0		9.0	9.0
Actuated g/C Ratio	0.32		0.36		0.36	0.36
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	626		1221		367	1232
v/s Ratio Prot	c0.08		0.09			c0.14
v/s Ratio Perm					0.02	
v/c Ratio	0.26		0.25		0.05	0.40
Uniform Delay, d1	6.3		5.6		5.2	6.0
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.2		0.1		0.1	0.2
Delay (s)	6.5		5.7		5.3	6.2
Level of Service	A		A		A	A
Approach Delay (s)	6.5		5.7			6.1
Approach LOS	A		A			A

Intersection Summary

HCM Average Control Delay	6.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	25.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

27: Villa Road & Derr Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	
Volume (vph)	29	100	71	62	250	31	88	55	48	70	208	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	12	12	12	12	11	12	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.98		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1685	3385		1805	1869		1745	1900	1561	1805	1813	
Flt Permitted	0.31	1.00		0.63	1.00		0.42	1.00	1.00	0.72	1.00	
Satd. Flow (perm)	550	3385		1201	1869		772	1900	1561	1363	1813	
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	111	79	69	278	34	98	61	53	78	231	102
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	32	190	0	69	312	0	98	61	53	78	333	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt		Perm		pm+pt	
Protected Phases	7	4		3	8		5	2			1	6
Permitted Phases	4			8			2		2		6	
Actuated Green, G (s)	12.9	10.9		22.1	15.5		26.5	22.0	22.0	26.5	22.0	
Effective Green, g (s)	16.9	12.9		25.5	17.5		30.5	24.0	24.0	30.5	24.0	
Actuated g/C Ratio	0.25	0.19		0.38	0.26		0.45	0.35	0.35	0.45	0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	203	642		527	481		439	671	551	654	640	
v/s Ratio Prot	0.01	0.06		c0.02	c0.17		c0.02	0.03		0.01	c0.18	
v/s Ratio Perm	0.03			0.03			0.08		0.03	0.04		
v/c Ratio	0.16	0.30		0.13	0.65		0.22	0.09	0.10	0.12	0.52	
Uniform Delay, d1	25.2	23.7		14.1	22.5		11.2	14.7	14.7	10.8	17.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.3		0.1	3.0		0.3	0.3	0.3	0.1	3.0	
Delay (s)	25.6	23.9		14.2	25.5		11.5	15.0	15.1	10.9	20.4	
Level of Service	C	C		B	C		B	B	B	B	C	
Approach Delay (s)		24.1			23.5			13.4			18.6	
Approach LOS		C			C			B			B	

Intersection Summary

HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

28: SR 334 & Derr Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↗	↘		↗	↘		↗	↘	↗
Volume (vph)	55	173	41	21	259	5	68	105	37	15	286	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			-2%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00		1.00	0.96		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)	1736	1774		1671	1754		1787	1808		1805	1900	1615
Flt Permitted	0.57	1.00		0.61	1.00		0.55	1.00		0.66	1.00	1.00
Satd. Flow (perm)	1034	1774		1074	1754		1031	1808		1248	1900	1615
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	192	46	23	288	6	76	117	41	17	318	236
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	61	238	0	23	294	0	76	158	0	17	318	236
Heavy Vehicles (%)	4%	4%	4%	8%	8%	8%	2%	2%	2%	1%	1%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	10.9	10.9		10.9	10.9		12.1	12.1		12.1	12.1	12.1
Effective Green, g (s)	12.9	12.9		12.9	12.9		14.1	14.1		14.1	14.1	14.1
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.40	0.40		0.40	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
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	381	654		396	646		415	728		503	765	651
v/s Ratio Prot		0.13			c0.17			0.09			c0.17	
v/s Ratio Perm	0.06			0.02			0.07			0.01		0.15
v/c Ratio	0.16	0.36		0.06	0.46		0.18	0.22		0.03	0.42	0.36
Uniform Delay, d1	7.4	8.1		7.1	8.4		6.7	6.8		6.3	7.5	7.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3		0.1	0.5		1.0	0.7		0.1	1.7	1.6
Delay (s)	7.6	8.4		7.2	8.9		7.7	7.5		6.5	9.2	8.9
Level of Service	A	A		A	A		A	A		A	A	A
Approach Delay (s)		8.2			8.8			7.6			9.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	35.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

3: SR 334 WB Off Ramp & Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	154	17	292	0	0	521
Sign Control	Stop		Free			Free
Grade	-4%		2%			-2%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	171	19	324	0	0	579
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	614	162			324	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	614	162			324	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	60	98			100	
cM capacity (veh/h)	424	854			1232	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	190	162	162	289	289	
Volume Left	171	0	0	0	0	
Volume Right	19	0	0	0	0	
cSH	447	1700	1700	1700	1700	
Volume to Capacity	0.43	0.10	0.10	0.17	0.17	
Queue Length 95th (ft)	52	0	0	0	0	
Control Delay (s)	18.9	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s)	18.9	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			30.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: SR 334 EB On Ramp & Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑	↗	↖	↑↑
Volume (veh/h)	0	0	307	60	11	670
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	341	67	12	744
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	738	171			341	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	738	171			341	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	350	843			1215	
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	171	171	67	12	372	372
Volume Left	0	0	0	12	0	0
Volume Right	0	0	67	0	0	0
cSH	1700	1700	1700	1215	1700	1700
Volume to Capacity	0.10	0.10	0.04	0.01	0.22	0.22
Queue Length 95th (ft)	0	0	0	1	0	0
Control Delay (s)	0.0	0.0	0.0	8.0	0.0	0.0
Lane LOS				A		
Approach Delay (s)	0.0			0.1		
Approach LOS						
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			22.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: Urbana Road & SR 334 WB On Ramp

12/27/2011

	↑	↗	↘	↓	↙	↖
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑	↗		↑↑		
Volume (veh/h)	292	115	0	675	0	0
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)	324	128	0	750	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			452		699	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			452		699	162
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1105		374	854
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	
Volume Total	162	162	128	375	375	
Volume Left	0	0	0	0	0	
Volume Right	0	0	128	0	0	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.10	0.10	0.08	0.22	0.22	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			30.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

20: Middle Urbana Road & SR 4

12/27/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	2	355	197	101	283	1
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)	2	394	219	112	314	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	865	315	316			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	865	315	316			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	45	82			
cM capacity (veh/h)	266	723	1233			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	397	331	316			
Volume Left	2	219	0			
Volume Right	394	0	1			
cSH	716	1233	1700			
Volume to Capacity	0.55	0.18	0.19			
Queue Length 95th (ft)	86	16	0			
Control Delay (s)	16.1	6.2	0.0			
Lane LOS	C	A				
Approach Delay (s)	16.1	6.2	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			8.1			
Intersection Capacity Utilization			63.3%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

13: Villa Road & SR 4

12/27/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	32	15	11	115	231	67
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)	36	17	12	128	257	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	446	294	331			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	446	294	331			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	98	99			
cM capacity (veh/h)	564	745	1223			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	52	140	331			
Volume Left	36	12	0			
Volume Right	17	0	74			
cSH	612	1223	1700			
Volume to Capacity	0.09	0.01	0.19			
Queue Length 95th (ft)	7	1	0			
Control Delay (s)	11.4	0.8	0.0			
Lane LOS	B	A				
Approach Delay (s)	11.4	0.8	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization		26.2%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

15: SR 334 & SR 4

12/27/2011



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	57	25	42	64	172	112
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)	63	28	47	71	191	124
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	418	253	191			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	418	253	191			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	89	96	97			
cM capacity (veh/h)	554	762	1371			
Direction, Lane #						
	SE 1	NE 1	SW 1			
Volume Total	91	118	316			
Volume Left	63	47	0			
Volume Right	28	0	124			
cSH	604	1371	1700			
Volume to Capacity	0.15	0.03	0.19			
Queue Length 95th (ft)	13	3	0			
Control Delay (s)	12.0	3.2	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.0	3.2	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization		36.3%		ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

24: Montego Drive & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	49	1	113	11	1	0	33	260	18	9	332	17
Sign Control		Stop			Stop			Free			Free	
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)	54	1	126	12	1	0	37	289	20	10	369	19
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	771	781	378	897	780	299	388			309		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	771	781	378	897	780	299	388			309		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	82	100	81	94	100	100	97			99		
cM capacity (veh/h)	308	315	671	207	316	745	1176			1257		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	181	13	346	398
Volume Left	54	12	37	10
Volume Right	126	0	20	19
cSH	493	213	1176	1257
Volume to Capacity	0.37	0.06	0.03	0.01
Queue Length 95th (ft)	42	5	2	1
Control Delay (s)	16.5	23.0	1.1	0.3
Lane LOS	C	C	A	A
Approach Delay (s)	16.5	23.0	1.1	0.3
Approach LOS	C	C		

Intersection Summary			
Average Delay		4.1	
Intersection Capacity Utilization	47.0%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 30: Moorefield Road & Derr Road

12/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	←
Sign Control	Stop			Stop	Stop	
Volume (vph)	72	24	72	239	34	52
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	80	27	80	266	38	58
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	107	346	96			
Volume Left (vph)	0	80	38			
Volume Right (vph)	27	0	58			
Hadj (s)	-0.15	0.05	-0.28			
Departure Headway (s)	4.4	4.3	4.6			
Degree Utilization, x	0.13	0.41	0.12			
Capacity (veh/h)	794	813	713			
Control Delay (s)	8.0	10.3	8.3			
Approach Delay (s)	8.0	10.3	8.3			
Approach LOS	A	B	A			
Intersection Summary						
Delay			9.5			
HCM Level of Service			A			
Intersection Capacity Utilization			35.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

31: Montego Drive & Derr Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	216	8	105	57	7	258
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)	240	9	117	63	8	287
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	451	148			180	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	451	148			180	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	58	99			99	
cM capacity (veh/h)	567	904			1408	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	249	180	294
Volume Left	240	0	8
Volume Right	9	63	0
cSH	575	1700	1408
Volume to Capacity	0.43	0.11	0.01
Queue Length 95th (ft)	54	0	0
Control Delay (s)	16.0	0.0	0.2
Lane LOS	C		A
Approach Delay (s)	16.0	0.0	0.2
Approach LOS	C		

