17

Critical Lane Volume and Level of Service Calculations

Intersection: 17. Chapman Ave / Thompson Ave

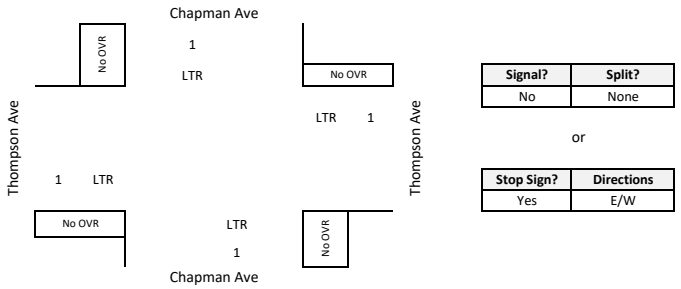
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Background Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

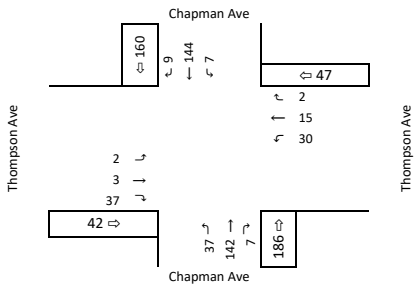


Signal?	Split?
No	None

or

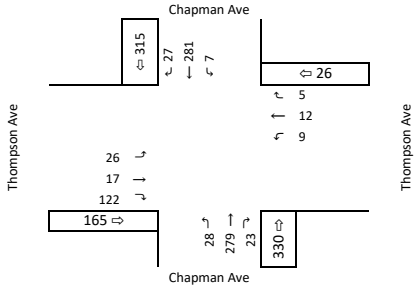
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	42	0	1.00	42				42	
WB	LTR	47	0	1.00	47				47	*
NB	LTR	186	0	1.00	186				186	*
SB	LTR	160	0	1.00	160				160	
Note:								CLV	233	
				Congestion Equiv.				v/c	0.150	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	165	0	1.00	165				165 0	*
WB	LTR	26	0	1.00	26				26 0	
NB	LTR	330	0	1.00	330				330 0	*
SB	LTR	315	0	1.00	315				315 0	
Note:								CLV	495	
				Congestion Equiv.				v/c	0.319	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

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Critical Lane Volume and Level of Service Calculations

Intersection: 16. Chapman Ave / Randolph Rd

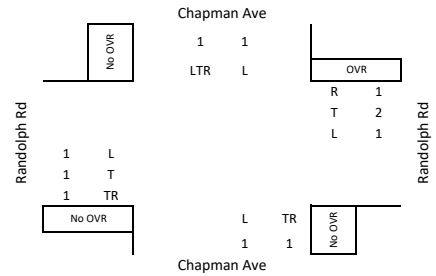
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Background Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

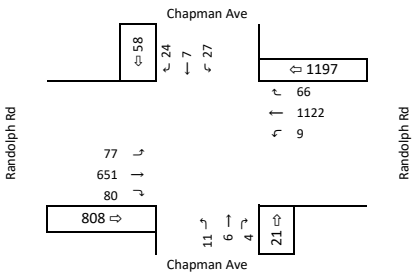


Signal?	Split?
Yes	N/S

or

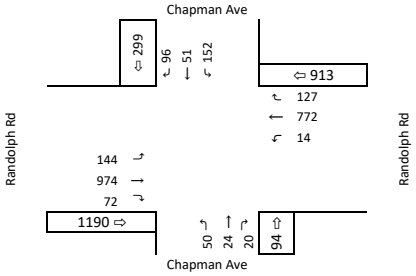
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	731	0	0.53	387	9	1.10	10	397	
WB	T	1122		0.53	595	77	1.10	85	680	*
	R	66	30	1.00	36				121	
NB	LTR	21	0	1.00	21				21	*
SB	LTR	58	0	0.60	35				35	*
Note:								CLV	736	
				Congestion Equiv.				v/c	0.475	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	1046	0	0.53	554	14	1.10	15	569	*
									15	
WB	T	772		0.53	409	144	1.10	158	567	
	R	127	127	1.00	0				158	
NB	LTR	94	0	1.00	94				94	*
									0	
SB	LTR	299	0	0.60	179				179	*
									0	
Note:								CLV	842	
				Congestion Equiv.				v/c	0.543	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	No	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	Yes	66	127		1.00	27	152		1.10	30	127	
Northbound	No	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	No	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

15

Critical Lane Volume and Level of Service Calculations

Intersection: 15. Rockville Pike / Hubbard Dr

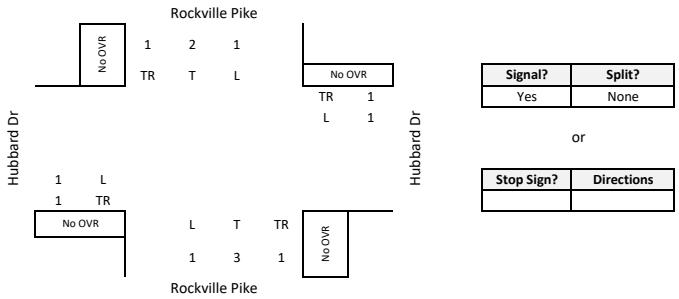
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Background Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

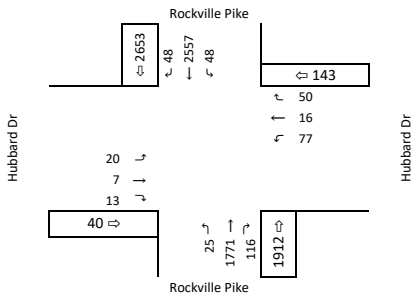


Signal?	Split?
Yes	None

or

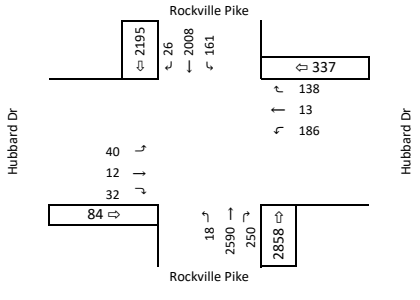
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	20	0	1.00	20	77	1.10	85	105	*
WB	TR	66	0	1.00	66	20	1.10	22	88	
NB	3T+TR	1887	0	0.30	566	48	1.10	53	619	
SB	2T+TR	2605	0	0.37	964	25	1.10	28	992	*
Note:								CLV	1097	
				Congestion Equiv.				v/c	0.708	
				1550				LOS	B	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	44	0	1.00	44	186	1.10	205	249	
	L	40		1.10	44				249	
WB	TR	151	0	1.00	151	40	1.10	44	195	
	L	186		1.10	205				249	*
NB	3T+TR	2840	0	0.30	852	161	1.10	177	1029	*
	L	18		1.10	20				197	
SB	2T+TR	2034	0	0.37	753	18	1.10	20	773	
				1.10	0				20	
Note:								CLV	1278	
				Congestion Equiv.				v/c	0.825	
				1550				LOS	C	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

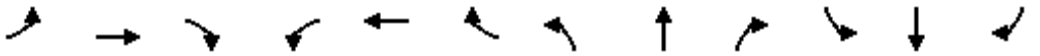
		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

HCM Signalized Intersection Capacity Analysis

Background Future AM

1: Rockville Pike - 355 & Bou Ave

10/15/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	21	25	467	11	65	36	1646	177	124	2077	6
Future Volume (vph)	14	21	25	467	11	65	36	1646	177	124	2077	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.98		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1704	1478	3204	1491		1711	4916	1531	1770	5083	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.07	1.00	
Satd. Flow (perm)		1704	1478	3204	1491		1711	4916	1531	134	5083	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	22	26	486	11	68	38	1715	184	129	2164	6
RTOR Reduction (vph)	0	0	25	0	54	0	0	0	91	0	0	0
Lane Group Flow (vph)	0	37	1	486	25	0	38	1715	93	129	2170	0
Confl. Peds. (#/hr)	4					4	5		9	9		5
Confl. Bikes (#/hr)			1									
Turn Type	Split	NA	Prot	Split	NA		Prot	NA	Prot	pm+pt	NA	
Protected Phases	3	3	3	4	4		1	5	5	6	2	
Permitted Phases										2		
Actuated Green, G (s)		7.2	7.2	31.4	31.4		7.6	67.0	67.0	79.8	79.8	
Effective Green, g (s)		7.2	7.2	31.4	31.4		7.6	67.0	67.0	79.8	79.8	
Actuated g/C Ratio		0.05	0.05	0.21	0.21		0.05	0.45	0.45	0.53	0.53	
Clearance Time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	6.0	6.0		3.0	0.2	0.2	3.0	0.2	
Lane Grp Cap (vph)		81	70	670	312		86	2195	683	288	2704	
v/s Ratio Prot		c0.02	0.00	c0.15	0.02		0.02	c0.35	0.06	0.06	c0.43	
v/s Ratio Perm										0.18		
v/c Ratio		0.46	0.02	0.73	0.08		0.44	0.78	0.14	0.45	0.80	
Uniform Delay, d1		69.5	68.0	55.3	47.7		69.1	35.3	24.5	43.2	28.7	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.70	0.57	
Incremental Delay, d2		4.0	0.1	5.5	0.3		3.6	2.8	0.4	0.9	2.1	
Delay (s)		73.5	68.1	60.7	48.0		72.7	38.1	24.9	31.3	18.6	
Level of Service		E	E	E	D		E	D	C	C	B	
Approach Delay (s)		71.3			59.0			37.5			19.3	
Approach LOS		E			E			D			B	

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	54	7	2	8	84	1544	11	30	2105	2
Future Volume (vph)	16	2	54	7	2	8	84	1544	11	30	2105	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	16	16	16	11	11	11	10	10	10
Total Lost time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.94		1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1664	1478		1917		1711	4909		1651	4745	
Flt Permitted		0.96	1.00		0.98		0.05	1.00		0.13	1.00	
Satd. Flow (perm)		1664	1478		1917		97	4909		229	4745	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	17	2	56	7	2	8	88	1608	11	31	2193	2
RTOR Reduction (vph)	0	0	54	0	8	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	19	2	0	9	0	88	1619	0	31	2195	0
Confl. Peds. (#/hr)	1					1	3		7	7		3
Confl. Bikes (#/hr)			1			1						
Turn Type	Split	NA	Prot	Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	8	8	8	4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		6.2	6.2		4.2		120.8	112.2		111.4	107.5	
Effective Green, g (s)		6.2	6.2		4.2		120.8	112.2		111.4	107.5	
Actuated g/C Ratio		0.04	0.04		0.03		0.81	0.75		0.74	0.72	
Clearance Time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	0.2		3.0	0.2	
Lane Grp Cap (vph)		68	61		53		170	3671		207	3400	
v/s Ratio Prot		c0.01	0.00		c0.00		c0.03	0.33		0.00	c0.46	
v/s Ratio Perm							0.39			0.11		
v/c Ratio		0.28	0.04		0.17		0.52	0.44		0.15	0.65	
Uniform Delay, d1		69.7	69.0		71.2		13.3	7.1		5.3	11.2	
Progression Factor		1.00	1.00		1.00		3.68	0.10		0.45	0.26	
Incremental Delay, d2		2.2	0.3		1.6		1.8	0.3		0.3	0.8	
Delay (s)		72.0	69.3		72.8		50.8	1.0		2.7	3.8	
Level of Service		E	E		E		D	A		A	A	
Approach Delay (s)		70.0			72.8			3.6			3.8	
Approach LOS		E			E			A			A	

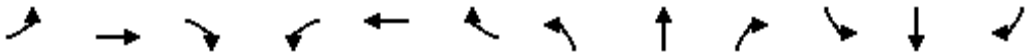
Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	19	1543	25	0	2156
Future Volume (Veh/h)	0	19	1543	25	0	2156
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	24	1953	32	0	2729
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			225			340
pX, platoon unblocked	0.78	0.88			0.88	
vC, conflicting volume	2879	667			1985	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1350	129			1632	
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	97			100	
cM capacity (veh/h)	110	786			345	

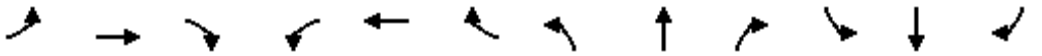
Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	24	781	781	423	910	910	910
Volume Left	0	0	0	0	0	0	0
Volume Right	24	0	0	32	0	0	0
cSH	786	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.03	0.46	0.46	0.25	0.54	0.54	0.54
Queue Length 95th (ft)	2	0	0	0	0	0	0
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	A						
Approach Delay (s)	9.7	0.0			0.0		
Approach LOS	A						

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	256	136	0	312	186	103	1430	106	200	2020	0
Future Volume (vph)	0	256	136	0	312	186	103	1430	106	200	2020	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	11	11	11
Total Lost time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		0.99			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3106			3539	1583	1652	4746	1478	1711	4916	
Flt Permitted		1.00			1.00	1.00	0.06	1.00	1.00	0.12	1.00	
Satd. Flow (perm)		3106			3539	1583	96	4746	1478	224	4916	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	261	139	0	318	190	105	1459	108	204	2061	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	45	0	0	0
Lane Group Flow (vph)	0	400	0	0	318	190	105	1459	63	204	2061	0
Confl. Peds. (#/hr)	13		9	9		13			4			
Confl. Bikes (#/hr)									1			
Turn Type		NA			NA	Prot	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases		4			8	8	1	6	6	5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		26.5			26.5	26.5	99.9	88.0	88.0	107.1	91.6	
Effective Green, g (s)		26.5			26.5	26.5	99.9	88.0	88.0	107.1	91.6	
Actuated g/C Ratio		0.18			0.18	0.18	0.67	0.59	0.59	0.71	0.61	
Clearance Time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Vehicle Extension (s)		4.0			4.0	4.0	4.0	0.2	0.2	4.0	0.2	
Lane Grp Cap (vph)		548			625	279	187	2784	867	313	3002	
v/s Ratio Prot		c0.13			0.09	0.12	0.04	0.31	0.04	c0.07	c0.42	
v/s Ratio Perm							0.33			0.40		
v/c Ratio		0.73			0.51	0.68	0.56	0.52	0.07	0.65	0.69	
Uniform Delay, d1		58.4			55.9	57.8	22.6	18.5	13.4	12.9	19.6	
Progression Factor		1.00			1.00	1.00	1.96	0.22	0.02	1.00	1.00	
Incremental Delay, d2		5.2			0.9	7.2	4.4	0.7	0.2	5.3	1.3	
Delay (s)		63.5			56.8	65.0	48.9	4.7	0.4	18.2	20.9	
Level of Service		E			E	E	D	A	A	B	C	
Approach Delay (s)		63.5			59.8			7.2			20.6	
Approach LOS		E			E			A			C	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	509	73	531	440	123	67	48	197	84	50	24
Future Volume (vph)	40	509	73	531	440	123	67	48	197	84	50	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	11	11	11	10	10	10	10	10	10
Total Lost time (s)	5.5	6.0		5.5	6.0			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	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	0.97			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1647	3235		3319	3283			1689	1478	3204	1739	1439
Flt Permitted	0.43	1.00		0.95	1.00			0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	751	3235		3319	3283			1689	1478	3204	1739	1439
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	41	525	75	547	454	127	69	49	203	87	52	25
RTOR Reduction (vph)	0	5	0	0	9	0	0	0	137	0	0	24
Lane Group Flow (vph)	41	595	0	547	572	0	0	118	66	87	52	1
Confl. Peds. (#/hr)	4		1	1		4	5		14	14		5
Confl. Bikes (#/hr)			4			1						1
Turn Type	pm+pt	NA		Prot	NA		Split	NA	pt+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	4 1	3	3	
Permitted Phases	2											3
Actuated Green, G (s)	104.0	98.3		37.1	129.7			18.4	62.0	11.2	11.2	11.2
Effective Green, g (s)	104.0	98.3		37.1	129.7			18.4	62.0	11.2	11.2	11.2
Actuated g/C Ratio	0.55	0.52		0.20	0.68			0.10	0.33	0.06	0.06	0.06
Clearance Time (s)	5.5	6.0		5.5	6.0			6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	439	1678		649	2246			163	483	189	102	85
v/s Ratio Prot	0.00	c0.18		c0.16	0.17			c0.07	0.04	0.03	c0.03	
v/s Ratio Perm	0.05											0.00
v/c Ratio	0.09	0.35		0.84	0.25			0.72	0.14	0.46	0.51	0.02
Uniform Delay, d1	19.8	26.9		73.4	11.4			83.1	44.9	86.2	86.5	84.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6		9.7	0.3			14.7	0.1	1.8	4.0	0.1
Delay (s)	19.9	27.5		83.1	11.7			97.8	45.0	88.0	90.5	84.0
Level of Service	B	C		F	B			F	D	F	F	F
Approach Delay (s)		27.0			46.3			64.4			88.2	
Approach LOS		C			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	189.5	Sum of lost time (s)	24.5
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	1	0	4	2	356	2	5	644	5
Future Volume (Veh/h)	0	0	0	1	0	4	2	356	2	5	644	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	0	0	1	0	5	3	451	3	6	815	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								471			256	
pX, platoon unblocked												
vC, conflicting volume	1066	1290	410	878	1292	227	821			454		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1066	1290	410	878	1292	227	821			454		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	100	100	100	100	100	99	100			99		
cM capacity (veh/h)	174	161	590	241	160	776	804			1103		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	6	228	228	414	414
Volume Left	0	1	3	0	6	0
Volume Right	0	5	0	3	0	6
cSH	1700	566	804	1700	1103	1700
Volume to Capacity	0.06	0.01	0.00	0.13	0.01	0.24
Queue Length 95th (ft)	0	1	0	0	0	0
Control Delay (s)	0.0	11.4	0.2	0.0	0.2	0.0
Lane LOS	A	B	A		A	
Approach Delay (s)	0.0	11.4	0.1		0.1	
Approach LOS	A	B				

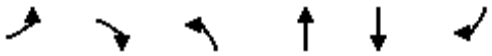
Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	31.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	36	324	71	36	572
Future Volume (Veh/h)	35	36	324	71	36	572
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	36	37	334	73	37	590
Pedestrians	11					3
Lane Width (ft)	12.0					10.0
Walking Speed (ft/s)	3.5					3.5
Percent Blockage	1					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			287			440
pX, platoon unblocked	0.96	0.96			0.96	
vC, conflicting volume	750	384			418	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	723	344			378	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	94			97	
cM capacity (veh/h)	333	621			1123	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	36	37	407	234	393
Volume Left	36	0	0	37	0
Volume Right	0	37	73	0	0
cSH	333	621	1700	1123	1700
Volume to Capacity	0.11	0.06	0.24	0.03	0.23
Queue Length 95th (ft)	9	5	0	3	0
Control Delay (s)	17.1	11.2	0.0	1.6	0.0
Lane LOS	C	B		A	
Approach Delay (s)	14.1		0.0	0.6	
Approach LOS	B				

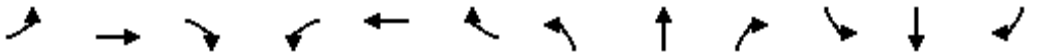
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	0	1	362	609	3
Future Volume (Veh/h)	1	0	1	362	609	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.85
Hourly flow rate (vph)	2	0	2	575	967	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				111	616	
pX, platoon unblocked	0.93					
vC, conflicting volume	1548	324	971			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1552	324	971			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	97	671	706			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	2	577	387	387	197
Volume Left	2	2	0	0	0
Volume Right	0	0	0	0	4
cSH	97	706	1700	1700	1700
Volume to Capacity	0.02	0.00	0.23	0.23	0.12
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	43.0	0.1	0.0	0.0	0.0
Lane LOS	E	A			
Approach Delay (s)	43.0	0.1	0.0		
Approach LOS	E				

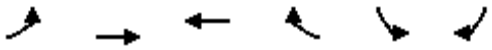
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	116	37	6	91	153	4	41	4	137	79	393
Future Volume (vph)	169	116	37	6	91	153	4	41	4	137	79	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.97	1.00	1.00	1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1635	1653		1605	1739	1416	1645	1711		1611	1739	1478
Flt Permitted	0.63	1.00		0.66	1.00	1.00	0.70	1.00		0.73	1.00	1.00
Satd. Flow (perm)	1085	1653		1107	1739	1416	1217	1711		1232	1739	1478
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	178	122	39	6	96	161	4	43	4	144	83	414
RTOR Reduction (vph)	0	7	0	0	0	103	0	1	0	0	0	175
Lane Group Flow (vph)	178	154	0	6	96	58	4	46	0	144	83	239
Confl. Peds. (#/hr)	5		8	8		5	2		11	11		2
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6			2			4			8	8 1
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	86.2	86.2		60.0	60.0	60.0	70.0	70.0		70.0	70.0	96.7
Effective Green, g (s)	86.2	86.2		60.0	60.0	60.0	70.0	70.0		70.0	70.0	96.7
Actuated g/C Ratio	0.51	0.51		0.36	0.36	0.36	0.42	0.42		0.42	0.42	0.58
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	6.0	0.2		0.2	0.2	0.2	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	625	849		396	622	506	507	714		514	725	852
v/s Ratio Prot	0.04	0.09			0.06			0.03			0.05	c0.16
v/s Ratio Perm	c0.11			0.01		0.04	0.00			0.12		
v/c Ratio	0.28	0.18		0.02	0.15	0.11	0.01	0.06		0.28	0.11	0.28
Uniform Delay, d1	22.4	21.8		34.8	36.6	36.1	28.6	29.2		32.2	29.9	17.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0		0.1	0.5	0.5	0.0	0.0		1.4	0.3	0.5
Delay (s)	23.1	21.9		34.8	37.1	36.5	28.6	29.3		33.6	30.2	18.4
Level of Service	C	C		C	D	D	C	C		C	C	B
Approach Delay (s)		22.5			36.7			29.2			23.4	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	167.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

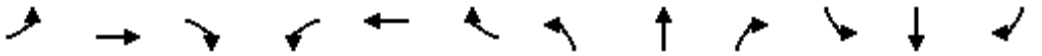
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	300	509	14	16	8
Future Volume (Veh/h)	10	300	509	14	16	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	319	541	15	17	9
Pedestrians		4			7	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		278	280			
pX, platoon unblocked						
vC, conflicting volume	563				737	289
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	563				737	289
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				95	99
cM capacity (veh/h)	998				348	700

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	117	213	361	195	26
Volume Left	11	0	0	0	17
Volume Right	0	0	0	15	9
cSH	998	1700	1700	1700	421
Volume to Capacity	0.01	0.13	0.21	0.11	0.06
Queue Length 95th (ft)	1	0	0	0	5
Control Delay (s)	0.9	0.0	0.0	0.0	14.1
Lane LOS	A				B
Approach Delay (s)	0.3		0.0		14.1
Approach LOS					B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	26.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	44	27	230	32	38	9	243	340	20	218	18
Future Volume (vph)	17	44	27	230	32	38	9	243	340	20	218	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.94		1.00	0.92			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1711	1680		1711	1620			1797	1506		3361	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00		0.92	
Satd. Flow (perm)	1711	1680		1711	1620			1777	1506		3103	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	48	29	250	35	41	10	264	370	22	237	20
RTOR Reduction (vph)	0	21	0	0	33	0	0	0	72	0	4	0
Lane Group Flow (vph)	18	56	0	250	43	0	0	274	298	0	275	0
Confl. Peds. (#/hr)	7		10	10		7	7		6	6		7
Confl. Bikes (#/hr)			1			1			1			1
Turn Type	Split	NA		Split	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	4	4		3	3			2	3		6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	7.2	7.2		20.1	20.1			67.7	87.8		67.7	
Effective Green, g (s)	7.2	7.2		20.1	20.1			67.7	87.8		67.7	
Actuated g/C Ratio	0.07	0.07		0.18	0.18			0.62	0.81		0.62	
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Vehicle Extension (s)	2.0	2.0		1.0	1.0			5.0	1.0		5.0	
Lane Grp Cap (vph)	113	110		315	298			1103	1213		1927	
v/s Ratio Prot	0.01	c0.03		c0.15	0.03				0.05			
v/s Ratio Perm								c0.15	0.15		0.09	
v/c Ratio	0.16	0.50		0.79	0.14			0.25	0.25		0.14	
Uniform Delay, d1	48.0	49.2		42.5	37.2			9.3	2.6		8.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.2	1.3		12.1	0.1			0.5	0.0		0.2	
Delay (s)	48.3	50.5		54.5	37.3			9.8	2.6		8.7	
Level of Service	D	D		D	D			A	A		A	
Approach Delay (s)		50.1			50.5			5.7			8.7	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	52	56	176	28	67	79	1234	311	63	1833	20
Future Volume (vph)	42	52	56	176	28	67	79	1234	311	63	1833	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.96	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3157		1690	1863	1583	1711	4741		1711	4906	
Flt Permitted	0.74	1.00		0.68	1.00	1.00	0.07	1.00		0.12	1.00	
Satd. Flow (perm)	1370	3157		1212	1863	1583	128	4741		209	4906	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	44	54	58	183	29	70	82	1285	324	66	1909	21
RTOR Reduction (vph)	0	47	0	0	0	56	0	16	0	0	0	0
Lane Group Flow (vph)	44	65	0	183	29	14	82	1593	0	66	1930	0
Confl. Peds. (#/hr)	2		28	28		2	1		7	7		1
Confl. Bikes (#/hr)						1						
Turn Type	Perm	NA		Perm	NA	Prot	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	8	1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	36.2	36.2		36.2	36.2	36.2	135.3	124.2		132.3	122.7	
Effective Green, g (s)	36.2	36.2		36.2	36.2	36.2	135.3	124.2		132.3	122.7	
Actuated g/C Ratio	0.19	0.19		0.19	0.19	0.19	0.72	0.66		0.71	0.65	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	264	609		233	359	305	186	3140		224	3210	
v/s Ratio Prot		0.02			0.02	0.01	c0.03	0.34		0.02	c0.39	
v/s Ratio Perm	0.03			c0.15			0.29			0.19		
v/c Ratio	0.17	0.11		0.79	0.08	0.04	0.44	0.51		0.29	0.60	
Uniform Delay, d1	63.1	62.3		72.0	62.0	61.6	14.5	16.1		10.5	18.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.2		18.1	0.2	0.1	3.5	0.6		1.5	0.8	
Delay (s)	63.7	62.5		90.1	62.2	61.7	18.0	16.7		12.0	19.3	
Level of Service	E	E		F	E	E	B	B		B	B	
Approach Delay (s)		62.8			80.2			16.7			19.1	
Approach LOS		E			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	187.5	Sum of lost time (s)	17.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	24	51	163	19	124	50	490	277	179	804	63
Future Volume (vph)	36	24	51	163	19	124	50	490	277	179	804	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	10	10	10	10	10	10
Total Lost time (s)	6.5	6.5		7.0	7.0	7.0	8.0	6.0		8.0	6.0	6.0
Lane Util. Factor	0.95	0.95		0.95	0.95	1.00	1.00	0.91		0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1572		1625	1645	1531	1651	4465		3203	3303	1433
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.30	1.00		0.31	1.00	1.00
Satd. Flow (perm)	1681	1572		1625	1645	1531	520	4465		1053	3303	1433
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	38	26	54	173	20	132	53	521	295	190	855	67
RTOR Reduction (vph)	0	33	0	0	0	111	0	20	0	0	0	20
Lane Group Flow (vph)	34	51	0	97	96	21	53	796	0	190	855	47
Confl. Peds. (#/hr)	10		2	2		10	2		1	1		2
Confl. Bikes (#/hr)												1
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases							2			6		6
Actuated Green, G (s)	12.4	12.4		18.5	18.5	34.4	157.6	150.2		160.6	151.7	151.7
Effective Green, g (s)	12.4	12.4		18.5	18.5	34.4	157.6	150.2		160.6	151.7	151.7
Actuated g/C Ratio	0.06	0.06		0.09	0.09	0.16	0.72	0.69		0.74	0.70	0.70
Clearance Time (s)	6.5	6.5		7.0	7.0		8.0	6.0		8.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	95	89		138	139	242	415	3083		865	2303	999
v/s Ratio Prot	0.02	c0.03		c0.06	0.06	0.01	0.00	0.18		c0.01	c0.26	
v/s Ratio Perm							0.09			0.15		0.03
v/c Ratio	0.36	0.57		0.70	0.69	0.09	0.13	0.26		0.22	0.37	0.05
Uniform Delay, d1	98.7	100.0		96.8	96.7	78.1	9.0	12.7		8.1	13.4	10.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3	8.6		15.0	13.8	0.2	0.1	0.2		0.1	0.5	0.1
Delay (s)	101.0	108.6		111.8	110.5	78.3	9.2	12.9		8.3	13.9	10.4
Level of Service	F	F		F	F	E	A	B		A	B	B
Approach Delay (s)		106.4			97.8			12.6			12.7	
Approach LOS		F			F			B			B	

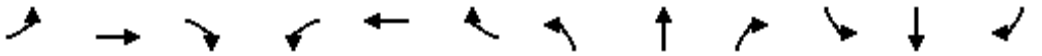
Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	217.5	Sum of lost time (s)	27.5
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	622	56	258	1041	129	80	54	123	138	74	14
Future Volume (vph)	16	622	56	258	1041	129	80	54	123	138	74	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	11	11	12	12	12
Total Lost time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	3252		1770	3475		1711	1801	1531	1765	1863	1583
Flt Permitted	0.20	1.00		0.30	1.00		0.71	1.00	1.00	0.57	1.00	1.00
Satd. Flow (perm)	348	3252		560	3475		1272	1801	1531	1057	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	655	59	272	1096	136	84	57	129	145	78	15
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	17	714	0	272	1232	0	84	57	129	145	78	15
Confl. Peds. (#/hr)	1		4	4		1			2	2		
Confl. Bikes (#/hr)									1			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Prot	pm+pt	NA	Prot
Protected Phases	1	6		5	2		3	8	8	7	4	4
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	120.5	116.5		149.1	139.1		39.6	24.5	24.5	53.4	31.8	31.8
Effective Green, g (s)	120.5	116.5		149.1	139.1		39.6	24.5	24.5	53.4	31.8	31.8
Actuated g/C Ratio	0.56	0.54		0.69	0.65		0.18	0.11	0.11	0.25	0.15	0.15
Clearance Time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	5.0		3.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	218	1758		536	2243		264	204	174	335	274	233
v/s Ratio Prot	0.00	0.22		c0.06	c0.35		0.02	0.03	c0.08	c0.04	0.04	0.01
v/s Ratio Perm	0.04			0.29			0.04			0.06		
v/c Ratio	0.08	0.41		0.51	0.55		0.32	0.28	0.74	0.43	0.28	0.06
Uniform Delay, d1	21.6	29.1		14.6	21.0		75.5	87.4	92.4	66.5	81.7	79.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.7		0.8	1.0		1.0	1.0	16.5	1.2	0.8	0.2
Delay (s)	21.8	29.8		15.3	22.0		76.4	88.4	109.0	67.8	82.5	79.2
Level of Service	C	C		B	C		E	F	F	E	F	E
Approach Delay (s)		29.6			20.8			94.5			73.3	
Approach LOS		C			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	215.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

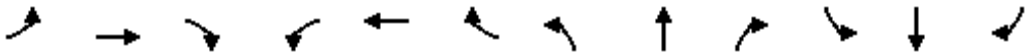
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	7	13	77	16	50	25	1771	116	48	2557	48
Future Volume (vph)	20	7	13	77	16	50	25	1771	116	48	2557	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.96		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.89		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1649	1603		1770	1579		1711	6112		1710	4893	
Flt Permitted	0.71	1.00		0.74	1.00		0.03	1.00		0.08	1.00	
Satd. Flow (perm)	1238	1603		1386	1579		62	6112		142	4893	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	7	13	79	16	51	26	1807	118	49	2609	49
RTOR Reduction (vph)	0	12	0	0	46	0	0	3	0	0	1	0
Lane Group Flow (vph)	20	8	0	79	21	0	26	1922	0	49	2657	0
Confl. Peds. (#/hr)	25					25	29		16	16		29
Confl. Bikes (#/hr)			4			3						
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	16.3	16.3		16.3	16.3		121.3	116.3		126.1	118.7	
Effective Green, g (s)	16.3	16.3		16.3	16.3		121.3	116.3		126.1	118.7	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.77	0.73		0.80	0.75	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	127	164		142	162		99	4484		186	3664	
v/s Ratio Prot		0.01			0.01		0.01	0.31		c0.01	c0.54	
v/s Ratio Perm	0.02			c0.06			0.19			0.20		
v/c Ratio	0.16	0.05		0.56	0.13		0.26	0.43		0.26	0.73	
Uniform Delay, d1	64.8	64.1		67.7	64.7		11.1	8.2		4.6	10.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.3		7.8	0.8		3.0	0.3		1.6	1.3	
Delay (s)	66.1	64.4		75.5	65.4		14.0	8.5		6.1	12.2	
Level of Service	E	E		E	E		B	A		A	B	
Approach Delay (s)		65.2			70.9			8.6			12.1	
Approach LOS		E			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	158.5	Sum of lost time (s)	18.5
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	651	80	9	1122	66	11	6	4	27	7	24
Future Volume (vph)	77	651	80	9	1122	66	11	6	4	27	7	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.97	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	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	1.00	0.85	1.00	0.94		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	3229		1646	3303	1429	1711	1675		1681	1545	
Flt Permitted	0.16	1.00		0.34	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	276	3229		582	3303	1429	1711	1675		1681	1545	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	89	748	92	10	1290	76	13	7	5	31	8	28
RTOR Reduction (vph)	0	3	0	0	0	24	0	5	0	0	0	0
Lane Group Flow (vph)	89	837	0	10	1290	52	13	7	0	28	39	0
Confl. Peds. (#/hr)	4		11	11		4	4		3	3		4
Confl. Bikes (#/hr)												1
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2						
Actuated Green, G (s)	116.1	108.3		103.9	101.1	101.1	5.1	5.1		8.8	8.8	
Effective Green, g (s)	116.1	108.3		103.9	101.1	101.1	5.1	5.1		8.8	8.8	
Actuated g/C Ratio	0.78	0.73		0.70	0.68	0.68	0.03	0.03		0.06	0.06	
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	0.2		4.0	0.2	0.2	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	309	2362		428	2256	976	58	57		99	91	
v/s Ratio Prot	c0.02	c0.26		0.00	c0.39		c0.01	0.00		0.02	c0.03	
v/s Ratio Perm	0.21			0.02		0.04						
v/c Ratio	0.29	0.35		0.02	0.57	0.05	0.22	0.13		0.28	0.43	
Uniform Delay, d1	7.0	7.2		6.6	12.2	7.7	69.5	69.3		66.6	67.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.4		0.0	1.1	0.1	2.7	1.4		2.1	4.4	
Delay (s)	7.7	7.6		6.6	13.3	7.8	72.2	70.6		68.7	71.5	
Level of Service	A	A		A	B	A	E	E		E	E	
Approach Delay (s)		7.6			12.9			71.5			70.4	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	3	37	30	15	2	37	142	7	7	144	9
Future Volume (Veh/h)	2	3	37	30	15	2	37	142	7	7	144	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	2	3	43	34	17	2	43	163	8	8	166	10
Pedestrians		71			19			50			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		7			2			5			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								638				
pX, platoon unblocked												
vC, conflicting volume	524	534	292	554	535	188	247			190		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	524	534	292	554	535	188	247			190		
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 %	99	99	94	90	96	100	97			99		
cM capacity (veh/h)	378	397	664	350	397	837	1230			1359		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	48	53	214	184
Volume Left	2	34	43	8
Volume Right	43	2	8	10
cSH	618	372	1230	1359
Volume to Capacity	0.08	0.14	0.03	0.01
Queue Length 95th (ft)	6	12	3	0
Control Delay (s)	11.3	16.3	1.9	0.4
Lane LOS	B	C	A	A
Approach Delay (s)	11.3	16.3	1.9	0.4
Approach LOS	B	C		

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	41.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	EB	EB	B28	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	LT	R	T	L	L	TR	L	T	T	T	R	L
Maximum Queue (ft)	142	68	35	200	200	192	182	424	448	430	237	270
Average Queue (ft)	37	36	1	172	175	43	54	252	280	278	75	154
95th Queue (ft)	88	74	12	235	237	127	121	495	522	502	186	303
Link Distance (ft)	69		243	192	192			394	394	394	394	
Upstream Blk Time (%)	7	2		31	37	0		6	8	10		
Queuing Penalty (veh)	0	0		80	96	0		26	37	45		
Storage Bay Dist (ft)		90				200	175					245
Storage Blk Time (%)	7	2			37	0	0	25				2
Queuing Penalty (veh)	2	1			28	0	0	9				13

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	538	554	529
Average Queue (ft)	378	386	398
95th Queue (ft)	655	668	660
Link Distance (ft)	511	511	511
Upstream Blk Time (%)	6	6	8
Queuing Penalty (veh)	43	46	55
Storage Bay Dist (ft)			
Storage Blk Time (%)	30		
Queuing Penalty (veh)	38		

Intersection: 2: Rockville Pike - 355 & Federal Plaza/Pike Center

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	LTR	L	T	T	TR	L	T	T	TR
Maximum Queue (ft)	104	63	70	198	509	544	521	156	200	198	205
Average Queue (ft)	41	41	19	55	86	171	188	24	98	114	113
95th Queue (ft)	83	69	55	118	323	492	518	78	214	220	211
Link Distance (ft)	79		42		511	511	511		160	160	160
Upstream Blk Time (%)	3	0	6		0	1	1	0	5	6	6
Queuing Penalty (veh)	0	0	0		0	6	4	0	36	42	44
Storage Bay Dist (ft)		150		245				175			
Storage Blk Time (%)	3	0			2			0	5		
Queuing Penalty (veh)	1	0			1			0	2		

Intersection: 3: Rockville Pike - 355 & Gas Station

Movement	WB	NB	NB	SB	SB	SB
Directions Served	R	T	TR	T	T	T
Maximum Queue (ft)	51	165	170	271	290	295
Average Queue (ft)	16	30	42	55	65	61
95th Queue (ft)	41	127	150	194	212	206
Link Distance (ft)	50	160	160	238	238	238
Upstream Blk Time (%)	0	1	1	1	2	2
Queuing Penalty (veh)	0	5	5	8	15	15
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Rockville Pike - 355 & Rolllins Avenue /Twinbrook Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	T	TR	T	T	R	L	T	T	T	R	L	T
Maximum Queue (ft)	394	454	487	483	175	114	267	257	249	238	424	745
Average Queue (ft)	149	230	101	100	84	47	110	106	113	16	161	245
95th Queue (ft)	318	396	297	310	190	107	259	263	259	114	354	546
Link Distance (ft)	1299	1299	549	549		238	238	238	238			1180
Upstream Blk Time (%)							2	1	2	0		
Queuing Penalty (veh)							7	5	7	0		
Storage Bay Dist (ft)					150					300	400	
Storage Blk Time (%)				6	11				2	0	0	3
Queuing Penalty (veh)				10	17				2	0	0	7

Intersection: 4: Rockville Pike - 355 & Rolllins Avenue /Twinbrook Parkway

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	707	670
Average Queue (ft)	244	246
95th Queue (ft)	527	527
Link Distance (ft)	1180	1180
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Chapman Ave & Twinbrook Parkway

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	L	T	TR	LT	R	L	L	T
Maximum Queue (ft)	199	356	386	312	325	1331	1330	178	185	132	168	199
Average Queue (ft)	20	99	123	190	317	1274	1039	156	152	41	76	90
95th Queue (ft)	100	281	311	370	329	1510	1846	214	217	110	150	171
Link Distance (ft)		549	549			1298	1298	167	167			530
Upstream Blk Time (%)						57	33	54	46			
Queuing Penalty (veh)						291	167	98	83			
Storage Bay Dist (ft)	175			300	300					300	300	
Storage Blk Time (%)		6		0	80							
Queuing Penalty (veh)		2		1	175							

Intersection: 6: Chapman Ave & Pike Center North/Driveway

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	LT	TR	LT	TR
Maximum Queue (ft)	22	111	109	148	183
Average Queue (ft)	2	58	57	24	33
95th Queue (ft)	13	125	132	92	137
Link Distance (ft)	28	97	97	167	167
Upstream Blk Time (%)	4	20	23	0	1
Queuing Penalty (veh)	0	36	42	0	4
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: Chapman Ave & Rollins Ave

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	LT	T
Maximum Queue (ft)	47	94	119	122	122
Average Queue (ft)	19	33	70	35	32
95th Queue (ft)	41	80	154	111	113
Link Distance (ft)	56	56	112	97	97
Upstream Blk Time (%)	0	13	29	4	3
Queuing Penalty (veh)	0	0	105	13	9
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: Chapman Ave & Pike Center South

Movement	NB	SB	SB	SB
Directions Served	LT	T	T	TR
Maximum Queue (ft)	119	119	109	119
Average Queue (ft)	56	40	15	54
95th Queue (ft)	149	107	67	132
Link Distance (ft)	46	112	112	112
Upstream Blk Time (%)	27	1	3	3
Queuing Penalty (veh)	98	3	5	5
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Chapman Ave & Bou Ave

Movement	EB	EB	WB	WB	WB	NB	NB	B35	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	T	L	T	R
Maximum Queue (ft)	217	170	29	152	139	24	204	124	49	48	52
Average Queue (ft)	121	51	7	70	43	3	61	12	36	23	32
95th Queue (ft)	250	139	25	133	122	16	174	67	64	56	66
Link Distance (ft)	201	201	817	817			130	285	46	46	46
Upstream Blk Time (%)	9						10		34	16	13
Queuing Penalty (veh)	15						15		68	33	26
Storage Bay Dist (ft)					250	70					
Storage Blk Time (%)							19				
Queuing Penalty (veh)							1				

Intersection: 10: Bou Ave & Pike Center

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	124	211	200	204	51
Average Queue (ft)	25	20	81	95	19
95th Queue (ft)	82	118	196	209	46
Link Distance (ft)		192	201	201	300
Upstream Blk Time (%)		3	0	2	
Queuing Penalty (veh)		10	0	4	
Storage Bay Dist (ft)	100				
Storage Blk Time (%)	6	0			
Queuing Penalty (veh)	8	0			

Intersection: 11: East Jefferson Street & Rolllins Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	TR
Maximum Queue (ft)	96	158	327	178	158	98	244	170
Average Queue (ft)	22	53	137	27	57	36	66	19
95th Queue (ft)	64	108	284	83	127	77	154	79
Link Distance (ft)	477	477	1299	1299	295	295	317	317
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 12: Rockville Pike - 355/Rockville PIke- 355 & Halpine Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	T	TR	L	T
Maximum Queue (ft)	140	74	137	306	71	162	189	583	639	644	200	512
Average Queue (ft)	42	29	44	185	20	62	79	167	196	215	60	387
95th Queue (ft)	106	66	96	286	57	124	172	460	484	532	182	556
Link Distance (ft)		832	832	497	497			1180	1180	1180		449
Upstream Blk Time (%)												10
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	250					450	165				175	
Storage Blk Time (%)							3	7				25
Queuing Penalty (veh)							13	5				16

Intersection: 12: Rockville Pike - 355/Rockville PIke- 355 & Halpine Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	464	464
Average Queue (ft)	299	202
95th Queue (ft)	509	417
Link Distance (ft)	449	449
Upstream Blk Time (%)	2	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	LT	R	L	T	T	TR	L	L	T
Maximum Queue (ft)	92	258	225	543	162	214	242	310	329	236	266	474
Average Queue (ft)	43	109	130	185	95	32	81	108	152	28	80	415
95th Queue (ft)	91	227	234	386	158	96	195	239	306	125	198	479
Link Distance (ft)	445	445		893	893		1298	1298	1298		411	411
Upstream Blk Time (%)												73
Queuing Penalty (veh)												0
Storage Bay Dist (ft)			200			190				240		
Storage Blk Time (%)			8	19			1			0	0	
Queuing Penalty (veh)			8	16			1			0	0	

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	445	275
Average Queue (ft)	390	66
95th Queue (ft)	482	256
Link Distance (ft)	411	
Upstream Blk Time (%)	48	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		250
Storage Blk Time (%)	71	0
Queuing Penalty (veh)	45	0

Intersection: 14: Nebel Street & Randolph Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	T	R
Maximum Queue (ft)	47	289	274	150	422	413	124	169	245	250	139	74
Average Queue (ft)	10	117	113	108	234	226	44	55	133	120	63	19
95th Queue (ft)	33	220	230	180	426	420	99	114	227	223	133	54
Link Distance (ft)		598	598		1100	1100		557	557		1623	1623
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140			125			100			250		
Storage Blk Time (%)		8		9	18		0	7		2		
Queuing Penalty (veh)		1		48	46		0	5		2		

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	T	TR	L	T	T
Maximum Queue (ft)	65	38	136	116	46	301	325	300	155	205	394	394
Average Queue (ft)	15	11	64	48	13	151	187	144	58	51	177	187
95th Queue (ft)	46	29	123	94	37	280	307	268	128	151	386	406
Link Distance (ft)	148	148	134	134	1538	1538	1538	1538	1538		394	394
Upstream Blk Time (%)			0	0							1	1
Queuing Penalty (veh)			0	0							6	5
Storage Bay Dist (ft)										180		
Storage Blk Time (%)											9	
Queuing Penalty (veh)											4	

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	402
Average Queue (ft)	215
95th Queue (ft)	424
Link Distance (ft)	394
Upstream Blk Time (%)	1
Queuing Penalty (veh)	9
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 16: Chapman Ave & Josiah Henson Parkway/Randolph Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	LTR
Maximum Queue (ft)	73	224	220	46	273	307	235	27	30	50	95
Average Queue (ft)	32	61	44	5	72	78	10	7	9	12	33
95th Queue (ft)	59	150	126	23	198	212	79	25	30	35	69
Link Distance (ft)		528	528		598	598			376	226	226
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	350			165			215	250			
Storage Blk Time (%)					2	2	0				
Queuing Penalty (veh)					0	1	0				

Intersection: 17: Chapman Ave/Chapman Road & Thompson Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	30	54	54	52
Average Queue (ft)	19	26	15	3
95th Queue (ft)	41	53	47	21
Link Distance (ft)	403	327	530	412
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 2307

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	31	36	329	21	175	57	2470	391	206	1715	18
Future Volume (vph)	17	31	36	329	21	175	57	2470	391	206	1715	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1708	1478	3204	1434		1711	4916	1531	1770	5071	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.06	1.00	
Satd. Flow (perm)		1708	1478	3204	1434		1711	4916	1531	120	5071	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	18	32	37	339	22	180	59	2546	403	212	1768	19
RTOR Reduction (vph)	0	0	35	0	148	0	0	0	89	0	0	0
Lane Group Flow (vph)	0	50	2	339	54	0	59	2546	314	212	1787	0
Confl. Peds. (#/hr)	25					25	25		25	25		25
Confl. Bikes (#/hr)			1			1			1			
Turn Type	Split	NA	Prot	Split	NA		Prot	NA	Prot	pm+pt	NA	
Protected Phases	3	3	3	4	4		1	5	5	6	2	
Permitted Phases										2		
Actuated Green, G (s)		7.6	7.6	26.9	26.9		9.3	71.0	71.0	82.2	82.2	
Effective Green, g (s)		7.6	7.6	26.9	26.9		9.3	71.0	71.0	82.2	82.2	
Actuated g/C Ratio		0.05	0.05	0.18	0.18		0.06	0.47	0.47	0.55	0.55	
Clearance Time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	6.0	6.0		3.0	0.2	0.2	3.0	0.2	
Lane Grp Cap (vph)		86	74	574	257		106	2326	724	285	2778	
v/s Ratio Prot		c0.03	0.00	c0.11	0.04		0.03	c0.52	0.21	c0.10	0.35	
v/s Ratio Perm										0.31		
v/c Ratio		0.58	0.03	0.59	0.21		0.56	1.09	0.43	0.74	0.64	
Uniform Delay, d1		69.6	67.7	56.5	52.5		68.3	39.5	26.2	58.1	23.7	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.61	0.54	
Incremental Delay, d2		9.6	0.1	3.0	1.2		6.2	50.2	1.9	8.0	0.9	
Delay (s)		79.3	67.8	59.5	53.7		74.5	89.7	28.1	43.5	13.6	
Level of Service		E	E	E	D		E	F	C	D	B	
Approach Delay (s)		74.4			57.3			81.1			16.8	
Approach LOS		E			E			F			B	

Intersection Summary			
HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	8	133	18	9	38	197	2323	23	26	1766	13
Future Volume (vph)	127	8	133	18	9	38	197	2323	23	26	1766	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	16	16	16	11	11	11	10	10	10
Total Lost time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.92		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1660	1478		1892		1711	4905		1652	4738	
Flt Permitted		0.95	1.00		0.99		0.07	1.00		0.04	1.00	
Satd. Flow (perm)		1660	1478		1892		126	4905		77	4738	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	132	8	139	19	9	40	205	2420	24	27	1840	14
RTOR Reduction (vph)	0	0	125	0	35	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	140	14	0	33	0	205	2443	0	27	1854	0
Confl. Peds. (#/hr)	3		5	5		3	23		16	16		23
Confl. Bikes (#/hr)						1						
Turn Type	Split	NA	Prot	Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	8	8	8	4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		15.1	15.1		6.6		109.8	100.9		94.6	90.7	
Effective Green, g (s)		15.1	15.1		6.6		109.8	100.9		94.6	90.7	
Actuated g/C Ratio		0.10	0.10		0.04		0.73	0.67		0.63	0.60	
Clearance Time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	0.2		3.0	0.2	
Lane Grp Cap (vph)		167	148		83		241	3299		89	2864	
v/s Ratio Prot		c0.08	0.01		c0.02		c0.08	0.50		0.01	0.39	
v/s Ratio Perm							c0.54			0.18		
v/c Ratio		0.84	0.09		0.39		0.85	0.74		0.30	0.65	
Uniform Delay, d1		66.3	61.2		69.8		36.7	16.0		15.0	19.3	
Progression Factor		1.00	1.00		1.00		1.64	0.92		1.84	0.30	
Incremental Delay, d2		29.1	0.3		3.1		2.8	0.1		1.6	0.9	
Delay (s)		95.3	61.5		72.8		62.9	14.8		29.2	6.7	
Level of Service		F	E		E		E	B		C	A	
Approach Delay (s)		78.5			72.8			18.5			7.0	
Approach LOS		E			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	58	2444	44	0	1793
Future Volume (Veh/h)	0	58	2444	44	0	1793
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	66	2777	50	0	2038
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			225			340
pX, platoon unblocked	0.79	0.67			0.67	
vC, conflicting volume	3481	951			2827	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1119	0			2006	
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	91			100	
cM capacity (veh/h)	159	727			189	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	66	1111	1111	605	679	679	679
Volume Left	0	0	0	0	0	0	0
Volume Right	66	0	0	50	0	0	0
cSH	727	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.65	0.65	0.36	0.40	0.40	0.40
Queue Length 95th (ft)	7	0	0	0	0	0	0
Control Delay (s)	10.4	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.4	0.0			0.0		
Approach LOS	B						

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	58.5%	ICU Level of Service		B
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	426	57	0	314	171	140	2106	121	204	1736	57
Future Volume (vph)	0	426	57	0	314	171	140	2106	121	204	1736	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	11	11	11
Total Lost time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3231			3539	1583	1652	4746	1478	1711	4882	
Flt Permitted		1.00			1.00	1.00	0.08	1.00	1.00	0.05	1.00	
Satd. Flow (perm)		3231			3539	1583	136	4746	1478	83	4882	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	430	58	0	317	173	141	2127	122	206	1754	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	42	0	2	0
Lane Group Flow (vph)	0	488	0	0	317	173	141	2127	80	206	1810	0
Confl. Peds. (#/hr)	24		18	18		24	26		36	36		26
Confl. Bikes (#/hr)			1			1			2			
Turn Type		NA			NA	Prot	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases		4			8	8	1	6	6	5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		29.2			29.2	29.2	96.0	82.0	82.0	105.6	86.8	
Effective Green, g (s)		29.2			29.2	29.2	96.0	82.0	82.0	105.6	86.8	
Actuated g/C Ratio		0.19			0.19	0.19	0.64	0.55	0.55	0.70	0.58	
Clearance Time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Vehicle Extension (s)		4.0			4.0	4.0	4.0	0.2	0.2	4.0	0.2	
Lane Grp Cap (vph)		628			688	308	228	2594	807	262	2825	
v/s Ratio Prot		c0.15			0.09	0.11	0.06	c0.45	0.05	c0.10	c0.37	
v/s Ratio Perm							0.34			0.45		
v/c Ratio		0.78			0.46	0.56	0.62	0.82	0.10	0.79	0.64	
Uniform Delay, d1		57.3			53.4	54.6	19.5	27.9	16.3	47.1	21.2	
Progression Factor		1.00			1.00	1.00	1.52	0.36	0.22	1.00	1.00	
Incremental Delay, d2		6.4			0.7	2.8	4.3	2.3	0.2	15.1	1.1	
Delay (s)		63.7			54.1	57.4	33.9	12.5	3.9	62.2	22.3	
Level of Service		E			D	E	C	B	A	E	C	
Approach Delay (s)		63.7			55.3			13.4			26.4	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	739	134	469	586	141	81	109	592	215	119	37
Future Volume (vph)	68	739	134	469	586	141	81	109	592	215	119	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	11	11	11	10	10	10	10	10	10
Total Lost time (s)	5.5	6.0		5.5	6.0			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	1.00	1.00	0.95
Flpb, ped/bikes	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	0.97			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1650	3211		3319	3304			1702	1478	3204	1739	1411
Flt Permitted	0.37	1.00		0.95	1.00			0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	638	3211		3319	3304			1702	1478	3204	1739	1411
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	70	762	138	484	604	145	84	112	610	222	123	38
RTOR Reduction (vph)	0	8	0	0	8	0	0	0	45	0	0	34
Lane Group Flow (vph)	70	892	0	484	741	0	0	196	565	222	123	4
Confl. Peds. (#/hr)	2		9	9		2	15		14	14		15
Confl. Bikes (#/hr)									1			1
Turn Type	pm+pt	NA		Prot	NA		Split	NA	pt+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	4 1	3	3	
Permitted Phases	2											3
Actuated Green, G (s)	85.4	77.3		47.7	116.9			22.3	76.5	17.7	17.7	17.7
Effective Green, g (s)	85.4	77.3		47.7	116.9			22.3	76.5	17.7	17.7	17.7
Actuated g/C Ratio	0.45	0.41		0.25	0.62			0.12	0.40	0.09	0.09	0.09
Clearance Time (s)	5.5	6.0		5.5	6.0			6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	330	1309		835	2038			200	596	299	162	131
v/s Ratio Prot	0.01	c0.28		0.15	0.22			0.12	c0.38	0.07	c0.07	
v/s Ratio Perm	0.09											0.00
v/c Ratio	0.21	0.68		0.58	0.36			0.98	0.95	0.74	0.76	0.03
Uniform Delay, d1	29.9	46.0		62.1	17.9			83.4	54.6	83.7	83.8	78.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	2.9		1.0	0.5			57.1	24.3	9.6	18.3	0.1
Delay (s)	30.2	48.9		63.1	18.4			140.5	78.8	93.2	102.1	78.2
Level of Service	C	D		E	B			F	E	F	F	E
Approach Delay (s)		47.5			36.0			93.8			94.6	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	59.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	189.5	Sum of lost time (s)	24.5
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1	4	4	1	7	3	751	8	5	634	4
Future Volume (Veh/h)	6	1	4	4	1	7	3	751	8	5	634	4
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)	7	1	4	4	1	8	3	834	9	6	704	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								471			256	
pX, platoon unblocked												
vC, conflicting volume	1150	1567	354	1213	1564	422	708			843		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1150	1567	354	1213	1564	422	708			843		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	95	99	99	97	99	99	100			99		
cM capacity (veh/h)	149	109	642	135	109	581	887			789		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	13	420	426	358	356
Volume Left	7	4	3	0	6	0
Volume Right	4	8	0	9	0	4
cSH	192	247	887	1700	789	1700
Volume to Capacity	0.06	0.05	0.00	0.25	0.01	0.21
Queue Length 95th (ft)	5	4	0	0	1	0
Control Delay (s)	25.0	20.4	0.1	0.0	0.3	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	25.0	20.4	0.1		0.1	
Approach LOS	C	C				

