Appendix C: Operational Analysis Results

C-1 – Existing (2012) Synchro/SimTraffic Results

SYNCHRO CAPACITY ANALYSIS - INTERSECTION LEVEL OF SERVICE SUMMARY
Existing (2012) Traffic Volumes
U.S. Route 360/Route 288 Interchange Study Area - Chesterfield County, Virginia

Intersection	Type of Control	Lane Group	Eastbound				Westbound				Northbound				Southbound				Overall	
			AM		PM		AM		PM		AM		PM		AM		PM		AM	PM
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS		
101 US 360 at Bridgewood Rd./ Warbro Rd.	Signal	Left	40.8	D	53.7	D	64.6	E	59.7	E					54.8	D	86.2	F	Delay	Delay
		Through	11.3	B	21.4	C	21.3	C	23.1	C	257.5	F	200.9	F	52.5	D	56.9	E	43.7	37.4
		Right	12.1	B	32.4	C	18.6	B	17.0	B					40.2	D	44.8	D	LOS	LOS
		Approach	14.5	B	26.0	C	21.7	C	23.1	C	257.5	F	200.9	F	45.5	D	66.2	E	D	D
102 US 360 at Lonas Pkwy./ Memphis Blvd.	Signal	Left	64.7	E	118.6	F	47.0	D	70.0	E	57.3	E	57.4	E	57.7	E	66.7	E	Delay	Delay
		Through	9.8	A	17.4	B	3.7	A	12.1	B	55.3	E	55.9	E	56.1	E	54.5	D	17.2	46.4
		Right	7.9	A	19.3	B	9.4	A	9.0	A	54.9	D	55.2	E	56.5	E	321.4	F	LOS	LOS
		Approach	15.0	B	35.4	D	5.8	A	14.6	B	56.1	E	56.4	E	56.9	E	225.8	F	B	D
107 US 360 at Market Square Ln.	One-Way Stop	Left	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	†	†	†	†	†	†	†	†	--	--	--	--	11.3	B	24.6	C	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	--	--	--	--	11.3	B	24.6	C	--	--
108 US 360 at Commonwealth Centre Pkwy./ Old Hundred Rd.	Signal	Left	60.1	E	197.6	F	51.8	D	163.1	F	59.1	E	202.2	F	193.2	F	182.8	F	Delay	Delay
		Through	71.5	E	44.1	D	15.7	B	101.4	F	58.6	E	111.1	F	56.5	E	217.4	F	62.0	102.7
		Right	27.0	C	103.6	F	6.9	A	33.6	C	57.6	E	88.0	F	42.1	D	96.2	F	LOS	LOS
		Approach	68.8	E	74.7	E	17.1	B	102.5	F	58.3	E	142.1	F	121.5	F	147.3	F	E	F
109 US 360 at Village Green Dr.	One-Way Stop	Left	10.7	B	33.7	D	--	--	--	--	--	--	--	--	--	--	--	--	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	--	--	--	--	†	†	†	†	--	--	--	--	--	--	--	--	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
110 US 360 at Wells Fargo Driveway	One-Way Stop	Left	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	--	--	--	--	†	†	†	†	--	--	--	--	10.8	B	27.7	D	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	--	--	--	--	10.8	B	27.7	D	--	--
111 US 360 at Brad McNeer Pkwy.	Signal	Left	--	--	--	--	53.3	D	170.3	F	54.3	D	180.8	F	--	--	--	--	Delay	Delay
		Through	30.1	C	34.9	C	1.0	A	5.2	A	--	--	--	--	--	--	--	--	26.9	38.9
		Right	3.6	A	53.7	D	--	--	--	--	122.9	F	75.7	E	--	--	--	--	LOS	LOS
		Approach	28.2	C	36.4	D	7.2	A	23.5	C	101.6	F	140.1	F	--	--	--	--	C	D
112 US 360 at Craig Rath Blvd.	One-Way Stop	Left	--	--	--	--	24.4	C	18.9	C	--	--	--	--	--	--	--	--	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	†	†	†	†	--	--	--	--	22.4	C	13.9	B	--	--	--	--	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	22.4	C	13.9	B	--	--	--	--	--	--
113 US 360 at Mockingbird Ln./ Harbour Pointe Pwky.	Signal	Left	70.2	E	52.3	D	53.7	D	46.9	D	--	--	--	--	99.9	F	379.3	F	Delay	Delay
		Through	71.1	E	32.7	C	9.1	A	95.5	F	79.0	E	293.8	F	112.7	F	400.6	F	56.9	82.9
		Right	--	--	--	--	12.1	B	4.2	A	70.4	E	34.8	C	51.5	D	54.5	D	LOS	LOS
		Approach	71.1	E	33.3	C	11.0	B	89.5	F	71.1	E	113.5	F	99.6	F	289.2	F	E	F
114 US 360 at Deer Run Dr./ Harbour View Ct.	Signal	Left	72.5	E	147.3	F	39.3	D	70.3	E	60.9	E	81.2	F	67.2	E	236.9	F	Delay	Delay
		Through	15.3	B	46.2	D	25.4	C	59.3	E	63.2	E	58.4	E	68.1	E	241.2	F	32.7	70.4
		Right	10.8	B	19.1	B	--	--	--	--	157.6	F	52.2	D	54.9	D	175.9	F	LOS	LOS
		Approach	17.4	B	53.6	D	26.4	C	60.5	E	143.9	F	57.0	E	63.1	E	208.3	F	C	E
115 US 360 at Chital Dr.	Signal	Left	82.8	F	77.9	E	56.9	E	65.6	E	64.0	E	200.4	F	--	--	--	--	Delay	Delay
		Through	15.1	B	2.2	A	1.1	A	4.4	A	55.3	E	55.0	D	60.1	E	61.7	E	14.6	12.3
		Right	--	--	--	--	5.1	A	5.7	A	55.9	E	55.2	E	58.9	E	58.4	E	LOS	LOS
		Approach	15.2	B	12.3	B	5.0	A	8.9	A	58.3	E	146.7	F	59.6	E	60.9	E	B	B
116 US 360 at N. Spring Run Rd./ Temie Lee Pkwy.	Signal	Left	71.5	E	40.4	D	88.9	F	43.9	D	--	--	--	--	135.5	F	152.6	F	Delay	Delay
		Through	20.7	C	41.7	D	35.0	C	17.3	B	83.8	F	205.3	F	136.7	F	151.0	F	70.9	48.1
		Right	13.1	B	743.3	F	--	--	--	--	460.3	F	54.2	D	53.1	D	53.5	D	LOS	LOS
		Approach	22.1	C	73.1	E	38.9	D	19.5	B	372.2	F	121.0	F	128.3	F	121.2	F	E	D
117 US 360 at Winterpock Rd./ Lake Harbour Dr.	Signal	Left	40.5	D	67.9	E	46.6	D	73.9	E	--	--	--	--	62.2	E	63.5	E	Delay	Delay
		Through	4.6	A	44.9	D	27.4	C	16.1	B	68.1	E	177.4	F	61.9	E	84.1	F	18.6	44.3
		Right	11.2	B	262.4	F	7.9	A	29.1	C	46.9	D	28.3	C	--	--	--	--	LOS	LOS
		Approach	4.8	A	56.7	E	29.6	C	30.0	C	51.7	D	93.1	F	62.0	E	75.7	E	B	D
118 US 360 at Duckridge Blvd./ Hancock Village St.	Signal	Left	87.4	F	72.2	E	44.3	D	57.5	E	59.7	E	69.4	E	--	--	--	--	Delay	Delay
		Through	4.8	A	20.0	B	5.0	A	113.8	F	59.5	E	68.7	E	60.2	E	59.4	E	7.7	76.3
		Right	0.5	A	50.8	D	7.0	A	9.3	A	43.9	D	37.7	D	57.1	E	57.9	E	LOS	LOS
		Approach	5.1	A	23.0	C	6.1	A	108.9	F	49.5	D	58.8	E	59.7	E	58.4	E	A	E
119 US 360 at Ashlake Pkwy.	Signal	Left	--	--	--	--	33.2	C	43.0	D	53.1	D	57.1	E	--	--	--	--	Delay	Delay
		Through	18.8	B	6.8	A	1.6	A	8.0	A	--	--	--	--	--	--	--	--	18.9	11.3
		Right	--	--	--	--	--	--	--	--	94.8	F	54.7	D	--	--	--	--	LOS	LOS
		Approach	18.8	B	6.8	A	1.6	A	10.5	B	84.2	F	56.0	E	--	--	--	--	B	B
120 US 360 at Woodlake Village Pkwy.	Signal	Left	70.2	E	76.4	E	--	--	--	--	--	--	--	--	58.6	E	57.3	E	Delay	Delay
		Through	16.8	B	6.9	A	33.9	C	22.0	C	--	--	--	--	--	--	--	--	46.5	23.6
		Right	--	--	--	--	159.8	F	22.4	C	--	--	--	--	37.4	D	41.9	D	LOS	LOS
		Approach	18.1	B	10.6	B	74.9	E	22.1	C	--	--	--	--	57.3	E	56.4	E	D	C
121 US 360 at Hampton Park Dr./ Fox Club Pkwy.	Signal	Left	73.2	E	46.8	D	37.3	D	23.8	C	--	--	--	--	70.9	E	137.6	F	Delay	Delay
		Through	15.0	B	20.9	C	5.8	A	3.0	A	54.7	D	58.0	E	53.5	D	56.1	E	27.7	26.5
		Right	15.1	B	20.2	C	13.2	B	0.3	A	70.0	E	55.7	E	52.3	D	53.2	D	LOS	LOS
		Approach	17.1	B	22.5	C	8.8	A	5.0	A	67.2	E	56.2	E	66.2	E	114.7	F	C	C
122 US 360 at Otterdale Rd.	Signal	Left	53.7	D	57.0	E	40.7	D	78.6	E	--	--	--	--	--	--	--	--	Delay	Delay
		Through	15.5	B	17.4	B	12.5	B	4.6	A	61.7	E	65.1	E	60.9	E	64.1	E	22.9	20.0
		Right	11.8	B	14.7	B	--	--	--	--	49.4	D	44.1	D	--	--	--	--	LOS	LOS
		Approach	18.8	B	19.4	B	15.5	B	14.4	B	51.4	D	47.2	D	60.9	E	64.1	E	C	B
124 Bailey Bridge Rd. at Deer Run Dr.	One-Way Stop	Left	8.1	A	8.3	A	--	--	--	--	--	--	--	--	18.6	C	16.3	C	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	--	--	--	--	†	†	†	†	--	--	--	--	9.0	A	10.1	B	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	--	--	--	--	17.2	C	13.6	B	--	--
125 Bailey Bridge Rd./ Springford Pkwy. at Spring Run Rd.	All-Way Stop	Left	11.1	B	13.3	A	11.0	B	13.0	A	--	--	--	--	--	--	--	--	Delay	Delay
		Through									19.2	C	14.6	B	9.9	A	18.6	C	13.9	13.7
		Right	6.5	A	7.0	A	6.4	A	6.4	A	--	--	--	--	--	--	--	--	LOS	LOS
		Approach	9.4	A	10.0	A	9.6	A	11.0	B	19.2	C	14.6	B	9.9	A	18.6	C	B	B
126 Old Hundred Road Rd./ Millridge Pkwy.	Two-Way Stop	Left	23.9	C	42.8	E	53.3	F	**	F	8.3	A	9.6	A	0.2	A	0.4	A	Delay	Delay
		Through									†	†	†	†					--	--
		Right					9.4	A	9.5	A	†	†	†	†					LOS	LOS
		Approach	23.9	C	42.8	E	50.3	F	9225.2	F	--	--	--	--	--	--	--	--	--	--
127 Old Hundred Road Rd./ Market Square Rd.	Two-Way Stop	Left	--	--	--	--	13.6	B	18.0	C	--	--	--	--	8.1	A	8.3	A	Delay	Delay
		Through	--	--	--	--					†	†	†	†	†	†	†	†	--	--
		Right	--	--	--	--					†	†	†	†	--	--	--	--	LOS	LOS
		Approach	--	--	--	--	13.6	B	18.0	C	--	--	--	--	--	--	--	--	--	--

NOTE: Lane configurations with a shared through lane shown as "through" lane group. Lane configurations with shared left-right lane shown as "left" lane group.
† SYNCHRO does not provide level of service or delay for movements with no conflicting volumes.
**Delay greater than 9999.99 seconds cannot be calculated by SYNCHRO.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
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	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		8				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	155	1309	32	10	832	93	141	45	43	75	4	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	3470	3893	1742	1947	5594	1600		1936		3470	1883	1600
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	3470	3893	1742	1947	5594	1600		1936		3470	1883	1600
Peak-hour factor, PHF	0.89	0.93	0.74	0.61	0.98	0.81	0.79	0.61	0.63	0.86	0.82	0.83
Adj. Flow (vph)	174	1408	43	16	849	115	178	74	68	87	5	158
RTOR Reduction (vph)	0	0	19	0	0	61	0	8	0	0	0	109
Lane Group Flow (vph)	174	1408	24	16	849	54	0	312	0	87	5	49
Heavy Vehicles (%)	11%	2%	2%	2%	2%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	15.4	71.3	71.3	2.8	59.0	59.0		14.6		11.4	11.4	26.8
Effective Green, g (s)	15.4	71.3	71.3	2.8	59.0	59.0		14.6		11.4	11.4	26.8
Actuated g/C Ratio	0.12	0.57	0.57	0.02	0.47	0.47		0.12		0.09	0.09	0.21
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	424	2202	985	43	2619	749		224		313	170	422
v/s Ratio Prot	0.05	c0.36		0.01	c0.15			c0.16		c0.03	0.00	0.01
v/s Ratio Perm			0.01			0.03						0.02
v/c Ratio	0.41	0.64	0.02	0.37	0.32	0.07		1.39		0.28	0.03	0.12
Uniform Delay, d1	51.1	18.6	12.0	60.7	21.0	18.4		55.7		53.5	52.3	40.0
Progression Factor	0.79	0.55	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	1.1	0.0	3.9	0.3	0.2		201.8		1.4	0.2	0.1
Delay (s)	40.8	11.3	12.1	64.6	21.3	18.6		257.5		54.8	52.5	40.2
Level of Service	D	B	B	E	C	B		F		D	D	D
Approach Delay (s)		14.5			21.7			257.5			45.5	
Approach LOS		B			C			F			D	

Intersection Summary				
HCM 2000 Control Delay	43.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	25.9	
Intersection Capacity Utilization	76.0%	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												
Volume (vph)	157	1388	24	34	1034	36	90	7	66	42	4	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.93	0.89	0.73	0.67	0.98	0.82	0.83	0.45	0.69	0.64	0.50	0.77
Adj. Flow (vph)	169	1560	33	51	1055	44	108	16	96	66	8	134
RTOR Reduction (vph)	0	0	12	0	0	17	0	0	89	0	0	126
Lane Group Flow (vph)	169	1560	21	51	1055	27	108	16	7	66	8	8
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	11.0	81.7	81.7	7.2	77.9	77.9	8.8	8.8	8.8	7.3	7.3	7.3
Effective Green, g (s)	11.0	81.7	81.7	7.2	77.9	77.9	8.8	8.8	8.8	7.3	7.3	7.3
Actuated g/C Ratio	0.09	0.65	0.65	0.06	0.62	0.62	0.07	0.07	0.07	0.06	0.06	0.06
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	299	2294	1026	196	3961	978	239	130	110	198	205	91
v/s Ratio Prot	0.05	c0.44		0.01	c0.16		c0.03	0.01		c0.02	0.00	
v/s Ratio Perm			0.01			0.02			0.00			0.00
v/c Ratio	0.57	0.68	0.02	0.26	0.27	0.03	0.45	0.12	0.06	0.33	0.04	0.09
Uniform Delay, d1	55.2	13.9	7.9	56.9	11.0	9.3	56.3	55.0	54.7	57.0	56.0	56.2
Progression Factor	1.15	0.63	1.00	0.82	0.32	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.9	0.0	0.5	0.1	0.0	1.0	0.3	0.2	0.7	0.1	0.3
Delay (s)	64.9	9.8	7.9	47.0	3.7	9.4	57.3	55.3	54.9	57.7	56.1	56.5
Level of Service	E	A	A	D	A	A	E	E	D	E	E	E
Approach Delay (s)		15.0			5.8			56.1			56.9	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	292	3557	159	97	1355	143	37	34	50	340	85	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Peak-hour factor, PHF	0.94	0.91	0.83	0.91	0.98	0.83	0.92	0.80	0.88	0.87	0.92	0.94
Adj. Flow (vph)	311	3909	192	107	1383	172	40	42	57	391	92	278
RTOR Reduction (vph)	0	0	65	0	0	82	0	0	54	0	0	119
Lane Group Flow (vph)	311	3909	127	107	1383	90	40	42	3	391	92	159
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	15.8	70.7	70.7	11.5	66.2	66.2	5.4	5.8	5.8	11.5	11.9	27.7
Effective Green, g (s)	15.8	70.7	70.7	11.5	66.2	66.2	5.4	5.8	5.8	11.5	11.9	27.7
Actuated g/C Ratio	0.13	0.56	0.56	0.09	0.53	0.53	0.04	0.05	0.05	0.09	0.09	0.22
Clearance Time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	430	3595	888	313	3366	831	147	162	72	313	175	429
v/s Ratio Prot	0.09	c0.61		0.03	c0.22		0.01	0.01		c0.11	c0.05	c0.05
v/s Ratio Perm			0.08			0.06			0.00			0.05
v/c Ratio	0.72	1.09	0.14	0.34	0.41	0.11	0.27	0.26	0.04	1.25	0.53	0.37
Uniform Delay, d1	53.0	27.6	13.2	53.7	18.1	15.1	58.4	58.0	57.4	57.2	54.4	41.7
Progression Factor	1.08	1.07	2.04	0.96	0.85	0.44	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	42.0	0.2	0.5	0.4	0.3	0.7	0.6	0.2	135.9	2.2	0.4
Delay (s)	60.1	71.5	27.0	51.8	15.7	6.9	59.1	58.6	57.6	193.2	56.5	42.1
Level of Service	E	E	C	D	B	A	E	E	E	F	E	D
Approach Delay (s)		68.8			17.1			58.3			121.5	
Approach LOS		E			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	62.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	3848	263	177	1457	99	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Lane Util. Factor	0.86	1.00	0.97	0.86	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6408	1583	3433	6408	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6408	1583	3433	6408	3433	1583
Peak-hour factor, PHF	0.88	0.80	0.88	0.98	0.89	0.92
Adj. Flow (vph)	4373	329	201	1487	111	247
RTOR Reduction (vph)	0	67	0	0	0	107
Lane Group Flow (vph)	4373	262	201	1487	111	140
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	84.7	84.7	10.5	101.3	11.5	11.5
Effective Green, g (s)	84.7	84.7	10.5	101.3	11.5	11.5
Actuated g/C Ratio	0.67	0.67	0.08	0.80	0.09	0.09
Clearance Time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Vehicle Extension (s)	8.0	8.0	2.5	8.0	2.5	2.5
Lane Grp Cap (vph)	4307	1064	286	5151	313	144
v/s Ratio Prot	c0.68		c0.06	0.23	0.03	
v/s Ratio Perm		0.17				c0.09
v/c Ratio	1.02	0.25	0.70	0.29	0.35	0.97
Uniform Delay, d1	20.6	8.1	56.2	3.2	53.8	57.1
Progression Factor	1.03	0.44	0.83	0.27	1.00	1.00
Incremental Delay, d2	8.8	0.0	6.6	0.1	0.5	65.8
Delay (s)	30.1	3.6	53.3	1.0	54.3	122.9
Level of Service	C	A	D	A	D	F
Approach Delay (s)	28.2			7.2	101.6	
Approach LOS	C			A	F	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	62	3731	11	54	1450	39	15	4	278	149	4	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	0.95	1.00
Satd. Flow (prot)	1770	6405		1770	6408	1583		1792	1583	1681	1689	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.60	1.00	0.74	0.71	1.00
Satd. Flow (perm)	1770	6405		1770	6408	1583		1110	1583	1302	1259	1583
Peak-hour factor, PHF	0.75	0.90	0.83	0.84	0.94	0.82	0.57	0.58	0.79	0.69	0.75	0.74
Adj. Flow (vph)	83	4146	13	64	1543	48	26	7	352	216	5	31
RTOR Reduction (vph)	0	0	0	0	0	21	0	0	126	0	0	28
Lane Group Flow (vph)	83	4159	0	64	1543	27	0	33	226	110	111	3
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			4	1		3	
Permitted Phases						6	4		4	3		3
Actuated Green, G (s)	10.2	72.2		9.5	71.5	71.5		6.0	15.5	12.2	12.2	12.2
Effective Green, g (s)	10.2	72.2		9.5	71.5	71.5		6.0	15.5	12.2	12.2	12.2
Actuated g/C Ratio	0.08	0.57		0.08	0.57	0.57		0.05	0.12	0.10	0.10	0.10
Clearance Time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0		2.5	8.0	8.0		2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	143	3670		133	3636	898		52	276	126	121	153
v/s Ratio Prot	0.05	c0.65		0.04	0.24				c0.06			
v/s Ratio Perm						0.02		0.03	0.08	0.08	c0.09	0.00
v/c Ratio	0.58	1.13		0.48	0.42	0.03		0.63	0.82	0.87	0.92	0.02
Uniform Delay, d1	55.8	26.9		55.9	15.5	12.0		58.9	53.9	56.1	56.4	51.5
Progression Factor	1.23	0.37		0.93	0.57	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	61.3		1.9	0.4	0.1		20.0	16.5	43.7	56.3	0.0
Delay (s)	70.2	71.1		53.7	9.1	12.1		79.0	70.4	99.9	112.7	51.5
Level of Service	E	E		D	A	B		E	E	F	F	D
Approach Delay (s)		71.1			11.0			71.1			99.6	
Approach LOS		E			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	56.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.1
Intersection Capacity Utilization	92.0%	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												
Volume (vph)	124	3311	19	102	1315	71	21	39	387	106	6	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86		1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	6408	1583	3433	6338		1770	1863	1583	1681	1693	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1770	6408	1583	3433	6338		1770	1863	1583	1681	1693	1583
Peak-hour factor, PHF	0.88	0.92	0.66	0.93	0.96	0.66	0.64	0.86	0.83	0.73	0.84	0.92
Adj. Flow (vph)	141	3599	29	110	1370	108	33	45	466	145	7	84
RTOR Reduction (vph)	0	0	12	0	9	0	0	0	124	0	0	78
Lane Group Flow (vph)	141	3599	17	110	1469	0	33	45	342	75	77	6
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	13.2	74.2	74.2	11.2	72.3		5.8	5.8	17.0	8.8	8.8	8.8
Effective Green, g (s)	13.2	74.2	74.2	11.2	72.3		5.8	5.8	17.0	8.8	8.8	8.8
Actuated g/C Ratio	0.10	0.59	0.59	0.09	0.57		0.05	0.05	0.13	0.07	0.07	0.07
Clearance Time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	185	3773	932	305	3636		81	85	295	117	118	110
v/s Ratio Prot	0.08	c0.56		0.03	0.23		0.02	0.02	c0.10	0.04	c0.05	
v/s Ratio Perm			0.01						0.11			0.00
v/c Ratio	0.76	0.95	0.02	0.36	0.40		0.41	0.53	1.16	0.64	0.65	0.05
Uniform Delay, d1	54.9	24.3	10.8	54.0	14.9		58.4	58.8	54.5	57.1	57.1	54.7
Progression Factor	1.14	0.44	1.00	0.72	1.69		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.0	4.7	0.0	0.5	0.3		2.4	4.5	103.1	10.1	11.0	0.1
Delay (s)	72.5	15.3	10.8	39.3	25.4		60.9	63.2	157.6	67.2	68.1	54.9
Level of Service	E	B	B	D	C		E	E	F	E	E	D
Approach Delay (s)		17.4			26.4			143.9			63.1	
Approach LOS		B			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	32.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	92.4%	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												
Volume (vph)	4	3312	82	90	1315	8	66	4	138	4	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.86		0.97	0.86	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (prot)	1947	7018		3776	7049	1742	1947	2049	1742		1986	1742
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (perm)	1947	7018		3776	7049	1742	1947	2049	1742		1986	1742
Peak-hour factor, PHF	0.56	0.94	0.79	0.88	0.98	0.92	0.90	0.92	0.82	0.58	0.92	0.50
Adj. Flow (vph)	7	3523	104	102	1342	9	73	4	168	7	4	8
RTOR Reduction (vph)	0	3	0	0	0	3	0	0	157	0	0	8
Lane Group Flow (vph)	7	3624	0	102	1342	6	73	4	11	0	11	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	3	4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	1.3	77.3		10.5	85.9	90.1	8.2	8.2	8.2		4.2	4.2
Effective Green, g (s)	1.3	77.3		10.5	85.9	90.1	8.2	8.2	8.2		4.2	4.2
Actuated g/C Ratio	0.01	0.61		0.08	0.68	0.72	0.07	0.07	0.07		0.03	0.03
Clearance Time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	8.0		5.0	8.0	2.5	3.5	3.5	3.5		2.5	2.5
Lane Grp Cap (vph)	20	4305		314	4805	1245	126	133	113		66	58
v/s Ratio Prot	0.00	c0.52		c0.03	c0.19	0.00	c0.04	0.00			c0.01	
v/s Ratio Perm						0.00			0.01			0.00
v/c Ratio	0.35	0.84		0.32	0.28	0.01	0.58	0.03	0.10		0.17	0.00
Uniform Delay, d1	61.9	19.5		54.4	7.9	5.1	57.2	55.2	55.4		59.2	58.9
Progression Factor	1.33	0.77		1.02	0.12	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	0.2		1.2	0.1	0.0	6.8	0.1	0.4		0.9	0.0
Delay (s)	82.8	15.1		56.9	1.1	5.1	64.0	55.3	55.9		60.1	58.9
Level of Service	F	B		E	A	A	E	E	E		E	E
Approach Delay (s)		15.2			5.0			58.3			59.6	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.4
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												
Volume (vph)	77	2749	41	99	1143	143	42	63	403	246	31	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86			1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3776	5594	1742	1947	6914			2013	1742	1849	1877	1742
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3776	5594	1742	1947	6914			2013	1742	1849	1877	1742
Peak-hour factor, PHF	0.87	0.94	0.86	0.93	0.97	0.83	0.86	0.72	0.90	0.89	0.76	0.88
Adj. Flow (vph)	89	2924	48	106	1178	172	49	88	448	276	41	33
RTOR Reduction (vph)	0	0	22	0	20	0	0	0	182	0	0	30
Lane Group Flow (vph)	89	2924	26	106	1330	0	0	137	267	157	160	3
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	7.8	69.0	69.0	10.5	70.8			10.5	10.5	10.5	10.5	10.5
Effective Green, g (s)	7.8	69.0	69.0	10.5	70.8			10.5	10.5	10.5	10.5	10.5
Actuated g/C Ratio	0.06	0.55	0.55	0.08	0.56			0.08	0.08	0.08	0.08	0.08
Clearance Time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	4.0	8.0			3.5	3.5	2.5	2.5	2.5
Lane Grp Cap (vph)	233	3063	953	162	3885			167	145	154	156	145
v/s Ratio Prot	0.02	c0.52		c0.05	0.19			0.07		0.08	c0.09	
v/s Ratio Perm			0.02						c0.15			0.00
v/c Ratio	0.38	0.95	0.03	0.65	0.34			0.82	1.84	1.02	1.03	0.02
Uniform Delay, d1	56.8	27.0	13.1	56.0	15.0			56.8	57.8	57.8	57.8	53.0
Progression Factor	1.25	0.54	1.00	1.41	2.32			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	6.2	0.0	9.9	0.2			27.0	402.6	77.7	79.0	0.0
Delay (s)	71.5	20.7	13.1	88.9	35.0			83.8	460.3	135.5	136.7	53.1
Level of Service	E	C	B	F	C			F	F	F	F	D
Approach Delay (s)		22.1			38.9			372.2			128.3	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	70.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	101.5%	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												
Volume (vph)	5	2413	41	127	1083	4	100	4	449	5	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00		1.00	0.88	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1947	5594	1742	3776	5594	1742		1956	3065	1947	1881	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1947	5594	1742	3776	5594	1742		1956	3065	1947	1881	
Peak-hour factor, PHF	0.70	0.92	0.88	0.85	0.97	0.87	0.68	0.53	0.86	0.84	0.81	0.72
Adj. Flow (vph)	7	2623	47	149	1116	5	147	8	522	6	5	6
RTOR Reduction (vph)	0	0	20	0	0	2	0	0	145	0	6	0
Lane Group Flow (vph)	7	2623	27	149	1116	3	0	155	377	6	5	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	1.9	73.4	73.4	10.2	81.3	81.3		13.4	23.6	2.7	2.7	
Effective Green, g (s)	1.9	73.4	73.4	10.2	81.3	81.3		13.4	23.6	2.7	2.7	
Actuated g/C Ratio	0.02	0.58	0.58	0.08	0.65	0.65		0.11	0.19	0.02	0.02	
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0		3.0	4.0	3.0	3.0	
Lane Grp Cap (vph)	29	3258	1014	305	3609	1124		208	732	41	40	
v/s Ratio Prot	0.00	c0.47		0.04	0.20			c0.08	c0.04	c0.00	0.00	
v/s Ratio Perm			0.02			0.00			0.08			
v/c Ratio	0.24	0.81	0.03	0.49	0.31	0.00		0.75	0.51	0.15	0.13	
Uniform Delay, d1	61.3	20.7	11.2	55.4	9.9	7.9		54.6	46.0	60.5	60.5	
Progression Factor	0.61	0.14	1.00	0.81	2.75	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.0	1.6	0.0	1.6	0.2	0.0		13.5	0.8	1.6	1.5	
Delay (s)	40.5	4.6	11.2	46.6	27.4	7.9		68.1	46.9	62.2	61.9	
Level of Service	D	A	B	D	C	A		E	D	E	E	
Approach Delay (s)		4.8			29.6			51.7			62.0	
Approach LOS		A			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	83.0%	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												
Volume (vph)	16	2333	105	35	1141	11	49	4	95	31	4	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1947	5594	1742	3776	3893	1742	1849	1867	1742		1961	1742
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	1947	5594	1742	3776	3893	1742	1849	1867	1742		1961	1742
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)	17	2536	114	38	1240	12	53	4	103	34	4	8
RTOR Reduction (vph)	0	0	49	0	0	4	0	0	86	0	0	8
Lane Group Flow (vph)	17	2536	65	38	1240	8	29	28	17	0	38	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	2.9	72.2	72.2	15.4	84.0	84.0	6.0	6.0	21.4		6.1	6.1
Effective Green, g (s)	2.9	72.2	72.2	15.4	84.0	84.0	6.0	6.0	21.4		6.1	6.1
Actuated g/C Ratio	0.02	0.57	0.57	0.12	0.67	0.67	0.05	0.05	0.17		0.05	0.05
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	44	3205	998	461	2595	1161	88	88	295		94	84
v/s Ratio Prot	0.01	c0.45		0.01	c0.32		c0.02	0.02	0.01		c0.02	
v/s Ratio Perm			0.04			0.00			0.00			0.00
v/c Ratio	0.39	0.79	0.07	0.08	0.48	0.01	0.33	0.32	0.06		0.40	0.00
Uniform Delay, d1	60.7	21.0	11.9	49.0	10.3	7.0	58.1	58.0	43.9		58.2	57.1
Progression Factor	1.39	0.15	0.03	0.90	0.42	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.1	1.6	0.1	0.1	0.6	0.0	1.6	1.5	0.1		2.1	0.0
Delay (s)	87.4	4.8	0.5	44.3	5.0	7.0	59.7	59.5	43.9		60.2	57.1
Level of Service	F	A	A	D	A	A	E	E	D		E	E
Approach Delay (s)		5.1			6.1			49.5			59.7	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2216	24	39	1158	81	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4		6.5	6.8	6.5	6.5
Lane Util. Factor	0.91		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5585		3776	3893	3776	1742
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	5585		3776	3893	3776	1742
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2409	26	42	1259	88	259
RTOR Reduction (vph)	1	0	0	0	0	113
Lane Group Flow (vph)	2434	0	42	1259	88	146
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	86.2		8.4	100.7	12.0	12.0
Effective Green, g (s)	86.2		8.4	100.7	12.0	12.0
Actuated g/C Ratio	0.68		0.07	0.80	0.10	0.10
Clearance Time (s)	6.4		6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0		2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	3820		251	3111	359	165
v/s Ratio Prot	c0.44		0.01	c0.32	0.02	
v/s Ratio Perm						c0.08
v/c Ratio	0.64		0.17	0.40	0.25	0.88
Uniform Delay, d1	11.1		55.5	3.8	52.8	56.3
Progression Factor	1.64		0.59	0.05	1.00	1.00
Incremental Delay, d2	0.6		0.2	0.4	0.3	38.5
Delay (s)	18.8		33.2	0.6	53.1	94.8
Level of Service	B		C	A	D	F
Approach Delay (s)	18.8			1.6	84.2	
Approach LOS	B			A	F	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	36	1505	835	404	735	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1947	3893	3893	1742	3776	1742
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1947	3893	3893	1742	3776	1742
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	1636	908	439	799	50
RTOR Reduction (vph)	0	0	0	193	0	24
Lane Group Flow (vph)	39	1636	908	246	799	26
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	6.5	83.1	70.5	70.5	29.7	29.7
Effective Green, g (s)	6.5	83.1	70.5	70.5	29.7	29.7
Actuated g/C Ratio	0.05	0.66	0.56	0.56	0.24	0.24
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	100	2567	2178	974	890	410
v/s Ratio Prot	0.02	c0.42	0.23		c0.21	
v/s Ratio Perm				0.14		0.01
v/c Ratio	0.39	0.64	0.42	0.25	0.90	0.06
Uniform Delay, d1	57.8	12.6	15.9	14.2	46.7	37.3
Progression Factor	1.19	1.26	2.09	11.19	1.00	1.00
Incremental Delay, d2	1.4	0.9	0.6	0.6	11.9	0.1
Delay (s)	70.2	16.8	33.9	159.8	58.6	37.4
Level of Service	E	B	C	F	E	D
Approach Delay (s)		18.1	74.9		57.3	
Approach LOS		B	E		E	

Intersection Summary			
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	73.6%	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												
Volume (vph)	27	1050	4	68	753	60	7	37	276	215	27	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1947	3893	1742	1947	3893	1742		2018	1742	3776	2049	1742
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1947	3893	1742	1947	3893	1742		2018	1742	3776	2049	1742
Peak-hour factor, PHF	0.62	0.89	0.75	0.92	0.96	0.89	0.31	0.72	0.85	0.76	0.73	0.60
Adj. Flow (vph)	44	1180	5	74	784	67	23	51	325	283	37	60
RTOR Reduction (vph)	0	0	2	0	0	30	0	0	203	0	0	55
Lane Group Flow (vph)	44	1180	3	74	784	37	0	74	122	283	37	5
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	7.1	64.4	64.4	11.6	69.0	69.0		12.1	12.1	11.5	11.5	11.5
Effective Green, g (s)	7.1	64.4	64.4	11.6	69.0	69.0		12.1	12.1	11.5	11.5	11.5
Actuated g/C Ratio	0.06	0.51	0.51	0.09	0.55	0.55		0.10	0.10	0.09	0.09	0.09
Clearance Time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	109	1989	890	179	2131	953		193	167	344	187	158
v/s Ratio Prot	0.02	c0.30		0.04	c0.20			0.04		c0.07	0.02	
v/s Ratio Perm			0.00			0.02			c0.07			0.00
v/c Ratio	0.40	0.59	0.00	0.41	0.37	0.04		0.38	0.73	0.82	0.20	0.03
Uniform Delay, d1	57.4	21.6	15.1	54.0	16.1	13.2		53.4	55.4	56.2	53.0	52.2
Progression Factor	1.23	0.64	1.00	0.66	0.33	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	1.2	0.0	1.5	0.5	0.1		1.3	14.6	14.6	0.5	0.1
Delay (s)	73.2	15.0	15.1	37.3	5.8	13.2		54.7	70.0	70.9	53.5	52.3
Level of Service	E	B	B	D	A	B		D	E	E	D	D
Approach Delay (s)		17.1			8.8			67.2			66.2	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.4
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												
Volume (vph)	72	845	13	84	662	50	5	12	154	82	11	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99	1.00		0.96	
Satd. Flow (prot)	1891	3893	1742	1947	3841			2026	1742		1879	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.99	1.00		0.96	
Satd. Flow (perm)	1891	3893	1742	1947	3841			2026	1742		1879	
Peak-hour factor, PHF	0.84	0.98	0.60	0.93	0.96	0.90	0.67	0.50	0.97	0.90	0.88	0.90
Adj. Flow (vph)	86	862	22	90	690	56	7	24	159	91	12	19
RTOR Reduction (vph)	0	0	9	0	4	0	0	0	139	0	5	0
Lane Group Flow (vph)	86	862	13	90	742	0	0	31	20	0	117	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	2%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			
Actuated Green, G (s)	13.5	71.7	71.7	10.4	68.5			4.8	15.2		12.3	
Effective Green, g (s)	13.5	71.7	71.7	10.4	68.5			4.8	15.2		12.3	
Actuated g/C Ratio	0.11	0.57	0.57	0.08	0.54			0.04	0.12		0.10	
Clearance Time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	202	2215	991	160	2088			77	210		183	
v/s Ratio Prot	0.05	c0.22		c0.05	0.19			c0.02	0.01		c0.06	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.43	0.39	0.01	0.56	0.36			0.40	0.10		0.64	
Uniform Delay, d1	52.6	15.0	11.8	55.6	16.3			59.2	49.3		54.7	
Progression Factor	1.00	1.00	1.00	0.67	0.74			1.00	1.00		1.00	
Incremental Delay, d2	1.1	0.5	0.0	3.5	0.5			2.5	0.1		6.2	
Delay (s)	53.7	15.5	11.8	40.7	12.5			61.7	49.4		60.9	
Level of Service	D	B	B	D	B			E	D		E	
Approach Delay (s)		18.8			15.5			51.4			60.9	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.9
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	87	272	120	153	145	24
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	95	296	130	166	158	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	297				615	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	297				615	130
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				63	97
cM capacity (veh/h)	1265				421	919

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	95	296	130	166	158	26
Volume Left	95	0	0	0	158	0
Volume Right	0	0	0	166	0	26
cSH	1265	1700	1700	1700	421	919
Volume to Capacity	0.07	0.17	0.08	0.10	0.37	0.03
Queue Length 95th (ft)	6	0	0	0	43	2
Control Delay (s)	8.1	0.0	0.0	0.0	18.6	9.0
Lane LOS	A				C	A
Approach Delay (s)	2.0		0.0		17.2	
Approach LOS					C	

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	82	55	80	15	126	61	198	214	40	30	54	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	60	87	16	137	66	215	233	43	33	59	49

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	149	87	153	66	491	140
Volume Left (vph)	89	0	16	0	215	33
Volume Right (vph)	0	87	0	66	43	49
Hadj (s)	0.15	-0.57	0.06	-0.57	0.07	-0.13
Departure Headway (s)	6.1	3.2	6.0	3.2	5.1	5.5
Degree Utilization, x	0.25	0.08	0.25	0.06	0.70	0.21
Capacity (veh/h)	528	1121	533	1121	679	595
Control Delay (s)	11.1	6.5	11.0	6.4	19.2	9.9
Approach Delay (s)	9.4		9.6		19.2	9.9
Approach LOS	A		A		C	A

Intersection Summary			
Delay	13.9		
Level of Service	B		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	28	6	288	25	2	2	62	345	34	5	361	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	7	313	27	2	2	67	375	37	5	392	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								871				
pX, platoon unblocked												
vC, conflicting volume	741	962	405	929	913	188	392			412		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	741	962	405	929	913	188	392			412		
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 %	89	97	47	72	99	100	94			100		
cM capacity (veh/h)	287	238	595	98	255	823	1163			1143		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1
Volume Total	350	29	2	67	188	188	37	423
Volume Left	30	27	0	67	0	0	0	5
Volume Right	313	0	2	0	0	0	37	25
cSH	531	103	823	1163	1700	1700	1700	1143
Volume to Capacity	0.66	0.28	0.00	0.06	0.11	0.11	0.02	0.00
Queue Length 95th (ft)	120	27	0	5	0	0	0	0
Control Delay (s)	23.9	53.3	9.4	8.3	0.0	0.0	0.0	0.2
Lane LOS	C	F	A	A				A
Approach Delay (s)	23.9	50.3		1.2				0.2
Approach LOS	C	F						

Intersection Summary			
Average Delay	8.2		
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	18	9	329	13	13	320
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)	20	10	358	14	14	348
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	734	358			372	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	734	358			372	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	99			99	
cM capacity (veh/h)	383	687			1187	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	29	358	14	14	348
Volume Left	20	0	0	14	0
Volume Right	10	0	14	0	0
cSH	449	1700	1700	1187	1700
Volume to Capacity	0.07	0.21	0.01	0.01	0.20
Queue Length 95th (ft)	5	0	0	1	0
Control Delay (s)	13.6	0.0	0.0	8.1	0.0
Lane LOS	B			A	
Approach Delay (s)	13.6	0.0		0.3	
Approach LOS	B				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 33: Bailey Bridge Road & Bailey Bridge Connector

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)

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	SB
Directions Served	L	L	T	T	R	L	T	T	T	R	LTR	L
Maximum Queue (ft)	89	118	176	202	17	25	133	179	218	82	876	71
Average Queue (ft)	45	75	103	109	4	6	73	103	137	19	608	16
95th Queue (ft)	100	125	188	202	19	24	136	181	233	85	1032	64
Link Distance (ft)			1512	1512			5210	5210			1542	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	205	205			90	190			200	200		220
Storage Blk Time (%)			0	12			0	0	2			
Queuing Penalty (veh)			1	5			0	2	5			

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	115	24	96
Average Queue (ft)	67	5	47
95th Queue (ft)	125	26	107
Link Distance (ft)		1256	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	220		250
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	B53	B53	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	L	L	T	T	T	T
Maximum Queue (ft)	79	153	314	302	4	4	30	66	33	50	85	76
Average Queue (ft)	46	76	168	175	1	1	8	34	8	18	37	31
95th Queue (ft)	88	192	342	344	10	8	31	70	29	53	91	77
Link Distance (ft)			628	628	1002	1002			1512	1512	1512	
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			2	3								
Storage Bay Dist (ft)	420	420					200	200				200
Storage Blk Time (%)			1								0	
Queuing Penalty (veh)			1								0	

Intersection: 102: Lonas Pkwy & Route 360

Movement	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	R	L	L	T	R	L	L	T	T
Maximum Queue (ft)	21	83	129	50	94	86	51	31	3
Average Queue (ft)	5	17	78	22	56	48	14	10	0
95th Queue (ft)	23	66	131	56	107	84	46	34	6
Link Distance (ft)				412	412	251	251	251	251
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200	240	240						
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

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)

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

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)

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

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)

Intersection: 107: Route 360 & Market Square Ln

Movement	EB	EB	EB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	458	585	581	44
Average Queue (ft)	107	284	230	27
95th Queue (ft)	452	732	671	53
Link Distance (ft)	572	572	572	262
Upstream Blk Time (%)	0	1	1	
Queuing Penalty (veh)	1	9	6	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	144	458	633	649	654	659	450	69	91	166	144	164
Average Queue (ft)	99	205	560	614	632	625	343	34	56	102	100	121
95th Queue (ft)	163	510	714	685	662	674	642	73	95	166	162	180
Link Distance (ft)			609	609	609	609		572	572	572	572	572
Upstream Blk Time (%)		0	6	16	33	25						
Queuing Penalty (veh)		0	74	186	378	281						
Storage Bay Dist (ft)	300	300					250					
Storage Blk Time (%)			15			48						
Queuing Penalty (veh)			46			92						

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB	B996	B996
Directions Served	T	L	L	T	T	R	L	L	T	R	T	T
Maximum Queue (ft)	187	26	48	49	16	55	440	552	321	205	86	57
Average Queue (ft)	141	6	21	23	3	24	342	428	157	105	25	21
95th Queue (ft)	201	26	50	58	15	59	616	766	538	223	169	152
Link Distance (ft)	572			704	704			741	741		792	792
Upstream Blk Time (%)								11	3			
Queuing Penalty (veh)								0	0			
Storage Bay Dist (ft)		390	390			250	430			430		
Storage Blk Time (%)							0	27	3			
Queuing Penalty (veh)							1	53	9			

Intersection: 109: Route 360 & Village Green Dr

Movement	EB	EB	EB	EB	EB	WB
Directions Served	L	T	T	T	T	TR
Maximum Queue (ft)	107	380	384	396	388	2
Average Queue (ft)	52	204	305	341	320	0
95th Queue (ft)	126	451	486	475	494	5
Link Distance (ft)		355	355	355	355	609
Upstream Blk Time (%)		1	4	16	11	
Queuing Penalty (veh)		11	57	217	149	
Storage Bay Dist (ft)	240					
Storage Blk Time (%)		3				
Queuing Penalty (veh)		2				