Intersection Summary			
Average Delay		5.6	
Intersection Capacity Utilization		38.3%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

39: Urbana Road & SR 334 EB Off Ramp

12/27/2011

	↑	↖	↙	↓	↘	↗
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑↑			↑↑		↗
Volume (veh/h)	307	0	0	675	0	100
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	341	0	0	750	0	111
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			341	716	171	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			341	716	171	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	100	87	
cM capacity (veh/h)			1215	365	843	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1	
Volume Total	171	171	375	375	111	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	111	
cSH	1700	1700	1700	1700	843	
Volume to Capacity	0.10	0.10	0.22	0.22	0.13	
Queue Length 95th (ft)	0	0	0	0	11	
Control Delay (s)	0.0	0.0	0.0	0.0	9.9	
Lane LOS					A	
Approach Delay (s)	0.0		0.0		9.9	
Approach LOS					A	
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			22.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

11: Home Road & SR 4

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	93	10	14	206	154	18	175	20	213	267	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			5%				0%
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.94		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1836		1726	1700		1645	3239		1752	3418	
Flt Permitted	0.43	1.00		0.68	1.00		0.54	1.00		0.62	1.00	
Satd. Flow (perm)	807	1836		1242	1700		933	3239		1137	3418	
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)	29	103	11	16	229	171	20	194	22	237	297	59
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	29	114	0	16	400	0	20	216	0	237	356	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	7%	7%	7%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	14.5	14.5		14.5	14.5		14.2	14.2		14.2	14.2	
Effective Green, g (s)	16.5	16.5		16.5	16.5		16.2	16.2		16.2	16.2	
Actuated g/C Ratio	0.41	0.41		0.41	0.41		0.40	0.40		0.40	0.40	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	327	744		504	689		371	1289		453	1360	
v/s Ratio Prot		0.06			c0.24			0.07			0.10	
v/s Ratio Perm	0.04			0.01			0.02			c0.21		
v/c Ratio	0.09	0.15		0.03	0.58		0.05	0.17		0.52	0.26	
Uniform Delay, d1	7.5	7.7		7.3	9.4		7.5	7.9		9.3	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.0	1.3		0.3	0.3		4.3	0.5	
Delay (s)	7.6	7.8		7.3	10.7		7.8	8.2		13.6	8.7	
Level of Service	A	A		A	B		A	A		B	A	
Approach Delay (s)		7.7			10.5			8.2			10.7	
Approach LOS		A			B			A			B	

Intersection Summary

HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	40.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 19: Villa Road & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	133	95	112	6	66	11	82	329	3	2	69	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	13	12	10	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		0.98		1.00	1.00		1.00	0.90	
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1773	1669		1736		1805	1898		1805	1715	
Flt Permitted	0.52	1.00	1.00		0.97		0.53	1.00		0.51	1.00	
Satd. Flow (perm)	994	1773	1669		1685		1011	1898		973	1715	
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)	148	106	124	7	73	12	91	366	3	2	77	143
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	148	106	124	0	92	0	91	369	0	2	220	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt		Perm	pm+pt			pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.3	17.3	17.3		6.9		34.3	29.9		27.7	26.6	
Effective Green, g (s)	19.3	19.3	19.3		8.9		38.3	31.9		31.7	28.6	
Actuated g/C Ratio	0.29	0.29	0.29		0.13		0.58	0.48		0.48	0.43	
Clearance Time (s)	6.0	6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	368	516	486		226		661	913		504	740	
v/s Ratio Prot	c0.04	0.06					c0.01	c0.19		0.00	0.13	
v/s Ratio Perm	c0.08		0.07		0.05		0.07			0.00		
v/c Ratio	0.40	0.21	0.26		0.41		0.14	0.40		0.00	0.30	
Uniform Delay, d1	18.5	17.7	18.0		26.3		6.4	11.1		9.1	12.3	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.2	0.3		1.2		0.1	1.3		0.0	1.0	
Delay (s)	19.2	17.9	18.3		27.5		6.5	12.4		9.1	13.3	
Level of Service	B	B	B		C		A	B		A	B	
Approach Delay (s)		18.5			27.5			11.2			13.3	
Approach LOS		B			C			B			B	

Intersection Summary

HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	66.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

21: SR 334 & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	168	88	8	107	30	62	290	12	11	193	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.97		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1700		1656	1686		1770	1852		1770	1786	
Flt Permitted	0.66	1.00		0.57	1.00		0.57	1.00		0.53	1.00	
Satd. Flow (perm)	1184	1700		993	1686		1067	1852		981	1786	
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)	163	187	98	9	119	33	69	322	13	12	214	81
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	163	285	0	9	152	0	69	335	0	12	295	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.3	11.3		11.3	11.3		13.1	13.1		13.1	13.1	
Effective Green, g (s)	13.3	13.3		13.3	13.3		15.1	15.1		15.1	15.1	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		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	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	433	621		363	616		443	768		407	741	
v/s Ratio Prot		c0.17			0.09			c0.18			0.17	
v/s Ratio Perm	0.14			0.01			0.06			0.01		
v/c Ratio	0.38	0.46		0.02	0.25		0.16	0.44		0.03	0.40	
Uniform Delay, d1	8.5	8.8		7.4	8.1		6.7	7.6		6.3	7.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.5		0.0	0.2		0.7	1.8		0.1	1.6	
Delay (s)	9.0	9.3		7.4	8.3		7.4	9.4		6.4	9.1	
Level of Service	A	A		A	A		A	A		A	A	
Approach Delay (s)		9.2			8.2			9.1			9.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	36.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

22: Moorefield Road & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	
Volume (vph)	29	97	35	42	102	18	51	77	39	11	75	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	11	12
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.98			0.97			0.95	
Flt Protected		0.99	1.00		0.99			0.98			1.00	
Satd. Flow (prot)		1860	1599		1829			1752			1745	
Flt Permitted		0.88	1.00		0.87			0.88			0.97	
Satd. Flow (perm)		1656	1599		1613			1560			1697	
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	108	39	47	113	20	57	86	43	12	83	49
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	140	39	0	180	0	0	186	0	0	144	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	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)		7.1	7.1		7.1			12.0			12.0	
Effective Green, g (s)		9.1	9.1		9.1			14.0			14.0	
Actuated g/C Ratio		0.29	0.29		0.29			0.45			0.45	
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		485	468		472			702			764	
v/s Ratio Prot												
v/s Ratio Perm		0.08	0.02		c0.11			c0.12			0.08	
v/c Ratio		0.29	0.08		0.38			0.26			0.19	
Uniform Delay, d1		8.5	8.0		8.8			5.3			5.1	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.3	0.1		0.5			0.9			0.5	
Delay (s)		8.8	8.1		9.3			6.3			5.7	
Level of Service		A	A		A			A			A	
Approach Delay (s)		8.7			9.3			6.3			5.7	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	31.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

26: Eagle City Road & Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↗	↘		↗	↑↑	↗	↗	↑↘	
Volume (vph)	289	181	19	25	197	77	65	476	18	116	351	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1854		1787	1802		1752	3504	1567	1805	3395	
Flt Permitted	0.57	1.00		0.48	1.00		0.25	1.00	1.00	0.34	1.00	
Satd. Flow (perm)	1081	1854		898	1802		463	3504	1567	641	3395	
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)	321	201	21	28	219	86	72	529	20	129	390	256
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	321	222	0	28	305	0	72	529	20	129	646	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type	Perm			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	23.0	23.0		31.0	31.0		23.4	18.9	18.9	23.4	18.9	
Effective Green, g (s)	25.0	25.0		33.0	33.0		27.4	20.9	20.9	27.4	20.9	
Actuated g/C Ratio	0.35	0.35		0.46	0.46		0.38	0.29	0.29	0.38	0.29	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	373	640		458	821		291	1012	452	347	980	
v/s Ratio Prot		0.12		0.00	c0.17		0.02	0.15		c0.03	c0.19	
v/s Ratio Perm	c0.30			0.02			0.07		0.01	0.11		
v/c Ratio	0.86	0.35		0.06	0.37		0.25	0.52	0.04	0.37	0.66	
Uniform Delay, d1	22.1	17.6		11.2	12.9		15.1	21.6	18.6	15.3	22.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.0	0.3		0.1	0.3		0.4	1.9	0.2	0.7	3.5	
Delay (s)	40.0	18.0		11.3	13.2		15.5	23.5	18.7	16.0	26.1	
Level of Service	D	B		B	B		B	C	B	B	C	
Approach Delay (s)		31.0			13.0			22.4			24.4	
Approach LOS		C			B			C			C	

Intersection Summary

HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: Villa Road & Derr Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	192	97	107	315	56	144	134	100	59	170	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	12	12	12	12	11	12	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		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)	1685	3428		1805	1857		1745	1900	1561	1805	1816	
Flt Permitted	0.26	1.00		0.51	1.00		0.45	1.00	1.00	0.66	1.00	
Satd. Flow (perm)	458	3428		960	1857		820	1900	1561	1258	1816	
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)	123	213	108	119	350	62	160	149	111	66	189	79
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	123	321	0	119	412	0	160	149	111	66	268	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	18.0	13.5		28.4	18.7		25.6	21.2	21.2	23.4	20.1	
Effective Green, g (s)	22.0	15.5		31.2	20.7		29.6	23.2	23.2	27.4	22.1	
Actuated g/C Ratio	0.31	0.22		0.44	0.29		0.41	0.32	0.32	0.38	0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	252	741		556	536		421	615	505	521	560	
v/s Ratio Prot	c0.04	0.09		0.03	c0.22		c0.03	0.08		0.01	c0.15	
v/s Ratio Perm	0.11			0.06			0.12		0.07	0.04		
v/c Ratio	0.49	0.43		0.21	0.77		0.38	0.24	0.22	0.13	0.48	
Uniform Delay, d1	27.7	24.3		14.1	23.3		13.9	17.8	17.7	14.2	20.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.4		0.2	6.6		0.6	0.9	1.0	0.1	2.9	
Delay (s)	29.2	24.7		14.3	29.9		14.5	18.7	18.7	14.3	23.0	
Level of Service	C	C		B	C		B	B	B	B	C	
Approach Delay (s)		26.0			26.4			17.1			21.3	
Approach LOS		C			C			B			C	