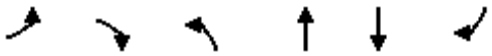
Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	33.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	71	97	665	68	45	597
Future Volume (Veh/h)	71	97	665	68	45	597
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	73	100	686	70	46	615
Pedestrians	18					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	2					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			287			440
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1138	739			774	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1091	639			679	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	57	73			94	
cM capacity (veh/h)	171	364			790	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	73	100	756	251	410
Volume Left	73	0	0	46	0
Volume Right	0	100	70	0	0
cSH	171	364	1700	790	1700
Volume to Capacity	0.43	0.27	0.44	0.06	0.24
Queue Length 95th (ft)	48	28	0	5	0
Control Delay (s)	40.8	18.6	0.0	2.3	0.0
Lane LOS	E	C		A	
Approach Delay (s)	28.0		0.0	0.9	
Approach LOS	D				

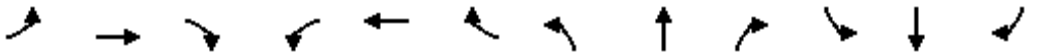
Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	3	0	728	704	8
Future Volume (Veh/h)	1	3	0	728	704	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	1	4	0	971	939	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)				111	616	
pX, platoon unblocked	0.80					
vC, conflicting volume	1916	318	950			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2018	318	950			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	41	677	719			

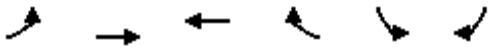
Direction, Lane #	EB 1	NB 1	SB 1	SB 2	SB 3
Volume Total	5	971	376	376	199
Volume Left	1	0	0	0	0
Volume Right	4	0	0	0	11
cSH	164	719	1700	1700	1700
Volume to Capacity	0.03	0.00	0.22	0.22	0.12
Queue Length 95th (ft)	2	0	0	0	0
Control Delay (s)	27.7	0.0	0.0	0.0	0.0
Lane LOS	D				
Approach Delay (s)	27.7	0.0	0.0		
Approach LOS	D				

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	343	239	56	15	167	258	17	127	42	246	127	334
Future Volume (vph)	343	239	56	15	167	258	17	127	42	246	127	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.98	1.00	1.00	0.98	1.00		0.97	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1637	1675		1626	1739	1391	1619	1650		1604	1739	1478
Flt Permitted	0.51	1.00		0.57	1.00	1.00	0.64	1.00		0.58	1.00	1.00
Satd. Flow (perm)	873	1675		969	1739	1391	1084	1650		976	1739	1478
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	373	260	61	16	182	280	18	138	46	267	138	363
RTOR Reduction (vph)	0	4	0	0	0	188	0	4	0	0	0	141
Lane Group Flow (vph)	373	317	0	16	182	92	18	180	0	267	138	222
Confl. Peds. (#/hr)	8		5	5		8	10		17	17		10
Confl. Bikes (#/hr)			2			1						
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6			2			4			8	8 1
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	101.9	101.9		60.1	60.1	60.1	70.1	70.1		70.1	70.1	112.4
Effective Green, g (s)	101.9	101.9		60.1	60.1	60.1	70.1	70.1		70.1	70.1	112.4
Actuated g/C Ratio	0.56	0.56		0.33	0.33	0.33	0.38	0.38		0.38	0.38	0.61
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	6.0	0.2		0.2	0.2	0.2	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	635	930		317	569	455	414	630		372	664	905
v/s Ratio Prot	c0.12	0.19			0.10			0.11			0.08	0.15
v/s Ratio Perm	c0.21			0.02		0.07	0.02			c0.27		
v/c Ratio	0.59	0.34		0.05	0.32	0.20	0.04	0.29		0.72	0.21	0.25
Uniform Delay, d1	24.3	22.4		42.2	46.3	44.4	35.6	39.3		48.3	38.1	16.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.7	0.1		0.3	1.5	1.0	0.0	0.3		11.3	0.7	0.4
Delay (s)	26.9	22.5		42.5	47.8	45.4	35.7	39.6		59.6	38.8	16.6
Level of Service	C	C		D	D	D	D	D		E	D	B
Approach Delay (s)		24.9			46.2			39.2			35.5	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	183.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	542	480	31	46	28
Future Volume (Veh/h)	20	542	480	31	46	28
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	21	559	495	32	47	29
Pedestrians		1			7	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		278	280			
pX, platoon unblocked						
vC, conflicting volume	534				840	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	534				840	272
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				84	96
cM capacity (veh/h)	1023				296	721

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	207	373	330	197	76
Volume Left	21	0	0	0	47
Volume Right	0	0	0	32	29
cSH	1023	1700	1700	1700	382
Volume to Capacity	0.02	0.22	0.19	0.12	0.20
Queue Length 95th (ft)	2	0	0	0	18
Control Delay (s)	1.0	0.0	0.0	0.0	16.8
Lane LOS	A				C
Approach Delay (s)	0.4		0.0		16.8
Approach LOS					C

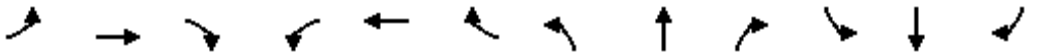
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	44	26	390	65	78	7	477	396	18	263	18
Future Volume (vph)	10	44	26	390	65	78	7	477	396	18	263	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.96			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.94		1.00	0.92			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1711	1674		1711	1591			1799	1495		3366	
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00		0.91	
Satd. Flow (perm)	1711	1674		1711	1591			1792	1495		3086	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	46	27	406	68	81	7	497	412	19	274	19
RTOR Reduction (vph)	0	21	0	0	40	0	0	0	80	0	4	0
Lane Group Flow (vph)	10	52	0	406	109	0	0	504	333	0	308	0
Confl. Peds. (#/hr)	19		20	20		19	18		15	15		18
Confl. Bikes (#/hr)			1			3			2			3
Turn Type	Split	NA		Split	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	4	4		3	3			2	3		6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	7.0	7.0		27.9	27.9			60.1	88.0		60.1	
Effective Green, g (s)	7.0	7.0		27.9	27.9			60.1	88.0		60.1	
Actuated g/C Ratio	0.06	0.06		0.26	0.26			0.55	0.81		0.55	
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Vehicle Extension (s)	2.0	2.0		1.0	1.0			5.0	1.0		5.0	
Lane Grp Cap (vph)	109	107		437	407			988	1206		1701	
v/s Ratio Prot	0.01	c0.03		c0.24	0.07				0.07			
v/s Ratio Perm								c0.28	0.15		0.10	
v/c Ratio	0.09	0.49		0.93	0.27			0.51	0.28		0.18	
Uniform Delay, d1	48.0	49.3		39.6	32.4			15.3	2.6		12.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.1	1.3		25.6	0.1			1.9	0.0		0.2	
Delay (s)	48.1	50.6		65.2	32.5			17.1	2.6		12.4	
Level of Service	D	D		E	C			B	A		B	
Approach Delay (s)		50.3			56.4			10.6			12.4	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	66	87	210	70	127	197	2117	105	99	1753	30
Future Volume (vph)	98	66	87	210	70	127	197	2117	105	99	1753	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.95	1.00		0.96	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1680	3132		1707	1863	1583	1711	4870		1711	4898	
Flt Permitted	0.71	1.00		0.64	1.00	1.00	0.06	1.00		0.04	1.00	
Satd. Flow (perm)	1253	3132		1152	1863	1583	99	4870		71	4898	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	69	92	221	74	134	207	2228	111	104	1845	32
RTOR Reduction (vph)	0	70	0	0	0	103	0	2	0	0	0	0
Lane Group Flow (vph)	103	91	0	221	74	31	207	2337	0	104	1877	0
Confl. Peds. (#/hr)	30		24	24		30	12		16	16		12
Confl. Bikes (#/hr)												1
Turn Type	Perm	NA		Perm	NA	Prot	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	8	1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	44.0	44.0		44.0	44.0	44.0	131.5	113.9		114.2	102.1	
Effective Green, g (s)	44.0	44.0		44.0	44.0	44.0	131.5	113.9		114.2	102.1	
Actuated g/C Ratio	0.23	0.23		0.23	0.23	0.23	0.70	0.61		0.61	0.54	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	294	734		270	437	371	274	2958		149	2667	
v/s Ratio Prot		0.03			0.04	0.02	c0.10	c0.48		0.05	0.38	
v/s Ratio Perm	0.08			c0.19			0.43			0.38		
v/c Ratio	0.35	0.12		0.82	0.17	0.08	0.76	0.79		0.70	0.70	
Uniform Delay, d1	59.8	56.6		68.0	57.2	56.0	53.0	27.8		47.2	31.5	
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	0.2		19.3	0.4	0.2	13.2	2.2		16.6	1.6	
Delay (s)	61.3	56.7		87.2	57.6	56.2	66.2	30.0		63.8	33.1	
Level of Service	E	E		F	E	E	E	C		E	C	
Approach Delay (s)		58.5			72.4			33.0			34.7	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	187.5	Sum of lost time (s)	17.5
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	32	68	304	39	272	31	1199	271	133	743	32
Future Volume (vph)	44	32	68	304	39	272	31	1199	271	133	743	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	10	10	10	10	10	10
Total Lost time (s)	6.5	6.5		7.0	7.0	7.0	8.0	6.0		8.0	6.0	6.0
Lane Util. Factor	0.95	0.95		0.95	0.95	1.00	1.00	0.91		0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1573		1625	1647	1531	1650	4563		3204	3303	1420
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.32	1.00		0.11	1.00	1.00
Satd. Flow (perm)	1681	1573		1625	1647	1531	547	4563		372	3303	1420
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	47	34	72	323	41	289	33	1276	288	141	790	34
RTOR Reduction (vph)	0	32	0	0	0	184	0	9	0	0	0	13
Lane Group Flow (vph)	42	79	0	181	183	105	33	1555	0	141	790	21
Confl. Peds. (#/hr)	12		2	2		12	4		17	17		4
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases							2			6		6
Actuated Green, G (s)	16.1	16.1		30.8	30.8	47.6	139.2	133.3		147.0	137.2	137.2
Effective Green, g (s)	16.1	16.1		30.8	30.8	47.6	139.2	133.3		147.0	137.2	137.2
Actuated g/C Ratio	0.07	0.07		0.14	0.14	0.22	0.64	0.61		0.68	0.63	0.63
Clearance Time (s)	6.5	6.5		7.0	7.0		8.0	6.0		8.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	124	116		230	233	335	380	2796		379	2083	895
v/s Ratio Prot	0.02	c0.05		c0.11	0.11	c0.07	0.00	c0.34		0.02	c0.24	
v/s Ratio Perm							0.05			0.23		0.02
v/c Ratio	0.34	0.68		0.79	0.79	0.31	0.09	0.56		0.37	0.38	0.02
Uniform Delay, d1	95.6	98.2		90.2	90.2	71.2	14.9	24.7		16.3	19.5	15.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	14.6		16.1	15.8	0.5	0.1	0.8		0.6	0.5	0.0
Delay (s)	97.3	112.7		106.3	106.0	71.8	15.0	25.5		17.0	20.0	15.1
Level of Service	F	F		F	F	E	B	C		B	C	B
Approach Delay (s)		108.5			90.9			25.3			19.4	
Approach LOS		F			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	40.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	217.5	Sum of lost time (s)	27.5
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

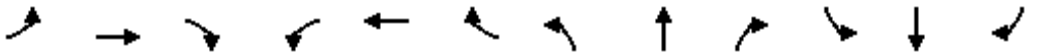
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1056	74	202	808	177	125	145	311	282	171	24
Future Volume (vph)	21	1056	74	202	808	177	125	145	311	282	171	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	11	11	12	12	12
Total Lost time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	3249		1770	3416		1672	1801	1531	1760	1863	1583
Flt Permitted	0.19	1.00		0.05	1.00		0.64	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	324	3249		87	3416		1133	1801	1531	879	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1112	78	213	851	186	132	153	327	297	180	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	1190	0	213	1037	0	132	153	327	297	180	25
Confl. Peds. (#/hr)	12		18	18		12	17		8	8		17
Confl. Bikes (#/hr)			4			3			3			3
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Prot	pm+pt	NA	Prot
Protected Phases	1	6		5	2		3	8	8	7	4	4
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	85.5	79.6		110.1	98.2		65.5	48.6	48.6	92.4	69.0	69.0
Effective Green, g (s)	85.5	79.6		110.1	98.2		65.5	48.6	48.6	92.4	69.0	69.0
Actuated g/C Ratio	0.40	0.37		0.51	0.46		0.30	0.23	0.23	0.43	0.32	0.32
Clearance Time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	5.0		3.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	164	1200		235	1556		386	406	345	529	596	506
v/s Ratio Prot	0.00	c0.37		c0.10	0.30		0.03	0.08	c0.21	c0.10	0.10	0.02
v/s Ratio Perm	0.05			0.36			0.08			0.14		
v/c Ratio	0.13	0.99		0.91	0.67		0.34	0.38	0.95	0.56	0.30	0.05
Uniform Delay, d1	41.4	67.6		74.2	45.8		56.7	70.6	82.2	43.0	55.1	50.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	24.1		34.3	2.3		0.7	0.8	34.9	1.7	0.4	0.1
Delay (s)	41.8	91.7		108.5	48.1		57.4	71.4	117.1	44.7	55.5	50.7
Level of Service	D	F		F	D		E	E	F	D	E	D
Approach Delay (s)		90.8			58.4			92.8			48.9	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	73.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	215.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

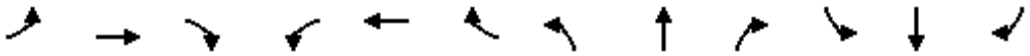
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	12	32	186	13	138	18	2590	250	161	2008	26
Future Volume (vph)	40	12	32	186	13	138	18	2590	250	161	2008	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.93		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.95	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.86		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1623	1589		1770	1490		1711	6069		1711	4900	
Flt Permitted	0.54	1.00		0.73	1.00		0.06	1.00		0.04	1.00	
Satd. Flow (perm)	925	1589		1354	1490		114	6069		74	4900	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	42	12	33	194	14	144	19	2698	260	168	2092	27
RTOR Reduction (vph)	0	27	0	0	116	0	0	8	0	0	1	0
Lane Group Flow (vph)	42	19	0	194	42	0	19	2950	0	168	2118	0
Confl. Peds. (#/hr)	44					44	25		20	20		25
Confl. Bikes (#/hr)			3						1			3
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	30.3	30.3		30.3	30.3		96.4	91.4		115.7	104.7	
Effective Green, g (s)	30.3	30.3		30.3	30.3		96.4	91.4		115.7	104.7	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.61	0.58		0.73	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	176	303		258	284		119	3499		243	3236	
v/s Ratio Prot		0.01			0.03		0.01	c0.49		c0.08	c0.43	
v/s Ratio Perm	0.05			c0.14			0.09			0.43		
v/c Ratio	0.24	0.06		0.75	0.15		0.16	0.84		0.69	0.65	
Uniform Delay, d1	54.3	52.5		60.5	53.3		14.0	27.6		48.9	16.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.2		13.7	0.5		1.3	2.7		10.3	1.0	
Delay (s)	55.8	52.7		74.3	53.8		15.4	30.3		59.2	17.1	
Level of Service	E	D		E	D		B	C		E	B	
Approach Delay (s)		54.2			65.1			30.2			20.2	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	158.5	Sum of lost time (s)	18.5
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	974	72	14	772	127	50	24	20	152	51	96
Future Volume (vph)	144	974	72	14	772	127	50	24	20	152	51	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1651	3257		1650	3303	1433	1711	1665		1681	1574	
Flt Permitted	0.27	1.00		0.23	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	476	3257		391	3303	1433	1711	1665		1681	1574	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	150	1015	75	15	804	132	52	25	21	158	53	100
RTOR Reduction (vph)	0	3	0	0	0	58	0	20	0	0	0	0
Lane Group Flow (vph)	150	1087	0	15	804	74	52	26	0	142	169	0
Confl. Peds. (#/hr)	3		10	10		3	9		2	2		9
Confl. Bikes (#/hr)						1						1
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2						
Actuated Green, G (s)	99.9	91.9		86.4	83.4	83.4	7.8	7.8		22.3	22.3	
Effective Green, g (s)	99.9	91.9		86.4	83.4	83.4	7.8	7.8		22.3	22.3	
Actuated g/C Ratio	0.68	0.62		0.58	0.56	0.56	0.05	0.05		0.15	0.15	
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	0.2		4.0	0.2	0.2	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	412	2022		253	1861	807	90	87		253	237	
v/s Ratio Prot	c0.03	c0.33		0.00	0.24		c0.03	0.02		0.08	c0.11	
v/s Ratio Perm	0.22			0.03		0.05						
v/c Ratio	0.36	0.54		0.06	0.43	0.09	0.58	0.30		0.56	0.71	
Uniform Delay, d1	10.2	16.0		13.4	18.6	14.9	68.5	67.5		58.3	59.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	1.0		0.1	0.7	0.2	10.3	2.6		3.4	10.4	
Delay (s)	10.9	17.0		13.6	19.4	15.1	78.8	70.1		61.7	70.2	
Level of Service	B	B		B	B	B	E	E		E	E	
Approach Delay (s)		16.3			18.7			74.7			66.3	
Approach LOS		B			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	17	122	9	12	5	28	279	23	7	281	27
Future Volume (Veh/h)	26	17	122	9	12	5	28	279	23	7	281	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	28	18	130	10	13	5	30	297	24	7	299	29
Pedestrians		66			56			51			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		6			5			5			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								638				
pX, platoon unblocked	0.99	0.99		0.99	0.99	0.99				0.99		
vC, conflicting volume	780	830	430	942	833	371	394			377		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	776	827	430	939	829	365	394			371		
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 %	89	93	77	93	95	99	97			99		
cM capacity (veh/h)	248	262	557	142	261	637	1091			1118		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	176	28	351	335
Volume Left	28	10	30	7
Volume Right	130	5	24	29
cSH	424	218	1091	1118
Volume to Capacity	0.42	0.13	0.03	0.01
Queue Length 95th (ft)	50	11	2	0
Control Delay (s)	19.4	23.9	1.0	0.2
Lane LOS	C	C	A	A
Approach Delay (s)	19.4	23.9	1.0	0.2
Approach LOS	C	C		

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	51.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	EB	EB	B28	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	LT	R	T	L	L	TR	L	T	T	T	R	L
Maximum Queue (ft)	166	69	277	202	250	191	200	433	448	446	455	270
Average Queue (ft)	131	16	218	142	167	134	77	317	330	333	292	260
95th Queue (ft)	149	56	341	231	250	224	171	560	566	558	537	271
Link Distance (ft)	69		243	192	192			394	394	394	394	
Upstream Blk Time (%)	98	0	77	15	31	14		22	25	26	36	
Queuing Penalty (veh)	0	0	0	38	78	0		156	172	177	250	
Storage Bay Dist (ft)		90				200	175					245
Storage Blk Time (%)	98	0			31	14	0	41				90
Queuing Penalty (veh)	35	0			60	23	0	23				513

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	528	553	538
Average Queue (ft)	507	211	209
95th Queue (ft)	544	567	541
Link Distance (ft)	511	511	511
Upstream Blk Time (%)	76	2	1
Queuing Penalty (veh)	486	13	6
Storage Bay Dist (ft)			
Storage Blk Time (%)	2		
Queuing Penalty (veh)	4		

Intersection: 2: Rockville Pike - 355 & Federal Plaza/Pike Center

Movement	EB	EB	B25	WB	B24	NB	NB	NB	NB	SB	SB	SB
Directions Served	LT	R	T	LTR	T	L	T	T	TR	L	T	T
Maximum Queue (ft)	174	79	228	116	186	270	519	543	544	160	179	225
Average Queue (ft)	140	58	193	88	98	113	167	297	301	11	162	78
95th Queue (ft)	178	76	286	124	221	259	456	651	634	62	169	207
Link Distance (ft)	79		213	42	171		511	511	511		160	160
Upstream Blk Time (%)	89	26	86	86	51		1	8	8	0	85	8
Queuing Penalty (veh)	0	0	0	0	0		13	73	71	0	511	46
Storage Bay Dist (ft)		150				245				175		
Storage Blk Time (%)	89	26				0	6			0	85	
Queuing Penalty (veh)	119	34				1	12			0	22	

Intersection: 2: Rockville Pike - 355 & Federal Plaza/Pike Center

Movement	SB
Directions Served	TR
Maximum Queue (ft)	164
Average Queue (ft)	72
95th Queue (ft)	182
Link Distance (ft)	160
Upstream Blk Time (%)	8
Queuing Penalty (veh)	47
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: Rockville Pike - 355 & Gas Station

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	TR	T	T	T
Maximum Queue (ft)	77	52	182	166	294	289	290
Average Queue (ft)	33	2	26	21	268	77	63
95th Queue (ft)	62	17	113	102	288	260	240
Link Distance (ft)	50	160	160	160	238	238	238
Upstream Blk Time (%)	5		2	1	77	3	6
Queuing Penalty (veh)	0		14	9	461	19	35
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 4: Rockville Pike - 355 & Rolllins Avenue /Twinbrook Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	T	TR	T	T	R	L	T	T	T	L	T	T
Maximum Queue (ft)	1156	1169	278	379	175	112	251	262	264	425	1200	1192
Average Queue (ft)	715	754	97	122	112	24	134	135	134	178	987	923
95th Queue (ft)	1091	1123	226	313	215	70	278	272	261	482	1602	1549
Link Distance (ft)	1299	1299	549	549		238	238	238	238		1180	1180
Upstream Blk Time (%)							3	2	2		54	34
Queuing Penalty (veh)							19	16	13		370	229
Storage Bay Dist (ft)					150					400		
Storage Blk Time (%)				5	21				2	0	77	
Queuing Penalty (veh)				8	33				2	0	157	

Intersection: 4: Rockville Pike - 355 & Rolllins Avenue /Twinbrook Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	1203
Average Queue (ft)	893
95th Queue (ft)	1522
Link Distance (ft)	1180
Upstream Blk Time (%)	34
Queuing Penalty (veh)	230
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Chapman Ave & Twinbrook Parkway

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	L	T	TR	LT	R	L	L	T
Maximum Queue (ft)	199	449	520	312	325	1328	1319	179	185	312	325	545
Average Queue (ft)	28	117	145	252	320	1187	956	160	173	200	265	402
95th Queue (ft)	124	339	401	367	327	1454	1614	208	184	294	366	668
Link Distance (ft)		549	549			1298	1298	167	167			530
Upstream Blk Time (%)						31	9	60	73			30
Queuing Penalty (veh)						176	50	228	279			122
Storage Bay Dist (ft)	175			300	300					300	300	
Storage Blk Time (%)		13		0	78					0	8	46
Queuing Penalty (veh)		9		1	229					0	13	115

Intersection: 5: Chapman Ave & Twinbrook Parkway

Movement	SB
Directions Served	R
Maximum Queue (ft)	325
Average Queue (ft)	54
95th Queue (ft)	254
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 6: Chapman Ave & Pike Center North/Driveway

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	48	44	111	115	200	204
Average Queue (ft)	10	7	23	98	75	32
95th Queue (ft)	34	25	70	107	206	140
Link Distance (ft)	22	28	97	97	167	167
Upstream Blk Time (%)	16	8	3	69	9	3
Queuing Penalty (veh)	0	0	10	263	32	10
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Chapman Ave & Rollins Ave

Movement	WB	WB	B50	B50	B51	B51	NB	SB	SB
Directions Served	L	R	T	T	T	T	TR	LT	T
Maximum Queue (ft)	126	146	12	248	330	330	127	123	123
Average Queue (ft)	39	125	0	207	140	185	115	65	33
95th Queue (ft)	98	133	4	295	384	417	121	147	117
Link Distance (ft)	56	56	146	146	315	315	112	97	97
Upstream Blk Time (%)	18	99		82	29	35	69	20	10
Queuing Penalty (veh)	0	0		0	0	0	503	65	31
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 8: Chapman Ave & Pike Center South

Movement	EB	NB	SB	SB	SB
Directions Served	LR	LT	T	T	TR
Maximum Queue (ft)	30	156	140	118	118
Average Queue (ft)	3	116	100	31	56
95th Queue (ft)	18	134	149	95	136
Link Distance (ft)	35	46	112	112	112
Upstream Blk Time (%)	3	70	30	5	8
Queuing Penalty (veh)	0	513	67	12	19
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 9: Chapman Ave & Bou Ave

Movement	EB	EB	WB	WB	WB	B36	B36	NB	NB	B35	B48	B49
Directions Served	L	TR	L	T	R	T	T	L	TR	T	T	T
Maximum Queue (ft)	216	213	815	925	275	1178	1192	94	241	355	579	579
Average Queue (ft)	200	54	165	811	269	379	555	24	199	332	459	335
95th Queue (ft)	212	168	679	1132	282	1074	1265	80	221	416	778	729
Link Distance (ft)	201	201	817	817		1623	1623		130	285	528	472
Upstream Blk Time (%)	72	2	8	67					91	83	65	49
Queuing Penalty (veh)	212	5	13	115					269	245	192	145
Storage Bay Dist (ft)					250			70				
Storage Blk Time (%)				4	90			13	93			
Queuing Penalty (veh)				10	150			22	16			

Intersection: 9: Chapman Ave & Bou Ave

Movement	B45	SB	SB	SB
Directions Served	T	L	T	R
Maximum Queue (ft)	248	59	49	56
Average Queue (ft)	117	45	33	32
95th Queue (ft)	302	57	63	68
Link Distance (ft)	226	46	46	46
Upstream Blk Time (%)	37	58	28	19
Queuing Penalty (veh)	108	137	65	46
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10: Bou Ave & Pike Center

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	125	213	200	247	315
Average Queue (ft)	101	163	51	99	246
95th Queue (ft)	146	283	162	254	381
Link Distance (ft)		192	201	201	300
Upstream Blk Time (%)		54	0	5	55
Queuing Penalty (veh)		340	0	14	0
Storage Bay Dist (ft)	100				
Storage Blk Time (%)	64	13			
Queuing Penalty (veh)	172	37			

Intersection: 11: East Jefferson Street & Rolllins Avenue

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	TR
Maximum Queue (ft)	51	139	960	718	310	310	200	165
Average Queue (ft)	9	60	525	260	171	46	86	38
95th Queue (ft)	33	114	945	644	340	144	170	119
Link Distance (ft)	477	477	1299	1299	295	295	317	317
Upstream Blk Time (%)					4	1		
Queuing Penalty (veh)					0	0		
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 12: Rockville Pike - 355/Rockville PIke- 355 & Halpine Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	T	TR	L	T
Maximum Queue (ft)	258	231	522	512	512	475	190	658	763	737	200	512
Average Queue (ft)	115	44	157	376	228	103	103	261	272	302	76	444
95th Queue (ft)	201	115	405	646	598	313	202	535	551	568	220	526
Link Distance (ft)		832	832	497	497			1180	1180	1180		449
Upstream Blk Time (%)				55	37							67
Queuing Penalty (veh)				0	0							0
Storage Bay Dist (ft)	250					450	165				175	
Storage Blk Time (%)	1	0			0	0	3	16			3	75
Queuing Penalty (veh)	0	0			1	0	24	32			15	74

Intersection: 12: Rockville Pike - 355/Rockville PIke- 355 & Halpine Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	483	464
Average Queue (ft)	387	327
95th Queue (ft)	536	522
Link Distance (ft)	449	449
Upstream Blk Time (%)	8	3
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	LT	R	L	T	T	TR	L	L	T
Maximum Queue (ft)	112	414	225	908	908	214	352	384	421	27	175	445
Average Queue (ft)	43	128	190	357	269	21	176	193	213	3	66	305
95th Queue (ft)	88	271	255	793	577	89	342	367	402	16	142	514
Link Distance (ft)	445	445		893	893		1298	1298	1298		411	411
Upstream Blk Time (%)				5	0							30
Queuing Penalty (veh)				0	0							0
Storage Bay Dist (ft)			200			190				240		
Storage Blk Time (%)			21	36			13					
Queuing Penalty (veh)			40	55			4					

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	474	275
Average Queue (ft)	264	12
95th Queue (ft)	527	93
Link Distance (ft)	411	
Upstream Blk Time (%)	23	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		250
Storage Blk Time (%)	34	
Queuing Penalty (veh)	11	

Intersection: 14: Nebel Street & Randolph Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	T	R
Maximum Queue (ft)	164	609	634	150	1116	1057	124	536	491	274	353	53
Average Queue (ft)	34	480	485	135	538	516	73	163	330	125	106	9
95th Queue (ft)	123	749	725	196	939	914	149	375	497	251	220	35
Link Distance (ft)		598	598		1100	1100		557	557		1623	1623
Upstream Blk Time (%)		9	6		6							
Queuing Penalty (veh)		50	35		0							
Storage Bay Dist (ft)	140			125			100			250		
Storage Blk Time (%)	0	45		50	15		8	21		2		
Queuing Penalty (veh)	0	10		202	29		11	26		3		

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	EB	EB	WB	WB	B31	B31	NB	NB	NB	NB	NB	SB
Directions Served	L	TR	L	TR	T	T	L	T	T	T	TR	L
Maximum Queue (ft)	107	86	206	206	120	53	1590	1601	1577	1590	1572	204
Average Queue (ft)	50	19	145	131	9	6	1237	1505	1528	1525	1506	67
95th Queue (ft)	106	54	215	227	51	32	2123	1663	1679	1705	1765	165
Link Distance (ft)	148	148	134	134	149	149	1538	1538	1538	1538	1538	
Upstream Blk Time (%)			21	25			31	34	69	81	75	
Queuing Penalty (veh)			0	0			0	0	0	0	0	
Storage Bay Dist (ft)												180
Storage Blk Time (%)												0
Queuing Penalty (veh)												2

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	410	394	407
Average Queue (ft)	114	117	127
95th Queue (ft)	309	325	342
Link Distance (ft)	394	394	394
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	2	1	3
Storage Bay Dist (ft)			
Storage Blk Time (%)	3		
Queuing Penalty (veh)	5		

Intersection: 16: Chapman Ave & Josiah Henson Parkway/Randolph Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	LTR
Maximum Queue (ft)	374	543	542	46	571	615	240	114	137	134	227
Average Queue (ft)	162	280	215	13	224	302	116	46	52	71	108
95th Queue (ft)	394	540	422	39	520	678	297	95	114	138	190
Link Distance (ft)		528	528		598	598			376	226	226
Upstream Blk Time (%)		15	0			18					1
Queuing Penalty (veh)		0	0			88					1
Storage Bay Dist (ft)	350			165			215	250			
Storage Blk Time (%)	21	0			13	7	38				
Queuing Penalty (veh)	104	0			2	9	148				

Intersection: 17: Chapman Ave/Chapman Road & Thompson Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	418	71	74	427
Average Queue (ft)	210	21	17	157
95th Queue (ft)	471	56	56	431
Link Distance (ft)	403	327	530	412
Upstream Blk Time (%)	28			6
Queuing Penalty (veh)	0			0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 10645

Pike Center
Background Conditions Levels of Service Summary[1]

Approach/ Lane Group	Existing Conditions				2034 Future Conditions without Development			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
1. Rockville Pike / Bou Avenue **-- Orange Policy Area**								
EBLT	E	73.5	E	79.3	E	73.5	E	79.3
EBR	E	68.1	E	67.8	E	68.1	E	67.8
WBL	E	60.3	E	59.4	E	60.7	E	59.5
WBTR	D	48.5	D	53.7	D	48.0	D	53.7
NBL	E	72.7	E	74.5	E	72.7	E	74.5
NBT	C	29.1	D	37.3	D	38.1	F	89.7
NBR	C	24.5	C	26.6	C	24.9	C	28.1
SBL	B	14.4	D	41.2	C	31.3	D	43.4
SBTR	B	13.3	B	11.9	B	18.6	B	13.6
Overall	C	27.8	C	33.2	C	31.8	E	55.9
2. Rockville Pike / Pike Center Driveway / Federal Plaza Driveway **-- Orange Policy Area**								
EBLT	E	72.0	F	95.3	E	72.0	F	95.3
EBR	E	69.3	E	61.5	E	69.3	E	61.5
WBLTR	E	72.8	E	72.8	E	72.8	E	72.8
NBL	B	11.0	C	25.7	D	50.8	E	62.9
NBTR	A	1.1	B	10.1	A	1.0	B	14.8
SBL	A	2.0	A	5.5	A	2.7	C	29.2
SBTR	A	3.3	A	5.8	A	3.8	A	6.7
Overall	A	5.2	B	15.8	A	5.2	B	18.3

3. Rockville Pike/ Shell Gas Station Driveway **- Unsignalized - Orange Policy Area**								
WBR	A	9.5	A	9.4	A	9.7	B	10.4
Overall	0.1	A	A	0.2	A	0.0	0.1	B
4. Rockville Pike / Twinbrook Pkwy / Rollins Ave **-- Red Policy Area**								
EBT	E	66.1	E	63.4	E	63.5	E	63.7
WBT	E	63.2	D	54.9	E	56.8	D	54.1
WBR	E	65.5	E	56.4	E	65.0	E	57.4
NBL	B	11.8	A	3.5	D	48.9	C	33.9
NBT	A	2.9	A	4.1	A	4.7	B	12.5
NBR	A	0.2	A	0.3	A	0.4	A	3.9
SBL	A	6.6	B	15.9	B	18.2	E	62.2
SBT	B	12.3	B	15.4	C	20.9	C	22.3
Overall	C	21.6	C	20.3	C	23.7	C	26.6
5. Chapman Ave / Twinbrook Pkwy **-- Red Policy Area**								
EBL	B	17.3	C	28.7	B	19.9	C	30.2
EBTR	C	23.8	D	44.9	C	27.5	D	48.9
WBL	F	83.5	E	65.6	F	83.1	E	63.1
WBTR	A	10.0	B	18.4	B	11.7	B	18.4
NBLT	F	93.9	F	107.7	F	97.8	F	140.5
NBR	D	49.2	E	75.8	D	45.0	E	78.8
SBL	F	88.0	F	93.2	F	88.0	F	93.2
SBT	F	90.5	F	102.1	F	90.5	F	102.1
SBR	F	84.0	E	78.2	F	84.0	E	78.1
Overall	D	44.5	E	56.1	D	46.5	E	59.6

6. Chapman Ave / Pike Center Driveway North **- Unsignalized -- Orange Policy Area**								
EBLTR	A	0.0	C	22.4	A	0.0	C	25.0
WBLTR	B	11.1	C	18.6	B	11.4	C	20.4
NBLT	A	0.2	A	0.1	A	0.2	A	0.1
SBLT	A	0.2	A	0.3	A	0.2	A	0.3
Overall	A	0.1	A	0.4	A	0.1	A	0.4
7. Chapman Ave / Rollins Ave **- Unsignalized -- Orange Policy Area**								
EBLTR	-	-	-	-	-	-	-	-
WBL	C	16.0	D	33.6	C	17.1	E	40.8
WBR/WBTR	B	10.3	C	17.1	B	11.2	C	18.6
NBTR/NBLTR	-	-	-	-	-	-	-	-
SBLT	A	1.7	A	2.3	A	1.6	A	2.3
Overall	A	1.3	B	3.2	A	1.3	B	3.4
8. Chapman Ave / Pike Center Driveway South **- Unsignalized -- Orange Policy Area**								
EBLR	E	35.7	C	21.2	E	43.0	D	27.7
NBLT	A	0.1	-	-	A	0.1	-	0.0
Overall	A	0.1	A	0.1	A	0.1	A	0.1

9. Chapman Ave / Bou Ave **-- Orange Policy Area**								
EBL	C	23.3	C	26.0	C	23.1	C	26.9
EBTR	C	21.7	C	22.8	C	21.9	C	22.5
WBL	D	35.3	D	40.4	C	34.8	D	42.5
WBT	D	37.6	D	45.2	D	37.1	D	47.8
WBR	D	36.5	D	42.7	D	36.5	D	45.4
NBL	C	29.1	C	33.7	C	28.6	D	35.7
NBTR	C	29.8	D	37.2	C	29.3	D	39.6
SBL	C	32.6	D	47.7	C	33.6	E	59.6
SBT	C	30.7	D	36.5	C	30.2	D	38.8
SBR	B	18.1	B	16.8	B	18.4	B	16.6
Overall	C	25.5	C	32.0	C	26.1	C	34.8
10. Bou Ave **/ Pike Center Driveway - Unsignalized -- Orange Policy Area**								
EBLT	A	0.9	A	1.1	A	0.9	A	1.0
SBLR	B	13.9	C	16.4	B	14.1	C	16.8
Overall	A	0.5	A	1.3	A	0.5	A	1.3
11. E Jefferson St / Rollins Ave **-- City of Rockville**								
EBL	D	48.3	D	48.1	D	48.3	D	48.1
EBTR	D	50.5	D	50.6	D	50.4	D	50.6
WBL	E	56.7	E	57.6	D	54.5	E	65.2
WBTR	D	35.3	C	34.6	D	37.3	C	32.5
NBLT	B	10.9	B	15.3	A	9.8	B	17.1
NBR	A	2.5	A	2.6	A	2.6	A	2.6
SBLTR	A	9.8	B	11.1	A	8.7	B	12.4
Overall	C	23.5	C	23.3	C	20.3	C	26.3

12. Rockville Pike / Halpine Rd **-- Red Policy Area**								
EBL	F	90.4	F	95.1	E	63.7	E	61.3
EBTR	F	83.6	E	74.7	E	62.5	E	56.7
WBL	F	82.2	E	74.6	F	90.1	F	87.2
WBT	F	83.8	E	77.0	E	62.2	E	57.6
WBR	F	81.4	E	73.4	E	61.7	E	56.2
NBL	A	3.8	B	12.6	B	18.0	E	66.2
NBTR	A	5.2	B	10.8	B	16.7	C	30.0
SBL	A	3.3	B	11.4	B	12.0	E	63.8
SBTR	A	6.8	B	16.2	B	19.3	C	33.1
Overall	B	13.7	C	21.3	C	23.9	D	38.2
13. Twinbrook Pkwy / Parklawn Dr **-- Red Policy Area**								
EBL	F	101.0	F	97.3	F	101.0	F	97.3
EBLTR	F	108.6	F	112.7	F	108.6	F	112.7
WBL	F	111.8	F	106.3	F	111.8	F	106.3
WBLT	F	110.5	F	106.0	F	110.5	F	106.0
WBR	E	78.3	E	71.8	E	78.3	E	71.8
NBL	A	9.1	B	14.9	A	9.2	B	15.0
NBTR	B	13.0	C	25.1	B	12.9	C	25.5
SBL	A	8.3	B	16.5	A	8.3	B	17.0
SBT	B	13.6	B	19.9	B	13.9	B	20.0
SBR	B	10.4	B	15.1	B	10.4	B	15.1
Overall	C	28.7	D	40.1	C	28.7	D	40.1

14. Nebel St / Randolph Rd **-- Red Policy Area**								
EBL	B	11.7	C	32.1	C	21.8	D	41.8
EBTR	B	15.8	D	53.4	C	29.8	F	91.7
WBL	A	8.9	D	38.6	B	15.3	F	108.5
WBTR	B	14.5	D	39.0	C	22.0	D	48.1
NBL	F	83.4	E	61.9	E	76.4	E	57.4
NBT	F	97.5	E	77.0	F	88.4	E	71.4
NBR	F	106.9	F	107.2	F	109.0	F	117.1
SBL	F	80.1	D	49.9	E	67.8	D	44.7
SBT	F	95.8	E	62.7	F	82.5	E	55.5
SBR	F	90.7	E	57.5	E	79.2	D	50.7
Overall	C	27.8	D	54.3	C	34.9	E	73.9
15. Rockville Pike / Hubbard Dr / Plaza Driveway **-- Orange Policy Area**								
EBL	E	66.1	E	55.8	E	66.1	E	55.8
EBTR	E	64.4	D	52.7	E	64.4	D	52.7
WBL	E	75.5	E	74.3	E	75.5	E	74.3
WBTR	E	65.4	D	53.8	E	65.4	D	53.8
NBL	A	6.1	B	12.8	B	14.0	B	15.4
NBTR	A	7.0	C	23.7	A	8.5	C	30.3
SBL	A	4.1	E	56.2	A	6.1	E	59.2
SBTR	A	8.6	B	13.9	B	12.2	B	17.1
Overall	B	11.3	C	25.4	B	12.9	C	28.7

16. Chapman Ave / Randolph Rd / Josiah Henson Pkwy **-- Red Policy Area**								
EBL	A	6.4	B	10.4	A	7.7	B	10.9
EBTR	A	7.4	B	16.0	A	7.6	B	17.0
WBL	A	6.4	B	13.2	A	6.6	B	13.6
WBT	B	12.0	B	18.7	B	13.2	B	19.4
WBR	A	7.6	B	15.1	A	7.8	B	15.1
NBL	E	72.2	E	78.8	E	72.2	E	78.8
NBTR	E	70.6	E	70.1	E	70.6	E	70.1
SBL	E	68.7	E	61.7	E	68.7	E	61.7
SBLTR	E	71.5	E	70.2	E	71.5	E	70.2
Overall	B	12.4	C	25.3	B	13.1	C	25.3
17. Chapman Ave / Thompson Ave **- Unsignalized -- Red Policy Area**								
EBLTR	B	11.3	C	19.3	B	11.3	C	19.4
WBLTR	C	16.3	C	24.0	C	16.3	C	23.9
NBLTR	A	1.9	A	1.0	A	1.9	A	1.0
SBLTR	A	0.4	A	0.2	A	0.4	A	0.2
Overall	A	3.8	A	5.0	A	3.8	A	5.1

18. Rockville Pike (MD 355) / Rollins Ave Extension - **Unsignalized -- Orange Policy Area**		
WBR **Overall**	FUTURE	FUTURE

Notes:

1. Capacity analysis based on Highway Capacity Manual 2000 methodology, using Synchro 11 unless otherwise noted.
2. **Bold** roadways indicate N/S direction.

Pike Center
Background Conditions Queuing Summary

Approach/ Lane Group	Storage Length (ft)	Existing Conditions				2034 Future Conditions without Development			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		50th %tile	95th %tile	50th %tile	95th %tile	50th %tile	95th %tile	50th %tile	95th %tile
1. Rockville Pike / Bou Avenue -- Orange Policy Area									
EBLT	69	50	110	127	139	37	88	131	149
EBR	90	29	73	16	59	36	74	16	56
WBL	192	154	252	149	236	172	235	142	231
WBL	192	163	255	173	249	175	237	167	250
WBTR	200	51	122	119	230	43	127	134	224
NBL	175	62	168	77	150	54	121	77	171
NBT	394	160	330	284	540	252	495	317	560
NBT	394	172	338	292	542	280	522	330	566
NBT	394	162	317	285	532	278	502	333	558
NBR	394	79	155	384	506	75	186	292	537
SBL	245	91	213	265	271	154	303	260	271
SBT	511	163	389	513	520	378	655	507	544
SBT	511	182	401	118	389	386	668	211	567
SBTR	511	176	400	124	390	398	660	209	541
2. Rockville Pike / Pike Center Driveway / Federal Plaza Driveway -- Orange Policy Area									
EBLT	79	56	121	142	154	41	83	140	178
EBR	150	53	86	61	73	41	69	58	76
WBLTR	42	16	42	88	128	19	55	88	124
NBL	245	74	147	117	259	55	118	113	259
NBT	511	4	22	120	372	86	323	167	456
NBT	511	20	75	239	544	171	492	297	651
NBTR	511	26	94	268	550	188	518	301	634
SBL	175	25	67	7	36	24	78	11	62
SBT	160	9	31	160	162	98	214	162	169
SBT	160	21	56	81	210	114	220	78	207
SBTR	160	30	68	68	194	113	211	72	182

3. Rockville Pike/ Shell Gas Station Driveway - Unsignalized -- Orange Policy Area									
WBR	50	12	36	25	46	16	41	33	62
NBT	160							2	17
NBT	160	4	39	13	69	30	127	26	113
NBTR	160	4	38	9	65	42	150	21	102
SBT	238	1	15	251	339	55	194	268	288
SBT	238	2	18	51	204	65	212	77	260
SBT	238			39	169	61	206	63	240
4. Rockville Pike / Twinbrook Pkwy / Rollins Ave -- Red Policy Area									
EBT	1299	78	152	853	1693	149	318	715	1091
EBTR	1299	115	192	870	1692	230	396	754	1123
WBT	549	61	147	77	187	101	297	97	226
WBT	549	62	158	61	184	100	310	122	313
WBR	150	56	145	43	129	84	190	112	215
NBL	238	38	105	22	82	47	107	24	70
NBT	238	82	190	96	255	110	259	134	278
NBT	238	67	185	88	207	106	263	135	272
NBT	238	54	164	83	187	113	259	134	261
NBR	300	8	79	-	-	16	114	-	-
SBL	400	67	138	120	423	161	354	178	482
SBT	1180	152	309	953	1561	245	546	987	1602
SBT	1180	136	292	448	864	244	527	923	1549
SBTR	1180	110	264	176	545	246	527	893	1522
5. Chapman Ave / Twinbrook Pkwy -- Red Policy Area									
EBL	175	14	74	14	75	20	100	28	124
EBT	549	90	238	79	266	99	281	117	339
EBTR	549	124	304	90	298	123	311	145	401
WBL	300	183	362	232	401	190	370	252	367
WBL	300	318	328	318	328	317	329	320	327
WBT	1298	1310	1322	1242	1663	1274	1510	1187	1454
WBTR	1298	1164	1729	1112	1837	1039	1846	956	1614
NBLT	167	118	202	149	197	156	214	160	208
NBR	167	156	231	174	185	152	217	173	184
SBL	300	51	139	193	305	41	110	200	294
SBL	300	88	156	249	359	76	150	265	366
SBT	530	77	138	342	614	90	171	402	668
SBR	300	-	-	32	193	-	-	54	254

6. Chapman Ave / Pike Center Driveway North - Unsignalized -- Orange Policy Area									
EBLTR	50	-	-	79	87	-	-	10	34
WBLTR	50	4	18	41	94	2	13	7	25
NBLT	97	13	58	22	78	58	125	23	70
NBTR	97	64	132	99	107	57	132	98	107
SBLT	167	6	38	42	158	24	92	75	206
SBTR	167	6	30	42	163	33	137	32	140
7. Chapman Ave / Rollins Ave - Unsignalized -- Orange Policy Area									
EBLTR	75	-	-	-	-	-	-	-	-
WBL	56	15	35	49	129	19	41	39	98
WBR	56	32	71	125	134	33	80	125	133
NBTR	112	62	146	114	123	70	154	115	121
SBLT	97	10	47	53	133	35	111	65	147
SBT	97	15	61	30	112	32	113	33	117
8. Chapman Ave / Pike Center Driveway South - Unsignalized -- Orange Policy Area									
EBLR	35	-	-	12	36	-	-	3	18
NBLT	46	41	129	116	141	56	149	116	134
SBT	122	11	44	79	153	40	107	100	149
SBT	122	4	28	29	86	15	67	31	95
SBTR	122	52	123	47	128	54	132	56	136

9. Chapman Ave / Bou Ave -- Orange Policy Area									
EBL	201	110	192	201	208	121	250	200	212
EBTR	201	49	137	42	143	51	139	54	168
WBL	817	5	21	244	800	7	25	165	679
WBT	817	100	183	880	933	70	133	811	1132
WBR	250	28	94	260	298	43	122	269	282
NBL	70	2	14	10	57	3	16	24	80
NBTR	130	34	70	196	217	61	174	199	221
SBL	46	23	55	46	69	36	64	45	57
SBT	46	18	48	32	63	23	56	33	63
SBR	46	29	67	32	70	32	66	32	68
10. Bou Ave / Pike Center Driveway - Unsignalized -- Orange Policy Area									
EBLT	100	8	34	113	142	7	41	101	146
EBT	192	-	-	189	264	-	-	163	283
WBT	201	70	186	46	172	26	103	51	162
WBTR	201	78	193	98	242	44	130	99	254
SBLR	300	14	41	299	338	19	46	246	381
11. E Jefferson St / Rollins Ave -- City of Rockville									
EBL	477	15	45	9	30	22	64	9	33
EBTR	477	58	115	154	426	53	108	60	114
WBL	1299	220	409	292	472	137	284	525	945
WBTR	1299	28	71	105	257	27	83	260	644
NBLT	295	57	126	70	218	57	127	171	340
NBR	295	23	58	158	373	36	77	46	144
SBLT	317	68	122	152	326	66	154	86	170
SBTR	317	9	32	93	273	19	79	38	119

12. Rockville Pike / Halpine Rd -- Red Policy Area									
EBL	250	36	83	73	139	42	106	115	201
EBT	832	46	89	84	313	29	66	44	115
EBTR	832	36	79	328	813	44	96	157	405
WBL	497	4	24	63	158	185	286	376	646
WBT	497	28	67	60	113	20	57	228	598
WBR	450	74	141	107	172	62	124	103	313
NBL	165	49	100	120	226	79	172	103	202
NBT	1180	70	214	166	377	167	460	261	535
NBT	1180	77	228	157	373	196	484	272	551
NBTR	1180	65	201	175	394	215	532	302	568
SBL	175	40	131	36	145	60	182	76	220
SBT	449	202	355	402	574	387	556	444	526
SBT	449	137	279	320	501	299	509	387	536
SBTR	449	51	142	250	496	202	417	327	522
13. Twinbrook Pkwy / Parklawn Dr -- Red Policy Area									
EBL	445	38	88	56	106	43	91	43	88
EBLTR	445	140	285	210	397	109	227	128	271
WBL	200	183	255	198	245	130	234	190	255
WBLTR	893	588	1080	691	1206	185	386	357	793
WBR	893	316	827	646	1136	95	158	269	577
NBL	190	39	115	16	49	32	96	21	89
NBT	1298	98	197	141	300	81	195	176	342
NBT	1298	121	220	156	335	108	239	193	367
NBTR	1298	161	321	178	383	152	306	213	402
SBL	240	32	138	30	140	28	125	3	16
SBL	411	70	186	76	207	80	198	66	142
SBT	411	416	482	394	478	415	479	305	514
SBT	411	391	518	379	523	390	482	264	527
SBR	250	77	273	57	235	66	256	12	93
14. Nebel St / Randolph Rd -- Red Policy Area									
EBL	140	12	63	23	90	10	33	34	123
EBT	598	99	203	199	496	117	220	480	749
EBTR	598	98	204	204	502	113	230	485	725
WBL	125	74	140	80	181	108	180	135	196
WBT	1100	124	277	223	423	234	426	538	939
WBTR	1100	116	255	233	439	226	420	516	914
NBL	100	60	124	66	140	44	99	73	149
NBT	557	58	144	150	305	55	114	163	375
NBR	557	69	143	299	471	133	227	330	497
SBL	250	68	121	124	260	120	223	125	251
SBT	1623	64	123	112	294	63	133	106	220
SBR	1623	14	47	14	46	19	54	9	35

15. Rockville Pike / Hubbard Dr / Plaza Driveway -- Orange Policy Area									
EBL	148	16	39	42	93	15	46	50	106
EBTR	148	10	29	19	52	11	29	19	54
WBL	134	73	126	150	230	64	123	145	215
WBTR	134	35	69	128	226	48	94	131	227
NBL	1538	16	47	568	1650	13	37	1237	2123
NBT	1538	68	158	1188	1914	151	280	1505	1663
NBT	1538	88	181	1223	1949	187	307	1528	1679
NBT	1538	47	135	1288	1995	144	268	1525	1705
NBTR	1538	51	106	1310	2023	58	128	1506	1765
SBL	180	26	86	59	150	51	151	67	165
SBT	394	100	276	76	248	177	386	114	309
SBT	394	97	282	86	270	187	406	117	325
SBTR	394	105	287	98	293	215	424	127	342
16. Chapman Ave / Randolph Rd / Josiah Henson Pkwy -- Red Policy Area									
EBL	350	34	61	242	481	32	59	162	394
EBT	528	60	149	353	699	61	150	280	540
EBTR	528	51	121	141	429	44	126	215	422
WBL	165	4	18	5	19	5	23	13	39
WBT	598	75	179	236	555	72	198	224	520
WBT	598	74	181	264	602	78	212	302	678
WBR	215	7	19	144	310	10	79	116	297
NBL	250	13	44	82	214	7	25	46	95
NBTR	376	17	57	157	381	9	30	52	114
SBL	226	12	39	79	155	12	35	71	138
SBLTR	226	24	60	119	212	33	69	108	190

17. Chapman Ave / Thompson Ave - Unsignalized -- Red Policy Area									
EBLTR	403	23	44	63	134	19	41	210	471
WBLTR	327	23	52	15	41	26	53	21	56
NBLTR	530	8	36	21	65	15	47	17	56
SBLTR	412	4	23	23	97	3	21	157	431
18. Rockville Pike (MD 355) / Rollins Ave Extension - Unsignalized									
WBR	80	FUTURE				FUTURE			
NBT	178								
NBT	178								
NBTR	178								
SBT	276								
SBT	276								
SBT	276								

Notes:

1. Capacity analysis based on Highway Capacity Manual 2000 Edition methodology, using Synchro 11.

2. Bold movements indicate storage lanes

APPENDIX J

Total Future

Conditions

Capacity Analyses

Pike Center
Total Future Conditions Levels of Service Summary[1]