Intersection: 110: Route 360

Movement	EB	EB	EB	EB	SB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	242	275	278	264	22
Average Queue (ft)	143	185	195	171	7
95th Queue (ft)	310	352	355	330	23
Link Distance (ft)	235	235	235	235	754
Upstream Blk Time (%)	1	4	6	3	
Queuing Penalty (veh)	9	47	69	31	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R	L	L	T	T	T	T	L
Maximum Queue (ft)	880	890	905	924	400	134	143	35	36	47	64	90
Average Queue (ft)	486	565	600	583	252	91	105	10	14	19	39	56
95th Queue (ft)	956	1013	1032	1061	535	163	174	36	40	50	76	99
Link Distance (ft)	870	870	870	870		235	235	235	235	235	235	396
Upstream Blk Time (%)	4	6	11	24		0	0					
Queuing Penalty (veh)	46	63	125	272		0	0					
Storage Bay Dist (ft)					200							
Storage Blk Time (%)				49								
Queuing Penalty (veh)				161								

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	72	279
Average Queue (ft)	32	202
95th Queue (ft)	80	344
Link Distance (ft)	396	396
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	EB	EB	EB	EB	EB	WB	NB
Directions Served	T	T	T	T	R	L	R
Maximum Queue (ft)	370	592	503	532	201	81	13
Average Queue (ft)	68	127	127	132	29	42	3
95th Queue (ft)	358	639	500	525	253	101	36
Link Distance (ft)	2133	2133	2133	2133			1050
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					500	600	
Storage Blk Time (%)				6			
Queuing Penalty (veh)				6			

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	R	LT
Maximum Queue (ft)	107	327	384	432	442	92	105	90	94	107	28	251
Average Queue (ft)	47	197	264	321	332	51	64	56	56	66	8	114
95th Queue (ft)	103	353	419	476	479	106	112	92	105	117	29	329
Link Distance (ft)		2494	2494	2494	2494		2133	2133	2133	2133		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140					150					160	200
Storage Blk Time (%)	1	17				0	0					
Queuing Penalty (veh)	7	14				2	0					

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	NB	SB	SB	SB
Directions Served	R	L	LT	R
Maximum Queue (ft)	675	119	145	28
Average Queue (ft)	454	71	94	10
95th Queue (ft)	787	124	148	29
Link Distance (ft)	874		588	
Upstream Blk Time (%)	3			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)		120		120
Storage Blk Time (%)	73	1	6	
Queuing Penalty (veh)	24	1	9	

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T	R	L	L	T	T	T	TR
Maximum Queue (ft)	194	251	280	316	328	31	68	96	187	179	197	248
Average Queue (ft)	125	162	197	230	237	8	30	58	128	120	136	168
95th Queue (ft)	206	266	297	329	345	29	79	104	202	192	215	258
Link Distance (ft)		1704	1704	1704	1704				2494	2494	2494	2494
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200					360	280	280				
Storage Blk Time (%)	2	5			0							
Queuing Penalty (veh)	19	8			0							

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	LT	R
Maximum Queue (ft)	70	520	1079	114	141	69
Average Queue (ft)	31	165	749	42	98	39
95th Queue (ft)	74	677	1240	112	153	74
Link Distance (ft)		1289	1289		818	
Upstream Blk Time (%)		3	6			
Queuing Penalty (veh)		0	0			
Storage Bay Dist (ft)	190			200		250
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	13	93	124	216	223	68	91	59	77	76	68	5
Average Queue (ft)	4	35	39	62	80	32	56	18	37	36	28	1
95th Queue (ft)	16	87	107	135	152	74	92	56	79	81	75	6
Link Distance (ft)		820	820	820	820			1704	1704	1704	1704	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	540					170	170					190
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 115: Chital Dr & Route 360

Movement	NB	NB	NB	SB	SB
Directions Served	L	T	R	LT	R
Maximum Queue (ft)	96	10	108	34	20
Average Queue (ft)	54	2	63	10	5
95th Queue (ft)	108	11	119	34	21
Link Distance (ft)		998	998	595	595
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)	3				
Queuing Penalty (veh)	0				

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	TR	LT
Maximum Queue (ft)	37	54	267	316	349	4	124	259	292	221	179	207
Average Queue (ft)	13	26	182	226	254	1	78	190	219	166	114	136
95th Queue (ft)	39	56	308	344	375	5	136	265	299	236	195	231
Link Distance (ft)			861	861	861			820	820	820	820	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	220	220				230	115					130
Storage Blk Time (%)			5		13		10	23				19
Queuing Penalty (veh)			5		6		28	24				84

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	NB	SB	SB	SB
Directions Served	R	L	LT	R
Maximum Queue (ft)	324	222	346	177
Average Queue (ft)	184	175	241	54
95th Queue (ft)	410	276	399	199
Link Distance (ft)	2172		979	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		90		170
Storage Blk Time (%)	16	48	78	
Queuing Penalty (veh)	22	102	133	

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	B1
Directions Served	L	T	T	T	R	L	L	T	T	T	R	T
Maximum Queue (ft)	13	151	168	198	25	70	105	250	308	210	11	84
Average Queue (ft)	2	63	84	108	7	36	69	174	217	102	2	12
95th Queue (ft)	13	170	199	237	26	80	116	264	330	232	11	176
Link Distance (ft)		1093	1093	1093				729	729	729		861
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	180				170	280	280				575	
Storage Blk Time (%)		1		2				0				
Queuing Penalty (veh)		0		1				0				

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	B1	B1	NB	NB	NB	SB	SB
Directions Served	T	T	LT	R	R	L	TR
Maximum Queue (ft)	165	80	175	190	179	14	10
Average Queue (ft)	24	11	96	132	116	3	2
95th Queue (ft)	251	168	184	200	188	12	10
Link Distance (ft)	861	861		1849		458	458
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			430		1000		
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	L	T	T	R	L	LT
Maximum Queue (ft)	30	189	202	213	48	31	58	60	74	2	63	53
Average Queue (ft)	13	83	115	130	20	10	29	21	29	0	30	18
95th Queue (ft)	36	183	211	227	55	35	61	67	79	3	72	51
Link Distance (ft)		1163	1163	1163				1093	1093	1093	784	784
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				200	300	300					
Storage Blk Time (%)		1		2								
Queuing Penalty (veh)		0		2								

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	SB	SB
Directions Served	R	LT	R
Maximum Queue (ft)	111	60	3
Average Queue (ft)	53	23	1
95th Queue (ft)	117	62	3
Link Distance (ft)	784	950	950
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 119: Ashlake & Route 360

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	TR	L	L	T	T	L	L	R
Maximum Queue (ft)	270	279	245	32	61	61	114	46	87	191
Average Queue (ft)	197	194	155	7	33	21	42	20	49	124
95th Queue (ft)	295	296	250	32	67	67	122	48	94	200
Link Distance (ft)	925	925				1163	1163		2584	2584
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			200	400	400			200		
Storage Blk Time (%)		4	1							
Queuing Penalty (veh)		34	5							

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	L	L	R
Maximum Queue (ft)	89	188	195	314	324	573	553	250
Average Queue (ft)	44	142	148	226	238	450	423	92
95th Queue (ft)	96	203	211	330	338	631	599	270
Link Distance (ft)		4659	4659	925	925	1153	1153	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200							150
Storage Blk Time (%)		0					71	
Queuing Penalty (veh)		0					36	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	T	R	L	T	T	LT	R	L	L	T
Maximum Queue (ft)	67	199	224	5	112	72	84	92	226	230	252	132
Average Queue (ft)	30	141	136	1	55	31	36	49	132	149	179	41
95th Queue (ft)	69	226	234	7	120	78	86	100	226	271	290	125
Link Distance (ft)		2661	2661			4659	4659	750	750			1435
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	240			200	230					240	240	
Storage Blk Time (%)		0	2							3	7	
Queuing Penalty (veh)		0	0							3	7	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB
Directions Served	R
Maximum Queue (ft)	52
Average Queue (ft)	27
95th Queue (ft)	51
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	130
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	L	T	TR	LT	R	LTR
Maximum Queue (ft)	94	171	176	105	82	75	56	80	178
Average Queue (ft)	53	101	106	61	29	34	25	41	112
95th Queue (ft)	109	180	187	112	86	88	57	78	188
Link Distance (ft)		3677	3677		2661	2661	1013		1599
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200			375				500	
Storage Blk Time (%)		0	0						
Queuing Penalty (veh)		0	0						

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	46	6	77	26
Average Queue (ft)	22	1	46	8
95th Queue (ft)	56	8	90	27
Link Distance (ft)				817
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	225	275	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LTR	LTR
Maximum Queue (ft)	61	22	71	49	194	81
Average Queue (ft)	38	3	45	12	105	40
95th Queue (ft)	63	24	73	53	191	78
Link Distance (ft)	777	777	840		660	541
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				400		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 2997

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
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	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		8				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	1258	101	27	1757	200	79	27	25	271	59	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.95	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	3470	3893	1742	1947	5594	1600		1936		3470	1883	1600
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	3470	3893	1742	1947	5594	1600		1936		3470	1883	1600
Peak-hour factor, PHF	0.89	0.93	0.74	0.61	0.98	0.81	0.79	0.61	0.63	0.86	0.82	0.83
Adj. Flow (vph)	191	1353	136	44	1793	247	100	44	40	315	72	263
RTOR Reduction (vph)	0	0	59	0	0	99	0	8	0	0	0	110
Lane Group Flow (vph)	191	1353	77	44	1793	148	0	176	0	315	72	153
Heavy Vehicles (%)	11%	2%	2%	2%	2%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	13.8	71.3	71.3	6.8	64.6	64.6		9.5		12.5	12.5	26.3
Effective Green, g (s)	13.8	71.3	71.3	6.8	64.6	64.6		9.5		12.5	12.5	26.3
Actuated g/C Ratio	0.11	0.57	0.57	0.05	0.51	0.51		0.08		0.10	0.10	0.21
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	380	2202	985	105	2868	820		145		344	186	333
v/s Ratio Prot	0.06	c0.35		0.02	c0.32			c0.09		c0.09	0.04	0.05
v/s Ratio Perm			0.04			0.09						0.05
v/c Ratio	0.50	0.61	0.08	0.42	0.63	0.18		1.21		0.92	0.39	0.46
Uniform Delay, d1	52.9	18.2	12.4	57.7	22.0	16.5		58.2		56.2	53.2	43.6
Progression Factor	1.00	1.13	2.60	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.9	0.1	2.0	1.0	0.5		142.7		30.0	3.7	1.2
Delay (s)	53.7	21.4	32.4	59.7	23.1	17.0		200.9		86.2	56.9	44.8
Level of Service	D	C	C	E	C	B		F		F	E	D
Approach Delay (s)		26.0			23.1			200.9			66.2	
Approach LOS		C			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	25.9
Intersection Capacity Utilization	70.7%	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												
Volume (vph)	332	1369	91	67	1915	72	80	9	47	113	4	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.93	0.89	0.73	0.67	0.98	0.82	0.83	0.45	0.69	0.64	0.50	0.77
Adj. Flow (vph)	357	1538	125	100	1954	88	96	20	68	177	8	309
RTOR Reduction (vph)	0	0	45	0	0	35	0	0	63	0	0	140
Lane Group Flow (vph)	357	1538	80	100	1954	53	96	20	5	177	8	169
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	12.0	78.6	78.6	9.0	75.6	75.6	8.4	8.4	8.4	9.0	9.0	9.0
Effective Green, g (s)	12.0	78.6	78.6	9.0	75.6	75.6	8.4	8.4	8.4	9.0	9.0	9.0
Actuated g/C Ratio	0.10	0.62	0.62	0.07	0.60	0.60	0.07	0.07	0.07	0.07	0.07	0.07
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	326	2207	987	245	3844	949	228	124	105	245	252	113
v/s Ratio Prot	c0.10	c0.43		0.03	0.30		c0.03	0.01		0.05	0.00	
v/s Ratio Perm			0.05			0.03			0.00			c0.11
v/c Ratio	1.10	0.70	0.08	0.41	0.51	0.06	0.42	0.16	0.04	0.72	0.03	1.49
Uniform Delay, d1	57.0	15.8	9.4	56.0	14.5	10.4	56.5	55.5	55.0	57.3	54.4	58.5
Progression Factor	0.75	1.00	2.04	1.24	0.81	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	75.7	1.7	0.1	0.6	0.4	0.1	0.9	0.4	0.1	9.5	0.0	262.9
Delay (s)	118.6	17.4	19.3	70.0	12.1	9.0	57.4	55.9	55.2	66.7	54.5	321.4
Level of Service	F	B	B	E	B	A	E	E	E	E	D	F
Approach Delay (s)		35.4			14.6			56.4			225.8	
Approach LOS		D			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	46.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	381	1829	336	479	3819	334	366	211	256	303	143	427
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Peak-hour factor, PHF	0.94	0.91	0.83	0.91	0.98	0.83	0.92	0.80	0.88	0.87	0.92	0.94
Adj. Flow (vph)	405	2010	405	526	3897	402	398	264	291	348	155	454
RTOR Reduction (vph)	0	0	172	0	0	111	0	0	195	0	0	129
Lane Group Flow (vph)	405	2010	234	526	3897	291	398	264	96	348	155	325
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.5	63.0	63.0	16.5	67.8	67.8	11.5	9.5	9.5	10.5	8.5	20.0
Effective Green, g (s)	11.5	63.0	63.0	16.5	67.8	67.8	11.5	9.5	9.5	10.5	8.5	20.0
Actuated g/C Ratio	0.09	0.50	0.50	0.13	0.54	0.54	0.09	0.08	0.08	0.08	0.07	0.16
Clearance Time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	313	3204	791	449	3448	851	313	266	119	286	125	332
v/s Ratio Prot	c0.12	0.31		0.15	c0.61		c0.12	0.07		0.10	0.08	c0.09
v/s Ratio Perm			0.15			0.18			0.06			0.12
v/c Ratio	1.29	0.63	0.30	1.17	1.13	0.34	1.27	0.99	0.81	1.22	1.24	0.98
Uniform Delay, d1	57.2	22.9	18.5	54.8	29.1	16.5	57.2	58.2	57.3	57.8	58.8	52.8
Progression Factor	0.83	1.89	5.56	1.18	1.33	1.98	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	150.1	0.8	0.8	98.4	62.8	1.1	144.9	52.9	30.7	125.1	158.6	43.4
Delay (s)	197.6	44.1	103.6	163.1	101.4	33.6	202.2	111.1	88.0	182.8	217.4	96.2
Level of Service	F	D	F	F	F	C	F	F	F	F	F	F
Approach Delay (s)		74.7			102.5			142.1			147.3	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	102.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2332	180	466	4162	433	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12
Total Lost time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Lane Util. Factor	0.86	1.00	0.97	0.86	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6408	1583	3433	6408	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6408	1583	3433	6408	3433	1583
Peak-hour factor, PHF	0.88	0.80	0.88	0.98	0.89	0.92
Adj. Flow (vph)	2650	225	530	4247	487	308
RTOR Reduction (vph)	0	75	0	0	0	162
Lane Group Flow (vph)	2650	150	530	4247	487	146
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	76.7	76.7	15.5	98.3	14.5	14.5
Effective Green, g (s)	76.7	76.7	15.5	98.3	14.5	14.5
Actuated g/C Ratio	0.61	0.61	0.12	0.78	0.12	0.12
Clearance Time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Vehicle Extension (s)	8.0	8.0	2.5	8.0	2.5	2.5
Lane Grp Cap (vph)	3900	963	422	4999	395	182
v/s Ratio Prot	0.41		c0.15	c0.66	c0.14	
v/s Ratio Perm		0.09				0.09
v/c Ratio	0.68	0.16	1.26	0.85	1.23	0.80
Uniform Delay, d1	16.4	10.7	55.2	9.0	55.8	54.4
Progression Factor	2.09	5.02	0.96	0.56	1.00	1.00
Incremental Delay, d2	0.4	0.2	117.0	0.2	125.0	21.4
Delay (s)	34.9	53.7	170.3	5.2	180.8	75.7
Level of Service	C	D	F	A	F	E
Approach Delay (s)	36.4			23.5	140.1	
Approach LOS	D			C	F	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	2251	20	249	4076	128	34	7	130	198	15	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	6399		1770	6408	1583		1788	1583	1681	1696	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.43	1.00	0.71	0.70	1.00
Satd. Flow (perm)	1770	6399		1770	6408	1583		804	1583	1257	1244	1583
Peak-hour factor, PHF	0.75	0.90	0.83	0.84	0.94	0.82	0.57	0.58	0.79	0.69	0.75	0.74
Adj. Flow (vph)	84	2501	24	296	4336	156	60	12	165	287	20	132
RTOR Reduction (vph)	0	1	0	0	0	60	0	0	105	0	0	122
Lane Group Flow (vph)	84	2524	0	296	4336	96	0	72	60	152	155	10
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			4	1		3	
Permitted Phases						6	4		4	3		3
Actuated Green, G (s)	9.0	56.4		25.5	72.9	72.9		8.5	34.0	9.5	9.5	9.5
Effective Green, g (s)	9.0	56.4		25.5	72.9	72.9		8.5	34.0	9.5	9.5	9.5
Actuated g/C Ratio	0.07	0.45		0.20	0.58	0.58		0.07	0.27	0.08	0.08	0.08
Clearance Time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	126	2864		358	3707	915		54	508	94	93	119
v/s Ratio Prot	0.05	c0.39		0.17	c0.68				0.02			
v/s Ratio Perm						0.06		c0.09	0.01	0.12	c0.12	0.01
v/c Ratio	0.67	0.88		0.83	1.17	0.10		1.33	0.12	1.62	1.67	0.08
Uniform Delay, d1	57.0	31.7		48.1	26.5	11.9		58.8	34.7	58.2	58.2	54.2
Progression Factor	0.77	0.94		0.81	0.66	0.35		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	2.9		7.8	78.0	0.1		235.1	0.1	321.1	342.4	0.3
Delay (s)	52.3	32.7		46.9	95.5	4.2		293.8	34.8	379.3	400.6	54.5
Level of Service	D	C		D	F	A		F	C	F	F	D
Approach Delay (s)		33.3			89.5			113.5			289.2	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	82.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.1
Intersection Capacity Utilization	92.1%	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												
Volume (vph)	166	1784	63	421	3718	69	56	46	380	170	84	292
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86		1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (prot)	1770	6408	1583	3433	6382		1770	1863	1583	1681	1734	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (perm)	1770	6408	1583	3433	6382		1770	1863	1583	1681	1734	1583
Peak-hour factor, PHF	0.88	0.92	0.66	0.93	0.96	0.66	0.64	0.86	0.83	0.73	0.84	0.92
Adj. Flow (vph)	189	1939	95	453	3873	105	88	53	458	233	100	317
RTOR Reduction (vph)	0	0	51	0	3	0	0	0	64	0	0	184
Lane Group Flow (vph)	189	1939	44	453	3975	0	88	53	394	163	170	133
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	11.7	57.8	57.8	24.4	70.6		8.3	8.3	32.7	9.5	9.5	9.5
Effective Green, g (s)	11.7	57.8	57.8	24.4	70.6		8.3	8.3	32.7	9.5	9.5	9.5
Actuated g/C Ratio	0.09	0.46	0.46	0.19	0.56		0.07	0.07	0.26	0.08	0.08	0.08
Clearance Time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	164	2939	726	664	3575		116	122	492	126	130	119
v/s Ratio Prot	0.11	0.30		0.13	c0.62		0.05	0.03	c0.15	0.10	c0.10	
v/s Ratio Perm			0.03						0.09			0.08
v/c Ratio	1.15	0.66	0.06	0.68	1.11		0.76	0.43	0.80	1.29	1.31	1.12
Uniform Delay, d1	57.1	26.5	19.0	47.2	27.7		57.9	56.6	43.6	58.2	58.2	58.2
Progression Factor	0.61	1.71	1.00	1.48	0.31		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	112.5	1.0	0.1	0.2	50.8		23.3	1.8	8.6	178.7	183.0	117.6
Delay (s)	147.3	46.2	19.1	70.3	59.3		81.2	58.4	52.2	236.9	241.2	175.9
Level of Service	F	D	B	E	E		F	E	D	F	F	F
Approach Delay (s)		53.6			60.5			57.0			208.3	
Approach LOS		D			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	70.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	94.0%	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												
Volume (vph)	9	1927	130	275	3787	4	141	4	72	14	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.86		0.97	0.86	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	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00
Satd. Flow (prot)	1947	6970		3776	7049	1742	1947	2049	1742		1965	1742
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00
Satd. Flow (perm)	1947	6970		3776	7049	1742	1947	2049	1742		1965	1742
Peak-hour factor, PHF	0.56	0.94	0.79	0.88	0.98	0.92	0.90	0.92	0.82	0.58	0.92	0.50
Adj. Flow (vph)	16	2050	165	312	3864	4	157	4	88	24	4	8
RTOR Reduction (vph)	0	9	0	0	0	1	0	0	82	0	0	8
Lane Group Flow (vph)	16	2206	0	312	3864	3	157	4	6	0	28	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	3	4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	2.9	70.6		16.4	83.5	88.2	8.5	8.5	8.5		4.7	4.7
Effective Green, g (s)	2.9	70.6		16.4	83.5	88.2	8.5	8.5	8.5		4.7	4.7
Actuated g/C Ratio	0.02	0.56		0.13	0.66	0.70	0.07	0.07	0.07		0.04	0.04
Clearance Time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	8.0		5.0	8.0	2.5	3.5	3.5	3.5		2.5	2.5
Lane Grp Cap (vph)	44	3905		491	4671	1219	131	138	117		73	64
v/s Ratio Prot	0.01	0.32		c0.08	c0.55	0.00	c0.08	0.00			c0.01	
v/s Ratio Perm						0.00			0.00			0.00
v/c Ratio	0.36	0.56		0.64	0.83	0.00	1.20	0.03	0.05		0.38	0.00
Uniform Delay, d1	60.6	17.8		52.0	15.9	5.7	58.8	54.9	55.0		59.2	58.4
Progression Factor	1.25	0.10		1.26	0.27	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	0.4		0.3	0.2	0.0	141.6	0.1	0.2		2.4	0.0
Delay (s)	77.9	2.2		65.6	4.4	5.7	200.4	55.0	55.2		61.7	58.4
Level of Service	E	A		E	A	A	F	D	E		E	E
Approach Delay (s)		2.7			8.9			146.7			60.9	
Approach LOS		A			A			F			E	

Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	90.1%	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												
Volume (vph)	132	1621	76	319	3284	329	120	46	231	214	73	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86			1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3776	5594	1742	1947	6938			1981	1742	1849	1905	1742
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.97	1.00	0.95	0.98	1.00
Satd. Flow (perm)	3776	5594	1742	1947	6938			1981	1742	1849	1905	1742
Peak-hour factor, PHF	0.87	0.94	0.86	0.93	0.97	0.83	0.86	0.72	0.90	0.89	0.76	0.88
Adj. Flow (vph)	152	1724	88	343	3386	396	140	64	257	240	96	152
RTOR Reduction (vph)	0	0	50	0	16	0	0	0	236	0	0	139
Lane Group Flow (vph)	152	1724	38	343	3766	0	0	204	21	166	170	13
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	8.9	54.0	54.0	25.5	69.7			10.5	10.5	10.5	10.5	10.5
Effective Green, g (s)	8.9	54.0	54.0	25.5	69.7			10.5	10.5	10.5	10.5	10.5
Actuated g/C Ratio	0.07	0.43	0.43	0.20	0.55			0.08	0.08	0.08	0.08	0.08
Clearance Time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	4.0	8.0			3.5	3.5	2.5	2.5	2.5
Lane Grp Cap (vph)	266	2397	746	394	3837			165	145	154	158	145
v/s Ratio Prot	0.04	c0.31		0.18	c0.54			c0.10		c0.09	0.09	
v/s Ratio Perm			0.02						0.01			0.01
v/c Ratio	0.57	0.72	0.05	0.87	0.98			1.24	0.15	1.08	1.08	0.09
Uniform Delay, d1	56.7	29.7	21.0	48.7	27.5			57.8	53.6	57.8	57.8	53.3
Progression Factor	0.68	1.36	35.35	0.64	0.34			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	1.3	0.1	12.8	7.9			147.5	0.6	94.8	93.3	0.2
Delay (s)	40.4	41.7	743.3	43.9	17.3			205.3	54.2	152.6	151.0	53.5
Level of Service	D	D	F	D	B			F	D	F	F	D
Approach Delay (s)		73.1			19.5			121.0			121.2	
Approach LOS		E			B			F			F	

Intersection Summary			
HCM 2000 Control Delay	48.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	89.6%	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												
Volume (vph)	14	1496	81	747	2683	108	130	21	259	74	78	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00		1.00	0.88	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1947	5594	1742	3776	5594	1742		1968	3065	1947	1972	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1947	5594	1742	3776	5594	1742		1968	3065	1947	1972	
Peak-hour factor, PHF	0.70	0.92	0.88	0.85	0.97	0.87	0.68	0.53	0.86	0.84	0.81	0.72
Adj. Flow (vph)	20	1626	92	879	2766	124	191	40	301	88	96	32
RTOR Reduction (vph)	0	0	58	0	0	51	0	0	99	0	9	0
Lane Group Flow (vph)	20	1626	34	879	2766	73	0	231	202	88	119	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	3.4	46.2	46.2	31.5	73.9	73.9		12.6	44.1	9.4	9.4	
Effective Green, g (s)	3.4	46.2	46.2	31.5	73.9	73.9		12.6	44.1	9.4	9.4	
Actuated g/C Ratio	0.03	0.37	0.37	0.25	0.59	0.59		0.10	0.35	0.07	0.07	
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0		3.0	4.0	3.0	3.0	
Lane Grp Cap (vph)	52	2051	638	944	3280	1021		196	1230	145	147	
v/s Ratio Prot	0.01	c0.29		0.23	c0.49			c0.12	0.04	0.05	c0.06	
v/s Ratio Perm			0.02			0.04			0.02			
v/c Ratio	0.38	0.79	0.05	0.93	0.84	0.07		1.18	0.16	0.61	0.81	
Uniform Delay, d1	60.3	35.6	25.8	46.2	21.3	11.2		56.7	28.2	56.5	57.4	
Progression Factor	1.06	1.18	10.18	1.46	0.71	2.58		1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.1	2.9	0.1	6.4	1.0	0.0		120.7	0.1	7.0	26.7	
Delay (s)	67.9	44.9	262.4	73.9	16.1	29.1		177.4	28.3	63.5	84.1	
Level of Service	E	D	F	E	B	C		F	C	E	F	
Approach Delay (s)		56.7			30.0			93.1			75.7	
Approach LOS		E			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	44.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	87.8%	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												
Volume (vph)	30	1474	106	215	2603	18	211	8	106	11	6	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	1947	5594	1742	3776	3893	1742	1849	1861	1742		1986	1742
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	1947	5594	1742	3776	3893	1742	1849	1861	1742		1986	1742
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)	33	1602	115	234	2829	20	229	9	115	12	7	37
RTOR Reduction (vph)	0	0	56	0	0	8	0	0	88	0	0	35
Lane Group Flow (vph)	33	1602	59	234	2829	12	119	119	27	0	19	2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	4.7	65.1	65.1	18.0	77.7	77.7	11.3	11.3	29.3		5.3	5.3
Effective Green, g (s)	4.7	65.1	65.1	18.0	77.7	77.7	11.3	11.3	29.3		5.3	5.3
Actuated g/C Ratio	0.04	0.52	0.52	0.14	0.62	0.62	0.09	0.09	0.23		0.04	0.04
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	72	2890	900	539	2400	1074	165	166	405		83	73
v/s Ratio Prot	0.02	c0.29		0.06	c0.73		c0.06	0.06	0.01		c0.01	
v/s Ratio Perm			0.03			0.01			0.01			0.00
v/c Ratio	0.46	0.55	0.07	0.43	1.18	0.01	0.72	0.72	0.07		0.23	0.02
Uniform Delay, d1	59.4	20.6	15.2	49.3	24.1	9.3	55.8	55.8	37.7		58.4	57.9
Progression Factor	1.17	0.94	3.33	1.16	1.27	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.9	0.7	0.1	0.2	83.2	0.0	13.6	12.9	0.1		1.0	0.1
Delay (s)	72.2	20.0	50.8	57.5	113.8	9.3	69.4	68.7	37.7		59.4	57.9
Level of Service	E	B	D	E	F	A	E	E	D		E	E
Approach Delay (s)		23.0			108.9			58.8			58.4	
Approach LOS		C			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	76.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	105.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1513	90	203	2645	115	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4		6.5	6.8	6.5	6.5
Lane Util. Factor	0.91		0.97	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5547		3776	3893	3776	1742
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	5547		3776	3893	3776	1742
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1645	98	221	2875	125	105
RTOR Reduction (vph)	5	0	0	0	0	98
Lane Group Flow (vph)	1738	0	221	2875	125	8
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	78.1		19.5	103.7	9.0	9.0
Effective Green, g (s)	78.1		19.5	103.7	9.0	9.0
Actuated g/C Ratio	0.62		0.15	0.82	0.07	0.07
Clearance Time (s)	6.4		6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0		2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	3438		584	3204	269	124
v/s Ratio Prot	0.31		0.06	c0.74	c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.51		0.38	0.90	0.46	0.06
Uniform Delay, d1	13.3		47.8	7.5	56.2	54.6
Progression Factor	0.48		0.90	1.01	1.00	1.00
Incremental Delay, d2	0.5		0.0	0.4	0.9	0.1
Delay (s)	6.8		43.0	8.0	57.1	54.7
Level of Service	A		D	A	E	D
Approach Delay (s)	6.8			10.5	56.0	
Approach LOS	A			B	E	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	59	1062	2001	759	541	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1947	3893	3893	1742	3776	1742
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1947	3893	3893	1742	3776	1742
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	1154	2175	825	588	38
RTOR Reduction (vph)	0	0	0	331	0	25
Lane Group Flow (vph)	64	1154	2175	494	588	13
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	7.5	89.1	75.5	75.5	23.7	23.7
Effective Green, g (s)	7.5	89.1	75.5	75.5	23.7	23.7
Actuated g/C Ratio	0.06	0.71	0.60	0.60	0.19	0.19
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	115	2752	2332	1043	710	327
v/s Ratio Prot	0.03	c0.30	c0.56		c0.16	
v/s Ratio Perm				0.28		0.01
v/c Ratio	0.56	0.42	0.93	0.47	0.83	0.04
Uniform Delay, d1	57.6	7.7	22.9	14.1	49.2	41.8
Progression Factor	1.26	0.86	0.77	1.53	1.00	1.00
Incremental Delay, d2	3.5	0.4	4.3	0.7	8.1	0.1
Delay (s)	76.4	6.9	22.0	22.4	57.3	41.9
Level of Service	E	A	C	C	E	D
Approach Delay (s)		10.6	22.1		56.4	
Approach LOS		B	C		E	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	81.4%	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												
Volume (vph)	32	686	6	213	1616	207	5	26	173	262	47	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1947	3893	1742	1947	3893	1742		2018	1742	3776	2049	1742
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1947	3893	1742	1947	3893	1742		2018	1742	3776	2049	1742
Peak-hour factor, PHF	0.62	0.89	0.75	0.92	0.96	0.89	0.31	0.72	0.85	0.76	0.73	0.60
Adj. Flow (vph)	52	771	8	232	1683	233	16	36	204	345	64	68
RTOR Reduction (vph)	0	0	5	0	0	61	0	0	190	0	0	62
Lane Group Flow (vph)	52	771	3	232	1683	172	0	52	14	345	64	6
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	7.6	54.8	54.8	25.8	73.1	73.1		8.5	8.5	10.5	10.5	10.5
Effective Green, g (s)	7.6	54.8	54.8	25.8	73.1	73.1		8.5	8.5	10.5	10.5	10.5
Actuated g/C Ratio	0.06	0.43	0.43	0.20	0.58	0.58		0.07	0.07	0.08	0.08	0.08
Clearance Time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	117	1693	757	398	2258	1010		136	117	314	170	145
v/s Ratio Prot	0.03	c0.20		0.12	c0.43			c0.03		c0.09	0.03	
v/s Ratio Perm			0.00			0.10			0.01			0.00
v/c Ratio	0.44	0.46	0.00	0.58	0.75	0.17		0.38	0.12	1.10	0.38	0.04
Uniform Delay, d1	57.2	25.1	20.2	45.2	19.6	12.3		56.2	55.2	57.8	54.7	53.1
Progression Factor	0.77	0.80	1.00	0.51	0.11	0.01		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.9	0.0	0.9	0.9	0.1		1.8	0.5	79.9	1.4	0.1
Delay (s)	46.8	20.9	20.2	23.8	3.0	0.3		58.0	55.7	137.6	56.1	53.2
Level of Service	D	C	C	C	A	A		E	E	F	E	D
Approach Delay (s)		22.5			5.0			56.2			114.7	
Approach LOS		C			A			E			F	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	80.3%	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												
Volume (vph)	27	557	12	216	1331	115	8	4	113	54	21	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1891	3893	1742	1947	3834			1989	1742		1840	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.98	
Satd. Flow (perm)	1891	3893	1742	1947	3834			1989	1742		1840	
Peak-hour factor, PHF	0.84	0.98	0.60	0.93	0.96	0.90	0.67	0.50	0.97	0.90	0.88	0.90
Adj. Flow (vph)	32	568	20	232	1386	128	12	8	116	60	24	60
RTOR Reduction (vph)	0	0	10	0	4	0	0	0	96	0	20	0
Lane Group Flow (vph)	32	568	10	232	1510	0	0	20	20	0	124	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	2%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			
Actuated Green, G (s)	8.1	65.4	65.4	18.3	75.5			3.0	21.3		12.5	
Effective Green, g (s)	8.1	65.4	65.4	18.3	75.5			3.0	21.3		12.5	
Actuated g/C Ratio	0.06	0.52	0.52	0.15	0.60			0.02	0.17		0.10	
Clearance Time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	121	2020	904	282	2297			47	294		182	
v/s Ratio Prot	0.02	c0.15		c0.12	c0.39			c0.01	0.01		c0.07	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.26	0.28	0.01	0.82	0.66			0.43	0.07		0.68	
Uniform Delay, d1	56.1	17.1	14.7	52.3	16.7			60.7	44.0		54.8	
Progression Factor	1.00	1.00	1.00	1.27	0.21			1.00	1.00		1.00	
Incremental Delay, d2	0.9	0.3	0.0	12.4	1.0			4.5	0.1		9.3	
Delay (s)	57.0	17.4	14.7	78.6	4.6			65.1	44.1		64.1	
Level of Service	E	B	B	E	A			E	D		E	
Approach Delay (s)		19.4			14.4			47.2			64.1	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	26.9
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	76	152	214	148	125	95
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	83	165	233	161	136	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	393				563	233
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	393				563	233
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				70	87
cM capacity (veh/h)	1165				453	807

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	83	165	233	161	136	103
Volume Left	83	0	0	0	136	0
Volume Right	0	0	0	161	0	103
cSH	1165	1700	1700	1700	453	807
Volume to Capacity	0.07	0.10	0.14	0.09	0.30	0.13
Queue Length 95th (ft)	6	0	0	0	31	11
Control Delay (s)	8.3	0.0	0.0	0.0	16.3	10.1
Lane LOS	A				C	B
Approach Delay (s)	2.8		0.0		13.6	
Approach LOS					B	

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	45	143	198	47	129	75	100	145	17	59	250	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	155	215	51	140	82	109	158	18	64	272	65

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	204	215	191	82	285	401
Volume Left (vph)	49	0	51	0	109	64
Volume Right (vph)	0	215	0	82	18	65
Hadj (s)	0.08	-0.57	0.09	-0.57	0.07	-0.03
Departure Headway (s)	6.5	3.2	6.6	3.2	6.1	5.8
Degree Utilization, x	0.37	0.19	0.35	0.07	0.48	0.64
Capacity (veh/h)	485	1121	480	1121	545	595
Control Delay (s)	13.3	7.0	13.0	6.4	14.6	18.6
Approach Delay (s)	10.0		11.0		14.6	18.6
Approach LOS	B		B		B	C

Intersection Summary			
Delay	13.7		
Level of Service	B		
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	12	207	101	30	11	294	360	79	12	424	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	13	225	110	33	12	320	391	86	13	461	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								871				
pX, platoon unblocked												
vC, conflicting volume	1362	1615	473	1536	1517	196	461			477		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1362	1615	473	1536	1517	196	461			477		
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 %	85	82	58	0	61	99	71			99		
cM capacity (veh/h)	57	72	538	31	83	813	1097			1081		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1
Volume Total	247	142	12	320	196	196	86	498
Volume Left	9	110	0	320	0	0	0	13
Volume Right	225	0	12	0	0	0	86	24
cSH	328	36	813	1097	1700	1700	1700	1081
Volume to Capacity	0.75	3.97	0.01	0.29	0.12	0.12	0.05	0.01
Queue Length 95th (ft)	145	Err	1	30	0	0	0	1
Control Delay (s)	42.8	Err	9.5	9.6	0.0	0.0	0.0	0.4
Lane LOS	E	F	A	A				A
Approach Delay (s)	42.8	9225.2		3.9				0.4
Approach LOS	E	F						

Intersection Summary			
Average Delay	847.9		
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	39	20	421	3	9	454
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)	42	22	458	3	10	493
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	971	458			461	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	971	458			461	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	96			99	
cM capacity (veh/h)	278	603			1100	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	64	458	3	10	493
Volume Left	42	0	0	10	0
Volume Right	22	0	3	0	0
cSH	340	1700	1700	1100	1700
Volume to Capacity	0.19	0.27	0.00	0.01	0.29
Queue Length 95th (ft)	17	0	0	1	0
Control Delay (s)	18.0	0.0	0.0	8.3	0.0
Lane LOS	C			A	
Approach Delay (s)	18.0	0.0		0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	33.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 33: Bailey Bridge Road & Bailey Bridge Connector

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)

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	SB
Directions Served	L	L	T	T	R	L	T	T	T	R	LTR	L
Maximum Queue (ft)	147	210	404	408	194	55	274	280	270	89	377	239
Average Queue (ft)	69	94	300	309	61	21	194	207	209	36	249	166
95th Queue (ft)	153	206	453	464	186	56	290	292	278	92	455	285
Link Distance (ft)			1512	1512			5210	5210			1542	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	205	205			90	190			200	200		220
Storage Blk Time (%)		0	15	28			8	8	9			5
Queuing Penalty (veh)		0	28	38			3	64	54			17

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	278	174	214
Average Queue (ft)	202	78	118
95th Queue (ft)	319	176	217
Link Distance (ft)		1256	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	220		250
Storage Blk Time (%)	13	0	0
Queuing Penalty (veh)	43	2	1

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	L	L	T	T	T	T	R	L
Maximum Queue (ft)	203	222	375	376	67	87	109	116	136	81	33	80
Average Queue (ft)	155	174	265	272	26	51	68	70	86	36	10	28
95th Queue (ft)	248	267	397	410	68	93	111	119	139	85	33	85
Link Distance (ft)			628	628			1512	1512	1512			
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	420	420			200	200				200	200	240
Storage Blk Time (%)			0									
Queuing Penalty (veh)			0									

Intersection: 102: Lonas Pkwy & Route 360

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	L	T
Maximum Queue (ft)	117	54	75	150	126	21
Average Queue (ft)	71	20	40	112	79	4
95th Queue (ft)	127	57	79	174	152	20
Link Distance (ft)		412	412	251	251	251
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	240					
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	WB	WB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	3	11	108	238
Average Queue (ft)	0	2	41	99
95th Queue (ft)	7	15	117	304
Link Distance (ft)	272	272	272	1031
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (ft)	61	124	612	681
Average Queue (ft)	9	9	301	303
95th Queue (ft)	128	131	843	850
Link Distance (ft)	632	632	632	632
Upstream Blk Time (%)		0	2	2
Queuing Penalty (veh)		0	18	18
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB	WB	WB	SB	B55
Directions Served	T	T	T	R	T
Maximum Queue (ft)	9	19	54	609	3433
Average Queue (ft)	1	2	14	329	2090
95th Queue (ft)	14	21	60	1217	4231
Link Distance (ft)	310	310	310	1129	3562
Upstream Blk Time (%)				13	18
Queuing Penalty (veh)				0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 107: Route 360 & Market Square Ln

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	SB
Directions Served	T	T	T	T	T	T	T	T	T	T	R
Maximum Queue (ft)	55	54	54	117	8	14	418	730	831	943	129
Average Queue (ft)	8	8	8	17	1	4	73	225	333	259	77
95th Queue (ft)	115	114	113	178	16	30	413	796	978	925	179
Link Distance (ft)	572	572	572	572			831	831	831	831	262
Upstream Blk Time (%)				0			0	0	1	5	
Queuing Penalty (veh)				0			0	1	13	69	
Storage Bay Dist (ft)					50	50					
Storage Blk Time (%)					0	0	2			1	
Queuing Penalty (veh)					1	4	35			0	

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	403	469	441	444	448	408	245	485	507	541	535	514
Average Queue (ft)	307	349	316	336	384	325	133	375	391	444	438	428
95th Queue (ft)	519	609	569	477	465	417	248	539	565	598	599	585
Link Distance (ft)			609	609	609	609		572	572	572	572	572
Upstream Blk Time (%)		2	6	0				1	1	2	1	1
Queuing Penalty (veh)		0	45	1				4	9	13	9	7
Storage Bay Dist (ft)	300	300					250					
Storage Blk Time (%)	32	40	1			11	0					
Queuing Penalty (veh)	162	203	4			46	0					

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	WB	NB	NB	NB	NB	NB	B995	B995	SB	SB	SB	SB
Directions Served	T	L	L	T	T	R	T	T	L	L	T	R
Maximum Queue (ft)	507	404	444	407	373	208	21	17	470	669	844	530
Average Queue (ft)	414	317	347	249	208	106	7	2	311	454	770	518
95th Queue (ft)	565	514	570	532	458	218	64	36	536	792	964	611
Link Distance (ft)	572			704	704		479	479		741	741	
Upstream Blk Time (%)	1			2	0					4	58	
Queuing Penalty (veh)	4			0	0					0	0	
Storage Bay Dist (ft)		390	390			250			430			430
Storage Blk Time (%)		16	22	0	9	1			2	9	24	76
Queuing Penalty (veh)		21	29	2	27	1			3	16	111	118

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	B996	B996
Directions Served	T	T
Maximum Queue (ft)	478	558
Average Queue (ft)	162	244
95th Queue (ft)	526	642
Link Distance (ft)	792	792
Upstream Blk Time (%)	1	2
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 109: Route 360 & Village Green Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB
Directions Served	L	T	T	T	T	T	T	TR
Maximum Queue (ft)	318	377	325	36	24	6	10	54
Average Queue (ft)	241	253	77	4	0	2	2	8
95th Queue (ft)	375	503	311	63	0	17	21	112
Link Distance (ft)		355	355	355	355	609	609	609
Upstream Blk Time (%)	0	38	0	0				
Queuing Penalty (veh)	0	323	3	0				
Storage Bay Dist (ft)	240							
Storage Blk Time (%)	56	14						
Queuing Penalty (veh)	402	12						

Intersection: 110: Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	SB
Directions Served	T	T	T	T	T	T	T	T	T	TR	R
Maximum Queue (ft)	211	173	63	73	214	218	206	68	41	8	116
Average Queue (ft)	112	42	22	14	108	118	63	10	5	1	64
95th Queue (ft)	298	194	133	99	241	247	229	106	75	12	137
Link Distance (ft)	235	235	235	235			355	355	355	355	754
Upstream Blk Time (%)	26	1	0	0			0	0	0		
Queuing Penalty (veh)	193	10	1	0			3	1	0		
Storage Bay Dist (ft)					150	150					
Storage Blk Time (%)					11	15	0				
Queuing Penalty (veh)					85	112	3				

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R	L	L	T	T	T	T	L
Maximum Queue (ft)	598	527	499	438	171	250	252	78	76	100	102	442
Average Queue (ft)	368	340	355	328	53	237	242	32	32	54	61	373
95th Queue (ft)	641	562	529	469	178	265	263	80	78	105	103	535
Link Distance (ft)	870	870	870	870		235	235	235	235	235	235	396
Upstream Blk Time (%)	3	0	0			47	53					38
Queuing Penalty (veh)	18	2	1			363	410					0
Storage Bay Dist (ft)					200							
Storage Blk Time (%)				17								
Queuing Penalty (veh)				38								

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	NB	NB	B61	B61	B61
Directions Served	L	R	T	T	T
Maximum Queue (ft)	419	363	172	125	129
Average Queue (ft)	350	205	65	42	16
95th Queue (ft)	505	395	229	189	127
Link Distance (ft)	396	396	808	808	808
Upstream Blk Time (%)	27	8			
Queuing Penalty (veh)	0	0			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	EB	EB	EB	EB	WB
Directions Served	T	T	T	T	L
Maximum Queue (ft)	60	58	38	9	174
Average Queue (ft)	5	0	0	1	99
95th Queue (ft)	67	0	0	11	188
Link Distance (ft)	2133	2133	2133	2133	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					600
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	R	LT
Maximum Queue (ft)	99	221	241	295	314	375	534	536	516	508	290	101
Average Queue (ft)	45	143	171	217	242	208	378	370	367	356	93	55
95th Queue (ft)	100	227	257	310	333	397	570	562	559	537	327	104
Link Distance (ft)		2494	2494	2494	2494		2133	2133	2133	2133		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140					150					160	200
Storage Blk Time (%)	0	3				14	32			32		
Queuing Penalty (veh)	0	3				147	95			50		