Intersection Summary

HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	71.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

28: SR 334 & Derr Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	283	376	67	23	214	14	74	363	25	5	249	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			-2%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.99		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)	1736	1786		1671	1743		1787	1863		1805	1900	1615
Flt Permitted	0.58	1.00		0.34	1.00		0.55	1.00		0.37	1.00	1.00
Satd. Flow (perm)	1067	1786		594	1743		1029	1863		711	1900	1615
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)	314	418	74	26	238	16	82	403	28	6	277	117
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	314	492	0	26	254	0	82	431	0	6	277	117
Heavy Vehicles (%)	4%	4%	4%	8%	8%	8%	2%	2%	2%	1%	1%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	20.0	20.0		20.0	20.0		18.3	18.3		18.3	18.3	18.3
Effective Green, g (s)	22.0	22.0		22.0	22.0		20.3	20.3		20.3	20.3	20.3
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.40	0.40		0.40	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
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	467	781		260	762		415	752		287	767	652
v/s Ratio Prot		0.28			0.15			c0.23			0.15	
v/s Ratio Perm	c0.29			0.04			0.08			0.01		0.07
v/c Ratio	0.67	0.63		0.10	0.33		0.20	0.57		0.02	0.36	0.18
Uniform Delay, d1	11.3	11.0		8.3	9.3		9.7	11.6		9.0	10.5	9.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	1.6		0.2	0.3		1.1	3.2		0.1	1.3	0.6
Delay (s)	15.1	12.6		8.5	9.6		10.8	14.8		9.2	11.8	10.2
Level of Service	B	B		A	A		B	B		A	B	B
Approach Delay (s)		13.6			9.5			14.2			11.3	
Approach LOS		B			A			B			B	

Intersection Summary

HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

41: Emmanuel Way & Middle Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	43	32	356	21	17	292
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	10	10
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1652	1478	1849		1652	1739
Flt Permitted	0.95	1.00	1.00		0.43	1.00
Satd. Flow (perm)	1652	1478	1849		756	1739
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	48	36	396	23	19	324
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	48	36	419	0	19	324
Turn Type		Perm			pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	4.6	4.6	34.6		41.4	41.4
Effective Green, g (s)	6.6	6.6	36.6		43.4	43.4
Actuated g/C Ratio	0.11	0.11	0.63		0.75	0.75
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	188	168	1167		609	1301
v/s Ratio Prot	c0.03		c0.23		0.00	c0.19
v/s Ratio Perm		0.02			0.02	
v/c Ratio	0.26	0.21	0.36		0.03	0.25
Uniform Delay, d1	23.5	23.3	5.1		2.2	2.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	0.6	0.9		0.0	0.5
Delay (s)	24.2	24.0	6.0		2.3	2.7
Level of Service	C	C	A		A	A
Approach Delay (s)	24.1		6.0			2.7
Approach LOS	C		A			A

Intersection Summary

HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

44: Providence & Derr Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	60	79	574	73	79	471
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	12	11	11	11	11
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.92		0.98		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1908		3363		1711	3421
Flt Permitted	0.98		1.00		0.37	1.00
Satd. Flow (perm)	1908		3363		665	3421
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	67	88	638	81	88	523
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	155	0	719	0	88	523
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	7.3		23.4		23.4	23.4
Effective Green, g (s)	9.3		25.4		25.4	25.4
Actuated g/C Ratio	0.22		0.59		0.59	0.59
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	416		2000		396	2035
v/s Ratio Prot	c0.08		c0.21			0.15
v/s Ratio Perm					0.13	
v/c Ratio	0.37		0.36		0.22	0.26
Uniform Delay, d1	14.2		4.5		4.0	4.1
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.6		0.5		1.3	0.3
Delay (s)	14.8		5.0		5.3	4.4
Level of Service	B		A		A	A
Approach Delay (s)	14.8		5.0			4.6
Approach LOS	B		A			A

Intersection Summary

HCM Average Control Delay	5.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	42.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

46: Woeber Mustard Mfg & Urbana

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	0	7	172	0	60	23	357	211	127	512	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	10	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1652	1478		1652	1478		1770	3539	1583	1770	3539	
Flt Permitted	0.71	1.00		0.75	1.00		0.44	1.00	1.00	0.44	1.00	
Satd. Flow (perm)	1240	1478		1308	1478		816	3539	1583	829	3539	
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)	2	0	8	191	0	67	26	397	234	141	569	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2	8	0	191	67	0	26	397	234	141	569	0
Turn Type	Perm			Perm			pm+pt			Perm	pm+pt	
Protected Phases		4			8		5	2			1	6
Permitted Phases	4			8			2		2		6	
Actuated Green, G (s)	9.8	9.8		9.8	9.8		19.0	18.1	18.1	25.6	21.4	
Effective Green, g (s)	11.8	11.8		11.8	11.8		23.0	20.1	20.1	29.6	23.4	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.46	0.40	0.40	0.59	0.47	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	292	348		308	348		430	1420	635	606	1653	
v/s Ratio Prot		0.01			0.05		0.00	0.11		c0.03	c0.16	
v/s Ratio Perm	0.00			c0.15			0.02		0.15	0.11		
v/c Ratio	0.01	0.02		0.62	0.19		0.06	0.28	0.37	0.23	0.34	
Uniform Delay, d1	14.7	14.7		17.1	15.3		7.4	10.1	10.5	4.7	8.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.0		3.8	0.3		0.1	0.1	0.4	0.2	0.1	
Delay (s)	14.7	14.7		21.0	15.6		7.5	10.2	10.9	4.9	8.6	
Level of Service	B	B		C	B		A	B	B	A	A	
Approach Delay (s)		14.7			19.6			10.4			7.9	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	50.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

3: SR 334 WB Off Ramp & Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	114	11	627	0	0	453
Sign Control	Stop		Free			Free
Grade	-4%		2%			-2%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	127	12	697	0	0	503
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	948	348			697	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	948	348			697	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	51	98			100	
cM capacity (veh/h)	259	648			895	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	139	348	348	252	252	
Volume Left	127	0	0	0	0	
Volume Right	12	0	0	0	0	
cSH	274	1700	1700	1700	1700	
Volume to Capacity	0.51	0.20	0.20	0.15	0.15	
Queue Length 95th (ft)	67	0	0	0	0	
Control Delay (s)	30.9	0.0	0.0	0.0	0.0	
Lane LOS	D					
Approach Delay (s)	30.9	0.0		0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			31.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

6: SR 334 EB On Ramp & Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑	↗	↖	↑↑
Volume (veh/h)	0	0	570	192	23	556
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	633	213	26	618
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	993	317			633	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	993	317			633	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			97	
cM capacity (veh/h)	236	679			946	
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	317	317	213	26	309	309
Volume Left	0	0	0	26	0	0
Volume Right	0	0	213	0	0	0
cSH	1700	1700	1700	946	1700	1700
Volume to Capacity	0.19	0.19	0.13	0.03	0.18	0.18
Queue Length 95th (ft)	0	0	0	2	0	0
Control Delay (s)	0.0	0.0	0.0	8.9	0.0	0.0
Lane LOS				A		
Approach Delay (s)	0.0			0.4		
Approach LOS						
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			28.6%		ICU Level of Service	A
Analysis Period (min)			15			

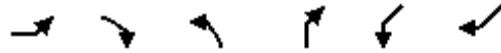
HCM Unsignalized Intersection Capacity Analysis
 14: Urbana Road & SR 334 WB On Ramp

12/27/2011

	↑	↗	↘	↓	↙	↖
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑	↗		↑↑		
Volume (veh/h)	627	43	0	567	0	0
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)	697	48	0	630	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			744		1012	348
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			744		1012	348
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			859		236	648
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	
Volume Total	348	348	48	315	315	
Volume Left	0	0	0	0	0	
Volume Right	0	0	48	0	0	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.20	0.20	0.03	0.19	0.19	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			31.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 13: Villa Road & SR 4

12/27/2011



Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	67	24	22	240	156	55
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)	74	27	24	267	173	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	519	204	234			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	519	204	234			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	97	98			
cM capacity (veh/h)	507	837	1327			

Direction, Lane #	EB 1	NB 1	SW 1
Volume Total	101	267	234
Volume Left	74	0	0
Volume Right	27	0	61
cSH	566	1700	1700
Volume to Capacity	0.18	0.16	0.14
Queue Length 95th (ft)	16	0	0
Control Delay (s)	12.7	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.7	Err	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		Err	
Intersection Capacity Utilization		Err%	ICU Level of Service
Analysis Period (min)		15	H

HCM Unsignalized Intersection Capacity Analysis
 15: SR 334 & SR 4

12/27/2011



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	151	36	38	198	143	96
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)	168	40	42	220	159	107
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	517	212	159			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	517	212	159			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	66	95	97			
cM capacity (veh/h)	486	803	1408			
Direction, Lane #	SE 1	NE 1	SW 1			
Volume Total	208	262	266			
Volume Left	168	42	0			
Volume Right	40	0	107			
cSH	526	1408	1700			
Volume to Capacity	0.39	0.03	0.16			
Queue Length 95th (ft)	47	2	0			
Control Delay (s)	16.2	1.4	0.0			
Lane LOS	C	A				
Approach Delay (s)	16.2	1.4	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			5.1			
Intersection Capacity Utilization		46.5%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

20: Middle Urbana Road & SR 4

12/27/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	9	211	272	229	194	10
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)	10	234	302	254	216	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1080	221	227			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1080	221	227			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	71	77			
cM capacity (veh/h)	186	816	1330			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	244	557	227			
Volume Left	10	302	0			
Volume Right	234	0	11			
cSH	717	1330	1700			
Volume to Capacity	0.34	0.23	0.13			
Queue Length 95th (ft)	38	22	0			
Control Delay (s)	12.6	5.7	0.0			
Lane LOS	B	A				
Approach Delay (s)	12.6	5.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			6.1			
Intersection Capacity Utilization		61.5%		ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