Approach/ Lane Group	Existing Conditions				2034 Future Conditions without Development				2034 Phase 1 Future Conditions with Development				2039 Phase 2 Future Conditions with Development			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)
1. Rockville Pike / Bou Avenue -- **Orange Policy Area**																
EBLT	E	73.5	E	79.3	E	73.5	E	79.3	E	73.5	E	79.3	E	73.5	E	79.3
EBR	E	68.1	E	67.8	E	68.1	E	67.8	E	68.1	E	67.8	E	68.1	E	67.8
WBL	E	60.3	E	59.4	E	60.7	E	59.5	E	62.9	E	58.7	E	63.9	E	60.4
WBTR	D	48.5	D	53.7	D	48.0	D	53.7	D	46.3	D	49.8	D	45.8	D	49.0
NBL	E	72.7	E	74.5	E	72.7	E	74.5	E	72.7	E	74.5	E	72.7	E	74.5
NBT	C	29.1	D	37.3	D	38.1	F	89.7	D	40.8	F	116.3	D	43.7	F	153.3
NBR	C	24.5	C	26.6	C	24.9	C	28.1	C	27.0	D	36.3	C	25.7	C	34.4
SBL	B	14.4	D	41.2	C	31.3	D	43.4	D	37.5	F	90.0	C	34.9	D	51.9
SBTR	B	13.3	B	11.9	B	18.6	B	13.6	C	20.1	B	17.9	B	19.6	B	17.5
Overall	C	27.8	C	33.2	C	31.8	E	55.9	C	34.6	E	70.0	D	35.7	F	86.0
2. Rockville Pike / Pike Center Driveway / Federal Plaza Driveway -- **Orange Policy Area**																
EBLT	E	72.0	F	95.3	E	72.0	F	95.3	E	72.0	F	125.7	E	72.0	F	98.5
EBR	E	69.3	E	61.5	E	69.3	E	61.5	E	69.3	E	61.5	E	69.3	E	60.0
WBLTR	E	72.8	E	72.8	E	72.8	E	72.8	E	71.6	F	82.0	E	72.1	E	72.2
NBL	B	11.0	C	25.7	D	50.8	E	62.9	D	51.6	E	77.4	D	49.5	E	68.9
NBTR	A	1.1	B	10.1	A	1.0	B	14.8	A	0.8	B	17.5	A	1.0	A	9.2
SBL	A	2.0	A	5.5	A	2.7	C	29.2	A	2.8	D	37.7	A	2.2	A	2.5
SBTR	A	3.3	A	5.8	A	3.8	A	6.7	A	3.7	A	8.0	A	2.9	A	5.5
Overall	A	5.2	B	15.8	A	5.2	B	18.3	A	5.2	C	22.4	A	5.3	B	15.2

3. Rockville Pike/ Shell Gas Station Driveway - **Unsignalized - Orange Policy Area**																
WBR	A	9.5	A	9.4	A	9.7	B	10.4	B	10.1	B	10.9	NONE			
Overall	0.1	A	A	0.2	A	0.0	0.1	B	0.1	A	0.1	B				
4. Rockville Pike / Twinbrook Pkwy / Rollins Ave **-- Red Policy Area**																
EBT	E	66.1	E	63.4	E	63.5	E	63.7	E	63.0	E	63.7	E	60.5	E	63.7
WBT	E	63.2	D	54.9	E	56.8	D	54.1	E	56.6	D	54.1	E	55.1	D	54.0
WBR	E	65.5	E	56.4	E	65.0	E	57.4	E	67.0	E	57.0	E	69.5	E	61.9
NBL	B	11.8	A	3.5	D	48.9	C	33.9	D	52.1	D	44.6	D	51.6	D	36.9
NBT	A	2.9	A	4.1	A	4.7	B	12.5	A	5.0	B	16.6	A	2.8	C	20.9
NBR	A	0.2	A	0.3	A	0.4	A	3.9	A	0.4	A	6.5	A	0.3	A	4.9
SBL	A	6.6	B	15.9	B	18.2	E	62.2	B	19.6	E	62.6	C	34.4	E	74.1
SBT	B	12.3	B	15.4	C	20.9	C	22.3	C	21.3	C	23.6	C	22.2	C	22.8
Overall	C	21.6	C	20.3	C	23.7	C	26.6	C	24.0	C	28.5	C	24.4	C	31.4
5. Chapman Ave / Twinbrook Pkwy **-- Red Policy Area**																
EBL	B	17.3	C	28.7	B	19.9	C	30.2	C	20.4	C	30.2	C	21.9	C	30.2
EBTR	C	23.8	D	44.9	C	27.5	D	48.9	C	28.2	D	48.9	C	31.0	D	52.5
WBL	F	83.5	E	65.6	F	83.1	E	63.1	F	82.7	E	63.1	F	82.7	E	63.1
WBTR	A	10.0	B	18.4	B	11.7	B	18.4	B	12.1	B	18.4	B	13.4	B	18.4
NBLT	F	93.9	F	107.7	F	97.8	F	140.5	F	97.8	F	123.0	F	96.8	F	185.2
NBR	D	49.2	E	75.8	D	45.0	E	78.8	D	44.2	E	78.8	D	42.1	E	78.8
SBL	F	88.0	F	93.2	F	88.0	F	93.2	F	88.0	F	93.2	F	88.0	F	93.2
SBT	F	90.5	F	102.1	F	90.5	F	102.1	F	90.5	F	102.1	F	90.5	F	102.1
SBR	F	84.0	E	78.2	F	84.0	E	78.1	F	84.0	E	78.2	F	84.0	E	78.2
Overall	D	44.5	E	56.1	D	46.5	E	59.6	D	46.9	E	58.4	D	47.8	E	63.9

6. Chapman Ave / Pike Center Driveway North - **Unsignalized -- Orange Policy Area**																
EBLTR	A	0.0	C	22.4	A	0.0	C	25.0	A	0.0	C	20.2	C	22.2	E	46.5
WBLTR	B	11.1	C	18.6	B	11.4	C	20.4	B	11.1	C	20.2	B	11.6	D	27.0
NBLT	A	0.2	A	0.1	A	0.2	A	0.1	A	0.2	A	0.1	A	0.6	A	2.1
SBLT	A	0.2	A	0.3	A	0.2	A	0.3	A	0.2	A	0.2	A	0.2	A	0.2
Overall	A	0.1	A	0.4	A	0.1	A	0.4	A	0.1	A	0.3	A	1.4	B	3.5
7. Chapman Ave / Rollins Ave **- Unsignalized -- Orange Policy Area**																
EBLTR	-	-	-	-	-	-	-	-	C	23.2	E	48.9	C	18.2	F	740.4
WBL	C	16.0	D	33.6	C	17.1	E	40.8	C	21.1	F	65.6	C	24.1	F	132.4
WBR/WBTR	B	10.3	C	17.1	B	11.2	C	18.6	B	13.1	D	30.0	B	13.4	E	39.3
NBTR/NBLTR	-	-	-	-	-	-	-	-	A	0.0	-	-	-	-	A	1.2
SBLT	A	1.7	A	2.3	A	1.6	A	2.3	A	1.2	A	1.9	A	1.2	A	1.8
Overall	A	1.3	B	3.2	A	1.3	B	3.4	B	2.0	C	5.7	B	2.3	D	38.2
8. Chapman Ave / Pike Center Driveway South - **Unsignalized -- Orange Policy Area**																
EBLR	E	35.7	C	21.2	E	43.0	D	27.7								
NBLT	A	0.1	-	-	A	0.1	-	0.0				NONE				
Overall	A	0.1	A	0.1	A	0.1	A	0.1								

9. Chapman Ave / Bou Ave **-- Orange Policy Area**															
EBL	C	23.3	C	26.0	C	23.1	C	26.9	C	22.8	C	26.3	C	22.8	C	26.6
EBTR	C	21.7	C	22.8	C	21.9	C	22.5	C	22.1	C	22.9	C	22.1	C	22.3
WBL	D	35.3	D	40.4	C	34.8	D	42.5	C	34.1	D	40.8	C	34.3	D	42.5
WBT	D	37.6	D	45.2	D	37.1	D	47.8	D	36.5	D	45.9	D	36.6	D	47.5
WBR	D	36.5	D	42.7	D	36.5	D	45.4	D	36.0	D	43.5	D	36.2	D	45.5
NBL	C	29.1	C	33.7	C	28.6	D	35.7	C	27.9	C	34.0	C	28.1	D	35.7
NBTR	C	29.8	D	37.2	C	29.3	D	39.6	C	28.6	D	37.5	C	28.8	D	39.3
SBL	C	32.6	D	47.7	C	33.6	E	59.6	C	32.9	D	53.3	C	33.6	E	59.0
SBT	C	30.7	D	36.5	C	30.2	D	38.8	C	29.5	D	36.8	C	29.7	D	38.6
SBR	B	18.1	B	16.8	B	18.4	B	16.6	B	18.6	B	16.7	B	19.1	B	16.8
Overall	C	25.5	C	32.0	C	26.1	C	34.8	C	26.1	C	33.4	C	26.1	C	34.5
10. Bou Ave **/ Pike Center Driveway - Unsignalized -- Orange Policy Area**															
EBLT	A	0.9	A	1.1	A	0.9	A	1.0	A	5.5	A	5.8	A	0.9	A	1.1
SBLR	B	13.9	C	16.4	B	14.1	C	16.8	B	14.1	D	32.9	B	13.2	C	18.4
Overall	A	0.5	A	1.3	A	0.5	A	1.3	A	2.6	B	7.2	A	1	A	3.9
11. E Jefferson St / Rollins Ave **-- City of Rockville**															
EBL	D	48.3	D	48.1	D	48.3	D	48.1	D	48.3	D	48.1	D	48.3	D	48.1
EBTR	D	50.5	D	50.6	D	50.4	D	50.6	D	50.5	D	50.6	D	50.5	D	50.6
WBL	E	56.7	E	57.6	D	54.5	E	65.2	E	56.7	E	65.2	E	56.7	E	65.2
WBTR	D	35.3	C	34.6	D	37.3	C	32.5	C	34.8	C	32.5	C	34.8	C	32.5
NBLT	B	10.9	B	15.3	A	9.8	B	17.1	B	11.3	B	17.1	B	11.3	B	17.1
NBR	A	2.5	A	2.6	A	2.6	A	2.6	A	2.6	A	2.7	A	2.7	A	2.6
SBLTR	A	9.8	B	11.1	A	8.7	B	12.4	B	10.1	B	12.4	B	10.1	B	12.4
Overall	C	23.5	C	23.3	C	20.3	C	26.3	C	22.4	C	26.2	C	22.3	C	26.3

12. Rockville Pike / Halpine Rd **-- Red Policy Area**																
EBL	F	90.4	F	95.1	E	63.7	E	61.3	E	63.7	E	61.3	E	63.7	C	61.3
EBTR	F	83.6	E	74.7	E	62.5	E	56.7	E	62.5	E	56.7	E	62.5	E	56.7
WBL	F	82.2	E	74.6	F	90.1	F	87.2	F	90.1	F	87.2	F	90.1	F	87.2
WBT	F	83.8	E	77.0	E	62.2	E	57.6	E	62.2	E	57.6	E	62.2	E	57.6
WBR	F	81.4	E	73.4	E	61.7	E	56.2	E	61.7	E	56.2	E	61.7	E	56.2
NBL	A	3.8	B	12.6	B	18.0	E	66.2	B	19.0	E	74.2	B	19.3	E	76.8
NBTR	A	5.2	B	10.8	B	16.7	C	30.0	B	17.1	C	32.6	B	17.2	C	32.9
SBL	A	3.3	B	11.4	B	12.0	E	63.8	B	12.6	E	65.5	B	12.9	E	65.6
SBTR	A	6.8	B	16.2	B	19.3	C	33.1	B	19.5	C	34.5	B	19.6	C	34.9
Overall	B	13.7	C	21.3	C	23.9	D	38.2	C	24.1	D	39.9	C	24.1	D	40.2
13. Twinbrook Pkwy / Parklawn Dr **-- Red Policy Area**																
EBL	F	101.0	F	97.3	F	101.0	F	97.3	F	101.0	F	97.3	F	101.0	F	97.3
EBLTR	F	108.6	F	112.7	F	108.6	F	112.7	F	108.6	F	112.7	F	108.6	F	112.7
WBL	F	111.8	F	106.3	F	111.8	F	106.3	F	111.8	F	106.3	F	111.8	F	106.3
WBLT	F	110.5	F	106.0	F	110.5	F	106.0	F	110.5	F	106.0	F	110.5	F	106.0
WBR	E	78.3	E	71.8	E	78.3	E	71.8	E	78.3	E	71.8	E	78.3	E	71.8
NBL	A	9.1	B	14.9	A	9.2	B	15.0	A	9.2	B	15.0	A	9.2	B	15.0
NBTR	B	13.0	C	25.1	B	12.9	C	25.5	B	12.9	C	25.5	B	12.9	C	25.5
SBL	A	8.3	B	16.5	A	8.3	B	17.0	A	8.3	B	17.0	A	8.3	B	17.0
SBT	B	13.6	B	19.9	B	13.9	B	20.0	B	13.9	C	20.0	B	13.9	C	20.0
SBR	B	10.4	B	15.1	B	10.4	B	15.1	B	10.4	B	15.1	B	10.4	B	15.1
Overall	C	28.7	D	40.1	C	28.7	D	40.1	C	28.6	D	40.1	C	28.6	D	40.1

14. Nebel St / Randolph Rd **-- Red Policy Area**															
EBL	B	11.7	C	32.1	C	21.8	D	41.8	C	21.3	D	41.3	B	16.4	D	41.7
EBTR	B	15.8	D	53.4	C	29.8	F	91.7	C	30.2	F	94.1	C	22.0	F	95.4
WBL	A	8.9	D	38.6	B	15.3	F	108.5	B	15.0	F	107.3	B	11.8	F	107.3
WBTR	B	14.5	D	39.0	C	22.0	D	48.1	C	20.3	D	49.4	B	19.4	D	49.9
NBL	F	83.4	E	61.9	E	76.4	E	57.4	E	79.8	E	57.2	F	82.8	E	57.3
NBT	F	97.5	E	77.0	F	88.4	E	71.4	F	93.7	E	71.4	F	99.5	E	71.3
NBR	F	106.9	F	107.2	F	109.0	F	117.1	F	108.6	F	117.1	F	107.0	F	117.1
SBL	F	80.1	D	49.9	E	67.8	D	44.7	E	71.0	D	44.9	E	76.0	D	44.9
SBT	F	95.8	E	62.7	F	82.5	E	55.5	F	85.6	E	55.9	F	92.2	D	54.8
SBR	F	90.7	E	57.5	E	79.2	D	50.7	F	82.0	D	51.0	F	87.7	D	50.0
Overall	C	27.8	D	54.3	C	34.9	E	73.9	C	34.2	E	74.7	C	31.8	E	75.2
15. Rockville Pike / Hubbard Dr / Plaza Driveway **-- Orange Policy Area**															
EBL	E	66.1	E	55.8	E	66.1	E	55.8	E	66.1	E	55.8	E	66.1	E	55.8
EBTR	E	64.4	D	52.7	E	64.4	D	52.7	E	64.4	D	52.7	E	64.4	D	52.7
WBL	E	75.5	E	74.3	E	75.5	E	74.3	E	75.5	E	74.3	E	75.5	E	74.3
WBTR	E	65.4	D	53.8	E	65.4	D	53.8	E	65.4	D	53.8	E	65.4	D	53.8
NBL	A	6.1	B	12.8	B	14.0	B	15.4	B	14.3	B	17.2	B	14.9	B	17.7
NBTR	A	7.0	C	23.7	A	8.5	C	30.3	A	8.6	C	32.7	A	8.6	C	33.8
SBL	A	4.1	E	56.2	A	6.1	E	59.2	A	6.4	E	60.0	A	6.5	E	60.4
SBTR	A	8.6	B	13.9	B	12.2	B	17.1	B	12.4	B	18.6	B	12.7	B	18.9
Overall	B	11.3	C	25.4	B	12.9	C	28.7	B	13.0	C	30.2	B	13.2	C	30.9

16. Chapman Ave / Randolph Rd / Josiah Henson Pkwy **-- Red Policy Area**																
EBL	A	6.4	B	10.4	A	7.7	B	10.9	A	7.6	B	11.2	A	9.2	B	11.1
EBTR	A	7.4	B	16.0	A	7.6	B	17.0	A	7.8	B	17.4	A	7.9	B	17.4
WBL	A	6.4	B	13.2	A	6.6	B	13.6	A	6.6	B	13.7	A	6.7	B	13.7
WBT	B	12.0	B	18.7	B	13.2	B	19.4	B	13.2	B	19.7	B	14.3	B	19.6
WBR	A	7.6	B	15.1	A	7.8	B	15.1	A	7.8	B	15.1	A	7.8	B	15.1
NBL	E	72.2	E	78.8	E	72.2	E	78.8	E	72.2	E	78.8	E	72.2	E	78.8
NBTR	E	70.6	E	70.1	E	70.6	E	70.1	E	70.6	E	70.1	E	70.6	E	70.1
SBL	E	68.7	E	61.7	E	68.7	E	61.7	E	68.7	E	61.7	E	68.7	E	61.7
SBLTR	E	71.5	E	70.2	E	71.5	E	70.2	E	71.4	E	70.2	E	71.4	E	70.2
Overall	B	12.4	C	25.3	B	13.1	C	25.3	B	13.0	C	25.4	B	13.6	C	25.4
17. Chapman Ave / Thompson Ave **- Unsignalized -- Red Policy Area**																
EBLTR	B	11.3	C	19.3	B	11.3	C	19.4	B	11.3	C	19.4	B	11.3	C	19.4
WBLTR	C	16.3	C	24.0	C	16.3	C	23.9	C	16.3	C	24.0	C	16.3	C	23.9
NBLTR	A	1.9	A	1.0	A	1.9	A	1.0	A	1.9	A	1.0	A	1.9	A	1.0
SBLTR	A	0.4	A	0.2	A	0.4	A	0.2	A	0.4	A	0.2	A	0.4	A	0.2
Overall	A	3.8	A	5.0	A	3.8	A	5.1	A	3.8	A	5.1	A	3.8	A	5.1

18. Rockville Pike (MD 355) / Rollins Ave Extension - **Unsignalized -- Orange Policy Area**										
WBR	FUTURE	FUTURE	B	10.1	B	12.8	B	10.4	B	12.7
Overall			A	0.1	C	0.4	A	0.1	C	0.4

Notes:

1. Capacity analysis based on Highway Capacity Manual 2000 methodology, using Synchro 11 unless otherwise noted.
2. **Bold** roadways indicate N/S direction.

Pike Center
Total Future Conditions Queuing Summary

Approach/ Lane Group	Storage Length (ft)	Existing Conditions				2034 Future Conditions without Development				2034 Phase 1 Future Conditions with Development				2039 Phase 2 Future Conditions with Development			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		50th %tile	95th %tile	50th %tile	95th %tile	50th %tile	95th %tile	50th %tile	95th %tile	50th %tile	95th %tile	50th %tile	95th %tile	50th %tile	95th %tile	50th %tile	95th %tile
1. Rockville Pike / Bou Avenue -- Orange Policy Area																	
EBLT	69	50	110	127	139	37	88	131	149	99	165	129	143	56	111	102	117
EBR	90	29	73	16	59	36	74	16	56	46	88	29	76	40	88	12	60
WBL	192	154	252	149	236	172	235	142	231	184	240	173	237	195	203	137	264
WBL	192	163	255	173	249	175	237	167	250	188	233	188	240	195	202	173	250
WBTR	200	51	122	119	230	43	127	134	224	49	163	130	232	38	128	139	217
NBL	175	62	168	77	150	54	121	77	171	47	118	95	203	75	168	52	161
NBT	394	160	330	284	540	252	495	317	560	283	525	387	476	306	532	361	431
NBT	394	172	338	292	542	280	522	330	566	308	528	392	482	355	509	390	448
NBT	394	162	317	285	532	278	502	333	558	298	510	398	477	347	511	399	458
NBR	394	79	155	384	506	75	186	292	537	85	191	262	457	96	269	184	388
SBL	245	91	213	265	271	154	303	260	271	131	214	165	185	111	209	158	187
SBT	511	163	389	513	520	378	655	507	544	190	256	210	238	186	236	195	227
SBT	511	182	401	118	389	386	668	211	567	181	230	87	223	178	237	81	225
SBTR	511	176	400	124	390	398	660	209	541	163	256	87	226	175	227	86	233
2. Rockville Pike / Pike Center Driveway / Federal Plaza Driveway -- Orange Policy Area																	
EBLT	79	56	121	142	154	41	83	140	178	11	44	30	116	23	59	32	103
EBR	150	53	86	61	73	41	69	58	76	60	131	146	158	75	128	115	128
WBLTR	42	16	42	88	128	19	55	88	124	21	45	97	101	34	89	21	43
NBL	245	74	147	117	259	55	118	113	259	78	184	109	259	64	130	46	155
NBT	511	4	22	120	372	86	323	167	456	63	240	146	343	57	213	125	350
NBT	511	20	75	239	544	171	492	297	651	110	313	178	379	139	356	156	367
NBTR	511	26	94	268	550	188	518	301	634	121	326	177	379	151	369	265	432
SBL	175	25	67	7	36	24	78	11	62	12	61	7	54	17	67	1	10
SBT	160	9	31	160	162	98	214	162	169	135	222	162	168	179	308	224	294
SBT	160	21	56	81	210	114	220	78	207	147	233	79	204	187	297	80	241
SBTR	160	30	68	68	194	113	211	72	182	148	213	77	201	187	300	81	245

3. Rockville Pike/ Shell Gas Station Driveway - Unsignalized -- Orange Policy Area																	
WBR	50	12	36	25	46	16	41	33	62	12	33	35	66	NONE			
NBT	160							2	17			3	30				
NBT	160	4	39	13	69	30	127	26	113	60	180	31	122				
NBTR	160	4	38	9	65	42	150	21	102	62	184	25	117				
SBT	238	1	15	251	339	55	194	268	288	157	361	274	294				
SBT	238	2	18	51	204	65	212	77	260	167	364	107	308				
SBT	238			39	169	61	206	63	240	167	359	96	303				
4. Rockville Pike / Twinbrook Pkwy / Rollins Ave -- Red Policy Area																	
EBT	1299	78	152	853	1693	149	318	715	1091	424	790	937	1462	160	333	1127	1490
EBTR	1299	115	192	870	1692	230	396	754	1123	538	883	972	1467	226	387	1178	1545
WBT	549	61	147	77	187	101	297	97	226	125	239	117	295	90	240	223	535
WBT	549	62	158	61	184	100	310	122	313	139	311	107	350	113	339	493	796
WBR	150	56	145	43	129	84	190	112	215	101	192	63	165	102	201	156	242
NBL	238	38	105	22	82	47	107	24	70	48	111	55	132	55	142	35	87
NBT	238	82	190	96	255	110	259	134	278	124	281	134	282	136	326	130	336
NBT	238	67	185	88	207	106	263	135	272	124	288	132	276	128	297	129	338
NBT	238	54	164	83	187	113	259	134	261	120	284	122	261	113	255	97	258
NBR	300	8	79	-	-	16	114	-	-	-	-	-	-	8	75	-	-
SBL	400	67	138	120	423	161	354	178	482	234	508	134	414	131	285	94	336
SBT	1180	152	309	953	1561	245	546	987	1602	510	1089	1112	1489	217	457	906	1636
SBT	1180	136	292	448	864	244	527	923	1549	509	1057	758	1221	207	442	592	1162
SBTR	1180	110	264	176	545	246	527	893	1522	493	996	490	1146	198	414	339	849
5. Chapman Ave / Twinbrook Pkwy -- Red Policy Area																	
EBL	175	14	74	14	75	20	100	28	124	14	43	22	106	8	31	26	123
EBT	549	90	238	79	266	99	281	117	339	75	215	125	367	90	276	187	538
EBTR	549	124	304	90	298	123	311	145	401	122	312	232	612	158	387	204	567
WBL	300	183	362	232	401	190	370	252	367	208	382	254	346	175	366	206	375
WBL	300	318	328	318	328	317	329	320	327	319	328	318	326	318	328	311	351
WBT	1298	1310	1322	1242	1663	1274	1510	1187	1454	1259	1467	1268	1528	1263	1489	1182	1702
WBTR	1298	1164	1729	1112	1837	1039	1846	956	1614	883	1738	1066	1818	1121	1787	883	1752
NBLT	167	118	202	149	197	156	214	160	208	164	196	165	183	171	180	132	238
NBR	167	156	231	174	185	152	217	173	184	149	217	173	185	128	206	113	228
SBL	300	51	139	193	305	41	110	200	294	58	115	207	312	58	114	187	342
SBL	300	88	156	249	359	76	150	265	366	58	117	241	402	61	126	190	362
SBT	530	77	138	342	614	90	171	402	668	69	152	384	610	65	145	337	540
SBR	300	-	-	32	193	-	-	54	254	-	-	-	-	-	-	43	176

6. Chapman Ave / Pike Center Driveway North - Unsignalized -- Orange Policy Area																	
EBLTR	50	-	-	79	87	-	-	10	34	-	-	8	23	44	75	56	71
WBLTR	50	4	18	41	94	2	13	7	25	3	17	28	65	10	32	15	43
NBLT	97	13	58	22	78	58	125	23	70	66	139	24	66	103	115	64	143
NBTR	97	64	132	99	107	57	132	98	107	49	133	107	118	6	36	30	102
SBLT	167	6	38	42	158	24	92	75	206	2	14	50	163	8	53	2	16
SBTR	167	6	30	42	163	33	137	32	140	47	169	38	149	87	221	53	182
7. Chapman Ave / Rollins Ave - Unsignalized -- Orange Policy Area																	
EBLTR	75	-	-	-	-	-	-	-	-	23	69	8	31	39	63	27	65
WBL	56	15	35	49	129	19	41	39	98	22	48	32	107	43	100	10	39
WBR	56	32	71	125	134	33	80	125	133	25	54	109	125	33	74	93	117
NBTR	112	62	146	114	123	70	154	115	121	71	166	122	134	166	231	170	185
SBLT	97	10	47	53	133	35	111	65	147	18	64	59	138	15	64	16	68
SBT	97	15	61	30	112	32	113	33	117	39	122	34	115	76	149	44	124
8. Chapman Ave / Pike Center Driveway South - Unsignalized -- Orange Policy Area																	
EBLR	35	-	-	12	36	-	-	3	18	51	139	118	135	NONE			
NBLT	46	41	129	116	141	56	149	116	134	38	114	95	162				
SBT	122	11	44	79	153	40	107	100	149	11	50	29	102				
SBT	122	4	28	29	86	15	67	31	95	60	146	70	149				
SBTR	122	52	123	47	128	54	132	56	136	-	-	-	-				

9. Chapman Ave / Bou Ave -- Orange Policy Area																	
EBL	201	110	192	201	208	121	250	200	212	88	178	197	249	108	213	196	225
EBTR	201	49	137	42	143	51	139	54	168	53	117	59	163	48	126	25	102
WBL	817	5	21	244	800	7	25	165	679	5	25	72	406	5	26	4	18
WBT	817	100	183	880	933	70	133	811	1132	190	473	841	1070	146	297	801	1182
WBR	250	28	94	260	298	43	122	269	282	99	287	271	281	123	299	258	321
NBL	70	2	14	10	57	3	16	24	80	1	9	28	83	8	40	8	47
NBTR	130	34	70	196	217	61	174	199	221	39	94	195	209	65	151	189	204
SBL	46	23	55	46	69	36	64	45	57	42	78	55	76	74	134	80	152
SBT	46	18	48	32	63	23	56	33	63	23	56	31	69	30	90	40	116
SBR	46	29	67	32	70	32	66	32	68	39	70	38	85	107	136	55	139
10. Bou Ave / Pike Center Driveway - Unsignalized -- Orange Policy Area																	
EBLT	100	8	34	113	142	7	41	101	146	20	70	95	156	10	43	98	152
EBT	192	-	-	189	264	-	-	163	283	-	-	133	279	-	-	162	282
WBT	201	70	186	46	172	26	103	51	162	131	271	81	206	179	257	57	173
WBTR	201	78	193	98	242	44	130	99	254	140	275	127	275	199	276	105	257
SBLR	300	14	41	299	338	19	46	246	381	59	85	70	83	61	74	64	78
11. E Jefferson St / Rollins Ave -- City of Rockville																	
EBL	477	15	45	9	30	22	64	9	33	19	48	8	28	15	44	9	35
EBTR	477	58	115	154	426	53	108	60	114	70	143	105	217	68	142	110	225
WBL	1299	220	409	292	472	137	284	525	945	253	488	548	973	142	259	313	640
WBTR	1299	28	71	105	257	27	83	260	644	60	220	280	707	26	63	143	433
NBLT	295	57	126	70	218	57	127	171	340	62	129	244	496	59	113	136	355
NBR	295	23	58	158	373	36	77	46	144	34	78	177	486	39	79	186	393
SBLT	317	68	122	152	326	66	154	86	170	64	139	103	201	58	115	189	363
SBTR	317	9	32	93	273	19	79	38	119	31	103	57	144	16	56	133	332

12. Rockville Pike / Halpine Rd -- Red Policy Area																	
EBL	250	36	83	73	139	42	106	115	201	46	98	87	183	41	89	43	122
EBT	832	46	89	84	313	29	66	44	115	45	105	122	377	48	96	26	83
EBTR	832	36	79	328	813	44	96	157	405	43	96	253	568	28	53	223	448
WBL	497	4	24	63	158	185	286	376	646	197	307	407	568	170	261	257	376
WBT	497	28	67	60	113	20	57	228	598	23	59	144	458	18	53	18	60
WBR	450	74	141	107	172	62	124	103	313	73	139	74	248	67	121	46	139
NBL	165	49	100	120	226	79	172	103	202	96	173	108	187	48	110	69	188
NBT	1180	70	214	166	377	167	460	261	535	158	405	226	442	112	287	139	356
NBT	1180	77	228	157	373	196	484	272	551	172	420	237	464	145	350	144	387
NBTR	1180	65	201	175	394	215	532	302	568	199	480	231	479	159	366	134	383
SBL	175	40	131	36	145	60	182	76	220	50	151	54	178	48	127	41	152
SBT	449	202	355	402	574	387	556	444	526	361	595	690	775	282	438	306	401
SBT	449	137	279	320	501	299	509	387	536	296	555	649	802	208	385	241	364
SBTR	449	51	142	250	496	202	417	327	522	194	380	577	822	136	275	114	315
13. Twinbrook Pkwy / Parklawn Dr -- Red Policy Area																	
EBL	445	38	88	56	106	43	91	43	88	45	90	46	90	25	75	39	113
EBLTR	445	140	285	210	397	109	227	128	271	72	173	127	242	97	231	160	352
WBL	200	183	255	198	245	130	234	190	255	123	220	187	248	150	252	169	251
WBLTR	893	588	1080	691	1206	185	386	357	793	206	507	652	1159	203	411	377	646
WBR	893	316	827	646	1136	95	158	269	577	123	317	573	1118	115	201	235	497
NBL	190	39	115	16	49	32	96	21	89	29	71	8	29	31	93	8	29
NBT	1298	98	197	141	300	81	195	176	342	72	189	148	299	71	181	122	303
NBT	1298	121	220	156	335	108	239	193	367	93	224	175	336	104	230	142	330
NBTR	1298	161	321	178	383	152	306	213	402	130	287	197	379	131	301	148	355
SBL	240	32	138	30	140	28	125	3	16	21	120	11	68	38	165	6	47
SBL	411	70	186	76	207	80	198	66	142	73	170	57	145	85	227	44	115
SBT	411	416	482	394	478	415	479	305	514	332	558	386	541	366	542	380	523
SBT	411	391	518	379	523	390	482	264	527	308	531	376	564	345	538	361	543
SBR	250	77	273	57	235	66	256	12	93	65	221	41	182	83	260	48	201
14. Nebel St / Randolph Rd -- Red Policy Area																	
EBL	140	12	63	23	90	10	33	34	123	8	30	34	120	10	31	9	30
EBT	598	99	203	199	496	117	220	480	749	136	283	449	682	148	279	339	711
EBTR	598	98	204	204	502	113	230	485	725	129	273	448	671	131	253	331	700
WBL	125	74	140	80	181	108	180	135	196	92	158	128	197	76	156	105	204
WBT	1100	124	277	223	423	234	426	538	939	194	395	385	725	192	370	243	346
WBTR	1100	116	255	233	439	226	420	516	914	191	377	382	729	177	361	238	360
NBL	100	60	124	66	140	44	99	73	149	72	144	76	143	73	137	47	130
NBT	557	58	144	150	305	55	114	163	375	104	220	165	371	76	142	100	178
NBR	557	69	143	299	471	133	227	330	497	98	172	337	500	81	136	110	212
SBL	250	68	121	124	260	120	223	125	251	132	246	151	296	145	282	107	260
SBT	1623	64	123	112	294	63	133	106	220	84	150	113	268	60	119	54	165
SBR	1623	14	47	14	46	19	54	9	35	12	40	20	58	10	31	5	20

15. Rockville Pike / Hubbard Dr / Plaza Driveway -- Orange Policy Area																	
EBL	148	16	39	42	93	15	46	50	106	19	54	55	121	20	55	86	181
EBTR	148	10	29	19	52	11	29	19	54	9	29	22	53	7	25	11	30
WBL	134	73	126	150	230	64	123	145	215	72	132	142	260	61	115	76	198
WBTR	134	35	69	128	226	48	94	131	227	41	83	261	423	51	111	156	210
NBL	1538	16	47	568	1650	13	37	1237	2123	19	45	1265	1794	15	43	4	20
NBT	1538	68	158	1188	1914	151	280	1505	1663	153	280	1473	1703	152	271	143	293
NBT	1538	88	181	1223	1949	187	307	1528	1679	183	305	1509	1732	198	273	184	254
NBT	1538	47	135	1288	1995	144	268	1525	1705	133	278	1499	1771	198	293	209	241
NBTR	1538	51	106	1310	2023	58	128	1506	1765	61	131	1493	1815	104	233	177	324
SBL	180	26	86	59	150	51	151	67	165	49	145	40	125	29	98	27	102
SBT	394	100	276	76	248	177	386	114	309	221	452	94	227	210	404	83	180
SBT	394	97	282	86	270	187	406	117	325	241	463	74	214	217	420	65	202
SBTR	394	105	287	98	293	215	424	127	342	245	463	81	240	229	433	69	213
16. Chapman Ave / Randolph Rd / Josiah Henson Pkwy -- Red Policy Area																	
EBL	350	34	61	242	481	32	59	162	394	42	86	111	227	41	80	187	438
EBT	528	60	149	353	699	61	150	280	540	68	149	165	281	49	128	143	352
EBTR	528	51	121	141	429	44	126	215	422	56	127	141	276	45	103	134	329
WBL	165	4	18	5	19	5	23	13	39	9	62	12	33	15	93	13	69
WBT	598	75	179	236	555	72	198	224	520	119	285	161	328	117	289	111	307
WBT	598	74	181	264	602	78	212	302	678	126	294	164	347	113	293	113	322
WBR	215	7	19	144	310	10	79	116	297	14	84	45	159	20	117	97	232
NBL	250	13	44	82	214	7	25	46	95	18	46	67	140	11	33	33	71
NBTR	376	17	57	157	381	9	30	52	114	17	43	39	95	8	30	156	404
SBL	226	12	39	79	155	12	35	71	138	11	32	61	121	7	29	67	126
SBLTR	226	24	60	119	212	33	69	108	190	27	69	109	167	33	85	88	172

17. Chapman Ave / Thompson Ave - Unsignalized -- Red Policy Area																	
EBLTR	403	23	44	63	134	19	41	210	471	18	42	39	82	20	52	54	113
WBLTR	327	23	52	15	41	26	53	21	56	28	51	24	47	27	50	20	52
NBLTR	530	8	36	21	65	15	47	17	56	13	48	15	46	8	39	12	45
SBLTR	412	4	23	23	97	3	21	157	431	4	28	32	111	9	37	31	121
18. Rockville Pike (MD 355) / Rollins Ave Extension - Unsignalized																	
WBR	80	FUTURE				FUTURE				18	57	77	181	24	60	71	112
NBT	178									9	58	103	261	27	123	63	199
NBT	178									37	143	110	247	61	181	158	263
NBTR	178									39	149	105	248	64	197	155	259
SBT	276									233	382	281	292	231	387	278	292
SBT	276									243	389	63	243	239	387	87	289
SBT	276									251	389	65	248	242	384	83	282

Notes:

1. Capacity analysis based on Highway Capacity Manual 2000 Edition methodology, using Synchro 11.

2. Bold movements indicate storage lanes

Intersection	Policy Area	Operating Condition	Measure of Performance	Existing Conditions		Future Background Conditions		P1 Total Future Conditions		P2 Total Future Conditions		Background vs. Total Future	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
01. Rockville Pike / Bou Ave	**Orange**	Signalized	CLV Pass/Fail (1550 CLV Max)	829 Pass	1154 Pass	1126 Pass	1386 Pass	1165 Pass	1520 Pass	1181 Pass	1546 Pass	+55 +4.9%	+160 +11.5%
02. Rockville Pike / Pike Center / Federal Plaza	**Orange**	Signalized	CLV Pass/Fail (1550 CLV Max)	625 Pass	874 Pass	907 Pass	1097 Pass	908 Pass	1180 Pass	924 Pass	1099 Pass	+17 +1.9%	+2 +0.2%
03. Rockville Pike / Gas Station	**Orange**	Unignalized	CLV Pass/Fail (1550 CLV Max)	535 Pass	748 Pass	817 Pass	979 Pass	809 Pass	1039 Pass	0 Pass	0 Pass	-817 -100.0%	-979 -100.0%
04. Rockville Pike / Twinbrook Park / Rollins Ave	**Red**	Signalized	CLV Pass/Fail (1550 CLV Max)	778 Pass	977 Pass	1068 Pass	1259 Pass	1079 Pass	1317 Pass	1084 Pass	1415 Pass	+16 +1.5%	+156 +12.4%
05. Twinbrook Park / Chapman Ave	**Red**	Signalized	CLV Pass/Fail (1550 CLV Max)	724 Pass	1128 Pass	792 Pass	1184 Pass	799 Pass	1184 Pass	856 Pass	1234 Pass	+64 +8.1%	+50 +4.2%
06. Chapman Ave / Site Drive North	**Orange**	Unignalized	CLV Pass/Fail (1550 CLV Max)	318 Pass	399 Pass	351 Pass	427 Pass	350 Pass	418 Pass	420 Pass	507 Pass	+69 +19.7%	+80 +18.7%
07. Chapman Ave / Rollins Ave	**Orange**	Unignalized	CLV Pass/Fail (1550 CLV Max)	454 Pass	826 Pass	474 Pass	880 Pass	486 Pass	853 Pass	520 Pass	949 Pass	+46 +9.7%	+69 +7.8%
08. Chapman Ave / Site Drive South	**Orange**	Unignalized	CLV Pass/Fail (1550 CLV Max)	343 Pass	675 Pass	363 Pass	729 Pass	353 Pass	728 Pass	0 Pass	0 Pass	-363 -100.0%	-729 -100.0%
09. Chapman Ave / Bou Ave	**Orange**	Signalized	CLV Pass/Fail (1550 CLV Max)	479 Pass	912 Pass	509 Pass	984 Pass	512 Pass	970 Pass	572 Pass	1010 Pass	+63 +12.4%	+26 +2.6%
10. Bou Ave / Site Drive	**Orange**	Unignalized	CLV Pass/Fail (1550 CLV Max)	343 Pass	597 Pass	326 Pass	623 Pass	518 Pass	810 Pass	383 Pass	864 Pass	+57 +17.5%	+241 +38.7%
11. Rollins Ave / East Jefferson St	**City of Rockville**	Signalized	CLV Pass/Fail (1550 CLV Max)	729 Pass	1106 Pass	750 Pass	1165 Pass	820 Pass	1165 Pass	807 Pass	1155 Pass	+57 +7.6%	-10 -0.9%
12. Rockville Pike / Halpine Rd	**Red**	Signalized	CLV Pass/Fail (1550 CLV Max)	657 Pass	877 Pass	1024 Pass	1243 Pass	1035 Pass	1296 Pass	1040 Pass	1302 Pass	+16 +1.6%	+59 +4.7%
13. Twinbrook Park / Parklawn Dr	**Red**	Signalized	CLV Pass/Fail (1550 CLV Max)	636 Pass	900 Pass	657 Pass	916 Pass	659 Pass	916 Pass	684 Pass	916 Pass	+27 +4.1%	- -
14. Nebel St / Randolph Rd	**Red**	Signalized	CLV Pass/Fail (1550 CLV Max)	745 Pass	1228 Pass	849 Pass	1442 Pass	899 Pass	1455 Pass	919 Pass	1459 Pass	+70 +8.2%	+17 +1.2%
15. Rockville Pike / Hubbard Dr	**Orange**	Signalized	CLV Pass/Fail (1550 CLV Max)	806 Pass	1083 Pass	1097 Pass	1278 Pass	1104 Pass	1321 Pass	1121 Pass	1337 Pass	+24 +2.2%	+59 +4.6%
16. Chapman Ave / Randolph Rd	**Red**	Signalized	CLV Pass/Fail (1550 CLV Max)	678 Pass	802 Pass	736 Pass	842 Pass	734 Pass	863 Pass	790 Pass	863 Pass	+54 +7.3%	+21 +2.5%
17. Chapman Ave / Thompson Ave	**Red**	Unsignalized	CLV Pass/Fail (1550 CLV Max)	233 Pass	495 Pass	233 Pass	495 Pass	233 Pass	495 Pass	233 Pass	495 Pass	- -	- -
18. Rockville Pike / Rollins Ave Ext	**Orange**	Unsignalized	CLV Pass/Fail (1550 CLV Max)	0 Pass	0 Pass	0 Pass	0 Pass	837 Pass	1133 Pass	836 Pass	1184 Pass		

1

Critical Lane Volume and Level of Service Calculations

Intersection: 01. Rockville Pike / Bou Ave

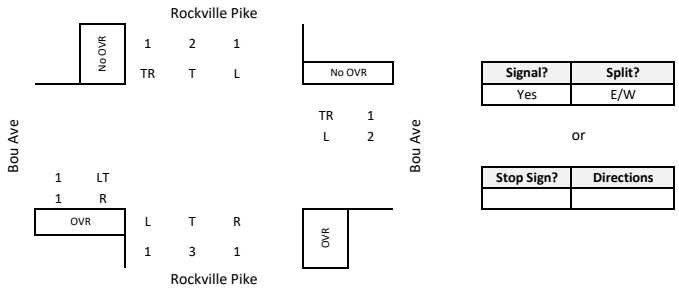
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

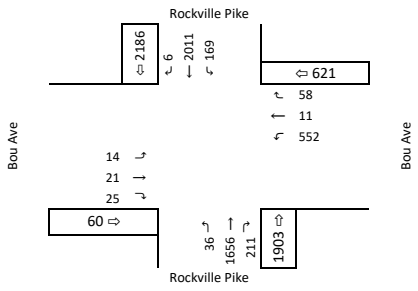


Signal?	Split?
Yes	E/W

or

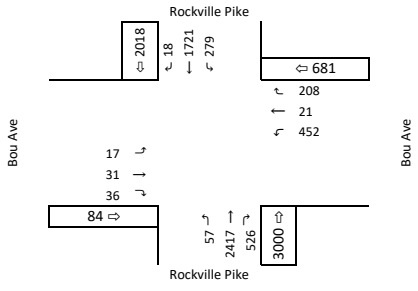
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LT	35		1.00	35				35	*
	R	25	0	1.00	25				25	
WB	2L	552		0.60	331				331	*
	TR	69	0	1.00	69				69	
NB	3T	1656		0.37	613	169	1.10	186	799	*
	R	211	211	1.00	0				186	
SB	2T+TR	2017	0	0.37	746	36	1.10	40	786	
Note:								CLV	1165	
				Congestion Equiv.				v/c	0.752	
				1550				LOS	C	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LT	48		1.00	48				48	*
	R	36	0	1.00	36				36	
WB	2L	452		0.60	271				271	*
	TR	229	0	1.00	229				229	
NB	3T	2417		0.37	894	279	1.10	307	1201	*
	R	526	526	1.00	0				307	
SB	2T+TR	1739	0	0.37	643	57	1.10	63	706	
Note:								CLV	1520	
				Congestion Equiv.				v/c	0.981	
				1550				LOS	E	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**Yes**	25	36		1.00	36	57		0.00	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**Yes**	211	526		0.00	552	452		0.60	211	526	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

Lane Use Factors: Number of Lanes	Left Turn LUF	Through LUF	LOS GRADE	LOS VALUE
1	1.1	1.00	A	1000.00
2	0.6	0.53	B	1150.00
3	0.4	0.37	C	1300.00
4		0.30	D	1450.00
5		0.25	E	1600.00
			F	1800.00

2

Critical Lane Volume and Level of Service Calculations

Intersection: 02. Rockville Pike / Pike Center / Federal Plaza

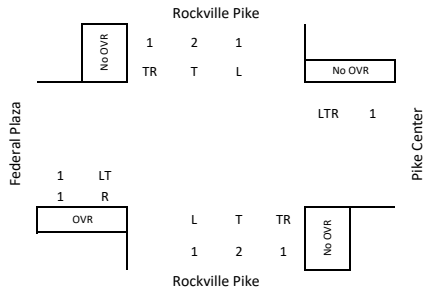
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

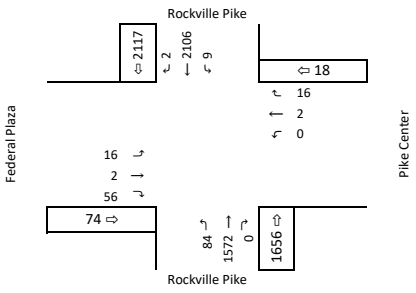


Signal?	Split?
Yes	E/W

or

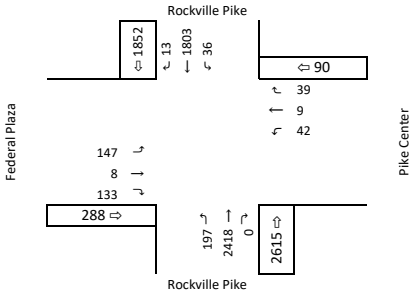
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LT	18		1.00	18				18	*
	R	56	56	1.00	0					
WB	LTR	18	0	1.00	18				18	*
NB	2T+TR	1572	0	0.37	582	9	1.10	10	592	
SB	2T+TR	2108	0	0.37	780	84	1.10	92	872	*
Note:								CLV	908	
				Congestion Equiv.				v/c	0.586	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LT	155		1.00	155				155	*
	R	133	133	1.00	0					
WB	LTR	90	0	1.00	90				90	*
NB	2T+TR	2418	0	0.37	895	36	1.10	40	935	*
									40	
SB	2T+TR	1816	0	0.37	672	197	1.10	217	889	
									217	
Note:								CLV	1180	
				Congestion Equiv.				v/c	0.761	
				1550				LOS	C	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM	Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM	Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM
Eastbound	**Yes**	56	133	1.00	84	197	1.10	56	133
Westbound	**No**	n/a	n/a	n/a	n/a	n/a	n/a	0	0
Northbound	**No**	n/a	n/a	n/a	n/a	n/a	n/a	0	0
Southbound	**No**	n/a	n/a	n/a	n/a	n/a	n/a	0	0

Montgomery County LATR

Lane Use Factors		
Number of Lanes	Left Turn LUF	Through LUF
1	1.1	1.00
2	0.6	0.53
3	0.4	0.37
4		0.30
5		0.25

3

Critical Lane Volume and Level of Service Calculations

Intersection: 03. Rockville Pike / Gas Station

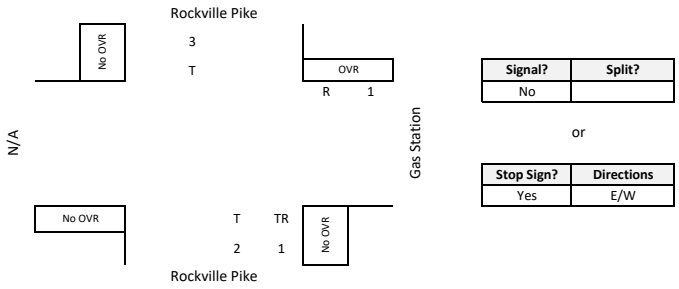
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

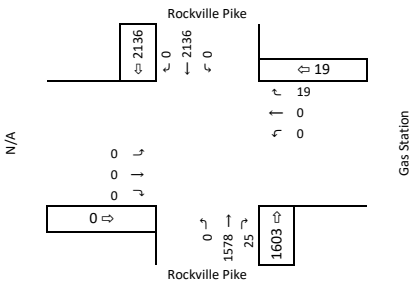


Signal?	Split?
No	

or

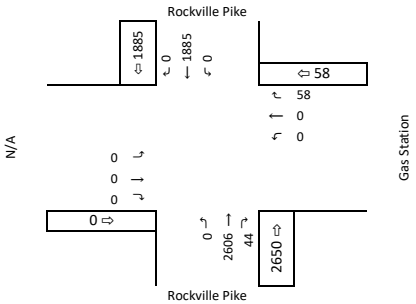
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB										
WB	R	19	0	1.00	19				19	*
NB	2T+TR	1603	0	0.37	593				593	
SB	3T	2136	0	0.37	790				790	*
Note:								CLV	809	
				Congestion Equiv.				v/c	0.522	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB										
WB	R	58	0	1.00	58				58	*
NB	2T+TR	2650	0	0.37	981				981	*
SB	3T	1885	0	0.37	697				697	
Note:								CLV	1039	
				Congestion Equiv.				v/c	0.670	
				1550				LOS	B	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	19	58		1.00	0	0		0.00	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

	Lane Use Factors		
	Number of Lanes	Left Turn LUF	Through LUF
	1	1.1	1.00
	2	0.6	0.53
	3	0.4	0.37
	4		0.30
	5		0.25

4

Critical Lane Volume and Level of Service Calculations

Intersection: 04. Rockville Pike / Twinbrook Park / Rollins Ave

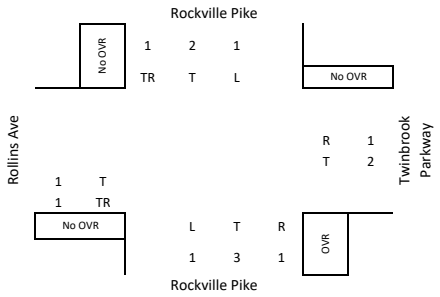
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

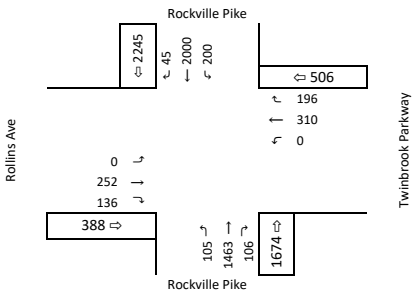


Signal?	Split?
Yes	None

or

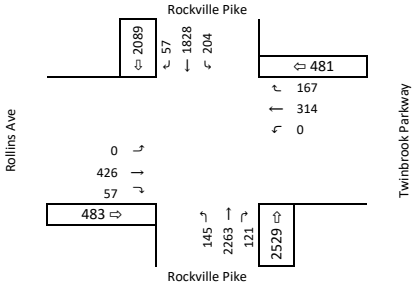
Stop Sign?	Directions
No	N/S

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	388	0	0.53	206				206	*
WB	2T	310		0.53	164				164	
	R	196	0	1.00	196				196	
NB	3T	1463		0.37	541	200	1.10	220	761	
	R	106	0	1.00	106				326	
SB	2T+TR	2045	0	0.37	757	105	1.10	116	873	*
Note:								CLV	1079	
				Congestion Equiv.				v/c	0.696	
				1550				LOS	B	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	483	0	0.53	256				256	*
WB	2T	314		0.53	166				166	
	R	167	0	1.00	167				167	
NB	3T	2263		0.37	837	204	1.10	224	1061	*
	R	121	0	1.00	121				345	
SB	2T+TR	1885	0	0.37	697	145	1.10	160	857	
Note:								CLV	1317	
				Congestion Equiv.				v/c	0.850	
				1550				LOS	D	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM	Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM	Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM
Eastbound	**No**	n/a	n/a	n/a	n/a	n/a	n/a	0	0
Westbound	**No**	n/a	n/a	n/a	n/a	n/a	n/a	0	0
Northbound	**Yes**	106	121	1.00	0	0	0.00	0	0
Southbound	**No**	n/a	n/a	n/a	n/a	n/a	n/a	0	0

Montgomery County LATR

Number of Lanes	Left Turn LUF	Through LUF
1	1.1	1.00
2	0.6	0.53
3	0.4	0.37
4		0.30
5		0.25

5

Critical Lane Volume and Level of Service Calculations

Intersection: 05. Twinbrook Park / Chapman Ave

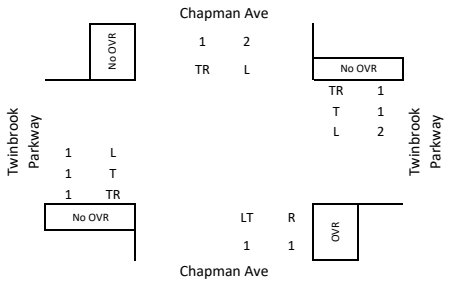
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

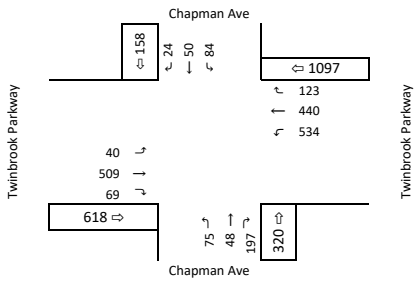


Signal?	Split?
Yes	N/S

or

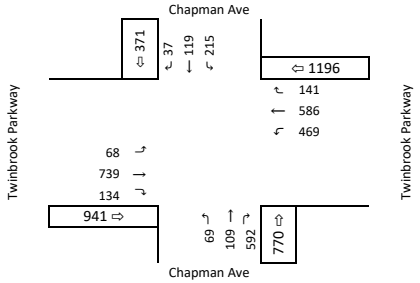
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	578	0	0.53	306	534	0.60	320	626	*
WB	T +TR	563	0	0.53	298	40	1.10	44	342	
NB	LT	123		1.00	123				123	*
	R	197	197	1.00	0					
SB	TR	50		1.00	50					
	L	84	0	0.60	50				50	*
Note:								CLV	799	
				Congestion Equiv.				v/c	0.515	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	873	0	0.53	463	469	0.60	281	744	*
WB	T +TR	727	0	0.53	385	68	1.10	75	460	
NB	LT	178		1.00	178					
	R	592	281	1.00	311				311	*
SB	TR	119		1.00	119					
	L	215	0	0.60	129				129	*
Note:								CLV	1184	
				Congestion Equiv.				v/c	0.764	
				1550				LOS	C	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**Yes**	197	592		1.00	534	469		0.60	197	281	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