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	NB	SB	SB	SB
Directions Served	R	L	LT	R
Maximum Queue (ft)	152	207	353	217
Average Queue (ft)	92	142	207	115
95th Queue (ft)	158	243	395	241
Link Distance (ft)	874		588	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)		120		120
Storage Blk Time (%)	0	23	47	6
Queuing Penalty (veh)	0	69	128	19

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T	R	L	L	T	T	T	TR
Maximum Queue (ft)	302	437	416	365	378	77	173	231	419	782	365	386
Average Queue (ft)	224	318	307	317	328	35	136	156	329	356	299	308
95th Queue (ft)	403	494	430	385	398	72	196	254	440	942	386	401
Link Distance (ft)		1704	1704	1704	1704				2494	2494	2494	2494
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200					360	280	280				
Storage Blk Time (%)	35	23			4				18			
Queuing Penalty (veh)	168	43			4				83			

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	LT	R
Maximum Queue (ft)	134	90	252	307	626	325
Average Queue (ft)	77	41	158	236	440	274
95th Queue (ft)	147	94	287	374	806	402
Link Distance (ft)		1289	1289		818	
Upstream Blk Time (%)					9	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	190			200		250
Storage Blk Time (%)	0			20	64	21
Queuing Penalty (veh)	0			106	279	70

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	27	50	110	66	96	136	253	405	314	433	262	3
Average Queue (ft)	9	13	21	24	50	91	152	297	234	235	169	0
95th Queue (ft)	34	45	174	73	105	140	316	449	356	544	284	5
Link Distance (ft)		820	820	820	820			1704	1704	1704	1704	
Upstream Blk Time (%)										0		
Queuing Penalty (veh)										0		
Storage Bay Dist (ft)	540					170	170					190
Storage Blk Time (%)						0	1	24			5	
Queuing Penalty (veh)						1	6	76			0	

Intersection: 115: Chital Dr & Route 360

Movement	NB	NB	NB	SB	SB
Directions Served	L	T	R	LT	R
Maximum Queue (ft)	165	249	53	51	30
Average Queue (ft)	145	145	26	22	6
95th Queue (ft)	219	407	56	57	26
Link Distance (ft)		998	998	595	595
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)	61				
Queuing Penalty (veh)	2				

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	B1	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	R	T	L	T	T	T	TR
Maximum Queue (ft)	77	156	344	378	412	126	5	314	814	702	636	561
Average Queue (ft)	35	63	279	306	332	26	1	265	603	506	428	347
95th Queue (ft)	76	172	354	384	406	172	11	400	928	804	704	617
Link Distance (ft)			861	861	861		729		820	820	820	820
Upstream Blk Time (%)									1	0	0	0
Queuing Penalty (veh)									14	1	1	0
Storage Bay Dist (ft)	220	220				230		115				
Storage Blk Time (%)			12		20			32	45			
Queuing Penalty (veh)			18		18			270	155			

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	NB	NB	SB	SB	SB
Directions Served	LT	R	L	LT	R
Maximum Queue (ft)	224	647	238	618	258
Average Queue (ft)	194	411	213	450	167
95th Queue (ft)	280	918	281	833	334
Link Distance (ft)		2172		979	
Upstream Blk Time (%)				2	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)	130		90		170
Storage Blk Time (%)	68	8	65	90	1
Queuing Penalty (veh)	176	15	238	244	4

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	B1
Directions Served	L	T	T	T	R	L	L	T	T	T	R	T
Maximum Queue (ft)	21	274	292	299	63	375	524	611	610	548	99	306
Average Queue (ft)	6	214	235	249	33	294	339	429	454	365	26	51
95th Queue (ft)	21	286	302	316	64	432	501	599	615	563	146	356
Link Distance (ft)		1093	1093	1093				729	729	729		861
Upstream Blk Time (%)								0	0	0		
Queuing Penalty (veh)								3	4	0		
Storage Bay Dist (ft)	180				170	280	280				575	
Storage Blk Time (%)		25		39		15	21	25		1		
Queuing Penalty (veh)		5		36		143	190	219		1		

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	B1	B1	B1	NB	NB	NB	SB	SB
Directions Served	T	T		LT	R	R	L	TR
Maximum Queue (ft)	457	308	66	320	177	63	103	132
Average Queue (ft)	85	44	9	203	55	22	59	91
95th Queue (ft)	477	337	138	344	166	65	118	165
Link Distance (ft)	861	861	861		1849		458	458
Upstream Blk Time (%)	0	0						
Queuing Penalty (veh)	1	0						
Storage Bay Dist (ft)				430		1000		
Storage Blk Time (%)				1	0			
Queuing Penalty (veh)				2	0			

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	L	T	T	R	L	LT
Maximum Queue (ft)	55	234	267	297	110	104	503	1017	1087	770	176	151
Average Queue (ft)	19	166	194	224	42	64	254	721	756	266	115	95
95th Queue (ft)	56	248	274	308	122	110	652	1305	1338	953	179	162
Link Distance (ft)		1163	1163	1163				1093	1093	1093	784	784
Upstream Blk Time (%)								3	5	1		
Queuing Penalty (veh)								25	49	10		
Storage Bay Dist (ft)	200				200	300	300					
Storage Blk Time (%)		5		14				16				
Queuing Penalty (veh)		2		16				37				

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	SB	SB
Directions Served	R	LT	R
Maximum Queue (ft)	61	29	30
Average Queue (ft)	36	7	10
95th Queue (ft)	67	28	32
Link Distance (ft)	784	950	950
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 119: Ashlake & Route 360

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	TR	L	L	T	T	L	L	R
Maximum Queue (ft)	120	116	131	97	110	108	134	62	112	67
Average Queue (ft)	73	72	65	56	78	53	75	30	69	40
95th Queue (ft)	127	124	133	109	120	111	147	65	114	65
Link Distance (ft)	925	925				1163	1163		2584	2584
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			200	400	400			200		
Storage Blk Time (%)			0							
Queuing Penalty (veh)			0							

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	L	L	R
Maximum Queue (ft)	89	96	100	295	306	289	284	154
Average Queue (ft)	51	53	62	217	230	214	207	51
95th Queue (ft)	99	104	106	339	362	348	344	173
Link Distance (ft)		4659	4659	925	925	1153	1153	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200							150
Storage Blk Time (%)							30	
Queuing Penalty (veh)							11	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	LT	R	L	L
Maximum Queue (ft)	78	210	235	10	166	173	168	17	69	132	361	463
Average Queue (ft)	40	138	140	1	102	87	95	2	40	70	288	331
95th Queue (ft)	91	220	229	11	177	172	166	21	80	131	422	514
Link Distance (ft)		2661	2661			4659	4659		750	750		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	240			200	230			210			240	240
Storage Blk Time (%)		0	1			0	0				43	56
Queuing Penalty (veh)		0	0			0	0				57	74

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	564	68
Average Queue (ft)	166	38
95th Queue (ft)	522	73
Link Distance (ft)	1435	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		130
Storage Blk Time (%)	1	0
Queuing Penalty (veh)	3	1

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	L	T	TR	LT	R	LTR
Maximum Queue (ft)	52	117	126	186	112	122	37	47	186
Average Queue (ft)	23	61	62	123	45	51	14	27	109
95th Queue (ft)	61	125	136	193	120	130	40	45	192
Link Distance (ft)		3677	3677		2661	2661	1013		1599
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200			375				500	
Storage Blk Time (%)			0						
Queuing Penalty (veh)			0						

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	46	9	70	39
Average Queue (ft)	24	1	35	20
95th Queue (ft)	54	10	69	43
Link Distance (ft)				817
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	225	275	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LTR	LTR
Maximum Queue (ft)	85	118	83	11	138	190
Average Queue (ft)	57	51	54	3	74	103
95th Queue (ft)	89	143	89	23	142	207
Link Distance (ft)	777	777	840		660	541
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				400		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 6619

C-2 – No-Build (2040) Synchro/SimTraffic Results

SYNCHRO CAPACITY ANALYSIS - INTERSECTION LEVEL OF SERVICE SUMMARY
No-Build (2040) Traffic Volumes
US 360/Route 288 Interchange Study - Chesterfield County, Virginia

Intersection	Type of Control	Lane Group	Eastbound				Westbound				Northbound				Southbound				Overall	
			AM		PM		AM		PM		AM		PM		AM		PM		AM	PM
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS		
101 US 360 at Bridgewood Rd./ Warbro Rd.	Signal	Left	38.7	D	78.2	E	84.2	F	137.5	F					82.9	F	147.1	F	Delay	Delay
		Through	36.0	D	28.1	C	34.1	C	101.9	F	137.5	F	216.7	F	65.5	E	63.2	E	42.4	71.4
		Right	2.3	A	8.8	A	24.7	C	20.9	C					48.2	D	95.7	F	LOS	LOS
		Approach	35.6	D	31.4	C	33.9	C	93.9	F	137.5	F	216.7	F	61.2	E	117.5	F	D	E
102 US 360 at Lonas Pkwy./ Memphis Blvd.	Signal	Left	73.8	E	82.7	F	56.5	E	59.5	E	72.7	E	140.4	F	64.4	E	64.3	E	Delay	Delay
		Through	7.0	A	16.7	B	5.9	A	6.6	A	63.0	E	66.3	E	62.7	E	59.2	E	15.0	23.2
		Right	1.3	A	4.2	A	0.5	A	0.1	A	64.1	E	67.1	E	63.1	E	73.3	E	LOS	LOS
		Approach	12.4	B	25.8	C	7.4	A	8.2	A	68.8	E	111.9	F	63.5	E	70.1	E	B	C
107 US 360 at Market Square Ln.	One-Way Stop	Left	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	†	†	†	†	†	†	†	†	--	--	--	--	13.4	B	66.6	F	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	--	--	--	--	13.4	B	66.6	F	--	--
108 US 360 at Commonwealth Centre Pkwy./ Old Hundred Rd.	Signal	Left	33.5	C	196.3	F	210.8	F	508.0	F	72.4	E	478.7	F	254.0	F	426.2	F	Delay	Delay
		Through	194.6	F	7.0	A	39.7	D	505.1	F	73.2	E	150.8	F	64.9	E	411.5	F	138.6	345.0
		Right	0.7	A	0.6	A	36.9	D	30.5	C	149.1	F	568.0	F	55.9	E	563.8	F	LOS	LOS
		Approach	174.5	F	33.8	C	49.9	D	471.2	F	104.7	F	423.2	F	155.1	F	490.2	F	F	F
109 US 360 at Village Green Dr.	One-Way Stop	Left	14.5	B	809.9	F	--	--	--	--	--	--	--	--	--	--	--	--	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	--	--	--	--	†	†	†	†	--	--	--	--	--	--	--	--	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
110 US 360 at Wells Fargo Driveway	One-Way Stop	Left	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	--	--	--	--	†	†	†	†	--	--	--	--	13.4	B	276.1	F	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	--	--	--	--	13.4	B	276.1	F	--	--
111 US 360 at Brad McNeer Pkwy.	Signal	Left	--	--	--	--	186.9	F	199.7	F	57.9	E	222.8	F	--	--	--	--	Delay	Delay
		Through	202.7	F	76.6	E	2.2	A	228.9	F	--	--	--	--	--	--	--	--	149.2	174.1
		Right	0.1	A	1.6	A	--	--	--	--	393.2	F	143.3	F	--	--	--	--	LOS	LOS
		Approach	189.5	F	71.3	E	21.9	C	226.0	F	291.9	F	191.2	F	--	--	--	--	F	F
112 US 360 at Craig Rath Blvd.	One-Way Stop	Left	--	--	--	--	43.8	E	88.4	F	--	--	--	--	--	--	--	--	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	†	†	†	†	--	--	--	--	37.5	E	17.1	C	--	--	--	--	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	37.5	E	17.1	C	--	--	--	--	--	--
113 US 360 at Mockingbird Ln./ Harbour Pointe Pwky.	Signal	Left	38.9	D	232.2	F	85.2	F	333.3	F	--	--	--	--	663.0	F	375.2	F	Delay	Delay
		Through	409.2	F	72.5	E	11.8	B	337.2	F	118.9	F	236.2	F	744.7	F	378.3	F	296.3	242.9
		Right	--	--	--	--	5.4	A	3.0	A	237.1	F	59.6	E	47.8	D	66.9	E	LOS	LOS
		Approach	403.5	F	77.0	E	14.1	B	328.2	F	228.1	F	97.8	F	621.2	F	278.8	F	F	F
114 US 360 at Deer Run Dr./ Harbour View Ct.	Signal	Left	61.6	E	308.8	F	18.6	B	91.9	F	72.2	E	227.8	F	251.3	F	235.4	F	Delay	Delay
		Through	276.6	F	7.9	A	7.2	A	343.1	F	166.6	F	167.0	F	249.3	F	230.4	F	198.8	252.8
		Right	2.2	A	0.3	A	--	--	--	--	370.5	F	437.5	F	65.1	E	604.7	F	LOS	LOS
		Approach	266.8	F	32.0	C	7.9	A	319.4	F	341.4	F	386.8	F	176.1	F	434.2	F	F	F
115 US 360 at Chital Dr.	Signal	Left	56.5	E	54.6	D	85.8	F	37.3	D	61.9	E	169.6	F	--	--	--	--	Delay	Delay
		Through	191.2	F	52.1	D	15.0	B	274.3	F	54.6	D	54.3	D	70.1	E	69.1	E	135.3	187.5
		Right	--	--	--	--	2.4	A	3.7	A	82.1	F	54.6	D	65.9	E	64.6	E	LOS	LOS
		Approach	190.9	F	52.1	D	19.5	B	258.1	F	74.9	E	128.1	F	68.7	E	67.9	E	F	F
116 US 360 at N. Spring Run Rd./ Temie Lee Pkwy.	Signal	Left	53.2	D	175.5	F	326.4	F	341.2	F	--	--	--	--	305.2	F	314.2	F	Delay	Delay
		Through	331.7	F	115.6	F	3.9	A	325.8	F	59.0	E	283.4	F	296.1	F	310.6	F	246.4	255.9
		Right	3.6	A	30.0	C	--	--	--	--	560.2	F	116.7	F	59.2	E	93.6	F	LOS	LOS
		Approach	319.8	F	116.2	F	26.5	C	327.0	F	456.9	F	186.7	F	277.3	F	242.0	F	F	F
117 US 360 at Winterpock Rd./ Lake Harbour Dr.	Signal	Left	79.4	E	53.8	D	41.4	D	304.3	F	--	--	--	--	71.6	E	203.7	F	Delay	Delay
		Through	236.3	F	113.0	F	15.0	B	216.9	F	98.2	F	276.5	F	72.1	E	297.5	F	153.7	187.5
		Right	2.2	A	4.3	A	18.4	B	0.0	A	103.4	F	37.5	D	--	--	--	--	LOS	LOS
		Approach	232.2	F	107.4	F	17.7	B	228.3	F	102.4	F	123.2	F	71.9	E	256.8	F	F	F
118 US 360 at Duckridge Blvd./ Hancock Village St.	Signal	Left	48.5	D	112.6	F	75.5	E	42.0	D	124.6	F	173.1	F	--	--	--	--	Delay	Delay
		Through	49.4	D	23.8	C	14.3	B	491.9	F	119.0	F	168.0	F	--	--	--	--	39.2	296.0
		Right	0.1	A	19.6	B	1.1	A	0.7	A	80.5	F	46.5	D	68.1	E	66.3	E	LOS	LOS
		Approach	47.3	D	25.3	C	15.8	B	458.0	F	94.3	F	130.2	F	68.1	E	66.3	E	D	F
119 US 360 at Ashlake Pkwy.	Signal	Left	--	--	--	--	57.6	E	42.4	D	53.0	D	66.8	E	--	--	--	--	Delay	Delay
		Through	77.0	E	13.2	B	3.3	A	306.9	F	--	--	--	--	--	--	--	--	59.8	187.6
		Right	--	--	--	--	--	--	--	--	191.5	F	60.4	E	--	--	--	--	LOS	LOS
		Approach	77.0	E	13.2	B	5.0	A	289.7	F	155.1	F	63.9	E	--	--	--	--	E	F
120 US 360 at Woodlake Village Pkwy.	Signal	Left	76.2	E	202.2	F	--	--	--	--	--	--	--	--	173.3	F	310.3	F	Delay	Delay
		Through	102.4	F	4.2	A	14.1	B	280.9	F	--	--	--	--	--	--	--	--	83.6	169.3
		Right	--	--	--	--	10.8	B	17.9	B	--	--	--	--	41.0	D	52.3	D	LOS	LOS
		Approach	101.9	F	13.3	B	13.1	B	215.4	F	--	--	--	--	165.6	F	293.4	F	F	F
121 US 360 at Hampton Park Dr./ Fox Club Pkwy.	Signal	Left	49.9	D	152.6	F	95.3	F	48.2	D	--	--	--	--	140.2	F	195.5	F	Delay	Delay
		Through	93.8	F	42.0	D	6.9	A	146.2	F	53.3	D	73.9	E	61.4	E	61.7	E	80.9	103.8
		Right	10.6	B	9.2	A	0.8	A	0.3	A	223.7	F	66.5	E	59.2	E	58.3	E	LOS	LOS
		Approach	92.5	F	45.6	D	13.3	B	123.6	F	199.4	F	67.6	E	120.8	F	163.3	F	F	F
122 US 360 at Otterdale Rd.	Signal	Left	70.7	E	150.5	F	41.4	D	65.1	E	--	--	--	--	--	--	--	--	Delay	Delay
		Through	35.4	D	31.1	C	13.9	B	73.1	E	83.4	F	82.1	F	108.1	F	207.2	F	37.4	66.3
		Right	14.3	B	18.9	B	--	--	--	--	91.4	F	43.2	D	--	--	--	--	LOS	LOS
		Approach	37.4	D	34.9	C	16.8	B	72.2	E	90.5	F	47.4	D	108.1	F	207.2	F	D	E
124 Bailey Bridge Rd. at Deer Run Dr.	One-Way Stop	Left	8.4	A	9.1	A	--	--	--	--	--	--	--	--	44.3	E	39.0	E	Delay	Delay
		Through	†	†	†	†	†	†	†	†	--	--	--	--	--	--	--	--	--	--
		Right	--	--	--	--	†	†	†	†	--	--	--	--	9.3	A	11.8	B	LOS	LOS
		Approach	--	--	--	--	--	--	--	--	--	--	--	--	39.3	E	26.9	D	--	--
125 Bailey Bridge Rd./ Springford Pkwy. at Spring Run Rd.	All-Way Stop	Left	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Delay	Delay
		Through	133.8	F	60.5	F	16.2	C	115.2	F	23.0	C	64.9	F	110.1	F	726.6	F	88.4	367.2
		Right	6.4	A	6.3	A	6.4	A	6.5	A	--	--	--	--	--	--	--	--	LOS	LOS
		Approach	123.0	F	57.3	F	13.1	B	97.1	F	23.0	C	64.9	F	110.1	F	726.6	F	F	F
126 Old Hundred Road Rd./ Millridge Pkwy.	Two-Way Stop	Left					**	F	**	F	9.3	A	19.6	C					Delay	Delay
		Through	374.1	F	**	F					†	†	†	†	0.3	A	1.1	A	--	--
		Right					10.3	B	11.4	B	†	†	†	†					LOS	LOS
		Approach	374.1	F	**	F	**	F	**	F	--	--	--	--	--	--	--	--	--	--
127 Old Hundred Road Rd./ Market Square Rd.	Two-Way Stop	Left	--	--	--	--					--	--	--	--	9.1	A	10.7	B	Delay	Delay
		Through	--	--	--	--	27.1	D	177.5	F	†	†	†	†	†	†	†	†	--	--
		Right	--	--	--	--					†	†	†	†	--	--	--	--	LOS	LOS
		Approach	--	--	--	--	27.1	D	177.5	F	--	--	--	--	--	--	--	--	--	--

NOTE: Lane configurations with a shared through lane shown as "through" lane group. Lane configurations with shared left-right lane shown as "left" lane group.
† SYNCHRO does not provide level of service or delay for movements with no conflicting volumes.
**Delay greater than 9999.99 seconds cannot be calculated by SYNCHRO.

HCM Signalized Intersection Capacity Analysis
101: Bridgewood Rd/Warbro Rd & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	2780	50	20	1460	150	190	60	60	100	10	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	3155	5085	1583	1770	5085	1455		1760		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	3155	5085	1583	1770	5085	1455		1760		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.96	0.92	0.93	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	3022	54	22	1521	163	204	65	65	109	11	185
RTOR Reduction (vph)	0	0	6	0	0	70	0	6	0	0	0	59
Lane Group Flow (vph)	283	3022	48	22	1521	93	0	328	0	109	11	126
Heavy Vehicles (%)	11%	2%	2%	2%	2%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	23.1	80.2	80.2	3.0	60.4	60.4		23.9		7.0	7.0	30.1
Effective Green, g (s)	23.1	80.2	80.2	3.0	60.4	60.4		23.9		7.0	7.0	30.1
Actuated g/C Ratio	0.17	0.57	0.57	0.02	0.43	0.43		0.17		0.05	0.05	0.22
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	521	2913	907	38	2194	628		300		158	86	313
v/s Ratio Prot	0.09	c0.59		0.01	c0.30			c0.19		c0.03	0.01	0.07
v/s Ratio Perm			0.03			0.06						0.02
v/c Ratio	0.54	1.04	0.05	0.58	0.69	0.15		1.09		0.69	0.13	0.40
Uniform Delay, d1	53.6	29.9	13.2	67.9	32.3	24.2		58.0		65.4	63.6	47.2
Progression Factor	0.71	0.41	0.17	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	23.7	0.1	16.3	1.8	0.5		79.5		17.5	1.9	1.0
Delay (s)	38.7	36.0	2.3	84.2	34.1	24.7		137.5		82.9	65.5	48.2
Level of Service	D	D	A	F	C	C		F		F	E	D
Approach Delay (s)		35.6			33.9			137.5			61.2	
Approach LOS		D			C			F			E	

Intersection Summary				
HCM Average Control Delay	42.4	HCM Level of Service	D	
HCM Volume to Capacity ratio	1.04			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.5	
Intersection Capacity Utilization	98.0%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
102: Lonas Pkwy & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	260	2950	40	60	1700	60	120	10	90	60	10	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	283	3105	43	65	1828	65	130	11	98	65	11	152
RTOR Reduction (vph)	0	0	10	0	0	24	0	0	77	0	0	144
Lane Group Flow (vph)	283	3105	33	65	1828	41	130	11	21	65	11	8
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	15.8	99.3	99.3	4.0	87.5	87.5	7.9	7.9	7.9	7.8	7.8	7.8
Effective Green, g (s)	15.8	99.3	99.3	4.0	87.5	87.5	7.9	7.9	7.9	7.8	7.8	7.8
Actuated g/C Ratio	0.11	0.71	0.71	0.03	0.62	0.62	0.06	0.06	0.06	0.06	0.06	0.06
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	387	3607	1123	98	4005	989	194	105	89	191	197	88
v/s Ratio Prot	0.08	c0.61		c0.02	0.29		c0.04	0.01		c0.02	0.00	
v/s Ratio Perm			0.02			0.03			0.01			0.01
v/c Ratio	0.73	0.86	0.03	0.66	0.46	0.04	0.67	0.10	0.23	0.34	0.06	0.10
Uniform Delay, d1	60.0	15.2	6.0	67.3	13.8	10.1	64.8	62.7	63.1	63.6	62.6	62.8
Progression Factor	1.18	0.38	0.22	0.68	0.41	0.04	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	1.2	0.0	10.5	0.3	0.1	8.0	0.3	1.0	0.8	0.1	0.3
Delay (s)	73.8	7.0	1.3	56.5	5.9	0.5	72.7	63.0	64.1	64.4	62.7	63.1
Level of Service	E	A	A	E	A	A	E	E	E	E	E	E
Approach Delay (s)		12.4			7.4			68.8			63.5	
Approach LOS		B			A			E			E	

Intersection Summary				
HCM Average Control Delay	15.0	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0	
Intersection Capacity Utilization	84.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
107: Route 360 & Market Square Ln

8/21/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	440	5430	240	150	2090	220	70	70	100	520	130	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	478	5598	261	163	2272	239	76	76	109	565	141	435
RTOR Reduction (vph)	0	0	45	0	0	102	0	0	58	0	0	5
Lane Group Flow (vph)	478	5598	216	163	2272	137	76	76	51	565	141	430
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	28.9	86.5	86.5	5.5	62.9	62.9	5.2	5.0	5.0	16.5	16.3	45.2
Effective Green, g (s)	28.9	86.5	86.5	5.5	62.9	62.9	5.2	5.0	5.0	16.5	16.3	45.2
Actuated g/C Ratio	0.21	0.62	0.62	0.04	0.45	0.45	0.04	0.04	0.04	0.12	0.12	0.32
Clearance Time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	709	3959	978	135	2879	711	128	126	57	405	217	511
v/s Ratio Prot	0.14	c0.87		0.05	c0.35		0.02	0.02		c0.16	0.08	0.17
v/s Ratio Perm			0.14			0.09			c0.03			0.10
v/c Ratio	0.67	1.41	0.22	1.21	0.79	0.19	0.59	0.60	0.90	1.40	0.65	0.84
Uniform Delay, d1	51.2	26.8	11.8	67.2	32.9	23.2	66.4	66.5	67.2	61.8	59.1	44.1
Progression Factor	0.65	0.31	0.06	1.00	1.14	1.56	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	186.4	0.0	143.7	2.3	0.6	6.0	6.7	81.8	192.3	5.8	11.8
Delay (s)	33.5	194.6	0.7	210.8	39.7	36.9	72.4	73.2	149.1	254.0	64.9	55.9
Level of Service	C	F	A	F	D	D	E	E	F	F	E	E
Approach Delay (s)		174.5			49.9			104.7			155.1	
Approach LOS		F			D			F			F	

Intersection Summary			
HCM Average Control Delay	138.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.7
Intersection Capacity Utilization	124.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
111: Brad McNeer Pkwy & Route 360

8/21/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	5840	400	270	2260	160	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Lane Util. Factor	0.86	1.00	0.97	0.86	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6408	1583	3433	6408	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6408	1583	3433	6408	3433	1583
Peak-hour factor, PHF	0.94	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	6213	435	293	2457	174	402
RTOR Reduction (vph)	0	56	0	0	0	86
Lane Group Flow (vph)	6213	379	293	2457	174	316
Turn Type	NA	Perm	Prot	NA	NA	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	94.7	94.7	9.5	110.3	16.5	16.5
Effective Green, g (s)	94.7	94.7	9.5	110.3	16.5	16.5
Actuated g/C Ratio	0.68	0.68	0.07	0.79	0.12	0.12
Clearance Time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Vehicle Extension (s)	8.0	8.0	2.5	8.0	2.5	2.5
Lane Grp Cap (vph)	4335	1071	233	5049	405	187
v/s Ratio Prot	c0.97		c0.09	0.38	0.05	
v/s Ratio Perm		0.24				c0.20
v/c Ratio	1.43	0.35	1.26	0.49	0.43	1.69
Uniform Delay, d1	22.6	9.6	65.2	5.1	57.4	61.8
Progression Factor	0.34	0.00	0.79	0.40	1.00	1.00
Incremental Delay, d2	195.1	0.1	135.2	0.2	0.5	331.4
Delay (s)	202.7	0.1	186.9	2.2	57.9	393.2
Level of Service	F	A	F	A	E	F
Approach Delay (s)	189.5			21.9	291.9	
Approach LOS	F			C	F	

Intersection Summary			
HCM Average Control Delay	149.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	118.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
112: Craig Rath Boulevard & Route 360

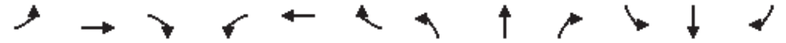
8/21/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

8/21/2014

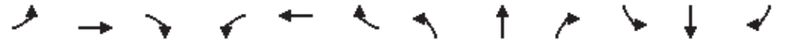


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	5740	20	80	2260	60	20	10	370	200	10	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	6404		1770	6408	1583		1803	1583	1681	1693	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.83	1.00	0.16	0.16	1.00
Satd. Flow (perm)	1770	6404		1770	6408	1583		1552	1583	289	275	1583
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)	98	6239	22	87	2457	65	22	11	402	217	11	33
RTOR Reduction (vph)	0	0	0	0	0	17	0	0	50	0	0	27
Lane Group Flow (vph)	98	6261	0	87	2457	48	0	33	352	113	115	6
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			4	1		3	
Permitted Phases						6	4		4	3		3
Actuated Green, G (s)	13.2	72.6		12.8	72.2	72.2		4.0	16.8	24.5	24.5	24.5
Effective Green, g (s)	13.2	72.6		12.8	72.2	72.2		4.0	16.8	24.5	24.5	24.5
Actuated g/C Ratio	0.09	0.52		0.09	0.52	0.52		0.03	0.12	0.18	0.18	0.18
Clearance Time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	167	3321		162	3305	816		44	263	51	48	277
v/s Ratio Prot	0.06	c0.98		0.05	0.38				c0.12			
v/s Ratio Perm						0.03		0.02	0.10	0.39	c0.42	0.00
v/c Ratio	0.59	1.89		0.54	0.74	0.06		0.75	1.34	2.22	2.40	0.02
Uniform Delay, d1	60.8	33.7		60.8	26.6	16.9		67.5	61.6	57.8	57.8	47.8
Progression Factor	0.63	0.32		1.35	0.39	0.31		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	398.4		3.0	1.4	0.1		51.4	175.5	605.2	687.0	0.0
Delay (s)	38.9	409.2		85.2	11.8	5.4		118.9	237.1	663.0	744.7	47.8
Level of Service	D	F		F	B	A		F	F	F	F	D
Approach Delay (s)		403.5			14.1			228.1			621.2	
Approach LOS		F			B			F			F	

Intersection Summary			
HCM Average Control Delay	296.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	128.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
114: Deer Run Dr/Harbour View Ct & Route 360

8/21/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	5080	30	150	2050	110	30	60	640	140	10	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86		1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	6408	1583	3433	6359		1770	1863	1583	1681	1696	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1770	6408	1583	3433	6359		1770	1863	1583	1681	1696	1583
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	5237	33	163	2228	120	33	65	696	152	11	109
RTOR Reduction (vph)	0	0	9	0	5	0	0	0	0	0	0	105
Lane Group Flow (vph)	207	5237	24	163	2343	0	33	65	696	81	82	4
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	20.7	72.0	72.0	31.5	82.9		5.0	5.0	36.5	5.5	5.5	5.5
Effective Green, g (s)	20.7	72.0	72.0	31.5	82.9		5.0	5.0	36.5	5.5	5.5	5.5
Actuated g/C Ratio	0.15	0.51	0.51	0.22	0.59		0.04	0.04	0.26	0.04	0.04	0.04
Clearance Time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	262	3296	814	772	3765		63	67	413	66	67	62
v/s Ratio Prot	0.12	c0.82		0.05	0.37		0.02	0.03	c0.38	0.05	c0.05	
v/s Ratio Perm			0.02						0.06			0.00
v/c Ratio	0.79	1.59	0.03	0.21	0.62		0.52	0.97	1.69	1.23	1.22	0.07
Uniform Delay, d1	57.6	34.0	16.8	44.1	18.4		66.3	67.4	51.8	67.2	67.2	64.8
Progression Factor	1.04	0.34	0.13	0.42	0.36		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	265.1	0.0	0.1	0.5		5.9	99.2	318.7	184.1	182.0	0.3
Delay (s)	61.6	276.6	2.2	18.6	7.2		72.2	166.6	370.5	251.3	249.3	65.1
Level of Service	E	F	A	B	A		E	F	F	F	F	E
Approach Delay (s)		266.8			7.9			341.4			176.1	
Approach LOS		F			A			F			F	

Intersection Summary			
HCM Average Control Delay	198.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	133.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
115: Chital Dr & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	5060	120	140	2040	10	110	10	230	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.86		0.97	0.86	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00
Satd. Flow (prot)	1770	6385		3433	6408	1583	1770	1863	1583		1817	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00
Satd. Flow (perm)	1770	6385		3433	6408	1583	1770	1863	1583		1817	1583
Peak-hour factor, PHF	0.92	0.96	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	5271	129	152	2217	11	120	11	250	11	11	11
RTOR Reduction (vph)	0	2	0	0	0	4	0	0	97	0	0	11
Lane Group Flow (vph)	11	5398	0	152	2217	7	120	11	153	0	22	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	3	4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	2.0	83.8		9.4	90.6	94.8	16.8	16.8	16.8		4.2	4.2
Effective Green, g (s)	2.0	83.8		9.4	90.6	94.8	16.8	16.8	16.8		4.2	4.2
Actuated g/C Ratio	0.01	0.60		0.07	0.65	0.68	0.12	0.12	0.12		0.03	0.03
Clearance Time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	8.0		5.0	8.0	2.5	3.5	3.5	3.5		2.5	2.5
Lane Grp Cap (vph)	25	3822		231	4147	1072	212	224	190		55	47
v/s Ratio Prot	0.01	c0.85		c0.04	0.35	0.00	0.07	0.01			c0.01	
v/s Ratio Perm						0.00			c0.10			0.00
v/c Ratio	0.44	1.41		0.66	0.53	0.01	0.57	0.05	0.81		0.40	0.01
Uniform Delay, d1	68.4	28.1		63.7	13.3	7.3	58.2	54.5	60.0		66.7	65.9
Progression Factor	0.81	0.20		1.24	1.10	0.33	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	185.7		7.0	0.4	0.0	3.7	0.1	22.0		3.4	0.0
Delay (s)	56.5	191.2		85.8	15.0	2.4	61.9	54.6	82.1		70.1	65.9
Level of Service	E	F		F	B	A	E	D	F		E	E
Approach Delay (s)		190.9			19.5			74.9			68.7	
Approach LOS		F			B			E			E	

Intersection Summary			
HCM Average Control Delay	135.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	111.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	4360	60	150	1780	220	50	80	500	330	40	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86			1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	5085	1583	1770	6304			1828	1583	1681	1703	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	5085	1583	1770	6304			1828	1583	1681	1703	1583
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	4638	65	163	1935	234	54	87	543	359	43	43
RTOR Reduction (vph)	0	0	10	0	15	0	0	0	86	0	0	39
Lane Group Flow (vph)	130	4638	55	163	2154	0	0	141	457	201	201	4
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	10.0	75.0	75.0	8.5	72.6			19.5	19.5	11.5	11.5	11.5
Effective Green, g (s)	10.0	75.0	75.0	8.5	72.6			19.5	19.5	11.5	11.5	11.5
Actuated g/C Ratio	0.07	0.54	0.54	0.06	0.52			0.14	0.14	0.08	0.08	0.08
Clearance Time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	4.0	8.0			3.5	3.5	2.5	2.5	2.5
Lane Grp Cap (vph)	245	2724	848	107	3269			255	220	138	140	130
v/s Ratio Prot	0.04	c0.91		c0.09	0.34			0.08		c0.12	0.12	
v/s Ratio Perm			0.03						c0.29			0.00
v/c Ratio	0.53	1.70	0.06	1.52	0.66			0.55	2.08	1.46	1.44	0.03
Uniform Delay, d1	62.7	32.5	15.6	65.8	24.6			56.2	60.2	64.2	64.2	59.1
Progression Factor	0.84	0.47	0.23	0.82	0.12			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	316.3	0.0	272.7	0.9			2.8	499.9	240.9	231.9	0.1
Delay (s)	53.2	331.7	3.6	326.4	3.9			59.0	560.2	305.2	296.1	59.2
Level of Service	D	F	A	F	A			E	F	F	F	E
Approach Delay (s)		319.8			26.5			456.9			277.3	
Approach LOS		F			C			F			F	

Intersection Summary			
HCM Average Control Delay	246.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	141.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
117: Winterpock Rd/Lake Harbour Dr & Route 360

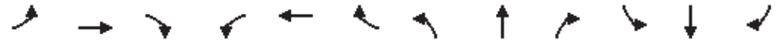
8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	3800	60	190	1680	10	160	10	740	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00		1.00	0.88	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583		1779	2787	1770	1723	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583		1779	2787	1770	1723	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	11	4130	65	207	1826	11	174	11	787	11	11	11
RTOR Reduction (vph)	0	0	10	0	0	4	0	0	60	0	11	0
Lane Group Flow (vph)	11	4130	55	207	1826	7	0	185	727	11	11	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	2.0	76.2	76.2	18.4	92.2	92.2		16.1	34.5	3.0	3.0	
Effective Green, g (s)	2.0	76.2	76.2	18.4	92.2	92.2		16.1	34.5	3.0	3.0	
Actuated g/C Ratio	0.01	0.54	0.54	0.13	0.66	0.66		0.12	0.25	0.02	0.02	
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0		3.0	4.0	3.0	3.0	
Lane Grp Cap (vph)	25	2768	862	451	3349	1043		205	687	38	37	
v/s Ratio Prot	0.01	c0.81		0.06	0.36			0.10	c0.14	0.01	c0.01	
v/s Ratio Perm			0.04			0.00			0.12			
v/c Ratio	0.44	1.49	0.06	0.46	0.55	0.01		0.90	1.06	0.29	0.30	
Uniform Delay, d1	68.4	31.9	15.1	56.2	12.7	8.2		61.2	52.8	67.5	67.5	
Progression Factor	1.14	0.46	0.15	0.72	1.14	2.24		1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	221.6	0.0	0.8	0.5	0.0		37.0	50.6	4.2	4.6	
Delay (s)	79.4	236.3	2.2	41.4	15.0	18.4		98.2	103.4	71.6	72.1	
Level of Service	E	F	A	D	B	B		F	F	E	E	
Approach Delay (s)		232.2			17.7			102.4			71.9	
Approach LOS		F			B			F			E	

Intersection Summary			
HCM Average Control Delay	153.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.3
Intersection Capacity Utilization	120.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
118: Hancock Village/Duckridge Blvd & Route 360

8/21/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	3670	160	50	1780	20	60	10	140	0	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5			6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.95	0.95	1.00			1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00			1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1681	1709	1583			1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00			1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1681	1709	1583			1583
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)	22	3989	174	54	1935	22	65	11	152	0	0	11
RTOR Reduction (vph)	0	0	27	0	0	5	0	0	52	0	0	11
Lane Group Flow (vph)	22	3989	147	54	1935	17	38	38	100	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split		Perm
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	3.6	99.8	99.8	7.9	103.4	103.4	4.0	4.0	11.9			2.0
Effective Green, g (s)	3.6	99.8	99.8	7.9	103.4	103.4	4.0	4.0	11.9			2.0
Actuated g/C Ratio	0.03	0.71	0.71	0.06	0.74	0.74	0.03	0.03	0.09			0.01
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5			6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5	2.5			2.5
Lane Grp Cap (vph)	46	3625	1128	194	2614	1169	48	49	135			23
v/s Ratio Prot	0.01	c0.78		0.02	c0.55		c0.02	0.02	0.04			
v/s Ratio Perm			0.09			0.01			0.02			c0.00
v/c Ratio	0.48	1.10	0.13	0.28	0.74	0.01	0.79	0.78	0.74			0.01
Uniform Delay, d1	67.3	20.1	6.4	63.3	10.6	4.8	67.6	67.6	62.5			68.0
Progression Factor	0.71	0.18	0.02	1.19	1.20	0.23	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.5	45.7	0.0	0.5	1.6	0.0	57.1	51.5	18.0			0.1
Delay (s)	48.5	49.4	0.1	75.5	14.3	1.1	124.6	119.0	80.5			68.1
Level of Service	D	D	A	E	B	A	F	F	F			E
Approach Delay (s)		47.3			15.8			94.3			68.1	
Approach LOS		D			B			F			E	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	27.3
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	3540	40	60	1790	110	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4		6.5	6.8	6.5	6.5
Lane Util. Factor	0.91		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5077		3433	3539	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	5077		3433	3539	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3848	43	65	1946	120	337
RTOR Reduction (vph)	1	0	0	0	0	54
Lane Group Flow (vph)	3890	0	65	1946	120	283
Turn Type	NA		Prot	NA	NA	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	95.3		4.8	106.2	20.5	20.5
Effective Green, g (s)	95.3		4.8	106.2	20.5	20.5
Actuated g/C Ratio	0.68		0.03	0.76	0.15	0.15
Clearance Time (s)	6.4		6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0		2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	3456		118	2685	503	232
v/s Ratio Prot	c0.77		0.02	c0.55	0.03	
v/s Ratio Perm						c0.18
v/c Ratio	1.13		0.55	0.72	0.24	1.22
Uniform Delay, d1	22.4		66.5	9.1	52.8	59.8
Progression Factor	0.89		0.82	0.22	1.00	1.00
Incremental Delay, d2	57.0		3.2	1.3	0.2	131.7
Delay (s)	77.0		57.6	3.3	53.0	191.5
Level of Service	E		E	A	D	F
Approach Delay (s)	77.0			5.0	155.1	
Approach LOS	E			A	F	

Intersection Summary			
HCM Average Control Delay	59.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	50	2610	1280	610	970	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2837	1391	663	1054	65
RTOR Reduction (vph)	0	0	0	289	0	22
Lane Group Flow (vph)	54	2837	1391	374	1054	43
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	7.3	92.3	78.9	78.9	34.5	34.5
Effective Green, g (s)	7.3	92.3	78.9	78.9	34.5	34.5
Actuated g/C Ratio	0.05	0.66	0.56	0.56	0.25	0.25
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	92	2333	1994	892	846	390
v/s Ratio Prot	0.03	c0.80	0.39		c0.31	
v/s Ratio Perm				0.24		0.03
v/c Ratio	0.59	1.22	0.70	0.42	1.25	0.11
Uniform Delay, d1	64.9	23.9	22.0	17.5	52.8	40.9
Progression Factor	1.16	0.20	0.58	0.56	1.00	1.00
Incremental Delay, d2	0.7	97.6	1.5	1.0	120.5	0.1
Delay (s)	76.2	102.4	14.1	10.8	173.3	41.0
Level of Service	E	F	B	B	F	D
Approach Delay (s)		101.9	13.1		165.6	
Approach LOS		F	B		F	

Intersection Summary			
HCM Average Control Delay	83.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	110.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
121: Hampton Park Dr/Fox Club Pkwy & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	2020	10	100	1150	90	10	50	360	280	40	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1847	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1847	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.96	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	2104	11	109	1198	98	11	54	391	304	43	54
RTOR Reduction (vph)	0	0	2	0	0	36	0	0	89	0	0	50
Lane Group Flow (vph)	43	2104	9	109	1198	62	0	65	302	304	43	4
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	7.2	71.8	71.8	9.8	74.5	74.5		20.5	20.5	11.5	11.5	11.5
Effective Green, g (s)	7.2	71.8	71.8	9.8	74.5	74.5		20.5	20.5	11.5	11.5	11.5
Actuated g/C Ratio	0.05	0.51	0.51	0.07	0.53	0.53		0.15	0.15	0.08	0.08	0.08
Clearance Time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	91	1815	812	124	1883	842		270	232	282	153	130
v/s Ratio Prot	0.02	c0.59		c0.06	0.34			0.04		c0.09	0.02	
v/s Ratio Perm			0.01			0.04			c0.19			0.00
v/c Ratio	0.47	1.16	0.01	0.88	0.64	0.07		0.24	1.30	1.08	0.28	0.03
Uniform Delay, d1	64.6	34.1	16.7	64.5	23.2	15.9		52.9	59.8	64.2	60.4	59.1
Progression Factor	0.75	0.56	0.64	0.90	0.24	0.04		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	74.6	0.0	36.9	1.2	0.1		0.5	164.0	75.9	1.0	0.1
Delay (s)	49.9	93.8	10.6	95.3	6.9	0.8		53.3	223.7	140.2	61.4	59.2
Level of Service	D	F	B	F	A	A		D	F	F	E	E
Approach Delay (s)		92.5			13.3			199.4			120.8	
Approach LOS		F			B			F			F	