24: Montego Drive & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	8	1	68	27	6	7	87	297	18	5	218	21
Sign Control		Stop			Stop			Free			Free	
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)	9	1	76	30	7	8	97	330	20	6	242	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	809	808	254	874	810	340	266			350		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	809	808	254	874	810	340	266			350		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	90	87	98	99	93			100		
cM capacity (veh/h)	274	291	787	231	291	707	1304			1214		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	86	44	447	271
Volume Left	9	30	97	6
Volume Right	76	8	20	23
cSH	647	271	1304	1214
Volume to Capacity	0.13	0.16	0.07	0.00
Queue Length 95th (ft)	11	14	6	0
Control Delay (s)	11.4	20.9	2.3	0.2
Lane LOS	B	C	A	A
Approach Delay (s)	11.4	20.9	2.3	0.2
Approach LOS	B	C		

Intersection Summary

Average Delay		3.5		
Intersection Capacity Utilization		53.5%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
 30: Moorefield Road & Derr Road

12/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	→
Sign Control	Stop			Stop	Stop	
Volume (vph)	207	36	76	130	39	122
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	230	40	84	144	43	136
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	270	229	179			
Volume Left (vph)	0	84	43			
Volume Right (vph)	40	0	136			
Hadj (s)	-0.09	0.07	-0.41			
Departure Headway (s)	4.5	4.7	4.6			
Degree Utilization, x	0.34	0.30	0.23			
Capacity (veh/h)	753	723	711			
Control Delay (s)	9.9	9.8	9.0			
Approach Delay (s)	9.9	9.8	9.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			9.6			
HCM Level of Service			A			
Intersection Capacity Utilization			43.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

31: Montego Drive & Derr Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	102	10	289	179	13	172
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)	113	11	321	199	14	191
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	641	421			520	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	641	421			520	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	74	98			99	
cM capacity (veh/h)	436	637			1056	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	124	520	206
Volume Left	113	0	14
Volume Right	11	199	0
cSH	449	1700	1056
Volume to Capacity	0.28	0.31	0.01
Queue Length 95th (ft)	28	0	1
Control Delay (s)	16.1	0.0	0.7
Lane LOS	C		A
Approach Delay (s)	16.1	0.0	0.7
Approach LOS	C		

Intersection Summary			
Average Delay		2.5	
Intersection Capacity Utilization		39.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

39: Urbana Road & SR 334 EB Off Ramp

12/27/2011

	↑	↖	↙	↓	↘	↗
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑↑			↑↑		↗
Volume (veh/h)	570	0	0	567	0	100
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	633	0	0	630	0	111
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			633		948	317
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			633		948	317
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	84
cM capacity (veh/h)			946		259	679
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1	
Volume Total	317	317	315	315	111	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	111	
cSH	1700	1700	1700	1700	679	
Volume to Capacity	0.19	0.19	0.19	0.19	0.16	
Queue Length 95th (ft)	0	0	0	0	15	
Control Delay (s)	0.0	0.0	0.0	0.0	11.3	
Lane LOS					B	
Approach Delay (s)	0.0		0.0		11.3	
Approach LOS					B	
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			28.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

11: Home Road & SR 4

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	100	10	20	110	210	20	170	20	380	410	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			5%				0%
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.90		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1838		1726	1638		1645	3238		1752	3438	
Flt Permitted	0.43	1.00		0.68	1.00		0.45	1.00		0.62	1.00	
Satd. Flow (perm)	807	1838		1233	1638		773	3238		1143	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)	22	111	11	22	122	233	22	189	22	422	456	67
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	122	0	22	355	0	22	211	0	422	523	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	7%	7%	7%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.4	15.4		15.4	15.4		21.2	21.2		21.2	21.2	
Effective Green, g (s)	17.4	17.4		17.4	17.4		23.2	23.2		23.2	23.2	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.48	0.48		0.48	0.48	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	289	658		441	586		369	1546		546	1641	
v/s Ratio Prot		0.07			c0.22			0.07			0.15	
v/s Ratio Perm	0.03			0.02			0.03			c0.37		
v/c Ratio	0.08	0.19		0.05	0.61		0.06	0.14		0.77	0.32	
Uniform Delay, d1	10.3	10.7		10.2	12.8		6.8	7.1		10.5	7.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.0	1.8		0.3	0.2		10.2	0.5	
Delay (s)	10.4	10.9		10.2	14.6		7.1	7.3		20.7	8.3	
Level of Service	B	B		B	B		A	A		C	A	
Approach Delay (s)		10.8			14.3			7.3			13.9	
Approach LOS		B			B			A			B	

Intersection Summary

HCM Average Control Delay	12.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	48.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

19: Villa Road & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	70	70	10	90	60	60	310	20	10	400	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	13	12	10	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		0.95		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1773	1669		1678		1805	1883		1805	1805	
Flt Permitted	0.38	1.00	1.00		0.98		0.13	1.00		0.49	1.00	
Satd. Flow (perm)	730	1773	1669		1651		252	1883		934	1805	
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)	222	78	78	11	100	67	67	344	22	11	444	222
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	222	78	78	0	178	0	67	366	0	11	666	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt		Perm	Perm			pm+pt			pm+pt		
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	25.7	25.7	25.7		13.6		42.0	37.4		35.0	33.9	
Effective Green, g (s)	27.7	27.7	27.7		15.6		46.0	39.4		39.0	35.9	
Actuated g/C Ratio	0.34	0.34	0.34		0.19		0.56	0.48		0.47	0.44	
Clearance Time (s)	6.0	6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	352	597	562		313		266	903		476	788	
v/s Ratio Prot	c0.06	0.04					c0.02	0.19		0.00	c0.37	
v/s Ratio Perm	c0.15		0.05		0.11		0.12			0.01		
v/c Ratio	0.63	0.13	0.14		0.57		0.25	0.41		0.02	0.85	
Uniform Delay, d1	21.5	18.9	19.0		30.2		13.0	13.8		11.5	20.7	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.7	0.1	0.1		2.4		0.5	1.4		0.0	10.8	
Delay (s)	25.2	19.0	19.1		32.6		13.5	15.2		11.5	31.5	
Level of Service	C	B	B		C		B	B		B	C	
Approach Delay (s)		22.6			32.6			14.9			31.1	
Approach LOS		C			C			B			C	

Intersection Summary

HCM Average Control Delay	25.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	82.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

21: SR 334 & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Volume (vph)	90	80	170	30	130	30	120	220	10	20	380	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.97		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1629		1770	1811		1770	1851		1770	1792	
Flt Permitted	0.65	1.00		0.53	1.00		0.32	1.00		0.60	1.00	
Satd. Flow (perm)	1157	1629		997	1811		591	1851		1120	1792	
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)	100	89	189	33	144	33	133	244	11	22	422	144
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	100	278	0	33	177	0	133	255	0	22	566	0
Heavy Vehicles (%)	6%	2%	6%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	12.4	12.4		12.4	12.4		19.1	19.1		19.1	19.1	
Effective Green, g (s)	14.4	14.4		14.4	14.4		21.1	21.1		21.1	21.1	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.49	0.49		0.49	0.49	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	383	539		330	600		287	898		543	869	
v/s Ratio Prot		c0.17			0.10			0.14			c0.32	
v/s Ratio Perm	0.09			0.03			0.22			0.02		
v/c Ratio	0.26	0.52		0.10	0.29		0.46	0.28		0.04	0.65	
Uniform Delay, d1	10.7	11.7		10.1	10.8		7.4	6.7		5.9	8.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.8		0.1	0.3		5.3	0.8		0.1	3.8	
Delay (s)	11.0	12.6		10.2	11.1		12.7	7.5		6.0	12.2	
Level of Service	B	B		B	B		B	A		A	B	
Approach Delay (s)		12.2			10.9			9.3			12.0	
Approach LOS		B			B			A			B	

Intersection Summary

HCM Average Control Delay	11.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	43.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

22: Moorefield Road & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	
Volume (vph)	40	150	90	100	180	40	50	80	50	40	150	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	11	12
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.98			0.96			0.98	
Flt Protected		0.99	1.00		0.98			0.99			0.99	
Satd. Flow (prot)		1862	1599		1821			1743			1787	
Flt Permitted		0.87	1.00		0.83			0.86			0.92	
Satd. Flow (perm)		1641	1599		1537			1516			1650	
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	167	100	111	200	44	56	89	56	44	167	33
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	211	100	0	355	0	0	201	0	0	244	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	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)		13.7	13.7		13.7			13.1			13.1	
Effective Green, g (s)		15.7	15.7		15.7			15.1			15.1	
Actuated g/C Ratio		0.40	0.40		0.40			0.39			0.39	
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		664	647		622			590			642	
v/s Ratio Prot												
v/s Ratio Perm		0.13	0.06		0.23			0.13			0.15	
v/c Ratio		0.32	0.15		0.57			0.34			0.38	
Uniform Delay, d1		7.9	7.3		8.9			8.3			8.5	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.3	0.1		1.3			1.6			1.7	
Delay (s)		8.2	7.4		10.2			9.9			10.2	
Level of Service		A	A		B			A			B	
Approach Delay (s)		7.9			10.2			9.9			10.2	
Approach LOS		A			B			A			B	

Intersection Summary

HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	38.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

26: Eagle City Road & Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	70	30	20	140	80	20	230	10	100	670	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	0.95		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1797		1787	1779		1752	3504	1567	1805	3495	
Flt Permitted	0.61	1.00		0.53	1.00		0.23	1.00	1.00	0.52	1.00	
Satd. Flow (perm)	1141	1797		996	1779		419	3504	1567	985	3495	
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)	56	78	33	22	156	89	22	256	11	111	744	200
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	56	111	0	22	245	0	22	256	11	111	944	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type	Perm			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases		4		3	8		5	2			1	6
Permitted Phases	4			8			2		2		6	
Actuated Green, G (s)	11.6	11.6		18.6	18.6		23.2	22.2	22.2	30.2	25.7	
Effective Green, g (s)	13.6	13.6		20.6	20.6		27.2	24.2	24.2	34.2	27.7	
Actuated g/C Ratio	0.21	0.21		0.33	0.33		0.43	0.38	0.38	0.54	0.44	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	245	386		362	579		243	1340	599	616	1529	
v/s Ratio Prot		0.06		0.00	c0.14		0.00	0.07		c0.02	c0.27	
v/s Ratio Perm	0.05			0.02			0.03		0.01	0.08		
v/c Ratio	0.23	0.29		0.06	0.42		0.09	0.19	0.02	0.18	0.62	
Uniform Delay, d1	20.5	20.8		14.7	16.7		10.7	13.0	12.2	7.2	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.4		0.1	0.5		0.2	0.3	0.1	0.1	1.9	
Delay (s)	21.0	21.2		14.8	17.2		10.9	13.3	12.2	7.4	15.6	
Level of Service	C	C		B	B		B	B	B	A	B	
Approach Delay (s)		21.1			17.0			13.1			14.7	
Approach LOS		C			B			B			B	