Number of Lanes	Left Turn LUF	Through LUF
1	1.1	1.00
2	0.6	0.53
3	0.4	0.37
4		0.30
5		0.25

6

Critical Lane Volume and Level of Service Calculations

Intersection: 06. Chapman Ave / Site Drive North

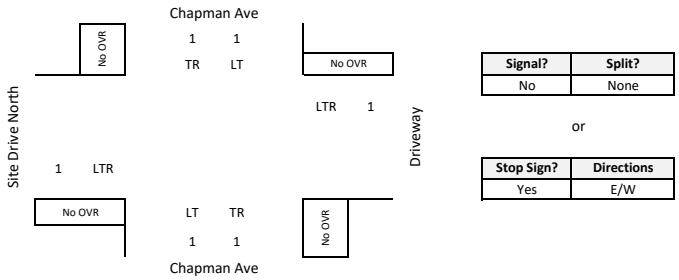
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

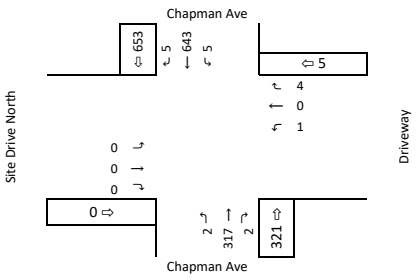


Signal?	Split?
No	None

or

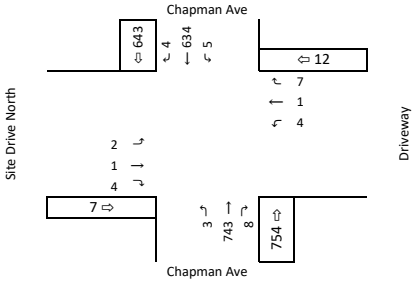
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	0	0	1.00	0	1	1.10	1	1	
WB	LTR	5	0	1.00	5	0	1.10	0	5	*
NB	T+TR	319	0	0.53	169	5	1.10	6	175	
	L	2		1.10	2				8	
SB	T+TR	648	0	0.53	343	2	1.10	2	345	*
	L	5		1.10	6				8	
Note:								CLV	350	
				Congestion Equiv.				v/c	0.226	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	5	0	1.00	5	4	1.10	4	9	
									4	
WB	LTR	12	0	1.00	12	2	1.10	2	14	*
									2	
NB	T+TR	751	0	0.53	398	5	1.10	6	404	*
	L	3		1.10	3				9	
SB	T+TR	638	0	0.53	338	3	1.10	3	341	
	L	5		1.10	6				9	
Note:								CLV	418	
				Congestion Equiv.				v/c	0.270	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

7

Critical Lane Volume and Level of Service Calculations

Intersection: 07. Chapman Ave / Rollins Ave

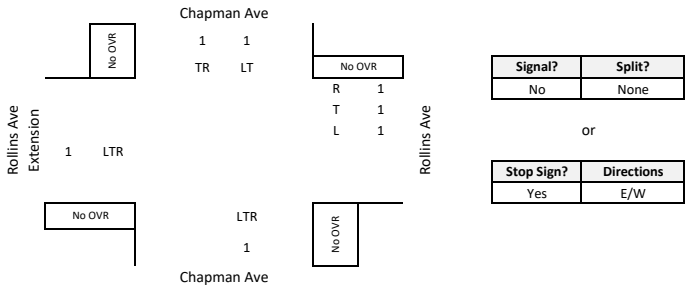
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

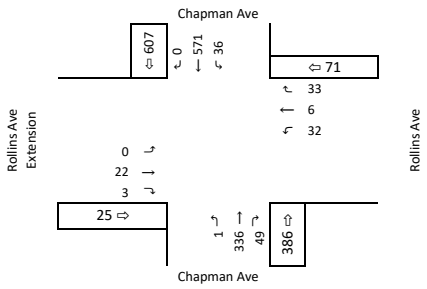


Signal?	Split?
No	None

or

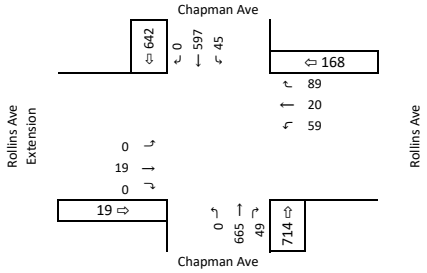
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	25	0	1.00	25	32	1.10	35	60	*
WB	T	6		1.00	6	0	1.10	0	6	
	R	33	0	1.00	33				33	
NB	LTR	386	0	1.00	386	36	1.10	40	426	*
SB	T+TR	571	0	0.53	303	1	1.10	1	304	
Note:								CLV	486	
				Congestion Equiv.				v/c	0.314	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	19	0	1.00	19	59	1.10	65	84	
WB	T	20		1.00	20	0	1.10	0	20	
	R	89	0	1.00	89				89	*
NB	LTR	714	0	1.00	714	45	1.10	50	764	*
SB	T+TR	597	0	0.53	316	0	1.10	0	316	
Note:								CLV	853	
				Congestion Equiv.				v/c	0.550	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

Lane Use Factors: Number of Lanes	Left Turn LUF	Through LUF	LOS: GRADE	LOS: VALUE
1	1.1	1.00	A	1000.00
2	0.6	0.53	B	1150.00
3	0.4	0.37	C	1300.00
4		0.30	D	1450.00
5		0.25	E	1600.00
			F	1800.00

8

Critical Lane Volume and Level of Service Calculations

Intersection: 08. Chapman Ave / Site Drive South

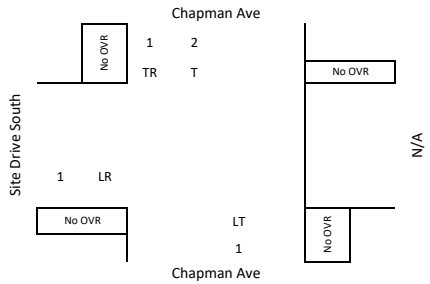
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

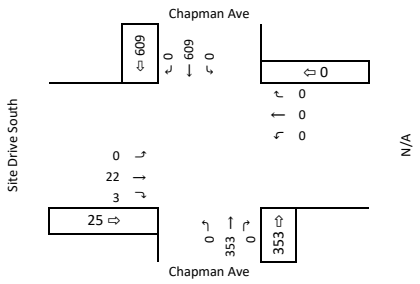


Signal?	Split?

or

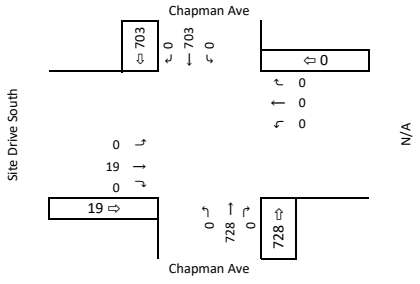
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LR	0	0	1.10	0				0	* *
WB										* *
NB	LT	353	0	1.00	353				353	*
SB	T+TR	609	0	0.37	225	0	1.10	0	225	
Note:								CLV	353	
				Congestion Equiv.				v/c	0.228	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LR	0	0	1.10	0				0	* *
WB										* *
NB	LT	728	0	1.00	728				728	*
SB	T+TR	703	0	0.37	260	0	1.10	0	260	
Note:								CLV	728	
				Congestion Equiv.				v/c	0.470	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

	Lane Use Factors		
	Number of Lanes	Left Turn LUF	Through LUF
	1	1.1	1.00
	2	0.6	0.53
	3	0.4	0.37
	4		0.30
	5		0.25

9

Critical Lane Volume and Level of Service Calculations

Intersection: 09. Chapman Ave / Bou Ave

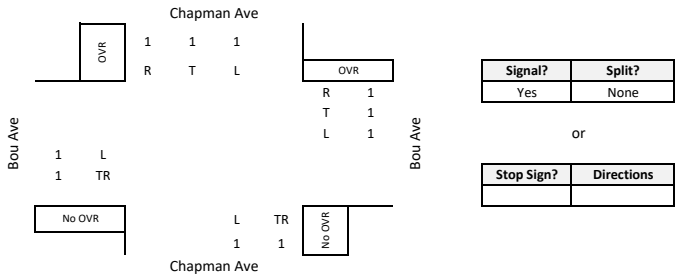
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

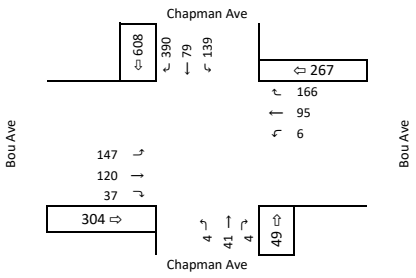


Signal?	Split?
Yes	None

or

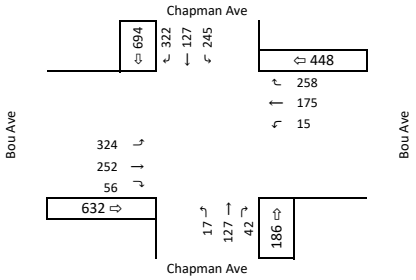
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	157	0	1.00	157	6	1.10	7	164	
WB	T	95		1.00	95	147	1.10	162	257	*
	R	166	153	1.00	13				175	
NB	TR	45	0	1.00	45	139	1.10	153	198	
SB	T	79		1.00	79	4	1.10	4	83	
	R	390	162	1.10	251				255	*
Note:								CLV	512	
				Congestion Equiv.				v/c	0.330	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	308	0	1.00	308	15	1.10	17	325	
									17	
WB	T	175		1.00	175	324	1.10	356	531	*
	R	258	258	1.00	0				356	
NB	TR	169	0	1.00	169	245	1.10	270	439	*
									270	
SB	T	127		1.00	127	17	1.10	19	146	
	R	322	322	1.10	0				19	
Note:								CLV	970	
				Congestion Equiv.				v/c	0.626	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	166	258		1.00	139	245		1.10	153	258	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**Yes**	390	322		1.00	147	324		1.10	162	322	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

10

Critical Lane Volume and Level of Service Calculations

Intersection: 10. Bou Ave / Site Drive

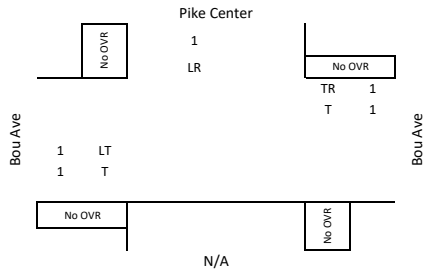
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

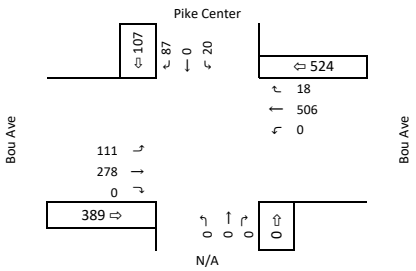


Signal?	Split?
No	None

or

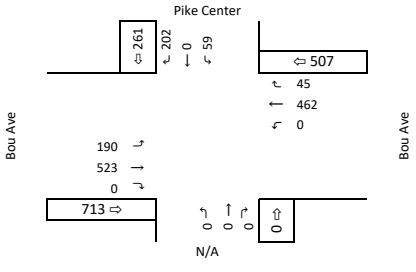
Stop Sign?	Directions
Yes	N/S

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	2T	278	0	1.00	278	0	1.10	0	278	
WB	T+TR	524	0	0.53	278	111	1.10	122	400	*
NB										
SB	LR	107	0	1.10	118				118	*
Note:								CLV	518	
				Congestion Equiv.				v/c	0.334	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	2T	523	0	1.00	523	0	1.10	0	523	*
WB	T+TR	507	0	0.53	269	190	1.10	209	478	
NB										
SB	LR	261	0	1.10	287				287	*
Note:								CLV	810	
				Congestion Equiv.				v/c	0.523	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

11

Critical Lane Volume and Level of Service Calculations

Intersection: 11. Rollins Ave / East Jefferson St

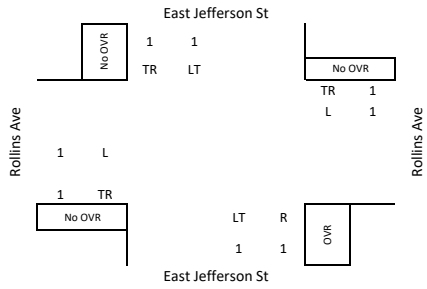
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

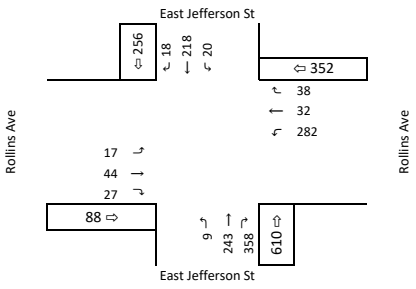


Signal?	Split?
Yes	E/W

or

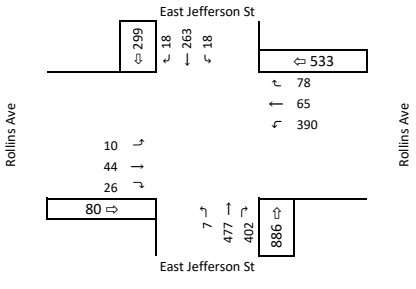
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	88	0	1.00	88				88	*
WB	LTR	352	0	1.00	352				352	*
NB	LT	252		1.10	277	20	1.10	22	299	
	R	358	0	1.00	358				380	*
SB	LTR	256	0	0.53	136	9	1.10	10	146	
Note:								CLV	820	
				Congestion Equiv.				v/c	0.529	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	80	0	1.00	80				80	*
WB	LTR	533	0	1.00	533				533	*
NB	LT	484		1.10	532	18	1.10	20	552	
	R	402	0	1.00	402				422	*
SB	LTR	299	0	0.53	158	7	1.10	8	166	
Note:								CLV	1165	
				Congestion Equiv.				v/c	0.752	
				1550				LOS	C	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**Yes**	358	402		1.00	282	390		0.00	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

12

Critical Lane Volume and Level of Service Calculations

Intersection: 12. Rockville Pike / Halpine Rd

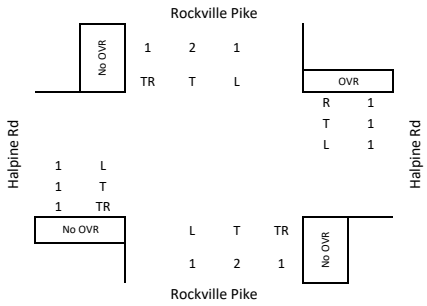
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

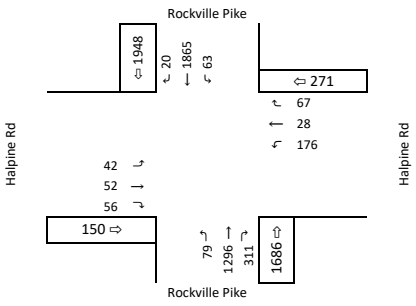


Signal?	Split?
Yes	None

or

Stop Sign?	Directions
No	None

AM Peak Hour Critical Lane Volume Analysis

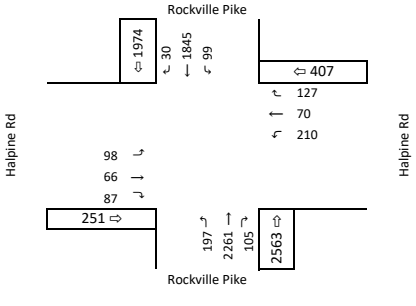


Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	108	0	0.53	57	176	1.10	194	251	*
WB	LTR	271	67	0.37	75	42	1.10	46	46	
NB	2T+TR	1607	0	0.37	595	63	1.10	69	664	
SB	2T+TR	1885	0	0.37	697	79	1.10	87	784	*
Note:								CLV	1035	
				Congestion Equiv.				v/c	0.668	
				1550				LOS	B	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	67	127		1.00	63	99		1.10	67	109	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	153	0	0.53	81	210	1.10	231	312 231	*
WB	LTR	407	109	0.37	110	98	1.10	108	218 108	
NB	2T+TR	2366	0	0.37	875	99	1.10	109	984 109	*
SB	2T+TR	1875	0	0.37	694	197	1.10	217	911 217	
Note:								CLV	1296	
				Congestion Equiv.				v/c	0.836	
				1550				LOS	C	

Montgomery County LATR

	Lane Use Factors		
	Number of Lanes	Left Turn LUF	Through LUF
	1	1.1	1.00
	2	0.6	0.53
	3	0.4	0.37
	4		0.30
	5		0.25

13

Critical Lane Volume and Level of Service Calculations

Intersection: 13. Twinbrook Park / Parklawn Dr

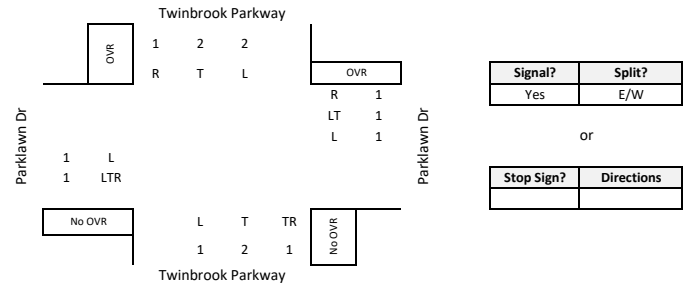
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

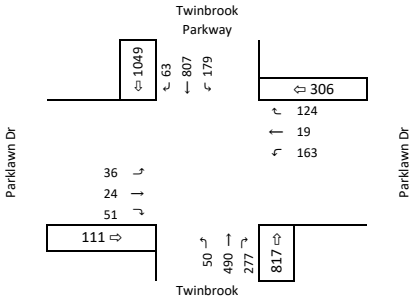


Signal?	Split?
Yes	E/W

or

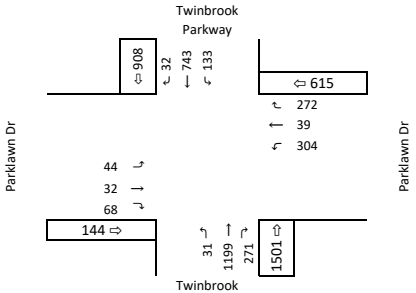
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	111	0	0.60	67				67	*
WB	LT	182		0.60	109				109	*
	R	124	107	1.00	17					
NB	2T+TR	767	0	0.37	284	179	0.60	107	391	
SB	T	807		0.53	428	50	1.10	55	483	*
	R	63	40	1.00	23				78	
Note:								CLV	659	
				Congestion Equiv.				v/c	0.425	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	144	0	0.60	86				86	*
WB	LT	343		0.60	206				206	*
	R	272	80	1.00	192				192	
NB	2T+TR	1470	0	0.37	544	133	0.60	80	624	*
SB	T	743		0.53	394	31	1.10	34	428	
	R	32	32	1.00	0				34	
Note:								CLV	916	
				Congestion Equiv.				v/c	0.591	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	124	272		1.00	179	133		0.60	107	80	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**Yes**	63	32		1.00	36	44		1.10	40	32	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

14

Critical Lane Volume and Level of Service Calculations

Intersection: 14. Nebel St / Randolph Rd

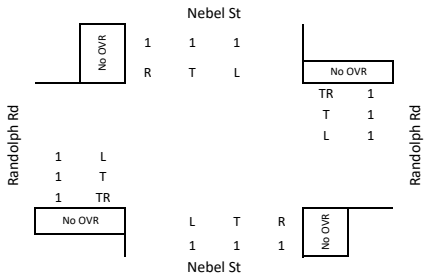
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

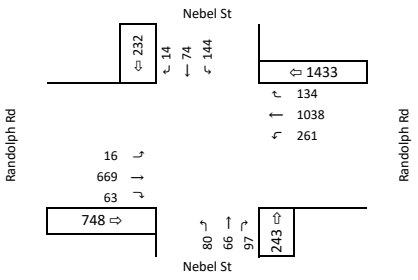


Signal?	Split?
Yes	None

or

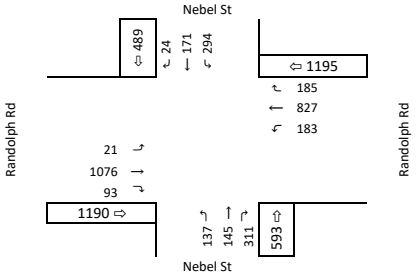
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	732	0	0.53	388	261	1.10	287	675	*
WB	T+TR	1172	0	0.53	621	16	1.10	18	639	
NB	T	66		1.00	66	144	1.10	158	224	*
	R	97	0	1.00	97					
SB	T	74		1.00	74	80	1.10	88	162	
	R	14	0	1.00	14					
Note:								CLV	899	
				Congestion Equiv.				v/c	0.580	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	1169	0	0.53	620	183	1.10	201	821 201	*
WB	T+TR	1012	0	0.53	536	21	1.10	23	559 23	
NB	T	145		1.00	145	294	1.10	323	468	
	R	311	0	1.00	311				634	*
SB	T	171		1.00	171	137	1.10	151	322	
	R	24	0	1.00	24				175	
Note:								CLV	1455	
				Congestion Equiv.				v/c	0.939	
				1550				LOS	E	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

Lane Use Factors		
Number of Lanes	Left Turn LUF	Through LUF
1	1.1	1.00
2	0.6	0.53
3	0.4	0.37
4		0.30
5		0.25

17

Critical Lane Volume and Level of Service Calculations

Intersection: 17. Chapman Ave / Thompson Ave

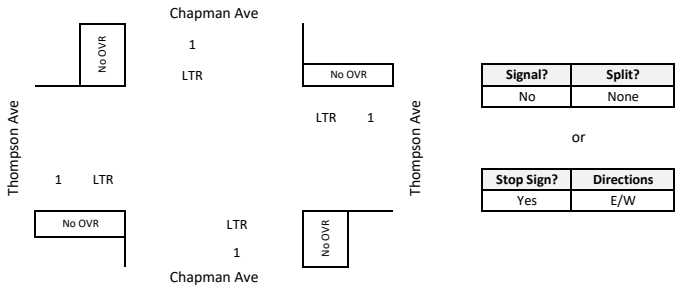
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

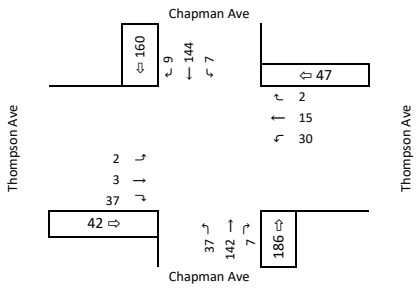


Signal?	Split?
No	None

or

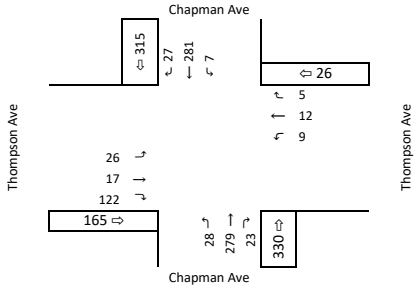
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	42	0	1.00	42				42	
WB	LTR	47	0	1.00	47				47	*
NB	LTR	186	0	1.00	186				186	*
SB	LTR	160	0	1.00	160				160	
Note:								CLV	233	
				Congestion Equiv.				v/c	0.150	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	165	0	1.00	165				165 0	*
WB	LTR	26	0	1.00	26				26 0	
NB	LTR	330	0	1.00	330				330 0	*
SB	LTR	315	0	1.00	315				315 0	
Note:								CLV	495	
				Congestion Equiv.				v/c	0.319	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

16

Critical Lane Volume and Level of Service Calculations

Intersection: 16. Chapman Ave / Randolph Rd

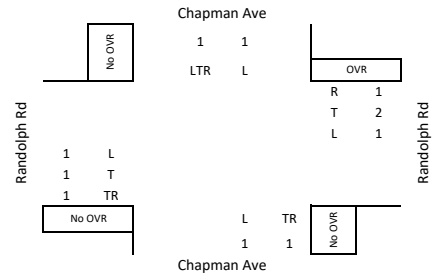
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

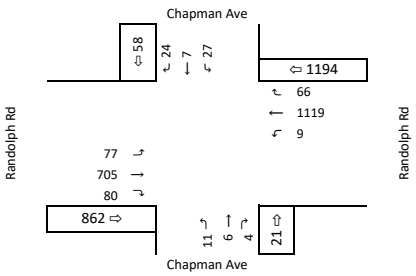


Signal?	Split?
Yes	N/S

or

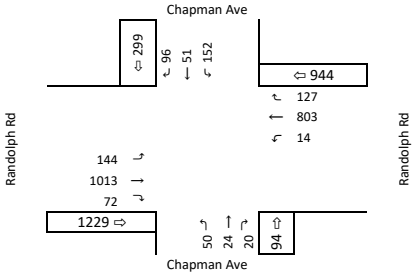
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	785	0	0.53	416	9	1.10	10	426	
WB	T	1119		0.53	593	77	1.10	85	678	*
	R	66	30	1.00	36				121	
NB	LTR	21	0	1.00	21				21	*
SB	LTR	58	0	0.60	35				35	*
Note:								CLV	734	
				Congestion Equiv.				v/c	0.474	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	1085	0	0.53	575	14	1.10	15	590	*
									15	
WB	T	803		0.53	426	144	1.10	158	584	
	R	127	127	1.00	0				158	
NB	LTR	94	0	1.00	94				94	*
									0	
SB	LTR	299	0	0.60	179				179	*
									0	
Note:								CLV	863	
				Congestion Equiv.				v/c	0.557	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	66	127		1.00	27	152		1.10	30	127	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

Lane Use Factors		
Number of Lanes	Left Turn LUF	Through LUF
1	1.1	1.00
2	0.6	0.53
3	0.4	0.37
4		0.30
5		0.25

15

Critical Lane Volume and Level of Service Calculations

Intersection: 15. Rockville Pike / Hubbard Dr

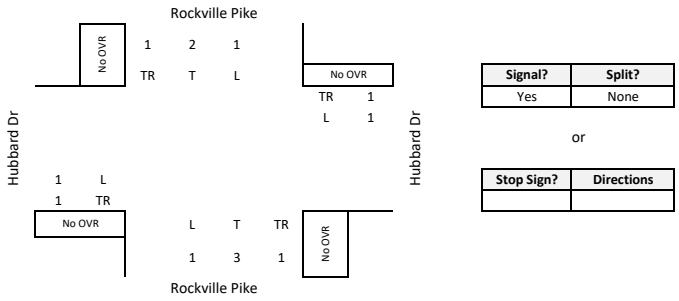
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

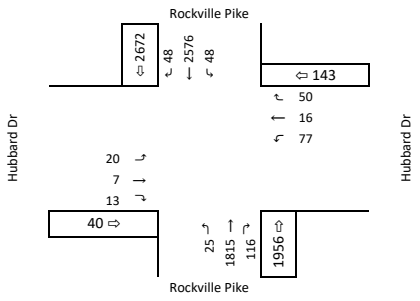


Signal?	Split?
Yes	None

or

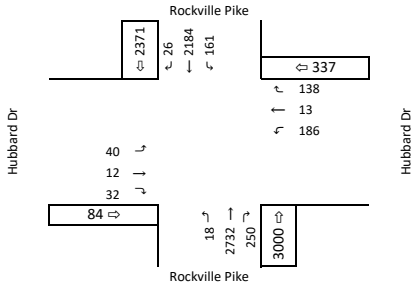
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	20	0	1.00	20	77	1.10	85	105	*
WB	TR	66	0	1.00	66	20	1.10	22	88	
NB	3T+TR	1931	0	0.30	579	48	1.10	53	632	
SB	2T+TR	2624	0	0.37	971	25	1.10	28	999	*
Note:								CLV	1104	
				Congestion Equiv.				v/c	0.712	
				1550				LOS	B	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	44	0	1.00	44	186	1.10	205	249	
	L	40		1.10	44				249	
WB	TR	151	0	1.00	151	40	1.10	44	195	
	L	186		1.10	205				249	*
NB	3T+TR	2982	0	0.30	895	161	1.10	177	1072	*
	L	18		1.10	20				197	
SB	2T+TR	2210	0	0.37	818	18	1.10	20	838	
				1.10	0				20	
Note:								CLV	1321	
				Congestion Equiv.				v/c	0.852	
				1550				LOS	D	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

18

Critical Lane Volume and Level of Service Calculations

Intersection: Rockville Pike / Rollins Ave Ext

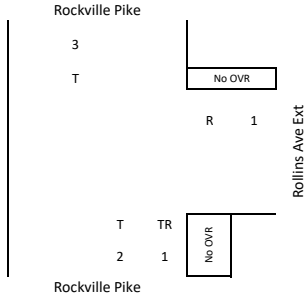
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 1 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

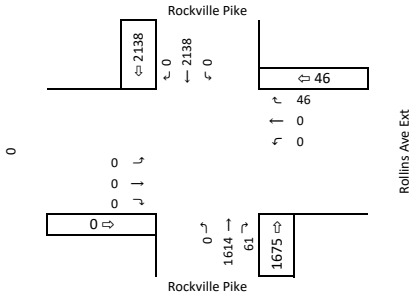


Signal?	Split?
No	None

or

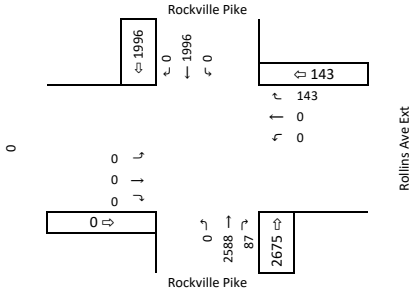
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB										
WB	R	46	0	1.00	46				46	*
NB	2T+TR	1675	0	0.37	620				620	
SB	3T	2138	0	0.37	791				791	*
Note:								CLV	837	
				Congestion Equiv.				v/c	0.523	
				1600				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB										
WB	R	143	0	1.00	143				143	*
NB	2T+TR	2675	0	0.37	990				990	*
SB	3T	1996	0	0.37	739				739	
Note:								CLV	1133	
				Congestion Equiv.				v/c	0.708	
				1600				LOS	B	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM	Right Vol.	Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM	Adjacent Overlap Vol.	Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	Overlap
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

	Lane Use Factors		
	Number of Lanes	Left Turn LUF	Through LUF
	1	1.1	1.00
	2	0.6	0.53
	3	0.4	0.37
	4		0.30
	5		0.25

1

Critical Lane Volume and Level of Service Calculations

Intersection: 01. Rockville Pike / Bou Ave

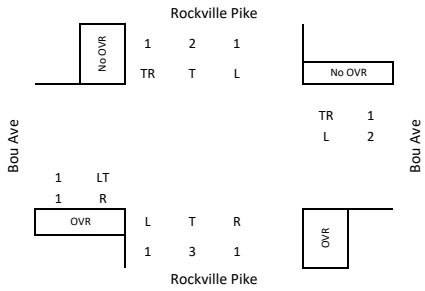
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

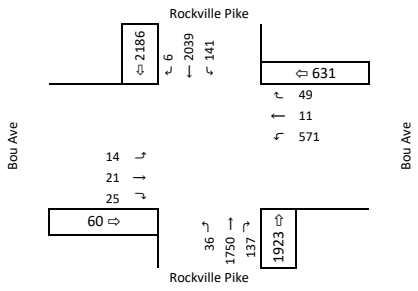


Signal?	Split?
Yes	E/W

or

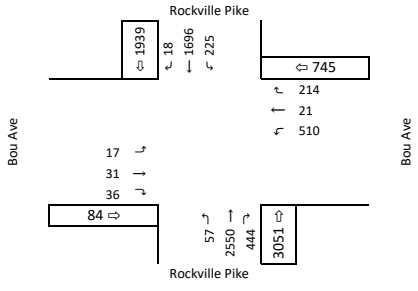
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LT	35		1.00	35				35	*
	R	25	0	1.00	25				25	
WB	2L	571		0.60	343				343	*
	TR	60	0	1.00	60				60	
NB	3T	1750		0.37	648	141	1.10	155	803	*
	R	137	137	1.00	0				155	
SB	2T+TR	2045	0	0.37	757	36	1.10	40	797	
Note:								CLV	1181	
				Congestion Equiv.				v/c	0.762	
				1550				LOS	C	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LT	48		1.00	48				48	*
	R	36	0	1.00	36				36	
WB	2L	510		0.60	306				306	*
	TR	235	0	1.00	235				235	
NB	3T	2550		0.37	944	225	1.10	248	1192	*
	R	444	444	1.00	0				248	
SB	2T+TR	1714	0	0.37	634	57	1.10	63	697	
Note:								CLV	1546	
				Congestion Equiv.				v/c	0.997	
				1550				LOS	E	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	Yes	25	36		1.00	36	57		0.00	0	0	
Westbound	No	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	Yes	137	444		0.00	571	510		0.60	137	444	
Southbound	No	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors: Number of Lanes	Left Turn LUF	Through LUF		LOS: GRADE	VALUE
		1	1.1	1.00		A	1000.00
		2	0.6	0.53		B	1150.00
		3	0.4	0.37		C	1300.00
		4		0.30		D	1450.00
		5		0.25		E	1600.00
						F	1800.00

2

Critical Lane Volume and Level of Service Calculations

Intersection: 02. Rockville Pike / Pike Center / Federal Plaza

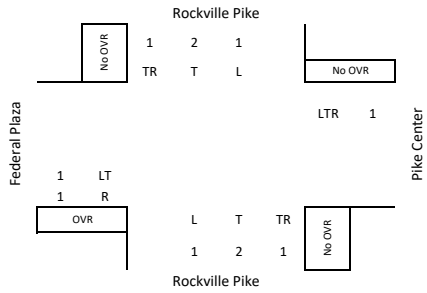
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

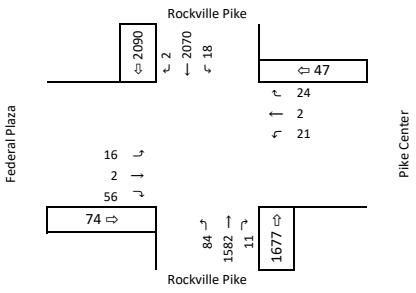


Signal?	Split?
Yes	E/W

or

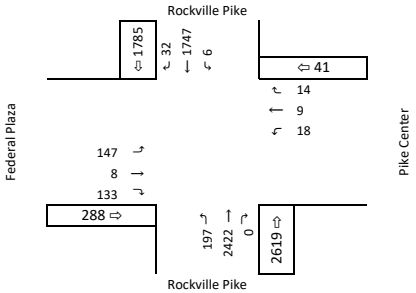
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LT	18		1.00	18				18	*
	R	56	56	1.00	0					
WB	LTR	47	0	1.00	47				47	*
NB	2T+TR	1593	0	0.37	589	18	1.10	20	609	
SB	2T+TR	2072	0	0.37	767	84	1.10	92	859	*
Note:								CLV	924	
				Congestion Equiv.				v/c	0.596	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LT	155		1.00	155				155	*
	R	133	133	1.00	0					
WB	LTR	41	0	1.00	41				41	*
NB	2T+TR	2422	0	0.37	896	6	1.10	7	903	*
									7	
SB	2T+TR	1779	0	0.37	658	197	1.10	217	875	
									217	
Note:								CLV	1099	
				Congestion Equiv.				v/c	0.709	
				1550				LOS	B	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**Yes**	56	133		1.00	84	197		1.10	56	133	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

3

Critical Lane Volume and Level of Service Calculations

Intersection: 03. Rockville Pike / Gas Station

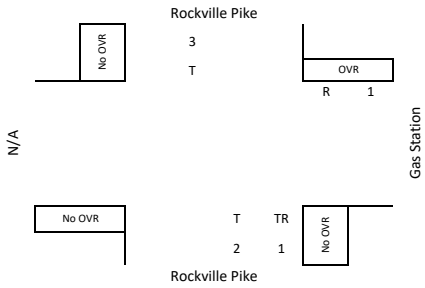
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

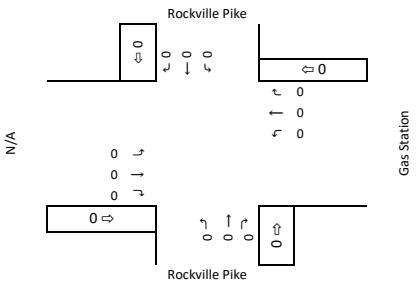


Signal?	Split?
No	

or

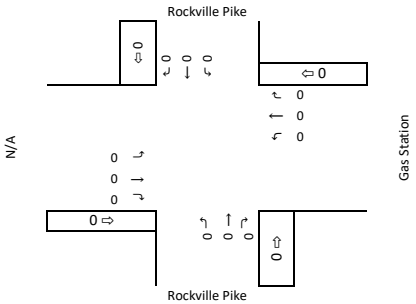
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB										* *
WB	R	0	0	1.00	0				0	* *
NB	2T+TR	0	0	0.37	0				0	* *
SB	3T	0	0	0.37	0				0	*
Note:								CLV	0	
				Congestion Equiv.				v/c	0.000	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB										* *
WB	R	0	0	1.00	0				0	* *
NB	2T+TR	0	0	0.37	0				0	* *
SB	3T	0	0	0.37	0				0	*
Note:								CLV	0	
				Congestion Equiv.				v/c	0.000	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	0	0		1.00	0	0		0.00	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

Lane Use Factors		
Number of Lanes	Left Turn LUF	Through LUF
1	1.1	1.00
2	0.6	0.53
3	0.4	0.37
4		0.30
5		0.25

4

Critical Lane Volume and Level of Service Calculations

Intersection: 04. Rockville Pike / Twinbrook Park / Rollins Ave

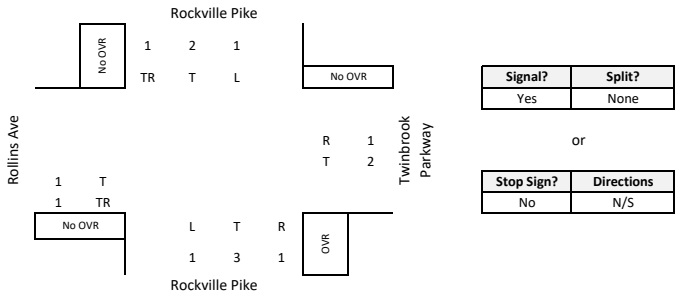
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

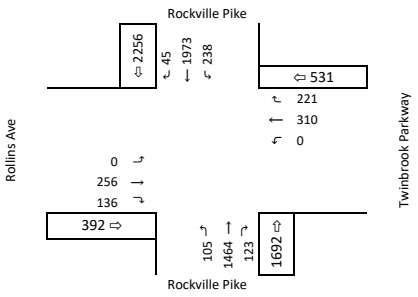


Signal?	Split?
Yes	None

or

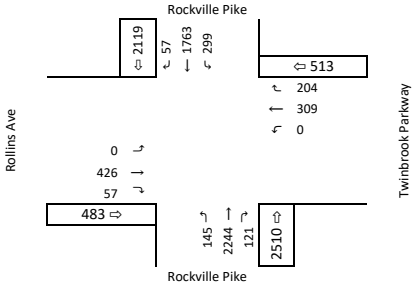
Stop Sign?	Directions
No	N/S

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	392	0	0.53	208				208	
WB	2T	310		0.53	164				164	
	R	221	0	1.00	221				221	*
NB	3T	1464		0.37	542	238	1.10	262	804	
	R	123	0	1.00	123				385	
SB	2T+TR	2018	0	0.37	747	105	1.10	116	863	*
Note:								CLV	1084	
				Congestion Equiv.				v/c	0.699	
				1550				LOS	B	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	483	0	0.53	256				256	*
WB	2T	309		0.53	164				164	
	R	204	0	1.00	204				204	
NB	3T	2244		0.37	830	299	1.10	329	1159	*
	R	121	0	1.00	121				450	
SB	2T+TR	1820	0	0.37	673	145	1.10	160	833	
Note:								CLV	1415	
				Congestion Equiv.				v/c	0.913	
				1550				LOS	D	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**Yes**	123	121		1.00	0	0		0.00	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors: Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

5

Critical Lane Volume and Level of Service Calculations

Intersection: 05. Twinbrook Park / Chapman Ave

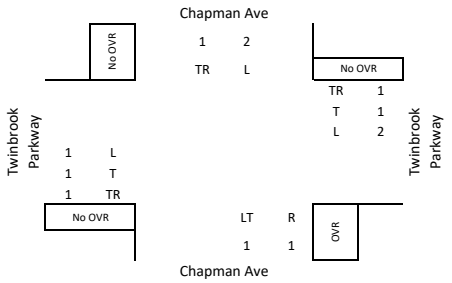
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

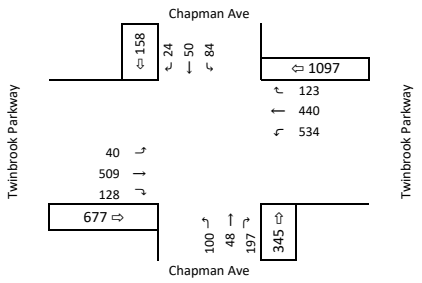


Signal?	Split?
Yes	N/S

or

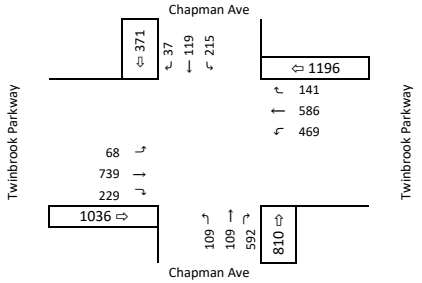
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	637	0	0.53	338	534	0.60	320	658	*
WB	T +TR	563	0	0.53	298	40	1.10	44	342	
NB	LT	148		1.00	148				148	*
	R	197	197	1.00	0					
SB	TR	50		1.00	50					
	L	84	0	0.60	50				50	*
Note:								CLV	856	
				Congestion Equiv.				v/c	0.552	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	968	0	0.53	513	469	0.60	281	794	*
WB	T +TR	727	0	0.53	385	68	1.10	75	460	
NB	LT	218		1.00	218					
	R	592	281	1.00	311				311	*
SB	TR	119		1.00	119					
	L	215	0	0.60	129				129	*
Note:								CLV	1234	
				Congestion Equiv.				v/c	0.796	
				1550				LOS	C	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**Yes**	197	592		1.00	534	469		0.60	197	281	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

Lane Use Factors		
Number of Lanes	Left Turn LUF	Through LUF
1	1.1	1.00
2	0.6	0.53
3	0.4	0.37
4		0.30
5		0.25

6

Critical Lane Volume and Level of Service Calculations

Intersection: 06. Chapman Ave / Site Drive North

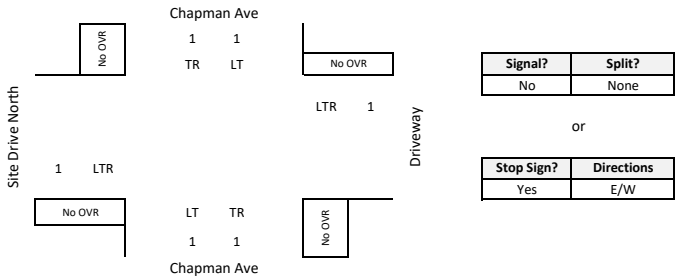
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

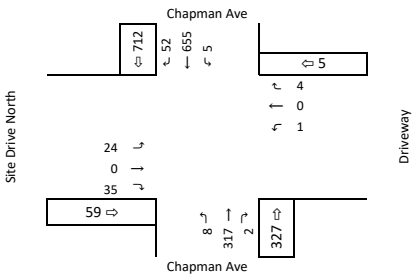


Signal?	Split?
No	None

or

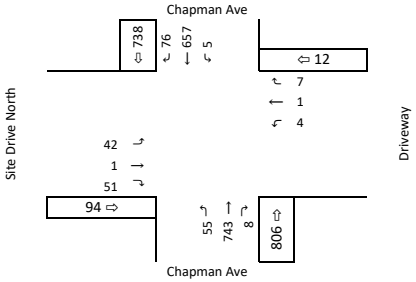
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	35	0	1.00	35	1	1.10	1	36	*
WB	LTR	5	0	1.00	5	24	1.10	26	31	
NB	T+TR	319	0	0.53	169	5	1.10	6	175	
	L	8		1.10	9				15	
SB	T+TR	707	0	0.53	375	8	1.10	9	384	*
	L	5		1.10	6				15	
Note:								CLV	420	
				Congestion Equiv.				v/c	0.271	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	52	0	1.00	52	4	1.10	4	56	
									4	
WB	LTR	12	0	1.00	12	42	1.10	46	58	*
									46	
NB	T+TR	751	0	0.53	398	5	1.10	6	404	
	L	55		1.10	61				67	
SB	T+TR	733	0	0.53	388	55	1.10	61	449	*
	L	5		1.10	6				67	
Note:								CLV	507	
				Congestion Equiv.				v/c	0.327	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

7

Critical Lane Volume and Level of Service Calculations

Intersection: 07. Chapman Ave / Rollins Ave

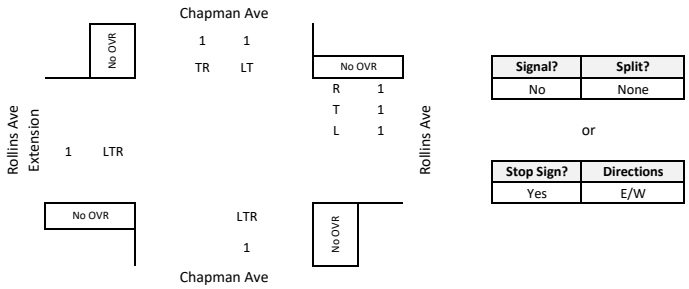
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

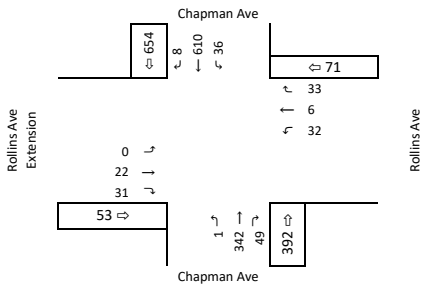


Signal?	Split?
No	None

or

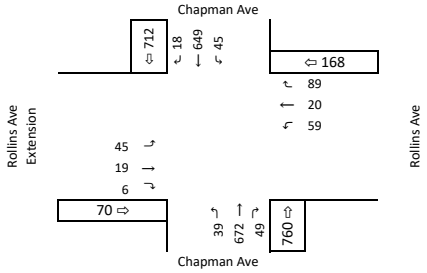
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	53	0	1.00	53	32	1.10	35	88	*
WB	T	6		1.00	6	0	1.10	0	6	
	R	33	0	1.00	33				33	
NB	LTR	392	0	1.00	392	36	1.10	40	432	*
SB	T+TR	618	0	0.53	328	1	1.10	1	329	
Note:								CLV	520	
				Congestion Equiv.				v/c	0.335	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	70	0	1.00	70	59	1.10	65	135	
WB	T	20		1.00	20	45	1.10	50	70	
	R	89	0	1.00	89				139	*
NB	LTR	760	0	1.00	760	45	1.10	50	810	*
SB	T+TR	667	0	0.53	354	39	1.10	43	397	
Note:								CLV	949	
				Congestion Equiv.				v/c	0.612	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

Number of Lanes	Left Turn LUF	Through LUF	LOS GRADE	LOS VALUE
1	1.1	1.00	A	1000.00
2	0.6	0.53	B	1150.00
3	0.4	0.37	C	1300.00
4		0.30	D	1450.00
5		0.25	E	1600.00
			F	1800.00

8

Critical Lane Volume and Level of Service Calculations

Intersection: 08. Chapman Ave / Site Drive South

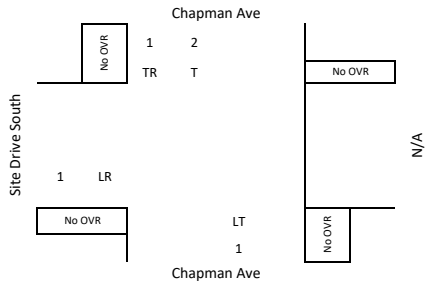
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

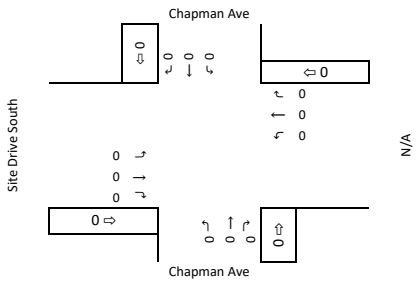


Signal?	Split?

or

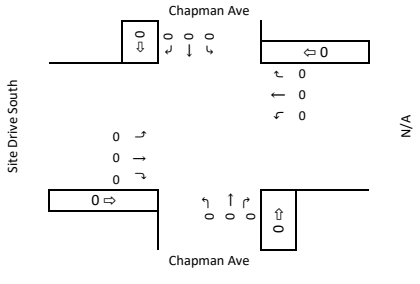
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LR	0	0	1.10	0				0	* *
WB										* *
NB	LT	0	0	1.00	0				0	* *
SB	T+TR	0	0	0.37	0	0	1.10	0	0	*
Note:								CLV	0	
				Congestion Equiv.				v/c	0.000	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LR	0	0	1.10	0				0 0	* *
WB									0 0	* *
NB	LT	0	0	1.00	0				0 0	* *
SB	T+TR	0	0	0.37	0	0		0	0 0	*
Note:								CLV	0	
				Congestion Equiv.				v/c	0.000	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

9

Critical Lane Volume and Level of Service Calculations

Intersection: 09. Chapman Ave / Bou Ave

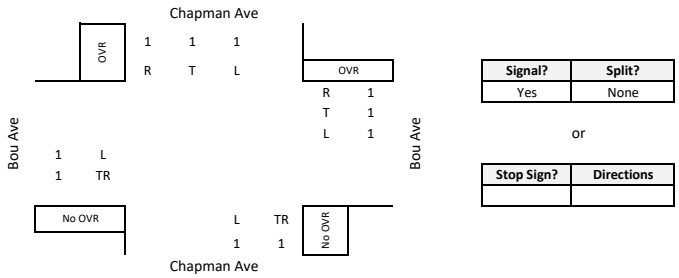
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

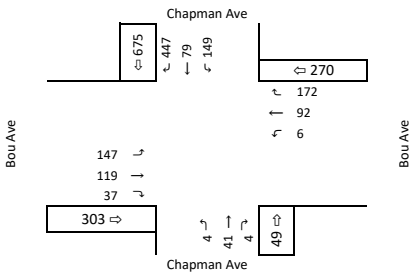


Signal?	Split?
Yes	None

or

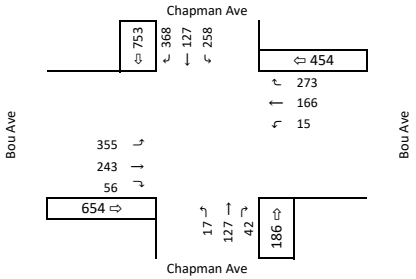
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	156	0	1.00	156	6	1.10	7	163	
WB	T	92		1.00	92	147	1.10	162	254	*
	R	172	164	1.00	8				170	
NB	TR	45	0	1.00	45	149	1.10	164	209	
SB	T	79		1.00	79	4	1.10	4	83	
	R	447	162	1.10	314				318	*
Note:								CLV	572	
				Congestion Equiv.				v/c	0.369	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	299	0	1.00	299	15	1.10	17	316	
									17	
WB	T	166		1.00	166	355	1.10	391	557	*
	R	273	273	1.00	0				391	
NB	TR	169	0	1.00	169	258	1.10	284	453	*
									284	
SB	T	127		1.00	127	17	1.10	19	146	
	R	368	368	1.10	0				19	
Note:								CLV	1010	
				Congestion Equiv.				v/c	0.652	
				1550				LOS	B	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	172	273		1.00	149	258		1.10	164	273	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**Yes**	447	368		1.00	147	355		1.10	162	368	

Montgomery County LATR

		Lane Use Factors: Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

10

Critical Lane Volume and Level of Service Calculations

Intersection: 10. Bou Ave / Site Drive

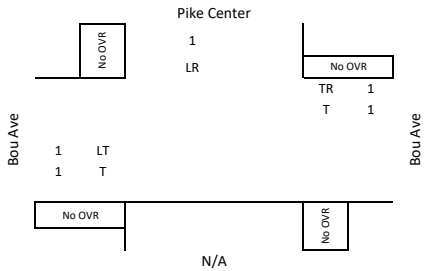
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

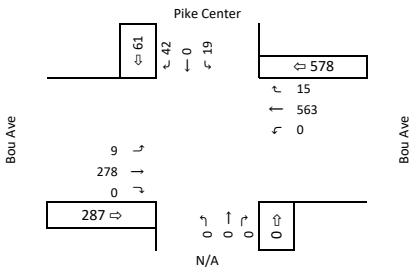


Signal?	Split?
No	None

or

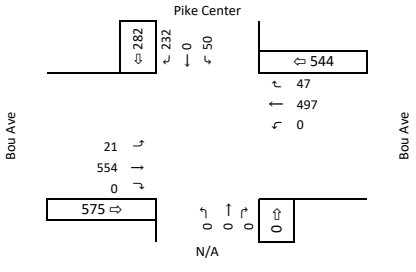
Stop Sign?	Directions
Yes	N/S

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	2T	278	0	1.00	278	0	1.10	0	278	
WB	T+TR	578	0	0.53	306	9	1.10	10	316	*
NB										
SB	LR	61	0	1.10	67				67	*
Note:								CLV	383	
				Congestion Equiv.				v/c	0.247	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	2T	554	0	1.00	554	0	1.10	0	554	*
WB	T+TR	544	0	0.53	288	21	1.10	23	311	
NB										
SB	LR	282	0	1.10	310				310	*
Note:								CLV	864	
				Congestion Equiv.				v/c	0.557	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

11

Critical Lane Volume and Level of Service Calculations

Intersection: 11. Rollins Ave / East Jefferson St

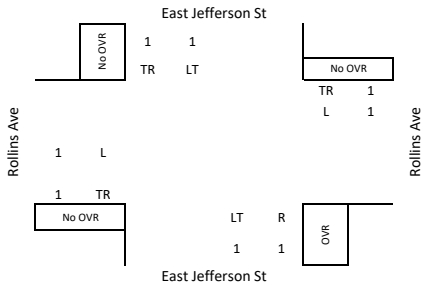
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