Intersection Summary			
HCM Average Control Delay	80.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
122: Otterdale Rd & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	1710	20	130	1000	80	10	20	250	110	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.96	
Satd. Flow (prot)	1719	3539	1583	1770	3494			1832	1583		1707	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.96	
Satd. Flow (perm)	1719	3539	1583	1770	3494			1832	1583		1707	
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	1763	22	141	1087	83	11	22	272	120	11	22
RTOR Reduction (vph)	0	0	5	0	4	0	0	0	39	0	5	0
Lane Group Flow (vph)	120	1763	17	141	1166	0	0	33	233	0	148	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	2%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			
Actuated Green, G (s)	14.2	77.2	77.2	18.5	81.4			4.1	22.6		13.4	
Effective Green, g (s)	14.2	77.2	77.2	18.5	81.4			4.1	22.6		13.4	
Actuated g/C Ratio	0.10	0.55	0.55	0.13	0.58			0.03	0.16		0.10	
Clearance Time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	174	1952	873	234	2032			54	256		163	
v/s Ratio Prot	0.07	c0.50		0.08	0.33			0.02	c0.12		c0.09	
v/s Ratio Perm			0.01						0.03			
v/c Ratio	0.69	0.90	0.02	0.60	0.57			0.61	0.91		0.91	
Uniform Delay, d1	60.8	28.1	14.2	57.3	18.4			67.2	57.7		62.7	
Progression Factor	1.00	1.00	1.00	0.67	0.70			1.00	1.00		1.00	
Incremental Delay, d2	10.0	7.4	0.0	3.0	1.0			16.2	33.7		45.4	
Delay (s)	70.7	35.4	14.3	41.4	13.9			83.4	91.4		108.1	
Level of Service	E	D	B	D	B			F	F		F	
Approach Delay (s)		37.4			16.8			90.5			108.1	
Approach LOS		D			B			F			F	

Intersection Summary			
HCM Average Control Delay	37.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.8
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
123: Bailey Bridge Road & Bailey Bridge Connector

8/21/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
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	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		8				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

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

HCM Unsignalized Intersection Capacity Analysis
124: Bailey Bridge Road & Deer Run Drive

8/21/2014

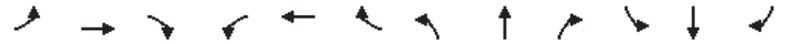
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	110	450	160	200	180	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	489	174	217	196	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	391				902	174
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	391				902	174
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				29	96
cM capacity (veh/h)	1167				277	870

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	120	489	174	217	196	33
Volume Left	120	0	0	0	196	0
Volume Right	0	0	0	217	0	33
cSH	1167	1700	1700	1700	277	870
Volume to Capacity	0.10	0.29	0.10	0.13	0.71	0.04
Queue Length 95th (ft)	9	0	0	0	122	3
Control Delay (s)	8.4	0.0	0.0	0.0	44.3	9.3
Lane LOS	A				E	A
Approach Delay (s)	1.7		0.0		39.3	
Approach LOS					E	

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
125: Springford Parkway/Bailey Bridge Road & Spring Run Road

8/21/2014



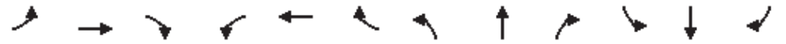
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	260	280	50	40	90	60	20	170	80	200	130	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	283	304	54	43	98	65	22	185	87	217	141	217

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	587	54	141	65	293	576
Volume Left (vph)	283	0	43	0	22	217
Volume Right (vph)	0	54	0	65	87	217
Hadj (s)	0.13	-0.57	0.10	-0.57	-0.13	-0.12
Departure Headway (s)	7.4	3.2	8.7	3.2	7.7	7.1
Degree Utilization, x	1.20	0.05	0.34	0.06	0.63	1.14
Capacity (veh/h)	493	1121	387	1121	451	503
Control Delay (s)	133.8	6.4	16.2	6.4	23.0	110.1
Approach Delay (s)	123.0		13.1		23.0	110.1
Approach LOS	F		B		C	F

Intersection Summary				
Delay	88.4			
HCM Level of Service	F			
Intersection Capacity Utilization	94.5%	ICU Level of Service	F	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
126: Old Hundred Rd & Millridge

4/1/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	10	430	40	10	10	100	570	60	10	580	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	11	467	43	11	11	109	620	65	11	630	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								871				
pX, platoon unblocked												
vC, conflicting volume	1217	1576	652	1516	1489	310	630			685		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1217	1576	652	1516	1489	310	630			685		
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 %	52	89	0	0	90	98	89			99		
cM capacity (veh/h)	112	95	410	0	107	686	948			905		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1
Volume Total	533	54	11	109	310	310	65	685
Volume Left	54	43	0	109	0	0	0	11
Volume Right	467	0	11	0	0	0	65	43
cSH	307	0	686	948	1700	1700	1700	905
Volume to Capacity	1.74	Err	0.02	0.11	0.18	0.18	0.04	0.01
Queue Length 95th (ft)	853	Err	1	10	0	0	0	1
Control Delay (s)	374.1	Err	10.3	9.3	0.0	0.0	0.0	0.3
Lane LOS	F	F	B	A				A
Approach Delay (s)	374.1	Err		1.3				0.3
Approach LOS	F	F						

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	95.8%	ICU Level of Service	F	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
127: Old Hundred Rd & Market Square

4/1/2015

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	20	610	20	20	600
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)	33	22	663	22	22	652
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1359	663			685	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1359	663			685	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	95			98	
cM capacity (veh/h)	160	461			909	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	54	663	22	22	652
Volume Left	33	0	0	22	0
Volume Right	22	0	22	0	0
cSH	217	1700	1700	909	1700
Volume to Capacity	0.25	0.39	0.01	0.02	0.38
Queue Length 95th (ft)	24	0	0	2	0
Control Delay (s)	27.1	0.0	0.0	9.1	0.0
Lane LOS	D			A	
Approach Delay (s)	27.1	0.0		0.3	
Approach LOS	D				

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	LTR
Maximum Queue (ft)	134	153	409	521	544	90	49	327	414	463	268	843
Average Queue (ft)	84	92	275	343	376	16	23	246	316	360	115	545
95th Queue (ft)	141	162	442	543	586	78	60	344	426	478	268	849
Link Distance (ft)			1521	1521	1521			5220	5220	5220		1540
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	205	205				90	190				200	
Storage Blk Time (%)	0	0	13		31			11		31	1	
Queuing Penalty (veh)	1	1	38		21			4		57	5	

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	90	114	34	201
Average Queue (ft)	53	72	13	107
95th Queue (ft)	101	125	39	207
Link Distance (ft)			1263	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		250
Storage Blk Time (%)				0
Queuing Penalty (veh)				0

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	L	L	T	T	T	T	R
Maximum Queue (ft)	93	114	209	297	336	54	70	141	200	266	224	30
Average Queue (ft)	53	75	132	177	220	24	39	70	127	182	147	14
95th Queue (ft)	96	118	222	314	355	57	75	147	221	286	242	37
Link Distance (ft)			635	635	635			1521	1521	1521		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	420	420				200	200				200	200
Storage Blk Time (%)								0		5	2	
Queuing Penalty (veh)								0		24	7	

Intersection: 102: Lonas Pkwy & Route 360

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	L	L	T	T
Maximum Queue (ft)	74	137	37	123	54	66	14	32
Average Queue (ft)	35	89	15	71	30	41	3	10
95th Queue (ft)	77	148	43	121	61	73	16	34
Link Distance (ft)			402	402	256	256	256	256
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	240	240						
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

Movement	WB
Directions Served	T
Maximum Queue (ft)	35
Average Queue (ft)	6
95th Queue (ft)	60
Link Distance (ft)	1000
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	WB	WB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	29	97	236	605
Average Queue (ft)	6	22	111	354
95th Queue (ft)	29	109	239	914
Link Distance (ft)	290	290	290	1044
Upstream Blk Time (%)			2	6
Queuing Penalty (veh)			6	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	EB	EB	WB	NB
Directions Served	T	T	R	R
Maximum Queue (ft)	383	385	64	79
Average Queue (ft)	154	344	0	49
95th Queue (ft)	451	468	0	86
Link Distance (ft)	331	331	632	949
Upstream Blk Time (%)	1	15	0	
Queuing Penalty (veh)	23	268	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB	EB	EB	EB
Directions Served	T	T	T	R
Maximum Queue (ft)	574	864	876	877
Average Queue (ft)	140	656	819	751
95th Queue (ft)	635	1080	1020	1208
Link Distance (ft)	834	834	834	834
Upstream Blk Time (%)	0	3	34	16
Queuing Penalty (veh)	5	47	559	269
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 107: Route 360 & Market Square Ln

Movement	EB	EB	EB	EB	SB	B993
Directions Served	T	T	T	T	R	T
Maximum Queue (ft)	564	580	599	606	153	3
Average Queue (ft)	216	377	478	387	79	0
95th Queue (ft)	619	773	780	753	202	0
Link Distance (ft)	576	576	576	576	262	319
Upstream Blk Time (%)	1	4	10	4	2	
Queuing Penalty (veh)	19	68	165	69	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	168	518	656	660	655	651	449	183	201	296	322	363
Average Queue (ft)	113	212	570	613	630	609	187	143	158	204	229	268
95th Queue (ft)	186	505	728	716	674	705	511	262	278	307	337	379
Link Distance (ft)			619	619	619	619		576	576	576	576	576
Upstream Blk Time (%)		0	10	25	43	27						
Queuing Penalty (veh)		0	171	429	746	461						
Storage Bay Dist (ft)	300	300					250					
Storage Blk Time (%)			16			39						
Queuing Penalty (veh)			76			112						

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB	B996	B996
Directions Served	T	L	L	T	T	R	L	L	T	R	T	T
Maximum Queue (ft)	391	50	68	69	81	129	589	839	839	491	711	729
Average Queue (ft)	295	27	33	33	45	73	519	778	621	270	396	385
95th Queue (ft)	413	58	69	71	89	132	696	976	1119	488	931	940
Link Distance (ft)	576			704	704			756	756		795	795
Upstream Blk Time (%)								56	28		11	16
Queuing Penalty (veh)								0	0		0	0
Storage Bay Dist (ft)		390	390			250	430			430		
Storage Blk Time (%)							45	81		3		
Queuing Penalty (veh)							135	244		4		

Intersection: 109: Route 360 & Village Green Dr

Movement	EB	EB	EB	EB	EB	WB
Directions Served	L	T	T	T	T	TR
Maximum Queue (ft)	209	381	392	393	391	2
Average Queue (ft)	75	226	290	320	299	0
95th Queue (ft)	200	481	508	515	525	4
Link Distance (ft)		358	358	358	358	619
Upstream Blk Time (%)	0	6	12	34	23	
Queuing Penalty (veh)	0	130	239	686	474	
Storage Bay Dist (ft)	240					
Storage Blk Time (%)	0	10				
Queuing Penalty (veh)	0	12				

Intersection: 110: Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	SB
Directions Served	T	T	T	T	T	T	TR	R
Maximum Queue (ft)	265	282	281	267	107	120	5	38
Average Queue (ft)	123	180	211	192	48	58	1	19
95th Queue (ft)	309	369	364	364	159	176	11	46
Link Distance (ft)	241	241	241	241			358	775
Upstream Blk Time (%)	5	11	20	17				
Queuing Penalty (veh)	89	201	359	305				
Storage Bay Dist (ft)					150	150		
Storage Blk Time (%)					4	7		
Queuing Penalty (veh)					19	31		

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R	L	L	T	T	T	T	L
Maximum Queue (ft)	886	897	916	947	399	247	252	111	137	166	204	186
Average Queue (ft)	490	576	644	667	202	212	220	60	82	113	143	92
95th Queue (ft)	1028	1085	1107	1169	494	291	288	122	154	197	228	214
Link Distance (ft)	876	876	876	876		241	241	241	241	241	241	410
Upstream Blk Time (%)	9	11	21	38		33	38			0	0	
Queuing Penalty (veh)	158	197	357	665		139	161			0	1	
Storage Bay Dist (ft)					200							
Storage Blk Time (%)				50								
Queuing Penalty (veh)				248								

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	NB	NB	B61	B61	B61
Directions Served	L	R	T	T	T
Maximum Queue (ft)	469	476	126	430	642
Average Queue (ft)	392	451	20	182	356
95th Queue (ft)	642	540	186	622	832
Link Distance (ft)	410	410	810	810	810
Upstream Blk Time (%)	11	61		1	8
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	EB	EB	EB	EB	EB	WB	NB
Directions Served	T	T	T	T	R	L	R
Maximum Queue (ft)	616	765	904	963	361	70	19
Average Queue (ft)	116	172	228	259	51	35	13
95th Queue (ft)	539	660	799	862	341	87	87
Link Distance (ft)	2140	2140	2140	2140			1052
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)					500	600	
Storage Blk Time (%)				13	0		
Queuing Penalty (veh)				19	0		

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	R	LT
Maximum Queue (ft)	232	2488	2490	2488	2487	126	260	272	309	342	68	239
Average Queue (ft)	51	1924	1924	1955	1985	73	169	181	221	247	19	96
95th Queue (ft)	207	2780	2791	2771	2765	131	288	306	356	379	93	260
Link Distance (ft)		2493	2493	2493	2493		2140	2140	2140	2140		
Upstream Blk Time (%)		3	2	3	4							
Queuing Penalty (veh)		41	40	46	58							
Storage Bay Dist (ft)	140					150					160	200
Storage Blk Time (%)		50				1	11			18		
Queuing Penalty (veh)		60				4	10			13		

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	NB	SB	SB	SB
Directions Served	R	L	LT	R
Maximum Queue (ft)	512	180	209	50
Average Queue (ft)	339	106	130	19
95th Queue (ft)	578	179	206	48
Link Distance (ft)	874		588	
Upstream Blk Time (%)	1			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)		120		120
Storage Blk Time (%)	40	7	14	
Queuing Penalty (veh)	21	14	25	

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T	R	L	L	T	T	T	TR
Maximum Queue (ft)	365	1340	1348	1372	1390	244	65	83	154	171	218	252
Average Queue (ft)	162	762	774	847	928	45	28	44	88	99	141	173
95th Queue (ft)	346	1354	1324	1364	1395	244	67	88	162	175	227	264
Link Distance (ft)		1713	1713	1713	1713				2493	2493	2493	2493
Upstream Blk Time (%)		1	0	0	1							
Queuing Penalty (veh)		9	3	5	7							
Storage Bay Dist (ft)	200					360	280	280				
Storage Blk Time (%)	1	43			43							
Queuing Penalty (veh)	16	93			19							

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	LT	R
Maximum Queue (ft)	69	1310	1312	223	324	175
Average Queue (ft)	33	1224	1259	157	201	76
95th Queue (ft)	82	1523	1444	306	468	212
Link Distance (ft)		1289	1289		830	
Upstream Blk Time (%)		16	54		2	
Queuing Penalty (veh)		0	0		0	
Storage Bay Dist (ft)	190			200		250
Storage Blk Time (%)				23	27	
Queuing Penalty (veh)				51	56	

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	29	139	169	188	209	139	148	237	245	272	224	5
Average Queue (ft)	8	85	105	121	150	95	104	142	158	174	115	1
95th Queue (ft)	31	131	160	175	205	169	173	260	270	303	241	7
Link Distance (ft)		840	840	840	840			1713	1713	1713	1713	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	540					170	170					190
Storage Blk Time (%)						5	5	3			1	
Queuing Penalty (veh)						26	29	4			0	

Intersection: 115: Chital Dr & Route 360

Movement	NB	NB	NB	SB	SB
Directions Served	L	T	R	LT	R
Maximum Queue (ft)	160	72	281	61	37
Average Queue (ft)	117	20	180	28	14
95th Queue (ft)	182	91	323	74	41
Link Distance (ft)		1010	1010	610	610
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)	18				
Queuing Penalty (veh)	2				

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	B1	B1	B1	WB	WB	WB
Directions Served	L	L	T	T	T	R	T	T	T	L	T	T
Maximum Queue (ft)	41	320	939	940	951	181	753	761	756	290	550	545
Average Queue (ft)	16	85	937	936	938	31	742	744	745	250	281	260
95th Queue (ft)	45	337	943	947	948	203	756	761	757	375	706	643
Link Distance (ft)			869	869	869		736	736	736		840	840
Upstream Blk Time (%)			42	43	46		20	20	21		1	0
Queuing Penalty (veh)			698	722	768		334	336	356		4	0
Storage Bay Dist (ft)	220	220				230				115		
Storage Blk Time (%)			43		46					73	7	
Queuing Penalty (veh)			60		32					336	10	

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	LT	R	L	LT	R
Maximum Queue (ft)	343	164	227	683	239	1003	190
Average Queue (ft)	126	56	187	392	226	853	73
95th Queue (ft)	403	176	288	811	265	1217	235
Link Distance (ft)	840	840		2183		996	
Upstream Blk Time (%)						32	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)			130		90		170
Storage Blk Time (%)			14	56	88	90	
Queuing Penalty (veh)			76	94	248	207	

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	L	T	T	T	R	LT
Maximum Queue (ft)	72	1129	1134	1138	177	99	117	353	404	255	18	629
Average Queue (ft)	12	1036	1034	1046	35	57	80	264	298	140	4	412
95th Queue (ft)	98	1356	1356	1352	196	108	122	372	427	273	19	750
Link Distance (ft)		1112	1112	1112				736	736	736		
Upstream Blk Time (%)		22	21	21								
Queuing Penalty (veh)		307	285	295								
Storage Bay Dist (ft)	180				170	280	280				575	430
Storage Blk Time (%)		49		52				5				6
Queuing Penalty (veh)		7		35				10				49

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	NB	NB	SB	SB
Directions Served	R	R	L	TR
Maximum Queue (ft)	1764	1238	16	38
Average Queue (ft)	970	833	5	12
95th Queue (ft)	1813	1344	17	43
Link Distance (ft)	1868		470	470
Upstream Blk Time (%)	9			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)		1000		
Storage Blk Time (%)	63	19		
Queuing Penalty (veh)	428	127		

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	L	T	T	R	L	LT
Maximum Queue (ft)	104	1183	1187	1186	254	28	52	355	418	1	76	77
Average Queue (ft)	23	709	715	735	54	10	25	113	163	0	36	44
95th Queue (ft)	118	1466	1460	1470	236	31	50	347	430	2	81	91
Link Distance (ft)		1172	1172	1172				1112	1112	1112	796	796
Upstream Blk Time (%)		9	8	9								
Queuing Penalty (veh)		132	115	123								
Storage Bay Dist (ft)	200				200	300	300					
Storage Blk Time (%)		39		39				0				
Queuing Penalty (veh)		9		68				0				

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	188	10
Average Queue (ft)	115	2
95th Queue (ft)	193	11
Link Distance (ft)	796	958
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 119: Ashlake & Route 360

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	TR	L	L	T	T	L	L	R
Maximum Queue (ft)	942	948	300	50	68	241	306	86	113	435
Average Queue (ft)	696	699	293	21	39	145	199	47	67	307
95th Queue (ft)	1044	1086	319	56	73	248	322	97	121	503
Link Distance (ft)	931	931				1172	1172		2592	2592
Upstream Blk Time (%)	6	6								
Queuing Penalty (veh)	124	121								
Storage Bay Dist (ft)			200	400	400			200		
Storage Blk Time (%)		25	26							
Queuing Penalty (veh)		336	336							

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	L	L	R
Maximum Queue (ft)	184	2288	2305	255	289	1176	1180	174
Average Queue (ft)	57	1302	1360	157	178	1121	1127	55
95th Queue (ft)	187	2175	2225	273	305	1350	1348	187
Link Distance (ft)		4676	4676	931	931	1161	1161	
Upstream Blk Time (%)						48	55	
Queuing Penalty (veh)						0	0	
Storage Bay Dist (ft)	200							150
Storage Blk Time (%)		38					79	
Queuing Penalty (veh)		21					51	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	T	R	L	T	T	LT	R	L	L	T
Maximum Queue (ft)	180	2610	2613	20	191	154	171	436	658	371	494	781
Average Queue (ft)	52	2167	2164	4	130	59	66	182	539	296	362	254
95th Queue (ft)	193	2875	2855	18	252	158	185	569	811	452	615	846
Link Distance (ft)		2671	2671			4676	4676	759	759			1442
Upstream Blk Time (%)		4	4					0	8			
Queuing Penalty (veh)		40	38					0	0			
Storage Bay Dist (ft)	240			200	230					240	240	
Storage Blk Time (%)		49	50		6	1	1			50	53	0
Queuing Penalty (veh)		32	7		35	1	1			70	73	0

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB
Directions Served	R
Maximum Queue (ft)	79
Average Queue (ft)	42
95th Queue (ft)	88
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	130
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	312	854	888	217	156	294	311	114	262	278
Average Queue (ft)	144	545	592	32	88	197	217	63	165	200
95th Queue (ft)	311	1075	1115	208	172	319	339	134	291	393
Link Distance (ft)		3682	3682			2671	2671	1022		1606
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			200	375				500	
Storage Blk Time (%)	1	30	34			0				
Queuing Penalty (veh)	4	40	11			0				

Intersection: 123: Bailey Bridge Road & Bailey Bridge Connector

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)

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	59	21	127	22
Average Queue (ft)	32	4	74	9
95th Queue (ft)	64	21	131	25
Link Distance (ft)				826
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	225	275	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LT	LTR	LTR
Maximum Queue (ft)	806	800	78	110	365
Average Queue (ft)	719	608	47	72	207
95th Queue (ft)	970	1136	80	129	444
Link Distance (ft)	778	778	840	663	544
Upstream Blk Time (%)	59	17			2
Queuing Penalty (veh)	0	0			0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 16790

HCM Signalized Intersection Capacity Analysis
101: Bridgewood Rd/Warbro Rd & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	280	2820	170	40	2990	330	100	40	30	360	80	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	3155	5085	1583	1770	5085	1455		1766		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	3155	5085	1583	1770	5085	1455		1766		3155	1712	1455
Peak-hour factor, PHF	0.92	0.93	0.92	0.92	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	3032	185	43	3051	359	109	43	33	391	87	315
RTOR Reduction (vph)	0	0	20	0	0	76	0	6	0	0	0	22
Lane Group Flow (vph)	304	3032	165	43	3051	283	0	179	0	391	87	293
Heavy Vehicles (%)	11%	2%	2%	2%	2%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	13.8	83.1	83.1	4.0	73.6	73.6		11.5		15.5	15.5	29.3
Effective Green, g (s)	13.8	83.1	83.1	4.0	73.6	73.6		11.5		15.5	15.5	29.3
Actuated g/C Ratio	0.10	0.59	0.59	0.03	0.53	0.53		0.08		0.11	0.11	0.21
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	311	3018	940	51	2673	765		145		349	190	305
v/s Ratio Prot	0.10	c0.60		0.02	c0.60			c0.10		c0.12	0.05	0.09
v/s Ratio Perm			0.10			0.19						0.11
v/c Ratio	0.98	1.00	0.18	0.84	1.14	0.37		1.24		1.12	0.46	0.96
Uniform Delay, d1	62.9	28.5	12.9	67.7	33.2	19.5		64.2		62.2	58.3	54.8
Progression Factor	0.82	0.59	0.67	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	26.5	11.4	0.2	69.8	68.7	1.4		152.4		84.8	4.9	40.9
Delay (s)	78.2	28.1	8.8	137.5	101.9	20.9		216.7		147.1	63.2	95.7
Level of Service	E	C	A	F	F	C		F		F	E	F
Approach Delay (s)		31.4			93.9			216.7			117.5	
Approach LOS		C			F			F			F	

Intersection Summary				
HCM Average Control Delay	71.4	HCM Level of Service	E	
HCM Volume to Capacity ratio	1.09			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	101.1%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
102: Lonas Pkwy & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	550	3050	150	110	3160	120	110	10	60	150	10	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.93	0.92	0.92	0.92	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	591	3315	163	120	3224	130	120	11	65	163	11	337
RTOR Reduction (vph)	0	0	37	0	0	32	0	0	52	0	0	251
Lane Group Flow (vph)	591	3315	126	120	3224	98	120	11	13	163	11	86
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	25.7	97.4	97.4	5.1	76.8	76.8	5.0	5.0	5.0	11.5	11.5	11.5
Effective Green, g (s)	25.7	97.4	97.4	5.1	76.8	76.8	5.0	5.0	5.0	11.5	11.5	11.5
Actuated g/C Ratio	0.18	0.70	0.70	0.04	0.55	0.55	0.04	0.04	0.04	0.08	0.08	0.08
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	630	3538	1101	125	3515	868	123	67	57	282	291	130
v/s Ratio Prot	0.17	c0.65		0.03	c0.50		c0.03	0.01		0.05	0.00	
v/s Ratio Perm			0.08			0.06			0.01			c0.05
v/c Ratio	0.94	0.94	0.11	0.96	0.92	0.11	0.98	0.16	0.23	0.58	0.04	0.66
Uniform Delay, d1	56.4	18.6	7.0	67.3	28.7	15.2	67.4	65.5	65.6	61.9	59.2	62.4
Progression Factor	1.14	0.62	0.58	0.65	0.21	0.01	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.6	5.2	0.2	15.4	0.5	0.0	72.9	0.8	1.5	2.3	0.0	11.0
Delay (s)	82.7	16.7	4.2	59.5	6.6	0.1	140.4	66.3	67.1	64.3	59.2	73.3
Level of Service	F	B	A	E	A	A	F	E	E	E	E	E
Approach Delay (s)		25.8			8.2			111.9			70.1	
Approach LOS		C			A			F			E	

Intersection Summary				
HCM Average Control Delay	23.2	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	87.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
107: Route 360 & Market Square Ln

8/21/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	580	2810	510	730	6210	510	710	410	500	460	220	650
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Peak-hour factor, PHF	0.94	0.92	0.92	0.92	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	617	3054	554	793	6337	554	772	446	543	500	239	691
RTOR Reduction (vph)	0	0	177	0	0	85	0	0	179	0	0	0
Lane Group Flow (vph)	617	3054	378	793	6337	469	772	446	364	500	239	691
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.5	70.0	70.0	16.5	67.8	67.8	16.5	15.5	15.5	11.5	10.5	29.0
Effective Green, g (s)	18.5	70.0	70.0	16.5	67.8	67.8	16.5	15.5	15.5	11.5	10.5	29.0
Actuated g/C Ratio	0.13	0.50	0.50	0.12	0.48	0.48	0.12	0.11	0.11	0.08	0.08	0.21
Clearance Time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	454	3204	792	405	3103	767	405	392	175	282	140	328
v/s Ratio Prot	0.18	0.48		0.23	c0.99		0.22	0.13		0.15	0.13	c0.28
v/s Ratio Perm			0.24			0.30			c0.23			0.16
v/c Ratio	1.36	0.95	0.48	1.96	2.04	0.61	1.91	1.14	2.08	1.77	1.71	2.11
Uniform Delay, d1	60.8	33.4	23.0	61.8	36.1	26.4	61.8	62.2	62.2	64.2	64.8	55.5
Progression Factor	0.55	0.18	0.02	1.11	0.97	1.02	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	162.9	1.0	0.2	439.7	470.1	3.5	416.9	88.5	505.7	361.9	346.7	508.3
Delay (s)	196.3	7.0	0.6	508.0	505.1	30.5	478.7	150.8	568.0	426.2	411.5	563.8
Level of Service	F	A	A	F	F	C	F	F	F	F	F	F
Approach Delay (s)		33.8			471.2			423.2			490.2	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM Average Control Delay	345.0	HCM Level of Service	F
HCM Volume to Capacity ratio	2.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	167.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
109: Route 360 & Village Green Dr

8/21/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

HCM Unsignalized Intersection Capacity Analysis
110: Route 360

8/21/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
111: Brad McNeer Pkwy & Route 360

8/21/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	3540	270	710	6870	710	470
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Lane Util. Factor	0.86	1.00	0.97	0.86	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6408	1583	3433	6408	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6408	1583	3433	6408	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.98	0.92	0.92
Adj. Flow (vph)	3848	293	772	7010	772	511
RTOR Reduction (vph)	0	61	0	0	0	218
Lane Group Flow (vph)	3848	232	772	7010	772	293
Turn Type	NA	Perm	Prot	NA	NA	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	73.7	73.7	23.5	103.3	23.5	23.5
Effective Green, g (s)	73.7	73.7	23.5	103.3	23.5	23.5
Actuated g/C Ratio	0.53	0.53	0.17	0.74	0.17	0.17
Clearance Time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Vehicle Extension (s)	8.0	8.0	2.5	8.0	2.5	2.5
Lane Grp Cap (vph)	3373	833	576	4728	576	266
v/s Ratio Prot	0.60		0.22	c1.09	c0.22	
v/s Ratio Perm		0.15				0.19
v/c Ratio	1.14	0.28	1.34	1.48	1.34	1.10
Uniform Delay, d1	33.1	18.4	58.2	18.4	58.2	58.2
Progression Factor	0.39	0.08	0.78	0.63	1.00	1.00
Incremental Delay, d2	63.8	0.1	154.2	217.3	164.6	85.1
Delay (s)	76.6	1.6	199.7	228.9	222.8	143.3
Level of Service	E	A	F	F	F	F
Approach Delay (s)	71.3			226.0	191.2	
Approach LOS	E			F	F	

Intersection Summary			
HCM Average Control Delay	174.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	130.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
112: Craig Rath Boulevard & Route 360

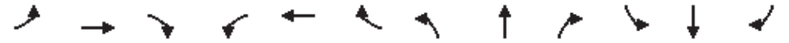
8/21/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

8/21/2014

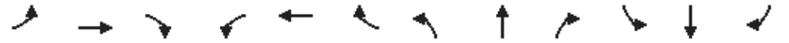


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	3470	30	380	6800	190	40	10	180	260	20	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	6400		1770	6408	1583		1791	1583	1681	1697	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.72	1.00	0.72	0.72	1.00
Satd. Flow (perm)	1770	6400		1770	6408	1583		1338	1583	1277	1272	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	3772	33	413	7234	207	43	11	196	283	22	141
RTOR Reduction (vph)	0	1	0	0	0	19	0	0	1	0	0	78
Lane Group Flow (vph)	109	3804	0	413	7234	188	0	54	195	153	152	63
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			4	1		3	
Permitted Phases						6	4		4	3		3
Actuated Green, G (s)	6.5	77.9		20.5	91.9	91.9		5.0	25.5	10.5	10.5	10.5
Effective Green, g (s)	6.5	77.9		20.5	91.9	91.9		5.0	25.5	10.5	10.5	10.5
Actuated g/C Ratio	0.05	0.56		0.15	0.66	0.66		0.04	0.18	0.08	0.08	0.08
Clearance Time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	82	3561		259	4206	1039		48	288	96	95	119
v/s Ratio Prot	0.06	c0.59		0.23	c1.13				0.10			
v/s Ratio Perm						0.12		c0.04	0.02	c0.12	0.12	0.04
v/c Ratio	1.33	1.07		1.59	1.72	0.18		1.12	0.68	1.59	1.60	0.53
Uniform Delay, d1	66.8	31.0		59.8	24.0	9.4		67.5	53.4	64.8	64.8	62.4
Progression Factor	1.15	1.32		1.07	0.55	0.31		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	155.8	31.4		269.2	324.1	0.0		168.8	6.2	310.5	313.5	4.5
Delay (s)	232.2	72.5		333.3	337.2	3.0		236.2	59.6	375.2	378.3	66.9
Level of Service	F	E		F	F	A		F	E	F	F	E
Approach Delay (s)		77.0			328.2			97.8			278.8	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	242.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.58		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	134.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
114: Deer Run Dr/Harbour View Ct & Route 360

8/21/2014

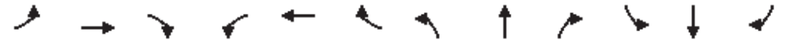


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2750	100	640	6230	100	90	80	630	220	110	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86		1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (prot)	1770	6408	1583	3433	6392		1770	1863	1583	1681	1740	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (perm)	1770	6408	1583	3433	6392		1770	1863	1583	1681	1740	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	2989	109	688	6490	109	98	87	685	239	120	424
RTOR Reduction (vph)	0	0	50	0	2	0	0	0	2	0	0	145
Lane Group Flow (vph)	272	2989	59	688	6597	0	98	87	683	177	182	279
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	13.5	69.5	69.5	26.5	82.6		6.5	6.5	33.0	11.5	11.5	11.5
Effective Green, g (s)	13.5	69.5	69.5	26.5	82.6		6.5	6.5	33.0	11.5	11.5	11.5
Actuated g/C Ratio	0.10	0.50	0.50	0.19	0.59		0.05	0.05	0.24	0.08	0.08	0.08
Clearance Time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	171	3181	786	650	3771		82	86	373	138	143	130
v/s Ratio Prot	c0.15	0.47		0.20	c1.03		0.06	0.05	c0.35	0.11	0.10	
v/s Ratio Perm			0.04						0.08			c0.18
v/c Ratio	1.59	0.94	0.08	1.06	1.75		1.20	1.01	1.83	1.28	1.27	2.15
Uniform Delay, d1	63.2	33.3	18.4	56.8	28.7		66.8	66.8	53.5	64.2	64.2	64.2
Progression Factor	0.55	0.16	0.02	1.09	0.20		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	274.2	2.5	0.1	30.2	337.4		161.1	100.3	384.0	171.2	166.1	540.4
Delay (s)	308.8	7.9	0.3	91.9	343.1		227.8	167.0	437.5	235.4	230.4	604.7
Level of Service	F	A	A	F	F		F	F	F	F	F	F
Approach Delay (s)		32.0			319.4			386.8			434.2	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM Average Control Delay	252.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.9
Intersection Capacity Utilization	137.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
115: Chital Dr & Route 360

8/21/2014

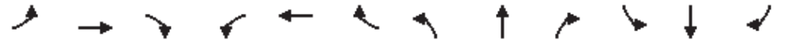


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	2960	200	420	6280	10	230	10	120	20	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.86		0.97	0.86	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	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (prot)	1770	6346		3433	6408	1583	1770	1863	1583		1803	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (perm)	1770	6346		3433	6408	1583	1770	1863	1583		1803	1583
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.98	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	3149	217	457	6408	11	250	11	130	22	11	11
RTOR Reduction (vph)	0	8	0	0	0	1	0	0	114	0	0	11
Lane Group Flow (vph)	11	3358	0	457	6408	10	250	11	16	0	33	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	3	4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	2.0	68.3		23.1	88.8	94.4	17.2	17.2	17.2		5.6	5.6
Effective Green, g (s)	2.0	68.3		23.1	88.8	94.4	17.2	17.2	17.2		5.6	5.6
Actuated g/C Ratio	0.01	0.49		0.17	0.63	0.67	0.12	0.12	0.12		0.04	0.04
Clearance Time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	8.0		5.0	8.0	2.5	3.5	3.5	3.5		2.5	2.5
Lane Grp Cap (vph)	25	3096		566	4065	1067	217	229	194		72	63
v/s Ratio Prot	0.01	0.53		c0.13	c1.00	0.00	c0.14	0.01			c0.02	
v/s Ratio Perm						0.01			0.01			0.00
v/c Ratio	0.44	1.08		0.81	1.58	0.01	1.15	0.05	0.08		0.46	0.01
Uniform Delay, d1	68.4	35.9		56.3	25.6	7.5	61.4	54.2	54.4		65.7	64.5
Progression Factor	0.79	0.37		0.65	0.58	0.49	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	38.8		0.9	259.5	0.0	108.2	0.1	0.2		3.3	0.0
Delay (s)	54.6	52.1		37.3	274.3	3.7	169.6	54.3	54.6		69.1	64.6
Level of Service	D	D		D	F	A	F	D	D		E	E
Approach Delay (s)		52.1			258.1			128.1			67.9	
Approach LOS		D			F			F			E	

Intersection Summary			
HCM Average Control Delay	187.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	131.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

8/21/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	200	2600	120	480	5540	500	150	60	290	280	100	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86			1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3433	5085	1583	1770	6324			1798	1583	1681	1728	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.97	1.00	0.95	0.98	1.00
Satd. Flow (perm)	3433	5085	1583	1770	6324			1798	1583	1681	1728	1583
Peak-hour factor, PHF	0.92	0.94	0.92	0.93	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	2766	130	516	5711	543	163	65	315	304	109	196
RTOR Reduction (vph)	0	0	34	0	11	0	0	0	185	0	0	90
Lane Group Flow (vph)	217	2766	96	516	6243	0	0	228	130	204	209	106
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	7.5	66.0	66.0	24.5	82.1			12.5	12.5	11.5	11.5	11.5
Effective Green, g (s)	7.5	66.0	66.0	24.5	82.1			12.5	12.5	11.5	11.5	11.5
Actuated g/C Ratio	0.05	0.47	0.47	0.18	0.59			0.09	0.09	0.08	0.08	0.08
Clearance Time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	4.0	8.0			3.5	3.5	2.5	2.5	2.5
Lane Grp Cap (vph)	184	2397	746	310	3709			161	141	138	142	130
v/s Ratio Prot	0.06	0.54		c0.29	c0.99			c0.13		c0.12	0.12	
v/s Ratio Perm			0.06						0.08			0.07
v/c Ratio	1.18	1.15	0.13	1.66	1.68			1.42	0.92	1.48	1.47	0.82
Uniform Delay, d1	66.2	37.0	20.8	57.8	29.0			63.8	63.3	64.2	64.2	63.2
Progression Factor	1.35	1.24	1.44	0.71	0.63			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	86.1	69.8	0.0	300.3	307.6			219.7	53.4	249.9	246.4	30.4
Delay (s)	175.5	115.6	30.0	341.2	325.8			283.4	116.7	314.2	310.6	93.6
Level of Service	F	F	C	F	F			F	F	F	F	F
Approach Delay (s)		116.2			327.0			186.7			242.0	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	255.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	129.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
117: Winterpock Rd/Lake Harbour Dr & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	2390	120	1130	4570	160	210	30	430	100	100	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00		1.00	0.88	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583		1785	2787	1770	1798	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583		1785	2787	1770	1798	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2598	130	1228	4711	174	228	33	467	109	109	33
RTOR Reduction (vph)	0	0	27	0	0	60	0	0	11	0	8	0
Lane Group Flow (vph)	22	2598	103	1228	4711	114	0	261	456	109	134	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	3.0	59.2	59.2	32.5	88.3	88.3		14.5	47.0	7.5	7.5	
Effective Green, g (s)	3.0	59.2	59.2	32.5	88.3	88.3		14.5	47.0	7.5	7.5	
Actuated g/C Ratio	0.02	0.42	0.42	0.23	0.63	0.63		0.10	0.34	0.05	0.05	
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0		3.0	4.0	3.0	3.0	
Lane Grp Cap (vph)	38	2150	669	797	3207	998		185	936	95	96	
v/s Ratio Prot	0.01	c0.51		0.36	c0.93			c0.15	0.11	0.06	c0.07	
v/s Ratio Perm			0.06			0.07			0.05			
v/c Ratio	0.58	1.21	0.15	1.54	1.47	0.11		1.41	0.49	1.15	1.40	
Uniform Delay, d1	67.9	40.4	24.9	53.8	25.9	10.3		62.8	36.9	66.2	66.2	
Progression Factor	0.64	0.42	0.16	1.12	0.22	0.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.3	96.2	0.2	243.9	211.2	0.0		213.8	0.5	137.5	231.2	
Delay (s)	53.8	113.0	4.3	304.3	216.9	0.0		276.5	37.5	203.7	297.5	
Level of Service	D	F	A	F	F	A		F	D	F	F	
Approach Delay (s)		107.4			228.3			123.2			256.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	187.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	135.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
118: Hancock Village/Duckridge Blvd & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	2380	160	330	4460	30	280	10	140	0	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5			6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.95	0.95	1.00			1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1681	1691	1583			1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00			1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1681	1691	1583			1583
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)	54	2587	174	359	4848	33	304	11	152	0	0	43
RTOR Reduction (vph)	0	0	43	0	0	4	0	0	55	0	0	42
Lane Group Flow (vph)	54	2587	131	359	4848	29	158	157	97	0	0	1
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split		Perm
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	5.0	79.9	79.9	18.0	92.2	92.2	11.8	11.8	29.8			4.0
Effective Green, g (s)	5.0	79.9	79.9	18.0	92.2	92.2	11.8	11.8	29.8			4.0
Actuated g/C Ratio	0.04	0.57	0.57	0.13	0.66	0.66	0.08	0.08	0.21			0.03
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5			6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5	2.5			2.5
Lane Grp Cap (vph)	63	2902	903	441	2331	1043	142	143	337			45
v/s Ratio Prot	0.03	c0.51		0.10	c1.37		c0.09	0.09	0.04			
v/s Ratio Perm			0.08			0.02			0.02			c0.00
v/c Ratio	0.86	0.89	0.14	0.81	2.08	0.03	1.11	1.10	0.29			0.03
Uniform Delay, d1	67.1	26.3	14.1	59.4	23.9	8.3	64.1	64.1	46.2			66.1
Progression Factor	1.06	0.81	1.38	0.69	0.25	0.09	1.00	1.00	1.00			1.00
Incremental Delay, d2	41.4	2.6	0.2	1.1	486.0	0.0	109.0	103.9	0.3			0.2
Delay (s)	112.6	23.8	19.6	42.0	491.9	0.7	173.1	168.0	46.5			66.3
Level of Service	F	C	B	D	F	A	F	F	D			E
Approach Delay (s)		25.3			458.0			130.2			66.3	
Approach LOS		C			F			F			E	

Intersection Summary			
HCM Average Control Delay	296.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	27.3
Intersection Capacity Utilization	152.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
119: Ashlake & Route 360

8/21/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2460	140	310	4470	150	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4		6.5	6.8	6.5	6.5
Lane Util. Factor	0.91		0.97	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5044		3433	3539	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	5044		3433	3539	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2674	152	337	4859	163	141
RTOR Reduction (vph)	4	0	0	0	0	130
Lane Group Flow (vph)	2822	0	337	4859	163	11
Turn Type	NA		Prot	NA	NA	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	92.7		17.3	116.1	10.6	10.6
Effective Green, g (s)	92.7		17.3	116.1	10.6	10.6
Actuated g/C Ratio	0.66		0.12	0.83	0.08	0.08
Clearance Time (s)	6.4		6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0		2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	3340		424	2935	260	120
v/s Ratio Prot	0.56		0.10	c1.37	c0.05	
v/s Ratio Perm						0.01
v/c Ratio	0.84		0.79	1.66	0.63	0.09
Uniform Delay, d1	18.1		59.6	12.0	62.8	60.2
Progression Factor	0.68		0.70	0.98	1.00	1.00
Incremental Delay, d2	0.8		0.9	295.1	4.0	0.2
Delay (s)	13.2		42.4	306.9	66.8	60.4
Level of Service	B		D	F	E	E
Approach Delay (s)	13.2			289.7	63.9	
Approach LOS	B			F	E	

Intersection Summary			
HCM Average Control Delay	187.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.3
Intersection Capacity Utilization	139.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
120: Route 360 & Woodlake Village Pkwy

8/21/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	90	1880	3470	1150	710	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	2043	3772	1250	772	54
RTOR Reduction (vph)	0	0	0	279	0	25
Lane Group Flow (vph)	98	2043	3772	971	772	29
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	6.5	106.3	93.7	93.7	20.5	20.5
Effective Green, g (s)	6.5	106.3	93.7	93.7	20.5	20.5
Actuated g/C Ratio	0.05	0.76	0.67	0.67	0.15	0.15
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	82	2687	2369	1059	503	232
v/s Ratio Prot	0.06	c0.58	c1.07		c0.22	
v/s Ratio Perm				0.61		0.02
v/c Ratio	1.20	0.76	1.59	0.92	1.53	0.13
Uniform Delay, d1	66.8	9.6	23.1	19.8	59.8	52.0
Progression Factor	1.24	0.37	0.61	0.82	1.00	1.00
Incremental Delay, d2	119.7	0.7	266.7	1.6	250.5	0.3
Delay (s)	202.2	4.2	280.9	17.9	310.3	52.3
Level of Service	F	A	F	B	F	D
Approach Delay (s)		13.3	215.4		293.4	
Approach LOS		B	F		F	

Intersection Summary			
HCM Average Control Delay	169.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.57		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	126.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
121: Hampton Park Dr/Fox Club Pkwy & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	1390	10	320	2880	310	10	30	230	350	60	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1840	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1840	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	1511	11	348	3000	337	11	33	250	380	65	54
RTOR Reduction (vph)	0	0	3	0	0	50	0	0	235	0	0	49
Lane Group Flow (vph)	54	1511	8	348	3000	287	0	44	16	380	65	5
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	4.8	65.3	65.3	29.8	90.4	90.4		6.0	6.0	12.5	12.5	12.5
Effective Green, g (s)	4.8	65.3	65.3	29.8	90.4	90.4		6.0	6.0	12.5	12.5	12.5
Actuated g/C Ratio	0.03	0.47	0.47	0.21	0.65	0.65		0.04	0.04	0.09	0.09	0.09
Clearance Time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	61	1651	738	377	2285	1022		79	68	307	166	141
v/s Ratio Prot	0.03	0.43		c0.20	c0.85			c0.02		c0.11	0.03	
v/s Ratio Perm			0.00			0.18			0.01			0.00
v/c Ratio	0.89	0.92	0.01	0.92	1.31	0.28		0.56	0.23	1.24	0.39	0.03
Uniform Delay, d1	67.3	34.8	20.0	54.0	24.8	10.7		65.7	64.8	63.8	60.2	58.2
Progression Factor	1.32	0.99	0.46	0.82	0.21	0.02		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	63.5	7.6	0.0	4.0	141.1	0.1		8.3	1.7	131.8	1.5	0.1
Delay (s)	152.6	42.0	9.2	48.2	146.2	0.3		73.9	66.5	195.5	61.7	58.3
Level of Service	F	D	A	D	F	A		E	E	F	E	E
Approach Delay (s)		45.6			123.6			67.6			163.3	
Approach LOS		D			F			E			F	