Intersection Summary

HCM Average Control Delay	15.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	63.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: Villa Road & Derr Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	130	70	100	290	30	100	70	70	80	250	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	12	12	12	12	11	12	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1685	3420		1805	1874		1745	1900	1561	1805	1813	
Flt Permitted	0.32	1.00		0.61	1.00		0.32	1.00	1.00	0.71	1.00	
Satd. Flow (perm)	563	3420		1165	1874		580	1900	1561	1342	1813	
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)	33	144	78	111	322	33	111	78	78	89	278	122
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	33	222	0	111	355	0	111	78	78	89	400	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt		Perm		pm+pt	
Protected Phases	7	4		3	8		5	2			1	6
Permitted Phases	4			8			2		2		6	
Actuated Green, G (s)	12.7	10.6		25.8	17.7		25.4	21.0	21.0	25.4	21.0	
Effective Green, g (s)	16.7	12.6		27.8	19.7		29.4	23.0	23.0	29.4	23.0	
Actuated g/C Ratio	0.24	0.18		0.40	0.28		0.42	0.33	0.33	0.42	0.33	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	202	623		572	533		354	632	519	613	603	
v/s Ratio Prot	0.01	0.06		c0.03	c0.19		c0.03	0.04		0.01	c0.22	
v/s Ratio Perm	0.03			0.05			0.10		0.05	0.05		
v/c Ratio	0.16	0.36		0.19	0.67		0.31	0.12	0.15	0.15	0.66	
Uniform Delay, d1	27.1	24.8		13.7	21.8		12.9	16.1	16.2	12.0	19.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.4		0.2	3.1		0.5	0.4	0.6	0.1	5.7	
Delay (s)	27.5	25.1		13.9	25.0		13.4	16.5	16.8	12.1	25.5	
Level of Service	C	C		B	C		B	B	B	B	C	
Approach Delay (s)		25.4			22.3			15.3			23.0	
Approach LOS		C			C			B			C	

Intersection Summary

HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

28: SR 334 & Derr Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↗	↘		↗	↘		↗	↘	↗
Volume (vph)	80	250	50	20	340	10	80	120	50	30	320	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			-2%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00		1.00	0.96		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)	1736	1781		1671	1752		1787	1798		1805	1900	1615
Flt Permitted	0.44	1.00		0.51	1.00		0.48	1.00		0.64	1.00	1.00
Satd. Flow (perm)	810	1781		892	1752		910	1798		1213	1900	1615
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)	89	278	56	22	378	11	89	133	56	33	356	278
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	89	334	0	22	389	0	89	189	0	33	356	278
Heavy Vehicles (%)	4%	4%	4%	8%	8%	8%	2%	2%	2%	1%	1%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	13.9	13.9		13.9	13.9		14.1	14.1		14.1	14.1	14.1
Effective Green, g (s)	15.9	15.9		15.9	15.9		16.1	16.1		16.1	16.1	16.1
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	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
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	322	708		355	696		366	724		488	765	650
v/s Ratio Prot		0.19			c0.22			0.11			c0.19	
v/s Ratio Perm	0.11			0.02			0.10			0.03		0.17
v/c Ratio	0.28	0.47		0.06	0.56		0.24	0.26		0.07	0.47	0.43
Uniform Delay, d1	8.2	8.9		7.4	9.3		7.9	8.0		7.3	8.8	8.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5		0.1	1.0		1.6	0.9		0.3	2.0	2.1
Delay (s)	8.6	9.4		7.5	10.3		9.5	8.9		7.6	10.8	10.7
Level of Service	A	A		A	B		A	A		A	B	B
Approach Delay (s)		9.3			10.2			9.1			10.6	
Approach LOS		A			B			A			B	

Intersection Summary

HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

38: Woeber Mustard Mfg & Urbana

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔		↔	↑↑	↔	↔	↑↔	
Volume (vph)	0	0	2	243	0	34	7	208	45	47	305	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	10	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Fr _t		0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Fl _t Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1478		1652	1478		1770	3539	1583	1770	3538	
Fl _t Permitted		1.00		0.76	1.00		0.55	1.00	1.00	0.57	1.00	
Satd. Flow (perm)		1478		1315	1478		1019	3539	1583	1059	3538	
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	2	270	0	38	8	231	50	52	339	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2	0	270	38	0	8	231	50	52	340	0
Turn Type	Perm			Perm			pm+pt			Perm	pm+pt	
Protected Phases		4			8		5	2			1	6
Permitted Phases	4			8			2		2		6	
Actuated Green, G (s)		14.9		14.9	14.9		13.3	12.5	12.5	15.3	13.5	
Effective Green, g (s)		16.9		16.9	16.9		17.3	14.5	14.5	19.3	15.5	
Actuated g/C Ratio		0.36		0.36	0.36		0.37	0.31	0.31	0.41	0.33	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		529		471	529		418	1087	486	490	1162	
v/s Ratio Prot		0.00			0.03		0.00	0.07		c0.01	c0.10	
v/s Ratio Perm				c0.21			0.01		0.03	0.03		
v/c Ratio		0.00		0.57	0.07		0.02	0.21	0.10	0.11	0.29	
Uniform Delay, d1		9.7		12.2	10.0		9.5	12.1	11.7	8.5	11.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		1.7	0.1		0.0	0.1	0.1	0.1	0.1	
Delay (s)		9.7		13.9	10.0		9.5	12.2	11.8	8.6	11.9	
Level of Service		A		B	B		A	B	B	A	B	
Approach Delay (s)		9.7			13.4			12.1			11.5	
Approach LOS		A			B			B			B	

Intersection Summary

HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	47.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

41: Emmanuel Way & Middle Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	170	90	270	240	200	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	10	10
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.94		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1652	1478	1744		1652	1739
Flt Permitted	0.95	1.00	1.00		0.22	1.00
Satd. Flow (perm)	1652	1478	1744		389	1739
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	189	100	300	267	222	411
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	189	100	567	0	222	411
Turn Type		Perm			pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	12.1	12.1	25.1		37.1	37.1
Effective Green, g (s)	14.1	14.1	27.1		39.1	39.1
Actuated g/C Ratio	0.23	0.23	0.44		0.64	0.64
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	381	341	772		414	1111
v/s Ratio Prot	c0.11		c0.33		c0.07	0.24
v/s Ratio Perm		0.07			0.27	
v/c Ratio	0.50	0.29	0.73		0.54	0.37
Uniform Delay, d1	20.5	19.4	14.1		7.4	5.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.5	6.1		1.3	0.9
Delay (s)	21.5	19.9	20.2		8.8	6.2
Level of Service	C	B	C		A	A
Approach Delay (s)	20.9		20.2			7.1
Approach LOS	C		C			A

Intersection Summary

HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

44: Providence & Derr Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	120	60	290	20	20	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	12	11	11	11	11
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.95		0.99		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1951		3388		1711	3421
Flt Permitted	0.97		1.00		0.55	1.00
Satd. Flow (perm)	1951		3388		982	3421
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	67	322	22	22	578
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	200	0	344	0	22	578
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	6.8		11.5		11.5	11.5
Effective Green, g (s)	8.8		13.5		13.5	13.5
Actuated g/C Ratio	0.29		0.45		0.45	0.45
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	567		1510		438	1524
v/s Ratio Prot	c0.10		0.10			c0.17
v/s Ratio Perm					0.02	
v/c Ratio	0.35		0.23		0.05	0.38
Uniform Delay, d1	8.5		5.2		4.8	5.6
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.4		0.1		0.0	0.2
Delay (s)	8.9		5.3		4.8	5.8
Level of Service	A		A		A	A
Approach Delay (s)	8.9		5.3			5.7
Approach LOS	A		A			A

Intersection Summary

HCM Average Control Delay	6.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	30.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

3: SR 334 WB Off Ramp & Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕			↕
Volume (veh/h)	170	20	280	0	0	690
Sign Control	Stop		Free			Free
Grade	-4%		2%			-2%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	189	22	311	0	0	767
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	694	156			311	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	694	156			311	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	50	97			100	
cM capacity (veh/h)	377	863			1246	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	211	156	156	383	383
Volume Left	189	0	0	0	0
Volume Right	22	0	0	0	0
cSH	401	1700	1700	1700	1700
Volume to Capacity	0.53	0.09	0.09	0.23	0.23
Queue Length 95th (ft)	74	0	0	0	0
Control Delay (s)	23.5	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	23.5	0.0		0.0	
Approach LOS	C				

Intersection Summary					
Average Delay			3.9		
Intersection Capacity Utilization			36.4%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

6: SR 334 EB On Ramp & Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑	↗	↖	↑↑
Volume (veh/h)	0	0	330	70	10	870
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	367	78	11	967
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	872	183			367	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	872	183			367	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	287	828			1188	
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	183	183	78	11	483	483
Volume Left	0	0	0	11	0	0
Volume Right	0	0	78	0	0	0
cSH	1700	1700	1700	1188	1700	1700
Volume to Capacity	0.11	0.11	0.05	0.01	0.28	0.28
Queue Length 95th (ft)	0	0	0	1	0	0
Control Delay (s)	0.0	0.0	0.0	8.1	0.0	0.0
Lane LOS				A		
Approach Delay (s)	0.0			0.1		
Approach LOS						
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			27.4%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