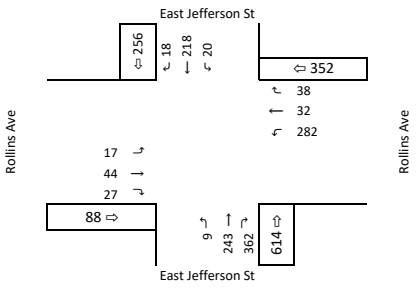


Signal?	Split?
Yes	E/W

or

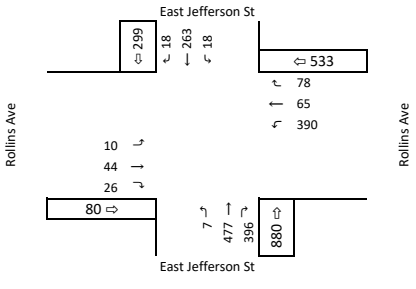
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	71	0	1.00	71				71	*
WB	LTR	352	0	1.00	352				352	*
NB	LT	252		1.10	277	20	1.10	22	299	
	R	362	0	1.00	362				384	*
SB	LTR	256	0	0.53	136	9	1.10	10	146	
Note:								CLV	807	
				Congestion Equiv.				v/c	0.521	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	70	0	1.00	70				70	*
WB	LTR	533	0	1.00	533				533	*
NB	LT	484		1.10	532	18	1.10	20	552	
	R	396	0	1.00	396				416	*
SB	LTR	299	0	0.53	158	7	1.10	8	166	
Note:								CLV	1155	
				Congestion Equiv.				v/c	0.745	
				1550				LOS	C	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**Yes**	362	396		1.00	282	390		0.00	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

12

Critical Lane Volume and Level of Service Calculations

Intersection: 12. Rockville Pike / Halpine Rd

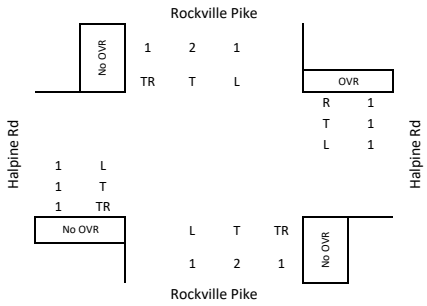
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

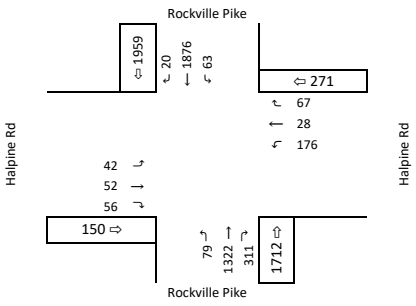


Signal?	Split?
Yes	None

or

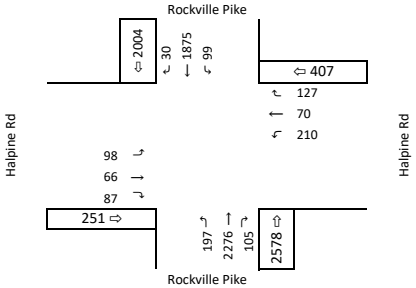
Stop Sign?	Directions
No	None

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	108	0	0.53	57	176	1.10	194	251	*
WB	LTR	271	67	0.37	75	42	1.10	46	46	
NB	2T+TR	1633	0	0.37	604	63	1.10	69	673	
SB	2T+TR	1896	0	0.37	702	79	1.10	87	789	*
Note:								CLV	1040	
				Congestion Equiv.				v/c	0.671	
				1550				LOS	B	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	153	0	0.53	81	210	1.10	231	312	*
WB	LTR	407	109	0.37	110	98	1.10	108	231 218	
NB	2T+TR	2381	0	0.37	881	99	1.10	109	108 990	*
SB	2T+TR	1905	0	0.37	705	197	1.10	217	109 922	
Note:								CLV	217 1302	
				Congestion Equiv.				v/c	0.840	
				1550				LOS	D	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	67	127		1.00	63	99		1.10	67	109	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

13

Critical Lane Volume and Level of Service Calculations

Intersection: 13. Twinbrook Park / Parklawn Dr

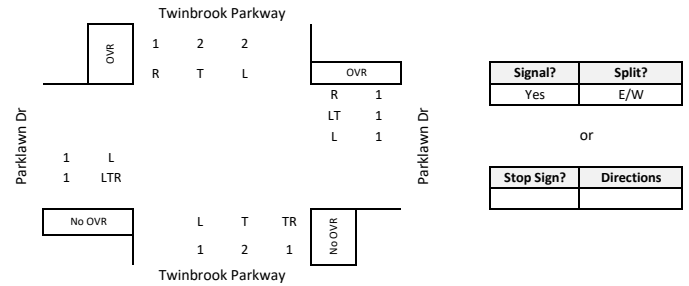
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

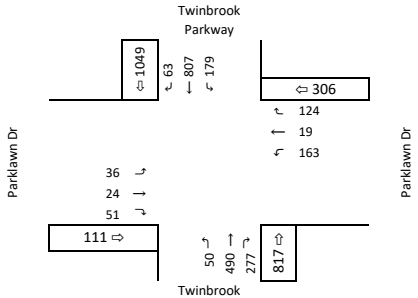


Signal?	Split?
Yes	E/W

or

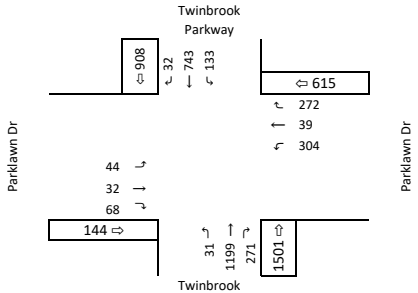
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	111	0	0.53	59				59	*
WB	LT	182		0.60	109				109	*
	R	124	107	1.00	17					
NB	2T+TR	767	0	0.37	284	179	0.60	107	391	
SB	T	870		0.53	461	50	1.10	55	516	*
	R	63	40	1.00	23				78	
Note:								CLV	684	
				Congestion Equiv.				v/c	0.441	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	144	0	0.60	86				86	*
WB	LT	343		0.60	206				206	*
	R	272	80	1.00	192				192	
NB	2T+TR	1470	0	0.37	544	133	0.60	80	624	*
SB	T+TR	775	0	0.53	411	31	1.10	34	445	
	R	32	32	1.00	0				34	
Note:								CLV	916	
				Congestion Equiv.				v/c	0.591	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	124	272		1.00	179	133		0.60	107	80	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**Yes**	63	32		1.00	36	44		1.10	40	32	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

14

Critical Lane Volume and Level of Service Calculations

Intersection: 14. Nebel St / Randolph Rd

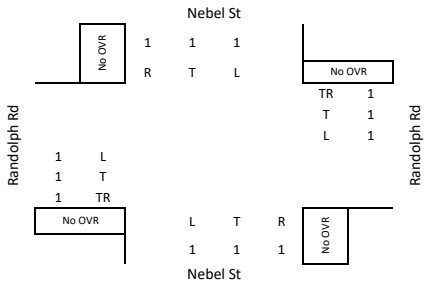
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

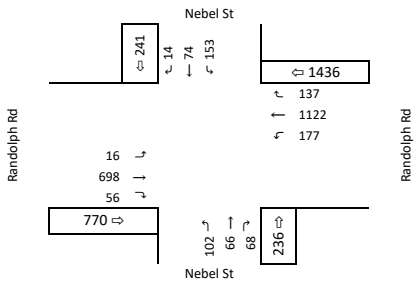


Signal?	Split?
Yes	None

or

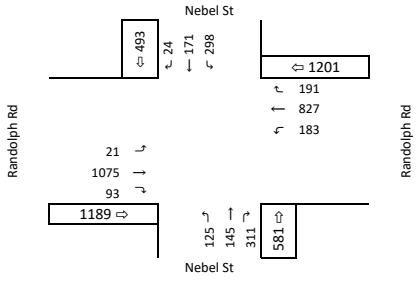
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	754	0	0.53	400	177	1.10	195	595	
WB	T+TR	1259	0	0.53	667	16	1.10	18	685	*
NB	T	66		1.00	66	153	1.10	168	234	*
	R	68	0	1.00	68					
SB	T	74		1.00	74	102	1.10	112	186	
	R	14	0	1.00	14					
Note:								CLV	919	
				Congestion Equiv.				v/c	0.593	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	1168	0	0.53	619	183	1.10	201	820	*
									201	
WB	T+TR	1018	0	0.53	540	21	1.10	23	563	
									23	
NB	T	145		1.00	145	298	1.10	328	473	
	R	311	0	1.00	311				639	*
SB	T	171		1.00	171	125	1.10	138	309	
	R	24	0	1.00	24				162	
Note:								CLV	1459	
				Congestion Equiv.				v/c	0.941	
				1550				LOS	E	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

17

Critical Lane Volume and Level of Service Calculations

Intersection: 17. Chapman Ave / Thompson Ave

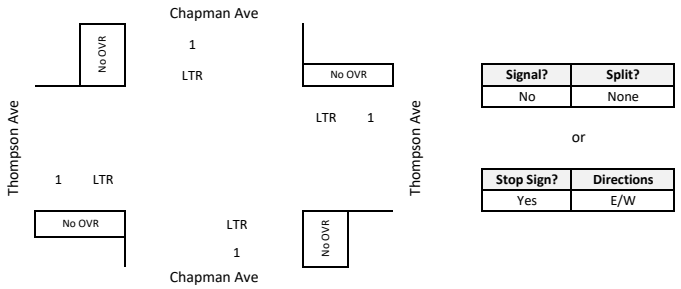
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

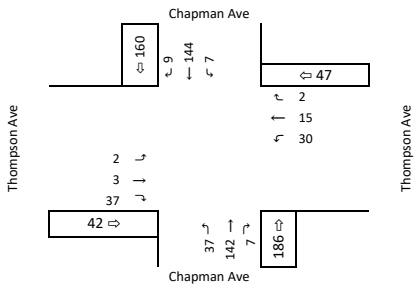


Signal?	Split?
No	None

or

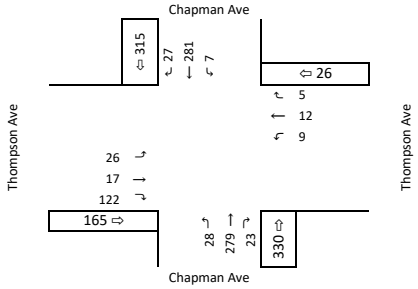
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	42	0	1.00	42				42	
WB	LTR	47	0	1.00	47				47	*
NB	LTR	186	0	1.00	186				186	*
SB	LTR	160	0	1.00	160				160	
Note:								CLV	233	
				Congestion Equiv.				v/c	0.150	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	LTR	165	0	1.00	165				165 0	*
WB	LTR	26	0	1.00	26				26 0	
NB	LTR	330	0	1.00	330				330 0	*
SB	LTR	315	0	1.00	315				315 0	
Note:								CLV	495	
				Congestion Equiv.				v/c	0.319	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

16

Critical Lane Volume and Level of Service Calculations

Intersection: 16. Chapman Ave / Randolph Rd

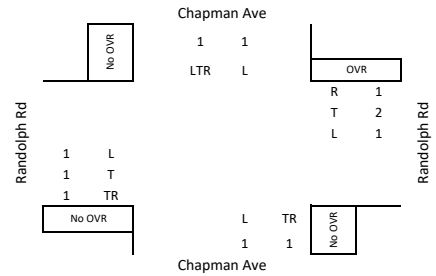
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

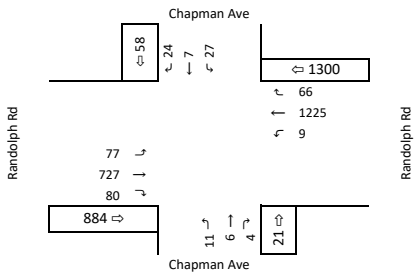


Signal?	Split?
Yes	N/S

or

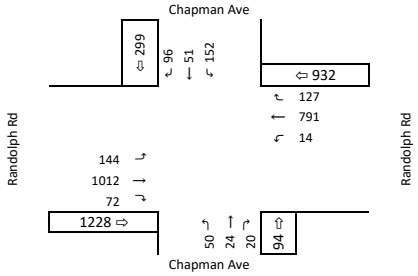
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	807	0	0.53	428	9	1.10	10	438	
WB	T	1225		0.53	649	77	1.10	85	734	*
	R	66	30	1.00	36				121	
NB	LTR	21	0	1.00	21				21	*
SB	LTR	58	0	0.60	35				35	*
Note:								CLV	790	
				Congestion Equiv.				v/c	0.510	
				1550				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	T+TR	1084	0	0.53	575	14	1.10	15	590	*
									15	
WB	T	791		0.53	419	144	1.10	158	577	
	R	127	127	1.00	0				158	
NB	LTR	94	0	1.00	94				94	*
									0	
SB	LTR	299	0	0.60	179				179	*
									0	
Note:								CLV	863	
				Congestion Equiv.				v/c	0.557	
				1550				LOS	A	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**Yes**	66	127		1.00	27	152		1.10	30	127	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

15

Critical Lane Volume and Level of Service Calculations

Intersection: 15. Rockville Pike / Hubbard Dr

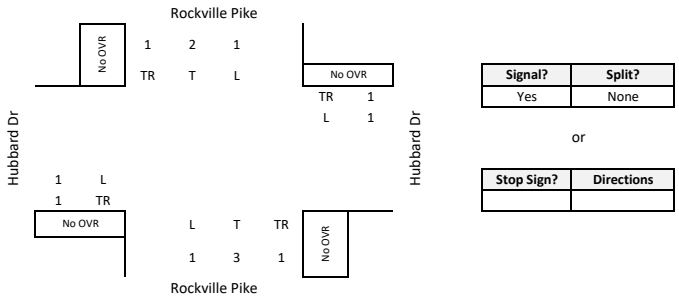
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

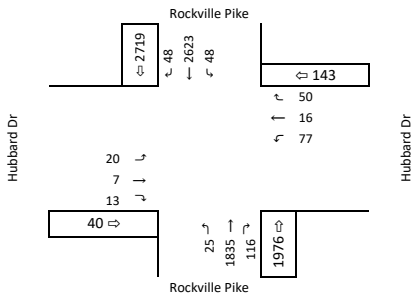


Signal?	Split?
Yes	None

or

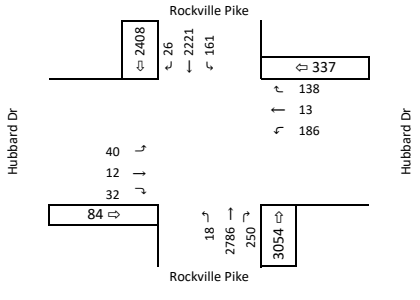
Stop Sign?	Directions

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	20	0	1.00	20	77	1.10	85	105	*
WB	TR	66	0	1.00	66	20	1.10	22	88	
NB	3T+TR	1951	0	0.30	585	48	1.10	53	638	
SB	2T+TR	2671	0	0.37	988	25	1.10	28	1016	*
Note:								CLV	1121	
				Congestion Equiv.				v/c	0.723	
				1550				LOS	B	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB	TR	44	0	1.00	44	186	1.10	205	249	
	L	40		1.10	44				249	
WB	TR	151	0	1.00	151	40	1.10	44	195	
	L	186		1.10	205				249	*
NB	3T+TR	3036	0	0.30	911	161	1.10	177	1088	*
	L	18		1.10	20				197	
SB	2T+TR	2247	0	0.37	831	18	1.10	20	851	
				1.10	0				20	
Note:								CLV	1337	
				Congestion Equiv.				v/c	0.863	
				1550				LOS	D	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

		Lane Use Factors					
		Number of Lanes	Left Turn LUF	Through LUF			
		1	1.1	1.00			
		2	0.6	0.53			
		3	0.4	0.37			
		4		0.30			
		5		0.25			

18

Critical Lane Volume and Level of Service Calculations

Intersection: Rockville Pike / Rollins Ave Ext

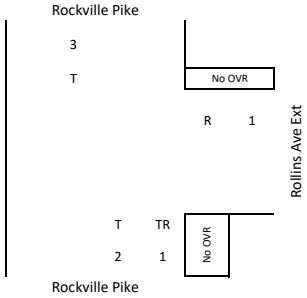
Jurisdiction: Montgomery County, MD

Scenario/Design Year: Total Future Phase 2 Conditions

Computed by: W+A

WELLS + ASSOCIATES

Intersection Lane Use & Traffic Control

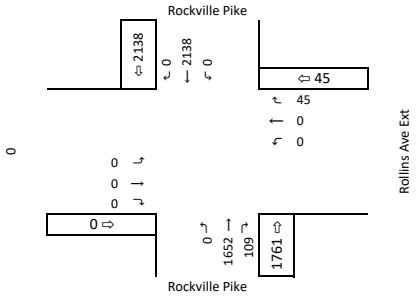


Signal?	Split?
No	None

or

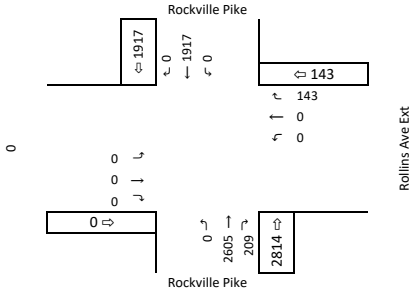
Stop Sign?	Directions
Yes	E/W

AM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB										
WB	R	45	0	1.00	45				45	*
NB	2T+TR	1761	0	0.37	652				652	
SB	3T	2138	0	0.37	791				791	*
Note:								CLV	836	
				Congestion Equiv.				v/c	0.523	
				1600				LOS	A	

PM Peak Hour Critical Lane Volume Analysis



Direction	Lane Group	Lane Group Volume	Right Turn Overlap	Lane Use Factor (LUF)	Volume	Opposing Lefts	Lane Use Factor (LUF)	Opposing Volume	Critical Lane Volume (CLV)	Included in CLV
EB										
WB	R	143	0	1.00	143				143	*
NB	2T+TR	2814	0	0.37	1041				1041	*
SB	3T	1917	0	0.37	709				709	
Note:								CLV	1184	
				Congestion Equiv.				v/c	0.740	
				1600				LOS	C	

Right Turn Overlap

Approach	Excl. Right	Right Vol. AM	Right Vol. PM		Right Vol. LUF	Adjacent Overlap Vol. AM	Adjacent Overlap Vol. PM		Adjacent Overlap Vol. LUF	Overlap AM	Overlap PM	
Eastbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Westbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Northbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	
Southbound	**No**	n/a	n/a		n/a	n/a	n/a		n/a	0	0	

Montgomery County LATR

Lane Use Factors		
Number of Lanes	Left Turn LUF	Through LUF
1	1.1	1.00
2	0.6	0.53
3	0.4	0.37
4		0.30
5		0.25

HCM Signalized Intersection Capacity Analysis

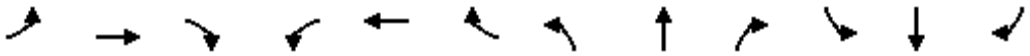
Total Future AM Phase 1

1: Rockville Pike - 355 & Bou Ave

10/15/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	21	25	552	11	58	36	1656	211	169	2011	6
Future Volume (vph)	14	21	25	552	11	58	36	1656	211	169	2011	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1704	1478	3204	1496		1711	4916	1531	1770	5083	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.07	1.00	
Satd. Flow (perm)		1704	1478	3204	1496		1711	4916	1531	129	5083	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	22	26	575	11	60	38	1725	220	176	2095	6
RTOR Reduction (vph)	0	0	25	0	47	0	0	0	93	0	0	0
Lane Group Flow (vph)	0	37	1	575	24	0	38	1725	127	176	2101	0
Confl. Peds. (#/hr)	4					4	5		9	9		5
Confl. Bikes (#/hr)			1									
Turn Type	Split	NA	Prot	Split	NA		Prot	NA	Prot	pm+pt	NA	
Protected Phases	3	3	3	4	4		1	5	5	6	2	
Permitted Phases										2		
Actuated Green, G (s)		7.2	7.2	33.5	33.5		7.6	64.8	64.8	77.7	77.7	
Effective Green, g (s)		7.2	7.2	33.5	33.5		7.6	64.8	64.8	77.7	77.7	
Actuated g/C Ratio		0.05	0.05	0.22	0.22		0.05	0.43	0.43	0.52	0.52	
Clearance Time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	6.0	6.0		3.0	0.2	0.2	3.0	0.2	
Lane Grp Cap (vph)		81	70	715	334		86	2123	661	285	2632	
v/s Ratio Prot		c0.02	0.00	c0.18	0.02		0.02	c0.35	0.08	0.08	c0.41	
v/s Ratio Perm										0.24		
v/c Ratio		0.46	0.02	0.80	0.07		0.44	0.81	0.19	0.62	0.80	
Uniform Delay, d1		69.5	68.0	55.1	46.0		69.1	37.3	26.4	46.4	29.7	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.74	0.60	
Incremental Delay, d2		4.0	0.1	7.8	0.3		3.6	3.5	0.6	3.2	2.1	
Delay (s)		73.5	68.1	62.9	46.3		72.7	40.8	27.0	37.5	20.1	
Level of Service		E	E	E	D		E	D	C	D	C	
Approach Delay (s)		71.3			61.1			39.9			21.4	
Approach LOS		E			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	56	0	2	16	84	1572	0	9	2106	2
Future Volume (vph)	16	2	56	0	2	16	84	1572	0	9	2106	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	16	16	16	11	11	11	10	10	10
Total Lost time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.88		1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1664	1478		1820		1711	4916		1651	4745	
Flt Permitted		0.96	1.00		1.00		0.05	1.00		0.13	1.00	
Satd. Flow (perm)		1664	1478		1820		97	4916		233	4745	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	17	2	58	0	2	17	88	1638	0	9	2194	2
RTOR Reduction (vph)	0	0	56	0	17	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	19	2	0	2	0	88	1638	0	9	2196	0
Confl. Peds. (#/hr)	1					1	3		7	7		3
Confl. Bikes (#/hr)			1			1						
Turn Type	Split	NA	Prot		NA		pm+pt	NA		pm+pt	NA	
Protected Phases	8	8	8	4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		6.2	6.2		4.0		121.3	115.1		109.0	107.8	
Effective Green, g (s)		6.2	6.2		4.0		121.3	115.1		109.0	107.8	
Actuated g/C Ratio		0.04	0.04		0.03		0.81	0.77		0.73	0.72	
Clearance Time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	0.2		3.0	0.2	
Lane Grp Cap (vph)		68	61		48		169	3772		180	3410	
v/s Ratio Prot		c0.01	0.00		c0.00		c0.03	0.33		0.00	c0.46	
v/s Ratio Perm							0.39			0.04		
v/c Ratio		0.28	0.04		0.05		0.52	0.43		0.05	0.64	
Uniform Delay, d1		69.7	69.0		71.2		13.3	6.1		5.7	11.1	
Progression Factor		1.00	1.00		1.00		3.73	0.09		0.47	0.26	
Incremental Delay, d2		2.2	0.3		0.4		1.9	0.2		0.1	0.8	
Delay (s)		72.0	69.3		71.6		51.6	0.8		2.8	3.7	
Level of Service		E	E		E		D	A		A	A	
Approach Delay (s)		70.0			71.6			3.4			3.7	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



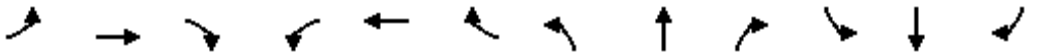
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	19	1578	25	0	2136
Future Volume (Veh/h)	0	19	1578	25	0	2136
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	24	1997	32	0	2704
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			225			340
pX, platoon unblocked	0.77	0.88			0.88	
vC, conflicting volume	2914	682			2029	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1415	182			1706	
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	97			100	
cM capacity (veh/h)	99	733			326	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	24	799	799	431	901	901	901
Volume Left	0	0	0	0	0	0	0
Volume Right	24	0	0	32	0	0	0
cSH	733	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.03	0.47	0.47	0.25	0.53	0.53	0.53
Queue Length 95th (ft)	3	0	0	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.1	0.0			0.0		
Approach LOS	B						

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

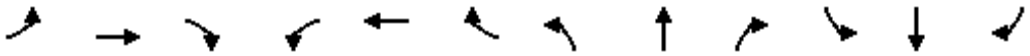
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	252	136	0	310	196	105	1463	106	200	2000	45
Future Volume (vph)	0	252	136	0	310	196	105	1463	106	200	2000	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	11	11	11
Total Lost time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		0.99			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3104			3539	1583	1652	4746	1478	1711	4897	
Flt Permitted		1.00			1.00	1.00	0.05	1.00	1.00	0.12	1.00	
Satd. Flow (perm)		3104			3539	1583	92	4746	1478	211	4897	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	257	139	0	316	200	107	1493	108	204	2041	46
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	41	0	1	0
Lane Group Flow (vph)	0	396	0	0	316	200	107	1493	67	204	2086	0
Confl. Peds. (#/hr)	13		9	9		13			4			4
Confl. Bikes (#/hr)									1			
Turn Type		NA			NA	Prot	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases		4			8	8	1	6	6	5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		26.6			26.6	26.6	99.4	87.4	87.4	107.4	91.4	
Effective Green, g (s)		26.6			26.6	26.6	99.4	87.4	87.4	107.4	91.4	
Actuated g/C Ratio		0.18			0.18	0.18	0.66	0.58	0.58	0.72	0.61	
Clearance Time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Vehicle Extension (s)		4.0			4.0	4.0	4.0	0.2	0.2	4.0	0.2	
Lane Grp Cap (vph)		550			627	280	185	2765	861	311	2983	
v/s Ratio Prot		c0.13			0.09	0.13	0.05	0.31	0.05	c0.07	c0.43	
v/s Ratio Perm							0.34			0.40		
v/c Ratio		0.72			0.50	0.71	0.58	0.54	0.08	0.66	0.70	
Uniform Delay, d1		58.2			55.7	58.1	25.6	19.1	13.7	14.1	19.9	
Progression Factor		1.00			1.00	1.00	1.84	0.22	0.01	1.00	1.00	
Incremental Delay, d2		4.8			0.9	8.9	5.0	0.7	0.2	5.4	1.4	
Delay (s)		63.0			56.6	67.0	52.1	5.0	0.4	19.6	21.3	
Level of Service		E			E	E	D	A	A	B	C	
Approach Delay (s)		63.0			60.7			7.6			21.2	
Approach LOS		E			E			A			C	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	509	69	534	440	123	75	48	197	84	50	24
Future Volume (vph)	40	509	69	534	440	123	75	48	197	84	50	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	11	11	11	10	10	10	10	10	10
Total Lost time (s)	5.5	6.0		5.5	6.0			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	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	0.97			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1647	3238		3319	3283			1687	1478	3204	1739	1439
Flt Permitted	0.43	1.00		0.95	1.00			0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	751	3238		3319	3283			1687	1478	3204	1739	1439
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	41	525	71	551	454	127	77	49	203	87	52	25
RTOR Reduction (vph)	0	4	0	0	9	0	0	0	135	0	0	24
Lane Group Flow (vph)	41	592	0	551	572	0	0	126	68	87	52	1
Confl. Peds. (#/hr)	4		1	1		4	5		14	14		5
Confl. Bikes (#/hr)			4			1						1
Turn Type	pm+pt	NA		Prot	NA		Split	NA	pt+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	4 1	3	3	
Permitted Phases	2											3
Actuated Green, G (s)	102.8	97.1		37.4	128.8			19.3	63.2	11.2	11.2	11.2
Effective Green, g (s)	102.8	97.1		37.4	128.8			19.3	63.2	11.2	11.2	11.2
Actuated g/C Ratio	0.54	0.51		0.20	0.68			0.10	0.33	0.06	0.06	0.06
Clearance Time (s)	5.5	6.0		5.5	6.0			6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	434	1659		655	2231			171	492	189	102	85
v/s Ratio Prot	0.00	c0.18		c0.17	0.17			c0.07	0.05	0.03	c0.03	
v/s Ratio Perm	0.05											0.00
v/c Ratio	0.09	0.36		0.84	0.26			0.74	0.14	0.46	0.51	0.02
Uniform Delay, d1	20.3	27.6		73.2	11.8			82.6	44.1	86.2	86.5	84.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6		9.6	0.3			15.2	0.1	1.8	4.0	0.1
Delay (s)	20.4	28.2		82.7	12.1			97.8	44.2	88.0	90.5	84.0
Level of Service	C	C		F	B			F	D	F	F	F
Approach Delay (s)		27.7			46.5			64.8			88.2	
Approach LOS		C			D			E			F	

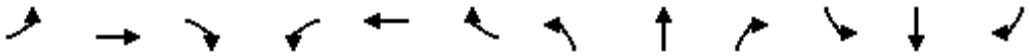
Intersection Summary			
HCM 2000 Control Delay	46.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	189.5	Sum of lost time (s)	24.5
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	1	0	4	2	317	2	5	643	5
Future Volume (Veh/h)	0	0	0	1	0	4	2	317	2	5	643	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	0	0	1	0	5	3	401	3	6	814	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								471			256	
pX, platoon unblocked												
vC, conflicting volume	1040	1239	410	828	1240	202	820			404		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1040	1239	410	828	1240	202	820			404		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	100	100	100	100	100	99	100			99		
cM capacity (veh/h)	182	173	591	262	172	805	805			1151		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	6	204	204	413	413
Volume Left	0	1	3	0	6	0
Volume Right	0	5	0	3	0	6
cSH	1700	598	805	1700	1151	1700
Volume to Capacity	0.00	0.01	0.00	0.12	0.01	0.24
Queue Length 95th (ft)	0	1	0	0	0	0
Control Delay (s)	0.0	11.1	0.2	0.0	0.2	0.0
Lane LOS	A	B	A		A	
Approach Delay (s)	0.0	11.1	0.1		0.1	
Approach LOS	A	B				

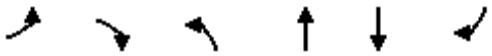
Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	31.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	22	3	32	6	33	1	336	49	36	571	0
Future Volume (Veh/h)	0	22	3	32	6	33	1	336	49	36	571	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	23	3	33	6	34	1	346	51	37	589	0
Pedestrians					11						3	
Lane Width (ft)					12.0						10.0	
Walking Speed (ft/s)					3.5						3.5	
Percent Blockage					1						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								287			440	
pX, platoon unblocked	0.95	0.95		0.95	0.95	0.95				0.95		
vC, conflicting volume	1076	1073	294	768	1048	386	589			408		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1055	1052	294	731	1025	330	589			354		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	100	89	100	87	97	95	100			97		
cM capacity (veh/h)	153	205	702	257	213	626	982			1133		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	26	33	40	398	332	294
Volume Left	0	33	0	1	37	0
Volume Right	3	0	34	51	0	0
cSH	223	257	485	982	1133	1700
Volume to Capacity	0.12	0.13	0.08	0.00	0.03	0.17
Queue Length 95th (ft)	10	11	7	0	3	0
Control Delay (s)	23.2	21.1	13.1	0.0	1.2	0.0
Lane LOS	C	C	B	A	A	
Approach Delay (s)	23.2	16.7		0.0	0.6	
Approach LOS	C	C				

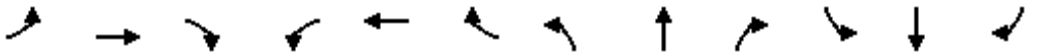
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	353	609	0
Future Volume (Veh/h)	0	0	0	353	609	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	415	716	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)				111	616	
pX, platoon unblocked	0.94					
vC, conflicting volume	1131	239	716			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1107	239	716			
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	100			
cM capacity (veh/h)	192	763	880			

Direction, Lane #	NB 1	SB 1	SB 2	SB 3
Volume Total	415	239	239	239
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.24	0.14	0.14	0.14
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0	0.0		
Approach LOS				

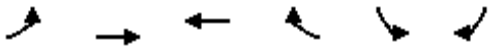
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	120	37	6	95	166	4	41	4	139	79	390
Future Volume (vph)	147	120	37	6	95	166	4	41	4	139	79	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.97	1.00	1.00	1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1636	1655		1606	1739	1417	1645	1711		1611	1739	1478
Flt Permitted	0.63	1.00		0.65	1.00	1.00	0.70	1.00		0.73	1.00	1.00
Satd. Flow (perm)	1078	1655		1103	1739	1417	1217	1711		1232	1739	1478
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	155	126	39	6	100	175	4	43	4	146	83	411
RTOR Reduction (vph)	0	7	0	0	0	112	0	1	0	0	0	176
Lane Group Flow (vph)	155	158	0	6	100	63	4	46	0	146	83	235
Confl. Peds. (#/hr)	5		8	8		5	2		11	11		2
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6			2			4			8	8 1
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	84.6	84.6		60.0	60.0	60.0	70.0	70.0		70.0	70.0	95.1
Effective Green, g (s)	84.6	84.6		60.0	60.0	60.0	70.0	70.0		70.0	70.0	95.1
Actuated g/C Ratio	0.51	0.51		0.36	0.36	0.36	0.42	0.42		0.42	0.42	0.57
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	6.0	0.2		0.2	0.2	0.2	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	613	842		398	628	511	512	721		519	732	846
v/s Ratio Prot	0.03	0.10			0.06			0.03			0.05	c0.16
v/s Ratio Perm	c0.10			0.01		0.04	0.00			0.12		
v/c Ratio	0.25	0.19		0.02	0.16	0.12	0.01	0.06		0.28	0.11	0.28
Uniform Delay, d1	22.2	22.1		34.1	36.0	35.5	27.9	28.6		31.5	29.2	18.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.0		0.1	0.5	0.5	0.0	0.0		1.4	0.3	0.5
Delay (s)	22.8	22.1		34.1	36.5	36.0	27.9	28.6		32.9	29.5	18.6
Level of Service	C	C		C	D	D	C	C		C	C	B
Approach Delay (s)		22.5			36.1			28.5			23.2	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	166.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

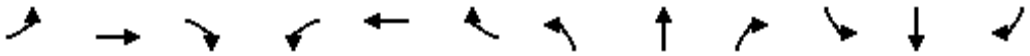
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	111	278	506	18	20	87
Future Volume (Veh/h)	111	278	506	18	20	87
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	118	296	538	19	21	93
Pedestrians		4			7	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		278	280			
pX, platoon unblocked						
vC, conflicting volume	564				938	290
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	564				938	290
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				91	87
cM capacity (veh/h)	997				230	700

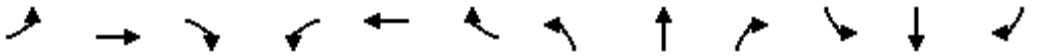
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	217	197	359	198	114
Volume Left	118	0	0	0	21
Volume Right	0	0	0	19	93
cSH	997	1700	1700	1700	508
Volume to Capacity	0.12	0.12	0.21	0.12	0.22
Queue Length 95th (ft)	10	0	0	0	21
Control Delay (s)	5.5	0.0	0.0	0.0	14.1
Lane LOS	A				B
Approach Delay (s)	2.9		0.0		14.1
Approach LOS					B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		



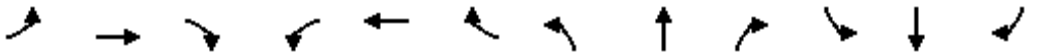
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	44	27	282	32	38	9	243	358	20	218	18
Future Volume (vph)	17	44	27	282	32	38	9	243	358	20	218	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.94		1.00	0.92			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1711	1680		1711	1620			1797	1507		3361	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00		0.92	
Satd. Flow (perm)	1711	1680		1711	1620			1777	1507		3102	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	48	29	307	35	41	10	264	389	22	237	20
RTOR Reduction (vph)	0	21	0	0	32	0	0	0	76	0	4	0
Lane Group Flow (vph)	18	56	0	307	44	0	0	274	313	0	275	0
Confl. Peds. (#/hr)	7		10	10		7	7		6	6		7
Confl. Bikes (#/hr)			1			1			1			1
Turn Type	Split	NA		Split	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	4	4		3	3			2	3		6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	7.2	7.2		23.2	23.2			64.6	87.8		64.6	
Effective Green, g (s)	7.2	7.2		23.2	23.2			64.6	87.8		64.6	
Actuated g/C Ratio	0.07	0.07		0.21	0.21			0.59	0.81		0.59	
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Vehicle Extension (s)	2.0	2.0		1.0	1.0			5.0	1.0		5.0	
Lane Grp Cap (vph)	113	110		364	344			1053	1213		1838	
v/s Ratio Prot	0.01	c0.03		c0.18	0.03				0.05			
v/s Ratio Perm								c0.15	0.15		0.09	
v/c Ratio	0.16	0.50		0.84	0.13			0.26	0.26		0.15	
Uniform Delay, d1	48.0	49.2		41.2	34.7			10.7	2.6		9.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.2	1.3		15.5	0.1			0.6	0.0		0.2	
Delay (s)	48.3	50.5		56.7	34.8			11.3	2.6		10.1	
Level of Service	D	D		E	C			B	A		B	
Approach Delay (s)		50.1			52.3			6.2			10.1	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



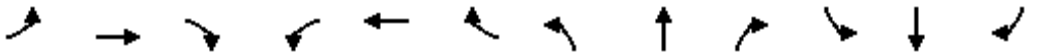
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	52	56	176	28	67	79	1296	311	63	1865	20
Future Volume (vph)	42	52	56	176	28	67	79	1296	311	63	1865	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.96	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3157		1690	1863	1583	1711	4748		1711	4907	
Flt Permitted	0.74	1.00		0.68	1.00	1.00	0.07	1.00		0.11	1.00	
Satd. Flow (perm)	1370	3157		1212	1863	1583	121	4748		192	4907	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	44	54	58	183	29	70	82	1350	324	66	1943	21
RTOR Reduction (vph)	0	47	0	0	0	56	0	15	0	0	0	0
Lane Group Flow (vph)	44	65	0	183	29	14	82	1659	0	66	1964	0
Confl. Peds. (#/hr)	2		28	28		2	1		7	7		1
Confl. Bikes (#/hr)						1						
Turn Type	Perm	NA		Perm	NA	Prot	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	8	1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	36.2	36.2		36.2	36.2	36.2	135.3	124.2		132.3	122.7	
Effective Green, g (s)	36.2	36.2		36.2	36.2	36.2	135.3	124.2		132.3	122.7	
Actuated g/C Ratio	0.19	0.19		0.19	0.19	0.19	0.72	0.66		0.71	0.65	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	264	609		233	359	305	181	3145		213	3211	
v/s Ratio Prot		0.02			0.02	0.01	c0.03	0.35		0.02	c0.40	
v/s Ratio Perm	0.03			c0.15			0.30			0.20		
v/c Ratio	0.17	0.11		0.79	0.08	0.04	0.45	0.53		0.31	0.61	
Uniform Delay, d1	63.1	62.3		72.0	62.0	61.6	15.2	16.4		10.9	18.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.2		18.1	0.2	0.1	3.7	0.6		1.7	0.9	
Delay (s)	63.7	62.5		90.1	62.2	61.7	19.0	17.1		12.6	19.5	
Level of Service	E	E		F	E	E	B	B		B	B	
Approach Delay (s)		62.8			80.2			17.2			19.3	
Approach LOS		E			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	187.5	Sum of lost time (s)	17.5
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	24	51	163	19	124	50	490	277	179	807	63
Future Volume (vph)	36	24	51	163	19	124	50	490	277	179	807	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	10	10	10	10	10	10
Total Lost time (s)	6.5	6.5		7.0	7.0	7.0	8.0	6.0		8.0	6.0	6.0
Lane Util. Factor	0.95	0.95		0.95	0.95	1.00	1.00	0.91		0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1572		1625	1645	1531	1651	4465		3203	3303	1433
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.30	1.00		0.31	1.00	1.00
Satd. Flow (perm)	1681	1572		1625	1645	1531	517	4465		1053	3303	1433
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	38	26	54	173	20	132	53	521	295	190	859	67
RTOR Reduction (vph)	0	33	0	0	0	111	0	20	0	0	0	20
Lane Group Flow (vph)	34	51	0	97	96	21	53	796	0	190	859	47
Confl. Peds. (#/hr)	10		2	2		10	2		1	1		2
Confl. Bikes (#/hr)												1
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases							2			6		6
Actuated Green, G (s)	12.4	12.4		18.5	18.5	34.4	157.6	150.2		160.6	151.7	151.7
Effective Green, g (s)	12.4	12.4		18.5	18.5	34.4	157.6	150.2		160.6	151.7	151.7
Actuated g/C Ratio	0.06	0.06		0.09	0.09	0.16	0.72	0.69		0.74	0.70	0.70
Clearance Time (s)	6.5	6.5		7.0	7.0		8.0	6.0		8.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	95	89		138	139	242	413	3083		865	2303	999
v/s Ratio Prot	0.02	c0.03		c0.06	0.06	0.01	0.00	0.18		c0.01	c0.26	
v/s Ratio Perm							0.09			0.15		0.03
v/c Ratio	0.36	0.57		0.70	0.69	0.09	0.13	0.26		0.22	0.37	0.05
Uniform Delay, d1	98.7	100.0		96.8	96.7	78.1	9.1	12.7		8.1	13.5	10.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3	8.6		15.0	13.8	0.2	0.1	0.2		0.1	0.5	0.1
Delay (s)	101.0	108.6		111.8	110.5	78.3	9.2	12.9		8.3	13.9	10.4
Level of Service	F	F		F	F	E	A	B		A	B	B
Approach Delay (s)		106.4			97.8			12.7			12.7	
Approach LOS		F			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	217.5	Sum of lost time (s)	27.5
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	669	63	261	1038	134	80	66	97	144	74	14
Future Volume (vph)	16	669	63	261	1038	134	80	66	97	144	74	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	11	11	12	12	12
Total Lost time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	3250		1770	3473		1711	1801	1531	1766	1863	1583
Flt Permitted	0.21	1.00		0.28	1.00		0.71	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	361	3250		517	3473		1272	1801	1531	946	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	704	66	275	1093	141	84	69	102	152	78	15
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	17	770	0	275	1234	0	84	69	102	152	78	15
Confl. Peds. (#/hr)	1		4	4		1			2	2		
Confl. Bikes (#/hr)									1			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Prot	pm+pt	NA	Prot
Protected Phases	1	6		5	2		3	8	8	7	4	4
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	121.1	117.1		152.1	142.1		36.0	20.7	20.7	50.4	28.6	28.6
Effective Green, g (s)	121.1	117.1		152.1	142.1		36.0	20.7	20.7	50.4	28.6	28.6
Actuated g/C Ratio	0.56	0.54		0.71	0.66		0.17	0.10	0.10	0.23	0.13	0.13
Clearance Time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	5.0		3.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	226	1766		533	2290		243	172	147	309	247	210
v/s Ratio Prot	0.00	0.24		c0.07	c0.36		0.02	0.04	c0.07	c0.05	0.04	0.01
v/s Ratio Perm	0.04			0.29			0.03			0.06		
v/c Ratio	0.08	0.44		0.52	0.54		0.35	0.40	0.69	0.49	0.32	0.07
Uniform Delay, d1	21.1	29.4		14.1	19.4		78.6	91.6	94.3	69.4	84.6	81.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.8		0.8	0.9		1.2	2.1	14.2	1.7	1.0	0.2
Delay (s)	21.3	30.2		15.0	20.3		79.8	93.7	108.6	71.0	85.6	82.0
Level of Service	C	C		B	C		E	F	F	E	F	F
Approach Delay (s)		30.0			19.3			95.1			76.3	
Approach LOS		C			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	215.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

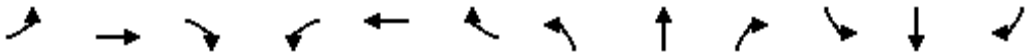
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	7	13	77	16	50	25	1815	116	48	2576	48
Future Volume (vph)	20	7	13	77	16	50	25	1815	116	48	2576	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.96		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.89		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1649	1603		1770	1579		1711	6114		1711	4893	
Flt Permitted	0.71	1.00		0.74	1.00		0.03	1.00		0.07	1.00	
Satd. Flow (perm)	1238	1603		1386	1579		62	6114		134	4893	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	7	13	79	16	51	26	1852	118	49	2629	49
RTOR Reduction (vph)	0	12	0	0	46	0	0	3	0	0	1	0
Lane Group Flow (vph)	20	8	0	79	21	0	26	1967	0	49	2677	0
Confl. Peds. (#/hr)	25					25	29		16	16		29
Confl. Bikes (#/hr)			4			3						
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	16.3	16.3		16.3	16.3		121.3	116.3		126.1	118.7	
Effective Green, g (s)	16.3	16.3		16.3	16.3		121.3	116.3		126.1	118.7	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.77	0.73		0.80	0.75	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	127	164		142	162		99	4486		180	3664	
v/s Ratio Prot		0.01			0.01		0.01	0.32		c0.01	c0.55	
v/s Ratio Perm	0.02			c0.06			0.19			0.20		
v/c Ratio	0.16	0.05		0.56	0.13		0.26	0.44		0.27	0.73	
Uniform Delay, d1	64.8	64.1		67.7	64.7		11.3	8.3		4.7	11.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.3		7.8	0.8		3.0	0.3		1.7	1.3	
Delay (s)	66.1	64.4		75.5	65.4		14.3	8.6		6.4	12.4	
Level of Service	E	E		E	E		B	A		A	B	
Approach Delay (s)		65.2			70.9			8.7			12.2	
Approach LOS		E			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	158.5	Sum of lost time (s)	18.5
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	705	80	9	1119	66	11	6	4	27	7	24
Future Volume (vph)	77	705	80	9	1119	66	11	6	4	27	7	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	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	1.00	0.85	1.00	0.94		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	3234		1647	3303	1429	1711	1675		1681	1550	
Flt Permitted	0.16	1.00		0.31	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	278	3234		542	3303	1429	1711	1675		1681	1550	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	89	810	92	10	1286	76	13	7	5	31	8	28
RTOR Reduction (vph)	0	3	0	0	0	24	0	5	0	0	0	0
Lane Group Flow (vph)	89	899	0	10	1286	52	13	7	0	28	39	0
Confl. Peds. (#/hr)	4		11	11		4	4		3	3		4
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2						
Actuated Green, G (s)	116.1	108.3		103.9	101.1	101.1	5.1	5.1		8.8	8.8	
Effective Green, g (s)	116.1	108.3		103.9	101.1	101.1	5.1	5.1		8.8	8.8	
Actuated g/C Ratio	0.78	0.73		0.70	0.68	0.68	0.03	0.03		0.06	0.06	
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	0.2		4.0	0.2	0.2	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	310	2366		401	2256	976	58	57		99	92	
v/s Ratio Prot	c0.02	c0.28		0.00	c0.39		c0.01	0.00		0.02	c0.03	
v/s Ratio Perm	0.21			0.02		0.04						
v/c Ratio	0.29	0.38		0.02	0.57	0.05	0.22	0.13		0.28	0.42	
Uniform Delay, d1	6.9	7.4		6.6	12.2	7.7	69.5	69.3		66.6	67.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.5		0.0	1.1	0.1	2.7	1.4		2.1	4.2	
Delay (s)	7.6	7.8		6.6	13.2	7.8	72.2	70.6		68.7	71.4	
Level of Service	A	A		A	B	A	E	E		E	E	
Approach Delay (s)		7.8			12.9			71.5			70.3	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	3	37	30	15	2	37	142	7	7	144	9
Future Volume (Veh/h)	2	3	37	30	15	2	37	142	7	7	144	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	2	3	43	34	17	2	43	163	8	8	166	10
Pedestrians		71			19			50			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		7			2			5			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								638				
pX, platoon unblocked												
vC, conflicting volume	524	534	292	554	535	188	247			190		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	524	534	292	554	535	188	247			190		
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 %	99	99	94	90	96	100	97			99		
cM capacity (veh/h)	378	397	664	350	397	837	1230			1359		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	48	53	214	184
Volume Left	2	34	43	8
Volume Right	43	2	8	10
cSH	618	372	1230	1359
Volume to Capacity	0.08	0.14	0.03	0.01
Queue Length 95th (ft)	6	12	3	0
Control Delay (s)	11.3	16.3	1.9	0.4
Lane LOS	B	C	A	A
Approach Delay (s)	11.3	16.3	1.9	0.4
Approach LOS	B	C		

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	41.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	46	1614	61	0	2138
Future Volume (Veh/h)	0	46	1614	61	0	2138
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	50	1754	66	0	2324
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			249			340
pX, platoon unblocked	0.82	0.69			0.69	
vC, conflicting volume	2562	618			1820	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98	0			634	
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	93			100	
cM capacity (veh/h)	726	752			655	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	50	702	702	417	775	775	775
Volume Left	0	0	0	0	0	0	0
Volume Right	50	0	0	66	0	0	0
cSH	752	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.41	0.41	0.25	0.46	0.46	0.46
Queue Length 95th (ft)	5	0	0	0	0	0	0
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.1	0.0			0.0		
Approach LOS	B						

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	EB	EB	B28	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	LT	R	T	L	L	TR	L	T	T	T	R	L
Maximum Queue (ft)	142	69	144	238	206	187	199	422	443	429	220	178
Average Queue (ft)	99	46	21	184	188	49	47	283	308	298	85	131
95th Queue (ft)	165	88	86	240	233	163	118	525	528	510	191	214
Link Distance (ft)	69		319	187	187			393	393	393	393	
Upstream Blk Time (%)	47	30		56	61	0		5	8	6		14
Queuing Penalty (veh)	0	0		167	181	0		24	40	28		0
Storage Bay Dist (ft)		90				200	175					245
Storage Blk Time (%)	47	30			61	0		26				14
Queuing Penalty (veh)	12	11			42	1		9				91

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	249	218	216
Average Queue (ft)	190	181	163
95th Queue (ft)	256	230	256
Link Distance (ft)	178	178	178
Upstream Blk Time (%)	46	36	36
Queuing Penalty (veh)	330	256	260
Storage Bay Dist (ft)			
Storage Blk Time (%)	46		
Queuing Penalty (veh)	78		

Intersection: 2: Rockville Pike - 355 & Federal Plaza/Pike Center

Movement	EB	EB	B25	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LT	R	T	LTR	L	T	T	TR	L	T	T	TR
Maximum Queue (ft)	73	147	78	49	269	293	291	317	158	185	192	192
Average Queue (ft)	11	60	8	21	78	63	110	121	12	135	147	148
95th Queue (ft)	44	131	45	45	184	240	313	326	61	222	233	213
Link Distance (ft)	79	79	63	45		276	276	276		160	160	160
Upstream Blk Time (%)	0	17	3	3	0	1	3	4	0	20	24	26
Queuing Penalty (veh)	0	0	0	0	0	5	19	22	0	145	173	182
Storage Bay Dist (ft)					245				175			
Storage Blk Time (%)						2			0	20		
Queuing Penalty (veh)						1			0	2		

Intersection: 3: Rockville Pike - 355 & Gas Station

Movement	WB	NB	NB	SB	SB	SB
Directions Served	R	T	TR	T	T	T
Maximum Queue (ft)	28	195	187	312	294	292
Average Queue (ft)	12	60	62	157	167	167
95th Queue (ft)	33	180	184	361	364	359
Link Distance (ft)	17	160	160	240	240	240
Upstream Blk Time (%)	3	2	1	11	10	10
Queuing Penalty (veh)	0	10	6	77	72	73
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: Rockville Pike - 355/Rockville Pike- 355 & Rollins Ave/Twinbrook Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	T	TR	T	T	R	L	T	T	T	L	T	T
Maximum Queue (ft)	851	888	299	413	175	135	251	258	293	425	1139	1138
Average Queue (ft)	424	538	125	139	101	48	124	124	120	234	510	509
95th Queue (ft)	790	883	239	311	192	111	281	288	284	508	1089	1057
Link Distance (ft)	1299	1299	548	548		240	240	240	240		1180	1180
Upstream Blk Time (%)							4	3	2			
Queuing Penalty (veh)							14	10	7			
Storage Bay Dist (ft)					150					400		
Storage Blk Time (%)				7	18					0	23	
Queuing Penalty (veh)				13	28					1	47	

Intersection: 4: Rockville Pike - 355/Rockville Pike- 355 & Rollins Ave/Twinbrook Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	1081
Average Queue (ft)	493
95th Queue (ft)	996
Link Distance (ft)	1180
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Chapman Ave & Twinbrook Parkway

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	L	T	TR	LT	R	L	L	T
Maximum Queue (ft)	70	286	333	312	325	1324	1330	179	184	120	142	178
Average Queue (ft)	14	75	122	208	319	1259	883	164	149	58	58	69
95th Queue (ft)	43	215	312	382	328	1467	1738	196	217	115	117	152
Link Distance (ft)		548	548			1298	1298	167	167	528	528	528
Upstream Blk Time (%)						46	11	53	37			
Queuing Penalty (veh)						237	59	85	60			
Storage Bay Dist (ft)	175			300	300							
Storage Blk Time (%)		4		0	81	0						
Queuing Penalty (veh)		2		1	179	0						

Intersection: 6: Chapman Ave & Pike Center North/Driveway

Movement	WB	NB	NB	SB	SB
Directions Served	LTR	LT	TR	LT	TR
Maximum Queue (ft)	25	116	119	29	198
Average Queue (ft)	3	66	49	2	47
95th Queue (ft)	17	139	133	14	169
Link Distance (ft)	44	101	101	167	167
Upstream Blk Time (%)	0	24	17		6
Queuing Penalty (veh)	0	45	32		21
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: Chapman Ave & Rollins Ave Extension/Rollins Ave

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	L	TR	LTR	LT	TR
Maximum Queue (ft)	140	63	72	133	89	131
Average Queue (ft)	23	22	25	71	18	39
95th Queue (ft)	69	48	54	166	64	122
Link Distance (ft)	221	67	67	118	101	101
Upstream Blk Time (%)		3	1	25	0	19
Queuing Penalty (veh)		0	0	87	0	60
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 8: Chapman Ave & Pike Center South

Movement	NB	SB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (ft)	147	118	74	136
Average Queue (ft)	51	38	11	60
95th Queue (ft)	139	114	50	146
Link Distance (ft)	51	118	118	118
Upstream Blk Time (%)	22	8		23
Queuing Penalty (veh)	79	16		47
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Chapman Ave & Bou Ave

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R	L	TR	L	T	R
Maximum Queue (ft)	219	131	50	653	275	24	136	68	51	55
Average Queue (ft)	88	53	5	190	99	1	39	42	23	39
95th Queue (ft)	178	117	25	473	287	9	94	78	56	70
Link Distance (ft)	204	204	817	817			130	51	51	51
Upstream Blk Time (%)	2						0	21	15	35
Queuing Penalty (veh)	2						1	43	30	70
Storage Bay Dist (ft)					250	70				
Storage Blk Time (%)				11	6		8			
Queuing Penalty (veh)				19	5		0			