Intersection Summary			
HCM Average Control Delay	103.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.8
Intersection Capacity Utilization	117.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
122: Otterdale Rd & Route 360

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1200	20	330	2440	170	10	10	180	70	30	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.98	
Satd. Flow (prot)	1719	3539	1583	1770	3496			1817	1583		1675	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.98	
Satd. Flow (perm)	1719	3539	1583	1770	3496			1817	1583		1675	
Peak-hour factor, PHF	0.92	0.98	0.92	0.93	0.96	0.92	0.92	0.92	0.97	0.92	0.92	0.92
Adj. Flow (vph)	43	1224	22	355	2542	185	11	11	186	76	33	76
RTOR Reduction (vph)	0	0	7	0	4	0	0	0	60	0	18	0
Lane Group Flow (vph)	43	1224	15	355	2723	0	0	22	126	0	167	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	2%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			
Actuated Green, G (s)	4.0	67.7	67.7	31.0	94.6			3.0	34.0		11.5	
Effective Green, g (s)	4.0	67.7	67.7	31.0	94.6			3.0	34.0		11.5	
Actuated g/C Ratio	0.03	0.48	0.48	0.22	0.68			0.02	0.24		0.08	
Clearance Time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	49	1711	765	392	2362			39	458		138	
v/s Ratio Prot	0.03	c0.35		0.20	c0.78			0.01	c0.06		c0.10	
v/s Ratio Perm			0.01						0.02			
v/c Ratio	0.88	0.72	0.02	0.91	1.15			0.56	0.28		1.21	
Uniform Delay, d1	67.8	28.5	18.8	53.1	22.7			67.9	43.0		64.2	
Progression Factor	1.00	1.00	1.00	1.17	0.16			1.00	1.00		1.00	
Incremental Delay, d2	82.7	2.6	0.0	3.1	69.4			14.3	0.2		143.0	
Delay (s)	150.5	31.1	18.9	65.1	73.1			82.1	43.2		207.2	
Level of Service	F	C	B	E	E			F	D		F	
Approach Delay (s)		34.9			72.2			47.4			207.2	
Approach LOS		C			E			D			F	

Intersection Summary			
HCM Average Control Delay	66.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	110.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
123: Bailey Bridge Road & Bailey Bridge Connector

8/21/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
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	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		8				
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS	A				
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS	A				

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

HCM Unsignalized Intersection Capacity Analysis
124: Bailey Bridge Road & Deer Run Drive

8/21/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	100	300	360	190	150	120
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	326	391	207	163	130
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	598				935	391
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	598				935	391
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				38	80
cM capacity (veh/h)	979				262	657

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	109	326	391	207	163	130
Volume Left	109	0	0	0	163	0
Volume Right	0	0	0	207	0	130
cSH	979	1700	1700	1700	262	657
Volume to Capacity	0.11	0.19	0.23	0.12	0.62	0.20
Queue Length 95th (ft)	9	0	0	0	95	18
Control Delay (s)	9.1	0.0	0.0	0.0	39.0	11.8
Lane LOS	A				E	B
Approach Delay (s)	2.3		0.0		26.9	
Approach LOS					D	

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
125: Springford Parkway/Bailey Bridge Road & Spring Run Road

8/21/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	130	190	20	80	320	80	60	180	100	110	350	480
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	141	207	22	87	348	87	65	196	109	120	380	522

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	348	22	435	87	370	1022
Volume Left (vph)	141	0	87	0	65	120
Volume Right (vph)	0	22	0	87	109	522
Hadj (s)	0.12	-0.57	0.07	-0.57	-0.11	-0.25
Departure Headway (s)	9.5	3.2	9.3	3.2	9.3	9.0
Degree Utilization, x	0.92	0.02	1.13	0.08	0.95	2.56
Capacity (veh/h)	370	1121	398	1121	384	410
Control Delay (s)	60.5	6.3	115.2	6.5	64.9	726.6
Approach Delay (s)	57.3		97.1		64.9	726.6
Approach LOS	F		F		F	F

Intersection Summary				
Delay	367.2			
HCM Level of Service	F			
Intersection Capacity Utilization	113.4%	ICU Level of Service	H	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
126: Old Hundred Rd & Millridge

4/1/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	20	310	150	50	20	440	940	120	20	880	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	22	337	163	54	22	478	1022	130	22	957	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								871				
pX, platoon unblocked	0.95	0.95		0.95	0.95	0.95				0.95		
vC, conflicting volume	2538	3130	978	3011	2978	511	957			1152		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2515	3137	978	3011	2977	385	957			1058		
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	0	0	0	0	96	33			97		
cM capacity (veh/h)	0	3	250	0	4	584	715			622		

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	NB 3	NB 4	SB 1
Volume Total	380	217	22	478	511	511	130	1022
Volume Left	22	163	0	478	0	0	0	22
Volume Right	337	0	22	0	0	0	130	43
cSH	0	0	584	715	1700	1700	1700	622
Volume to Capacity	Err	Err	0.04	0.67	0.30	0.30	0.08	0.03
Queue Length 95th (ft)	Err	Err	3	129	0	0	0	3
Control Delay (s)	Err	Err	11.4	19.6	0.0	0.0	0.0	1.1
Lane LOS	F	F	B	C				A
Approach Delay (s)	Err	Err		5.8				1.1
Approach LOS	F	F						

Intersection Summary				
Average Delay	Err			
Intersection Capacity Utilization	121.4%	ICU Level of Service	H	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
127: Old Hundred Rd & Market Square

4/1/2015

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	50	30	970	10	20	840
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)	54	33	1054	11	22	913
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2011	1054			1065	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2011	1054			1065	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	13	88			97	
cM capacity (veh/h)	63	274			654	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	87	1054	11	22	913
Volume Left	54	0	0	22	0
Volume Right	33	0	11	0	0
cSH	88	1700	1700	654	1700
Volume to Capacity	0.99	0.62	0.01	0.03	0.54
Queue Length 95th (ft)	141	0	0	3	0
Control Delay (s)	177.5	0.0	0.0	10.7	0.0
Lane LOS	F			B	
Approach Delay (s)	177.5	0.0		0.2	
Approach LOS	F				

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	LTR
Maximum Queue (ft)	204	201	416	513	610	138	189	4138	4175	4256	450	557
Average Queue (ft)	142	145	252	320	387	49	58	3044	3171	3257	261	372
95th Queue (ft)	221	229	416	539	627	156	187	4321	4388	4462	502	652
Link Distance (ft)			1521	1521	1521			5220	5220	5220		1540
Upstream Blk Time (%)								0	0	0		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (ft)	205	205				90	190				200	
Storage Blk Time (%)	3	2	8		31			45		46	15	
Queuing Penalty (veh)	28	24	25		71			30		186	148	

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	302	389	410	310
Average Queue (ft)	236	269	153	218
95th Queue (ft)	355	441	460	333
Link Distance (ft)			1263	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		250
Storage Blk Time (%)	26	30	1	6
Queuing Penalty (veh)	116	132	4	33

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	B53	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	L	L	T	T	T	T
Maximum Queue (ft)	251	264	356	518	554	288	95	205	535	564	601	380
Average Queue (ft)	183	196	266	363	417	29	48	72	340	369	403	262
95th Queue (ft)	273	284	378	536	588	308	107	197	514	549	595	449
Link Distance (ft)			635	635	635	1000			1521	1521	1521	
Upstream Blk Time (%)					0	0						
Queuing Penalty (veh)					1	2						
Storage Bay Dist (ft)	420	420					200	200				200
Storage Blk Time (%)			0						28		33	7
Queuing Penalty (veh)			0						46		317	57

Intersection: 102: Lonas Pkwy & Route 360

Movement	WB	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	R	L	L	T	R	L	L	T	T	R
Maximum Queue (ft)	75	131	143	44	124	148	157	21	25	85
Average Queue (ft)	28	76	98	20	70	97	107	4	7	17
95th Queue (ft)	57	152	167	50	140	165	170	19	25	108
Link Distance (ft)				402	402	256	256	256	256	256
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200	240	240							
Storage Blk Time (%)		0	0							
Queuing Penalty (veh)		0	0							

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

Movement	EB	EB	WB	WB	WB	WB	B53	B53	B53
Directions Served	T	T	T	T	T	R	T	T	T
Maximum Queue (ft)	2	5	440	582	628	366	5	9	11
Average Queue (ft)	0	1	100	217	265	86	1	1	2
95th Queue (ft)	4	8	458	666	725	450	11	11	23
Link Distance (ft)	290	290	1000	1000	1000	1000	635	635	635
Upstream Blk Time (%)			0	0	0	0			
Queuing Penalty (veh)			3	3	4	3			
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	WB	WB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	270	351	348	1085
Average Queue (ft)	110	281	303	1067
95th Queue (ft)	310	392	379	1087
Link Distance (ft)	290	290	290	1044
Upstream Blk Time (%)	4	8	28	79
Queuing Penalty (veh)	41	87	324	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	EB	EB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	T	R	R
Maximum Queue (ft)	345	367	635	663	679	688	977
Average Queue (ft)	182	268	483	511	523	362	905
95th Queue (ft)	413	440	817	862	871	898	1176
Link Distance (ft)	331	331	632	632	632	632	949
Upstream Blk Time (%)	0	13	8	9	10	7	50
Queuing Penalty (veh)	5	150	112	132	142	100	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	SB	B55
Directions Served	T	T	T	R	T	T	T	R	T
Maximum Queue (ft)	12	263	326	135	349	367	360	1234	3592
Average Queue (ft)	2	100	156	48	324	324	326	1202	3470
95th Queue (ft)	27	442	560	347	419	431	413	1343	4148
Link Distance (ft)	834	834	834	834	331	331	331	1141	3562
Upstream Blk Time (%)			0		24	19	22	44	44
Queuing Penalty (veh)			4		415	324	387	0	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 107: Route 360 & Market Square Ln

Movement	EB	EB	WB	WB	WB	WB	WB	WB	WB	SB
Directions Served	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	30	37	88	349	865	881	900	897	184	220
Average Queue (ft)	6	8	24	295	850	851	883	867	34	135
95th Queue (ft)	52	62	118	460	904	935	907	956	186	273
Link Distance (ft)	576	576			834	834	834	834		262
Upstream Blk Time (%)					32	25	28	22		10
Queuing Penalty (veh)					661	518	569	441		0
Storage Bay Dist (ft)			50	50					75	
Storage Blk Time (%)			3	11	45			36		
Queuing Penalty (veh)			43	151	1232			43		

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	402	507	435	378	479	385	166	568	600	617	600	604
Average Queue (ft)	274	326	236	222	294	217	80	418	469	592	587	588
95th Queue (ft)	534	659	597	433	531	429	173	640	678	619	601	604
Link Distance (ft)			619	619	619	619		576	576	576	576	576
Upstream Blk Time (%)		0	6		0	0		6	8	42	39	38
Queuing Penalty (veh)		0	72		3	0		69	92	496	462	453
Storage Bay Dist (ft)	300	300					250					
Storage Blk Time (%)	30	33	1			6						
Queuing Penalty (veh)	233	254	8			37						

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	WB	WB	NB	NB	NB	NB	NB	B995	B995	SB	SB	SB
Directions Served	T	R	L	L	T	T	R	T	T	L	L	T
Maximum Queue (ft)	609	39	514	640	782	336	317	500	491	552	835	842
Average Queue (ft)	591	6	507	638	775	186	204	492	277	453	796	837
95th Queue (ft)	612	86	527	646	785	496	386	517	633	660	963	845
Link Distance (ft)	576	576			704	704		479	479		756	756
Upstream Blk Time (%)	36				77	2		69	6		31	67
Queuing Penalty (veh)	427				0	0		0	0		0	0
Storage Bay Dist (ft)			390	390			250			430		
Storage Blk Time (%)			85	86		6	11			38	55	49
Queuing Penalty (veh)			218	221		36	29			99	145	338

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	SB	B996	B996
Directions Served	R	T	T
Maximum Queue (ft)	530	809	821
Average Queue (ft)	513	737	809
95th Queue (ft)	623	981	832
Link Distance (ft)		795	795
Upstream Blk Time (%)		24	67
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)	430		
Storage Blk Time (%)	48		
Queuing Penalty (veh)	115		

Intersection: 109: Route 360 & Village Green Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB
Directions Served	L	T	T	T	T	T	T	T	TR
Maximum Queue (ft)	347	397	252	97	32	56	56	40	31
Average Queue (ft)	279	267	75	36	9	8	7	6	4
95th Queue (ft)	413	545	311	213	99	124	107	88	69
Link Distance (ft)		358	358	358	358	619	619	619	619
Upstream Blk Time (%)	22	47	3	1	0	0	0		
Queuing Penalty (veh)	0	620	43	11	0	7	0		
Storage Bay Dist (ft)	240								
Storage Blk Time (%)	74	7							
Queuing Penalty (veh)	816	9							

Intersection: 110: Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB
Directions Served	T	T	T	T	T	T	T	T	TR	R
Maximum Queue (ft)	237	241	202	145	30	44	32	24	10	344
Average Queue (ft)	152	90	67	44	10	11	9	3	2	255
95th Queue (ft)	345	282	265	212	91	104	96	53	15	497
Link Distance (ft)	241	241	241	241			358	358	358	775
Upstream Blk Time (%)	35	3	3	2			2			
Queuing Penalty (veh)	394	32	34	17			32			
Storage Bay Dist (ft)					150	150				
Storage Blk Time (%)					3	3				
Queuing Penalty (veh)					36	34				

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R	L	L	T	T	T	T	L
Maximum Queue (ft)	852	859	902	902	399	215	224	163	192	220	231	484
Average Queue (ft)	572	567	613	613	179	141	153	104	122	149	175	479
95th Queue (ft)	1049	1018	1053	1055	433	215	220	175	191	226	247	493
Link Distance (ft)	876	876	876	876		241	241	241	241	241	241	410
Upstream Blk Time (%)	22	13	14	15		4	4		0	0	0	77
Queuing Penalty (veh)	228	141	145	159		52	51		0	1	4	0
Storage Bay Dist (ft)					200							
Storage Blk Time (%)				39	0							
Queuing Penalty (veh)				132	5							

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	NB	NB	B61	B61	B61
Directions Served	L	R	T	T	T
Maximum Queue (ft)	483	476	764	775	790
Average Queue (ft)	475	425	487	514	467
95th Queue (ft)	496	562	887	927	976
Link Distance (ft)	410	410	810	810	810
Upstream Blk Time (%)	72	50	5	13	20
Queuing Penalty (veh)	0	0	0	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB
Directions Served	T	T	T	T	R	L	T	T
Maximum Queue (ft)	592	609	680	722	245	376	204	115
Average Queue (ft)	188	189	217	244	35	208	34	16
95th Queue (ft)	769	784	840	903	281	427	227	153
Link Distance (ft)	2140	2140	2140	2140			876	876
Upstream Blk Time (%)	0	0	0	1				
Queuing Penalty (veh)	3	2	3	11				
Storage Bay Dist (ft)					500	600		
Storage Blk Time (%)				10	0	0		
Queuing Penalty (veh)				18	0	1		

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	R	LT
Maximum Queue (ft)	254	501	596	756	790	397	1287	1189	1226	1292	389	153
Average Queue (ft)	101	380	466	601	663	288	876	798	819	878	110	84
95th Queue (ft)	268	528	645	779	813	444	1445	1272	1294	1351	372	169
Link Distance (ft)		2493	2493	2493	2493		2140	2140	2140	2140		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140					150					160	200
Storage Blk Time (%)	13	20				47	35			36		2
Queuing Penalty (veh)	121	27				848	156			83		4

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	NB	SB	SB	SB	B18
Directions Served	R	L	LT	R	T
Maximum Queue (ft)	226	227	529	226	201
Average Queue (ft)	140	179	325	143	33
95th Queue (ft)	241	264	632	269	219
Link Distance (ft)	874		588		887
Upstream Blk Time (%)			7		
Queuing Penalty (veh)			0		
Storage Bay Dist (ft)		120		120	
Storage Blk Time (%)	4	49	60	11	
Queuing Penalty (veh)	4	193	217	45	

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T	R	L	L	T	T	T	TR
Maximum Queue (ft)	379	999	894	781	351	93	196	384	1047	798	592	668
Average Queue (ft)	347	638	575	316	232	35	128	179	519	433	411	456
95th Queue (ft)	439	1304	1176	668	322	116	203	384	1100	855	726	741
Link Distance (ft)		1713	1713	1713	1713				2493	2493	2493	2493
Upstream Blk Time (%)		1										
Queuing Penalty (veh)		9										
Storage Bay Dist (ft)	200					360	280	280				
Storage Blk Time (%)	82	10			0				32			
Queuing Penalty (veh)	610	29			1				217			

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	LT	R
Maximum Queue (ft)	213	1265	1267	298	858	325
Average Queue (ft)	140	1114	1172	220	825	320
95th Queue (ft)	252	1635	1573	368	969	356
Link Distance (ft)		1289	1289		830	
Upstream Blk Time (%)		8	41		47	
Queuing Penalty (veh)		0	0		0	
Storage Bay Dist (ft)	190			200		250
Storage Blk Time (%)	18	0		39	56	70
Queuing Penalty (veh)	17	0		272	324	300

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	30	221	211	297	256	137	372	1702	1536	1513	1289	76
Average Queue (ft)	5	159	158	180	197	77	200	1056	850	737	587	11
95th Queue (ft)	23	221	218	339	246	144	454	2004	1683	1510	1218	114
Link Distance (ft)		840	840	840	840			1713	1713	1713	1713	
Upstream Blk Time (%)				0				8	1	0		
Queuing Penalty (veh)				0				147	12	1		
Storage Bay Dist (ft)	540					170	170					190
Storage Blk Time (%)						0	1	53			29	
Queuing Penalty (veh)						2	11	251			3	

Intersection: 115: Chital Dr & Route 360

Movement	NB	NB	NB	SB	SB
Directions Served	L	T	R	LT	R
Maximum Queue (ft)	179	550	115	97	47
Average Queue (ft)	175	376	64	48	16
95th Queue (ft)	193	662	126	108	48
Link Distance (ft)		1010	1010	610	610
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)	80				
Queuing Penalty (veh)	9				

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	TR	LT
Maximum Queue (ft)	111	119	342	379	423	134	314	859	860	868	852	230
Average Queue (ft)	67	72	268	302	336	41	214	830	799	747	613	221
95th Queue (ft)	119	123	399	438	495	210	373	927	960	987	954	267
Link Distance (ft)			869	869	869			840	840	840	840	
Upstream Blk Time (%)								15	7	4	3	
Queuing Penalty (veh)								255	123	69	46	
Storage Bay Dist (ft)	220	220				230	115					130
Storage Blk Time (%)			17		33		26	47				80
Queuing Penalty (veh)			40		47		367	244				259

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	NB	SB	SB	SB
Directions Served	R	L	LT	R
Maximum Queue (ft)	1588	239	1005	270
Average Queue (ft)	1021	208	933	192
95th Queue (ft)	1884	277	1219	343
Link Distance (ft)	2183		996	
Upstream Blk Time (%)	1		44	
Queuing Penalty (veh)	0		0	
Storage Bay Dist (ft)		90		170
Storage Blk Time (%)	16	83	91	6
Queuing Penalty (veh)	41	411	331	26

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	B1
Directions Served	L	T	T	T	R	L	L	T	T	T	R	T
Maximum Queue (ft)	162	1128	1133	1135	328	286	579	816	817	812	312	891
Average Queue (ft)	33	951	953	972	116	184	385	748	762	677	69	384
95th Queue (ft)	177	1288	1296	1301	338	315	703	901	899	938	336	1004
Link Distance (ft)		1112	1112	1112				736	736	736		869
Upstream Blk Time (%)		6	6	7				25	33	16		4
Queuing Penalty (veh)		57	58	63				500	671	326		67
Storage Bay Dist (ft)	180				170	280	280				575	
Storage Blk Time (%)		63		63	1	1	1	46		18		
Queuing Penalty (veh)		18		86	6	10	21	610		33		

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	B1	B1	B1	NB	NB	NB	SB	SB
Directions Served	T	T		LT	R	R	L	TR
Maximum Queue (ft)	891	863	799	626	1178	576	280	404
Average Queue (ft)	391	327	213	532	565	181	189	318
95th Queue (ft)	991	914	767	775	1359	574	371	548
Link Distance (ft)	869	869	869		1868		470	470
Upstream Blk Time (%)	4	2	1		1		2	14
Queuing Penalty (veh)	60	30	9		0		0	0
Storage Bay Dist (ft)				430		1000		
Storage Blk Time (%)				61				
Queuing Penalty (veh)				303				

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	L	T	T	R	L	LT
Maximum Queue (ft)	142	647	618	638	175	94	373	1177	1183	1190	217	229
Average Queue (ft)	50	296	305	319	54	49	138	996	1050	840	148	163
95th Queue (ft)	137	612	606	629	167	97	448	1442	1457	1645	245	263
Link Distance (ft)		1172	1172	1172				1112	1112	1112	796	796
Upstream Blk Time (%)								7	15	5		
Queuing Penalty (veh)								119	258	89		
Storage Bay Dist (ft)	200				200	300	300					
Storage Blk Time (%)		25		31				25				
Queuing Penalty (veh)		13		53				90				

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	155	59
Average Queue (ft)	86	19
95th Queue (ft)	164	55
Link Distance (ft)	796	958
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 119: Ashlake & Route 360

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	TR	L	L	T	T	L	L	R
Maximum Queue (ft)	250	248	264	98	117	188	222	108	124	121
Average Queue (ft)	179	182	197	58	77	120	148	67	85	62
95th Queue (ft)	268	261	274	107	124	205	238	122	137	118
Link Distance (ft)	931	931				1172	1172		2592	2592
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			200	400	400			200		
Storage Blk Time (%)		4	8							
Queuing Penalty (veh)		45	69							

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	L	L	R
Maximum Queue (ft)	222	218	294	392	407	1178	1176	196
Average Queue (ft)	161	148	201	276	297	1156	1157	68
95th Queue (ft)	302	229	312	409	418	1275	1265	203
Link Distance (ft)		4676	4676	931	931	1161	1161	
Upstream Blk Time (%)						56	68	
Queuing Penalty (veh)						0	0	
Storage Bay Dist (ft)	200							150
Storage Blk Time (%)	19	1					87	
Queuing Penalty (veh)	196	1					47	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	LT	R	L	L
Maximum Queue (ft)	247	637	710	52	204	252	258	30	207	307	378	501
Average Queue (ft)	128	431	488	9	124	154	169	4	106	200	335	419
95th Queue (ft)	285	706	781	81	219	253	261	39	277	407	459	639
Link Distance (ft)		2671	2671			4676	4676		759	759		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	240			200	230			210			240	240
Storage Blk Time (%)	4	15	20		0	2	5				66	69
Queuing Penalty (veh)	31	12	3		6	7	17				108	114

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	1007	116
Average Queue (ft)	499	60
95th Queue (ft)	1382	120
Link Distance (ft)	1442	
Upstream Blk Time (%)	7	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		130
Storage Blk Time (%)	1	1
Queuing Penalty (veh)	6	7

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	86	316	357	8	230	98	116	67	130	386
Average Queue (ft)	42	211	237	1	142	45	59	29	70	275
95th Queue (ft)	98	337	384	8	248	105	119	67	129	469
Link Distance (ft)		3682	3682			2671	2671	1022		1606
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			200	375				500	
Storage Blk Time (%)		6	9							
Queuing Penalty (veh)		3	3							

Intersection: 123: Bailey Bridge Road & Bailey Bridge Connector

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)

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	WB	SB	SB
Directions Served	L	T	R	L	R
Maximum Queue (ft)	59	2	18	151	58
Average Queue (ft)	34	0	3	83	29
95th Queue (ft)	62	4	21	160	62
Link Distance (ft)		1156			826
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	150		225	275	
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	WB	WB	NB	SB
Directions Served	LT	LT	R	LTR	LTR
Maximum Queue (ft)	274	740	364	176	585
Average Queue (ft)	188	628	253	114	565
95th Queue (ft)	335	1019	665	205	585
Link Distance (ft)	778	840		663	544
Upstream Blk Time (%)		26			69
Queuing Penalty (veh)		0			0
Storage Bay Dist (ft)			400		
Storage Blk Time (%)		65			
Queuing Penalty (veh)		57			

Network Summary

Network wide Queuing Penalty: 24419

C-3 – Concept 1 (2040) Synchro/SimTraffic Results

HCM Signalized Intersection Capacity Analysis
101: Bridgewood Rd/Warbro Rd & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	2080	50	20	1150	130	190	60	60	100	10	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	3155	5036	1583	1770	5036	1455		1760		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	3155	5036	1583	1770	5036	1455		1760		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	2261	54	22	1198	141	207	65	65	109	11	196
RTOR Reduction (vph)	0	0	25	0	0	81	0	6	0	0	0	109
Lane Group Flow (vph)	239	2261	29	22	1198	60	0	331	0	109	11	87
Heavy Vehicles (%)	11%	3%	2%	2%	3%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	19.6	80.2	80.2	3.1	64.0	64.0		31.3		9.5	9.5	29.1
Effective Green, g (s)	19.6	80.2	80.2	3.1	64.0	64.0		31.3		9.5	9.5	29.1
Actuated g/C Ratio	0.13	0.53	0.53	0.02	0.43	0.43		0.21		0.06	0.06	0.19
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	412	2692	846	36	2148	620		367		199	108	282
v/s Ratio Prot	c0.08	c0.45		0.01	0.24			c0.19		c0.03	0.01	0.04
v/s Ratio Perm			0.02			0.04						0.02
v/c Ratio	0.58	0.84	0.03	0.61	0.56	0.10		0.90		0.55	0.10	0.31
Uniform Delay, d1	61.3	29.5	16.5	72.9	32.4	25.7		57.9		68.2	66.2	51.8
Progression Factor	0.88	0.60	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	2.2	0.0	23.4	1.1	0.3		24.6		6.8	1.2	0.7
Delay (s)	55.2	19.9	16.6	96.3	33.4	26.0		82.4		75.0	67.4	52.6
Level of Service	E	B	B	F	C	C		F		E	E	D
Approach Delay (s)		23.1			33.7			82.4			60.8	
Approach LOS		C			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.9
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
102: Lonas Pkwy & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	2190	40	50	1410	50	120	10	90	60	10	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5036	1583	3433	6346	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5036	1583	3433	6346	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	2305	43	54	1516	54	130	11	98	65	11	152
RTOR Reduction (vph)	0	0	19	0	0	29	0	0	91	0	0	142
Lane Group Flow (vph)	239	2305	24	54	1516	25	130	11	7	65	11	10
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	8.6	41.0	41.0	3.0	35.4	35.4	5.0	5.0	5.0	5.0	5.0	5.0
Effective Green, g (s)	8.6	41.0	41.0	3.0	35.4	35.4	5.0	5.0	5.0	5.0	5.0	5.0
Actuated g/C Ratio	0.11	0.55	0.55	0.04	0.47	0.47	0.07	0.07	0.07	0.07	0.07	0.07
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	393	2753	865	137	2995	747	228	124	105	228	235	105
v/s Ratio Prot	0.07	c0.46		0.02	c0.24		c0.04	0.01		c0.02	0.00	
v/s Ratio Perm			0.01			0.02			0.00			0.01
v/c Ratio	0.61	0.84	0.03	0.39	0.51	0.03	0.57	0.09	0.06	0.29	0.05	0.10
Uniform Delay, d1	31.6	14.2	7.8	35.1	13.7	10.6	34.0	32.9	32.8	33.3	32.8	32.9
Progression Factor	0.99	1.12	1.00	0.82	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.0	1.1	0.5	0.1	2.8	0.2	0.2	0.5	0.1	0.3
Delay (s)	31.6	16.2	7.8	29.9	9.7	10.7	36.8	33.1	33.0	33.8	32.8	33.2
Level of Service	C	B	A	C	A	B	D	C	C	C	C	C
Approach Delay (s)		17.5			10.4			35.0			33.3	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

8/28/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	5030	0	130	1890	0	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5467	0	141	2054	0	120
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	5467	0	141	2054	0	120
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	90.3		46.0	150.0		46.0
Effective Green, g (s)	90.3		46.0	150.0		46.0
Actuated g/C Ratio	0.60		0.31	1.00		0.31
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	3747		1052	7329		494
v/s Ratio Prot	c0.88		0.04	0.28		0.07
v/s Ratio Perm						
v/c Ratio	1.46		0.13	0.28		0.24
Uniform Delay, d1	29.9		37.6	0.0		39.0
Progression Factor	0.45		1.34	1.00		0.86
Incremental Delay, d2	206.7		0.1	0.1		0.3
Delay (s)	220.2		50.3	0.1		33.9
Level of Service	F		D	A		C
Approach Delay (s)	220.2			3.3	33.9	
Approach LOS	F			A	C	

Intersection Summary			
HCM 2000 Control Delay	156.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

8/28/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	4580	200	1710	180	90	80	110	450	120	350	370	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.42	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	1484	1863	1583	3335	3335
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)	4978	217	1859	196	98	87	120	489	130	380	402	141
RTOR Reduction (vph)	0	48	0	78	0	0	94	0	0	293	0	0
Lane Group Flow (vph)	4978	169	1859	118	98	87	26	489	130	87	402	141
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8			4		2	6
Permitted Phases		2		6			8	4		4		
Actuated Green, G (s)	90.3	90.3	90.3	90.3	5.0	32.4	32.4	34.5	34.5	34.5	90.3	90.3
Effective Green, g (s)	90.3	90.3	90.3	90.3	5.0	32.4	32.4	34.5	34.5	34.5	90.3	90.3
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.03	0.22	0.22	0.23	0.23	0.23	0.60	0.60
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3747	925	3747	925	114	764	332	341	428	364	2007	2007
v/s Ratio Prot	c0.80		0.30		c0.03	0.02			0.07		0.12	0.04
v/s Ratio Perm		0.11		0.08			0.02	c0.33		0.06		
v/c Ratio	1.33	0.18	0.50	0.13	0.86	0.11	0.08	1.43	0.30	0.24	0.20	0.07
Uniform Delay, d1	29.9	13.4	16.9	12.9	72.2	47.3	46.9	57.8	47.8	47.1	13.5	12.4
Progression Factor	0.70	0.54	0.73	0.27	1.00	1.00	1.00	0.93	0.90	1.65	2.80	2.79
Incremental Delay, d2	148.8	0.2	0.5	0.3	43.5	0.1	0.1	210.4	0.4	0.3	0.2	0.1
Delay (s)	169.6	7.4	12.8	3.8	115.7	47.3	47.0	264.1	43.2	78.1	38.0	34.7
Level of Service	F	A	B	A	F	D	D	F	D	E	D	C
Approach Delay (s)	162.9		12.0			69.2			164.6			
Approach LOS	F		B			E			F			

Intersection Summary			
HCM 2000 Control Delay	118.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
109: Route 360 & 360 EB LT

8/28/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	370	4780	1800	0	0	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	402	5196	1957	0	0	372
RTOR Reduction (vph)	0	0	0	0	0	15
Lane Group Flow (vph)	402	5196	1957	0	0	357
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	46.0	150.0	90.3			46.0
Effective Green, g (s)	46.0	150.0	90.3			46.0
Actuated g/C Ratio	0.31	1.00	0.60			0.31
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	1022	6225	3747			830
v/s Ratio Prot	0.12	0.83	0.31			
v/s Ratio Perm						0.13
v/c Ratio	0.39	0.83	0.52			0.43
Uniform Delay, d1	41.0	0.0	17.3			41.5
Progression Factor	1.19	1.00	0.32			0.70
Incremental Delay, d2	0.0	0.1	0.5			0.3
Delay (s)	49.0	0.1	6.0			29.6
Level of Service	D	A	A			C
Approach Delay (s)		3.6	6.0		29.6	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
111: Brad McNeer Pkwy & Route 360

8/28/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	4850	330	230	1910	130	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Lane Util. Factor	0.86	1.00	0.97	0.86	0.94	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6108	1583	3433	6108	4990	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6108	1583	3433	6108	4990	1583
Peak-hour factor, PHF	0.94	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5160	359	250	2076	141	326
RTOR Reduction (vph)	0	52	0	0	0	81
Lane Group Flow (vph)	5160	307	250	2076	141	245
Heavy Vehicles (%)	7%	2%	2%	7%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	104.7	104.7	9.5	120.3	16.5	16.5
Effective Green, g (s)	104.7	104.7	9.5	120.3	16.5	16.5
Actuated g/C Ratio	0.70	0.70	0.06	0.80	0.11	0.11
Clearance Time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Vehicle Extension (s)	8.0	8.0	2.5	8.0	2.5	2.5
Lane Grp Cap (vph)	4263	1104	217	4898	548	174
v/s Ratio Prot	c0.84		c0.07	0.34	0.03	
v/s Ratio Perm		0.19				c0.15
v/c Ratio	1.21	0.28	1.15	0.42	0.26	1.41
Uniform Delay, d1	22.6	8.5	70.2	4.5	61.1	66.8
Progression Factor	0.25	0.03	0.85	0.83	1.00	1.00
Incremental Delay, d2	94.9	0.1	104.4	0.2	0.2	214.2
Delay (s)	100.6	0.3	163.8	3.9	61.3	281.0
Level of Service	F	A	F	A	E	F
Approach Delay (s)	94.0			21.1	214.7	
Approach LOS	F			C	F	

Intersection Summary			
HCM 2000 Control Delay	80.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
112: Craig Rath Boulevard & Route 360

8/28/2014

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	4670	20	70	1910	50	20	10	370	200	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.6		6.5	6.6	6.6	6.5	6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	6106		1770	6108	1583	1770	1863	1583	3433	1640	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	6106		1770	6108	1583	1770	1863	1583	3433	1640	
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)	87	5076	22	76	2076	54	22	11	402	217	11	43
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	105	0	41	0
Lane Group Flow (vph)	87	5098	0	76	2076	36	22	11	297	217	13	0
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6		7	4	1	3	8	
Permitted Phases						6			4			
Actuated Green, G (s)	11.8	93.5		17.6	99.3	99.3	6.5	2.0	19.6	10.8	6.3	
Effective Green, g (s)	11.8	93.5		17.6	99.3	99.3	6.5	2.0	19.6	10.8	6.3	
Actuated g/C Ratio	0.08	0.62		0.12	0.66	0.66	0.04	0.01	0.13	0.07	0.04	
Clearance Time (s)	6.5	6.6		6.5	6.6	6.6	6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	2.5	8.0		2.5	8.0	8.0	3.0	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	139	3806		207	4043	1047	76	24	206	247	68	
v/s Ratio Prot	0.05	c0.83		0.04	0.34		c0.01	0.01	c0.17	c0.06	0.01	
v/s Ratio Perm						0.02			0.02			
v/c Ratio	0.63	1.34		0.37	0.51	0.03	0.29	0.46	1.44	0.88	0.19	
Uniform Delay, d1	67.0	28.2		61.1	13.0	8.8	69.5	73.5	65.2	69.0	69.4	
Progression Factor	1.24	0.25		0.93	0.52	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	152.9		0.7	0.4	0.1	2.1	9.8	223.7	27.5	1.0	
Delay (s)	83.6	159.8		57.6	7.2	8.8	71.6	83.2	288.9	96.5	70.4	
Level of Service	F	F		E	A	A	E	F	F	F	E	
Approach Delay (s)		158.6			9.0			272.7			91.3	
Approach LOS		F			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	121.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.1
Intersection Capacity Utilization	113.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
114: Deer Run Dr/Harbour View Ct & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	4200	30	130	1740	90	20	30	350	220	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.4	6.4	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86		0.97	0.86	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	6104		3433	6108	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	6104		3433	6108	1583	1770	1863	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	4330	33	141	1891	98	22	33	380	239	11	120
RTOR Reduction (vph)	0	1	0	0	0	43	0	0	101	0	0	93
Lane Group Flow (vph)	174	4362	0	141	1891	55	22	33	279	239	11	27
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4	1	3	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	24.3	89.7		18.9	84.4	84.4	6.6	4.0	22.9	11.4	8.8	33.1
Effective Green, g (s)	24.3	89.7		18.9	84.4	84.4	6.6	4.0	22.9	11.4	8.8	33.1
Actuated g/C Ratio	0.16	0.60		0.13	0.56	0.56	0.04	0.03	0.15	0.08	0.06	0.22
Clearance Time (s)	6.5	6.5		6.5	6.4	6.4	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0		2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	286	3650		432	3436	890	77	49	241	260	109	349
v/s Ratio Prot	0.10	c0.71		0.04	0.31		0.01	0.02	c0.15	c0.07	0.01	0.01
v/s Ratio Perm						0.03			0.03			0.00
v/c Ratio	0.61	1.20		0.33	0.55	0.06	0.29	0.67	1.16	0.92	0.10	0.08
Uniform Delay, d1	58.4	30.1		59.7	20.8	14.9	69.4	72.4	63.5	68.8	66.9	46.4
Progression Factor	0.67	0.37		0.90	1.01	3.76	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	88.1		0.3	0.6	0.1	1.5	28.3	107.5	34.6	0.3	0.1
Delay (s)	39.7	99.1		54.2	21.6	56.0	70.9	100.7	171.0	103.4	67.2	46.4
Level of Service	D	F		D	C	E	E	F	F	F	E	D
Approach Delay (s)		96.8			25.3			160.6			83.8	
Approach LOS		F			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	79.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
115: Chital Dr & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	4200	110	120	1740	10	50	10	180	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3	6.3	6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.86	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00
Satd. Flow (prot)	1770	4848	1583	3433	6108	1583	1770	1863	1583		1817	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00
Satd. Flow (perm)	1770	4848	1583	3433	6108	1583	1770	1863	1583		1817	1583
Peak-hour factor, PHF	0.92	0.96	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4375	118	130	1891	11	54	11	196	11	11	11
RTOR Reduction (vph)	0	0	37	0	0	3	0	0	160	0	0	11
Lane Group Flow (vph)	11	4375	81	130	1891	8	54	11	36	0	22	0
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	3	4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	2.0	103.0	103.0	9.4	109.8	114.0	7.6	7.6	7.6		4.2	4.2
Effective Green, g (s)	2.0	103.0	103.0	9.4	109.8	114.0	7.6	7.6	7.6		4.2	4.2
Actuated g/C Ratio	0.01	0.69	0.69	0.06	0.73	0.76	0.05	0.05	0.05		0.03	0.03
Clearance Time (s)	6.5	6.3	6.3	6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	5.0	8.0	2.5	3.5	3.5	3.5		2.5	2.5
Lane Grp Cap (vph)	23	3328	1086	215	4471	1203	89	94	80		50	44
v/s Ratio Prot	0.01	c0.90		c0.04	0.31	0.00	c0.03	0.01			c0.01	
v/s Ratio Perm			0.05			0.01			0.02			0.00
v/c Ratio	0.48	1.31	0.07	0.60	0.42	0.01	0.61	0.12	0.44		0.44	0.01
Uniform Delay, d1	73.5	23.5	7.8	68.5	7.8	4.3	69.7	68.0	69.2		71.7	70.9
Progression Factor	1.18	0.25	0.09	0.66	0.09	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	141.8	0.0	6.0	0.3	0.0	11.7	0.7	4.6		4.4	0.0
Delay (s)	87.8	147.7	0.7	51.4	0.9	4.3	81.4	68.7	73.7		76.2	70.9
Level of Service	F	F	A	D	A	A	F	E	E		E	E
Approach Delay (s)		143.7			4.2			75.1			74.4	
Approach LOS		F			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	99.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	3660	60	130	1490	180	30	50	340	330	50	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	6.5	6.9	6.9	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.86	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4848	1583	3433	6108	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4848	1583	3433	6108	1583	1770	1863	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	3894	65	141	1620	191	33	54	370	359	54	43
RTOR Reduction (vph)	0	0	24	0	0	73	0	0	102	0	0	36
Lane Group Flow (vph)	109	3894	41	141	1620	118	33	54	268	359	54	7
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	13.6	93.7	93.7	13.5	92.7	92.7	5.6	4.8	18.3	12.5	11.7	25.3
Effective Green, g (s)	13.6	93.7	93.7	13.5	92.7	92.7	5.6	4.8	18.3	12.5	11.7	25.3
Actuated g/C Ratio	0.09	0.62	0.62	0.09	0.62	0.62	0.04	0.03	0.12	0.08	0.08	0.17
Clearance Time (s)	6.5	6.0	6.0	6.5	6.9	6.9	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	4.0	8.0	8.0	3.5	3.5	4.0	2.5	2.5	2.5
Lane Grp Cap (vph)	160	3028	988	308	3774	978	66	59	193	286	145	335
v/s Ratio Prot	0.06	c0.80		0.04	0.27		0.02	0.03	c0.12	c0.10	0.03	0.00
v/s Ratio Perm			0.03			0.07			0.04			0.00
v/c Ratio	0.68	1.29	0.04	0.46	0.43	0.12	0.50	0.92	1.39	1.26	0.37	0.02
Uniform Delay, d1	66.1	28.1	10.8	64.8	14.9	11.8	70.8	72.4	65.8	68.8	65.7	52.0
Progression Factor	1.18	0.36	1.00	0.56	0.41	0.05	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	128.9	0.0	1.4	0.3	0.2	6.9	87.4	203.8	140.2	1.2	0.0
Delay (s)	79.0	139.0	10.9	37.6	6.4	0.8	77.7	159.8	269.7	209.0	66.8	52.0
Level of Service	E	F	B	D	A	A	E	F	F	F	E	D
Approach Delay (s)		135.3			8.1			242.8			177.3	
Approach LOS		F			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	109.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	117.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
117: Winterpock Rd/Lake Harbour Dr & Route 360

8/28/2014

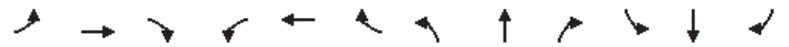
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	3220	60	160	1390	10	130	0	570	30	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00		1.00	0.88	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4848	1583	3433	4848	1583		1770	2787	1770	1723	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4848	1583	3433	4848	1583		1770	2787	1770	1723	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	11	3500	65	174	1511	11	141	0	606	33	11	11
RTOR Reduction (vph)	0	0	25	0	0	3	0	0	105	0	11	0
Lane Group Flow (vph)	11	3500	40	174	1511	8	0	141	501	33	11	0
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	2.0	93.4	93.4	15.8	106.8	106.8		10.5	26.3	4.0	4.0	
Effective Green, g (s)	2.0	93.4	93.4	15.8	106.8	106.8		10.5	26.3	4.0	4.0	
Actuated g/C Ratio	0.01	0.62	0.62	0.11	0.71	0.71		0.07	0.18	0.03	0.03	
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0		3.0	4.0	3.0	3.0	
Lane Grp Cap (vph)	23	3018	985	361	3451	1127		123	488	47	45	
v/s Ratio Prot	0.01	c0.72		0.05	0.31			c0.08	c0.11	c0.02	0.01	
v/s Ratio Perm			0.03			0.00			0.07			
v/c Ratio	0.48	1.16	0.04	0.48	0.44	0.01		1.15	1.03	0.70	0.25	
Uniform Delay, d1	73.5	28.3	11.0	63.2	9.0	6.3		69.8	61.9	72.4	71.5	
Progression Factor	0.73	0.36	1.00	0.78	1.60	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.2	73.3	0.0	1.3	0.4	0.0		125.8	47.9	38.0	2.9	
Delay (s)	58.7	83.5	11.0	50.6	14.8	6.3		195.6	109.7	110.4	74.5	
Level of Service	E	F	B	D	B	A		F	F	F	E	
Approach Delay (s)		82.1			18.4			125.9			96.0	
Approach LOS		F			B			F			F	

Intersection Summary			
HCM 2000 Control Delay	69.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
118: Hancock Village/Duckridge Blvd & Route 360

8/28/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	3110	140	50	1460	20	70	10	130	50	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1604		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1604		1770	1863	1583
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)	22	3380	152	54	1587	22	76	11	141	54	11	11
RTOR Reduction (vph)	0	0	40	0	0	7	0	55	0	0	0	11
Lane Group Flow (vph)	22	3380	112	54	1587	15	76	97	0	54	11	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	3.7	100.2	100.2	4.0	99.8	99.8	16.7	13.9		5.6	2.8	6.5
Effective Green, g (s)	3.7	100.2	100.2	4.0	99.8	99.8	16.7	13.9		5.6	2.8	6.5
Actuated g/C Ratio	0.02	0.67	0.67	0.03	0.67	0.67	0.11	0.09		0.04	0.02	0.04
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5		6.5	6.5	6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	43	3396	1057	91	3383	1053	382	148		66	34	137
v/s Ratio Prot	0.01	c0.66		0.02	c0.31		c0.02	c0.06		c0.03	0.01	0.00
v/s Ratio Perm			0.07			0.01						0.00
v/c Ratio	0.51	1.00	0.11	0.59	0.47	0.01	0.20	0.65		0.82	0.32	0.00
Uniform Delay, d1	72.3	24.7	8.9	72.2	12.2	8.5	60.6	65.7		71.7	72.7	68.7
Progression Factor	0.73	0.16	0.00	1.21	0.36	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	3.7	0.0	7.5	0.4	0.0	0.2	8.9		51.2	4.0	0.0
Delay (s)	53.3	7.6	0.0	95.0	4.8	8.5	60.8	74.6		122.9	76.7	68.7
Level of Service	D	A	A	F	A	A	E	E		F	E	E
Approach Delay (s)		7.6			7.8			70.0			108.3	
Approach LOS		A			A			E			F	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
119: Ashlake Pkwy & Route 360