13: Villa Road & SR 4

12/27/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	50	60	20	140	330	90
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)	56	67	22	156	367	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	617	417	467			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	617	417	467			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	87	90	98			
cM capacity (veh/h)	444	636	1090			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	122	178	467			
Volume Left	56	22	0			
Volume Right	67	0	100			
cSH	532	1090	1700			
Volume to Capacity	0.23	0.02	0.27			
Queue Length 95th (ft)	22	2	0			
Control Delay (s)	13.8	1.2	0.0			
Lane LOS	B	A				
Approach Delay (s)	13.8	1.2	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			2.5			
Intersection Capacity Utilization			37.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 14: Urbana Road & SR 334 WB On Ramp

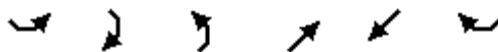
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	↑	↗	↘	↓	↙	↖
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑	↗		↑↑		
Volume (veh/h)	280	160	0	870	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	311	178	0	967	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume				489	794	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				489	794	156
tC, single (s)				4.1	6.8	6.9
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %						
cM capacity (veh/h)				1071	325	862
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	
Volume Total	156	156	178	483	483	
Volume Left	0	0	0	0	0	
Volume Right	0	0	178	0	0	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.09	0.09	0.10	0.28	0.28	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay	0.0					
Intersection Capacity Utilization	36.4%			ICU Level of Service	A	
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

15: SR 334 & SR 4

12/27/2011



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	80	30	50	80	210	150
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)	89	33	56	89	233	167
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	517	317	233			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	517	317	233			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	82	95	96			
cM capacity (veh/h)	497	724	1334			
Direction, Lane #	SE 1	NE 1	SW 1			
Volume Total	122	144	400			
Volume Left	89	56	0			
Volume Right	33	0	167			
cSH	544	1334	1700			
Volume to Capacity	0.22	0.04	0.24			
Queue Length 95th (ft)	21	3	0			
Control Delay (s)	13.5	3.2	0.0			
Lane LOS	B	A				
Approach Delay (s)	13.5	3.2	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			3.2			
Intersection Capacity Utilization			43.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

20: Middle Urbana Road & SR 4

12/27/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	410	270	140	420	10
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)	11	456	300	156	467	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1228	472	478			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1228	472	478			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	23	72			
cM capacity (veh/h)	141	590	1074			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	467	456	478			
Volume Left	11	300	0			
Volume Right	456	0	11			
cSH	548	1074	1700			
Volume to Capacity	0.85	0.28	0.28			
Queue Length 95th (ft)	227	29	0			
Control Delay (s)	38.4	7.4	0.0			
Lane LOS	E	A				
Approach Delay (s)	38.4	7.4	0.0			
Approach LOS	E					
Intersection Summary						
Average Delay			15.2			
Intersection Capacity Utilization			81.0%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

24: Montego Drive & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Volume (veh/h)	50	10	140	10	10	10	40	300	20	10	400	20
Sign Control		Stop			Stop			Free			Free	
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)	56	11	156	11	11	11	44	333	22	11	444	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	928	922	456	1072	922	344	467			356		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	928	922	456	1072	922	344	467			356		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	96	74	92	96	98	96			99		
cM capacity (veh/h)	229	258	607	138	259	703	1100			1209		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	222	33	400	478
Volume Left	56	11	44	11
Volume Right	156	11	22	22
cSH	410	240	1100	1209
Volume to Capacity	0.54	0.14	0.04	0.01
Queue Length 95th (ft)	78	12	3	1
Control Delay (s)	23.7	22.4	1.3	0.3
Lane LOS	C	C	A	A
Approach Delay (s)	23.7	22.4	1.3	0.3
Approach LOS	C	C		

Intersection Summary			
Average Delay		5.9	
Intersection Capacity Utilization	58.8%		ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 30: Moorefield Road & Derr Road

12/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	←
Sign Control	Stop			Stop	Stop	
Volume (vph)	70	30	90	310	30	70
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	78	33	100	344	33	78
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	111	444	111			
Volume Left (vph)	0	100	33			
Volume Right (vph)	33	0	78			
Hadj (s)	-0.18	0.04	-0.36			
Departure Headway (s)	4.5	4.4	4.8			
Degree Utilization, x	0.14	0.54	0.15			
Capacity (veh/h)	766	805	679			
Control Delay (s)	8.2	12.3	8.6			
Approach Delay (s)	8.2	12.3	8.6			
Approach LOS	A	B	A			
Intersection Summary						
Delay			11.0			
HCM Level of Service			B			
Intersection Capacity Utilization			40.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

31: Montego Drive & Derr Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	230	10	140	60	10	320
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)	256	11	156	67	11	356
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	567	189			222	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	567	189			222	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	99			99	
cM capacity (veh/h)	485	858			1359	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	267	222	367
Volume Left	256	0	11
Volume Right	11	67	0
cSH	493	1700	1359
Volume to Capacity	0.54	0.13	0.01
Queue Length 95th (ft)	79	0	1
Control Delay (s)	20.5	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	20.5	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization	44.9%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

39: Urbana Road & SR 334 EB Off Ramp

12/27/2011

	↑	↖	↙	↓	↘	↗
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑↑			↑↑		↗
Volume (veh/h)	330	0	0	870	0	90
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	367	0	0	967	0	100
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			367	850	183	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			367	850	183	
tC, single (s)			4.1	6.8	6.9	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			100	100	88	
cM capacity (veh/h)			1188	300	828	
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1	
Volume Total	183	183	483	483	100	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	100	
cSH	1700	1700	1700	1700	828	
Volume to Capacity	0.11	0.11	0.28	0.28	0.12	
Queue Length 95th (ft)	0	0	0	0	10	
Control Delay (s)	0.0	0.0	0.0	0.0	9.9	
Lane LOS					A	
Approach Delay (s)	0.0		0.0		9.9	
Approach LOS					A	
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			27.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

11: Home Road & SR 4

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	110	10	20	240	240	20	240	20	300	360	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			3%			5%				0%
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		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)	1770	1840		1726	1681		1645	3252		1752	3409	
Flt Permitted	0.28	1.00		0.67	1.00		0.45	1.00		0.57	1.00	
Satd. Flow (perm)	523	1840		1221	1681		778	3252		1060	3409	
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	122	11	22	267	267	22	267	22	333	400	89
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	44	133	0	22	534	0	22	289	0	333	489	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	7%	7%	7%	3%	3%	3%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.1	21.1		21.1	21.1		21.2	21.2		21.2	21.2	
Effective Green, g (s)	23.1	23.1		23.1	23.1		23.2	23.2		23.2	23.2	
Actuated g/C Ratio	0.43	0.43		0.43	0.43		0.43	0.43		0.43	0.43	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	222	783		519	715		332	1389		453	1457	
v/s Ratio Prot		0.07			c0.32			0.09			0.14	
v/s Ratio Perm	0.08			0.02			0.03			c0.31		
v/c Ratio	0.20	0.17		0.04	0.75		0.07	0.21		0.74	0.34	
Uniform Delay, d1	9.8	9.7		9.1	13.1		9.2	9.8		13.0	10.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.0	4.3		0.4	0.3		10.2	0.6	
Delay (s)	10.2	9.8		9.2	17.4		9.6	10.1		23.1	11.0	
Level of Service	B	A		A	B		A	B		C	B	
Approach Delay (s)		9.9			17.1			10.1			15.9	
Approach LOS		A			B			B			B	

Intersection Summary

HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	54.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

19: Villa Road & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	140	130	10	80	30	90	460	10	20	120	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	10	13	12	10	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0	4.0		4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		0.97		1.00	1.00		1.00	0.90	
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1773	1669		1707		1805	1894		1805	1719	
Flt Permitted	0.45	1.00	1.00		0.96		0.35	1.00		0.31	1.00	
Satd. Flow (perm)	856	1773	1669		1647		662	1894		597	1719	
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)	222	156	144	11	89	33	100	511	11	22	133	233
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	222	156	144	0	133	0	100	522	0	22	366	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt		Perm	Perm			pm+pt			pm+pt		
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	20.9	20.9	20.9		8.3		30.1	25.7		23.3	22.3	
Effective Green, g (s)	22.9	22.9	22.9		10.3		34.1	27.7		27.3	24.3	
Actuated g/C Ratio	0.35	0.35	0.35		0.16		0.52	0.42		0.42	0.37	
Clearance Time (s)	6.0	6.0	6.0		6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	423	619	583		259		456	800		304	637	
v/s Ratio Prot	c0.07	0.09					c0.02	c0.28		0.00	0.21	
v/s Ratio Perm	c0.11		0.09		0.08		0.09			0.03		
v/c Ratio	0.52	0.25	0.25		0.51		0.22	0.65		0.07	0.57	
Uniform Delay, d1	16.4	15.2	15.2		25.4		8.8	15.1		11.8	16.5	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.2	0.2		1.7		0.2	4.1		0.1	3.7	
Delay (s)	17.6	15.5	15.4		27.1		9.1	19.2		11.9	20.3	
Level of Service	B	B	B		C		A	B		B	C	
Approach Delay (s)		16.4			27.1			17.6			19.8	
Approach LOS		B			C			B			B	

Intersection Summary

HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	65.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

21: SR 334 & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	190	150	20	130	40	130	370	30	20	250	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.96		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1703	1674		1656	1682		1770	1842		1770	1795	
Flt Permitted	0.64	1.00		0.43	1.00		0.47	1.00		0.39	1.00	
Satd. Flow (perm)	1146	1674		753	1682		880	1842		734	1795	
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)	233	211	167	22	144	44	144	411	33	22	278	89
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	233	378	0	22	188	0	144	444	0	22	367	0
Heavy Vehicles (%)	6%	6%	6%	9%	9%	9%	2%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.8	15.8		15.8	15.8		18.2	18.2		18.2	18.2	
Effective Green, g (s)	17.8	17.8		17.8	17.8		20.2	20.2		20.2	20.2	
Actuated g/C Ratio	0.39	0.39		0.39	0.39		0.44	0.44		0.44	0.44	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	443	648		291	651		386	809		322	788	
v/s Ratio Prot		c0.23			0.11			c0.24			0.20	
v/s Ratio Perm	0.20			0.03			0.16			0.03		
v/c Ratio	0.53	0.58		0.08	0.29		0.37	0.55		0.07	0.47	
Uniform Delay, d1	10.9	11.2		8.9	9.7		8.7	9.5		7.5	9.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	1.3		0.1	0.2		2.7	2.7		0.4	2.0	
Delay (s)	12.0	12.5		9.0	10.0		11.4	12.2		7.9	11.1	
Level of Service	B	B		A	A		B	B		A	B	
Approach Delay (s)		12.3			9.9			12.0			10.9	
Approach LOS		B			A			B			B	