Intersection: 10: Bou Ave & Pike Center

Movement	EB	WB	WB	SB
Directions Served	LT	T	TR	LR
Maximum Queue (ft)	76	226	242	95
Average Queue (ft)	20	131	140	59
95th Queue (ft)	70	271	275	85
Link Distance (ft)		204	204	62
Upstream Blk Time (%)		23	31	60
Queuing Penalty (veh)		57	75	60
Storage Bay Dist (ft)	100			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: East Jefferson Street & Rolllins Avenue /Rollins Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	TR
Maximum Queue (ft)	52	180	641	410	158	98	177	127
Average Queue (ft)	19	70	253	60	62	34	64	31
95th Queue (ft)	48	143	488	220	129	78	139	103
Link Distance (ft)	973	973	1299	1299	431	431	281	281
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 12: Rockville Pike- 355 & Halpine Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	T	TR	L	T
Maximum Queue (ft)	118	136	161	357	70	178	190	529	504	622	200	595
Average Queue (ft)	46	45	43	197	23	73	96	158	172	199	50	361
95th Queue (ft)	98	105	96	307	59	139	173	405	420	480	151	595
Link Distance (ft)		557	557	469	469			1180	1180	1180		690
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250					450	165				175	
Storage Blk Time (%)							0	9				25
Queuing Penalty (veh)							0	7				16

Intersection: 12: Rockville Pike- 355 & Halpine Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	532	433
Average Queue (ft)	296	194
95th Queue (ft)	555	380
Link Distance (ft)	690	690
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	LT	R	L	T	T	TR	L	L	T
Maximum Queue (ft)	110	219	224	736	685	88	237	278	309	246	265	426
Average Queue (ft)	45	72	123	206	123	29	72	93	130	21	73	332
95th Queue (ft)	90	173	220	507	317	71	189	224	287	120	170	558
Link Distance (ft)	440	440		904	904		1298	1298	1298		411	411
Upstream Blk Time (%)												42
Queuing Penalty (veh)												0
Storage Bay Dist (ft)			200			190				240		
Storage Blk Time (%)			0	24			1			0	1	
Queuing Penalty (veh)			0	19			1			0	1	

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	426	235
Average Queue (ft)	308	65
95th Queue (ft)	531	221
Link Distance (ft)	411	
Upstream Blk Time (%)	16	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		210
Storage Blk Time (%)	42	0
Queuing Penalty (veh)	27	0

Intersection: 14: Nebel Street & Randolph Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	T	R
Maximum Queue (ft)	45	348	323	149	410	419	124	296	197	263	157	74
Average Queue (ft)	8	136	129	92	194	191	72	104	98	132	84	12
95th Queue (ft)	30	283	273	158	395	377	144	220	172	246	150	40
Link Distance (ft)		598	598		1095	1095		450	450		1623	1623
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140			125			100			250		
Storage Blk Time (%)		12		2	15		9	8		1		
Queuing Penalty (veh)		2		12	39		6	7		0		

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	T	TR	L	T	T
Maximum Queue (ft)	86	38	161	95	64	320	368	317	159	204	401	401
Average Queue (ft)	19	9	72	41	19	153	183	133	61	49	221	241
95th Queue (ft)	54	29	132	83	45	280	305	278	131	145	452	463
Link Distance (ft)	400	400	353	353	1536	1536	1536	1536	1536		393	393
Upstream Blk Time (%)											1	2
Queuing Penalty (veh)											10	18
Storage Bay Dist (ft)										180		
Storage Blk Time (%)											10	
Queuing Penalty (veh)											5	

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	402
Average Queue (ft)	245
95th Queue (ft)	463
Link Distance (ft)	393
Upstream Blk Time (%)	2
Queuing Penalty (veh)	22
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 16: Chapman Ave & Josiah Henson Parkway/Randolph Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	LTR
Maximum Queue (ft)	117	158	158	177	379	390	240	49	50	29	73
Average Queue (ft)	42	68	56	9	119	126	14	18	17	11	27
95th Queue (ft)	86	149	127	62	285	294	84	46	43	32	69
Link Distance (ft)		520	520		598	598			375	226	226
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	350			165			215	250			
Storage Blk Time (%)				0	5	4					
Queuing Penalty (veh)				0	0	3					

Intersection: 17: Chapman Ave/Chapman Road & Thompson Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	50	52	75	72
Average Queue (ft)	18	28	13	4
95th Queue (ft)	42	51	48	28
Link Distance (ft)	363	242	528	350
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Rockville Pike - 355 & Rollins Ave Extension

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	TR	T	T	T
Maximum Queue (ft)	73	134	206	186	316	320	319
Average Queue (ft)	18	9	37	39	233	243	251
95th Queue (ft)	57	58	143	149	382	389	389
Link Distance (ft)	173	178	178	178	276	276	276
Upstream Blk Time (%)			2	1	20	21	26
Queuing Penalty (veh)			10	7	143	150	184
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 20: Driveway & Rollins Ave Extension

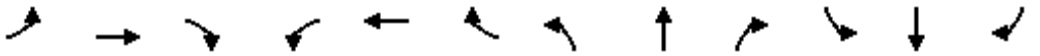
Movement	NB
Directions Served	LTR
Maximum Queue (ft)	67
Average Queue (ft)	13
95th Queue (ft)	43
Link Distance (ft)	50
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

HCM Signalized Intersection Capacity Analysis

Total Future PM Phase 1

1: Rockville Pike - 355 & Bou Ave

10/17/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	31	36	452	21	208	57	2417	526	279	1721	18
Future Volume (vph)	17	31	36	452	21	208	57	2417	526	279	1721	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.96		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.86		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1708	1478	3204	1437		1711	4916	1531	1770	5071	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.07	1.00	
Satd. Flow (perm)		1708	1478	3204	1437		1711	4916	1531	130	5071	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	18	32	37	466	22	214	59	2492	542	288	1774	19
RTOR Reduction (vph)	0	0	35	0	168	0	0	0	130	0	0	0
Lane Group Flow (vph)	0	50	2	466	68	0	59	2492	412	288	1793	0
Confl. Peds. (#/hr)	25					25	25		25	25		25
Confl. Bikes (#/hr)			1			1			1			
Turn Type	Split	NA	Prot	Split	NA		Prot	NA	Prot	pm+pt	NA	
Protected Phases	3	3	3	4	4		1	5	5	6	2	
Permitted Phases										2		
Actuated Green, G (s)		7.6	7.6	31.9	31.9		9.3	66.0	66.0	77.2	77.2	
Effective Green, g (s)		7.6	7.6	31.9	31.9		9.3	66.0	66.0	77.2	77.2	
Actuated g/C Ratio		0.05	0.05	0.21	0.21		0.06	0.44	0.44	0.51	0.51	
Clearance Time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	6.0	6.0		3.0	0.2	0.2	3.0	0.2	
Lane Grp Cap (vph)		86	74	681	305		106	2163	673	285	2609	
v/s Ratio Prot		c0.03	0.00	c0.15	0.05		0.03	c0.51	0.27	c0.13	0.35	
v/s Ratio Perm										0.38		
v/c Ratio		0.58	0.03	0.68	0.22		0.56	1.15	0.61	1.01	0.69	
Uniform Delay, d1		69.6	67.7	54.4	48.8		68.3	42.0	32.2	60.9	27.3	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.67	0.61	
Incremental Delay, d2		9.6	0.1	4.3	1.0		6.2	74.3	4.1	49.4	1.2	
Delay (s)		79.3	67.8	58.7	49.8		74.5	116.3	36.3	90.0	17.9	
Level of Service		E	E	E	D		E	F	D	F	B	
Approach Delay (s)		74.4			55.7			101.4			27.9	
Approach LOS		E			E			F			C	

Intersection Summary			
HCM 2000 Control Delay	70.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	97.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	8	133	42	9	39	197	2418	0	36	1803	13
Future Volume (vph)	147	8	133	42	9	39	197	2418	0	36	1803	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	16	16	16	11	11	11	10	10	10
Total Lost time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.94		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1660	1478		1924		1711	4916		1652	4738	
Flt Permitted		0.95	1.00		0.98		0.06	1.00		0.05	1.00	
Satd. Flow (perm)		1660	1478		1924		113	4916		79	4738	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	153	8	139	44	9	41	205	2519	0	38	1878	14
RTOR Reduction (vph)	0	0	125	0	19	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	161	14	0	75	0	205	2519	0	38	1892	0
Confl. Peds. (#/hr)	3		5	5		3	23		16	16		23
Confl. Bikes (#/hr)						1						
Turn Type	Split	NA	Prot	Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	8	8	8	4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		15.1	15.1		8.9		107.5	97.2		93.2	87.9	
Effective Green, g (s)		15.1	15.1		8.9		107.5	97.2		93.2	87.9	
Actuated g/C Ratio		0.10	0.10		0.06		0.72	0.65		0.62	0.59	
Clearance Time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	0.2		3.0	0.2	
Lane Grp Cap (vph)		167	148		114		236	3185		104	2776	
v/s Ratio Prot		c0.10	0.01		c0.04		c0.08	0.51		0.01	0.40	
v/s Ratio Perm							c0.54			0.21		
v/c Ratio		0.96	0.09		0.66		0.87	0.79		0.37	0.68	
Uniform Delay, d1		67.2	61.2		69.1		40.6	19.1		18.5	21.4	
Progression Factor		1.00	1.00		1.00		1.63	0.88		1.95	0.32	
Incremental Delay, d2		58.6	0.3		13.0		11.3	0.7		1.7	1.1	
Delay (s)		125.7	61.5		82.0		77.4	17.5		37.7	8.0	
Level of Service		F	E		F		E	B		D	A	
Approach Delay (s)		96.0			82.0			22.0			8.6	
Approach LOS		F			F			C			A	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	58	2606	44	0	1885
Future Volume (Veh/h)	0	58	2606	44	0	1885
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	66	2961	50	0	2142
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			225			340
pX, platoon unblocked	0.76	0.62			0.62	
vC, conflicting volume	3700	1012			3011	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1036	0			2113	
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	90			100	
cM capacity (veh/h)	173	676			159	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	66	1184	1184	642	714	714	714
Volume Left	0	0	0	0	0	0	0
Volume Right	66	0	0	50	0	0	0
cSH	676	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.70	0.70	0.38	0.42	0.42	0.42
Queue Length 95th (ft)	8	0	0	0	0	0	0
Control Delay (s)	10.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.9	0.0			0.0		
Approach LOS	B						

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	426	57	0	314	167	145	2263	121	204	1828	57
Future Volume (vph)	0	426	57	0	314	167	145	2263	121	204	1828	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	11	11	11
Total Lost time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3231			3539	1583	1652	4746	1478	1711	4884	
Flt Permitted		1.00			1.00	1.00	0.07	1.00	1.00	0.05	1.00	
Satd. Flow (perm)		3231			3539	1583	114	4746	1478	84	4884	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	430	58	0	317	169	146	2286	122	206	1846	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	38	0	2	0
Lane Group Flow (vph)	0	488	0	0	317	169	146	2286	84	206	1902	0
Confl. Peds. (#/hr)	24		18	18		24	26		36	36		26
Confl. Bikes (#/hr)			1			1			2			
Turn Type		NA			NA	Prot	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases		4			8	8	1	6	6	5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		29.2			29.2	29.2	96.6	81.9	81.9	105.0	86.1	
Effective Green, g (s)		29.2			29.2	29.2	96.6	81.9	81.9	105.0	86.1	
Actuated g/C Ratio		0.19			0.19	0.19	0.64	0.55	0.55	0.70	0.57	
Clearance Time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Vehicle Extension (s)		4.0			4.0	4.0	4.0	0.2	0.2	4.0	0.2	
Lane Grp Cap (vph)		628			688	308	224	2591	806	263	2803	
v/s Ratio Prot		c0.15			0.09	0.11	0.06	c0.48	0.06	c0.10	0.39	
v/s Ratio Perm							0.35			c0.45		
v/c Ratio		0.78			0.46	0.55	0.65	0.88	0.10	0.78	0.68	
Uniform Delay, d1		57.3			53.4	54.5	28.9	29.8	16.4	47.7	22.3	
Progression Factor		1.00			1.00	1.00	1.36	0.44	0.39	1.00	1.00	
Incremental Delay, d2		6.4			0.7	2.5	5.2	3.4	0.2	14.9	1.3	
Delay (s)		63.7			54.1	57.0	44.6	16.6	6.5	62.6	23.6	
Level of Service		E			D	E	D	B	A	E	C	
Approach Delay (s)		63.7			55.1			17.7			27.4	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

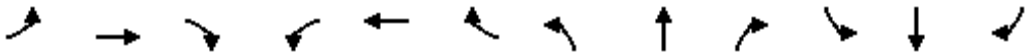
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	739	134	469	586	141	69	109	592	215	119	37
Future Volume (vph)	68	739	134	469	586	141	69	109	592	215	119	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	11	11	11	10	10	10	10	10	10
Total Lost time (s)	5.5	6.0		5.5	6.0			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	1.00	1.00	0.95
Flpb, ped/bikes	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	0.97			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1650	3211		3319	3304			1705	1478	3204	1739	1411
Flt Permitted	0.37	1.00		0.95	1.00			0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	638	3211		3319	3304			1705	1478	3204	1739	1411
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	70	762	138	484	604	145	71	112	610	222	123	38
RTOR Reduction (vph)	0	8	0	0	8	0	0	0	45	0	0	34
Lane Group Flow (vph)	70	892	0	484	741	0	0	183	565	222	123	4
Confl. Peds. (#/hr)	2		9	9		2	15		14	14		15
Confl. Bikes (#/hr)									1			1
Turn Type	pm+pt	NA		Prot	NA		Split	NA	pt+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	4 1	3	3	
Permitted Phases	2											3
Actuated Green, G (s)	85.4	77.3		47.7	116.9			22.3	76.5	17.7	17.7	17.7
Effective Green, g (s)	85.4	77.3		47.7	116.9			22.3	76.5	17.7	17.7	17.7
Actuated g/C Ratio	0.45	0.41		0.25	0.62			0.12	0.40	0.09	0.09	0.09
Clearance Time (s)	5.5	6.0		5.5	6.0			6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	330	1309		835	2038			200	596	299	162	131
v/s Ratio Prot	0.01	c0.28		0.15	0.22			0.11	c0.38	0.07	c0.07	
v/s Ratio Perm	0.09											0.00
v/c Ratio	0.21	0.68		0.58	0.36			0.92	0.95	0.74	0.76	0.03
Uniform Delay, d1	29.9	46.0		62.1	17.9			82.7	54.6	83.7	83.8	78.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	2.9		1.0	0.5			40.4	24.3	9.6	18.3	0.1
Delay (s)	30.2	48.9		63.1	18.4			123.0	78.8	93.2	102.1	78.2
Level of Service	C	D		E	B			F	E	F	F	E
Approach Delay (s)		47.5			36.0			89.0			94.6	
Approach LOS		D			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	58.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	189.5	Sum of lost time (s)	24.5
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1	4	4	1	7	3	743	8	5	634	4
Future Volume (Veh/h)	2	1	4	4	1	7	3	743	8	5	634	4
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)	2	1	4	4	1	8	3	826	9	6	704	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								471			256	
pX, platoon unblocked												
vC, conflicting volume	1146	1559	354	1205	1556	418	708			835		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1146	1559	354	1205	1556	418	708			835		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	99	99	99	97	99	99	100			99		
cM capacity (veh/h)	150	110	642	137	110	584	887			794		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	7	13	416	422	358	356
Volume Left	2	4	3	0	6	0
Volume Right	4	8	0	9	0	4
cSH	244	250	887	1700	794	1700
Volume to Capacity	0.03	0.05	0.00	0.25	0.01	0.21
Queue Length 95th (ft)	2	4	0	0	1	0
Control Delay (s)	20.2	20.2	0.1	0.0	0.2	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	20.2	20.2	0.1		0.1	
Approach LOS	C	C				

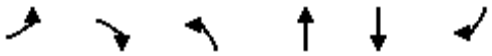
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	32.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	19	0	59	20	89	0	665	49	45	597	0
Future Volume (Veh/h)	0	19	0	59	20	89	0	665	49	45	597	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	20	0	61	21	92	0	686	51	46	615	0
Pedestrians					18							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					2							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								287			440	
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	1521	1462	308	1139	1436	730	615			755		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1525	1455	308	1076	1425	596	615			626		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	100	80	100	48	80	75	100			94		
cM capacity (veh/h)	42	102	688	117	106	374	961			797		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	20	61	113	737	354	308
Volume Left	0	61	0	0	46	0
Volume Right	0	0	92	51	0	0
cSH	102	117	255	961	797	1700
Volume to Capacity	0.20	0.52	0.44	0.00	0.06	0.18
Queue Length 95th (ft)	17	61	53	0	5	0
Control Delay (s)	48.9	65.6	30.0	0.0	1.9	0.0
Lane LOS	E	F	D		A	
Approach Delay (s)	48.9	42.5		0.0	1.0	
Approach LOS	E	E				

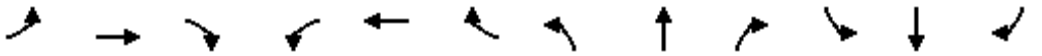
Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	67.3%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	728	703	0
Future Volume (Veh/h)	0	0	0	728	703	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	856	827	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)				111	616	
pX, platoon unblocked	0.82					
vC, conflicting volume	1683	276	827			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1723	276	827			
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	100			
cM capacity (veh/h)	66	722	800			

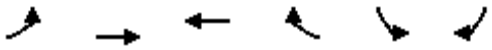
Direction, Lane #	NB 1	SB 1	SB 2	SB 3
Volume Total	856	276	276	276
Volume Left	0	0	0	0
Volume Right	0	0	0	0
cSH	1700	1700	1700	1700
Volume to Capacity	0.50	0.16	0.16	0.16
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0	0.0		
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	324	252	56	15	175	258	17	127	42	245	127	322
Future Volume (vph)	324	252	56	15	175	258	17	127	42	245	127	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.98	1.00	1.00	0.98	1.00		0.97	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1636	1678		1627	1739	1392	1619	1650		1603	1739	1478
Flt Permitted	0.51	1.00		0.57	1.00	1.00	0.65	1.00		0.59	1.00	1.00
Satd. Flow (perm)	880	1678		969	1739	1392	1102	1650		999	1739	1478
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	338	262	58	16	182	269	18	132	44	255	132	335
RTOR Reduction (vph)	0	5	0	0	0	179	0	4	0	0	0	133
Lane Group Flow (vph)	338	316	0	16	182	90	18	172	0	255	132	202
Confl. Peds. (#/hr)	8		5	5		8	10		17	17		10
Confl. Bikes (#/hr)			2			1						
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6			2			4			8	8 1
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	98.1	98.1		60.1	60.1	60.1	70.1	70.1		70.1	70.1	108.6
Effective Green, g (s)	98.1	98.1		60.1	60.1	60.1	70.1	70.1		70.1	70.1	108.6
Actuated g/C Ratio	0.55	0.55		0.33	0.33	0.33	0.39	0.39		0.39	0.39	0.60
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	6.0	0.2		0.2	0.2	0.2	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	617	916		324	581	465	429	643		389	678	893
v/s Ratio Prot	c0.10	0.19			0.10			0.10			0.08	0.14
v/s Ratio Perm	c0.20			0.02		0.06	0.02			c0.26		
v/c Ratio	0.55	0.35		0.05	0.31	0.19	0.04	0.27		0.66	0.19	0.23
Uniform Delay, d1	24.1	22.8		40.5	44.5	42.6	34.0	37.3		44.9	36.2	16.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3	0.1		0.3	1.4	0.9	0.0	0.2		8.4	0.6	0.4
Delay (s)	26.3	22.9		40.8	45.9	43.5	34.0	37.5		53.3	36.8	16.7
Level of Service	C	C		D	D	D	C	D		D	D	B
Approach Delay (s)		24.7			44.3			37.2			33.3	
Approach LOS		C			D			D			C	

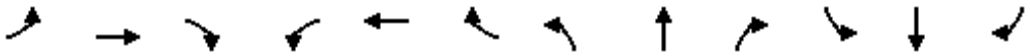
Intersection Summary			
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	179.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	190	523	462	45	59	202
Future Volume (Veh/h)	190	523	462	45	59	202
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	196	539	476	46	61	208
Pedestrians		1			7	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		278	280			
pX, platoon unblocked						
vC, conflicting volume	529				1168	269
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	529				1168	269
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	81				59	71
cM capacity (veh/h)	1027				150	723

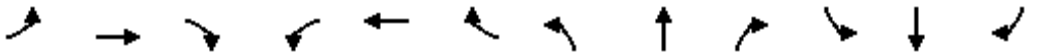
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	376	359	317	205	269
Volume Left	196	0	0	0	61
Volume Right	0	0	0	46	208
cSH	1027	1700	1700	1700	388
Volume to Capacity	0.19	0.21	0.19	0.12	0.69
Queue Length 95th (ft)	18	0	0	0	127
Control Delay (s)	5.8	0.0	0.0	0.0	32.9
Lane LOS	A				D
Approach Delay (s)	3.0		0.0		32.9
Approach LOS					D

Intersection Summary			
Average Delay	7.2		
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	44	26	390	65	78	7	477	402	18	263	18
Future Volume (vph)	10	44	26	390	65	78	7	477	402	18	263	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.96			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.94		1.00	0.92			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1711	1674		1711	1591			1799	1495		3366	
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00		0.91	
Satd. Flow (perm)	1711	1674		1711	1591			1792	1495		3086	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	46	27	406	68	81	7	497	419	19	274	19
RTOR Reduction (vph)	0	21	0	0	40	0	0	0	81	0	4	0
Lane Group Flow (vph)	10	52	0	406	109	0	0	504	338	0	308	0
Confl. Peds. (#/hr)	19		20	20		19	18		15	15		18
Confl. Bikes (#/hr)			1			3			2			3
Turn Type	Split	NA		Split	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	4	4		3	3			2	3		6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	7.0	7.0		27.9	27.9			60.1	88.0		60.1	
Effective Green, g (s)	7.0	7.0		27.9	27.9			60.1	88.0		60.1	
Actuated g/C Ratio	0.06	0.06		0.26	0.26			0.55	0.81		0.55	
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Vehicle Extension (s)	2.0	2.0		1.0	1.0			5.0	1.0		5.0	
Lane Grp Cap (vph)	109	107		437	407			988	1206		1701	
v/s Ratio Prot	0.01	c0.03		c0.24	0.07				0.07			
v/s Ratio Perm								c0.28	0.15		0.10	
v/c Ratio	0.09	0.49		0.93	0.27			0.51	0.28		0.18	
Uniform Delay, d1	48.0	49.3		39.6	32.4			15.3	2.6		12.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.1	1.3		25.6	0.1			1.9	0.0		0.2	
Delay (s)	48.1	50.6		65.2	32.5			17.1	2.7		12.4	
Level of Service	D	D		E	C			B	A		B	
Approach Delay (s)		50.3			56.4			10.6			12.4	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	66	87	210	70	127	197	2261	105	99	1845	30
Future Volume (vph)	98	66	87	210	70	127	197	2261	105	99	1845	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.95	1.00		0.96	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1680	3132		1707	1863	1583	1711	4873		1711	4899	
Flt Permitted	0.71	1.00		0.64	1.00	1.00	0.05	1.00		0.04	1.00	
Satd. Flow (perm)	1253	3132		1152	1863	1583	82	4873		71	4899	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	69	92	221	74	134	207	2380	111	104	1942	32
RTOR Reduction (vph)	0	70	0	0	0	103	0	2	0	0	0	0
Lane Group Flow (vph)	103	91	0	221	74	31	207	2489	0	104	1974	0
Confl. Peds. (#/hr)	30		24	24		30	12		16	16		12
Confl. Bikes (#/hr)												1
Turn Type	Perm	NA		Perm	NA	Prot	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	8	1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	44.0	44.0		44.0	44.0	44.0	131.5	113.9		114.2	102.1	
Effective Green, g (s)	44.0	44.0		44.0	44.0	44.0	131.5	113.9		114.2	102.1	
Actuated g/C Ratio	0.23	0.23		0.23	0.23	0.23	0.70	0.61		0.61	0.54	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	294	734		270	437	371	265	2960		149	2667	
v/s Ratio Prot		0.03			0.04	0.02	c0.10	c0.51		0.05	0.40	
v/s Ratio Perm	0.08			c0.19			0.45			0.38		
v/c Ratio	0.35	0.12		0.82	0.17	0.08	0.78	0.84		0.70	0.74	
Uniform Delay, d1	59.8	56.6		68.0	57.2	56.0	58.3	29.5		48.8	32.6	
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	0.2		19.3	0.4	0.2	15.9	3.1		16.6	1.9	
Delay (s)	61.3	56.7		87.2	57.6	56.2	74.2	32.6		65.5	34.5	
Level of Service	E	E		F	E	E	E	C		E	C	
Approach Delay (s)		58.5			72.4			35.8			36.0	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	187.5	Sum of lost time (s)	17.5
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	32	68	304	39	272	31	1199	271	133	743	32
Future Volume (vph)	44	32	68	304	39	272	31	1199	271	133	743	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	10	10	10	10	10	10
Total Lost time (s)	6.5	6.5		7.0	7.0	7.0	8.0	6.0		8.0	6.0	6.0
Lane Util. Factor	0.95	0.95		0.95	0.95	1.00	1.00	0.91		0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1573		1625	1647	1531	1650	4563		3204	3303	1420
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.32	1.00		0.11	1.00	1.00
Satd. Flow (perm)	1681	1573		1625	1647	1531	547	4563		372	3303	1420
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	47	34	72	323	41	289	33	1276	288	141	790	34
RTOR Reduction (vph)	0	32	0	0	0	184	0	9	0	0	0	13
Lane Group Flow (vph)	42	79	0	181	183	105	33	1555	0	141	790	21
Confl. Peds. (#/hr)	12		2	2		12	4		17	17		4
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases							2			6		6
Actuated Green, G (s)	16.1	16.1		30.8	30.8	47.6	139.2	133.3		147.0	137.2	137.2
Effective Green, g (s)	16.1	16.1		30.8	30.8	47.6	139.2	133.3		147.0	137.2	137.2
Actuated g/C Ratio	0.07	0.07		0.14	0.14	0.22	0.64	0.61		0.68	0.63	0.63
Clearance Time (s)	6.5	6.5		7.0	7.0		8.0	6.0		8.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	124	116		230	233	335	380	2796		379	2083	895
v/s Ratio Prot	0.02	c0.05		c0.11	0.11	c0.07	0.00	c0.34		0.02	c0.24	
v/s Ratio Perm							0.05			0.23		0.02
v/c Ratio	0.34	0.68		0.79	0.79	0.31	0.09	0.56		0.37	0.38	0.02
Uniform Delay, d1	95.6	98.2		90.2	90.2	71.2	14.9	24.7		16.3	19.5	15.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	14.6		16.1	15.8	0.5	0.1	0.8		0.6	0.5	0.0
Delay (s)	97.3	112.7		106.3	106.0	71.8	15.0	25.5		17.0	20.0	15.1
Level of Service	F	F		F	F	E	B	C		B	C	B
Approach Delay (s)		108.5			90.9			25.3			19.4	
Approach LOS		F			F			C			B	

Intersection Summary					
HCM 2000 Control Delay	40.1	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.60				
Actuated Cycle Length (s)	217.5	Sum of lost time (s)	27.5		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C		
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1076	93	183	827	185	137	145	311	294	171	24
Future Volume (vph)	21	1076	93	183	827	185	137	145	311	294	171	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	11	11	12	12	12
Total Lost time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	3237		1770	3414		1672	1801	1531	1760	1863	1583
Flt Permitted	0.17	1.00		0.05	1.00		0.64	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	291	3237		85	3414		1133	1801	1531	879	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1133	98	193	871	195	144	153	327	309	180	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	1231	0	193	1066	0	144	153	327	309	180	25
Confl. Peds. (#/hr)	12		18	18		12	17		8	8		17
Confl. Bikes (#/hr)			4			3			3			3
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Prot	pm+pt	NA	Prot
Protected Phases	1	6		5	2		3	8	8	7	4	4
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	87.4	81.5		109.6	97.7		66.5	48.6	48.6	92.9	68.5	68.5
Effective Green, g (s)	87.4	81.5		109.6	97.7		66.5	48.6	48.6	92.9	68.5	68.5
Actuated g/C Ratio	0.41	0.38		0.51	0.45		0.31	0.23	0.23	0.43	0.32	0.32
Clearance Time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	5.0		3.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	155	1224		216	1547		394	406	345	533	592	503
v/s Ratio Prot	0.00	c0.38		c0.09	0.31		0.03	0.08	c0.21	c0.10	0.10	0.02
v/s Ratio Perm	0.05			0.36			0.08			0.15		
v/c Ratio	0.14	1.01		0.89	0.69		0.37	0.38	0.95	0.58	0.30	0.05
Uniform Delay, d1	40.9	67.0		73.5	46.8		56.4	70.6	82.2	43.0	55.5	50.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	27.1		33.8	2.5		0.8	0.8	34.9	1.8	0.4	0.1
Delay (s)	41.3	94.1		107.3	49.4		57.2	71.4	117.1	44.9	55.9	51.0
Level of Service	D	F		F	D		E	E	F	D	E	D
Approach Delay (s)		93.2			58.2			92.1			49.0	
Approach LOS		F			E			F			D	

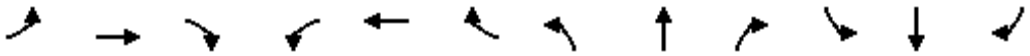
Intersection Summary			
HCM 2000 Control Delay	74.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	215.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	91.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	12	32	186	13	138	18	2732	250	161	2184	26
Future Volume (vph)	40	12	32	186	13	138	18	2732	250	161	2184	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.93		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.95	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.86		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1623	1589		1770	1490		1711	6075		1711	4902	
Flt Permitted	0.54	1.00		0.73	1.00		0.05	1.00		0.04	1.00	
Satd. Flow (perm)	925	1589		1354	1490		84	6075		74	4902	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	42	12	33	194	14	144	19	2846	260	168	2275	27
RTOR Reduction (vph)	0	27	0	0	116	0	0	7	0	0	0	0
Lane Group Flow (vph)	42	19	0	194	42	0	19	3099	0	168	2302	0
Confl. Peds. (#/hr)	44					44	25		20	20		25
Confl. Bikes (#/hr)			3						1			3
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	30.3	30.3		30.3	30.3		96.4	91.4		115.7	104.7	
Effective Green, g (s)	30.3	30.3		30.3	30.3		96.4	91.4		115.7	104.7	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.61	0.58		0.73	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	176	303		258	284		102	3503		243	3238	
v/s Ratio Prot		0.01			0.03		0.01	c0.51		c0.08	c0.47	
v/s Ratio Perm	0.05			c0.14			0.11			0.43		
v/c Ratio	0.24	0.06		0.75	0.15		0.19	0.88		0.69	0.71	
Uniform Delay, d1	54.3	52.5		60.5	53.3		15.4	29.0		49.7	17.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.2		13.7	0.5		1.8	3.7		10.3	1.4	
Delay (s)	55.8	52.7		74.3	53.8		17.2	32.7		60.0	18.6	
Level of Service	E	D		E	D		B	C		E	B	
Approach Delay (s)		54.2			65.1			32.6			21.4	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	158.5	Sum of lost time (s)	18.5
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	1013	72	14	803	127	50	24	20	152	51	96
Future Volume (vph)	144	1013	72	14	803	127	50	24	20	152	51	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1651	3259		1650	3303	1433	1711	1665		1681	1574	
Flt Permitted	0.26	1.00		0.21	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	454	3259		368	3303	1433	1711	1665		1681	1574	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	150	1055	75	15	836	132	52	25	21	158	53	100
RTOR Reduction (vph)	0	3	0	0	0	58	0	20	0	0	0	0
Lane Group Flow (vph)	150	1127	0	15	836	74	52	26	0	142	169	0
Confl. Peds. (#/hr)	3		10	10		3	9		2	2		9
Confl. Bikes (#/hr)						1						1
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2						
Actuated Green, G (s)	99.9	91.9		86.4	83.4	83.4	7.8	7.8		22.3	22.3	
Effective Green, g (s)	99.9	91.9		86.4	83.4	83.4	7.8	7.8		22.3	22.3	
Actuated g/C Ratio	0.68	0.62		0.58	0.56	0.56	0.05	0.05		0.15	0.15	
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	0.2		4.0	0.2	0.2	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	399	2023		240	1861	807	90	87		253	237	
v/s Ratio Prot	c0.03	c0.35		0.00	0.25		c0.03	0.02		0.08	c0.11	
v/s Ratio Perm	0.22			0.04		0.05						
v/c Ratio	0.38	0.56		0.06	0.45	0.09	0.58	0.30		0.56	0.71	
Uniform Delay, d1	10.4	16.3		13.5	18.9	14.9	68.5	67.5		58.3	59.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	1.1		0.1	0.8	0.2	10.3	2.6		3.4	10.4	
Delay (s)	11.2	17.4		13.7	19.7	15.1	78.8	70.1		61.7	70.2	
Level of Service	B	B		B	B	B	E	E		E	E	
Approach Delay (s)		16.6			19.0			74.7			66.3	
Approach LOS		B			B			E			E	

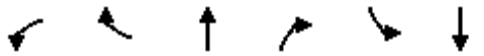
Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	17	122	9	12	5	28	279	23	7	281	27
Future Volume (Veh/h)	26	17	122	9	12	5	28	279	23	7	281	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	28	18	130	10	13	5	30	297	24	7	299	29
Pedestrians		66			56			51			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		6			5			5			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								638				
pX, platoon unblocked	0.96	0.96		0.96	0.96	0.96				0.96		
vC, conflicting volume	780	830	430	942	833	371	394			377		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	754	806	430	922	809	330	394			336		
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 %	89	93	77	93	95	99	97			99		
cM capacity (veh/h)	249	261	557	141	260	646	1091			1117		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	176	28	351	335
Volume Left	28	10	30	7
Volume Right	130	5	24	29
cSH	424	218	1091	1117
Volume to Capacity	0.41	0.13	0.03	0.01
Queue Length 95th (ft)	50	11	2	0
Control Delay (s)	19.4	24.0	1.0	0.2
Lane LOS	C	C	A	A
Approach Delay (s)	19.4	24.0	1.0	0.2
Approach LOS	C	C		

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	51.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	143	2588	87	0	1996
Future Volume (Veh/h)	0	143	2588	87	0	1996
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	155	2813	95	0	2170
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			249			340
pX, platoon unblocked	0.70	0.57			0.57	
vC, conflicting volume	3584	985			2908	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	567	0			1686	
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	75			100	
cM capacity (veh/h)	319	614			212	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	155	1125	1125	658	723	723	723
Volume Left	0	0	0	0	0	0	0
Volume Right	155	0	0	95	0	0	0
cSH	614	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.25	0.66	0.66	0.39	0.43	0.43	0.43
Queue Length 95th (ft)	25	0	0	0	0	0	0
Control Delay (s)	12.8	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.8	0.0			0.0		
Approach LOS	B						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	EB	EB	B28	WB	WB	WB	NB	NB	NB	NB	NB	SB
Directions Served	LT	R	T	L	L	TR	L	T	T	T	R	L
Maximum Queue (ft)	142	69	334	201	220	187	200	420	442	434	419	178
Average Queue (ft)	129	29	289	173	188	130	95	387	392	398	262	165
95th Queue (ft)	143	76	421	237	240	232	203	476	482	477	457	185
Link Distance (ft)	69		319	187	187			393	393	393	393	
Upstream Blk Time (%)	95	22	72	39	59	11		39	42	43	14	54
Queuing Penalty (veh)	0	0	0	128	194	0		285	303	312	99	0
Storage Bay Dist (ft)		90				200	175					245
Storage Blk Time (%)	95	22			59	11	4	52				54
Queuing Penalty (veh)	34	11			134	26	29	30				312

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	237	208	204
Average Queue (ft)	210	87	87
95th Queue (ft)	238	223	226
Link Distance (ft)	178	178	178
Upstream Blk Time (%)	93	12	13
Queuing Penalty (veh)	616	83	85
Storage Bay Dist (ft)			
Storage Blk Time (%)	93		
Queuing Penalty (veh)	259		

Intersection: 2: Rockville Pike - 355 & Federal Plaza/Pike Center

Movement	EB	EB	B25	B25	WB	B24	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	T	T	LTR	T	L	T	T	TR	L	T
Maximum Queue (ft)	149	166	64	97	102	233	270	298	318	294	159	171
Average Queue (ft)	30	146	5	64	97	212	109	146	178	177	7	162
95th Queue (ft)	116	158	33	80	101	228	259	343	379	379	54	168
Link Distance (ft)	79	79	63	63	45	218		276	276	276		160
Upstream Blk Time (%)	15	99	7	99	99	98	0	5	24	23	0	89
Queuing Penalty (veh)	0	0	0	0	0	0	0	48	220	213	0	561
Storage Bay Dist (ft)							245				175	
Storage Blk Time (%)							9	17			0	89
Queuing Penalty (veh)							70	34			0	32

Intersection: 2: Rockville Pike - 355 & Federal Plaza/Pike Center

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	180	180
Average Queue (ft)	79	77
95th Queue (ft)	204	201
Link Distance (ft)	160	160
Upstream Blk Time (%)	16	16
Queuing Penalty (veh)	98	99
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Rockville Pike - 355 & Gas Station

Movement	WB	B22	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	T	TR	T	T	T
Maximum Queue (ft)	73	58	90	163	173	292	292	297
Average Queue (ft)	35	6	3	31	25	274	107	96
95th Queue (ft)	66	34	30	122	117	294	308	303
Link Distance (ft)	17	181	160	160	160	240	240	240
Upstream Blk Time (%)	20			6	6	81	9	10
Queuing Penalty (veh)	0			56	56	506	56	62
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Rockville Pike - 355/Rockville Pike- 355 & Rollins Ave/Twinbrook Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	T	TR	T	T	R	L	T	T	T	L	T	T
Maximum Queue (ft)	1314	1328	439	561	175	148	254	263	245	425	1194	1179
Average Queue (ft)	937	972	117	107	63	55	134	132	122	134	1112	758
95th Queue (ft)	1462	1467	295	350	165	132	282	276	261	414	1489	1221
Link Distance (ft)	1299	1299	548	548		240	240	240	240		1180	1180
Upstream Blk Time (%)	5	22		1			8	7	7		71	0
Queuing Penalty (veh)	12	50		5			40	39	36		506	0
Storage Bay Dist (ft)					150					400		
Storage Blk Time (%)				6	7					0	90	
Queuing Penalty (veh)				11	12					0	184	

Intersection: 4: Rockville Pike - 355/Rockville Pike- 355 & Rollins Ave/Twinbrook Parkway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	1194
Average Queue (ft)	490
95th Queue (ft)	1146
Link Distance (ft)	1180
Upstream Blk Time (%)	0
Queuing Penalty (veh)	3
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: Chapman Ave & Twinbrook Parkway

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	L	T	TR	LT	R	L	L	T
Maximum Queue (ft)	199	518	677	312	325	1324	1326	180	185	328	528	546
Average Queue (ft)	22	125	232	254	318	1268	1066	165	173	207	241	384
95th Queue (ft)	106	367	612	346	326	1528	1818	183	185	312	402	610
Link Distance (ft)		548	548			1298	1298	167	167	528	528	528
Upstream Blk Time (%)			0			52	35	59	76		0	9
Queuing Penalty (veh)			1			289	194	221	288		0	9
Storage Bay Dist (ft)	175			300	300							
Storage Blk Time (%)		11		0	80							
Queuing Penalty (veh)		7		1	234							

Intersection: 6: Chapman Ave & Pike Center North/Driveway

Movement	EB	WB	B40	NB	NB	SB	SB
Directions Served	LTR	LTR	T	LT	TR	LT	TR
Maximum Queue (ft)	27	88	32	70	118	198	201
Average Queue (ft)	8	28	1	24	107	50	38
95th Queue (ft)	23	65	10	66	118	163	149
Link Distance (ft)	28	44	107	101	101	167	167
Upstream Blk Time (%)	37	37			74	3	6
Queuing Penalty (veh)	0	0			277	11	20
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 7: Chapman Ave & Rollins Ave Extension/Rollins Ave

Movement	EB	WB	WB	B50	B50	B57	B57	NB	SB	SB
Directions Served	LTR	L	TR	T	T	T	T	LTR	LT	TR
Maximum Queue (ft)	50	123	136	47	252	382	334	140	117	126
Average Queue (ft)	8	32	109	4	222	232	273	122	59	34
95th Queue (ft)	31	107	125	23	259	469	452	134	138	115
Link Distance (ft)	221	67	67	148	148	319	319	118	101	101
Upstream Blk Time (%)		19	100		96	61	69	70	21	15
Queuing Penalty (veh)		0	0		0	0	0	509	69	47
Storage Bay Dist (ft)										
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 8: Chapman Ave & Pike Center South

Movement	NB	SB	SB	SB
Directions Served	T	T	T	T
Maximum Queue (ft)	142	139	118	137
Average Queue (ft)	118	95	29	70
95th Queue (ft)	135	162	102	149
Link Distance (ft)	51	118	118	118
Upstream Blk Time (%)	71	24	4	20
Queuing Penalty (veh)	503	52	9	45
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 9: Chapman Ave & Bou Ave

Movement	EB	EB	WB	WB	WB	B36	B36	NB	NB	B35	B48	B49
Directions Served	L	TR	L	T	R	T	T	L	TR	T	T	T
Maximum Queue (ft)	221	199	679	910	275	1617	1638	95	204	355	579	566
Average Queue (ft)	197	59	72	841	271	825	910	28	195	349	529	313
95th Queue (ft)	249	163	406	1070	281	1790	1815	83	209	358	719	693
Link Distance (ft)	204	204	817	817		1623	1623		130	285	528	472
Upstream Blk Time (%)	52	0		86		0	9		90	87	64	41
Queuing Penalty (veh)	151	0		151		0	15		264	256	190	120
Storage Bay Dist (ft)					250			70				
Storage Blk Time (%)				1	94			22	90			
Queuing Penalty (veh)				3	164			37	15			

Intersection: 9: Chapman Ave & Bou Ave

Movement	B45	SB	SB	SB
Directions Served	T	L	T	R
Maximum Queue (ft)	236	68	65	99
Average Queue (ft)	92	55	31	38
95th Queue (ft)	271	76	69	85
Link Distance (ft)	226	51	51	51
Upstream Blk Time (%)	22	53	29	36
Queuing Penalty (veh)	64	123	68	84
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 10: Bou Ave & Pike Center

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	125	226	209	253	95
Average Queue (ft)	95	133	81	127	70
95th Queue (ft)	156	279	206	275	83
Link Distance (ft)		187	204	204	62
Upstream Blk Time (%)		33	3	24	88
Queuing Penalty (veh)		273	7	63	205
Storage Bay Dist (ft)	100				
Storage Blk Time (%)	44	1			
Queuing Penalty (veh)	116	3			

Intersection: 11: East Jefferson Street & Rolllins Avenue /Rollins Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	TR
Maximum Queue (ft)	30	260	888	758	446	446	218	184
Average Queue (ft)	8	105	548	280	244	177	103	57
95th Queue (ft)	28	217	973	707	496	486	201	144
Link Distance (ft)	973	973	1299	1299	431	431	281	281
Upstream Blk Time (%)					21	18		
Queuing Penalty (veh)					0	0		
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 12: Rockville Pike- 355 & Halpine Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	T	TR	L	T
Maximum Queue (ft)	275	567	572	484	484	469	190	505	548	513	200	753
Average Queue (ft)	87	122	253	407	144	74	108	226	237	231	54	690
95th Queue (ft)	183	377	568	568	458	248	187	442	464	479	178	775
Link Distance (ft)		557	557	469	469			1180	1180	1180		690
Upstream Blk Time (%)		0	8	47	16	0						87
Queuing Penalty (veh)		0	0	0	0	0						0
Storage Bay Dist (ft)	250					450	165				175	
Storage Blk Time (%)	0	2			16	0	5	10			0	92
Queuing Penalty (veh)	0	2			20	0	39	20			0	91

Intersection: 12: Rockville Pike- 355 & Halpine Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	707	705
Average Queue (ft)	649	577
95th Queue (ft)	802	822
Link Distance (ft)	690	690
Upstream Blk Time (%)	44	7
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	LT	R	L	T	T	TR	L	L	T
Maximum Queue (ft)	120	280	225	938	938	47	363	367	394	157	202	445
Average Queue (ft)	46	127	187	652	573	8	148	175	197	11	57	386
95th Queue (ft)	90	242	248	1159	1118	29	299	336	379	68	145	541
Link Distance (ft)	440	440		904	904		1298	1298	1298		411	411
Upstream Blk Time (%)				50	37							72
Queuing Penalty (veh)				0	0							0
Storage Bay Dist (ft)			200			190				240		
Storage Blk Time (%)			34	70			5					
Queuing Penalty (veh)			65	106			1					

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	463	235
Average Queue (ft)	376	41
95th Queue (ft)	564	182
Link Distance (ft)	411	
Upstream Blk Time (%)	61	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		210
Storage Blk Time (%)	68	0
Queuing Penalty (veh)	22	0

Intersection: 14: Nebel Street & Randolph Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	T	R
Maximum Queue (ft)	164	614	612	150	936	996	124	466	466	274	373	72
Average Queue (ft)	34	449	448	128	385	382	76	165	337	151	113	20
95th Queue (ft)	120	682	671	197	725	729	143	371	500	296	268	58
Link Distance (ft)		598	598		1095	1095		450	450		1623	1623
Upstream Blk Time (%)		2	1					5	8			
Queuing Penalty (veh)		11	6					0	0			
Storage Bay Dist (ft)	140			125			100			250		
Storage Blk Time (%)		42		37	23		12	24		6		
Queuing Penalty (veh)		9		154	43		17	33		11		

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	T	TR	L	T	T
Maximum Queue (ft)	130	61	290	392	1575	1570	1575	1575	1599	204	277	317
Average Queue (ft)	55	22	142	261	1265	1473	1509	1499	1493	40	94	74
95th Queue (ft)	121	53	260	423	1794	1703	1732	1771	1815	125	227	214
Link Distance (ft)	400	400	353	353	1536	1536	1536	1536	1536		393	393
Upstream Blk Time (%)				28	18	22	52	85	81			
Queuing Penalty (veh)				0	0	0	0	0	0			
Storage Bay Dist (ft)										180		
Storage Blk Time (%)										3	2	
Queuing Penalty (veh)										23	3	

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	334
Average Queue (ft)	81
95th Queue (ft)	240
Link Distance (ft)	393
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 16: Chapman Ave & Josiah Henson Parkway/Randolph Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	LTR
Maximum Queue (ft)	286	310	386	45	422	460	240	150	139	136	178
Average Queue (ft)	111	165	141	12	161	164	45	67	39	61	109
95th Queue (ft)	227	281	276	33	328	347	159	140	95	121	167
Link Distance (ft)		520	520		598	598			375	226	226
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	350			165			215	250			
Storage Blk Time (%)					10	7	0				
Queuing Penalty (veh)					1	8	0				

Intersection: 17: Chapman Ave/Chapman Road & Thompson Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	153	52	54	226
Average Queue (ft)	39	24	15	32
95th Queue (ft)	82	47	46	111
Link Distance (ft)	363	242	528	350
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Rockville Pike - 355 & Rollins Ave Extension

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	TR	T	T	T
Maximum Queue (ft)	182	224	205	200	294	291	308
Average Queue (ft)	77	103	110	105	281	63	65
95th Queue (ft)	181	261	247	248	292	243	248
Link Distance (ft)	173	178	178	178	276	276	276
Upstream Blk Time (%)	12	22	23	22	86	5	5
Queuing Penalty (veh)	14	196	199	198	566	36	34
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 20: Driveway & Rollins Ave Extension

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	67	50
Average Queue (ft)	18	8
95th Queue (ft)	52	32
Link Distance (ft)	50	103
Upstream Blk Time (%)	10	
Queuing Penalty (veh)	10	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Signalized Intersection Capacity Analysis

Total Future AM Phase 2

1: Rockville Pike - 355 & Bou Ave

10/16/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	21	25	571	11	49	36	1750	137	141	2039	6
Future Volume (vph)	14	21	25	571	11	49	36	1750	137	141	2039	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.88		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1704	1478	3204	1502		1711	4916	1531	1770	5083	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.07	1.00	
Satd. Flow (perm)		1704	1478	3204	1502		1711	4916	1531	130	5083	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	15	22	26	595	11	51	38	1823	143	147	2124	6
RTOR Reduction (vph)	0	0	25	0	39	0	0	0	82	0	0	0
Lane Group Flow (vph)	0	37	1	595	23	0	38	1823	61	147	2130	0
Confl. Peds. (#/hr)	4					4	5		9	9		5
Confl. Bikes (#/hr)			1									
Turn Type	Split	NA	Prot	Split	NA		Prot	NA	Prot	pm+pt	NA	
Protected Phases	3	3	3	4	4		1	5	5	6	2	
Permitted Phases										2		
Actuated Green, G (s)		7.2	7.2	33.9	33.9		7.6	64.5	64.5	77.3	77.3	
Effective Green, g (s)		7.2	7.2	33.9	33.9		7.6	64.5	64.5	77.3	77.3	
Actuated g/C Ratio		0.05	0.05	0.23	0.23		0.05	0.43	0.43	0.52	0.52	
Clearance Time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	6.0	6.0		3.0	0.2	0.2	3.0	0.2	
Lane Grp Cap (vph)		81	70	724	339		86	2113	658	284	2619	
v/s Ratio Prot		c0.02	0.00	c0.19	0.01		0.02	c0.37	0.04	0.07	c0.42	
v/s Ratio Perm										0.20		
v/c Ratio		0.46	0.02	0.82	0.07		0.44	0.86	0.09	0.52	0.81	
Uniform Delay, d1		69.5	68.0	55.2	45.6		69.1	38.7	25.4	47.5	30.3	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.71	0.57	
Incremental Delay, d2		4.0	0.1	8.7	0.2		3.6	5.0	0.3	1.3	2.4	
Delay (s)		73.5	68.1	63.9	45.8		72.7	43.7	25.7	34.9	19.6	
Level of Service		E	E	E	D		E	D	C	C	B	
Approach Delay (s)		71.3			62.2			43.0			20.6	
Approach LOS		E			E			D			C	

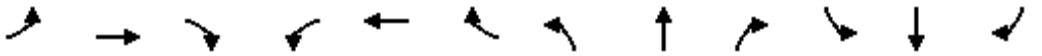
Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	56	21	2	24	84	1582	11	18	2070	2
Future Volume (vph)	16	2	56	21	2	24	84	1582	11	18	2070	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	16	16	16	11	11	11	10	10	10
Total Lost time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.93		1.00	1.00		1.00	1.00	
Flt Protected		0.96	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1664	1478		1904		1711	4910		1651	4745	
Flt Permitted		0.96	1.00		0.98		0.05	1.00		0.12	1.00	
Satd. Flow (perm)		1664	1478		1904		99	4910		216	4745	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	17	2	58	22	2	25	88	1648	11	19	2156	2
RTOR Reduction (vph)	0	0	56	0	24	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	19	2	0	25	0	88	1659	0	19	2158	0
Confl. Peds. (#/hr)	1					1	3		7	7		3
Confl. Bikes (#/hr)			1			1						
Turn Type	Split	NA	Prot	Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	8	8	8	4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		6.2	6.2		6.3		119.0	110.3		108.9	105.2	
Effective Green, g (s)		6.2	6.2		6.3		119.0	110.3		108.9	105.2	
Actuated g/C Ratio		0.04	0.04		0.04		0.79	0.74		0.73	0.70	
Clearance Time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	0.2		3.0	0.2	
Lane Grp Cap (vph)		68	61		79		173	3610		192	3327	
v/s Ratio Prot		c0.01	0.00		c0.01		c0.03	0.34		0.00	c0.45	
v/s Ratio Perm							0.38			0.07		
v/c Ratio		0.28	0.04		0.32		0.51	0.46		0.10	0.65	
Uniform Delay, d1		69.7	69.0		69.8		13.7	7.9		6.0	12.3	
Progression Factor		1.00	1.00		1.00		3.52	0.09		0.33	0.18	
Incremental Delay, d2		2.2	0.3		2.3		1.4	0.3		0.2	0.7	
Delay (s)		72.0	69.3		72.1		49.5	1.0		2.2	2.9	
Level of Service		E	E		E		D	A		A	A	
Approach Delay (s)		70.0			72.1			3.4			2.9	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

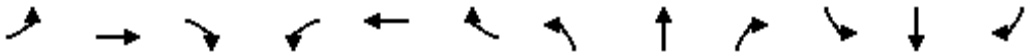
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	256	136	0	310	221	105	1464	123	238	1973	45
Future Volume (vph)	0	256	136	0	310	221	105	1464	123	238	1973	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	11	11	11
Total Lost time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		0.99			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3106			3539	1583	1652	4746	1478	1711	4899	
Flt Permitted		1.00			1.00	1.00	0.06	1.00	1.00	0.11	1.00	
Satd. Flow (perm)		3106			3539	1583	96	4746	1478	196	4899	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	261	139	0	316	226	107	1494	126	243	2013	46
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	51	0	1	0
Lane Group Flow (vph)	0	400	0	0	316	226	107	1494	75	243	2058	0
Confl. Peds. (#/hr)	13		9	9		13			4	4		
Confl. Bikes (#/hr)									1			
Turn Type		NA			NA	Prot	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases		4			8	8	1	6	6	5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		28.1			28.1	28.1	95.6	83.6	83.6	108.2	89.9	
Effective Green, g (s)		28.1			28.1	28.1	95.6	83.6	83.6	108.2	89.9	
Actuated g/C Ratio		0.19			0.19	0.19	0.64	0.56	0.56	0.72	0.60	
Clearance Time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Vehicle Extension (s)		4.0			4.0	4.0	4.0	0.2	0.2	4.0	0.2	
Lane Grp Cap (vph)		581			662	296	185	2645	823	326	2936	
v/s Ratio Prot		0.13			0.09	c0.14	0.05	0.31	0.05	c0.09	c0.42	
v/s Ratio Perm							0.32			c0.45		
v/c Ratio		0.69			0.48	0.76	0.58	0.56	0.09	0.75	0.70	
Uniform Delay, d1		56.9			54.4	57.8	24.1	21.4	15.5	24.9	20.8	
Progression Factor		1.00			1.00	1.00	1.94	0.09	0.01	1.00	1.00	
Incremental Delay, d2		3.7			0.7	11.7	4.8	0.8	0.2	9.5	1.4	
Delay (s)		60.5			55.1	69.5	51.6	2.8	0.3	34.4	22.2	
Level of Service		E			E	E	D	A	A	C	C	
Approach Delay (s)		60.5			61.1			5.6			23.5	
Approach LOS		E			E			A			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	509	128	534	440	123	100	48	197	84	50	24
Future Volume (vph)	40	509	128	534	440	123	100	48	197	84	50	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	11	11	11	10	10	10	10	10	10
Total Lost time (s)	5.5	6.0		5.5	6.0			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	1.00	1.00	0.97
Flpb, ped/bikes	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	0.97			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1647	3193		3319	3283			1682	1478	3204	1739	1439
Flt Permitted	0.43	1.00		0.95	1.00			0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	751	3193		3319	3283			1682	1478	3204	1739	1439
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	41	525	132	551	454	127	103	49	203	87	52	25
RTOR Reduction (vph)	0	10	0	0	9	0	0	0	132	0	0	24
Lane Group Flow (vph)	41	647	0	551	572	0	0	152	71	87	52	1
Confl. Peds. (#/hr)	4		1	1		4	5		14	14		5
Confl. Bikes (#/hr)			4			1						1
Turn Type	pm+pt	NA		Prot	NA		Split	NA	pt+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	4 1	3	3	
Permitted Phases	2											3
Actuated Green, G (s)	99.7	93.9		37.4	125.5			22.5	66.4	11.2	11.2	11.2
Effective Green, g (s)	99.7	93.9		37.4	125.5			22.5	66.4	11.2	11.2	11.2
Actuated g/C Ratio	0.53	0.50		0.20	0.66			0.12	0.35	0.06	0.06	0.06
Clearance Time (s)	5.5	6.0		5.5	6.0			6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	422	1582		655	2174			199	517	189	102	85
v/s Ratio Prot	0.00	c0.20		c0.17	0.17			c0.09	0.05	0.03	c0.03	
v/s Ratio Perm	0.05											0.00
v/c Ratio	0.10	0.41		0.84	0.26			0.76	0.14	0.46	0.51	0.02
Uniform Delay, d1	21.8	30.2		73.2	13.1			80.9	42.0	86.2	86.5	84.0
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.8		9.6	0.3			15.9	0.1	1.8	4.0	0.1
Delay (s)	21.9	31.0		82.7	13.4			96.8	42.1	88.0	90.5	84.0
Level of Service	C	C		F	B			F	D	F	F	F
Approach Delay (s)		30.5			47.1			65.5			88.2	
Approach LOS		C			D			E			F	