8/28/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2940	30	50	1490	110	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	6.5	6.8	6.5	6.5
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4577	1425	3090	4577	3090	1425
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4577	1425	3090	4577	3090	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3196	33	54	1620	120	348
RTOR Reduction (vph)	0	11	0	0	0	50
Lane Group Flow (vph)	3196	22	54	1620	120	298
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	99.3	99.3	4.8	110.2	26.5	26.5
Effective Green, g (s)	99.3	99.3	4.8	110.2	26.5	26.5
Actuated g/C Ratio	0.66	0.66	0.03	0.73	0.18	0.18
Clearance Time (s)	6.4	6.4	6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0	6.0	2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	3029	943	98	3362	545	251
v/s Ratio Prot	c0.70		0.02	c0.35	0.04	
v/s Ratio Perm		0.02				c0.21
v/c Ratio	1.06	0.02	0.55	0.48	0.22	1.19
Uniform Delay, d1	25.4	8.7	71.5	8.2	52.9	61.8
Progression Factor	0.79	1.26	0.60	0.07	1.00	1.00
Incremental Delay, d2	30.1	0.0	4.9	0.5	0.1	116.7
Delay (s)	50.0	11.0	48.0	1.0	53.0	178.4
Level of Service	D	B	D	A	D	F
Approach Delay (s)	49.6		D	2.5	146.3	
Approach LOS	D			A	F	

Intersection Summary			
HCM 2000 Control Delay	43.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
120: Route 360 & Woodlake Village Pkwy

8/28/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	50	2000	1090	510	980	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	4848	4848	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	4848	4848	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2174	1185	554	1065	76
RTOR Reduction (vph)	0	0	0	297	0	25
Lane Group Flow (vph)	54	2174	1185	257	1065	51
Heavy Vehicles (%)	2%	7%	7%	2%	2%	2%
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	8.2	83.8	69.5	69.5	53.0	53.0
Effective Green, g (s)	8.2	83.8	69.5	69.5	53.0	53.0
Actuated g/C Ratio	0.05	0.56	0.46	0.46	0.35	0.35
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	96	2708	2246	733	1212	559
v/s Ratio Prot	0.03	c0.45	0.24		c0.31	
v/s Ratio Perm				0.16		0.03
v/c Ratio	0.56	0.80	0.53	0.35	0.88	0.09
Uniform Delay, d1	69.2	26.5	28.6	25.8	45.5	32.4
Progression Factor	0.79	0.51	0.70	1.98	1.00	1.00
Incremental Delay, d2	0.6	0.2	0.8	1.2	7.7	0.1
Delay (s)	55.3	13.7	20.9	52.3	53.1	32.5
Level of Service	E	B	C	D	D	C
Approach Delay (s)		14.7	30.9		51.8	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
121: Hampton Park Dr/Fox Club Pkwy & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1400	10	90	990	80	10	50	370	290	40	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00		1.00	1.00	0.97	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4847	1583	1770	4848	1583		1847	1583	3433	1863	1583
Flt Permitted		0.85	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4102	1583	1770	4848	1583		1847	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.96	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1458	11	98	1031	87	11	54	402	315	43	54
RTOR Reduction (vph)	0	0	5	0	0	31	0	0	147	0	0	50
Lane Group Flow (vph)	0	1501	6	98	1031	56	0	65	255	315	43	5
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)		82.1	82.1	7.5	96.2	96.2		21.5	21.5	12.5	12.5	12.5
Effective Green, g (s)		82.1	82.1	7.5	96.2	96.2		21.5	21.5	12.5	12.5	12.5
Actuated g/C Ratio		0.55	0.55	0.05	0.64	0.64		0.14	0.14	0.08	0.08	0.08
Clearance Time (s)		6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)		7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2245	866	88	3109	1015		264	226	286	155	131	
v/s Ratio Prot			c0.06	0.21			0.04		c0.09	0.02		
v/s Ratio Perm	c0.37	0.00				0.04		c0.16				0.00
v/c Ratio	0.67	0.01	1.11	0.33	0.05		0.25	1.13	1.10	0.28	0.03	
Uniform Delay, d1	24.2	15.4	71.2	12.3	10.0		57.1	64.2	68.8	64.5	63.2	
Progression Factor	0.87	1.00	0.97	0.19	0.18		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.0	124.1	0.3	0.1		0.5	98.2	83.1	1.0	0.1	
Delay (s)	21.9	15.4	193.5	2.6	1.9		57.5	162.4	151.9	65.5	63.3	
Level of Service	C	B	F	A	A		E	F	F	E	E	
Approach Delay (s)	21.8			17.9			147.8			131.3		
Approach LOS	C			B			F			F		

Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
122: Otterdale Rd & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	1120	20	110	880	70	10	20	210	110	20	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3	7.3	6.5	7.4	7.4	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	4848	1583	1593	4848	1538	1770	3539	1583	1719	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	4848	1583	1593	4848	1538	1770	3539	1583	1719	3438	1538
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	1155	22	120	957	73	11	22	228	120	22	33
RTOR Reduction (vph)	0	0	14	0	0	42	0	0	186	0	0	30
Lane Group Flow (vph)	98	1155	8	120	957	31	11	22	42	120	22	3
Heavy Vehicles (%)	5%	7%	2%	2%	7%	5%	2%	2%	2%	5%	5%	5%
Parking (#/hr)				0								
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	7.3	27.0	27.0	11.8	31.4	31.4	2.0	2.0	13.8	7.4	7.4	7.4
Effective Green, g (s)	7.3	27.0	27.0	11.8	31.4	31.4	2.0	2.0	13.8	7.4	7.4	7.4
Actuated g/C Ratio	0.10	0.36	0.36	0.16	0.42	0.42	0.03	0.03	0.18	0.10	0.10	0.10
Clearance Time (s)	6.5	7.3	7.3	6.5	7.4	7.4	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	167	1745	569	250	2029	643	47	94	291	169	339	151
v/s Ratio Prot	0.06	c0.24		0.08	c0.20		0.01	c0.01	0.02	c0.07	0.01	
v/s Ratio Perm			0.01			0.02			0.00			0.00
v/c Ratio	0.59	0.66	0.01	0.48	0.47	0.05	0.23	0.23	0.14	0.71	0.06	0.02
Uniform Delay, d1	32.4	20.2	15.4	28.8	15.8	12.9	35.7	35.7	25.7	32.8	30.7	30.5
Progression Factor	1.00	1.00	1.00	0.73	0.63	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	2.0	0.0	1.0	0.8	0.1	1.9	0.9	0.2	12.3	0.1	0.0
Delay (s)	36.7	22.2	15.5	22.2	10.7	13.1	37.6	36.7	25.8	45.1	30.7	30.6
Level of Service	D	C	B	C	B	B	D	D	C	D	C	C
Approach Delay (s)		23.2			12.0			27.2			40.5	
Approach LOS		C			B			C			D	

Intersection Summary				
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	26.9	
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
123: Bailey Bridge Road & Bailey Bridge Connector

8/28/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	190	400	300	350	100	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.56	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1050	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	435	326	380	109	239
RTOR Reduction (vph)	0	257	0	229	0	0
Lane Group Flow (vph)	207	178	326	151	109	239
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	9.4	9.4	11.5	11.5	11.5	11.5
Effective Green, g (s)	9.4	9.4	11.5	11.5	11.5	11.5
Actuated g/C Ratio	0.33	0.33	0.40	0.40	0.40	0.40
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	575	514	741	629	417	741
v/s Ratio Prot	c0.12		c0.18			0.13
v/s Ratio Perm		0.11		0.10	0.10	
v/c Ratio	0.36	0.35	0.44	0.24	0.26	0.32
Uniform Delay, d1	7.5	7.4	6.3	5.8	5.8	6.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.4	0.4	0.2	0.3	0.3
Delay (s)	7.8	7.8	6.8	6.0	6.2	6.3
Level of Service	A	A	A	A	A	A
Approach Delay (s)	7.8		6.4			6.2
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	28.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
124: Bailey Bridge Road & Deer Run Drive

8/28/2014

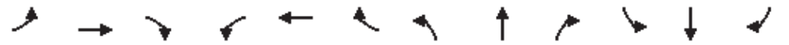
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	90	450	180	230	210	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	489	196	250	228	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	446				880	196
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	446				880	196
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				21	95
cM capacity (veh/h)	1115				290	846

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	98	489	196	250	228	43
Volume Left	98	0	0	0	228	0
Volume Right	0	0	0	250	0	43
cSH	1115	1700	1700	1700	290	846
Volume to Capacity	0.09	0.29	0.12	0.15	0.79	0.05
Queue Length 95th (ft)	7	0	0	0	155	4
Control Delay (s)	8.5	0.0	0.0	0.0	51.5	9.5
Lane LOS	A				F	A
Approach Delay (s)	1.4		0.0		44.8	
Approach LOS					E	

Intersection Summary				
Average Delay	10.0			
Intersection Capacity Utilization	42.0%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
125: Springford Parkway/Bailey Bridge Road & Spring Run Road

8/28/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	60	90	20	140	70	250	380	50	40	140	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1830		1770	1790	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.63	1.00		0.39	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1171	1830		728	1790	
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)	98	65	98	22	152	76	272	413	54	43	152	54
RTOR Reduction (vph)	0	0	73	0	0	61	0	7	0	0	20	0
Lane Group Flow (vph)	98	65	25	22	152	15	272	460	0	43	186	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	3.4	11.8	11.8	0.6	9.0	9.0	21.6	21.6		21.6	21.6	
Effective Green, g (s)	3.4	11.8	11.8	0.6	9.0	9.0	21.6	21.6		21.6	21.6	
Actuated g/C Ratio	0.07	0.26	0.26	0.01	0.20	0.20	0.47	0.47		0.47	0.47	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	130	477	406	23	364	309	549	859		341	840	
v/s Ratio Prot	c0.06	c0.03		0.01	c0.08			c0.25			0.10	
v/s Ratio Perm			0.02			0.01	0.23			0.06		
v/c Ratio	0.75	0.14	0.06	0.96	0.42	0.05	0.50	0.54		0.13	0.22	
Uniform Delay, d1	20.9	13.2	12.9	22.7	16.2	15.0	8.4	8.6		6.9	7.2	
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	21.6	0.1	0.1	166.5	0.8	0.1	0.7	0.6		0.2	0.1	
Delay (s)	42.5	13.3	13.0	189.2	17.0	15.1	9.1	9.3		7.0	7.4	
Level of Service	D	B	B	F	B	B	A	A		A	A	
Approach Delay (s)		24.2			31.6			9.2			7.3	
Approach LOS		C			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	46.0	Sum of lost time (s)		12.0
Intersection Capacity Utilization	52.1%	ICU Level of Service		A
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
126: Old Hundred Road/Old Hundred Rd & Millridge Pkwy/Market Square Ent

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	10	380	40	10	10	90	500	50	10	510	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.95	
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1740	1538	3335	1674		3335	3438	1538	1719	3409	
Flt Permitted		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1740	1538	3335	1674		3335	3438	1538	1719	3409	
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)	43	11	413	43	11	11	98	543	54	11	554	33
RTOR Reduction (vph)	0	0	359	0	10	0	0	0	22	0	4	0
Lane Group Flow (vph)	0	54	54	43	12	0	98	543	32	11	583	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)		9.8	9.8	4.2	4.2		6.4	44.2	44.2	0.8	38.6	
Effective Green, g (s)		9.8	9.8	4.2	4.2		6.4	44.2	44.2	0.8	38.6	
Actuated g/C Ratio		0.13	0.13	0.06	0.06		0.09	0.59	0.59	0.01	0.51	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		227	200	186	93		284	2026	906	18	1754	
v/s Ratio Prot		0.03		c0.01	0.01		c0.03	c0.16		0.01	c0.17	
v/s Ratio Perm			c0.04						0.02			
v/c Ratio	0.24	0.27	0.23	0.12			0.35	0.27	0.04	0.61	0.33	
Uniform Delay, d1	29.2	29.4	33.9	33.7			32.3	7.5	6.5	36.9	10.7	
Progression Factor	1.00	1.00	1.00	1.00			0.84	0.59	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.7	0.6	0.6			0.7	0.3	0.1	48.7	0.5	
Delay (s)	29.8	30.1	34.5	34.3			28.0	4.7	6.5	85.6	11.2	
Level of Service	C	C	C	C			C	A	A	F	B	
Approach Delay (s)	30.1			34.4				8.1			12.5	
Approach LOS	C			C				A			B	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

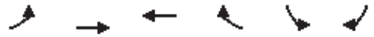
HCM Unsignalized Intersection Capacity Analysis
127: Old Hundred Rd & Market Square

8/28/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	20	520	20	20	520
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)	33	22	565	22	22	565
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			916			
pX, platoon unblocked	0.87	0.87			0.87	
vC, conflicting volume	1174	565			587	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1123	420			445	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	96			98	
cM capacity (veh/h)	190	543			951	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	54	565	22	22	565
Volume Left	33	0	0	22	0
Volume Right	22	0	22	0	0
cSH	256	1700	1700	951	1700
Volume to Capacity	0.21	0.33	0.01	0.02	0.33
Queue Length 95th (ft)	20	0	0	2	0
Control Delay (s)	22.8	0.0	0.0	8.9	0.0
Lane LOS	C			A	
Approach Delay (s)	22.8	0.0		0.3	
Approach LOS	C				

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	100	650	170	340	530	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1719	1810	1810	1538	1719	1538
Flt Permitted	0.54	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	969	1810	1810	1538	1719	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	707	185	370	576	174
RTOR Reduction (vph)	0	0	0	233	0	106
Lane Group Flow (vph)	109	707	185	137	576	68
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	41.8	41.8	32.8	32.8	34.7	34.7
Effective Green, g (s)	41.8	41.8	32.8	32.8	34.7	34.7
Actuated g/C Ratio	0.47	0.47	0.37	0.37	0.39	0.39
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	483	854	670	570	674	603
v/s Ratio Prot	0.01	c0.39	0.10		c0.34	
v/s Ratio Perm	0.10			0.09		0.04
v/c Ratio	0.23	0.83	0.28	0.24	0.85	0.11
Uniform Delay, d1	13.6	20.2	19.5	19.2	24.6	17.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	6.6	0.2	0.2	10.3	0.1
Delay (s)	13.8	26.9	19.8	19.5	34.9	17.2
Level of Service	B	C	B	B	C	B
Approach Delay (s)		25.1	19.6		30.8	
Approach LOS		C	B		C	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	LTR
Maximum Queue (ft)	131	141	294	326	342	125	33	211	252	295	63	392
Average Queue (ft)	74	98	212	239	250	39	11	167	194	234	22	261
95th Queue (ft)	135	152	326	351	364	156	33	225	264	315	68	389
Link Distance (ft)			1521	1521	1521			5220	5220	5220		1540
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	205	205				90	190				200	
Storage Blk Time (%)		0	5		23			3		17		
Queuing Penalty (veh)		1	12		11			1		22		

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	115	153	31	157
Average Queue (ft)	36	96	7	80
95th Queue (ft)	105	155	31	153
Link Distance (ft)			1263	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		250
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	L	L	T	T	T	T	R
Maximum Queue (ft)	82	109	194	209	217	30	46	84	115	162	181	36
Average Queue (ft)	42	69	111	128	137	6	21	48	69	97	100	12
95th Queue (ft)	87	114	227	238	250	27	51	89	120	168	185	36
Link Distance (ft)			635	635	635			1521	1521	1521		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	420	420				200	200				200	200
Storage Blk Time (%)											0	
Queuing Penalty (veh)											1	

Intersection: 102: Lonas Pkwy & Route 360

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	L	L	T	T
Maximum Queue (ft)	85	114	29	78	64	28	21	2
Average Queue (ft)	30	72	7	42	39	10	7	0
95th Queue (ft)	89	123	27	78	68	33	25	5
Link Distance (ft)			402	402	257	257	257	257
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	240	240						
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

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)

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	EB
Directions Served	T
Maximum Queue (ft)	5
Average Queue (ft)	1
95th Queue (ft)	10
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB	EB
Directions Served	T	T
Maximum Queue (ft)	198	429
Average Queue (ft)	28	86
95th Queue (ft)	222	439
Link Distance (ft)	660	660
Upstream Blk Time (%)		0
Queuing Penalty (veh)		3
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	NW	B9
Directions Served	T	T	T	T	L	L	R	T
Maximum Queue (ft)	661	706	712	713	86	113	94	29
Average Queue (ft)	425	600	643	638	37	70	57	7
95th Queue (ft)	697	805	787	787	89	118	106	51
Link Distance (ft)	692	692	692	692			22	659
Upstream Blk Time (%)	0	1	2	2			38	
Queuing Penalty (veh)	4	18	31	21			42	
Storage Bay Dist (ft)					500	500		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	<	<	T
Maximum Queue (ft)	438	458	466	452	411	194	182	209	224	77	113	19
Average Queue (ft)	404	428	436	427	157	130	118	146	164	22	69	6
95th Queue (ft)	476	462	465	460	485	211	193	216	239	71	128	25
Link Distance (ft)	412	412	412	412		692	692	692	692			1190
Upstream Blk Time (%)	13	25	36	27	0							
Queuing Penalty (veh)	161	302	426	322	0							
Storage Bay Dist (ft)					250					390	390	
Storage Blk Time (%)				58								
Queuing Penalty (veh)				115								

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	T	<	<	T	<	<	<	<
Maximum Queue (ft)	106	523	577	190	60	324	93	100
Average Queue (ft)	56	381	461	89	22	230	34	62
95th Queue (ft)	114	617	676	222	61	349	83	105
Link Distance (ft)	1190		652	652	397	397	659	659
Upstream Blk Time (%)			3	0		0		
Queuing Penalty (veh)			10	1		0		
Storage Bay Dist (ft)		430						
Storage Blk Time (%)		4	36					
Queuing Penalty (veh)		10	81					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	78	565	780	789	791	780	54	59	55	81	89	85
Average Queue (ft)	27	324	611	655	675	656	24	29	28	44	66	61
95th Queue (ft)	78	668	995	984	973	971	58	63	62	88	104	100
Link Distance (ft)			761	761	761	761	412	412	412	412	11	11
Upstream Blk Time (%)			2	4	7	4					47	44
Queuing Penalty (veh)			27	56	87	45					82	77
Storage Bay Dist (ft)	500	500										
Storage Blk Time (%)			9									
Queuing Penalty (veh)			33									

Intersection: 109: Route 360 & 360 EB LT

Movement	B10	B10
Directions Served	T	T
Maximum Queue (ft)	38	9
Average Queue (ft)	11	2
95th Queue (ft)	49	14
Link Distance (ft)	397	397
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R	L	L	T	T	T	T	L
Maximum Queue (ft)	913	921	921	965	400	272	278	140	164	172	198	107
Average Queue (ft)	581	648	680	679	273	204	212	74	90	112	144	70
95th Queue (ft)	1027	1039	1045	1103	554	381	380	155	175	193	212	111
Link Distance (ft)	880	880	880	880				761	761	761	761	391
Upstream Blk Time (%)	9	11	17	33								
Queuing Penalty (veh)	119	147	223	429								
Storage Bay Dist (ft)					200	500	500					
Storage Blk Time (%)				43		0						
Queuing Penalty (veh)				140		0						

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	NB	NB	NB	B61
Directions Served	L	L	R	T
Maximum Queue (ft)	90	44	439	96
Average Queue (ft)	35	15	359	50
95th Queue (ft)	91	47	529	194
Link Distance (ft)	391	391	391	809
Upstream Blk Time (%)			30	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	EB	EB	EB	EB	EB	WB	NB
Directions Served	T	T	T	T	R	L	R
Maximum Queue (ft)	892	944	1091	1042	405	102	48
Average Queue (ft)	156	188	244	224	58	58	21
95th Queue (ft)	598	666	892	769	369	126	105
Link Distance (ft)	2132	2132	2132	2132			1052
Upstream Blk Time (%)			0				
Queuing Penalty (veh)			0				
Storage Bay Dist (ft)					500	600	
Storage Blk Time (%)				16			
Queuing Penalty (veh)				16			

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	R	L
Maximum Queue (ft)	115	330	614	442	676	123	62	60	61	69	11	39
Average Queue (ft)	60	255	333	361	406	65	29	22	31	44	3	15
95th Queue (ft)	122	374	782	490	846	139	67	65	72	84	17	44
Link Distance (ft)		2506	2506	2506	2506		2132	2132	2132	2132		
Upstream Blk Time (%)			0		0							
Queuing Penalty (veh)			0		0							
Storage Bay Dist (ft)	140					150					160	200
Storage Blk Time (%)	1	21				1						
Queuing Penalty (veh)	10	17				5						

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	NB	NB	SB	SB	SB	B20
Directions Served	T	R	L	L	TR	T
Maximum Queue (ft)	910	300	166	198	270	56
Average Queue (ft)	858	300	119	149	150	33
95th Queue (ft)	1000	300	204	246	498	212
Link Distance (ft)	877				584	887
Upstream Blk Time (%)	63				10	
Queuing Penalty (veh)	0				0	
Storage Bay Dist (ft)		200	120	120		
Storage Blk Time (%)		92	23	39	1	
Queuing Penalty (veh)		28	12	19	3	

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	149	249	266	275	283	76	90	213	213	219	231	28
Average Queue (ft)	97	119	143	167	177	35	60	146	135	149	169	11
95th Queue (ft)	161	260	283	295	315	75	95	242	244	242	264	31
Link Distance (ft)		1708	1708	1708	1708			2506	2506	2506	2506	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200					280	280					400
Storage Blk Time (%)	0	1										
Queuing Penalty (veh)	1	2										

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	L	T	R
Maximum Queue (ft)	46	69	475	214	254	83	97
Average Queue (ft)	20	36	342	125	167	24	46
95th Queue (ft)	49	85	516	240	273	166	96
Link Distance (ft)		1300	1300			819	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	190			200	200		250
Storage Blk Time (%)				3	9		
Queuing Penalty (veh)				3	11		

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	R	L	L	T	T	T	T	L	T
Maximum Queue (ft)	505	592	431	24	90	107	48	34	64	70	83	27
Average Queue (ft)	258	308	285	5	50	70	14	7	25	16	47	9
95th Queue (ft)	498	590	452	21	101	118	56	31	67	57	90	31
Link Distance (ft)	843	843	843	843			1708	1708	1708	1708		1010
Upstream Blk Time (%)	0	0	0									
Queuing Penalty (veh)	0	0	0									
Storage Bay Dist (ft)					170	170					110	
Storage Blk Time (%)											2	
Queuing Penalty (veh)											0	

Intersection: 115: Chital Dr & Route 360

Movement	NB	SB	SB
Directions Served	R	LT	R
Maximum Queue (ft)	129	54	26
Average Queue (ft)	72	21	10
95th Queue (ft)	142	62	31
Link Distance (ft)	1010	610	610
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	B4	B4	B4	WB	WB	WB	WB
Directions Served	L	T	T	T	R	T	T	T	L	L	T	T
Maximum Queue (ft)	448	960	958	959	352	717	750	742	85	96	142	170
Average Queue (ft)	163	900	914	909	83	503	543	559	35	61	82	112
95th Queue (ft)	453	1080	1036	1064	337	946	971	976	82	102	155	176
Link Distance (ft)		864	864	864		736	736	736			843	843
Upstream Blk Time (%)		35	38	42		0	1	1				
Queuing Penalty (veh)		445	481	529		6	14	12				
Storage Bay Dist (ft)	220				230				115	115		
Storage Blk Time (%)		38		41					0	0	3	
Queuing Penalty (veh)		38		25					0	1	4	

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	R	L	L	T	R
Maximum Queue (ft)	204	140	57	54	423	429	165	238	581	202
Average Queue (ft)	146	67	26	27	244	355	154	218	340	38
95th Queue (ft)	206	146	58	58	767	547	180	267	831	167
Link Distance (ft)	843	843			2190				985	
Upstream Blk Time (%)									1	
Queuing Penalty (veh)									0	
Storage Bay Dist (ft)			400	130		400	90	90		170
Storage Blk Time (%)					2	26	64	84	0	
Queuing Penalty (veh)					9	21	58	75	1	

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	L	T	T	T	R	LT
Maximum Queue (ft)	107	1123	1134	1128	301	94	107	153	204	242	5	228
Average Queue (ft)	18	779	798	805	76	54	73	65	92	121	1	152
95th Queue (ft)	126	1282	1313	1328	307	105	121	159	199	243	9	280
Link Distance (ft)		1118	1118	1118				736	736	736	736	
Upstream Blk Time (%)		1	2	3								
Queuing Penalty (veh)		13	20	33								
Storage Bay Dist (ft)	180				170	280	280					430
Storage Blk Time (%)		42		47								
Queuing Penalty (veh)		4		28								

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	NB	NB	SB	SB
Directions Served	R	R	L	TR
Maximum Queue (ft)	279	276	51	25
Average Queue (ft)	191	182	21	8
95th Queue (ft)	284	278	57	31
Link Distance (ft)	1868		470	470
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		1000		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	L	T	T	T	R	L
Maximum Queue (ft)	104	703	670	701	308	29	68	66	111	137	5	62
Average Queue (ft)	28	260	280	289	74	10	38	31	53	80	1	33
95th Queue (ft)	129	612	588	610	290	30	80	73	118	154	7	67
Link Distance (ft)		1184	1184	1184				1118	1118	1118		1063
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				200	300	300				400	
Storage Blk Time (%)		19		24								
Queuing Penalty (veh)		4		34								

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (ft)	59	184	89	27	12
Average Queue (ft)	20	110	50	7	4
95th Queue (ft)	57	200	98	27	14
Link Distance (ft)	1063	1063	959	959	959
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 119: Ashlake Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	R	L	L	T	T	T	L	L	R
Maximum Queue (ft)	400	431	443	21	49	74	47	80	150	64	114	441
Average Queue (ft)	276	318	326	6	10	35	10	27	80	24	60	311
95th Queue (ft)	440	476	490	26	38	76	43	78	163	67	119	491
Link Distance (ft)	942	942	942				1184	1184	1184		2574	2574
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				400	400	400				200		
Storage Blk Time (%)			5									
Queuing Penalty (veh)			1									

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	L	L	R
Maximum Queue (ft)	90	239	266	279	234	209	224	436	434	249
Average Queue (ft)	50	163	201	213	140	136	147	331	317	76
95th Queue (ft)	96	252	278	294	238	217	231	467	454	233
Link Distance (ft)		4668	4668	4668	942	942	942	1148	1148	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200									150
Storage Blk Time (%)		2							36	
Queuing Penalty (veh)		1							25	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	T	R	L	T	T	T	LT	R	L	L
Maximum Queue (ft)	495	502	445	49	175	86	38	53	96	366	227	260
Average Queue (ft)	418	412	333	13	102	17	7	17	50	256	171	200
95th Queue (ft)	572	564	490	117	192	97	37	53	104	433	286	300
Link Distance (ft)	2656	2656	2656			4668	4668	4668	747	747		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				200	230						240	240
Storage Blk Time (%)			17		2	0					4	9
Queuing Penalty (veh)			2		6	0					4	8

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	128	49
Average Queue (ft)	45	25
95th Queue (ft)	125	53
Link Distance (ft)	1429	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		130
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	T	T	T	R	L	T
Maximum Queue (ft)	81	123	140	124	0	122	129	161	162	6	30	38
Average Queue (ft)	35	65	88	62	0	58	58	90	95	1	11	20
95th Queue (ft)	84	125	148	141	1	127	137	163	175	8	33	45
Link Distance (ft)		3646	3646	3646			2656	2656	2656			1012
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				200	375				400	200	
Storage Blk Time (%)				0								
Queuing Penalty (veh)				0								

Intersection: 122: Otterdale Rd & Route 360

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	R	L	T	T	R
Maximum Queue (ft)	8	96	112	33	16	36
Average Queue (ft)	1	51	61	8	3	16
95th Queue (ft)	8	98	120	28	14	40
Link Distance (ft)	1012			1585	1585	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		200	200			200
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 123: Bailey Bridge Road & Bailey Bridge Connector

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	76	113	106	78	86	81
Average Queue (ft)	45	73	63	52	52	42
95th Queue (ft)	84	121	110	83	98	82
Link Distance (ft)	1170		1128			930
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		200		200	200	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	62	15	162	76
Average Queue (ft)	31	3	94	25
95th Queue (ft)	65	15	190	112
Link Distance (ft)				826
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	225	275	
Storage Blk Time (%)			0	0
Queuing Penalty (veh)			0	0

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	NB	SB
Directions Served	LT	R	LT	LTR	LTR
Maximum Queue (ft)	520	82	82	323	121
Average Queue (ft)	373	57	48	190	67
95th Queue (ft)	729	396	82	440	124
Link Distance (ft)	778	778	840	663	544
Upstream Blk Time (%)	9	6		4	
Queuing Penalty (veh)	0	0		0	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	L	T	R	L	TR	L	TR
Maximum Queue (ft)	79	47	34	78	15	132	162	54	73
Average Queue (ft)	45	22	17	48	1	79	92	24	34
95th Queue (ft)	83	52	40	82	15	132	175	55	76
Link Distance (ft)		778		840			663		545
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200		200		400	200		200	
Storage Blk Time (%)							0		
Queuing Penalty (veh)							1		

Network Summary

Network wide Queuing Penalty: 1

Intersection: 126: Old Hundred Road/Old Hundred Rd & Millridge Pkwy/Market Square Ent

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	L	L	T	T	R	L	T
Maximum Queue (ft)	61	193	45	40	46	53	64	86	20	1	36	135
Average Queue (ft)	32	108	17	17	18	23	24	37	4	0	10	58
95th Queue (ft)	68	204	46	44	53	56	61	90	23	1	35	125
Link Distance (ft)	625	625	373	373	373	652	652	652	652	652		825
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)											200	
Storage Blk Time (%)												1
Queuing Penalty (veh)												0

Intersection: 126: Old Hundred Road/Old Hundred Rd & Millridge Pkwy/Market Square Ent

Movement	SB
Directions Served	TR
Maximum Queue (ft)	121
Average Queue (ft)	59
95th Queue (ft)	120
Link Distance (ft)	825
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 127: Old Hundred Rd & Market Square

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	43	19
Average Queue (ft)	18	4
95th Queue (ft)	42	22
Link Distance (ft)	566	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 128: Bailey Bridge Connector & Brad McNeer Pkwy

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	109	324	118	90	289	52
Average Queue (ft)	50	191	67	56	187	27
95th Queue (ft)	116	327	128	93	287	56
Link Distance (ft)		548	624	624	696	696
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200					
Storage Blk Time (%)		6				
Queuing Penalty (veh)		6				

Network Summary

Network wide Queuing Penalty: 5096

HCM Signalized Intersection Capacity Analysis
101: Bridgewood Rd/Warbro Rd & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1730	140	40	2400	280	110	40	40	360	80	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	3155	5036	1583	1770	5036	1455		1759		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	3155	5036	1583	1770	5036	1455		1759		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	1880	152	43	2500	304	120	43	43	391	87	315
RTOR Reduction (vph)	0	0	55	0	0	73	0	6	0	0	0	91
Lane Group Flow (vph)	261	1880	97	43	2500	231	0	200	0	391	87	224
Heavy Vehicles (%)	11%	3%	2%	2%	3%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	14.4	81.8	81.8	6.8	74.5	74.5		16.8		18.7	18.7	33.1
Effective Green, g (s)	14.4	81.8	81.8	6.8	74.5	74.5		16.8		18.7	18.7	33.1
Actuated g/C Ratio	0.10	0.55	0.55	0.05	0.50	0.50		0.11		0.12	0.12	0.22
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	302	2746	863	80	2501	722		197		393	213	321
v/s Ratio Prot	c0.08	0.37		0.02	c0.50			c0.11		c0.12	0.05	0.07
v/s Ratio Perm			0.06			0.16						0.09
v/c Ratio	0.86	0.68	0.11	0.54	1.00	0.32		1.01		0.99	0.41	0.70
Uniform Delay, d1	66.8	24.7	16.5	70.1	37.7	22.6		66.6		65.6	60.5	53.8
Progression Factor	0.85	0.70	0.76	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	17.4	1.0	0.2	5.3	17.9	1.2		67.8		44.0	3.6	6.7
Delay (s)	74.1	18.3	12.7	75.4	55.6	23.8		134.4		109.6	64.1	60.5
Level of Service	E	B	B	E	E	C		F		F	E	E
Approach Delay (s)		24.3			52.5			134.4			85.1	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	48.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	25.9
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
102: Lonas Pkwy & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	460	1890	130	100	2610	100	110	20	70	150	10	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5036	1583	3433	6346	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5036	1583	3433	6346	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	500	1989	141	109	2806	109	120	22	76	163	11	348
RTOR Reduction (vph)	0	0	67	0	0	62	0	0	72	0	0	252
Lane Group Flow (vph)	500	1989	74	109	2806	47	120	22	4	163	11	96
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	11.0	39.5	39.5	4.0	32.5	32.5	4.0	4.0	4.0	6.5	6.5	6.5
Effective Green, g (s)	11.0	39.5	39.5	4.0	32.5	32.5	4.0	4.0	4.0	6.5	6.5	6.5
Actuated g/C Ratio	0.15	0.53	0.53	0.05	0.43	0.43	0.05	0.05	0.05	0.09	0.09	0.09
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	503	2652	833	183	2749	685	183	99	84	297	306	137
v/s Ratio Prot	c0.15	0.39		0.03	c0.44		c0.03	0.01		0.05	0.00	
v/s Ratio Perm			0.05			0.03			0.00			c0.06
v/c Ratio	0.99	0.75	0.09	0.60	1.02	0.07	0.66	0.22	0.05	0.55	0.04	0.70
Uniform Delay, d1	32.0	13.9	8.8	34.7	21.2	12.4	34.8	34.0	33.7	32.8	31.4	33.3
Progression Factor	1.00	0.97	1.45	1.12	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.5	1.5	0.2	1.5	16.0	0.1	7.3	0.8	0.2	1.6	0.0	13.9
Delay (s)	64.5	14.9	13.0	40.3	36.8	12.5	42.2	34.8	33.9	34.5	31.4	47.2
Level of Service	E	B	B	D	D	B	D	C	C	C	C	D
Approach Delay (s)		24.2			36.1			38.5			42.9	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

8/28/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	2770	0	600	4910	0	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3011	0	652	5337	0	609
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	3011	0	652	5337	0	608
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	92.8		43.5	150.0		43.5
Effective Green, g (s)	92.8		43.5	150.0		43.5
Actuated g/C Ratio	0.62		0.29	1.00		0.29
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	3851		995	7329		467
v/s Ratio Prot	0.48		0.19	0.73		c0.38
v/s Ratio Perm						
v/c Ratio	0.78		0.66	0.73		1.30
Uniform Delay, d1	21.1		46.7	0.0		53.2
Progression Factor	0.36		0.86	1.00		0.94
Incremental Delay, d2	1.0		1.4	0.6		144.8
Delay (s)	8.6		41.4	0.6		194.9
Level of Service	A		D	A		F
Approach Delay (s)	8.6			5.0	194.9	
Approach LOS	A			A	F	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

8/28/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2360	470	4490	420	800	460	560	410	190	570	480	600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	2565	511	4880	457	870	500	609	446	207	620	522	652
RTOR Reduction (vph)	0	181	0	85	0	0	518	0	0	568	0	0
Lane Group Flow (vph)	2565	330	4880	372	870	500	91	446	207	52	522	652
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	92.8	92.8	92.8	92.8	24.5	22.5	22.5	14.5	12.5	12.5	92.8	92.8
Effective Green, g (s)	92.8	92.8	92.8	92.8	24.5	22.5	22.5	14.5	12.5	12.5	92.8	92.8
Actuated g/C Ratio	0.62	0.62	0.62	0.62	0.16	0.15	0.15	0.10	0.08	0.08	0.62	0.62
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3851	951	3851	951	560	530	230	322	155	131	2063	2063
v/s Ratio Prot	0.41		c0.78		c0.25	0.14		0.13	c0.11		0.16	0.20
v/s Ratio Perm		0.21		0.24			0.06			0.03		
v/c Ratio	0.67	0.35	1.27	0.39	1.55	0.94	0.40	1.39	1.34	0.39	0.25	0.32
Uniform Delay, d1	18.6	13.9	28.6	14.4	62.8	63.1	57.6	67.8	68.8	65.2	12.9	13.6
Progression Factor	0.08	0.00	0.84	0.68	1.00	1.00	1.00	1.13	0.86	5.22	3.01	2.54
Incremental Delay, d2	0.8	0.9	121.7	0.8	257.8	25.5	1.1	189.8	185.0	1.8	0.3	0.3
Delay (s)	2.3	0.9	145.8	10.7	320.6	88.7	58.7	266.4	243.9	341.9	39.2	34.7
Level of Service	A	A	F	B	F	F	E	F	F	F	D	C
Approach Delay (s)	2.1		134.2			181.4			299.5			
Approach LOS	A		F			F			F			

Intersection Summary			
HCM 2000 Control Delay	117.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	137.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
109: Route 360 & 360 EB LT

8/28/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	480	2830	5290	0	0	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	522	3076	5750	0	0	606
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	522	3076	5750	0	0	606
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	43.5	150.0	92.8			43.5
Effective Green, g (s)	43.5	150.0	92.8			43.5
Actuated g/C Ratio	0.29	1.00	0.62			0.29
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	967	6225	3851			785
v/s Ratio Prot	0.16	0.49	c0.92			
v/s Ratio Perm						c0.22
v/c Ratio	0.54	0.49	1.49			0.77
Uniform Delay, d1	44.8	0.0	28.6			48.7
Progression Factor	1.49	1.00	0.46			0.86
Incremental Delay, d2	0.3	0.1	222.0			2.1
Delay (s)	67.2	0.1	235.2			43.8
Level of Service	E	A	F			D
Approach Delay (s)		9.9	235.2		43.8	
Approach LOS		A	F		D	

Intersection Summary			
HCM 2000 Control Delay	142.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	108.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
111: Brad McNeer Pkwy & Route 360

8/28/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2940	230	590	5260	560	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Lane Util. Factor	0.86	1.00	0.97	0.86	0.94	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6108	1583	3433	6108	4990	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6108	1583	3433	6108	4990	1583
Peak-hour factor, PHF	0.94	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3128	250	641	5717	609	402
RTOR Reduction (vph)	0	60	0	0	0	246
Lane Group Flow (vph)	3128	190	641	5717	609	156
Heavy Vehicles (%)	7%	2%	2%	7%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	85.2	85.2	29.0	120.3	16.5	16.5
Effective Green, g (s)	85.2	85.2	29.0	120.3	16.5	16.5
Actuated g/C Ratio	0.57	0.57	0.19	0.80	0.11	0.11
Clearance Time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Vehicle Extension (s)	8.0	8.0	2.5	8.0	2.5	2.5
Lane Grp Cap (vph)	3469	899	663	4898	548	174
v/s Ratio Prot	0.51		0.19	c0.94	c0.12	
v/s Ratio Perm		0.12				0.10
v/c Ratio	0.90	0.21	0.97	1.17	1.11	0.90
Uniform Delay, d1	28.7	15.9	60.0	14.9	66.8	65.9
Progression Factor	0.14	0.05	0.66	0.92	1.00	1.00
Incremental Delay, d2	1.8	0.2	5.0	75.5	72.7	40.1
Delay (s)	5.8	1.0	44.6	89.1	139.4	106.0
Level of Service	A	A	D	F	F	F
Approach Delay (s)	5.4			84.6	126.2	
Approach LOS	A			F	F	

Intersection Summary			
HCM 2000 Control Delay	63.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
112: Craig Rath Boulevard & Route 360

8/28/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

8/28/2014

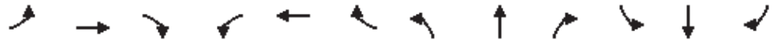
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	2820	30	320	5170	160	50	10	180	270	20	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.6		6.5	6.6	6.6	6.5	6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00	1.00	1.00	1.00	0.97	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	6102		1770	6108	1583	1770	1863	1583	3433	1621	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	6102		1770	6108	1583	1770	1863	1583	3433	1621	
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)	87	3065	33	348	5620	174	54	11	196	293	22	141
RTOR Reduction (vph)	0	1	0	0	0	42	0	0	95	0	66	0
Lane Group Flow (vph)	87	3097	0	348	5620	132	54	11	101	293	97	0
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	
Protected Phases	5	2		1	6		7	4	1	3	8	
Permitted Phases						6			4			
Actuated Green, G (s)	6.5	74.6		29.9	98.0	98.0	5.3	2.0	31.9	17.4	14.1	
Effective Green, g (s)	6.5	74.6		29.9	98.0	98.0	5.3	2.0	31.9	17.4	14.1	
Actuated g/C Ratio	0.04	0.50		0.20	0.65	0.65	0.04	0.01	0.21	0.12	0.09	
Clearance Time (s)	6.5	6.6		6.5	6.6	6.6	6.5	6.5	6.5	6.5	6.5	
Vehicle Extension (s)	2.5	8.0		2.5	8.0	8.0	3.0	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	76	3034		352	3990	1034	62	24	405	398	152	
v/s Ratio Prot	0.05	c0.51		0.20	c0.92		c0.03	0.01	0.05	c0.09	0.06	
v/s Ratio Perm						0.08			0.01			
v/c Ratio	1.14	1.02		0.99	1.41	0.13	0.87	0.46	0.25	0.74	0.64	
Uniform Delay, d1	71.8	37.7		59.9	26.0	9.8	72.0	73.5	49.1	64.1	65.5	
Progression Factor	1.13	0.58		1.07	1.18	1.35	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	127.4	18.8		11.8	184.0	0.0	70.2	9.8	0.2	6.6	7.4	
Delay (s)	208.4	40.6		76.1	214.7	13.3	142.2	83.2	49.3	70.6	72.9	
Level of Service	F	D		E	F	B	F	F	D	E	E	
Approach Delay (s)		45.1			201.1			70.0			71.5	
Approach LOS		D			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	142.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.1
Intersection Capacity Utilization	113.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
114: Deer Run Dr/Harbour View Ct & Route 360

8/28/2014



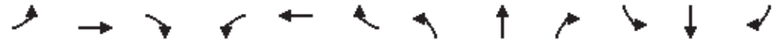
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	2430	80	530	4730	90	40	40	270	230	120	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.4	6.4	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86		0.97	0.86	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	6087		3433	6108	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	6087		3433	6108	1583	1770	1863	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	2505	87	576	5141	98	43	43	293	250	130	424
RTOR Reduction (vph)	0	3	0	0	0	37	0	0	94	0	0	98
Lane Group Flow (vph)	228	2589	0	576	5141	61	43	43	199	250	130	326
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4	1	3	8	5
Permitted Phases						6			4			8
Actuated Green, G (s)	15.5	80.4		28.1	93.1	93.1	4.0	4.0	32.1	11.5	11.5	27.0
Effective Green, g (s)	15.5	80.4		28.1	93.1	93.1	4.0	4.0	32.1	11.5	11.5	27.0
Actuated g/C Ratio	0.10	0.54		0.19	0.62	0.62	0.03	0.03	0.21	0.08	0.08	0.18
Clearance Time (s)	6.5	6.5		6.5	6.4	6.4	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0		2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	182	3262		643	3791	982	47	49	407	263	142	284
v/s Ratio Prot	c0.13	0.43		0.17	c0.84		0.02	0.02	0.09	c0.07	0.07	c0.12
v/s Ratio Perm						0.04			0.03			0.09
v/c Ratio	1.25	0.79		0.90	1.36	0.06	0.91	0.88	0.49	0.95	0.92	1.15
Uniform Delay, d1	67.2	28.1		59.5	28.5	11.2	72.8	72.8	51.8	69.0	68.8	61.5
Progression Factor	0.62	0.21		1.12	0.19	0.08	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	130.8	0.8		1.7	160.4	0.0	98.6	82.7	0.7	42.0	50.5	100.0
Delay (s)	172.3	6.8		68.2	165.8	0.9	171.4	155.5	52.4	110.9	119.3	161.5
Level of Service	F	A		E	F	A	F	F	D	F	F	F
Approach Delay (s)		20.2			153.3			77.6			138.9	
Approach LOS		C			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	111.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	113.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
115: Chital Dr & Route 360