Intersection Summary

HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	46.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

22: Moorefield Road & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕			↕			↕	
Volume (vph)	30	120	40	50	140	30	60	120	80	20	110	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	12	12	11	12
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			1.00			1.00	
Frt		1.00	0.85		0.98			0.96			0.96	
Flt Protected		0.99	1.00		0.99			0.99			0.99	
Satd. Flow (prot)		1863	1599		1826			1740			1758	
Flt Permitted		0.90	1.00		0.88			0.88			0.94	
Satd. Flow (perm)		1695	1599		1624			1555			1665	
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)	33	133	44	56	156	33	67	133	89	22	122	56
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	166	44	0	245	0	0	289	0	0	200	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	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)		7.8	7.8		7.8			11.4			11.4	
Effective Green, g (s)		9.8	9.8		9.8			13.4			13.4	
Actuated g/C Ratio		0.31	0.31		0.31			0.43			0.43	
Clearance Time (s)		6.0	6.0		6.0			6.0			6.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		532	502		510			668			715	
v/s Ratio Prot												
v/s Ratio Perm		0.10	0.03		0.15			0.19			0.12	
v/c Ratio		0.31	0.09		0.48			0.43			0.28	
Uniform Delay, d1		8.1	7.5		8.6			6.2			5.8	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		0.3	0.1		0.7			2.0			1.0	
Delay (s)		8.5	7.6		9.4			8.3			6.7	
Level of Service		A	A		A			A			A	
Approach Delay (s)		8.3			9.4			8.3			6.7	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	31.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

26: Eagle City Road & Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	130	30	20	170	80	70	560	20	120	460	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%				-2%
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	0.95		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1829		1787	1791		1752	3504	1567	1805	3396	
Flt Permitted	0.59	1.00		0.51	1.00		0.19	1.00	1.00	0.28	1.00	
Satd. Flow (perm)	1108	1829		967	1791		355	3504	1567	539	3396	
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)	289	144	33	22	189	89	78	622	22	133	511	333
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	289	177	0	22	278	0	78	622	22	133	844	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type	Perm			pm+pt			pm+pt		Perm	pm+pt		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	19.3	19.3		27.3	27.3		23.3	18.8	18.8	23.3	18.8	
Effective Green, g (s)	21.3	21.3		29.3	29.3		27.3	20.8	20.8	27.3	20.8	
Actuated g/C Ratio	0.31	0.31		0.43	0.43		0.40	0.30	0.30	0.40	0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	344	568		461	765		274	1062	475	334	1030	
v/s Ratio Prot		0.10		0.00	c0.16		0.03	0.18		c0.04	c0.25	
v/s Ratio Perm	c0.26			0.02			0.09		0.01	0.12		
v/c Ratio	0.84	0.31		0.05	0.36		0.28	0.59	0.05	0.40	0.82	
Uniform Delay, d1	22.1	18.1		11.6	13.3		14.1	20.2	16.9	13.8	22.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.6	0.3		0.0	0.3		0.6	2.4	0.2	0.8	7.3	
Delay (s)	38.7	18.4		11.6	13.6		14.7	22.6	17.1	14.6	29.4	
Level of Service	D	B		B	B		B	C	B	B	C	
Approach Delay (s)		31.0			13.5			21.6			27.4	
Approach LOS		C			B			C			C	

Intersection Summary

HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	68.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: Villa Road & Derr Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗	↗	↖	↗	
Volume (vph)	140	200	90	160	350	60	140	160	140	70	200	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	12	12	12	12	12	11	12	11	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		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)	1685	3442		1805	1858		1745	1900	1561	1805	1818	
Flt Permitted	0.28	1.00		0.49	1.00		0.35	1.00	1.00	0.63	1.00	
Satd. Flow (perm)	500	3442		922	1858		652	1900	1561	1198	1818	
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)	156	222	100	178	389	67	156	178	156	78	222	89
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	156	322	0	178	456	0	156	178	156	78	311	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			pm+pt			pm+pt		Perm		pm+pt	
Protected Phases	7	4		3	8		5	2			1	6
Permitted Phases	4			8			2		2		6	
Actuated Green, G (s)	18.2	12.2		31.9	19.9		26.6	20.6	20.6	24.0	19.3	
Effective Green, g (s)	22.2	14.2		33.9	21.9		30.6	22.6	22.6	28.0	21.3	
Actuated g/C Ratio	0.30	0.19		0.45	0.29		0.41	0.30	0.30	0.37	0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	274	650		600	541		382	571	469	500	515	
v/s Ratio Prot	c0.06	0.09		0.06	c0.25		c0.04	0.09		0.01	c0.17	
v/s Ratio Perm	0.11			0.07			0.12		0.10	0.04		
v/c Ratio	0.57	0.50		0.30	0.84		0.41	0.31	0.33	0.16	0.60	
Uniform Delay, d1	28.6	27.3		15.2	25.0		15.1	20.3	20.4	15.5	23.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	0.6		0.3	11.4		0.7	1.4	1.9	0.1	5.2	
Delay (s)	31.3	27.9		15.5	36.5		15.8	21.7	22.3	15.6	28.5	
Level of Service	C	C		B	D		B	C	C	B	C	
Approach Delay (s)		29.0			30.6			20.0			25.9	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	26.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	75.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

28: SR 334 & Derr Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	500	90	30	300	20	90	420	40	10	270	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			-2%			-2%	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	0.99		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)	1736	1785		1671	1743		1787	1857		1805	1900	1615
Flt Permitted	0.48	1.00		0.22	1.00		0.50	1.00		0.25	1.00	1.00
Satd. Flow (perm)	885	1785		386	1743		932	1857		482	1900	1615
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)	356	556	100	33	333	22	100	467	44	11	300	122
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	356	656	0	33	355	0	100	511	0	11	300	122
Heavy Vehicles (%)	4%	4%	4%	8%	8%	8%	2%	2%	2%	1%	1%	1%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	25.0	25.0		25.0	25.0		19.2	19.2		19.2	19.2	19.2
Effective Green, g (s)	27.0	27.0		27.0	27.0		21.2	21.2		21.2	21.2	21.2
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.38	0.38		0.38	0.38	0.38
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	425	858		185	837		352	701		182	717	609
v/s Ratio Prot		0.37			0.20			c0.28			0.16	
v/s Ratio Perm	c0.40			0.09			0.11			0.02		0.08
v/c Ratio	0.84	0.76		0.18	0.42		0.28	0.73		0.06	0.42	0.20
Uniform Delay, d1	12.7	12.0		8.3	9.5		12.2	15.0		11.2	12.9	11.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	13.4	4.1		0.5	0.3		2.0	6.6		0.6	1.8	0.7
Delay (s)	26.1	16.1		8.8	9.9		14.2	21.6		11.8	14.7	12.5
Level of Service	C	B		A	A		B	C		B	B	B
Approach Delay (s)		19.6			9.8			20.4			14.0	
Approach LOS		B			A			C			B	

Intersection Summary

HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	56.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

41: Emmanuel Way & Middle Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	190	130	430	130	80	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	12	10	10
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
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)	1652	1478	1805		1652	1739
Flt Permitted	0.95	1.00	1.00		0.19	1.00
Satd. Flow (perm)	1652	1478	1805		338	1739
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	211	144	478	144	89	400
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	211	144	622	0	89	400
Turn Type		Perm			pm+pt	
Protected Phases	8		2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	12.4	12.4	24.5		33.7	33.7
Effective Green, g (s)	14.4	14.4	26.5		35.7	35.7
Actuated g/C Ratio	0.25	0.25	0.46		0.61	0.61
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	409	366	823		325	1069
v/s Ratio Prot	c0.13		c0.34		0.02	c0.23
v/s Ratio Perm		0.10			0.14	
v/c Ratio	0.52	0.39	0.76		0.27	0.37
Uniform Delay, d1	18.8	18.2	13.1		7.3	5.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.1	0.7	6.4		0.5	1.0
Delay (s)	19.9	18.9	19.5		7.7	6.6
Level of Service	B	B	B		A	A
Approach Delay (s)	19.5		19.5			6.8
Approach LOS	B		B			A

Intersection Summary

HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

44: Providence & Derr Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↕↘		↙	↕↘
Volume (vph)	110	70	660	100	100	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	16	12	11	11	11	11
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		0.95		1.00	0.95
Frt	0.95		0.98		1.00	1.00
Flt Protected	0.97		1.00		0.95	1.00
Satd. Flow (prot)	1941		3354		1711	3421
Flt Permitted	0.97		1.00		0.31	1.00
Satd. Flow (perm)	1941		3354		554	3421
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	78	733	111	111	589
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	200	0	844	0	111	589
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Actuated Green, G (s)	7.3		18.7		18.7	18.7
Effective Green, g (s)	9.3		20.7		20.7	20.7
Actuated g/C Ratio	0.24		0.54		0.54	0.54
Clearance Time (s)	6.0		6.0		6.0	6.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	475		1827		302	1864
v/s Ratio Prot	c0.10		c0.25			0.17
v/s Ratio Perm					0.20	
v/c Ratio	0.42		0.46		0.37	0.32
Uniform Delay, d1	12.1		5.3		4.9	4.8
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	0.6		0.2		0.8	0.1
Delay (s)	12.7		5.4		5.7	4.9
Level of Service	B		A		A	A
Approach Delay (s)	12.7		5.4			5.0
Approach LOS	B		A			A

Intersection Summary

HCM Average Control Delay	6.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	38.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