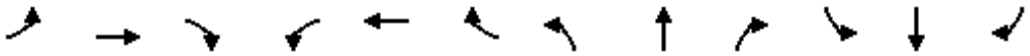
Intersection Summary			
HCM 2000 Control Delay	47.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	189.5	Sum of lost time (s)	24.5
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	0	35	1	0	4	8	317	2	5	655	52
Future Volume (Veh/h)	24	0	35	1	0	4	8	317	2	5	655	52
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	30	0	44	1	0	5	10	401	3	6	829	66
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								471			256	
pX, platoon unblocked												
vC, conflicting volume	1100	1298	448	893	1330	202	895			404		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1100	1298	448	893	1330	202	895			404		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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	92	100	100	99	99			99		
cM capacity (veh/h)	164	158	559	215	151	805	754			1151		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	74	6	210	204	420	480
Volume Left	30	1	10	0	6	0
Volume Right	44	5	0	3	0	66
cSH	282	552	754	1700	1151	1700
Volume to Capacity	0.26	0.01	0.01	0.12	0.01	0.28
Queue Length 95th (ft)	26	1	1	0	0	0
Control Delay (s)	22.2	11.6	0.6	0.0	0.2	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	22.2	11.6	0.3		0.1	
Approach LOS	C	B				

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	36.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	22	31	32	6	33	1	342	49	36	610	8
Future Volume (Veh/h)	0	22	31	32	6	33	1	342	49	36	610	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	23	32	33	6	34	1	353	51	37	629	8
Pedestrians					11						3	
Lane Width (ft)					12.0						10.0	
Walking Speed (ft/s)					3.5						3.5	
Percent Blockage					1						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								287			440	
pX, platoon unblocked	0.95	0.95		0.95	0.95	0.95				0.95		
vC, conflicting volume	1128	1124	318	824	1102	392	637			415		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1108	1104	318	787	1081	333	637			357		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	100	88	95	85	97	95	100			97		
cM capacity (veh/h)	139	190	677	221	196	621	943			1126		

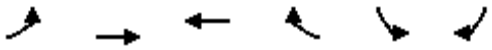
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	55	33	40	405	352	322
Volume Left	0	33	0	1	37	0
Volume Right	32	0	34	51	0	8
cSH	327	221	469	943	1126	1700
Volume to Capacity	0.17	0.15	0.09	0.00	0.03	0.19
Queue Length 95th (ft)	15	13	7	0	3	0
Control Delay (s)	18.2	24.1	13.4	0.0	1.2	0.0
Lane LOS	C	C	B	A	A	
Approach Delay (s)	18.2	18.2		0.0	0.6	
Approach LOS	C	C				

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	57.6%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	119	37	6	92	172	4	41	4	149	79	447
Future Volume (vph)	147	119	37	6	92	172	4	41	4	149	79	447
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.96	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.97	1.00	1.00	1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1635	1655		1606	1739	1416	1645	1711		1611	1739	1478
Flt Permitted	0.63	1.00		0.65	1.00	1.00	0.70	1.00		0.73	1.00	1.00
Satd. Flow (perm)	1084	1655		1104	1739	1416	1217	1711		1232	1739	1478
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	155	125	39	6	97	181	4	43	4	157	83	471
RTOR Reduction (vph)	0	7	0	0	0	116	0	1	0	0	0	201
Lane Group Flow (vph)	155	157	0	6	97	65	4	46	0	157	83	270
Confl. Peds. (#/hr)	5		8	8		5	2		11	11		2
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6			2			4			8	8 1
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	85.0	85.0		60.0	60.0	60.0	70.0	70.0		70.0	70.0	95.5
Effective Green, g (s)	85.0	85.0		60.0	60.0	60.0	70.0	70.0		70.0	70.0	95.5
Actuated g/C Ratio	0.51	0.51		0.36	0.36	0.36	0.42	0.42		0.42	0.42	0.57
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	6.0	0.2		0.2	0.2	0.2	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	617	844		397	626	510	511	719		517	731	847
v/s Ratio Prot	0.03	0.09			0.06			0.03			0.05	c0.18
v/s Ratio Perm	c0.10			0.01		0.05	0.00			0.13		
v/c Ratio	0.25	0.19		0.02	0.15	0.13	0.01	0.06		0.30	0.11	0.32
Uniform Delay, d1	22.2	22.0		34.2	36.1	35.7	28.1	28.7		32.1	29.4	18.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.0		0.1	0.5	0.5	0.0	0.0		1.5	0.3	0.6
Delay (s)	22.8	22.1		34.3	36.6	36.2	28.1	28.8		33.6	29.7	19.1
Level of Service	C	C		C	D	D	C	C		C	C	B
Approach Delay (s)		22.4			36.3			28.7			23.6	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	166.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	62.5%	ICU Level of Service	B
Analysis Period (min)	15		

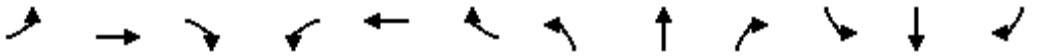
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	278	563	15	19	42
Future Volume (Veh/h)	9	278	563	15	19	42
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	10	296	599	16	20	45
Pedestrians		4			7	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		278	280			
pX, platoon unblocked						
vC, conflicting volume	622				782	318
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	622				782	318
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				94	93
cM capacity (veh/h)	948				325	670

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	109	197	399	216	65
Volume Left	10	0	0	0	20
Volume Right	0	0	0	16	45
cSH	948	1700	1700	1700	505
Volume to Capacity	0.01	0.12	0.23	0.13	0.13
Queue Length 95th (ft)	1	0	0	0	11
Control Delay (s)	0.9	0.0	0.0	0.0	13.2
Lane LOS	A				B
Approach Delay (s)	0.3		0.0		13.2
Approach LOS					B

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	44	27	282	32	38	9	243	362	20	218	18
Future Volume (vph)	17	44	27	282	32	38	9	243	362	20	218	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.94		1.00	0.92			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1711	1680		1711	1620			1797	1507		3361	
Flt Permitted	0.95	1.00		0.95	1.00			0.99	1.00		0.92	
Satd. Flow (perm)	1711	1680		1711	1620			1777	1507		3102	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	48	29	307	35	41	10	264	393	22	237	20
RTOR Reduction (vph)	0	21	0	0	32	0	0	0	76	0	4	0
Lane Group Flow (vph)	18	56	0	307	44	0	0	274	317	0	275	0
Confl. Peds. (#/hr)	7		10	10		7	7		6	6		7
Confl. Bikes (#/hr)			1			1			1			1
Turn Type	Split	NA		Split	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	4	4		3	3			2	3		6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	7.2	7.2		23.2	23.2			64.6	87.8		64.6	
Effective Green, g (s)	7.2	7.2		23.2	23.2			64.6	87.8		64.6	
Actuated g/C Ratio	0.07	0.07		0.21	0.21			0.59	0.81		0.59	
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Vehicle Extension (s)	2.0	2.0		1.0	1.0			5.0	1.0		5.0	
Lane Grp Cap (vph)	113	110		364	344			1053	1213		1838	
v/s Ratio Prot	0.01	c0.03		c0.18	0.03				c0.06			
v/s Ratio Perm								0.15	0.15		0.09	
v/c Ratio	0.16	0.50		0.84	0.13			0.26	0.26		0.15	
Uniform Delay, d1	48.0	49.2		41.2	34.7			10.7	2.6		9.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.2	1.3		15.5	0.1			0.6	0.0		0.2	
Delay (s)	48.3	50.5		56.7	34.8			11.3	2.7		10.1	
Level of Service	D	D		E	C			B	A		B	
Approach Delay (s)		50.1			52.3			6.2			10.1	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	52	56	176	28	67	79	1322	311	63	1876	20
Future Volume (vph)	42	52	56	176	28	67	79	1322	311	63	1876	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.96	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	3157		1690	1863	1583	1711	4750		1711	4907	
Flt Permitted	0.74	1.00		0.68	1.00	1.00	0.07	1.00		0.10	1.00	
Satd. Flow (perm)	1370	3157		1212	1863	1583	119	4750		185	4907	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	44	54	58	183	29	70	82	1377	324	66	1954	21
RTOR Reduction (vph)	0	47	0	0	0	56	0	14	0	0	0	0
Lane Group Flow (vph)	44	65	0	183	29	14	82	1687	0	66	1975	0
Confl. Peds. (#/hr)	2		28	28		2	1		7	7		1
Confl. Bikes (#/hr)						1						
Turn Type	Perm	NA		Perm	NA	Prot	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	8	1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	36.2	36.2		36.2	36.2	36.2	135.3	124.2		132.3	122.7	
Effective Green, g (s)	36.2	36.2		36.2	36.2	36.2	135.3	124.2		132.3	122.7	
Actuated g/C Ratio	0.19	0.19		0.19	0.19	0.19	0.72	0.66		0.71	0.65	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	264	609		233	359	305	180	3146		208	3211	
v/s Ratio Prot		0.02			0.02	0.01	c0.03	0.36		0.02	c0.40	
v/s Ratio Perm	0.03			c0.15			0.30			0.21		
v/c Ratio	0.17	0.11		0.79	0.08	0.04	0.46	0.54		0.32	0.61	
Uniform Delay, d1	63.1	62.3		72.0	62.0	61.6	15.5	16.6		11.1	18.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.2		18.1	0.2	0.1	3.8	0.7		1.8	0.9	
Delay (s)	63.7	62.5		90.1	62.2	61.7	19.3	17.2		12.9	19.6	
Level of Service	E	E		F	E	E	B	B		B	B	
Approach Delay (s)		62.8			80.2			17.3			19.4	
Approach LOS		E			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	187.5	Sum of lost time (s)	17.5
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	24	51	163	19	124	50	490	277	179	807	63
Future Volume (vph)	36	24	51	163	19	124	50	490	277	179	807	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	10	10	10	10	10	10
Total Lost time (s)	6.5	6.5		7.0	7.0	7.0	8.0	6.0		8.0	6.0	6.0
Lane Util. Factor	0.95	0.95		0.95	0.95	1.00	1.00	0.91		0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1572		1625	1645	1531	1651	4465		3203	3303	1433
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.30	1.00		0.31	1.00	1.00
Satd. Flow (perm)	1681	1572		1625	1645	1531	517	4465		1053	3303	1433
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	38	26	54	173	20	132	53	521	295	190	859	67
RTOR Reduction (vph)	0	33	0	0	0	111	0	20	0	0	0	20
Lane Group Flow (vph)	34	51	0	97	96	21	53	796	0	190	859	47
Confl. Peds. (#/hr)	10		2	2		10	2		1	1		2
Confl. Bikes (#/hr)												1
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases							2			6		6
Actuated Green, G (s)	12.4	12.4		18.5	18.5	34.4	157.6	150.2		160.6	151.7	151.7
Effective Green, g (s)	12.4	12.4		18.5	18.5	34.4	157.6	150.2		160.6	151.7	151.7
Actuated g/C Ratio	0.06	0.06		0.09	0.09	0.16	0.72	0.69		0.74	0.70	0.70
Clearance Time (s)	6.5	6.5		7.0	7.0		8.0	6.0		8.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	95	89		138	139	242	413	3083		865	2303	999
v/s Ratio Prot	0.02	c0.03		c0.06	0.06	0.01	0.00	0.18		c0.01	c0.26	
v/s Ratio Perm							0.09			0.15		0.03
v/c Ratio	0.36	0.57		0.70	0.69	0.09	0.13	0.26		0.22	0.37	0.05
Uniform Delay, d1	98.7	100.0		96.8	96.7	78.1	9.1	12.7		8.1	13.5	10.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3	8.6		15.0	13.8	0.2	0.1	0.2		0.1	0.5	0.1
Delay (s)	101.0	108.6		111.8	110.5	78.3	9.2	12.9		8.3	13.9	10.4
Level of Service	F	F		F	F	E	A	B		A	B	B
Approach Delay (s)		106.4			97.8			12.7			12.7	
Approach LOS		F			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	217.5	Sum of lost time (s)	27.5
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	698	56	177	1122	137	102	66	68	153	74	14
Future Volume (vph)	16	698	56	177	1122	137	102	66	68	153	74	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	11	11	12	12	12
Total Lost time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	3257		1770	3476		1711	1801	1531	1766	1863	1583
Flt Permitted	0.17	1.00		0.29	1.00		0.71	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	294	3257		537	3476		1272	1801	1531	891	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	735	59	186	1181	144	107	69	72	161	78	15
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	17	794	0	186	1325	0	107	69	72	161	78	15
Confl. Peds. (#/hr)	1		4	4		1			2	2		
Confl. Bikes (#/hr)									1			
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Prot	pm+pt	NA	Prot
Protected Phases	1	6		5	2		3	8	8	7	4	4
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	135.9	131.9		155.5	145.5		34.6	16.5	16.5	46.4	22.4	22.4
Effective Green, g (s)	135.9	131.9		155.5	145.5		34.6	16.5	16.5	46.4	22.4	22.4
Actuated g/C Ratio	0.63	0.61		0.72	0.68		0.16	0.08	0.08	0.22	0.10	0.10
Clearance Time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	5.0		3.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	210	1993		488	2346		241	137	117	289	193	164
v/s Ratio Prot	0.00	0.24		c0.03	c0.38		0.04	0.04	0.05	c0.06	0.04	0.01
v/s Ratio Perm	0.05			0.24			0.03			c0.06		
v/c Ratio	0.08	0.40		0.38	0.56		0.44	0.50	0.62	0.56	0.40	0.09
Uniform Delay, d1	16.3	21.4		11.3	18.4		81.0	95.6	96.4	73.1	90.3	87.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.6		0.5	1.0		1.8	3.9	10.5	2.9	1.9	0.3
Delay (s)	16.4	22.0		11.8	19.4		82.8	99.5	107.0	76.0	92.2	87.7
Level of Service	B	C		B	B		F	F	F	E	F	F
Approach Delay (s)		21.9			18.4			94.4			81.7	
Approach LOS		C			B			F			F	

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	215.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

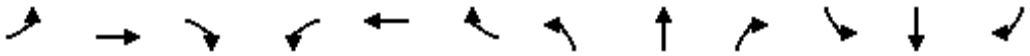
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	7	13	77	16	50	25	1835	116	48	2623	48
Future Volume (vph)	20	7	13	77	16	50	25	1835	116	48	2623	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.96		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.96	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.89		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1649	1603		1770	1579		1711	6114		1711	4893	
Flt Permitted	0.71	1.00		0.74	1.00		0.03	1.00		0.07	1.00	
Satd. Flow (perm)	1238	1603		1386	1579		62	6114		130	4893	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	20	7	13	79	16	51	26	1872	118	49	2677	49
RTOR Reduction (vph)	0	12	0	0	46	0	0	3	0	0	1	0
Lane Group Flow (vph)	20	8	0	79	21	0	26	1987	0	49	2725	0
Confl. Peds. (#/hr)	25					25	29		16	16		29
Confl. Bikes (#/hr)			4			3						
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	16.3	16.3		16.3	16.3		121.3	116.3		126.1	118.7	
Effective Green, g (s)	16.3	16.3		16.3	16.3		121.3	116.3		126.1	118.7	
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.77	0.73		0.80	0.75	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	127	164		142	162		99	4486		177	3664	
v/s Ratio Prot		0.01			0.01		0.01	0.32		c0.01	c0.56	
v/s Ratio Perm	0.02			c0.06			0.19			0.21		
v/c Ratio	0.16	0.05		0.56	0.13		0.26	0.44		0.28	0.74	
Uniform Delay, d1	64.8	64.1		67.7	64.7		11.9	8.3		4.7	11.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.3		7.8	0.8		3.0	0.3		1.8	1.4	
Delay (s)	66.1	64.4		75.5	65.4		14.9	8.6		6.5	12.7	
Level of Service	E	E		E	E		B	A		A	B	
Approach Delay (s)		65.2			70.9			8.7			12.6	
Approach LOS		E			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	158.5	Sum of lost time (s)	18.5
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	727	80	9	1225	66	11	6	4	27	7	24
Future Volume (vph)	77	727	80	9	1225	66	11	6	4	27	7	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.94		1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1652	3236		1647	3303	1429	1711	1675		1681	1550	
Flt Permitted	0.13	1.00		0.30	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	232	3236		525	3303	1429	1711	1675		1681	1550	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	89	836	92	10	1408	76	13	7	5	31	8	28
RTOR Reduction (vph)	0	3	0	0	0	24	0	5	0	0	0	0
Lane Group Flow (vph)	89	925	0	10	1408	52	13	7	0	28	39	0
Confl. Peds. (#/hr)	4		11	11		4	4		3	3		4
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2						
Actuated Green, G (s)	116.1	108.3		103.9	101.1	101.1	5.1	5.1		8.8	8.8	
Effective Green, g (s)	116.1	108.3		103.9	101.1	101.1	5.1	5.1		8.8	8.8	
Actuated g/C Ratio	0.78	0.73		0.70	0.68	0.68	0.03	0.03		0.06	0.06	
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	0.2		4.0	0.2	0.2	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	277	2367		389	2256	976	58	57		99	92	
v/s Ratio Prot	c0.02	c0.29		0.00	c0.43		c0.01	0.00		0.02	c0.03	
v/s Ratio Perm	0.23			0.02		0.04						
v/c Ratio	0.32	0.39		0.03	0.62	0.05	0.22	0.13		0.28	0.42	
Uniform Delay, d1	8.3	7.5		6.6	13.0	7.7	69.5	69.3		66.6	67.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.5		0.0	1.3	0.1	2.7	1.4		2.1	4.2	
Delay (s)	9.2	7.9		6.7	14.3	7.8	72.2	70.6		68.7	71.4	
Level of Service	A	A		A	B	A	E	E		E	E	
Approach Delay (s)		8.1			13.9			71.5			70.3	
Approach LOS		A			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

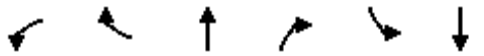
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	3	37	30	15	2	37	142	7	7	144	9
Future Volume (Veh/h)	2	3	37	30	15	2	37	142	7	7	144	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	2	3	43	34	17	2	43	163	8	8	166	10
Pedestrians		71			19			50			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		7			2			5			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								638				
pX, platoon unblocked												
vC, conflicting volume	524	534	292	554	535	188	247			190		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	524	534	292	554	535	188	247			190		
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 %	99	99	94	90	96	100	97			99		
cM capacity (veh/h)	378	397	664	350	397	837	1230			1359		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	48	53	214	184
Volume Left	2	34	43	8
Volume Right	43	2	8	10
cSH	618	372	1230	1359
Volume to Capacity	0.08	0.14	0.03	0.01
Queue Length 95th (ft)	6	12	3	0
Control Delay (s)	11.3	16.3	1.9	0.4
Lane LOS	B	C	A	A
Approach Delay (s)	11.3	16.3	1.9	0.4
Approach LOS	B	C		

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	41.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	45	1652	109	0	2138
Future Volume (Veh/h)	0	45	1652	109	0	2138
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	49	1796	118	0	2324
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			249			340
pX, platoon unblocked	0.79	0.66			0.66	
vC, conflicting volume	2630	658			1914	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			604	
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	93			100	
cM capacity (veh/h)	807	720			644	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	49	718	718	477	775	775	775
Volume Left	0	0	0	0	0	0	0
Volume Right	49	0	0	118	0	0	0
cSH	720	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.42	0.42	0.28	0.46	0.46	0.46
Queue Length 95th (ft)	5	0	0	0	0	0	0
Control Delay (s)	10.4	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	10.4	0.0			0.0		
Approach LOS	B						

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	L	T	T	T	R	L	T
Maximum Queue (ft)	112	97	204	204	191	200	420	444	424	396	178	268
Average Queue (ft)	56	40	195	195	38	75	306	355	347	96	111	186
95th Queue (ft)	111	88	203	202	128	168	532	509	511	269	209	236
Link Distance (ft)	97		191	191			394	394	394	394		179
Upstream Blk Time (%)	14	0	70	74	0		11	15	20	1	7	43
Queuing Penalty (veh)	0	0	213	223	0		53	74	95	5	0	307
Storage Bay Dist (ft)		90			200	175					245	
Storage Blk Time (%)	14	4		74	0		27				7	43
Queuing Penalty (veh)	3	1		44	0		10				48	61

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	244	241
Average Queue (ft)	178	175
95th Queue (ft)	237	227
Link Distance (ft)	179	179
Upstream Blk Time (%)	37	37
Queuing Penalty (veh)	265	262
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Rockville Pike - 355 & Federal Plaza/New Street

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB	B3
Directions Served	LT	R	LTR	L	T	T	TR	L	T	T	TR	T
Maximum Queue (ft)	70	122	132	180	275	311	313	166	238	239	263	302
Average Queue (ft)	23	75	34	64	57	139	151	17	179	187	187	84
95th Queue (ft)	59	128	89	130	213	356	369	67	308	297	300	268
Link Distance (ft)	107	107	68		276	276	276		166	166	166	231
Upstream Blk Time (%)		9	2		0	6	7	0	19	20	23	4
Queuing Penalty (veh)		0	1		0	35	41	0	130	144	165	27
Storage Bay Dist (ft)				245				175				
Storage Blk Time (%)					1			0	19			
Queuing Penalty (veh)					0			0	3			

Intersection: 2: Rockville Pike - 355 & Federal Plaza/New Street

Movement	B3	B3
Directions Served	T	T
Maximum Queue (ft)	309	306
Average Queue (ft)	87	86
95th Queue (ft)	277	275
Link Distance (ft)	231	231
Upstream Blk Time (%)	4	4
Queuing Penalty (veh)	26	28
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Rockville Pike - 355 & Rollins Ave/Twinbrook Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	B3	B3
Directions Served	T	TR	T	T	R	L	T	T	T	R	T	T
Maximum Queue (ft)	376	412	387	420	175	179	322	302	241	227	124	247
Average Queue (ft)	160	226	90	113	102	55	136	128	113	8	9	45
95th Queue (ft)	333	387	240	339	201	142	326	297	255	75	50	169
Link Distance (ft)	1300	1300	548	548		231	231	231	231	231	166	166
Upstream Blk Time (%)							5	3	1	0		1
Queuing Penalty (veh)							15	10	2	0		7
Storage Bay Dist (ft)					150							
Storage Blk Time (%)				1	18							
Queuing Penalty (veh)				1	28							

Intersection: 4: Rockville Pike - 355 & Rollins Ave/Twinbrook Parkway

Movement	B3	SB	SB	SB	SB
Directions Served	T	L	T	T	TR
Maximum Queue (ft)	210	424	616	602	578
Average Queue (ft)	44	131	217	207	198
95th Queue (ft)	160	285	457	442	414
Link Distance (ft)	166		1180	1180	1180
Upstream Blk Time (%)	1				
Queuing Penalty (veh)	7				
Storage Bay Dist (ft)		400			
Storage Blk Time (%)			2		
Queuing Penalty (veh)			5		

Intersection: 5: Chapman Ave & Twinbrook Parkway

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	L	T	TR	LT	R	L	L	T
Maximum Queue (ft)	65	423	432	312	325	1322	1374	182	182	136	136	179
Average Queue (ft)	8	90	158	175	318	1263	1121	171	128	58	61	65
95th Queue (ft)	31	276	387	366	328	1489	1787	180	206	114	126	145
Link Distance (ft)		548	548			1300	1300	167	167	526	526	526
Upstream Blk Time (%)						55	30	77	11			
Queuing Penalty (veh)						283	153	133	19			
Storage Bay Dist (ft)	175			300	300							
Storage Blk Time (%)		6		0	84							
Queuing Penalty (veh)		3		0	184							

Intersection: 6: Chapman Ave & Pike Center North/Driveway

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	64	44	116	96	139	200
Average Queue (ft)	44	10	103	6	8	87
95th Queue (ft)	75	32	115	36	53	221
Link Distance (ft)	49	49	96	96	167	167
Upstream Blk Time (%)	57	14	70	2		17
Queuing Penalty (veh)	0	0	131	3		60
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Chapman Ave & Rollins Ave Extension/Rollins Ave

Movement	EB	WB	WB	NB	B8	SB	SB
Directions Served	LTR	L	TR	LTR	T	LT	TR
Maximum Queue (ft)	55	104	104	183	130	108	123
Average Queue (ft)	39	43	33	166	89	15	76
95th Queue (ft)	63	100	74	231	150	64	149
Link Distance (ft)	52	89	89	112	39	96	96
Upstream Blk Time (%)	28	21	3	56	44	1	28
Queuing Penalty (veh)	14	0	0	203	158	3	97
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 9: Chapman Ave & Bou Ave

Movement	EB	EB	WB	WB	WB	B36	NB	NB	B35	SB	SB	SB
Directions Served	L	TR	L	T	R	T	L	TR	T	L	T	R
Maximum Queue (ft)	201	192	48	402	275	29	93	202	68	111	112	132
Average Queue (ft)	108	48	5	146	123	1	8	65	2	74	30	107
95th Queue (ft)	213	126	26	297	299	10	40	151	22	134	90	136
Link Distance (ft)	201	201	817	817		1622		130	285	39	39	39
Upstream Blk Time (%)	7	0						7		39	15	63
Queuing Penalty (veh)	10	0						11		87	34	141
Storage Bay Dist (ft)					250		70					
Storage Blk Time (%)				6	1			24				
Queuing Penalty (veh)				10	1			1				

Intersection: 9: Chapman Ave & Bou Ave

Movement	B8	B8	B8
Directions Served	T	T	T
Maximum Queue (ft)	123	81	198
Average Queue (ft)	27	6	124
95th Queue (ft)	91	37	220
Link Distance (ft)	112	112	112
Upstream Blk Time (%)	1		45
Queuing Penalty (veh)	1		102
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 10: Bou Ave & Pike Center

Movement	EB	WB	WB	SB
Directions Served	LT	T	TR	LR
Maximum Queue (ft)	69	210	248	74
Average Queue (ft)	10	179	199	61
95th Queue (ft)	43	257	276	74
Link Distance (ft)		201	201	54
Upstream Blk Time (%)		18	52	90
Queuing Penalty (veh)		50	143	67
Storage Bay Dist (ft)	100			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: East Jefferson Street & Rolllins Avenue /Rollins Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	TR
Maximum Queue (ft)	52	223	260	89	136	76	149	120
Average Queue (ft)	15	68	142	26	59	39	58	16
95th Queue (ft)	44	142	259	63	113	79	115	56
Link Distance (ft)	477	477	1300	1300	295	295	317	317
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 12: Rockville Pike - 355/Rockville PIke- 355 & Halpine Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	T	TR	L	T
Maximum Queue (ft)	95	114	67	308	71	140	190	314	422	414	199	324
Average Queue (ft)	41	48	28	170	18	67	48	112	145	159	48	282
95th Queue (ft)	89	96	53	261	53	121	110	287	350	366	127	438
Link Distance (ft)		335	335	325	325			1180	1180	1180		309
Upstream Blk Time (%)				0								14
Queuing Penalty (veh)				0								0
Storage Bay Dist (ft)	250					450	165				175	
Storage Blk Time (%)								7				20
Queuing Penalty (veh)								6				12

Intersection: 12: Rockville Pike - 355/Rockville PIke- 355 & Halpine Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	324	320
Average Queue (ft)	208	136
95th Queue (ft)	385	275
Link Distance (ft)	309	309
Upstream Blk Time (%)	3	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	LT	R	L	T	T	TR	L	L	T
Maximum Queue (ft)	110	327	224	511	270	152	223	265	396	254	311	444
Average Queue (ft)	25	97	150	203	115	31	71	104	131	38	85	366
95th Queue (ft)	75	231	252	411	201	93	181	230	301	165	227	542
Link Distance (ft)	354	354		496	496		1300	1300	1300		410	410
Upstream Blk Time (%)				3								59
Queuing Penalty (veh)				0								0
Storage Bay Dist (ft)			200			190				240		
Storage Blk Time (%)			14	29			1			0	2	
Queuing Penalty (veh)			14	23			1			0	2	

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	449	235
Average Queue (ft)	345	83
95th Queue (ft)	538	260
Link Distance (ft)	410	
Upstream Blk Time (%)	36	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		210
Storage Blk Time (%)	62	0
Queuing Penalty (veh)	39	0

Intersection: 14: Nebel Street & Randolph Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	T	R
Maximum Queue (ft)	27	332	260	150	287	287	124	150	150	269	157	30
Average Queue (ft)	10	148	131	76	192	177	73	76	81	145	60	10
95th Queue (ft)	31	279	253	156	370	361	137	142	136	282	119	31
Link Distance (ft)		598	598		272	272		135	135		1622	1622
Upstream Blk Time (%)					9	6	0	3	4			
Queuing Penalty (veh)					0	0	0	0	0			
Storage Bay Dist (ft)	140			125			100			250		
Storage Blk Time (%)		11		2	16		12	4		3		
Queuing Penalty (veh)		2		10	28		8	4		2		

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	T	TR	L	T	T
Maximum Queue (ft)	86	37	136	178	65	229	233	248	253	204	394	418
Average Queue (ft)	20	7	61	51	15	152	198	198	104	29	210	217
95th Queue (ft)	55	25	115	111	43	271	273	293	233	98	404	420
Link Distance (ft)	176	176	162	162	214	214	214	214	214		394	394
Upstream Blk Time (%)				2		7	15	21	2		1	2
Queuing Penalty (veh)				0		0	0	0	0		8	14
Storage Bay Dist (ft)										180		
Storage Blk Time (%)											9	
Queuing Penalty (veh)											4	

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	410
Average Queue (ft)	229
95th Queue (ft)	433
Link Distance (ft)	394
Upstream Blk Time (%)	2
Queuing Penalty (veh)	19
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 16: Chapman Ave & Josiah Henson Parkway/Randolph Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	LTR
Maximum Queue (ft)	140	137	138	189	412	412	240	49	30	48	113
Average Queue (ft)	41	49	45	15	117	113	20	11	8	7	33
95th Queue (ft)	80	128	103	93	289	293	117	33	30	29	85
Link Distance (ft)		367	367		598	598			375	226	226
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	350			165			215	250			
Storage Blk Time (%)					4	3	0				
Queuing Penalty (veh)					0	2	0				

Intersection: 17: Chapman Ave/Chapman Road & Thompson Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	70	66	73	52
Average Queue (ft)	20	27	8	9
95th Queue (ft)	52	50	39	37
Link Distance (ft)	157	137	526	192
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Rockville Pike - 355 & Rollins Ave Extension

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	TR	T	T	T
Maximum Queue (ft)	80	177	190	192	302	310	314
Average Queue (ft)	24	27	61	64	231	239	242
95th Queue (ft)	60	123	181	197	387	387	384
Link Distance (ft)	80	179	179	179	276	276	276
Upstream Blk Time (%)	0	0	2	3	16	17	20
Queuing Penalty (veh)	0	0	11	16	114	119	144
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 19: Rollins Ave Extension & New Street

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

HCM Signalized Intersection Capacity Analysis

Total Future PM Phase 2

1: Rockville Pike - 355 & Bou Ave

10/17/2024

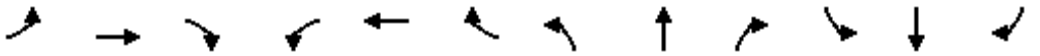
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	31	36	510	21	214	57	2550	444	225	1696	18
Future Volume (vph)	17	31	36	510	21	214	57	2550	444	225	1696	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.96		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85	1.00	0.86		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1708	1478	3204	1439		1711	4916	1531	1770	5070	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.07	1.00	
Satd. Flow (perm)		1708	1478	3204	1439		1711	4916	1531	133	5070	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	18	32	37	526	22	221	59	2629	458	232	1748	19
RTOR Reduction (vph)	0	0	35	0	172	0	0	0	106	0	0	0
Lane Group Flow (vph)	0	50	2	526	71	0	59	2629	352	232	1767	0
Confl. Peds. (#/hr)	25					25	25		25	25		25
Turn Type	Split	NA	Prot	Split	NA		Prot	NA	Prot	pm+pt	NA	
Protected Phases	3	3	3	4	4		1	5	5	6	2	
Permitted Phases										2		
Actuated Green, G (s)		7.6	7.6	33.0	33.0		9.3	64.9	64.9	76.1	76.1	
Effective Green, g (s)		7.6	7.6	33.0	33.0		9.3	64.9	64.9	76.1	76.1	
Actuated g/C Ratio		0.05	0.05	0.22	0.22		0.06	0.43	0.43	0.51	0.51	
Clearance Time (s)		6.0	6.0	7.0	7.0		5.0	5.5	5.5	6.0	6.0	
Vehicle Extension (s)		3.0	3.0	6.0	6.0		3.0	0.2	0.2	3.0	0.2	
Lane Grp Cap (vph)		86	74	704	316		106	2126	662	285	2572	
v/s Ratio Prot		c0.03	0.00	c0.16	0.05		0.03	c0.53	0.23	c0.11	0.35	
v/s Ratio Perm										0.30		
v/c Ratio		0.58	0.03	0.75	0.22		0.56	1.24	0.53	0.81	0.69	
Uniform Delay, d1		69.6	67.7	54.6	48.0		68.3	42.5	31.4	58.8	27.9	
Progression Factor		1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.66	0.58	
Incremental Delay, d2		9.6	0.1	5.8	1.0		6.2	110.7	3.1	13.3	1.2	
Delay (s)		79.3	67.8	60.4	49.0		74.5	153.3	34.4	51.9	17.5	
Level of Service		E	E	E	D		E	F	C	D	B	
Approach Delay (s)		74.4			56.8			134.5			21.5	
Approach LOS		E			E			F			C	

Intersection Summary			
HCM 2000 Control Delay	86.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	31.0
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

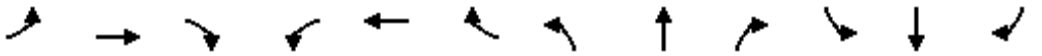
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	8	133	18	9	14	197	2422	0	6	1747	32
Future Volume (vph)	147	8	133	18	9	14	197	2422	0	6	1747	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	16	16	16	11	11	11	10	10	10
Total Lost time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes		1.00	1.00		0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.95		1.00	1.00		1.00	1.00	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1660	1478		1953		1711	4916		1652	4726	
Flt Permitted		0.95	1.00		0.98		0.07	1.00		0.04	1.00	
Satd. Flow (perm)		1660	1478		1953		123	4916		78	4726	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	153	8	139	19	9	15	205	2523	0	6	1820	33
RTOR Reduction (vph)	0	0	123	0	13	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	161	16	0	30	0	205	2523	0	6	1852	0
Confl. Peds. (#/hr)	3		5	5		3	23		16	16		23
Confl. Bikes (#/hr)						1						
Turn Type	Split	NA	Prot	Split	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	8	8	8	4	4		5	2		1	6	
Permitted Phases							2			6		
Actuated Green, G (s)		16.8	16.8		6.5		108.2	102.0		90.2	89.0	
Effective Green, g (s)		16.8	16.8		6.5		108.2	102.0		90.2	89.0	
Actuated g/C Ratio		0.11	0.11		0.04		0.72	0.68		0.60	0.59	
Clearance Time (s)		6.5	6.5		6.5		5.0	5.5		5.0	5.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	0.2		3.0	0.2	
Lane Grp Cap (vph)		185	165		84		239	3342		59	2804	
v/s Ratio Prot		c0.10	0.01		c0.02		c0.08	0.51		0.00	0.39	
v/s Ratio Perm							c0.54			0.06		
v/c Ratio		0.87	0.09		0.35		0.86	0.75		0.10	0.66	
Uniform Delay, d1		65.5	59.8		69.7		37.9	15.8		15.6	20.4	
Progression Factor		1.00	1.00		1.00		1.74	0.58		0.13	0.22	
Incremental Delay, d2		33.0	0.2		2.5		3.0	0.1		0.6	0.9	
Delay (s)		98.5	60.0		72.2		68.9	9.2		2.5	5.5	
Level of Service		F	E		E		E	A		A	A	
Approach Delay (s)		80.7			72.2			13.7			5.5	
Approach LOS		F			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	23.5
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



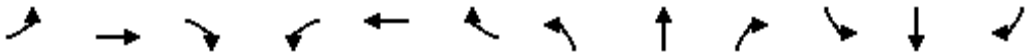
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	426	57	0	309	204	145	2244	121	299	1763	57
Future Volume (vph)	0	426	57	0	309	204	145	2244	121	299	1763	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	10	10	10	11	11	11
Total Lost time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Lane Util. Factor		0.95			0.95	1.00	1.00	0.91	1.00	1.00	0.91	
Frpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3231			3539	1583	1652	4746	1478	1711	4883	
Flt Permitted		1.00			1.00	1.00	0.08	1.00	1.00	0.05	1.00	
Satd. Flow (perm)		3231			3539	1583	141	4746	1478	88	4883	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	0	430	58	0	312	206	146	2267	122	302	1781	58
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	42	0	2	0
Lane Group Flow (vph)	0	488	0	0	312	206	146	2267	80	302	1837	0
Confl. Peds. (#/hr)	24		18	18		24	26		36	36		26
Confl. Bikes (#/hr)			1			1			2			
Turn Type		NA			NA	Prot	pm+pt	NA	Prot	pm+pt	NA	
Protected Phases		4			8	8	1	6	6	5	2	
Permitted Phases							6			2		
Actuated Green, G (s)		29.2			29.2	29.2	89.5	75.1	75.1	107.8	86.4	
Effective Green, g (s)		29.2			29.2	29.2	89.5	75.1	75.1	107.8	86.4	
Actuated g/C Ratio		0.19			0.19	0.19	0.60	0.50	0.50	0.72	0.58	
Clearance Time (s)		7.5			7.5	7.5	7.0	5.5	5.5	7.0	5.5	
Vehicle Extension (s)		4.0			4.0	4.0	4.0	0.2	0.2	4.0	0.2	
Lane Grp Cap (vph)		628			688	308	229	2376	739	341	2812	
v/s Ratio Prot		c0.15			0.09	0.13	0.06	c0.48	0.05	c0.15	0.38	
v/s Ratio Perm							0.32			0.49		
v/c Ratio		0.78			0.45	0.67	0.64	0.95	0.11	0.89	0.65	
Uniform Delay, d1		57.3			53.4	55.9	20.4	35.8	19.8	50.7	21.6	
Progression Factor		1.00			1.00	1.00	1.59	0.37	0.24	1.00	1.00	
Incremental Delay, d2		6.4			0.6	5.9	4.4	7.7	0.2	23.4	1.2	
Delay (s)		63.7			54.0	61.9	36.9	20.9	4.9	74.1	22.8	
Level of Service		E			D	E	D	C	A	E	C	
Approach Delay (s)		63.7			57.1			21.0			30.0	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	97.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	739	229	469	586	141	109	109	592	215	119	37
Future Volume (vph)	68	739	229	469	586	141	109	109	592	215	119	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	11	11	11	10	10	10	10	10	10
Total Lost time (s)	5.5	6.0		5.5	6.0			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		0.97	0.95			1.00	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00	1.00	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.97			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1650	3162		3319	3304			1696	1478	3204	1739	1411
Flt Permitted	0.37	1.00		0.95	1.00			0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	638	3162		3319	3304			1696	1478	3204	1739	1411
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	70	762	236	484	604	145	112	112	610	222	123	38
RTOR Reduction (vph)	0	15	0	0	8	0	0	0	45	0	0	34
Lane Group Flow (vph)	70	983	0	484	741	0	0	224	565	222	123	4
Confl. Peds. (#/hr)	2		9	9		2	15		14	14		15
Confl. Bikes (#/hr)									1			1
Turn Type	pm+pt	NA		Prot	NA		Split	NA	pt+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	4 1	3	3	
Permitted Phases	2											3
Actuated Green, G (s)	85.4	77.3		47.7	116.9			22.3	76.5	17.7	17.7	17.7
Effective Green, g (s)	85.4	77.3		47.7	116.9			22.3	76.5	17.7	17.7	17.7
Actuated g/C Ratio	0.45	0.41		0.25	0.62			0.12	0.40	0.09	0.09	0.09
Clearance Time (s)	5.5	6.0		5.5	6.0			6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	330	1289		835	2038			199	596	299	162	131
v/s Ratio Prot	0.01	c0.31		0.15	0.22			c0.13	c0.38	0.07	c0.07	
v/s Ratio Perm	0.09											0.00
v/c Ratio	0.21	0.76		0.58	0.36			1.13	0.95	0.74	0.76	0.03
Uniform Delay, d1	29.9	48.2		62.1	17.9			83.6	54.6	83.7	83.8	78.1
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	4.3		1.0	0.5			101.6	24.3	9.6	18.3	0.1
Delay (s)	30.2	52.5		63.1	18.4			185.2	78.8	93.2	102.1	78.2
Level of Service	C	D		E	B			F	E	F	F	E
Approach Delay (s)		51.0			36.0			107.4			94.6	
Approach LOS		D			D			F			F	

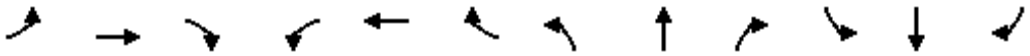
Intersection Summary			
HCM 2000 Control Delay	63.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	189.5	Sum of lost time (s)	24.5
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	1	51	4	1	7	55	743	8	5	657	76
Future Volume (Veh/h)	42	1	51	4	1	7	55	743	8	5	657	76
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)	47	1	57	4	1	8	61	826	9	6	730	84
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								471			256	
pX, platoon unblocked												
vC, conflicting volume	1328	1741	407	1387	1778	418	814			835		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1328	1741	407	1387	1778	418	814			835		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	55	99	90	95	99	99	92			99		
cM capacity (veh/h)	104	79	593	86	75	584	809			794		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	105	13	474	422	371	449
Volume Left	47	4	61	0	6	0
Volume Right	57	8	0	9	0	84
cSH	187	176	809	1700	794	1700
Volume to Capacity	0.56	0.07	0.08	0.25	0.01	0.26
Queue Length 95th (ft)	75	6	6	0	1	0
Control Delay (s)	46.5	27.0	2.1	0.0	0.2	0.0
Lane LOS	E	D	A		A	
Approach Delay (s)	46.5	27.0	1.1		0.1	
Approach LOS	E	D				

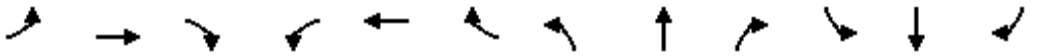
Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	61.3%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	19	6	59	20	89	39	672	49	45	649	18
Future Volume (Veh/h)	45	19	6	59	20	89	39	672	49	45	649	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	46	20	6	61	21	92	40	693	51	46	669	19
Pedestrians					18							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					2							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								287			440	
pX, platoon unblocked	0.82	0.82		0.82	0.82	0.82				0.82		
vC, conflicting volume	1672	1612	344	1259	1596	736	688			762		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1710	1638	344	1205	1618	566	688			597		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	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 %	0	72	99	24	72	76	96			94		
cM capacity (veh/h)	26	72	652	80	74	376	902			784		

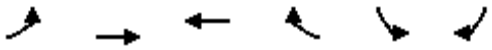
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	72	61	113	784	380	354
Volume Left	46	61	0	40	46	0
Volume Right	6	0	92	51	0	19
cSH	35	80	214	902	784	1700
Volume to Capacity	2.07	0.76	0.53	0.04	0.06	0.21
Queue Length 95th (ft)	200	94	69	3	5	0
Control Delay (s)	740.4	132.4	39.3	1.2	1.8	0.0
Lane LOS	F	F	E	A	A	
Approach Delay (s)	740.4	72.0		1.2	0.9	
Approach LOS	F	F				

Intersection Summary				
Average Delay	38.2			
Intersection Capacity Utilization	80.9%	ICU Level of Service	D	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	243	56	15	166	273	17	127	42	258	127	368
Future Volume (vph)	355	243	56	15	166	273	17	127	42	258	127	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.94	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	0.99	1.00		0.98	1.00	1.00	0.98	1.00		0.97	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1635	1676		1626	1739	1391	1618	1650		1603	1739	1478
Flt Permitted	0.52	1.00		0.57	1.00	1.00	0.64	1.00		0.59	1.00	1.00
Satd. Flow (perm)	892	1676		978	1739	1391	1097	1650		992	1739	1478
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	370	253	58	16	173	284	18	132	44	269	132	383
RTOR Reduction (vph)	0	4	0	0	0	191	0	4	0	0	0	148
Lane Group Flow (vph)	370	307	0	16	173	93	18	172	0	269	132	235
Confl. Peds. (#/hr)	8		5	5		8	10		17	17		10
Confl. Bikes (#/hr)			2			1						
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6			2			4			8	8 1
Permitted Phases	6			2		2	4			8		
Actuated Green, G (s)	101.9	101.9		60.1	60.1	60.1	70.1	70.1		70.1	70.1	112.4
Effective Green, g (s)	101.9	101.9		60.1	60.1	60.1	70.1	70.1		70.1	70.1	112.4
Actuated g/C Ratio	0.56	0.56		0.33	0.33	0.33	0.38	0.38		0.38	0.38	0.61
Clearance Time (s)	5.5	5.5		5.5	5.5	5.5	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	6.0	0.2		0.2	0.2	0.2	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	642	930		320	569	455	419	630		378	664	905
v/s Ratio Prot	c0.11	0.18			0.10			0.10			0.08	0.16
v/s Ratio Perm	c0.21			0.02		0.07	0.02			c0.27		
v/c Ratio	0.58	0.33		0.05	0.30	0.20	0.04	0.27		0.71	0.20	0.26
Uniform Delay, d1	24.2	22.2		42.2	46.1	44.5	35.6	39.1		48.1	37.9	16.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	0.1		0.3	1.4	1.0	0.0	0.2		10.8	0.7	0.4
Delay (s)	26.6	22.3		42.5	47.5	45.5	35.7	39.3		59.0	38.6	16.8
Level of Service	C	C		D	D	D	D	D		E	D	B
Approach Delay (s)		24.7			46.1			39.0			34.9	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	183.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	554	497	47	50	232
Future Volume (Veh/h)	21	554	497	47	50	232
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	22	571	512	48	52	239
Pedestrians		1			7	
Lane Width (ft)		12.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		278	280			
pX, platoon unblocked						
vC, conflicting volume	567				872	288
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	567				872	288
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				82	66
cM capacity (veh/h)	994				281	703

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	212	381	341	219	291
Volume Left	22	0	0	0	52
Volume Right	0	0	0	48	239
cSH	994	1700	1700	1700	555
Volume to Capacity	0.02	0.22	0.20	0.13	0.52
Queue Length 95th (ft)	2	0	0	0	76
Control Delay (s)	1.1	0.0	0.0	0.0	18.4
Lane LOS	A				C
Approach Delay (s)	0.4		0.0		18.4
Approach LOS					C

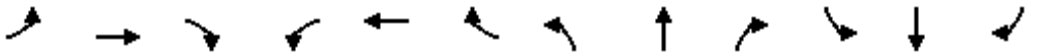
Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	44	26	390	65	78	7	477	396	18	263	18
Future Volume (vph)	10	44	26	390	65	78	7	477	396	18	263	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.96			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Frt	1.00	0.94		1.00	0.92			1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00		1.00	
Satd. Flow (prot)	1711	1674		1711	1591			1799	1495		3366	
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00		0.91	
Satd. Flow (perm)	1711	1674		1711	1591			1792	1495		3086	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	10	46	27	406	68	81	7	497	412	19	274	19
RTOR Reduction (vph)	0	21	0	0	40	0	0	0	80	0	4	0
Lane Group Flow (vph)	10	52	0	406	109	0	0	504	333	0	308	0
Confl. Peds. (#/hr)	19		20	20		19	18		15	15		18
Confl. Bikes (#/hr)			1			3			2			3
Turn Type	Split	NA		Split	NA		Perm	NA	pm+ov	Perm	NA	
Protected Phases	4	4		3	3			2	3		6	
Permitted Phases							2		2	6		
Actuated Green, G (s)	7.0	7.0		27.9	27.9			60.1	88.0		60.1	
Effective Green, g (s)	7.0	7.0		27.9	27.9			60.1	88.0		60.1	
Actuated g/C Ratio	0.06	0.06		0.26	0.26			0.55	0.81		0.55	
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0	4.5		5.0	
Vehicle Extension (s)	2.0	2.0		1.0	1.0			5.0	1.0		5.0	
Lane Grp Cap (vph)	109	107		437	407			988	1206		1701	
v/s Ratio Prot	0.01	c0.03		c0.24	0.07				0.07			
v/s Ratio Perm								c0.28	0.15		0.10	
v/c Ratio	0.09	0.49		0.93	0.27			0.51	0.28		0.18	
Uniform Delay, d1	48.0	49.3		39.6	32.4			15.3	2.6		12.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.1	1.3		25.6	0.1			1.9	0.0		0.2	
Delay (s)	48.1	50.6		65.2	32.5			17.1	2.6		12.4	
Level of Service	D	D		E	C			B	A		B	
Approach Delay (s)		50.3			56.4			10.6			12.4	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	66	87	210	70	127	197	2276	105	99	1875	30
Future Volume (vph)	98	66	87	210	70	127	197	2276	105	99	1875	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.91		1.00	0.91	
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.95	1.00		0.96	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1680	3132		1707	1863	1583	1711	4873		1711	4899	
Flt Permitted	0.71	1.00		0.64	1.00	1.00	0.04	1.00		0.04	1.00	
Satd. Flow (perm)	1253	3132		1152	1863	1583	77	4873		71	4899	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	103	69	92	221	74	134	207	2396	111	104	1974	32
RTOR Reduction (vph)	0	70	0	0	0	103	0	2	0	0	0	0
Lane Group Flow (vph)	103	91	0	221	74	31	207	2505	0	104	2006	0
Confl. Peds. (#/hr)	30		24	24		30	12		16	16		12
Confl. Bikes (#/hr)												1
Turn Type	Perm	NA		Perm	NA	Prot	pm+pt	NA		pm+pt	NA	
Protected Phases		4			8	8	1	6		5	2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	44.0	44.0		44.0	44.0	44.0	131.5	113.9		114.2	102.1	
Effective Green, g (s)	44.0	44.0		44.0	44.0	44.0	131.5	113.9		114.2	102.1	
Actuated g/C Ratio	0.23	0.23		0.23	0.23	0.23	0.70	0.61		0.61	0.54	
Clearance Time (s)	6.5	6.5		6.5	6.5	6.5	5.5	5.5		5.5	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0	5.0	5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	294	734		270	437	371	262	2960		149	2667	
v/s Ratio Prot		0.03			0.04	0.02	c0.10	c0.51		0.05	0.41	
v/s Ratio Perm	0.08			c0.19			0.45			0.38		
v/c Ratio	0.35	0.12		0.82	0.17	0.08	0.79	0.85		0.70	0.75	
Uniform Delay, d1	59.8	56.6		68.0	57.2	56.0	59.9	29.7		49.0	32.9	
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	0.2		19.3	0.4	0.2	16.9	3.2		16.6	2.0	
Delay (s)	61.3	56.7		87.2	57.6	56.2	76.8	32.9		65.6	34.9	
Level of Service	E	E		F	E	E	E	C		E	C	
Approach Delay (s)		58.5			72.4			36.3			36.5	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	187.5	Sum of lost time (s)	17.5
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	32	68	304	39	272	31	1199	271	133	743	32
Future Volume (vph)	44	32	68	304	39	272	31	1199	271	133	743	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	10	10	10	10	10	10
Total Lost time (s)	6.5	6.5		7.0	7.0	7.0	8.0	6.0		8.0	6.0	6.0
Lane Util. Factor	0.95	0.95		0.95	0.95	1.00	1.00	0.91		0.97	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.96	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1573		1625	1647	1531	1650	4563		3204	3303	1420
Flt Permitted	0.95	1.00		0.95	0.96	1.00	0.32	1.00		0.11	1.00	1.00
Satd. Flow (perm)	1681	1573		1625	1647	1531	547	4563		372	3303	1420
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	47	34	72	323	41	289	33	1276	288	141	790	34
RTOR Reduction (vph)	0	32	0	0	0	184	0	9	0	0	0	13
Lane Group Flow (vph)	42	79	0	181	183	105	33	1555	0	141	790	21
Confl. Peds. (#/hr)	12		2	2		12	4		17	17		4
Turn Type	Split	NA		Split	NA	pt+ov	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	3	3		4	4	4 1	5	2		1	6	
Permitted Phases							2			6		6
Actuated Green, G (s)	16.1	16.1		30.8	30.8	47.6	139.2	133.3		147.0	137.2	137.2
Effective Green, g (s)	16.1	16.1		30.8	30.8	47.6	139.2	133.3		147.0	137.2	137.2
Actuated g/C Ratio	0.07	0.07		0.14	0.14	0.22	0.64	0.61		0.68	0.63	0.63
Clearance Time (s)	6.5	6.5		7.0	7.0		8.0	6.0		8.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	0.2		3.0	0.2	0.2
Lane Grp Cap (vph)	124	116		230	233	335	380	2796		379	2083	895
v/s Ratio Prot	0.02	c0.05		c0.11	0.11	c0.07	0.00	c0.34		0.02	c0.24	
v/s Ratio Perm							0.05			0.23		0.02
v/c Ratio	0.34	0.68		0.79	0.79	0.31	0.09	0.56		0.37	0.38	0.02
Uniform Delay, d1	95.6	98.2		90.2	90.2	71.2	14.9	24.7		16.3	19.5	15.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	14.6		16.1	15.8	0.5	0.1	0.8		0.6	0.5	0.0
Delay (s)	97.3	112.7		106.3	106.0	71.8	15.0	25.5		17.0	20.0	15.1
Level of Service	F	F		F	F	E	B	C		B	C	B
Approach Delay (s)		108.5			90.9			25.3			19.4	
Approach LOS		F			F			C			B	