8/28/2014



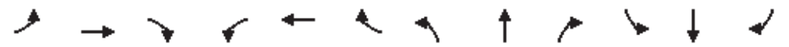
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	2650	170	350	4810	10	100	10	50	20	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3	6.3	6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.86	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (prot)	1770	4848	1583	3433	6108	1583	1770	1863	1583		1803	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (perm)	1770	4848	1583	3433	6108	1583	1770	1863	1583		1803	1583
Peak-hour factor, PHF	0.92	0.96	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2760	183	380	5228	11	109	11	54	22	11	11
RTOR Reduction (vph)	0	0	70	0	0	3	0	0	50	0	0	11
Lane Group Flow (vph)	22	2760	113	380	5228	8	109	11	4	0	33	0
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	3	4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	3.0	88.0	88.0	20.2	104.6	110.2	10.4	10.4	10.4		5.6	5.6
Effective Green, g (s)	3.0	88.0	88.0	20.2	104.6	110.2	10.4	10.4	10.4		5.6	5.6
Actuated g/C Ratio	0.02	0.59	0.59	0.13	0.70	0.73	0.07	0.07	0.07		0.04	0.04
Clearance Time (s)	6.5	6.3	6.3	6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	5.0	8.0	2.5	3.5	3.5	3.5		2.5	2.5
Lane Grp Cap (vph)	35	2844	928	462	4259	1162	122	129	109		67	59
v/s Ratio Prot	0.01	0.57		c0.11	c0.86	0.00	c0.06	0.01			c0.02	
v/s Ratio Perm			0.07			0.00			0.00			0.00
v/c Ratio	0.63	0.97	0.12	0.82	1.23	0.01	0.89	0.09	0.03		0.49	0.01
Uniform Delay, d1	72.9	29.8	13.8	63.2	22.7	5.3	69.3	65.3	65.1		70.8	69.5
Progression Factor	0.91	0.21	0.06	0.65	0.53	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	12.5	6.1	0.1	1.3	102.6	0.0	50.7	0.3	0.2		4.1	0.0
Delay (s)	78.8	12.3	0.9	42.5	114.6	5.3	120.0	65.7	65.3		74.9	69.6
Level of Service	E	B	A	D	F	A	F	E	E		E	E
Approach Delay (s)		12.1			109.5			99.6			73.6	
Approach LOS		B			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	76.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

8/28/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	2330	100	400	4100	420	110	40	220	290	100	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	6.5	6.9	6.9	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.86	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4848	1583	3433	6108	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4848	1583	3433	6108	1583	1770	1863	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	2479	109	435	4457	447	120	43	239	315	109	196
RTOR Reduction (vph)	0	0	49	0	0	144	0	0	95	0	0	101
Lane Group Flow (vph)	185	2479	60	435	4457	303	120	43	144	315	109	95
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2		1	6		7	4	1	3	8	5
Permitted Phases			2			6			4			8
Actuated Green, G (s)	13.5	82.2	82.2	22.5	90.3	90.3	10.8	4.8	27.3	15.0	9.0	22.5
Effective Green, g (s)	13.5	82.2	82.2	22.5	90.3	90.3	10.8	4.8	27.3	15.0	9.0	22.5
Actuated g/C Ratio	0.09	0.55	0.55	0.15	0.60	0.60	0.07	0.03	0.18	0.10	0.06	0.15
Clearance Time (s)	6.5	6.0	6.0	6.5	6.9	6.9	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	4.0	8.0	8.0	3.5	3.5	4.0	2.5	2.5	2.5
Lane Grp Cap (vph)	159	2656	867	514	3677	952	127	59	356	343	111	237
v/s Ratio Prot	0.10	c0.51		0.13	c0.73		0.07	0.02	0.06	c0.09	c0.06	0.04
v/s Ratio Perm			0.04			0.19			0.03			0.02
v/c Ratio	1.16	0.93	0.07	0.85	1.21	0.32	0.94	0.73	0.40	0.92	0.98	0.40
Uniform Delay, d1	68.2	31.4	15.9	62.1	29.9	14.7	69.3	72.0	54.2	66.9	70.4	57.6
Progression Factor	0.75	1.22	2.64	0.74	0.48	0.14	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	80.2	0.8	0.0	1.3	95.7	0.1	62.9	37.0	1.0	28.5	79.3	0.8
Delay (s)	131.5	39.0	42.0	47.3	109.9	2.1	132.2	109.0	55.2	95.4	149.7	58.5
Level of Service	F	D	D	D	F	A	F	F	E	F	F	E
Approach Delay (s)		45.3			95.8			83.9			93.3	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	79.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
117: Winterpock Rd/Lake Harbour Dr & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	2150	110	940	3320	140	170	0	330	120	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00		1.00	0.88	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4848	1583	3433	4848	1583		1770	2787	1770	1789	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4848	1583	3433	4848	1583		1770	2787	1770	1789	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	22	2337	120	1022	3609	152	185	0	351	130	120	43
RTOR Reduction (vph)	0	0	69	0	0	44	0	0	85	0	8	0
Lane Group Flow (vph)	22	2337	51	1022	3609	108	0	185	266	130	155	0
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	3.0	63.2	63.2	36.5	96.3	96.3		13.5	50.0	10.5	10.5	
Effective Green, g (s)	3.0	63.2	63.2	36.5	96.3	96.3		13.5	50.0	10.5	10.5	
Actuated g/C Ratio	0.02	0.42	0.42	0.24	0.64	0.64		0.09	0.33	0.07	0.07	
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0		3.0	4.0	3.0	3.0	
Lane Grp Cap (vph)	35	2042	666	835	3112	1016		159	929	123	125	
v/s Ratio Prot	0.01	c0.48		0.30	c0.74			c0.10	0.07	0.07	c0.09	
v/s Ratio Perm			0.03			0.07			0.03			
v/c Ratio	0.63	1.14	0.08	1.22	1.16	0.11		1.16	0.29	1.06	1.24	
Uniform Delay, d1	72.9	43.4	25.9	56.8	26.9	10.3		68.2	36.9	69.8	69.8	
Progression Factor	0.66	0.42	0.19	1.12	0.17	0.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	20.8	69.3	0.1	101.8	72.2	0.0		122.1	0.2	97.2	157.5	
Delay (s)	68.6	87.5	5.0	165.4	76.8	0.0		190.4	37.1	167.0	227.3	
Level of Service	E	F	A	F	E	A		F	D	F	F	
Approach Delay (s)		83.3			93.3			90.0			200.5	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	93.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
118: Hancock Village/Duckridge Blvd & Route 360

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	2110	140	270	3220	30	280	20	150	20	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1617		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1617		1770	1863	1583
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)	43	2293	152	293	3500	33	304	22	163	22	11	54
RTOR Reduction (vph)	0	0	65	0	0	11	0	140	0	0	0	51
Lane Group Flow (vph)	43	2293	87	293	3500	22	304	45	0	22	11	3
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	5.0	85.4	85.4	19.7	99.4	99.4	16.6	15.6		3.0	2.0	7.0
Effective Green, g (s)	5.0	85.4	85.4	19.7	99.4	99.4	16.6	15.6		3.0	2.0	7.0
Actuated g/C Ratio	0.03	0.57	0.57	0.13	0.66	0.66	0.11	0.10		0.02	0.01	0.05
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5		6.5	6.5	6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	59	2895	901	450	3369	1049	379	168		35	24	142
v/s Ratio Prot	0.02	0.45		c0.09	c0.69		c0.09	0.03		c0.01	0.01	0.00
v/s Ratio Perm			0.05			0.01						0.00
v/c Ratio	0.73	0.79	0.10	0.65	1.04	0.02	0.80	0.27		0.63	0.46	0.02
Uniform Delay, d1	71.8	25.3	14.7	61.9	25.3	8.7	65.1	61.9		72.9	73.5	68.2
Progression Factor	0.93	0.21	0.00	0.79	0.18	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	22.8	1.4	0.1	0.3	18.7	0.0	11.3	0.6		26.7	9.8	0.0
Delay (s)	89.5	6.7	0.1	49.3	23.4	8.7	76.4	62.6		99.7	83.2	68.3
Level of Service	F	A	A	D	C	A	E	E		F	F	E
Approach Delay (s)		7.7			25.2			71.2			78.1	
Approach LOS		A			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
119: Ashlake Pkwy & Route 360

8/28/2014

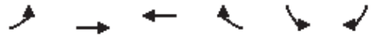
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2150	120	260	3290	160	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	6.5	6.8	6.5	6.5
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4577	1425	3090	4577	3090	1425
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4577	1425	3090	4577	3090	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2337	130	283	3576	174	141
RTOR Reduction (vph)	0	45	0	0	0	131
Lane Group Flow (vph)	2337	85	283	3576	174	10
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	98.3	98.3	21.2	125.6	11.1	11.1
Effective Green, g (s)	98.3	98.3	21.2	125.6	11.1	11.1
Actuated g/C Ratio	0.66	0.66	0.14	0.84	0.07	0.07
Clearance Time (s)	6.4	6.4	6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0	6.0	2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	2999	933	436	3832	228	105
v/s Ratio Prot	0.51		0.09	c0.78	c0.06	
v/s Ratio Perm		0.06				0.01
v/c Ratio	0.78	0.09	0.65	0.93	0.76	0.10
Uniform Delay, d1	18.2	9.5	60.9	9.1	68.2	64.8
Progression Factor	0.58	0.08	0.77	0.78	1.00	1.00
Incremental Delay, d2	1.6	0.1	0.8	1.7	13.5	0.3
Delay (s)	12.1	0.9	47.7	8.8	81.6	65.1
Level of Service	B	A	D	A	F	E
Approach Delay (s)	11.5			11.6	74.2	
Approach LOS	B			B	E	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
120: Route 360 & Woodlake Village Pkwy

8/28/2014



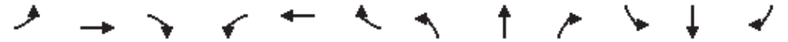
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	80	1550	2490	950	720	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	4848	4848	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	4848	4848	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	1685	2707	1033	783	54
RTOR Reduction (vph)	0	0	0	383	0	22
Lane Group Flow (vph)	87	1685	2707	650	783	32
Heavy Vehicles (%)	2%	7%	7%	2%	2%	2%
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	8.5	101.3	86.7	86.7	35.5	35.5
Effective Green, g (s)	8.5	101.3	86.7	86.7	35.5	35.5
Actuated g/C Ratio	0.06	0.68	0.58	0.58	0.24	0.24
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	100	3274	2802	914	812	374
v/s Ratio Prot	c0.05	0.35	c0.56		c0.23	
v/s Ratio Perm				0.41		0.02
v/c Ratio	0.87	0.51	0.97	0.71	0.96	0.09
Uniform Delay, d1	70.2	12.1	30.2	22.7	56.6	44.6
Progression Factor	1.00	1.00	0.70	0.75	1.00	1.00
Incremental Delay, d2	49.9	0.6	5.1	1.8	23.2	0.1
Delay (s)	120.1	12.7	26.3	18.7	79.8	44.7
Level of Service	F	B	C	B	E	D
Approach Delay (s)		18.0	24.2		77.5	
Approach LOS		B	C		E	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
121: Hampton Park Dr/Fox Club Pkwy & Route 360

8/28/2014



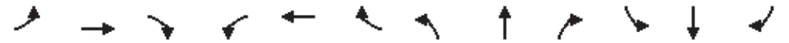
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1050	10	270	2010	260	10	40	230	350	70	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00		1.00	1.00	0.97	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4847	1583	1770	4848	1583		1844	1583	3433	1863	1583
Flt Permitted		0.72	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3514	1583	1770	4848	1583		1844	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.96	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1094	11	293	2094	283	11	43	250	380	76	65
RTOR Reduction (vph)	0	0	5	0	0	72	0	0	238	0	0	59
Lane Group Flow (vph)	0	1137	6	293	2094	211	0	54	12	380	76	6
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)		66.6	66.6	18.5	91.7	91.7		6.0	6.0	12.5	12.5	12.5
Effective Green, g (s)		66.6	66.6	18.5	91.7	91.7		6.0	6.0	12.5	12.5	12.5
Actuated g/C Ratio		0.51	0.51	0.14	0.71	0.71		0.05	0.05	0.10	0.10	0.10
Clearance Time (s)		6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)		7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1800	810	251	3419	1116		85	73	330	179	152	
v/s Ratio Prot			c0.17	c0.43			c0.03		c0.11	0.04		
v/s Ratio Perm	0.32	0.00			0.13			0.01				0.00
v/c Ratio	0.63	0.01	1.17	0.61	0.19		0.64	0.16	1.15	0.42	0.04	
Uniform Delay, d1	22.9	15.5	55.8	9.9	6.5		60.9	59.6	58.8	55.4	53.3	
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	1.4	0.0	109.7	0.7	0.3		14.5	1.0	97.2	1.6	0.1	
Delay (s)	24.3	15.5	165.4	10.6	6.8		75.4	60.6	156.0	57.0	53.4	
Level of Service	C	B	F	B	A		E	E	F	E	D	
Approach Delay (s)	24.2			27.2			63.2			128.8		
Approach LOS	C			C			E			F		

Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
122: Otterdale Rd & Route 360

8/28/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	870	20	270	1660	150	20	10	160	80	30	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3	7.3	6.5	7.4	7.4	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	4848	1583	1593	4848	1538	1770	3539	1583	1719	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	4848	1583	1593	4848	1538	1770	3539	1583	1719	3438	1538
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	897	22	293	1804	156	22	11	174	87	33	87
RTOR Reduction (vph)	0	0	17	0	0	81	0	0	123	0	0	82
Lane Group Flow (vph)	43	897	5	293	1804	75	22	11	51	87	33	5
Heavy Vehicles (%)	5%	7%	2%	2%	7%	5%	2%	2%	2%	5%	5%	5%
Parking (#/hr)				0								
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	1.7	15.7	15.7	17.4	31.3	31.3	1.7	1.7	19.1	3.8	3.8	3.8
Effective Green, g (s)	1.7	15.7	15.7	17.4	31.3	31.3	1.7	1.7	19.1	3.8	3.8	3.8
Actuated g/C Ratio	0.03	0.24	0.24	0.27	0.48	0.48	0.03	0.03	0.29	0.06	0.06	0.06
Clearance Time (s)	6.5	7.3	7.3	6.5	7.4	7.4	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	44	1163	380	423	2320	736	46	91	462	99	199	89
v/s Ratio Prot	0.03	c0.19		0.18	c0.37		c0.01	0.00	0.03	c0.05	0.01	
v/s Ratio Perm			0.00			0.05			0.00			0.00
v/c Ratio	0.98	0.77	0.01	0.69	0.78	0.10	0.48	0.12	0.11	0.88	0.17	0.06
Uniform Delay, d1	31.8	23.2	18.9	21.6	14.2	9.3	31.4	31.1	16.9	30.6	29.3	29.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	125.9	4.7	0.1	4.5	2.5	0.3	5.6	0.4	0.1	52.7	0.3	0.2
Delay (s)	157.7	27.9	19.0	26.1	16.7	9.6	37.0	31.6	17.0	83.3	29.6	29.3
Level of Service	F	C	B	C	B	A	D	C	B	F	C	C
Approach Delay (s)		33.5			17.4			19.9			52.0	
Approach LOS		C			B			B			D	

Intersection Summary				
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	65.4	Sum of lost time (s)	26.9	
Intersection Capacity Utilization	64.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
123: Bailey Bridge Road & Bailey Bridge Connector

8/28/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	270	200	290	290	390	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.56	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1047	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	293	217	315	315	424	554
RTOR Reduction (vph)	0	159	0	138	0	0
Lane Group Flow (vph)	293	58	315	177	424	554
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	12.4	12.4	26.0	26.0	26.0	26.0
Effective Green, g (s)	12.4	12.4	26.0	26.0	26.0	26.0
Actuated g/C Ratio	0.27	0.27	0.56	0.56	0.56	0.56
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	473	423	1043	887	586	1043
v/s Ratio Prot	c0.17		0.17			0.30
v/s Ratio Perm		0.04		0.11	c0.41	
v/c Ratio	0.62	0.14	0.30	0.20	0.72	0.53
Uniform Delay, d1	14.9	12.9	5.4	5.0	7.5	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.1	0.2	0.1	4.4	0.5
Delay (s)	17.3	13.1	5.6	5.2	12.0	6.9
Level of Service	B	B	A	A	B	A
Approach Delay (s)	15.5		5.4		9.1	
Approach LOS	B		A		A	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	46.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
124: Bailey Bridge Road & Deer Run Drive

8/28/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	80	400	570	220	180	140
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	435	620	239	196	152
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	859				1228	620
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	859				1228	620
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				0	69
cM capacity (veh/h)	782				175	488

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	87	435	620	239	196	152
Volume Left	87	0	0	0	196	0
Volume Right	0	0	0	239	0	152
cSH	782	1700	1700	1700	175	488
Volume to Capacity	0.11	0.26	0.36	0.14	1.12	0.31
Queue Length 95th (ft)	9	0	0	0	249	33
Control Delay (s)	10.2	0.0	0.0	0.0	157.9	15.7
Lane LOS	B				F	C
Approach Delay (s)	1.7		0.0		95.7	
Approach LOS					F	

Intersection Summary				
Average Delay	19.8			
Intersection Capacity Utilization	54.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Signalized Intersection Capacity Analysis
125: Springford Parkway/Bailey Bridge Road & Spring Run Road

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	160	220	60	150	90	130	350	30	70	580	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1840		1770	1833	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.22	1.00		0.45	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	408	1840		847	1833	
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)	54	174	239	65	163	98	141	380	33	76	630	76
RTOR Reduction (vph)	0	0	175	0	0	77	0	5	0	0	7	0
Lane Group Flow (vph)	54	174	64	65	163	21	141	408	0	76	699	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	2.0	10.8	10.8	2.0	10.8	10.8	26.8	26.8		26.8	26.8	
Effective Green, g (s)	2.0	10.8	10.8	2.0	10.8	10.8	26.8	26.8		26.8	26.8	
Actuated g/C Ratio	0.04	0.21	0.21	0.04	0.21	0.21	0.52	0.52		0.52	0.52	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	68	389	331	68	389	331	211	955		439	952	
v/s Ratio Prot	0.03	c0.09		c0.04	0.09			0.22			c0.38	
v/s Ratio Perm			0.04			0.01	0.35			0.09		
v/c Ratio	0.79	0.45	0.19	0.96	0.42	0.06	0.67	0.43		0.17	0.73	
Uniform Delay, d1	24.6	17.8	16.8	24.8	17.7	16.3	9.1	7.7		6.5	9.6	
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	45.6	0.8	0.3	92.9	0.7	0.1	7.8	0.3		0.2	3.0	
Delay (s)	70.2	18.6	17.1	117.7	18.4	16.4	16.9	8.0		6.7	12.6	
Level of Service	E	B	B	F	B	B	B	A		A	B	
Approach Delay (s)		23.8			37.6			10.2			12.0	
Approach LOS		C			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	51.6	Sum of lost time (s)		12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service		C
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
126: Old Hundred Road/Old Hundred Rd & Millridge Pkwy/Market Square Ent

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	20	270	140	40	20	390	870	110	20	760	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.95	
Frt		1.00	0.85	1.00	0.95		1.00	1.00	0.85	1.00	0.99	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1765	1538	3335	1718		3335	3438	1538	1719	3418	
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1765	1538	3335	1718		3335	3438	1538	1719	3418	
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)	22	22	293	152	43	22	424	946	120	22	826	33
RTOR Reduction (vph)	0	0	273	0	13	0	0	0	34	0	1	0
Lane Group Flow (vph)	0	44	20	152	52	0	424	946	86	22	858	0
Turn Type	Split	NA	Perm	Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)		10.3	10.3	12.2	12.2		28.8	107.9	107.9	3.6	82.7	
Effective Green, g (s)		10.3	10.3	12.2	12.2		28.8	107.9	107.9	3.6	82.7	
Actuated g/C Ratio		0.07	0.07	0.08	0.08		0.19	0.72	0.72	0.02	0.55	
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		121	105	271	139		640	2473	1106	41	1884	
v/s Ratio Prot		c0.02		c0.05	0.03		c0.13	0.28		0.01	c0.25	
v/s Ratio Perm			0.01						0.06			
v/c Ratio	0.36	0.19	0.56	0.38		0.66	0.38	0.08	0.54	0.46		
Uniform Delay, d1	66.7	65.9	66.3	65.3		56.1	8.2	6.3	72.4	20.2		
Progression Factor	1.00	1.00	1.00	1.00		0.97	0.88	1.84	1.00	1.00		
Incremental Delay, d2	1.9	0.9	2.6	1.7		2.2	0.4	0.1	12.8	0.8		
Delay (s)	68.6	66.8	69.0	67.0		56.4	7.6	11.7	85.2	21.0		
Level of Service	E	E	E	E		E	A	B	F	C		
Approach Delay (s)	67.0			68.4			21.8			22.6		
Approach LOS	E			E			C			C		

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
127: Old Hundred Rd & Market Square

8/28/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	60	30	890	10	20	750
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)	65	33	967	11	22	815
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			916			
pX, platoon unblocked	0.80	0.80			0.80	
vC, conflicting volume	1826	967			978	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1907	836			850	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	89			97	
cM capacity (veh/h)	57	291			622	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	98	967	11	22	815
Volume Left	65	0	0	22	0
Volume Right	33	0	11	0	0
cSH	78	1700	1700	622	1700
Volume to Capacity	1.25	0.57	0.01	0.03	0.48
Queue Length 95th (ft)	185	0	0	3	0
Control Delay (s)	278.3	0.0	0.0	11.0	0.0
Lane LOS	F			B	
Approach Delay (s)	278.3	0.0		0.3	
Approach LOS	F				

Intersection Summary			
Average Delay	14.4		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	250	240	770	600	470	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1719	1810	1810	1538	1719	1538
Flt Permitted	0.07	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	132	1810	1810	1538	1719	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	261	837	652	511	152
RTOR Reduction (vph)	0	0	0	281	0	107
Lane Group Flow (vph)	272	261	837	371	511	45
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	67.0	67.0	49.0	49.0	31.0	31.0
Effective Green, g (s)	67.0	67.0	49.0	49.0	31.0	31.0
Actuated g/C Ratio	0.61	0.61	0.45	0.45	0.28	0.28
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	253	1102	806	685	484	433
v/s Ratio Prot	c0.12	0.14	0.46		c0.30	
v/s Ratio Perm	c0.54			0.24		0.03
v/c Ratio	1.08	0.24	1.04	0.54	1.06	0.10
Uniform Delay, d1	35.7	9.8	30.5	22.3	39.5	29.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	78.0	0.1	42.1	0.9	56.4	0.1
Delay (s)	113.7	9.9	72.6	23.2	95.9	29.3
Level of Service	F	A	E	C	F	C
Approach Delay (s)		62.9	51.0		80.7	
Approach LOS		E	D		F	

Intersection Summary			
HCM 2000 Control Delay	60.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	LTR
Maximum Queue (ft)	168	175	239	267	285	179	209	597	618	680	422	296
Average Queue (ft)	105	119	148	168	182	68	62	466	491	518	295	227
95th Queue (ft)	172	186	257	277	306	196	231	669	695	755	609	391
Link Distance (ft)			1521	1521	1521			5220	5220	5220		1540
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	205	205				90	190				200	
Storage Blk Time (%)	0	0	2		22		0	34		40	0	
Queuing Penalty (veh)	1	2	5		30		0	14		111	0	

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	320	391	403	269
Average Queue (ft)	230	272	139	164
95th Queue (ft)	353	416	385	280
Link Distance (ft)			1263	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		250
Storage Blk Time (%)	9	24	0	3
Queuing Penalty (veh)	33	88	2	11

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	L	L	T	T	T	T	R
Maximum Queue (ft)	231	236	208	204	238	45	222	445	471	474	376	52
Average Queue (ft)	164	174	119	133	161	16	82	354	370	376	303	24
95th Queue (ft)	273	283	207	205	236	46	253	494	516	502	467	54
Link Distance (ft)			635	635	635			1521	1521	1521		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	420	420				200	200				200	200
Storage Blk Time (%)		0						21		25	2	
Queuing Penalty (veh)		1						21		189	11	

Intersection: 102: Lonas Pkwy & Route 360

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	L	L	T	R
Maximum Queue (ft)	72	104	44	68	116	85	26	50
Average Queue (ft)	27	61	17	38	67	30	9	7
95th Queue (ft)	73	109	50	73	118	83	30	63
Link Distance (ft)			402	402	257	257	257	257
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	240	240						
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

Movement	WB	WB	WB	WB	B53	B53	B53
Directions Served	T	T	T	R	T	T	T
Maximum Queue (ft)	393	471	481	132	53	55	59
Average Queue (ft)	75	89	100	9	0	0	8
95th Queue (ft)	370	403	426	135	0	0	116
Link Distance (ft)	1000	1000	1000	1000	635	635	635
Upstream Blk Time (%)			0				
Queuing Penalty (veh)			1				
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	WB	WB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	290	307	303	492
Average Queue (ft)	119	134	143	148
95th Queue (ft)	356	382	379	535
Link Distance (ft)	290	290	290	1044
Upstream Blk Time (%)	8	14	24	1
Queuing Penalty (veh)	77	125	222	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	EB	WB	WB	WB	WB
Directions Served	T	T	T	T	R
Maximum Queue (ft)	6	664	677	691	703
Average Queue (ft)	1	435	486	513	410
95th Queue (ft)	8	844	895	919	954
Link Distance (ft)	326	632	632	632	632
Upstream Blk Time (%)		5	11	30	19
Queuing Penalty (veh)		48	103	267	171
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB	WB	WB	SB	SB	B55	B55
Directions Served	T	T	T	R	R	T	T
Maximum Queue (ft)	351	359	343	1240	1239	1883	1857
Average Queue (ft)	310	320	318	1159	1137	754	718
95th Queue (ft)	428	428	399	1410	1420	1810	1783
Link Distance (ft)	326	326	326	1135	1135	3562	3562
Upstream Blk Time (%)	8	10	13	76	46		
Queuing Penalty (veh)	93	111	154	0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB	NW
Directions Served	T	T	T	T	L	L	T	T	T	T	T	R
Maximum Queue (ft)	119	158	190	151	264	659	726	728	742	837	780	134
Average Queue (ft)	71	98	129	79	142	598	703	712	728	817	665	113
95th Queue (ft)	139	169	191	160	281	841	744	732	743	841	834	148
Link Distance (ft)	692	692	692	692			660	660	660	660	660	22
Upstream Blk Time (%)						1	28	42	68	75	11	59
Queuing Penalty (veh)						0	302	459	749	820	117	333
Storage Bay Dist (ft)					500	500						
Storage Blk Time (%)						0	46					
Queuing Penalty (veh)						1	273					

Intersection: 107: 360 WB LT & Route 360

Movement	B9
Directions Served	T
Maximum Queue (ft)	427
Average Queue (ft)	238
95th Queue (ft)	571
Link Distance (ft)	659
Upstream Blk Time (%)	2
Queuing Penalty (veh)	10
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	>	<	<
Maximum Queue (ft)	83	111	132	100	16	710	720	733	729	726	515	640
Average Queue (ft)	22	55	83	56	2	698	703	708	706	491	513	639
95th Queue (ft)	70	114	142	109	34	711	719	733	729	1006	520	642
Link Distance (ft)	412	412	412	412		692	692	692	692	692		
Upstream Blk Time (%)						25	26	28	33	8		
Queuing Penalty (veh)						247	257	271	322	81		
Storage Bay Dist (ft)					250						390	390
Storage Blk Time (%)											85	90
Queuing Penalty (veh)											195	207

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	NB	SB	SB	SB	SE	SE	B10	NW	NW
Directions Served	T	T	>	<	<	T	<	<	T	<	<
Maximum Queue (ft)	1219	1208	382	547	627	472	144	427	26	253	260
Average Queue (ft)	1203	1143	215	432	496	353	82	299	5	151	173
95th Queue (ft)	1263	1441	562	594	674	656	161	460	32	265	276
Link Distance (ft)	1190	1190			652	652	397	397	11	659	659
Upstream Blk Time (%)	64	18			4	3		3	0		
Queuing Penalty (veh)	0	0			17	12		6	1		
Storage Bay Dist (ft)			250	430							
Storage Blk Time (%)	0	47		21	45						
Queuing Penalty (veh)	0	263		43	93						

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	B10	B10
Directions Served	L	L	T	T	T	T	T	R	R	T	T
Maximum Queue (ft)	286	434	5	390	375	356	344	98	122	178	140
Average Queue (ft)	121	316	1	322	297	277	265	91	104	111	76
95th Queue (ft)	289	464	10	411	388	383	358	104	127	186	149
Link Distance (ft)			761	412	412	412	412	11	11	397	397
Upstream Blk Time (%)				0	0	0	0	57	57		
Queuing Penalty (veh)				3	1	1	1	162	163		
Storage Bay Dist (ft)	500	500									
Storage Blk Time (%)	0	1									
Queuing Penalty (veh)	3	7									

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R	L	L	T	T	T	T	L
Maximum Queue (ft)	198	246	300	321	190	243	240	257	261	235	230	402
Average Queue (ft)	115	164	208	227	97	177	187	137	151	176	172	340
95th Queue (ft)	206	256	312	344	218	263	263	290	294	238	238	482
Link Distance (ft)	880	880	880	880				761	761	761	761	391
Upstream Blk Time (%)								0	0			12
Queuing Penalty (veh)								0	0			0
Storage Bay Dist (ft)					200	500	500					
Storage Blk Time (%)				14								
Queuing Penalty (veh)				32								

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	NB	NB	NB	B61	B61	B61
Directions Served	L	L	R	T	T	T
Maximum Queue (ft)	366	305	375	46	14	56
Average Queue (ft)	307	251	295	11	2	16
95th Queue (ft)	424	374	477	68	29	91
Link Distance (ft)	391	391	391	809	809	809
Upstream Blk Time (%)	2	0	15			
Queuing Penalty (veh)	0	0	0			
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	EB	EB	EB	WB
Directions Served	T	T	T	L
Maximum Queue (ft)	420	418	2	234
Average Queue (ft)	60	60	0	147
95th Queue (ft)	638	634	4	256
Link Distance (ft)	2132	2132	2132	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				600
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	R	L
Maximum Queue (ft)	121	202	251	306	335	364	483	474	502	491	215	116
Average Queue (ft)	73	127	163	209	237	232	365	371	369	381	72	69
95th Queue (ft)	133	229	278	328	353	397	523	520	537	526	272	132
Link Distance (ft)		2506	2506	2506	2506		2132	2132	2132	2132		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140					150					160	200
Storage Blk Time (%)	3	3				23	21			22		
Queuing Penalty (veh)	20	3				292	67			35		

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	L	TR
Maximum Queue (ft)	56	166	172	223	292
Average Queue (ft)	19	104	127	164	160
95th Queue (ft)	61	174	196	242	334
Link Distance (ft)	877				584
Upstream Blk Time (%)					0
Queuing Penalty (veh)					0
Storage Bay Dist (ft)		200	120	120	
Storage Blk Time (%)		0	14	30	12
Queuing Penalty (veh)		0	21	45	32

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	320	460	393	230	175	228	261	856	1306	880	641	41
Average Queue (ft)	267	288	211	127	129	162	180	394	431	378	344	13
95th Queue (ft)	435	691	583	251	188	233	249	1003	1289	993	773	40
Link Distance (ft)		1708	1708	1708	1708			2506	2506	2506	2506	
Upstream Blk Time (%)									0	0		
Queuing Penalty (veh)									2	0		
Storage Bay Dist (ft)	200					280	280					400
Storage Blk Time (%)	48	0				0	0	17			4	
Queuing Penalty (veh)	294	0				1	0	88			4	

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	L	T	R
Maximum Queue (ft)	89	95	209	168	298	675	325
Average Queue (ft)	43	48	129	103	165	565	304
95th Queue (ft)	105	103	231	215	317	1005	367
Link Distance (ft)		1300	1300			819	
Upstream Blk Time (%)						25	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)	190			200	200		250
Storage Blk Time (%)	0			2	6	3	52
Queuing Penalty (veh)	0			10	31	19	183

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	R	L	L	T	T	T	T	R	L
Maximum Queue (ft)	138	158	175	35	180	188	717	684	815	402	5	138
Average Queue (ft)	59	88	109	12	118	133	324	283	310	197	1	84
95th Queue (ft)	149	169	185	36	185	194	874	866	939	632	7	154
Link Distance (ft)	843	843	843	843			1708	1708	1708	1708		
Upstream Blk Time (%)								0	0	0		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (ft)					170	170					190	110
Storage Blk Time (%)					1	2	14			3		12
Queuing Penalty (veh)					17	27	49			0		1

Intersection: 115: Chital Dr & Route 360

Movement	NB	NB	SB	SB
Directions Served	T	R	LT	R
Maximum Queue (ft)	27	66	66	25
Average Queue (ft)	9	30	25	8
95th Queue (ft)	30	69	69	31
Link Distance (ft)	1010	1010	610	610
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	B4	B4	B4	WB	WB	WB	WB
Directions Served	L	T	T	T	R	T	T	T	L	L	T	T
Maximum Queue (ft)	317	321	341	331	18	147	70	4	159	304	565	539
Average Queue (ft)	235	245	257	269	5	21	10	1	99	171	343	337
95th Queue (ft)	374	341	338	337	19	224	146	8	169	317	570	546
Link Distance (ft)		864	864	864		736	736	736			843	843
Upstream Blk Time (%)						0						0
Queuing Penalty (veh)						0						0
Storage Bay Dist (ft)	220				230				115	115		
Storage Blk Time (%)	38	3		8					6	15	33	
Queuing Penalty (veh)	293	5		8					57	151	133	

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	WB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	T	R	L	L	T	R
Maximum Queue (ft)	581	451	105	186	172	212	164	227	495	232
Average Queue (ft)	367	258	52	135	83	127	139	197	337	123
95th Queue (ft)	599	457	106	233	262	233	208	273	788	267
Link Distance (ft)	843	843			2190				985	
Upstream Blk Time (%)	0								1	
Queuing Penalty (veh)	0								0	
Storage Bay Dist (ft)			400	130		400	90	90		170
Storage Blk Time (%)		1		36	0		41	71	50	3
Queuing Penalty (veh)		2		94	0		115	199	235	13

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	B4
Directions Served	L	T	T	T	R	L	L	T	T	T	R	T
Maximum Queue (ft)	156	753	775	791	338	338	354	293	304	312	32	273
Average Queue (ft)	31	575	586	604	189	288	303	169	185	199	6	39
95th Queue (ft)	169	925	961	970	471	372	379	295	305	326	26	308
Link Distance (ft)		1118	1118	1118				736	736	736	736	864
Upstream Blk Time (%)												0
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	180				170	280	280					
Storage Blk Time (%)		50		54		16	23	0				
Queuing Penalty (veh)		10		60		174	253	3				

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	B4	B4	NB	NB	NB	SB	SB
Directions Served	T	T	LT	R	R	L	TR
Maximum Queue (ft)	349	216	313	139	100	211	279
Average Queue (ft)	50	31	244	77	53	138	214
95th Queue (ft)	355	272	381	156	107	261	421
Link Distance (ft)	864	864		1868		470	470
Upstream Blk Time (%)	0						
Queuing Penalty (veh)	0						
Storage Bay Dist (ft)			430		1000		
Storage Blk Time (%)			1				
Queuing Penalty (veh)			2				

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	L	T	T	T	R	L
Maximum Queue (ft)	81	160	173	192	58	122	142	190	229	243	20	198
Average Queue (ft)	43	102	125	135	23	68	90	108	143	174	4	133
95th Queue (ft)	95	174	186	204	60	125	147	200	238	267	21	204
Link Distance (ft)		1184	1184	1184				1118	1118	1118		1063
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				200	300	300				400	
Storage Blk Time (%)		0		1								
Queuing Penalty (veh)		0		2								

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (ft)	179	179	52	24	69
Average Queue (ft)	119	107	21	7	28
95th Queue (ft)	197	186	52	28	71
Link Distance (ft)	1063	1063	959	959	959
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 119: Ashlake Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	R	L	L	T	T	T	L	L	R
Maximum Queue (ft)	219	250	275	51	135	136	131	154	243	116	151	122
Average Queue (ft)	126	152	179	25	82	99	81	110	173	60	94	71
95th Queue (ft)	226	265	297	60	140	145	147	172	255	116	158	135
Link Distance (ft)	942	942	942				1184	1184	1184		2574	2574
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				400	400	400				200		
Storage Blk Time (%)											0	
Queuing Penalty (veh)											0	

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	L	L	R
Maximum Queue (ft)	109	245	300	288	327	335	305	387	377	174
Average Queue (ft)	75	127	164	169	230	228	221	298	287	56
95th Queue (ft)	126	258	307	307	353	348	323	414	414	195
Link Distance (ft)		4668	4668	4668	942	942	942	1148	1148	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200									150
Storage Blk Time (%)		2							44	
Queuing Penalty (veh)		1							22	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	SB
Directions Served	LT	T	T	R	L	T	T	T	R	LT	R	L
Maximum Queue (ft)	492	467	303	19	276	379	394	387	140	80	166	263
Average Queue (ft)	397	326	222	4	203	174	175	170	26	41	103	209
95th Queue (ft)	523	498	329	19	319	440	453	425	199	84	191	344
Link Distance (ft)	2656	2656	2656			4668	4668	4668		747	747	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				200	230				210			240
Storage Blk Time (%)			10		12	3		6				13
Queuing Penalty (veh)			1		82	8		16				17

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	311	202	68
Average Queue (ft)	243	85	36
95th Queue (ft)	395	235	71
Link Distance (ft)		1429	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	240		130
Storage Blk Time (%)	22	1	
Queuing Penalty (veh)	28	4	

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	L	T	T	T	R	L	T	T
Maximum Queue (ft)	37	107	104	71	176	226	481	507	15	39	24	2
Average Queue (ft)	8	55	59	24	88	87	137	153	3	15	9	0
95th Queue (ft)	35	112	108	75	186	241	662	674	17	42	29	5
Link Distance (ft)		3646	3646	3646		2656	2656	2656			1012	1012
Upstream Blk Time (%)							0	0				
Queuing Penalty (veh)							0	0				
Storage Bay Dist (ft)	200				375				400	200		
Storage Blk Time (%)						0		0				
Queuing Penalty (veh)						0		0				

Intersection: 122: Otterdale Rd & Route 360

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	T	T	R
Maximum Queue (ft)	58	74	40	27	67
Average Queue (ft)	31	40	14	6	33
95th Queue (ft)	56	82	41	27	66
Link Distance (ft)			1585	1585	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	200			200
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 123: Bailey Bridge Road & Bailey Bridge Connector

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	172	71	94	62	274	419
Average Queue (ft)	114	43	52	42	207	229
95th Queue (ft)	185	74	96	70	324	665
Link Distance (ft)	1170		1128			930
Upstream Blk Time (%)						4
Queuing Penalty (veh)						0
Storage Bay Dist (ft)		200		200	200	
Storage Blk Time (%)	1				28	0
Queuing Penalty (veh)	1				145	2

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	59	17	306	372
Average Queue (ft)	31	3	242	197
95th Queue (ft)	65	16	441	551
Link Distance (ft)				826
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	225	275	
Storage Blk Time (%)			40	1
Queuing Penalty (veh)			56	2

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LTR	LTR
Maximum Queue (ft)	413	6	887	500	213	341
Average Queue (ft)	281	1	857	443	124	191
95th Queue (ft)	516	11	927	705	232	388
Link Distance (ft)	778	778	840		663	544
Upstream Blk Time (%)			96			2
Queuing Penalty (veh)			0			0
Storage Bay Dist (ft)				400		
Storage Blk Time (%)			100			
Queuing Penalty (veh)			70			

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (ft)	67	111	100	71	96	10	133	143	74	270
Average Queue (ft)	34	71	44	42	58	2	78	81	31	153
95th Queue (ft)	75	116	110	75	102	16	146	144	92	311
Link Distance (ft)		778	778		840			663		545
Upstream Blk Time (%)										0
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	200			200		400	200		200	
Storage Blk Time (%)							0	0		5
Queuing Penalty (veh)							2	0		3

Network Summary

Network wide Queuing Penalty: 5

Intersection: 126: Old Hundred Road/Old Hundred Rd & Millridge Pkwy/Market Square Ent

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	LT	R	L	L	TR	L	L	T	T	R	L	T
Maximum Queue (ft)	77	174	95	134	107	138	175	321	257	24	54	270
Average Queue (ft)	42	101	50	81	54	85	102	140	87	4	19	128
95th Queue (ft)	90	175	110	148	113	148	186	306	270	23	56	249
Link Distance (ft)	625	625	373	373	373	652	652	652	652	652		825
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)											200	
Storage Blk Time (%)												5
Queuing Penalty (veh)												1

Intersection: 126: Old Hundred Road/Old Hundred Rd & Millridge Pkwy/Market Square Ent

Movement	SB
Directions Served	TR
Maximum Queue (ft)	382
Average Queue (ft)	218
95th Queue (ft)	389
Link Distance (ft)	825
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 127: Old Hundred Rd & Market Square

Movement	WB	NB	SB
Directions Served	LR	T	L
Maximum Queue (ft)	75	80	24
Average Queue (ft)	37	11	8
95th Queue (ft)	70	168	28
Link Distance (ft)	566	825	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			200
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 128: Bailey Bridge Connector & Brad McNeer Pkwy

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	241	198	638	596	582	400
Average Queue (ft)	166	110	530	364	485	192
95th Queue (ft)	281	301	751	803	797	632
Link Distance (ft)		548	624	624	696	696
Upstream Blk Time (%)		0	23	13	13	6
Queuing Penalty (veh)		0	0	0	0	0
Storage Bay Dist (ft)	200					
Storage Blk Time (%)	12	0				
Queuing Penalty (veh)	28	0				

Network Summary

Network wide Queuing Penalty: 10885

C-4 – Concept 2 (2040) Synchro/SimTraffic Results

HCM Signalized Intersection Capacity Analysis
10: 360 WB On Ramp & Commonwealth Centre Pkwy Overpass & Old Hundred Rd & Old Hundred Rd O

8/27/2014

Movement	EBT	EBR2	NWR
Lane Configurations			
Volume (vph)	570	350	450
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.88
Frt	1.00	0.85	0.85
Flt Protected	1.00	1.00	1.00
Satd. Flow (prot)	3539	1583	2787
Flt Permitted	1.00	1.00	1.00
Satd. Flow (perm)	3539	1583	2787
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	620	380	489
RTOR Reduction (vph)	0	249	0
Lane Group Flow (vph)	620	131	489
Heavy Vehicles (%)	2%	2%	2%
Turn Type	NA	Perm	Perm
Protected Phases	4		
Permitted Phases		4	2
Actuated Green, G (s)	16.8	16.8	24.1
Effective Green, g (s)	16.8	16.8	24.1
Actuated g/C Ratio	0.34	0.34	0.49
Clearance Time (s)	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0
Lane Grp Cap (vph)	1215	543	1373
v/s Ratio Prot	c0.18		
v/s Ratio Perm		0.08	c0.18
v/c Ratio	0.51	0.24	0.36
Uniform Delay, d1	12.8	11.5	7.6
Progression Factor	1.00	1.00	1.67
Incremental Delay, d2	0.4	0.2	0.7
Delay (s)	13.1	11.7	13.5
Level of Service	B	B	B
Approach Delay (s)	12.6		
Approach LOS	B		

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: Old Hundred Rd. Overpass & Old Hundred Rd Overpass & 360 WB Off Ramp

8/27/2014

Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Volume (vph)	0	570	130	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		0.88	0.97			
Frt		0.85	1.00			
Flt Protected		1.00	0.95			
Satd. Flow (prot)		2787	3433			
Flt Permitted		1.00	0.95			
Satd. Flow (perm)		2787	3433			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	620	141	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	620	141	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		Free	Perm			
Protected Phases						
Permitted Phases		Free	2			
Actuated Green, G (s)		48.9	24.1			
Effective Green, g (s)		48.9	24.1			
Actuated g/C Ratio		1.00	0.49			
Clearance Time (s)			4.0			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)		2787	1691			
v/s Ratio Prot						
v/s Ratio Perm		c0.22	0.04			
v/c Ratio		0.22	0.08			
Uniform Delay, d1		0.0	6.6			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.2	0.1			
Delay (s)		0.2	6.7			
Level of Service		A	A			
Approach Delay (s)	0.2		6.7		0.0	
Approach LOS	A		A		A	

Intersection Summary			
HCM 2000 Control Delay	1.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Route 360 & Mockingbird Ln. EB U-turn

8/27/2014

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	30	0	5240	2020	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		4.0	6.6			
Lane Util. Factor	1.00		0.86	0.86			
Frt	1.00		1.00	1.00			
Flt Protected	0.95		1.00	1.00			
Satd. Flow (prot)	1770		6408	6408			
Flt Permitted	0.95		1.00	1.00			
Satd. Flow (perm)	1770		6408	6408			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	0	5696	2196	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	33	0	5696	2196	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA	NA			
Protected Phases	5		Free	6			
Permitted Phases							
Actuated Green, G (s)	5.2		130.0	111.7			
Effective Green, g (s)	5.2		130.0	111.7			
Actuated g/C Ratio	0.04		1.00	0.86			
Clearance Time (s)	6.5			6.6			
Vehicle Extension (s)	2.5			8.0			
Lane Grp Cap (vph)	70		6408	5505			
v/s Ratio Prot	0.02		0.89	0.34			
v/s Ratio Perm							
v/c Ratio	0.47		0.89	0.40			
Uniform Delay, d1	61.1		0.0	2.0			
Progression Factor	1.44		1.00	1.20			
Incremental Delay, d2	0.3		0.2	0.2			
Delay (s)	88.5		0.2	2.6			
Level of Service	F		A	A			
Approach Delay (s)			0.7	2.6	0.0		
Approach LOS			A	A	A		