46: Woeber Mustard Mfg & Urbana

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↗	↘		↗	↑↑	↗	↗	↑↑	
Volume (vph)	2	0	7	172	0	60	23	357	211	127	512	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	12	10	10	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1652	1478		1652	1478		1770	3539	1583	1770	3539	
Flt Permitted	0.71	1.00		0.75	1.00		0.44	1.00	1.00	0.44	1.00	
Satd. Flow (perm)	1240	1478		1308	1478		816	3539	1583	829	3539	
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)	2	0	8	191	0	67	26	397	234	141	569	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	2	8	0	191	67	0	26	397	234	141	569	0
Turn Type	Perm			Perm			pm+pt			Perm	pm+pt	
Protected Phases		4			8		5	2			1	6
Permitted Phases	4			8			2		2		6	
Actuated Green, G (s)	9.8	9.8		9.8	9.8		19.0	18.1	18.1	25.6	21.4	
Effective Green, g (s)	11.8	11.8		11.8	11.8		23.0	20.1	20.1	29.6	23.4	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.46	0.40	0.40	0.59	0.47	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	292	348		308	348		430	1420	635	606	1653	
v/s Ratio Prot		0.01			0.05		0.00	0.11		c0.03	c0.16	
v/s Ratio Perm	0.00			c0.15			0.02		0.15	0.11		
v/c Ratio	0.01	0.02		0.62	0.19		0.06	0.28	0.37	0.23	0.34	
Uniform Delay, d1	14.7	14.7		17.1	15.3		7.4	10.1	10.5	4.7	8.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.0	0.0		3.8	0.3		0.1	0.1	0.4	0.2	0.1	
Delay (s)	14.7	14.7		21.0	15.6		7.5	10.2	10.9	4.9	8.6	
Level of Service	B	B		C	B		A	B	B	A	A	
Approach Delay (s)		14.7			19.6			10.4			7.9	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	50.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

3: SR 334 WB Off Ramp & Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↑			↑↑
Volume (veh/h)	140	10	540	0	0	660
Sign Control	Stop		Free			Free
Grade	-4%		2%			-2%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	156	11	600	0	0	733
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	967	300			600	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	967	300			600	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	38	98			100	
cM capacity (veh/h)	252	696			973	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	167	300	300	367	367
Volume Left	156	0	0	0	0
Volume Right	11	0	0	0	0
cSH	264	1700	1700	1700	1700
Volume to Capacity	0.63	0.18	0.18	0.22	0.22
Queue Length 95th (ft)	97	0	0	0	0
Control Delay (s)	39.5	0.0	0.0	0.0	0.0
Lane LOS	E				
Approach Delay (s)	39.5	0.0		0.0	
Approach LOS	E				

Intersection Summary					
Average Delay			4.4		
Intersection Capacity Utilization			33.3%	ICU Level of Service	A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

6: SR 334 EB On Ramp & Urbana Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑	↑	↑	↑↑
Volume (veh/h)	0	0	610	140	20	660
Sign Control	Stop		Free			Free
Grade	0%		2%			0%
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	678	156	22	733
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1089	339			678	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1089	339			678	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			98	
cM capacity (veh/h)	205	657			910	
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	339	339	156	22	367	367
Volume Left	0	0	0	22	0	0
Volume Right	0	0	156	0	0	0
cSH	1700	1700	1700	910	1700	1700
Volume to Capacity	0.20	0.20	0.09	0.02	0.22	0.22
Queue Length 95th (ft)	0	0	0	2	0	0
Control Delay (s)	0.0	0.0	0.0	9.1	0.0	0.0
Lane LOS				A		
Approach Delay (s)	0.0			0.3		
Approach LOS						
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			30.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

13: Villa Road & SR 4

12/27/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	90	50	70	330	220	70
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)	100	56	78	367	244	78
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	806	283	322			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	806	283	322			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	70	93	94			
cM capacity (veh/h)	329	756	1232			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	156	444	322			
Volume Left	100	78	0			
Volume Right	56	0	78			
cSH	412	1232	1700			
Volume to Capacity	0.38	0.06	0.19			
Queue Length 95th (ft)	43	5	0			
Control Delay (s)	18.9	2.0	0.0			
Lane LOS	C	A				
Approach Delay (s)	18.9	2.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization		55.1%		ICU Level of Service		B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

14: Urbana Road & SR 334 WB On Ramp

12/27/2011

	↑	↗	↘	↓	↙	↖
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑↑	↗		↑↑		
Volume (veh/h)	660	60	0	660	0	0
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)	733	67	0	733	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			800		1100	367
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			800		1100	367
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			819		206	630
Direction, Lane #	NB 1	NB 2	NB 3	SB 1	SB 2	
Volume Total	367	367	67	367	367	
Volume Left	0	0	0	0	0	
Volume Right	0	0	67	0	0	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.22	0.22	0.04	0.22	0.22	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS						
Approach Delay (s)	0.0			0.0		
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			33.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 15: SR 334 & SR 4

12/27/2011



Movement	SEL	SER	NEL	NET	SWT	SWR
Lane Configurations						
Volume (veh/h)	190	40	50	240	180	130
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)	211	44	56	267	200	144
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	650	272	200			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	650	272	200			
tC, single (s)	6.5	6.3	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.2			
p0 queue free %	47	94	96			
cM capacity (veh/h)	401	743	1360			

Direction, Lane #	SE 1	NE 1	SW 1
Volume Total	256	322	344
Volume Left	211	56	0
Volume Right	44	0	144
cSH	436	1360	1700
Volume to Capacity	0.59	0.04	0.20
Queue Length 95th (ft)	91	3	0
Control Delay (s)	24.3	1.6	0.0
Lane LOS	C	A	
Approach Delay (s)	24.3	1.6	0.0
Approach LOS	C		

Intersection Summary			
Average Delay		7.3	
Intersection Capacity Utilization		55.8%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

20: Middle Urbana Road & SR 4

12/27/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	300	380	350	280	10
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)	11	333	422	389	311	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1550	317	322			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1550	317	322			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	86	54	66			
cM capacity (veh/h)	82	722	1226			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	344	811	322			
Volume Left	11	422	0			
Volume Right	333	0	11			
cSH	576	1226	1700			
Volume to Capacity	0.60	0.34	0.19			
Queue Length 95th (ft)	98	39	0			
Control Delay (s)	20.1	7.0	0.0			
Lane LOS	C	A				
Approach Delay (s)	20.1	7.0	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay			8.5			
Intersection Capacity Utilization			83.9%	ICU Level of Service	E	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

24: Montego Drive & Middle Urbana Road

12/27/2011



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	10	10	80	30	10	10	110	420	20	10	260	20
Sign Control		Stop			Stop			Free			Free	
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)	11	11	89	33	11	11	122	467	22	11	289	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1061	1056	300	1139	1056	478	311			489		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1061	1056	300	1139	1056	478	311			489		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	95	88	76	95	98	90			99		
cM capacity (veh/h)	175	202	742	139	203	592	1255			1079		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	111	56	611	322
Volume Left	11	33	122	11
Volume Right	89	11	22	22
cSH	466	178	1255	1079
Volume to Capacity	0.24	0.31	0.10	0.01
Queue Length 95th (ft)	23	31	8	1
Control Delay (s)	15.1	34.2	2.5	0.4
Lane LOS	C	D	A	A
Approach Delay (s)	15.1	34.2	2.5	0.4
Approach LOS	C	D		

Intersection Summary

Average Delay	4.8
Intersection Capacity Utilization	64.3%
ICU Level of Service	C
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis
 30: Moorefield Road & Derr Road

12/27/2011



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Sign Control	Stop			Stop	Stop	
Volume (vph)	200	40	80	160	40	170
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	222	44	89	178	44	189
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total (vph)	267	267	233			
Volume Left (vph)	0	89	44			
Volume Right (vph)	44	0	189			
Hadj (s)	-0.10	0.07	-0.45			
Departure Headway (s)	4.7	4.9	4.7			
Degree Utilization, x	0.35	0.36	0.31			
Capacity (veh/h)	717	698	703			
Control Delay (s)	10.3	10.6	9.8			
Approach Delay (s)	10.3	10.6	9.8			
Approach LOS	B	B	A			
Intersection Summary						
Delay			10.3			
HCM Level of Service			B			
Intersection Capacity Utilization			48.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

31: Montego Drive & Derr Road

12/27/2011



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	110	10	360	190	10	200
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)	122	11	400	211	11	222
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	750	506			611	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	750	506			611	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	68	98			99	
cM capacity (veh/h)	378	571			978	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	133	611	233
Volume Left	122	0	11
Volume Right	11	211	0
cSH	389	1700	978
Volume to Capacity	0.34	0.36	0.01
Queue Length 95th (ft)	37	0	1
Control Delay (s)	19.0	0.0	0.5
Lane LOS	C		A
Approach Delay (s)	19.0	0.0	0.5
Approach LOS	C		

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		43.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

39: Urbana Road & SR 334 EB Off Ramp

12/27/2011

	↑	↖	↙	↓	↘	↗	
Movement	NBT	NBR	SBL	SBT	NWL	NWR	
Lane Configurations	↑↑			↑↑		↗	
Volume (veh/h)	610	0	0	660	0	110	
Sign Control	Free			Free	Yield		
Grade	0%			0%	0%		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly flow rate (vph)	678	0	0	733	0	122	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	None			None			
Median storage (veh)							
Upstream signal (ft)							
pX, platoon unblocked							
vC, conflicting volume			678	1044	339		
vC1, stage 1 conf vol							
vC2, stage 2 conf vol							
vCu, unblocked vol			678	1044	339		
tC, single (s)			4.1	6.8	6.9		
tC, 2 stage (s)							
tF (s)			2.2	3.5	3.3		
p0 queue free %			100	100	81		
cM capacity (veh/h)			910	224	657		
Direction, Lane #	NB 1	NB 2	SB 1	SB 2	NW 1		
Volume Total	339	339	367	367	122		
Volume Left	0	0	0	0	0		
Volume Right	0	0	0	0	122		
cSH	1700	1700	1700	1700	657		
Volume to Capacity	0.20	0.20	0.22	0.22	0.19		
Queue Length 95th (ft)	0	0	0	0	17		
Control Delay (s)	0.0	0.0	0.0	0.0	11.7		
Lane LOS						B	
Approach Delay (s)	0.0			0.0	11.7		
Approach LOS						B	
Intersection Summary							
Average Delay			0.9				
Intersection Capacity Utilization			30.3%	ICU Level of Service	A		
Analysis Period (min)			15				