Intersection Summary			
HCM 2000 Control Delay	40.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	217.5	Sum of lost time (s)	27.5
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

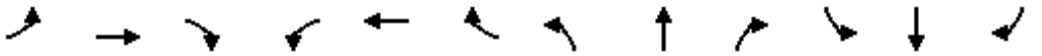
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1075	93	183	827	191	125	145	311	298	171	24
Future Volume (vph)	21	1075	93	183	827	191	125	145	311	298	171	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	12	12	12	11	11	11	12	12	12
Total Lost time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00	1.00	0.99	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1652	3237		1770	3411		1672	1801	1531	1760	1863	1583
Flt Permitted	0.16	1.00		0.05	1.00		0.64	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	285	3237		86	3411		1133	1801	1531	879	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	22	1132	98	193	871	201	132	153	327	314	180	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	22	1230	0	193	1072	0	132	153	327	314	180	25
Confl. Peds. (#/hr)	12		18	18		12	17		8	8		17
Confl. Bikes (#/hr)			4			3			3			3
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Prot	pm+pt	NA	Prot
Protected Phases	1	6		5	2		3	8	8	7	4	4
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	87.0	81.1		109.2	97.3		65.6	48.7	48.7	93.3	69.9	69.9
Effective Green, g (s)	87.0	81.1		109.2	97.3		65.6	48.7	48.7	93.3	69.9	69.9
Actuated g/C Ratio	0.40	0.38		0.51	0.45		0.30	0.23	0.23	0.43	0.32	0.32
Clearance Time (s)	6.0	6.5		6.0	6.5		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	5.0		3.0	5.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Grp Cap (vph)	152	1218		216	1540		387	407	345	536	604	513
v/s Ratio Prot	0.00	c0.38		c0.09	0.31		0.03	0.08	c0.21	c0.10	0.10	0.02
v/s Ratio Perm	0.05			0.36			0.08			0.15		
v/c Ratio	0.14	1.01		0.89	0.70		0.34	0.38	0.95	0.59	0.30	0.05
Uniform Delay, d1	41.2	67.2		73.5	47.3		56.6	70.5	82.1	42.9	54.4	50.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	28.2		33.8	2.6		0.7	0.8	34.9	1.9	0.4	0.1
Delay (s)	41.7	95.4		107.3	49.9		57.3	71.3	117.1	44.9	54.8	50.0
Level of Service	D	F		F	D		E	E	F	D	D	D
Approach Delay (s)		94.5			58.7			92.7			48.6	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	75.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	215.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

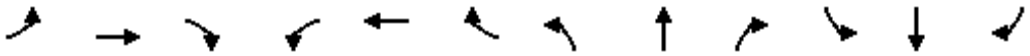
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	12	32	186	13	138	18	2786	250	161	2221	26
Future Volume (vph)	40	12	32	186	13	138	18	2786	250	161	2221	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	12	12	11	11	11	11	11	11
Total Lost time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.86		1.00	0.91	
Frpb, ped/bikes	1.00	0.99		1.00	0.93		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.95	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.86		1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1623	1589		1770	1490		1711	6077		1711	4902	
Flt Permitted	0.54	1.00		0.73	1.00		0.04	1.00		0.04	1.00	
Satd. Flow (perm)	925	1589		1354	1490		79	6077		74	4902	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	42	12	33	194	14	144	19	2902	260	168	2314	27
RTOR Reduction (vph)	0	27	0	0	116	0	0	7	0	0	0	0
Lane Group Flow (vph)	42	19	0	194	42	0	19	3155	0	168	2341	0
Confl. Peds. (#/hr)	44					44	25		20	20		25
Confl. Bikes (#/hr)			3						1			3
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		5	2		1	6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	30.3	30.3		30.3	30.3		96.4	91.4		115.7	104.7	
Effective Green, g (s)	30.3	30.3		30.3	30.3		96.4	91.4		115.7	104.7	
Actuated g/C Ratio	0.19	0.19		0.19	0.19		0.61	0.58		0.73	0.66	
Clearance Time (s)	7.0	7.0		7.0	7.0		6.0	5.5		6.0	5.5	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	0.2		5.0	0.2	
Lane Grp Cap (vph)	176	303		258	284		99	3504		243	3238	
v/s Ratio Prot		0.01			0.03		0.01	c0.52		c0.08	c0.48	
v/s Ratio Perm	0.05			c0.14			0.11			0.43		
v/c Ratio	0.24	0.06		0.75	0.15		0.19	0.90		0.69	0.72	
Uniform Delay, d1	54.3	52.5		60.5	53.3		15.7	29.5		50.0	17.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.2		13.7	0.5		2.0	4.2		10.3	1.4	
Delay (s)	55.8	52.7		74.3	53.8		17.7	33.8		60.4	18.9	
Level of Service	E	D		E	D		B	C		E	B	
Approach Delay (s)		54.2			65.1			33.7			21.7	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	158.5	Sum of lost time (s)	18.5
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	1012	72	14	791	127	50	24	20	152	51	96
Future Volume (vph)	144	1012	72	14	791	127	50	24	20	152	51	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	11	11	11	12	12	12
Total Lost time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1651	3259		1650	3303	1433	1711	1665		1681	1574	
Flt Permitted	0.27	1.00		0.21	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	462	3259		369	3303	1433	1711	1665		1681	1574	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	150	1054	75	15	824	132	52	25	21	158	53	100
RTOR Reduction (vph)	0	3	0	0	0	58	0	20	0	0	0	0
Lane Group Flow (vph)	150	1126	0	15	824	74	52	26	0	142	169	0
Confl. Peds. (#/hr)	3		10	10		3	9		2	2		9
Confl. Bikes (#/hr)						1						1
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Split	NA		Split	NA	
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2		2						
Actuated Green, G (s)	99.9	91.9		86.4	83.4	83.4	7.8	7.8		22.3	22.3	
Effective Green, g (s)	99.9	91.9		86.4	83.4	83.4	7.8	7.8		22.3	22.3	
Actuated g/C Ratio	0.68	0.62		0.58	0.56	0.56	0.05	0.05		0.15	0.15	
Clearance Time (s)	5.0	6.0		5.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	4.0	0.2		4.0	0.2	0.2	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	404	2023		241	1861	807	90	87		253	237	
v/s Ratio Prot	c0.03	c0.35		0.00	0.25		c0.03	0.02		0.08	c0.11	
v/s Ratio Perm	0.22			0.04		0.05						
v/c Ratio	0.37	0.56		0.06	0.44	0.09	0.58	0.30		0.56	0.71	
Uniform Delay, d1	10.3	16.3		13.5	18.8	14.9	68.5	67.5		58.3	59.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	1.1		0.1	0.8	0.2	10.3	2.6		3.4	10.4	
Delay (s)	11.1	17.4		13.7	19.6	15.1	78.8	70.1		61.7	70.2	
Level of Service	B	B		B	B	B	E	E		E	E	
Approach Delay (s)		16.6			18.9			74.7			66.3	
Approach LOS		B			B			E			E	

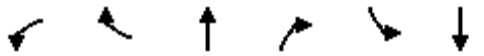
Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	148.0	Sum of lost time (s)	23.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	17	122	9	12	5	28	279	23	7	281	27
Future Volume (Veh/h)	26	17	122	9	12	5	28	279	23	7	281	27
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	28	18	130	10	13	5	30	297	24	7	299	29
Pedestrians		66			56			51			6	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		6			5			5			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								638				
pX, platoon unblocked	0.99	0.99		0.99	0.99	0.99				0.99		
vC, conflicting volume	780	830	430	942	833	371	394			377		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	776	827	430	939	829	365	394			371		
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 %	89	93	77	93	95	99	97			99		
cM capacity (veh/h)	248	262	557	142	261	637	1091			1118		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	176	28	351	335
Volume Left	28	10	30	7
Volume Right	130	5	24	29
cSH	424	218	1091	1118
Volume to Capacity	0.42	0.13	0.03	0.01
Queue Length 95th (ft)	50	11	2	0
Control Delay (s)	19.4	23.9	1.0	0.2
Lane LOS	C	C	A	A
Approach Delay (s)	19.4	23.9	1.0	0.2
Approach LOS	C	C		

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	51.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	143	2605	209	0	1917
Future Volume (Veh/h)	0	143	2605	209	0	1917
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	155	2832	227	0	2084
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			249			340
pX, platoon unblocked	0.70	0.57			0.57	
vC, conflicting volume	3640	1058			3059	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	783	0			1986	
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	75			100	
cM capacity (veh/h)	232	621			164	

Direction, Lane #	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	155	1133	1133	793	695	695	695
Volume Left	0	0	0	0	0	0	0
Volume Right	155	0	0	227	0	0	0
cSH	621	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.25	0.67	0.67	0.47	0.41	0.41	0.41
Queue Length 95th (ft)	25	0	0	0	0	0	0
Control Delay (s)	12.7	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	12.7	0.0			0.0		
Approach LOS	B						

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	L	T	T	T	R	L	T
Maximum Queue (ft)	131	97	205	206	191	199	423	419	431	423	178	242
Average Queue (ft)	102	12	137	173	139	52	361	390	399	184	158	195
95th Queue (ft)	117	60	264	250	217	161	431	448	458	388	187	227
Link Distance (ft)	97		191	191			394	394	394	394		179
Upstream Blk Time (%)	99	0	25	41	0		8	64	66	10	56	91
Queuing Penalty (veh)	0	0	90	151	0		59	477	490	72	0	580
Storage Bay Dist (ft)		90			200	175					245	
Storage Blk Time (%)	99	8		41	0		74				56	91
Queuing Penalty (veh)	36	4		97	1		42				316	204

Intersection: 1: Rockville Pike - 355 & Bou Ave

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	189	209
Average Queue (ft)	81	86
95th Queue (ft)	225	233
Link Distance (ft)	179	179
Upstream Blk Time (%)	12	12
Queuing Penalty (veh)	80	78
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Rockville Pike - 355 & Federal Plaza/New Street

Movement	EB	EB	WB	NB	NB	NB	NB	SB	SB	SB	SB	B3
Directions Served	LT	R	LTR	L	T	T	TR	L	T	T	TR	T
Maximum Queue (ft)	122	122	49	268	337	302	348	29	257	239	239	290
Average Queue (ft)	32	115	21	46	125	156	265	1	224	80	81	228
95th Queue (ft)	103	128	43	155	350	367	432	10	294	241	245	365
Link Distance (ft)	107	107			276	276	276		166	166	166	231
Upstream Blk Time (%)	4	95	0	0	22	26	45		87	7	9	77
Queuing Penalty (veh)	0	0	0	0	205	243	417		526	40	52	469
Storage Bay Dist (ft)				245				175				
Storage Blk Time (%)					23				87			
Queuing Penalty (veh)					46				5			

Intersection: 2: Rockville Pike - 355 & Federal Plaza/New Street

Movement	B3	B3
Directions Served	T	T
Maximum Queue (ft)	274	272
Average Queue (ft)	36	38
95th Queue (ft)	172	169
Link Distance (ft)	231	231
Upstream Blk Time (%)	1	1
Queuing Penalty (veh)	7	8
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Rockville Pike - 355 & Rollins Ave/Twinbrook Parkway

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	B3	B3	SB
Directions Served	T	TR	T	T	R	L	T	T	T	T	T	L
Maximum Queue (ft)	1307	1328	569	589	175	93	303	303	242	182	214	424
Average Queue (ft)	1127	1178	223	493	156	35	130	129	97	56	65	94
95th Queue (ft)	1490	1545	535	796	242	87	336	338	258	182	216	336
Link Distance (ft)	1300	1300	548	548		231	231	231	231	166	166	
Upstream Blk Time (%)	10	43	1	63			27	28	1	26	26	
Queuing Penalty (veh)	23	98	3	229			139	143	3	223	226	
Storage Bay Dist (ft)					150							400
Storage Blk Time (%)				2	83							0
Queuing Penalty (veh)				5	128							0

Intersection: 4: Rockville Pike - 355 & Rollins Ave/Twinbrook Parkway

Movement	SB	SB	SB
Directions Served	T	T	TR
Maximum Queue (ft)	1191	1173	1138
Average Queue (ft)	906	592	339
95th Queue (ft)	1636	1162	849
Link Distance (ft)	1180	1180	1180
Upstream Blk Time (%)	64	0	
Queuing Penalty (veh)	466	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)	75		
Queuing Penalty (veh)	224		

Intersection: 5: Chapman Ave & Twinbrook Parkway

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	L	T	TR	LT	R	L	L	T
Maximum Queue (ft)	199	561	565	312	325	1333	1339	182	183	381	400	527
Average Queue (ft)	26	187	204	206	311	1182	883	132	113	187	190	337
95th Queue (ft)	123	538	567	375	351	1702	1752	238	228	342	362	540
Link Distance (ft)		548	548			1300	1300	167	167	526	526	526
Upstream Blk Time (%)		13	14			52	16	58	36			7
Queuing Penalty (veh)		57	60			292	90	230	144			7
Storage Bay Dist (ft)	175			300	300							
Storage Blk Time (%)	0	25		0	74	15						
Queuing Penalty (veh)	0	17		1	217	70						

Intersection: 5: Chapman Ave & Twinbrook Parkway

Movement	SB
Directions Served	R
Maximum Queue (ft)	228
Average Queue (ft)	43
95th Queue (ft)	176
Link Distance (ft)	526
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Chapman Ave & Pike Center North/Driveway

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	64	63	113	98	50	202
Average Queue (ft)	56	15	64	30	2	53
95th Queue (ft)	71	43	143	102	16	182
Link Distance (ft)	49	49	96	96	167	167
Upstream Blk Time (%)	94	11	49	21		22
Queuing Penalty (veh)	0	0	199	86		88
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: Chapman Ave & Rollins Ave Extension/Rollins Ave

Movement	EB	WB	WB	NB	B8	SB	SB
Directions Served	LTR	L	TR	LTR	T	LT	TR
Maximum Queue (ft)	67	65	141	183	135	120	113
Average Queue (ft)	27	10	93	170	108	16	44
95th Queue (ft)	65	39	117	185	118	68	124
Link Distance (ft)	52	89	89	112	39	96	96
Upstream Blk Time (%)	33		92	90	87	2	28
Queuing Penalty (veh)	23		0	676	660	6	101
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 9: Chapman Ave & Bou Ave

Movement	EB	EB	WB	WB	WB	B36	B36	NB	NB	B35	B48	B49
Directions Served	L	TR	L	T	R	T	T	L	TR	T	T	T
Maximum Queue (ft)	202	155	28	889	275	1578	1640	94	204	355	597	542
Average Queue (ft)	196	25	4	801	258	787	935	8	189	334	499	310
95th Queue (ft)	225	102	18	1182	321	1852	1936	47	204	438	758	706
Link Distance (ft)	201	201	817	817		1622	1622		130	285	528	472
Upstream Blk Time (%)	76			84			28		92	90	69	47
Queuing Penalty (veh)	230			150			51		273	264	204	139
Storage Bay Dist (ft)					250			70				
Storage Blk Time (%)				0	91				93			
Queuing Penalty (veh)				0	151				16			

Intersection: 9: Chapman Ave & Bou Ave

Movement	B45	SB	SB	SB	B8	B8	B8
Directions Served	T	L	T	R	T	T	T
Maximum Queue (ft)	228	148	112	113	183	80	195
Average Queue (ft)	102	80	40	55	54	7	53
95th Queue (ft)	283	152	116	139	152	39	164
Link Distance (ft)	226	39	39	39	112	112	112
Upstream Blk Time (%)	42	53	19	23	10		11
Queuing Penalty (veh)	125	125	45	55	24		26
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 10: Bou Ave & Pike Center

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	125	222	201	250	93
Average Queue (ft)	98	162	57	105	64
95th Queue (ft)	152	282	173	257	78
Link Distance (ft)		191	201	201	54
Upstream Blk Time (%)		74	0	15	94
Queuing Penalty (veh)		520	0	43	243
Storage Bay Dist (ft)	100				
Storage Blk Time (%)	71	7			
Queuing Penalty (veh)	197	22			

Intersection: 11: East Jefferson Street & Rolllins Avenue /Rollins Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	R	LT	TR
Maximum Queue (ft)	50	269	641	504	310	334	332	326
Average Queue (ft)	9	110	313	143	136	186	189	133
95th Queue (ft)	35	225	640	433	355	393	363	332
Link Distance (ft)	477	477	1300	1300	295	295	317	317
Upstream Blk Time (%)					7	36	9	0
Queuing Penalty (veh)					0	0	0	0
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 12: Rockville Pike - 355/Rockville PIke- 355 & Halpine Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	T	TR	L	T
Maximum Queue (ft)	176	156	350	324	74	160	190	625	658	681	200	348
Average Queue (ft)	43	26	223	257	18	46	69	139	144	134	41	306
95th Queue (ft)	122	83	448	376	60	139	188	356	387	383	152	401
Link Distance (ft)		335	335	325	325			1180	1180	1180		309
Upstream Blk Time (%)			53	59								77
Queuing Penalty (veh)			0	0								0
Storage Bay Dist (ft)	250					450	165				175	
Storage Blk Time (%)							5	5				78
Queuing Penalty (veh)							41	10				77

Intersection: 12: Rockville Pike - 355/Rockville PIke- 355 & Halpine Road

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	324	324
Average Queue (ft)	241	114
95th Queue (ft)	364	315
Link Distance (ft)	309	309
Upstream Blk Time (%)	7	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LTR	L	LT	R	L	T	T	TR	L	L	T
Maximum Queue (ft)	202	364	225	511	504	46	416	439	446	140	175	444
Average Queue (ft)	39	160	169	377	235	8	122	142	148	6	44	380
95th Queue (ft)	113	352	251	646	497	29	303	330	355	47	115	523
Link Distance (ft)	354	354		496	496		1300	1300	1300		410	410
Upstream Blk Time (%)		17		44	6							69
Queuing Penalty (veh)		0		0	0							0
Storage Bay Dist (ft)			200			190				240		
Storage Blk Time (%)			22	62			4					
Queuing Penalty (veh)			43	95			1					

Intersection: 13: Twinbrook Parkway & Parklawn Dirve

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	462	235
Average Queue (ft)	361	48
95th Queue (ft)	543	201
Link Distance (ft)	410	
Upstream Blk Time (%)	34	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		210
Storage Blk Time (%)	67	0
Queuing Penalty (veh)	22	0

Intersection: 14: Nebel Street & Randolph Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	T	R
Maximum Queue (ft)	47	622	629	150	310	333	124	174	150	274	335	30
Average Queue (ft)	9	339	331	105	243	238	47	100	110	107	54	5
95th Queue (ft)	30	711	700	204	346	360	130	178	212	260	165	20
Link Distance (ft)		598	598		272	272		135	135		1622	1622
Upstream Blk Time (%)		2	2		36	32	0	34	36			
Queuing Penalty (veh)		14	14		0	0	0	0	0			
Storage Bay Dist (ft)	140			125			100			250		
Storage Blk Time (%)		30		21	17		4	35		3		
Queuing Penalty (veh)		6		87	32		6	44		5		

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	T	TR	L	T	T
Maximum Queue (ft)	173	41	178	197	43	253	266	248	266	146	239	238
Average Queue (ft)	86	11	76	156	4	143	184	209	177	27	83	65
95th Queue (ft)	181	30	198	210	20	293	254	241	324	102	180	202
Link Distance (ft)	176	176	162	162	214	214	214	214	214		394	394
Upstream Blk Time (%)	23		6	67		17	20	47	55			
Queuing Penalty (veh)	0		0	0		0	0	0	0			
Storage Bay Dist (ft)										180		
Storage Blk Time (%)											1	
Queuing Penalty (veh)											1	

Intersection: 15: Rockville Pike - 355 & Hubbard Dirve/Plaza Driveway

Movement	SB
Directions Served	TR
Maximum Queue (ft)	266
Average Queue (ft)	69
95th Queue (ft)	213
Link Distance (ft)	394
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 16: Chapman Ave & Josiah Henson Parkway/Randolph Road

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	LTR
Maximum Queue (ft)	367	382	401	189	437	440	240	70	384	136	201
Average Queue (ft)	187	143	134	13	111	113	97	33	156	67	88
95th Queue (ft)	438	352	329	69	307	322	232	71	404	126	172
Link Distance (ft)		367	367		598	598			375	226	226
Upstream Blk Time (%)	31	3	1						27		
Queuing Penalty (veh)	0	0	0						0		
Storage Bay Dist (ft)	350			165			215	250			
Storage Blk Time (%)	34	3			8	4	0		32		
Queuing Penalty (veh)	172	5			1	4	0		16		

Intersection: 17: Chapman Ave/Chapman Road & Thompson Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	172	72	54	224
Average Queue (ft)	54	20	12	31
95th Queue (ft)	113	52	45	121
Link Distance (ft)	157	137	526	192
Upstream Blk Time (%)	2			4
Queuing Penalty (veh)	0			0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Rockville Pike - 355 & Rollins Ave Extension

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	R	T	T	TR	T	T	T
Maximum Queue (ft)	96	190	217	214	292	293	292
Average Queue (ft)	71	63	158	155	278	87	83
95th Queue (ft)	112	199	263	259	292	289	282
Link Distance (ft)	80	179	179	179	276	276	276
Upstream Blk Time (%)	60	22	54	58	85	3	3
Queuing Penalty (veh)	88	208	498	535	539	16	19
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 19: Rollins Ave Extension & New Street

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (ft)	98	72
Average Queue (ft)	66	29
95th Queue (ft)	120	66
Link Distance (ft)	80	53
Upstream Blk Time (%)	58	50
Queuing Penalty (veh)	122	70
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 20: Driveway & Rollins Ave Extension

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	68	111	53
Average Queue (ft)	47	91	13
95th Queue (ft)	73	126	44
Link Distance (ft)	53	96	71
Upstream Blk Time (%)	77	81	0
Queuing Penalty (veh)	163	171	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 24: Rollins Ave Extension

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	108	72	103
Average Queue (ft)	47	29	68
95th Queue (ft)	117	67	86
Link Distance (ft)	96	52	64
Upstream Blk Time (%)	18	34	100
Queuing Penalty (veh)	31	26	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 34: Pike Center/Driveway

Movement	WB	NB	SB
Directions Served	LTR	TR	LTR
Maximum Queue (ft)	68	29	100
Average Queue (ft)	40	5	75
95th Queue (ft)	53	22	89
Link Distance (ft)	34	54	71
Upstream Blk Time (%)	100		85
Queuing Penalty (veh)	0		143
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 15960

APPENDIX K

ADA Ramp Evaluation

Street Ligting

Information

Curb Ramps

Construction/Alteration Date (circle one): Before 1/26/92 After 1/26/92

Facility Name/Address:	Date:
Location:	Surveyors:

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable).
A circled "N" signifies a violation.

Describe each curb ramp's location:	
Curb Ramp A: Twin/Chap SE X-Chap	Curb Ramp D: Twin/Chap SW X-Twin
Curb Ramp B: Twin/Chap SE X-Twin	Curb Ramp E: Twin/Chap NW X-Twin
Curb Ramp C: Twin/Chap SW X-Chap	Curb Ramp F: Twin/Chap NW X-Chap
	Curb Ramp G: Twin/Chap NW Ramp S

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y) N 60 "	(Y) N 60 "	(Y) N 63 "	(Y) N 62 "	(Y) N 64 "	(Y) N 65 "	(Y) N 62 "
2	Does CR have a running slope of 8.33% or less?	(Y) N 1.7 %	(Y) N 1.4 %	(Y) N 6.6 %	(Y) N 7.7 %	(Y) N 0.7 %	(Y) N 7.6 %	(Y) N 1.1 %
3	Does CR have a cross slope of 2% or less?	(Y) N 1.9 %	(Y) N 1.1 %	(Y) N 1 %	(Y) N 0.7 %	(Y) N 0.8 %	(Y) N 1 %	(Y) N 0.9 %
4	Does CR have a gutter slope of 5% or less?	(Y) N 4.9 %	(Y) N 4.6 %	(Y) N 1.9 %	(Y) N 2.3 %	(Y) N 1.8 %	(Y) N 0.4 %	(Y) N 2.2 %
5	Are transitions on and off CR flush and free of abrupt level changes? *Record the height of **any** level changes.*	(Y) N "	(Y) N "	(Y) N "	(Y) N "	(Y) N "	(Y) N "	(Y) N "
6	Does CR have detectable warnings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N
7	Can CR be blocked by legally parked cars?	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)
8	Is the sidewalk at the "top" of CR at least 36" wide?	(Y) N 55 "	(Y) N 55 "	(Y) N 60 "	(Y) N 60 "	(Y) N 55 "	(Y) N 55 "	(Y) N 62 "
9	Does CR have flared sides? *If yes, answer **one** of the next two questions. If not, skip to question **10**.*	(Y) n/a	(Y) n/a	(Y) n/a	(Y) n/a	Y (n/a)	Y (n/a)	Y (n/a)
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	(Y) N 5.7 %	(Y) N 6.5 %	Y (N) 22.3 %	Y (N) 24.1 %	Y N %	Y N %	Y N %
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? *If the CR has flared sides, skip this question.*	Y N	Y N	Y N	Y N	(Y) N	(Y) N	(Y) N
11	If CR is built-up to the curb, is it outside the path of cars? *If CR is not built-up to curb, skip this question.*	Y N	Y N	Y N	Y N	Y N	Y N	Y N
	Answer the last two questions only if the CR is located at a marked crossing:							
12	Is ramp of CR contained in markings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? *If not corner-type CR, skip this question.*	Y N "	Y N "	Y N "	Y N "	Y N "	Y N "	Y N "

Comments:

This survey form is designed to assist you in identifying common barriers to access – not all barriers. To identify all barriers, you must survey for compliance with §§ 4–10 of the ADA Standards.

Curb Ramps

Construction/Alteration Date (circle one): Before 1/26/92 After 1/26/92

Facility Name/Address:	Date:
Location:	Surveyors:

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable).
A circled "N" signifies a violation.

Describe each curb ramp's location:	
Curb Ramp A: West Lef Twin Refuge	Curb Ramp D: Twin/Chap NE X-Twin
Curb Ramp B: Twin/Chap NW Ramp N	Curb Ramp E:
Curb Ramp C: Twin/Chap NE X-Chap	Curb Ramp F:
	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A		Curb Ramp B		Curb Ramp C		Curb Ramp D		Curb Ramp E		Curb Ramp F		Curb Ramp G	
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		48 "		60 "		50 "		63 "		"		"		"	
2	Does CR have a running slope of 8.33% or less?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		2 %		1.1 %		7.3 %		1.4 %		%		%		%	
3	Does CR have a cross slope of 2% or less?	(Y)	N	(Y)	N	(Y)	N	Y	(N)	Y	N	Y	N	Y	N
		0 %		1.4 %		2.0 %		4.6 %		%		%		%	
4	Does CR have a gutter slope of 5% or less?	(Y)	N	(Y)	N	(Y)	N	Y	(N)	Y	N	Y	N	Y	N
		1 %		2.4 %		1.8 %		5.1 %		%		%		%	
5	Are transitions on and off CR flush and free of abrupt level changes? *Record the height of **any** level changes.*	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		"		"		"		"		"		"		"	
6	Does CR have detectable warnings?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
7	Can CR be blocked by legally parked cars?	Y	(N)	Y	(N)	Y	(N)	Y	(N)	Y	N	Y	N	Y	N
8	Is the sidewalk at the "top" of CR at least 36" wide?	Y	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
		— "		60 "		95 "		48 "		"		"		"	
9	Does CR have flared sides? *If yes, answer **one** of the next two questions. If not, skip to question **10**.*	Y	(n/a)	(Y)	n/a	(Y)	n/a	(Y)	n/a	Y	n/a	Y	n/a	Y	n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	Y	N	(Y)	N	Y	(N)	(Y)	N	Y	N	Y	N	Y	N
		%		7.6 %		11.2 %		9.6 %		%		%		%	
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
		%		%		%		%		%		%		%	
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? *If the CR has flared sides, skip this question.*	Y	(N)	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
11	If CR is built-up to the curb, is it outside the path of cars? *If CR is not built-up to curb, skip this question.*	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
	Answer the last two questions only if the CR is located at a marked crossing:														
12	Is ramp of CR contained in markings?	(Y)	N	(Y)	N	(Y)	N	(Y)	N	Y	N	Y	N	Y	N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? *If not corner-type CR, skip this question.*	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
		"		"		"		"		"		"		"	

Comments: _____

Curb Ramps

Construction/Alteration Date (circle one): Before 1/26/92 After 1/26/92

Facility Name/Address:	Date:
Location:	Surveyors:

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable).
A circled "N" signifies a violation.

Describe each curb ramp's location:	
Curb Ramp A: NE 355/BOU x Both	Curb Ramp D: SW 355/BOU x BOU
Curb Ramp B: SE 355/BOU x BOU	Curb Ramp E:
Curb Ramp C: NW 355/BOU x Both	Curb Ramp F:
	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y) N 14 ft. "	(Y) N 56 "	(Y) N 14 ft "	(Y) N 60 "	Y N "	Y N "	Y N "
2	Does CR have a running slope of 8.33% or less?	(Y) N 4.8 %	Y (N) 17.3 %	(Y) N 1.1 %	(Y) N 8 %	Y N %	Y N %	Y N %
3	Does CR have a cross slope of 2% or less?	(Y) N 0.5 %	Y (N) 3.7 %	Y (N) 2.2 %	Y (N) 2.4 %	Y N %	Y N %	Y N %
4	Does CR have a gutter slope of 5% or less?	(Y) N 4.1 %	(Y) N 3.5 %	(Y) N 3.3 %	(Y) N 3.1 %	Y N %	Y N %	Y N %
5	Are transitions on and off CR flush and free of abrupt level changes? *Record the height of **any** level changes.*	Y (N) 4 "	Y (N) 2 "	(Y) N "	(Y) N "	Y N "	Y N "	Y N "
6	Does CR have detectable warnings?	(Y) N	Y (N)	(Y) N	(Y) N	Y N	Y N	Y N
7	Can CR be blocked by legally parked cars?	Y (N)	Y (N)	Y (N)	Y (N)	Y N	Y N	Y N
8	Is the sidewalk at the "top" of CR at least 36" wide?	(Y) N 60 "	(Y) N 9 ft. "	(Y) N 84 "	(Y) N 72 "	Y N "	Y N "	Y N "
9	Does CR have flared sides? *If yes, answer **one** of the next two questions.* *If not, skip to question **10**.*	(Y) n/a	(Y) n/a	(Y) n/a	(Y) n/a	Y n/a	Y n/a	Y n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	(Y) N 5.5 %	Y (N) 14 %	Y (N) 14.9 %	Y (N) 16.9 %	Y N %	Y N %	Y N %
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? *If the CR has flared sides, skip this question.*	Y N	Y N	Y N	Y N	Y N	Y N	Y N
11	If CR is built-up to the curb, is it outside the path of cars? *If CR is not built-up to curb, skip this question.*	Y N	Y N	Y N	Y N	Y N	Y N	Y N
	Answer the last two questions only if the CR is located at a marked crossing:							
12	Is ramp of CR contained in markings?	(Y) N	(Y) N	(Y) N	(Y) N	Y N	Y N	Y N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? *If not corner-type CR, skip this question.*	(Y) N 52 "	Y N "	(Y) N 51 "	Y N "	Y N "	Y N "	Y N "

Comments: _____

This survey form is designed to assist you in identifying common barriers to access – not all barriers. To identify all barriers, you must survey for compliance with §§ 4–10 of the ADA Standards.

Curb Ramps

Construction/Alteration Date (circle one): Before 1/26/92 After 1/26/92

Facility Name/Address:	Date:
Location:	Surveyors:

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable).
A circled "N" signifies a violation.

Describe each curb ramp's location:	
Curb Ramp A: SW 355/Plaza x-Both	Curb Ramp D: NE 355/Plaza x-Both
Curb Ramp B: NW 355/Plaza x-Both	Curb Ramp E: SE 355/Twin ramp S
Curb Ramp C: SE 355/Plaza x-Both	Curb Ramp F: SE 355/Twin Ramp N
	Curb Ramp G: SE 355/Twin x-Twin

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y) N 90"	(Y) N 144"	(Y) N 48"	(Y) N 65"	(Y) N 60"	(Y) N 78"	(Y) N 61"
2	Does CR have a running slope of 8.33% or less?	(Y) N 2.8%	(Y) N 1.9%	Y (N) 9%	(Y) N 3.8%	(Y) N 1.3%	(Y) N 7%	Y (N) 11%
3	Does CR have a cross slope of 2% or less?	(Y) N 1.8%	Y (N) 2.3%	(Y) N 2%	(Y) N 1.4%	(Y) N 1.4%	(Y) N 1.9%	Y (N) 10%
4	Does CR have a gutter slope of 5% or less?	(Y) N 0.7%	(Y) N 1%	(Y) N 3.2%	(Y) N 4.9%	(Y) N 4.7%	(Y) N 4.6%	Y (N) 8.9%
5	Are transitions on and off CR flush and free of abrupt level changes? *Record the height of **any** level changes.*	(Y) N "	(Y) N "	(Y) N "	(Y) N "	(Y) N "	(Y) N "	(Y) N "
6	Does CR have detectable warnings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N
7	Can CR be blocked by legally parked cars?	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)
8	Is the sidewalk at the "top" of CR at least 36" wide?	(Y) N 70"	(Y) N 92"	(Y) N 60"	(Y) N 70"	(Y) N 70"	(Y) N 78"	(Y) N 61"
9	Does CR have flared sides? *If yes, answer **one** of the next two questions. If not, skip to question **10**.*	(Y) n/a	(Y) n/a	(Y) n/a	(Y) n/a	(Y) n/a	Y (n/a)	Y (n/a)
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	Y (N) 10.8%	(Y) N 3.9%	(Y) N 7.3%	(Y) N 4%	(Y) N 4.4%	Y N %	Y N %
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? *If the CR has flared sides, skip this question.*	Y N	Y N	Y N	Y N	Y N	(Y) N	(Y) N
11	If CR is built-up to the curb, is it outside the path of cars? *If CR is not built-up to curb, skip this question.*	Y N	Y N	Y N	Y N	Y N	Y N	Y N
	Answer the last two questions only if the CR is located at a marked crossing:							
12	Is ramp of CR contained in markings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? *If not corner-type CR, skip this question.*	(Y) N 90"	(Y) N 64"	(Y) N 80"	(Y) N 60"	Y N "	Y N "	Y N "

Comments:

Curb Ramps

Construction/Alteration Date (circle one): Before 1/26/92 After 1/26/92

Facility Name/Address:	Date:
Location:	Surveyors:

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable).
A circled "N" signifies a violation.

Describe each curb ramp's location:	
Curb Ramp A: Bou/Pike Center Ent. East	Curb Ramp D: Bou/Chapman, NW, x-chapman
Curb Ramp B: Bou/Pike Center Ent. West	Curb Ramp E: Bou/Chapman, NE, x-chapman
Curb Ramp C: Bou/Chapman, NW, X-Bou	Curb Ramp F: Bou/chapman, NE, wBR Ramp west
	Curb Ramp G: Bou/chapman, NE, wBR Ramp East

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G
1	Is ramp of CR at least 36" wide (not including flared sides)?	Y N None "	Y N None "	Y N 42 "	Y N 41 "	Y N 48 "	Y N 48 "	Y N 48 "
2	Does CR have a running slope of 8.33% or less?	Y N %	Y N %	Y N 8 %	Y N 11.5 %	Y N 5.2 %	Y N 4 %	Y N 5.3 %
3	Does CR have a cross slope of 2% or less?	Y N %	Y N %	Y N 0.2 %	Y N 0.4 %	Y N 0.2 %	Y N 1.3 %	Y N 1.3 %
4	Does CR have a gutter slope of 5% or less?	Y N %	Y N %	Y N 7.8 %	Y N 5 %	Y N 1.8 %	Y N 2.1 %	Y N 3.9 %
5	Are transitions on and off CR flush and free of abrupt level changes? *Record the height of **any** level changes.*	Y N "	Y N "	Y N 2 "	Y N "	Y N "	Y N "	Y N "
6	Does CR have detectable warnings?	Y N	Y N	Y N	Y N	Y N	Y N	Y N
7	Can CR be blocked by legally parked cars?	Y N	Y N	Y N	Y N	Y N	Y N	Y N
8	Is the sidewalk at the "top" of CR at least 36" wide?	Y N "	Y N "	Y N 14ft. "	Y N 14ft. "	Y N 9 ft "	N 9 ft. "	Y N 9ft. "
9	Does CR have flared sides? *If yes, answer **one** of the next two questions. If not, skip to question **10**.*	Y n/a	n/a	Y n/a	Y n/a	Y n/a	Y n/a	Y n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	Y N %	N %	Y N 9.2 %	Y N 8.4 %	Y N 8.2 %	Y N 10 %	Y N 7.1 %
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? *If the CR has flared sides, skip this question.*	Y N	Y N	Y N	Y N	Y N	Y N	Y N
11	If CR is built-up to the curb, is it outside the path of cars? *If CR is not built-up to curb, skip this question.*	Y N	Y N	Y N	Y N	Y N	Y N	Y N
	Answer the last two questions only if the CR is located at a marked crossing:							
12	Is ramp of CR contained in markings?	Y N	Y N	Y N	Y N	Y N	Y N	Y N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? *If not corner-type CR, skip this question.*	Y N "	Y N "	Y N "	Y N "	Y N "	Y N "	Y N "

Comments: _____

This survey form is designed to assist you in identifying common barriers to access – not all barriers. To identify all barriers, you must survey for compliance with §§ 4–10 of the ADA Standards.

Curb Ramps

Construction/Alteration Date (circle one): Before 1/26/92 After 1/26/92

Facility Name/Address:	Date:
Location:	Surveyors:

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable).
A circled "N" signifies a violation.

Describe each curb ramp's location:	
Curb Ramp A: BOU/chapman NE X-BOU	Curb Ramp D: BOU/chapman SE X-Chapman
Curb Ramp B: BOU/Chapman SW X-BOU	Curb Ramp E: BOU/chapman SE X-BOU
Curb Ramp C: BOU/chapman SW X-chapman	Curb Ramp F:
	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y) N 48 "	(Y) N 67 "	(Y) N 101 "	(Y) N 60 "	(Y) N 48 "	Y N "	Y N "
2	Does CR have a running slope of 8.33% or less?	(Y) N 6.2 %	(Y) N 1.5 %	(Y) N 4 %	(Y) N 5.4 %	Y (N) 10.3 %	Y N %	Y N %
3	Does CR have a cross slope of 2% or less?	(Y) N 0.3 %	(Y) N 0.3 %	Y (N) 3.9 %	Y (N) 2.7 %	(Y) N 1.1 %	Y N %	Y N %
4	Does CR have a gutter slope of 5% or less?	(Y) N 4.6 %	(Y) N 1.1 %	(Y) N 2 %	(Y) N 3.1 %	Y (N) 5.6 %	Y N %	Y N %
5	Are transitions on and off CR flush and free of abrupt level changes? *Record the height of **any** level changes.*	(Y) N "	(Y) N "	(Y) N "	(Y) N "	(Y) N "	Y N "	Y N "
6	Does CR have detectable warnings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	Y N	Y N
7	Can CR be blocked by legally parked cars?	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y N	Y N
8	Is the sidewalk at the "top" of CR at least 36" wide?	(Y) N 9ft. "	(Y) N 10 ft. "	(Y) N 10ft. "	(Y) N 20ft. "	(Y) N 20 ft. "	Y N "	Y N "
9	Does CR have flared sides? *If yes, answer **one** of the next two questions. If not, skip to question **10**.*	(Y) n/a	(Y) n/a	(Y) n/a	(Y) n/a	(Y) n/a	Y n/a	Y n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	(Y) N 8.7 %	(Y) N 6.5 %	(Y) N 6.5 %	(Y) N 6.4 %	Y (N) 13.6 %	Y N %	Y N %
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? *If the CR has flared sides, skip this question.*	Y N	Y N	Y N	Y N	Y N	Y N	Y N
11	If CR is built-up to the curb, is it outside the path of cars? *If CR is not built-up to curb, skip this question.*	Y N	Y N	Y N	Y N	Y N	Y N	Y N
	Answer the last two questions only if the CR is located at a marked crossing:							
12	Is ramp of CR contained in markings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	Y N	Y N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? *If not corner-type CR, skip this question.*	Y N "	Y N "	Y N "	Y N "	Y N "	Y N "	Y N "

Comments: _____

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Curb Ramps

Construction/Alteration Date (circle one): Before 1/26/92 After 1/26/92

Facility Name/Address:	Date:
Location:	Surveyors:

Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable).
A circled "N" signifies a violation.

Describe each curb ramp's location:	
Curb Ramp A: Chapman/Pike Ent S, S	Curb Ramp D: chap / Pike Ent N, N
Curb Ramp B: chap / P ike Ent S, N	Curb Ramp E: chap / Rollins S
Curb Ramp C: chap / Pike Ent N, S	Curb Ramp F: chap / Rollins N
	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A		Curb Ramp B		Curb Ramp C		Curb Ramp D		Curb Ramp E		Curb Ramp F		Curb Ramp G	
1	Is ramp of CR at least 36" wide (not including flared sides)?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
			"		"		"		"		"		"		"
2	Does CR have a running slope of 8.33% or less?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
			%		%		%		%		%		%		%
3	Does CR have a cross slope of 2% or less?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
			%		%		%		%		%		%		%
4	Does CR have a gutter slope of 5% or less?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
			%		%		%		%		%		%		%
5	Are transitions on and off CR flush and free of abrupt level changes? *Record the height of **any** level changes.*	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
			"		"		"		"		"		"		"
6	Does CR have detectable warnings?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
7	Can CR be blocked by legally parked cars?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
8	Is the sidewalk at the "top" of CR at least 36" wide?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
			"		"		"		"		"		"		"
9	Does CR have flared sides? *If yes, answer **one** of the next two questions. If not, skip to question **10**.*	Y	n/a	Y	n/a	Y	n/a	Y	n/a	Y	n/a	Y	n/a	Y	n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
			%		%		%		%		%		%		%
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
			%		%		%		%		%		%		%
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? *If the CR has flared sides, skip this question.*	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
11	If CR is built-up to the curb, is it outside the path of cars? *If CR is not built-up to curb, skip this question.*	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
	Answer the last two questions only if the CR is located at a marked crossing:														
12	Is ramp of CR contained in markings?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? *If not corner-type CR, skip this question.*	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
			"		"		"		"		"		"		"

Comments: No Ramps Meet standards

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Curb Ramps

Construction/Alteration Date (circle one): Before 1/26/92 After 1/26/92

Facility Name/Address:	Date:
Location:	Surveyors:

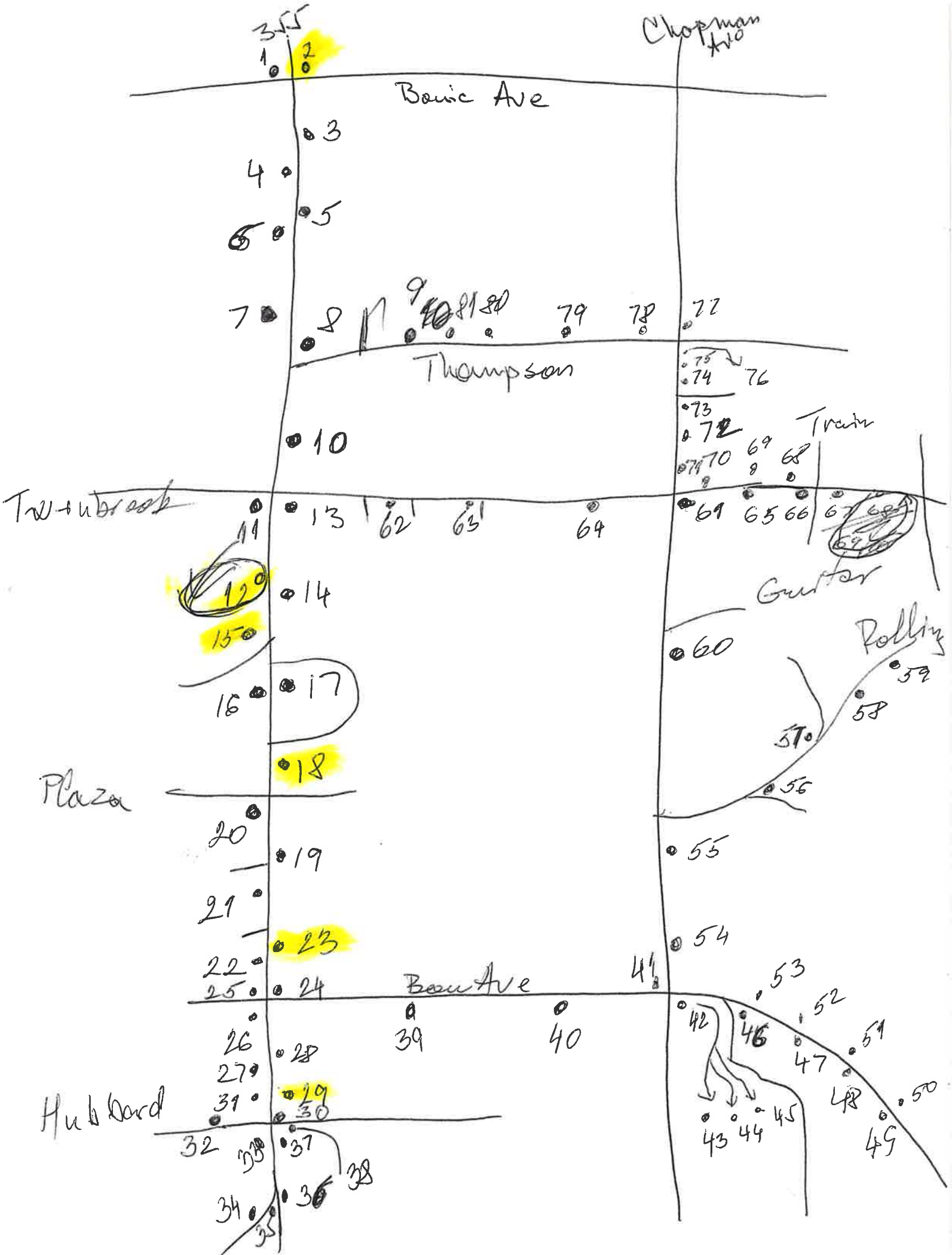
Record your measurements in the blanks when they are provided. Do not circle a response for a question you are directed to skip. If your answer to a question is no, but the choices are "Y" and "n/a," circle "n/a" (not applicable).
A circled "N" signifies a violation.

Describe each curb ramp's location:	
Curb Ramp A: SE 355/Twin X-355	Curb Ramp D: NW 355/Twin X-Twin
Curb Ramp B: NE 355/Twin X-Both	Curb Ramp E: SW 355/Twin X-Twin
Curb Ramp C: NW 355/Twin X-355	Curb Ramp F: SW 355/Twin X-355
	Curb Ramp G:

Refer to #	Curb Ramp (CR) Questions	Curb Ramp A	Curb Ramp B	Curb Ramp C	Curb Ramp D	Curb Ramp E	Curb Ramp F	Curb Ramp G
1	Is ramp of CR at least 36" wide (not including flared sides)?	(Y) N 60"	(Y) N 23ft."	(Y) N 60"	(Y) N 65"	(Y) N 62"	(Y) N 60"	Y N "
2	Does CR have a running slope of 8.33% or less?	Y (N) 9.7%	(Y) N 8%	Y (N) 10.4%	(Y) N 8.3%	(Y) N 4.2%	(Y) N 7.1%	Y N %
3	Does CR have a cross slope of 2% or less?	Y (N) 10.1%	Y (N) 3%	Y (N) 11.6%	Y (N) 12.5%	Y (N) 8%	Y (N) 10%	Y N %
4	Does CR have a gutter slope of 5% or less?	Y (N) 12.8%	Y (N) 8.8%	Y (N) 12.7%	Y (N) 9.4%	(Y) N 0.6%	Y (N) 13.5%	Y N %
5	Are transitions on and off CR flush and free of abrupt level changes? *Record the height of **any** level changes.*	(Y) N "	(Y) N "	(Y) N "	(Y) N "	(Y) N "	(Y) N "	Y N "
6	Does CR have detectable warnings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	Y N
7	Can CR be blocked by legally parked cars?	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y (N)	Y N
8	Is the sidewalk at the "top" of CR at least 36" wide?	(Y) N 60"	(Y) N 60"	(Y) N 68"	(Y) N 67"	(Y) N 55"	(Y) N 76"	Y N "
9	Does CR have flared sides? *If yes, answer **one** of the next two questions. If not, skip to question **10**.*	Y (n/a)	(Y) n/a	(Y) n/a	(Y) n/a	(Y) n/a	(Y) n/a	Y n/a
9.a	If the sidewalk at the "top" of CR is 48" wide or more, is the slope of the flared sides 10% or less?	Y N %	(Y) N 9%	Y (N) 30.9%	(Y) N 3.6%	(Y) N 0.2%	Y (N) 17.1%	Y N %
9.b	If the sidewalk at the "top" of CR is less than 48" wide, is the slope of the flared sides 8.33% or less?	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %	Y N %
10	If no flared sides, is there an obstruction or grass on each side of CR that discourages pedestrians from traveling across ramp? *If the CR has flared sides, skip this question.*	(Y) N	Y N	Y N	Y N	Y N	Y N	Y N
11	If CR is built-up to the curb, is it outside the path of cars? *If CR is not built-up to curb, skip this question.*	Y N	Y N	Y N	Y N	Y N	Y N	Y N
	Answer the last two questions only if the CR is located at a marked crossing:							
12	Is ramp of CR contained in markings?	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	(Y) N	Y N
13	If corner-type CR, is bottom landing at least 48" long and contained in crosswalk? *If not corner-type CR, skip this question.*	Y N "	(Y) N 84"	Y N "	Y N "	Y N "	Y N "	Y N "

Comments: _____

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Basic Ave
Chapman Ave
Thompson
Train
Guitar
Rolling
Plaza
Hubbard
Bow Ave


HILTON
HDW LEASING


STATE LAW
STOP FOR
IN X-WALKS




301 948 9870
avisonyoung.com








Thompson Ave
WILLARDRETAIL.COM
WILLARD
NOW LEASING
CONTACT US
301.657.7330
leasing@willardretail.com


CBA
15212
CBA
15212




Twinbrook PKWY
Rollins AVE
Rollins Ave
SOUTH
MARYLAND
355
TURNING VEHICLES
TO
FREE WASHES!




Rollins
Twinbrook
NORTH
355
Exxon
AMORE


C B A
15210


SILVER DINER
NEXT GENERATION DINER
FEDERAL PLAZA
STOP
NOW OPEN


Rollins
495 MOVERS
Moving Homes
Businesses for
495MOVERS
888.495.4951


REMOVES
100
OF PERFORMANC
ROBBING DEPOS






ATTRESS
FIRM
A NEIGHBOR


TOWNE PLAZA
Pediatrics
Specialized Urgent Care
COMFORT ONE SHOES
ALAN FURMAN & CO.
ROBERT J. SANKER DDS
SMILELAND PEDIATRIC DENTISTRY
R.E. HACKLEY DENTAL SPA
JUST LOSE WEIGHT MD
NAVY FEDERAL
Montrose Pkwy
To Randolph Rd
1000 FT


Bay Avenue
THE ORIGINAL PANCAKE HOUSE




Bou Ave
Bou Avenue
BANK OF AMERICA
5.11
PANCAKE HOUSE
TEA SPA


Bou Avenue


0427
BEST BED
BEST VAL
ERSAL



ONLY

RIGHT LANE
MUST
TURN RIGHT


Hubbard DR
Hubbard
ONLY


15212
C B A
ONLY


Trulieve
12200
Hubbard


NO ACCESS
TO
MONTROSE RD
Trulieve


Pkwy
Rd


Towne




Montrose
School


Hubbard
BLINDS TO GO
BLINDS TO GO
511
Hubbard


Hubbard
CHASE
GIAN
MARSHALL
VALUE CITY FUR TURE
BOB'S DISCOUNT F
BURLINGT
The Home Depot Des Center
OLD NAVY
HOMESEN
THE GENOCIDE IS REAL


METRO MIX
FX4


Chapman Av
C B A
15212


Bou Av
Flagship


Chapman Av


United Rentals
DANGER
MEN WORKING
ABOVE
CWC


HIDDEN
DRIVEWAY ON
RIGHT


POLARIS


13031


arget




LIMIT
30
We're
hiring.
P


SPEED
LIMIT
25


13026




RIGHT LANE
MUST
TURN RIGHT







NO PARKING ANY TIME

12401

KEYBOARDS
DRUMS
RECORDING

LIGHTING
DJ
LIVE SOUND

STUDIOS

Guitar center


KIA
VIRGINIA
UBY-2586
PRIORITY






ONLY
brook Pkwy
H1803


EMPATHY










A B C
14939


STUDENT DRIVER


Budget
1.800.GO.BUDGET
www.budget.com


PEAKE RELEAF
ONLY
ONLY

TWINBROOK
METRO PLAZA
Chapman Ave
ONLY




AHEAD
NEW
STOP
Thompson Crescent


Zone Number
Located on Meter
ParkMobile
Pay by App
Parking
STOP


TOYOTA
CAMRY LE
Maryland
6EP0782
DARCARS


STOP ID NO.
26 Mont. Mall
240-777-7433
RideOnBus.com
NEW
STOP
ALL WAY
STATE LAW
STOP
FOR
PEDESTRIANS
DENTAL IMPLANTS
ARE




NO PARKING ANY TIME
F.D.
AUTO SPRINKLER
WET
STANDPIPE
15212
A B C


LOADING DOCK


RETAIL LOADING DOCK