Intersection Summary			
HCM 2000 Control Delay	1.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Route 360 & Deer Run Dr. EB U-turn

8/27/2014

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	50	0	4770	1970	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		4.0	6.4			
Lane Util. Factor	1.00		0.81	0.86			
Frt	1.00		1.00	1.00			
Flt Protected	0.95		1.00	1.00			
Satd. Flow (prot)	1770		7544	6408			
Flt Permitted	0.95		1.00	1.00			
Satd. Flow (perm)	1770		7544	6408			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	0	5185	2141	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	54	0	5185	2141	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA	NA			
Protected Phases	5		Free	6			
Permitted Phases							
Actuated Green, G (s)	7.8		130.0	109.3			
Effective Green, g (s)	7.8		130.0	109.3			
Actuated g/C Ratio	0.06		1.00	0.84			
Clearance Time (s)	6.5			6.4			
Vehicle Extension (s)	2.5			8.0			
Lane Grp Cap (vph)	106		7544	5387			
v/s Ratio Prot	0.03		0.69	0.33			
v/s Ratio Perm							
v/c Ratio	0.51		0.69	0.40			
Uniform Delay, d1	59.2		0.0	2.5			
Progression Factor	0.87		1.00	0.09			
Incremental Delay, d2	2.7		0.2	0.2			
Delay (s)	54.2		0.2	0.4			
Level of Service	D		A	A			
Approach Delay (s)			0.8	0.4	0.0		
Approach LOS			A	A	A		

Intersection Summary			
HCM 2000 Control Delay	0.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
40: Harbour Pointe Pkwy. WB U-turn & Route 360

8/27/2014

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	4770	0	210	0	1970	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6		6.5		4.0		
Lane Util. Factor	0.81		1.00		0.86		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	7544		1770		6408		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	7544		1770		6408		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5185	0	228	0	2141	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	5185	0	228	0	2141	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	95.4		21.5		130.0		
Effective Green, g (s)	95.4		21.5		130.0		
Actuated g/C Ratio	0.73		0.17		1.00		
Clearance Time (s)	6.6		6.5				
Vehicle Extension (s)	8.0		2.5				
Lane Grp Cap (vph)	5536		292		6408		
v/s Ratio Prot	c0.69		c0.13		0.33		
v/s Ratio Perm							
v/c Ratio	0.94		0.78		0.33		
Uniform Delay, d1	14.7		52.0		0.0		
Progression Factor	0.39		0.44		1.00		
Incremental Delay, d2	3.1		15.9		0.1		
Delay (s)	8.8		38.8		0.1		
Level of Service	A		D		A		
Approach Delay (s)	8.8				3.9	0.0	
Approach LOS	A				A	A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
47: Commonwealth Centre Pkwy & Commonwealth Centre Pkwy Overpass & Old Hundred Rd. Overpass

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Volume (vph)	0	0	0	0	170	0	250	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0			
Lane Util. Factor					0.95		0.97			
Frt					1.00		1.00			
Flt Protected					1.00		0.95			
Satd. Flow (prot)					3539		3433			
Flt Permitted					1.00		0.95			
Satd. Flow (perm)					3539		3433			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	185	0	272	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	185	0	272	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type					NA		Prot			
Protected Phases					2		4			
Permitted Phases										
Actuated Green, G (s)					24.1		16.8			
Effective Green, g (s)					24.1		16.8			
Actuated g/C Ratio					0.49		0.34			
Clearance Time (s)					4.0		4.0			
Vehicle Extension (s)					3.0		3.0			
Lane Grp Cap (vph)					1744		1179			
v/s Ratio Prot					c0.05		c0.08			
v/s Ratio Perm										
v/c Ratio					0.11		0.23			
Uniform Delay, d1					6.6		11.4			
Progression Factor					1.00		1.09			
Incremental Delay, d2					0.1		0.1			
Delay (s)					6.8		12.6			
Level of Service					A		B			
Approach Delay (s)	0.0				6.8		12.6		0.0	
Approach LOS	A				A		B		A	

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	20.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	0	450	0	0	180
Sign Control	Stop		Free		Yield	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	489	0	0	196
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			
Median storage veh)						
Upstream signal (ft)			65			
pX, platoon unblocked						
vC, conflicting volume	978	0	0		978	978
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	978	0	0		978	978
tC, single (s)	6.5	6.2	4.1		7.1	6.5
tC, 2 stage (s)						
tF (s)	4.0	3.3	2.2		3.5	4.0
p0 queue free %	100	100	69		100	0
cM capacity (veh/h)	172	1076	1604		173	172

Direction, Lane #	NB 1	NB 2	SW 1
Volume Total	245	245	196
Volume Left	245	245	0
Volume Right	0	0	0
cSH	1604	1604	172
Volume to Capacity	0.31	0.31	1.14
Queue Length 95th (ft)	33	33	254
Control Delay (s)	8.2	8.2	165.0
Lane LOS	A	A	F
Approach Delay (s)	8.2		165.0
Approach LOS			F

Intersection Summary			
Average Delay	53.0		
Intersection Capacity Utilization	16.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (veh/h)	0	200	250	0	0	0
Sign Control	Yield		Free			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	217	272	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			
Median storage veh)						
Upstream signal (ft)			116			
pX, platoon unblocked						
vC, conflicting volume	543	543	0		543	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	543	543	0		543	0
tC, single (s)	7.1	6.5	4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)	3.5	4.0	2.2		4.0	3.3
p0 queue free %	100	42	83		100	100
cM capacity (veh/h)	392	372	1623		372	1085

Direction, Lane #	EB 1	SE 1	SE 2
Volume Total	217	136	136
Volume Left	0	136	136
Volume Right	0	0	0
cSH	372	1623	1623
Volume to Capacity	0.58	0.17	0.17
Queue Length 95th (ft)	89	15	15
Control Delay (s)	27.4	7.7	7.7
Lane LOS	D	A	A
Approach Delay (s)	27.4	7.7	
Approach LOS	D		

Intersection Summary			
Average Delay	16.5		
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
69: 360 EB On Ramp

8/27/2014

Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	450	0	0	110	0	0
Sign Control	Free		Yield		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	489	0	0	120	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		978	978	978	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		978	978	978	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	70		100	32	100	100
cM capacity (veh/h)	1623		176	175	175	1085

Direction, Lane #	EB 1	NB 1
Volume Total	489	120
Volume Left	489	0
Volume Right	0	0
cSH	1623	175
Volume to Capacity	0.30	0.68
Queue Length 95th (ft)	32	102
Control Delay (s)	8.2	61.2
Lane LOS	A	F
Approach Delay (s)	8.2	61.2
Approach LOS		F

Intersection Summary			
Average Delay	18.6		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
70: Old Hundred Rd. Overpass & 360 EB On Ramp

8/27/2014

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
71: 360 EB Off Ramp & Commonwealth Centre Pkwy Overpass

8/27/2014

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	170	370	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		0.88	0.97			
Frt		0.85	1.00			
Flt Protected		1.00	0.95			
Satd. Flow (prot)		2787	3433			
Flt Permitted		1.00	0.95			
Satd. Flow (perm)		2787	3433			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	185	402	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	185	402	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		custom	Prot			
Protected Phases		Free!	4!			
Permitted Phases						
Actuated Green, G (s)		48.9	16.8			
Effective Green, g (s)		48.9	16.8			
Actuated g/C Ratio		1.00	0.34			
Clearance Time (s)			4.0			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)		2787	1179			
v/s Ratio Prot		0.07	c0.12			
v/s Ratio Perm						
v/c Ratio		0.07	0.34			
Uniform Delay, d1		0.0	11.9			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.0	0.2			
Delay (s)		0.0	12.1			
Level of Service		A	B			
Approach Delay (s)	0.0		12.1	0.0		
Approach LOS	A		B	A		

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	18.4%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
72: 360 EB Off Ramp

8/27/2014

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
80: Route 360 & Chital Dr. EB U-turn

8/27/2014

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	60	0	4390	1870	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		4.0	6.9			
Lane Util. Factor	1.00		0.86	0.86			
Frt	1.00		1.00	1.00			
Flt Protected	0.95		1.00	1.00			
Satd. Flow (prot)	1770		6408	6408			
Flt Permitted	0.95		1.00	1.00			
Satd. Flow (perm)	1770		6408	6408			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	0	4772	2033	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	65	0	4772	2033	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA	NA			
Protected Phases	5		Free	6			
Permitted Phases							
Actuated Green, G (s)	8.5		130.0	108.1			
Effective Green, g (s)	8.5		130.0	108.1			
Actuated g/C Ratio	0.07		1.00	0.83			
Clearance Time (s)	6.5			6.9			
Vehicle Extension (s)	2.5			8.0			
Lane Grp Cap (vph)	115		6408	5328			
v/s Ratio Prot	0.04		0.74	0.32			
v/s Ratio Perm							
v/c Ratio	0.57		0.74	0.38			
Uniform Delay, d1	59.0		0.0	2.7			
Progression Factor	0.75		1.00	0.24			
Incremental Delay, d2	5.0		0.4	0.2			
Delay (s)	49.4		0.4	0.8			
Level of Service	D		A	A			
Approach Delay (s)			1.1	0.8	0.0		
Approach LOS			A	A	A		

Intersection Summary			
HCM 2000 Control Delay	1.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
81: Harbour View Ct. WB U-turn & Route 360

8/27/2014

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	4390	0	230	0	1870	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		6.5		4.0		
Lane Util. Factor	0.86		0.97		0.86		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	6408		3433		6408		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	6408		3433		6408		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4772	0	250	0	2033	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	4772	0	250	0	2033	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	104.9		12.1		130.0		
Effective Green, g (s)	104.9		12.1		130.0		
Actuated g/C Ratio	0.81		0.09		1.00		
Clearance Time (s)	6.5		6.5				
Vehicle Extension (s)	8.0		2.5				
Lane Grp Cap (vph)	5170		319		6408		
v/s Ratio Prot	c0.74		c0.07		0.32		
v/s Ratio Perm							
v/c Ratio	0.92		0.78		0.32		
Uniform Delay, d1	9.5		57.7		0.0		
Progression Factor	0.29		0.31		1.00		
Incremental Delay, d2	2.5		9.1		0.1		
Delay (s)	5.3		26.8		0.1		
Level of Service	A		C		A		
Approach Delay (s)	5.3				3.0	0.0	
Approach LOS	A				A	A	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	80	0	4330	0	20	0	1800	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		6.3		6.5		6.9					
Lane Util. Factor	1.00		0.86		1.00		0.86					
Frt	1.00		1.00		1.00		1.00					
Flt Protected	0.95		1.00		0.95		1.00					
Satd. Flow (prot)	1770		6408		1770		6408					
Flt Permitted	0.95		1.00		0.95		1.00					
Satd. Flow (perm)	1770		6408		1770		6408					
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)	87	0	4707	0	22	0	1957	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	87	0	4707	0	22	0	1957	0	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA		Prot		NA					
Protected Phases	5		2		1		6					
Permitted Phases												
Actuated Green, G (s)	10.6		113.7		3.5		106.0					
Effective Green, g (s)	10.6		113.7		3.5		106.0					
Actuated g/C Ratio	0.08		0.87		0.03		0.82					
Clearance Time (s)	6.5		6.3		6.5		6.9					
Vehicle Extension (s)	2.5		8.0		5.0		8.0					
Lane Grp Cap (vph)	144		5604		47		5224					
v/s Ratio Prot	0.05		c0.73		0.01		c0.31					
v/s Ratio Perm												
v/c Ratio	0.60		0.84		0.47		0.37					
Uniform Delay, d1	57.7		3.9		62.3		3.2					
Progression Factor	0.37		0.12		0.00		0.78					
Incremental Delay, d2	5.1		0.7		14.6		0.2					
Delay (s)	26.5		1.2		14.6		2.7					
Level of Service	C		A		B		A					
Approach Delay (s)			1.6				2.8			0.0		
Approach LOS			A				A			A		

Intersection Summary			
HCM 2000 Control Delay	2.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	0	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Heavy Vehicles (%)	2%	2%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)	0.0	
Approach LOS	A	

Intersection Summary

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑		↶↶		↑↑↑↑		
Volume (vph)	3820	0	380	0	1560	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		6.5		4.0		
Lane Util. Factor	0.86		0.97		0.86		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	6408		3433		6408		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	6408		3433		6408		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4152	0	413	0	1696	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	4152	0	413	0	1696	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	96.7		20.5		130.0		
Effective Green, g (s)	96.7		20.5		130.0		
Actuated g/C Ratio	0.74		0.16		1.00		
Clearance Time (s)	6.3		6.5				
Vehicle Extension (s)	8.0		5.0				
Lane Grp Cap (vph)	4766		541		6408		
v/s Ratio Prot	c0.65		c0.12		0.26		
v/s Ratio Perm							
v/c Ratio	0.87		0.76		0.26		
Uniform Delay, d1	12.1		52.4		0.0		
Progression Factor	0.22		0.35		1.00		
Incremental Delay, d2	1.9		5.9		0.1		
Delay (s)	4.5		24.3		0.1		
Level of Service	A		C		A		
Approach Delay (s)	4.5				4.8	0.0	
Approach LOS	A				A	A	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.8
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶		↑↑↑↑	↑↑↑↑			
Volume (vph)	140	0	3820	1560	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		4.0	7.2			
Lane Util. Factor	1.00		0.86	0.86			
Frt	1.00		1.00	1.00			
Flt Protected	0.95		1.00	1.00			
Satd. Flow (prot)	1770		6408	6408			
Flt Permitted	0.95		1.00	1.00			
Satd. Flow (perm)	1770		6408	6408			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	0	4152	1696	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	152	0	4152	1696	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA	NA			
Protected Phases	5		Free	6			
Permitted Phases							
Actuated Green, G (s)	16.5		130.0	99.8			
Effective Green, g (s)	16.5		130.0	99.8			
Actuated g/C Ratio	0.13		1.00	0.77			
Clearance Time (s)	6.5			7.2			
Vehicle Extension (s)	3.0			8.0			
Lane Grp Cap (vph)	224		6408	4919			
v/s Ratio Prot	0.09		0.65	0.26			
v/s Ratio Perm							
v/c Ratio	0.68		0.65	0.34			
Uniform Delay, d1	54.2		0.0	4.8			
Progression Factor	0.30		1.00	0.50			
Incremental Delay, d2	4.0		0.2	0.2			
Delay (s)	20.4		0.2	2.6			
Level of Service	C		A	A			
Approach Delay (s)			0.9	2.6	0.0		
Approach LOS			A	A	A		

Intersection Summary			
HCM 2000 Control Delay	1.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
93: Lake Harbour Dr. WB U-turn & Route 360

8/27/2014

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	3290	0	40	0	1530	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8		6.5		4.0		
Lane Util. Factor	0.86		1.00		0.91		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	6408		1770		5085		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	6408		1770		5085		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3576	0	43	0	1663	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	3576	0	43	0	1663	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	108.7		8.0		130.0		
Effective Green, g (s)	108.7		8.0		130.0		
Actuated g/C Ratio	0.84		0.06		1.00		
Clearance Time (s)	6.8		6.5				
Vehicle Extension (s)	8.0		4.0				
Lane Grp Cap (vph)	5358		108		5085		
v/s Ratio Prot	c0.56		0.02		0.33		
v/s Ratio Perm							
v/c Ratio	0.67		0.40		0.33		
Uniform Delay, d1	3.9		58.7		0.0		
Progression Factor	0.04		1.00		1.00		
Incremental Delay, d2	0.2		3.2		0.2		
Delay (s)	0.4		61.7		0.2		
Level of Service	A		E		A		
Approach Delay (s)	0.4				1.7	0.0	
Approach LOS	A				A	A	

Intersection Summary			
HCM 2000 Control Delay	0.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.3
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
96: Craig Rath Blvd. WB U-turn & Route 360

8/27/2014

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	5240	0	10	0	2020	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		
Lane Util. Factor	0.86		1.00		0.86		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	6225		1719		6225		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	6225		1719		6225		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5696	0	11	0	2196	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	5696	0	11	0	2196	0	0
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	120.4		1.6		130.0		
Effective Green, g (s)	120.4		1.6		130.0		
Actuated g/C Ratio	0.93		0.01		1.00		
Clearance Time (s)	4.0		4.0				
Vehicle Extension (s)	3.0		3.0				
Lane Grp Cap (vph)	5765		21		6225		
v/s Ratio Prot	c0.92		0.01		0.35		
v/s Ratio Perm							
v/c Ratio	0.99		0.52		0.35		
Uniform Delay, d1	4.2		63.8		0.0		
Progression Factor	0.71		1.00		1.00		
Incremental Delay, d2	5.5		20.7		0.2		
Delay (s)	8.5		84.8		0.2		
Level of Service	A		F		A		
Approach Delay (s)	8.5				0.6	0.0	
Approach LOS	A				A	A	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
101: Bridgewood Rd/Warbro Rd & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	2080	50	20	1150	130	190	60	60	100	10	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	3155	5036	1583	1770	5036	1455		1760		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	3155	5036	1583	1770	5036	1455		1760		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	2261	54	22	1198	141	207	65	65	109	11	196
RTOR Reduction (vph)	0	0	27	0	0	86	0	6	0	0	0	93
Lane Group Flow (vph)	239	2261	27	22	1198	55	0	331	0	109	11	103
Heavy Vehicles (%)	11%	3%	2%	2%	3%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	18.8	65.9	65.9	3.1	50.5	50.5		26.5		8.6	8.6	27.4
Effective Green, g (s)	18.8	65.9	65.9	3.1	50.5	50.5		26.5		8.6	8.6	27.4
Actuated g/C Ratio	0.14	0.51	0.51	0.02	0.39	0.39		0.20		0.07	0.07	0.21
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	456	2552	802	42	1956	565		358		208	113	306
v/s Ratio Prot	c0.08	c0.45		0.01	0.24			c0.19		c0.03	0.01	0.05
v/s Ratio Perm			0.02			0.04						0.02
v/c Ratio	0.52	0.89	0.03	0.52	0.61	0.10		0.92		0.52	0.10	0.34
Uniform Delay, d1	51.5	28.7	16.1	62.7	31.9	25.3		50.8		58.7	57.1	43.6
Progression Factor	0.79	0.60	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	4.0	0.1	8.7	1.4	0.3		28.8		5.9	1.1	0.8
Delay (s)	41.5	21.1	16.1	71.4	33.3	25.6		79.6		64.6	58.1	44.3
Level of Service	D	C	B	E	C	C		E		E	E	D
Approach Delay (s)		22.9			33.2			79.6			51.8	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	25.9
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
102: Lonas Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	2190	40	50	1410	50	120	10	90	60	10	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5036	1583	3433	6346	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5036	1583	3433	6346	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	2305	43	54	1516	54	130	11	98	65	11	152
RTOR Reduction (vph)	0	0	14	0	0	21	0	0	92	0	0	143
Lane Group Flow (vph)	239	2305	29	54	1516	33	130	11	6	65	11	9
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	13.7	88.6	88.6	4.0	78.9	78.9	8.5	8.5	8.5	7.9	7.9	7.9
Effective Green, g (s)	13.7	88.6	88.6	4.0	78.9	78.9	8.5	8.5	8.5	7.9	7.9	7.9
Actuated g/C Ratio	0.11	0.68	0.68	0.03	0.61	0.61	0.07	0.07	0.07	0.06	0.06	0.06
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	361	3432	1078	105	3851	960	224	121	103	208	215	96
v/s Ratio Prot	0.07	c0.46		0.02	c0.24		c0.04	0.01		c0.02	0.00	
v/s Ratio Perm			0.02			0.02			0.00			0.01
v/c Ratio	0.66	0.67	0.03	0.51	0.39	0.03	0.58	0.09	0.06	0.31	0.05	0.10
Uniform Delay, d1	55.9	12.2	6.7	62.0	13.2	10.3	59.0	57.1	57.0	58.5	57.5	57.7
Progression Factor	1.00	1.00	1.00	0.71	0.30	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	1.1	0.0	2.5	0.2	0.1	3.1	0.2	0.2	0.6	0.1	0.3
Delay (s)	60.0	13.2	6.8	46.5	4.2	0.1	62.2	57.4	57.2	59.1	57.6	58.0
Level of Service	E	B	A	D	A	A	E	E	E	E	E	E
Approach Delay (s)		17.4			5.4			59.9			58.3	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection has too many legs for HCM analysis.

Intersection has too many legs for HCM analysis.

HCM Signalized Intersection Capacity Analysis
111: Brad McNeer Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	4850	330	240	1900	0	130	0	300	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	6.5	4.0		6.5		6.5			
Lane Util. Factor		0.81	1.00	0.97	0.86		0.97		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		7192	1583	3433	6108		3433		1583			
Flt Permitted		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)		7192	1583	3433	6108		3433		1583			
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	5160	359	261	2065	0	141	0	326	0	0	0
RTOR Reduction (vph)	0	0	70	0	0	0	0	0	96	0	0	0
Lane Group Flow (vph)	0	5160	289	261	2065	0	141	0	230	0	0	0
Heavy Vehicles (%)	5%	7%	2%	2%	7%	5%	2%	5%	2%	5%	5%	5%
Turn Type		NA	Perm	Prot	NA	Perm	Prot		Perm			
Protected Phases		2		1	Free!		4!					
Permitted Phases			2			Free			4			
Actuated Green, G (s)		86.7	86.7	9.5	130.0		14.5		14.5			
Effective Green, g (s)		86.7	86.7	9.5	130.0		14.5		14.5			
Actuated g/C Ratio		0.67	0.67	0.07	1.00		0.11		0.11			
Clearance Time (s)		6.3	6.3	6.5			6.5		6.5			
Vehicle Extension (s)		8.0	8.0	2.5			2.5		2.5			
Lane Grp Cap (vph)	4796	1055	250	6108		382		176				
v/s Ratio Prot	c0.72		c0.08	0.34		0.04						
v/s Ratio Perm		0.18						c0.15				
v/c Ratio	1.08	0.27	1.04	0.34		0.37		1.31				
Uniform Delay, d1	21.6	8.8	60.2	0.0		53.5		57.8				
Progression Factor	0.79	0.58	1.00	1.00		1.00		1.00				
Incremental Delay, d2	35.9	0.2	68.9	0.2		0.4		173.0				
Delay (s)	53.0	5.3	129.1	0.2		54.0		230.7				
Level of Service	D	A	F	A		D		F				
Approach Delay (s)	49.9			14.6			177.3			0.0		
Approach LOS	D			B			F			A		

Intersection Summary			
HCM 2000 Control Delay	47.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
112: Craig Rath Boulevard & Route 360

8/27/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	4870	30	70	1930	60	0	0	400	0	0	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.6	6.6	6.5	6.6	6.6			6.5			6.5
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00			0.88			0.76
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	1770	6108	1583	1770	6108	1583			2787			3610
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	1770	6108	1583	1770	6108	1583			2787			3610
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)	87	5293	33	76	2098	65	0	0	435	0	0	272
RTOR Reduction (vph)	0	0	7	0	0	13	0	0	77	0	0	76
Lane Group Flow (vph)	87	5293	26	76	2098	52	0	0	358	0	0	196
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	13.5	103.4	103.4	13.5	103.4	103.4			13.5			13.5
Effective Green, g (s)	13.5	103.4	103.4	13.5	103.4	103.4			13.5			13.5
Actuated g/C Ratio	0.10	0.80	0.80	0.10	0.80	0.80			0.10			0.10
Clearance Time (s)	6.5	6.6	6.6	6.5	6.6	6.6			6.5			6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0			2.5			2.5
Lane Grp Cap (vph)	183	4858	1259	183	4858	1259			289			374
v/s Ratio Prot	0.05	c0.87		0.04	0.34				c0.13			0.05
v/s Ratio Perm			0.02			0.03						
v/c Ratio	0.48	1.09	0.02	0.42	0.43	0.04			1.24			0.52
Uniform Delay, d1	54.9	13.3	2.8	54.6	4.1	2.8			58.2			55.2
Progression Factor	0.77	0.41	0.00	0.91	0.76	0.27			1.00			1.00
Incremental Delay, d2	0.5	41.9	0.0	1.1	0.3	0.1			133.4			1.0
Delay (s)	42.6	47.3	0.0	50.9	3.4	0.8			191.6			56.2
Level of Service	D	D	A	D	A	A			F			E
Approach Delay (s)		46.9			5.0			191.6			56.2	
Approach LOS		D			A			F			E	

Intersection Summary			
HCM 2000 Control Delay	43.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
114: Deer Run Dr/Harbour View Ct & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	4420	40	130	1760	120	0	0	400	0	0	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	6.4	6.4			6.5			6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00			0.88			0.64
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	3433	6108	1583	3433	6108	1583			2787			4053
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	3433	6108	1583	3433	6108	1583			2787			4053
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	4557	43	141	1913	130	0	0	435	0	0	370
RTOR Reduction (vph)	0	0	10	0	0	26	0	0	73	0	0	95
Lane Group Flow (vph)	174	4557	33	141	1913	104	0	0	362	0	0	276
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	13.0	99.5	99.5	17.5	104.1	104.1			17.5			13.0
Effective Green, g (s)	13.0	99.5	99.5	17.5	104.1	104.1			17.5			13.0
Actuated g/C Ratio	0.10	0.77	0.77	0.13	0.80	0.80			0.13			0.10
Clearance Time (s)	6.5	6.5	6.5	6.5	6.4	6.4			6.5			6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0			2.5			2.5
Lane Grp Cap (vph)	343	4674	1211	462	4891	1267			375			405
v/s Ratio Prot	0.05	c0.75		0.04	0.31				c0.13			0.07
v/s Ratio Perm			0.02			0.07						
v/c Ratio	0.51	0.97	0.03	0.31	0.39	0.08			0.97			0.68
Uniform Delay, d1	55.5	14.1	3.7	50.8	3.8	2.8			56.0			56.5
Progression Factor	0.91	0.75	1.62	0.94	0.91	0.80			1.00			1.00
Incremental Delay, d2	0.3	4.2	0.0	0.3	0.2	0.1			37.2			4.3
Delay (s)	50.9	14.8	5.9	47.8	3.6	2.3			93.2			60.8
Level of Service	D	B	A	D	A	A			F			E
Approach Delay (s)		16.1			6.4			93.2			60.8	
Approach LOS		B			A			F			E	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
115: Chital Dr & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	4210	120	120	1790	20	0	0	240	0	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3	6.3	6.5	6.9	6.9			6.5			6.5
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86	1.00			0.88			0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	1770	6108	1583	3433	6108	1583			2787			2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	1770	6108	1583	3433	6108	1583			2787			2787
Peak-hour factor, PHF	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4385	130	130	1946	22	0	0	261	0	0	33
RTOR Reduction (vph)	0	0	28	0	0	3	0	0	72	0	0	32
Lane Group Flow (vph)	11	4385	102	130	1946	19	0	0	189	0	0	1
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	3.0	102.1	102.1	15.1	113.6	113.6			15.1			3.0
Effective Green, g (s)	3.0	102.1	102.1	15.1	113.6	113.6			15.1			3.0
Actuated g/C Ratio	0.02	0.79	0.79	0.12	0.87	0.87			0.12			0.02
Clearance Time (s)	6.5	6.3	6.3	6.5	6.9	6.9			6.5			6.5
Vehicle Extension (s)	2.5	8.0	8.0	5.0	8.0	8.0			5.0			2.5
Lane Grp Cap (vph)	40	4797	1243	398	5337	1383			323			64
v/s Ratio Prot	0.01	c0.72		0.04	0.32				c0.07			0.00
v/s Ratio Perm			0.06			0.01						
v/c Ratio	0.28	0.91	0.08	0.33	0.36	0.01			0.58			0.01
Uniform Delay, d1	62.4	10.6	3.2	52.8	1.5	1.0			54.5			62.1
Progression Factor	1.20	0.13	0.18	0.95	0.52	0.27			1.00			1.00
Incremental Delay, d2	1.6	2.2	0.1	1.0	0.2	0.0			4.1			0.1
Delay (s)	76.2	3.5	0.7	50.9	1.0	0.3			58.6			62.1
Level of Service	E	A	A	D	A	A			E			E
Approach Delay (s)		3.6			4.1			58.6			62.1	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	3990	110	130	1520	230	0	0	420	0	0	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3	6.3	6.5	6.9	6.9			6.5			6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00			0.76			0.64
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	3433	6108	1583	3433	6108	1583			3610			4053
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	3433	6108	1583	3433	6108	1583			3610			4053
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	4245	120	141	1652	245	0	0	457	0	0	457
RTOR Reduction (vph)	0	0	27	0	0	52	0	0	28	0	0	139
Lane Group Flow (vph)	109	4245	93	141	1652	193	0	0	429	0	0	318
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	14.3	98.6	98.6	18.6	102.3	102.3			18.6			14.3
Effective Green, g (s)	14.3	98.6	98.6	18.6	102.3	102.3			18.6			14.3
Actuated g/C Ratio	0.11	0.76	0.76	0.14	0.79	0.79			0.14			0.11
Clearance Time (s)	6.5	6.3	6.3	6.5	6.9	6.9			6.5			6.5
Vehicle Extension (s)	2.5	8.0	8.0	5.0	8.0	8.0			5.0			2.5
Lane Grp Cap (vph)	377	4632	1200	491	4806	1245			516			445
v/s Ratio Prot	0.03	c0.69		0.04	c0.27				c0.12			0.08
v/s Ratio Perm			0.06			0.12						
v/c Ratio	0.29	0.92	0.08	0.29	0.34	0.15			0.83			0.71
Uniform Delay, d1	53.2	12.4	4.0	49.8	4.0	3.4			54.2			55.9
Progression Factor	1.01	0.25	0.15	0.93	0.82	0.60			1.00			1.00
Incremental Delay, d2	0.2	2.0	0.1	0.6	0.2	0.2			12.1			5.0
Delay (s)	53.7	5.1	0.7	47.1	3.5	2.3			66.2			60.9
Level of Service	D	A	A	D	A	A			E			E
Approach Delay (s)		6.1			6.4			66.2			60.9	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
117: Winterpock Rd/Lake Harbour Dr & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	3250	70	160	1520	20	0	0	710	0	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2			6.5			6.5
Lane Util. Factor	1.00	0.86	1.00	0.94	0.91	1.00			0.88			0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	1770	6108	1583	4990	4848	1583			2787			2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	1770	6108	1583	4990	4848	1583			2787			2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	11	3533	76	174	1652	22	0	0	755	0	0	54
RTOR Reduction (vph)	0	0	16	0	0	3	0	0	67	0	0	52
Lane Group Flow (vph)	11	3533	60	174	1652	19	0	0	688	0	0	2
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	4.0	82.0	82.0	34.7	112.3	112.3			34.7			4.0
Effective Green, g (s)	4.0	82.0	82.0	34.7	112.3	112.3			34.7			4.0
Actuated g/C Ratio	0.03	0.63	0.63	0.27	0.86	0.86			0.27			0.03
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2			6.5			6.5
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0			4.0			3.0
Lane Grp Cap (vph)	54	3852	998	1331	4187	1367			743			85
v/s Ratio Prot	0.01	c0.58		0.03	0.34				c0.25			0.00
v/s Ratio Perm			0.04			0.01						
v/c Ratio	0.20	0.92	0.06	0.13	0.39	0.01			0.93			0.02
Uniform Delay, d1	61.4	21.0	9.2	36.2	1.8	1.2			46.4			61.1
Progression Factor	0.71	0.23	0.03	1.08	0.85	0.56			1.00			1.00
Incremental Delay, d2	1.4	3.6	0.1	0.1	0.3	0.0			17.5			0.1
Delay (s)	45.0	8.5	0.4	39.1	1.8	0.7			63.9			61.2
Level of Service	D	A	A	D	A	A			E			E
Approach Delay (s)		8.4			5.3			63.9			61.2	
Approach LOS		A			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
118: Hancock Village/Duckridge Blvd & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	3110	140	50	1460	20	70	10	130	50	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1604		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1604		1770	1863	1583
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)	22	3380	152	54	1587	22	76	11	141	54	11	11
RTOR Reduction (vph)	0	0	47	0	0	7	0	63	0	0	0	11
Lane Group Flow (vph)	22	3380	105	54	1587	15	76	89	0	54	11	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	3.5	85.6	85.6	5.3	86.7	86.7	10.4	8.8		4.0	2.4	5.9
Effective Green, g (s)	3.5	85.6	85.6	5.3	86.7	86.7	10.4	8.8		4.0	2.4	5.9
Actuated g/C Ratio	0.03	0.66	0.66	0.04	0.67	0.67	0.08	0.07		0.03	0.02	0.05
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5		6.5	6.5	6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	47	3348	1042	139	3391	1055	274	108		54	34	150
v/s Ratio Prot	0.01	c0.66		c0.02	0.31		0.02	c0.06		c0.03	0.01	0.00
v/s Ratio Perm			0.07			0.01						0.00
v/c Ratio	0.47	1.01	0.10	0.39	0.47	0.01	0.28	0.82		1.00	0.32	0.00
Uniform Delay, d1	62.3	22.2	8.1	60.8	10.5	7.3	56.3	59.8		63.0	63.0	59.2
Progression Factor	0.89	0.20	0.00	0.87	0.72	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	7.3	0.0	1.3	0.4	0.0	0.4	36.5		122.5	4.0	0.0
Delay (s)	56.2	11.7	0.0	54.3	8.0	7.3	56.7	96.3		185.5	67.0	59.2
Level of Service	E	B	A	D	A	A	E	F		F	E	E
Approach Delay (s)		11.5			9.5			83.1			150.1	
Approach LOS		B			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
119: Ashlake Pkwy & Route 360

8/27/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2940	30	50	1490	110	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	6.5	6.8	6.5	6.5
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4577	1425	3090	4577	3090	1425
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4577	1425	3090	4577	3090	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3196	33	54	1620	120	348
RTOR Reduction (vph)	0	11	0	0	0	59
Lane Group Flow (vph)	3196	22	54	1620	120	289
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	85.3	85.3	4.8	96.2	20.5	20.5
Effective Green, g (s)	85.3	85.3	4.8	96.2	20.5	20.5
Actuated g/C Ratio	0.66	0.66	0.04	0.74	0.16	0.16
Clearance Time (s)	6.4	6.4	6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0	6.0	2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	3003	935	114	3386	487	224
v/s Ratio Prot	c0.70		0.02	c0.35	0.04	
v/s Ratio Perm		0.02				c0.20
v/c Ratio	1.06	0.02	0.47	0.48	0.25	1.29
Uniform Delay, d1	22.4	7.8	61.4	6.8	48.0	54.8
Progression Factor	0.77	1.10	1.11	1.50	1.00	1.00
Incremental Delay, d2	33.5	0.0	2.1	0.4	0.2	159.8
Delay (s)	50.7	8.6	70.3	10.7	48.2	214.6
Level of Service	D	A	E	B	D	F
Approach Delay (s)	50.3			12.6	171.9	
Approach LOS	D			B	F	

Intersection Summary			
HCM 2000 Control Delay	49.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
120: Route 360 & Woodlake Village Pkwy

8/27/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	50	2000	1090	510	980	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	4848	4848	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	4848	4848	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2174	1185	554	1065	76
RTOR Reduction (vph)	0	0	0	306	0	28
Lane Group Flow (vph)	54	2174	1185	248	1065	48
Heavy Vehicles (%)	2%	7%	7%	2%	2%	2%
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	7.0	71.2	58.1	58.1	45.6	45.6
Effective Green, g (s)	7.0	71.2	58.1	58.1	45.6	45.6
Actuated g/C Ratio	0.05	0.55	0.45	0.45	0.35	0.35
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	95	2655	2166	707	1204	555
v/s Ratio Prot	0.03	c0.45	0.24		c0.31	
v/s Ratio Perm				0.16		0.03
v/c Ratio	0.57	0.82	0.55	0.35	0.88	0.09
Uniform Delay, d1	60.0	24.1	26.3	23.6	39.7	28.3
Progression Factor	1.11	0.48	0.61	0.78	1.00	1.00
Incremental Delay, d2	0.6	0.3	0.9	1.2	8.2	0.1
Delay (s)	67.4	11.8	17.0	19.7	47.9	28.3
Level of Service	E	B	B	B	D	C
Approach Delay (s)		13.1	17.9		46.6	
Approach LOS		B	B		D	

Intersection Summary			
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
121: Hampton Park Dr/Fox Club Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1400	10	90	990	80	10	50	370	290	40	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00		1.00	1.00	0.97	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4847	1583	1770	4848	1583		1847	1583	3433	1863	1583
Flt Permitted		0.85	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		4129	1583	1770	4848	1583		1847	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.96	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1458	11	98	1031	87	11	54	402	315	43	54
RTOR Reduction (vph)	0	0	5	0	0	31	0	0	174	0	0	50
Lane Group Flow (vph)	0	1501	6	98	1031	56	0	65	228	315	43	4
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)		70.1	70.1	6.5	83.2	83.2		16.5	16.5	10.5	10.5	10.5
Effective Green, g (s)		70.1	70.1	6.5	83.2	83.2		16.5	16.5	10.5	10.5	10.5
Actuated g/C Ratio		0.54	0.54	0.05	0.64	0.64		0.13	0.13	0.08	0.08	0.08
Clearance Time (s)		6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)		7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		2226	853	88	3102	1013		234	200	277	150	127
v/s Ratio Prot				c0.06	0.21			0.04		c0.09	0.02	
v/s Ratio Perm		c0.36	0.00			0.04			c0.14			0.00
v/c Ratio		0.67	0.01	1.11	0.33	0.05		0.28	1.14	1.14	0.29	0.03
Uniform Delay, d1		21.7	13.9	61.8	10.7	8.7		51.4	56.8	59.8	56.2	55.1
Progression Factor		0.74	1.00	0.58	0.18	0.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.7	0.0	123.5	0.3	0.1		0.6	106.8	96.3	1.1	0.1
Delay (s)		16.8	13.9	159.3	2.2	0.1		52.0	163.6	156.0	57.3	55.2
Level of Service		B	B	F	A	A		D	F	F	E	E
Approach Delay (s)		16.8			14.7			148.1			132.5	
Approach LOS		B			B			F			F	

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
122: Otterdale Rd & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	1120	20	110	880	70	10	20	210	110	20	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3		6.5	7.4	7.4	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	4838		1593	4848	1538	1770	3539	1583	1719	3438	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	4838		1593	4848	1538	1770	3539	1583	1719	3438	1538
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	1155	22	120	957	73	11	22	228	120	22	33
RTOR Reduction (vph)	0	1	0	0	0	35	0	0	131	0	0	29
Lane Group Flow (vph)	98	1176	0	120	957	38	11	22	97	120	22	4
Heavy Vehicles (%)	5%	7%	2%	2%	7%	5%	2%	2%	2%	5%	5%	5%
Parking (#/hr)				0								
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	18.5	71.0		14.6	67.0	67.0	3.7	3.7	18.3	13.9	13.9	13.9
Effective Green, g (s)	18.5	71.0		14.6	67.0	67.0	3.7	3.7	18.3	13.9	13.9	13.9
Actuated g/C Ratio	0.14	0.55		0.11	0.52	0.52	0.03	0.03	0.14	0.11	0.11	0.11
Clearance Time (s)	6.5	7.3		6.5	7.4	7.4	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0		2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	244	2642		178	2498	792	50	100	222	183	367	164
v/s Ratio Prot	0.06	c0.24		c0.08	0.20		0.01	0.01	c0.05	c0.07	0.01	
v/s Ratio Perm						0.02			0.01			0.00
v/c Ratio	0.40	0.45		0.67	0.38	0.05	0.22	0.22	0.43	0.66	0.06	0.02
Uniform Delay, d1	50.7	17.7		55.4	19.0	15.6	61.7	61.7	51.1	55.8	52.2	52.0
Progression Factor	1.00	1.00		0.79	0.40	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.5		8.5	0.4	0.1	1.6	0.8	1.0	7.3	0.1	0.0
Delay (s)	51.5	18.2		52.1	8.0	15.8	63.4	62.5	52.1	63.1	52.2	52.0
Level of Service	D	B		D	A	B	E	E	D	E	D	D
Approach Delay (s)		20.8			13.1			53.5			59.6	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	26.9
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
123: Bailey Bridge Road & Bailey Bridge Connector

8/27/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	190	400	350	300	100	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.50	1.00
Satd. Flow (perm)	1770	1583	1863	1583	934	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	207	435	380	326	109	239
RTOR Reduction (vph)	0	237	0	190	0	0
Lane Group Flow (vph)	207	198	380	136	109	239
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	10.1	10.1	13.0	13.0	13.0	13.0
Effective Green, g (s)	10.1	10.1	13.0	13.0	13.0	13.0
Actuated g/C Ratio	0.32	0.32	0.42	0.42	0.42	0.42
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	574	514	778	661	390	778
v/s Ratio Prot	0.12		c0.20			0.13
v/s Ratio Perm		c0.13		0.09	0.12	
v/c Ratio	0.36	0.39	0.49	0.21	0.28	0.31
Uniform Delay, d1	8.0	8.1	6.6	5.8	6.0	6.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.5	0.5	0.2	0.4	0.2
Delay (s)	8.4	8.6	7.1	5.9	6.4	6.3
Level of Service	A	A	A	A	A	A
Approach Delay (s)	8.5		6.6			6.3
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	31.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
124: Bailey Bridge Road & Deer Run Drive

8/27/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	90	450	180	230	210	40
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	489	196	250	228	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	446				880	196
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	446				880	196
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				21	95
cM capacity (veh/h)	1115				290	846

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	98	489	196	250	228	43
Volume Left	98	0	0	0	228	0
Volume Right	0	0	0	250	0	43
cSH	1115	1700	1700	1700	290	846
Volume to Capacity	0.09	0.29	0.12	0.15	0.79	0.05
Queue Length 95th (ft)	7	0	0	0	155	4
Control Delay (s)	8.5	0.0	0.0	0.0	51.5	9.5
Lane LOS	A				F	A
Approach Delay (s)	1.4		0.0		44.8	
Approach LOS					E	

Intersection Summary			
Average Delay	10.0		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
125: Springford Parkway/Bailey Bridge Road & Spring Run Road

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	60	90	20	140	70	250	380	50	40	140	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1830		1770	1790	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.63	1.00		0.39	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1171	1830		728	1790	
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)	98	65	98	22	152	76	272	413	54	43	152	54
RTOR Reduction (vph)	0	0	73	0	0	61	0	7	0	0	20	0
Lane Group Flow (vph)	98	65	25	22	152	15	272	460	0	43	186	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	3.4	11.8	11.8	0.6	9.0	9.0	21.6	21.6		21.6	21.6	
Effective Green, g (s)	3.4	11.8	11.8	0.6	9.0	9.0	21.6	21.6		21.6	21.6	
Actuated g/C Ratio	0.07	0.26	0.26	0.01	0.20	0.20	0.47	0.47		0.47	0.47	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	130	477	406	23	364	309	549	859		341	840	
v/s Ratio Prot	c0.06	c0.03		0.01	c0.08			c0.25			0.10	
v/s Ratio Perm			0.02			0.01	0.23			0.06		
v/c Ratio	0.75	0.14	0.06	0.96	0.42	0.05	0.50	0.54		0.13	0.22	
Uniform Delay, d1	20.9	13.2	12.9	22.7	16.2	15.0	8.4	8.6		6.9	7.2	
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	21.6	0.1	0.1	166.5	0.8	0.1	0.7	0.6		0.2	0.1	
Delay (s)	42.5	13.3	13.0	189.2	17.0	15.1	9.1	9.3		7.0	7.4	
Level of Service	D	B	B	F	B	B	A	A		A	A	
Approach Delay (s)		24.2			31.6			9.2			7.3	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	46.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
126: Millridge Pkwy/Market Square Ent & Old Hundred Rd

8/27/2014

Movement	EBL	EBT	EBR2	WBL	WBT	WBR	SBL2	SBT	SBR	NWL	NWR	NWR2
Lane Configurations												
Volume (vph)	40	10	380	40	10	10	10	510	30	90	500	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.95		0.97	0.88	1.00
Frt		1.00	0.85	1.00	0.93		1.00	0.99		1.00	0.85	0.85
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1740	1538	3335	1674		1719	3409		3335	2707	1538
Flt Permitted		0.96	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1740	1538	3335	1674		1719	3409		3335	2707	1538
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)	43	11	413	43	11	11	11	554	33	98	543	54
RTOR Reduction (vph)	0	0	342	0	10	0	0	4	0	0	0	30
Lane Group Flow (vph)	0	54	71	43	12	0	11	583	0	98	543	24
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	Perm	Perm
Protected Phases	4	4		3	3		1	6		5		
Permitted Phases			4								2	2
Actuated Green, G (s)		8.8	8.8	3.2	3.2		0.6	19.7		3.8	22.9	22.9
Effective Green, g (s)		8.8	8.8	3.2	3.2		0.6	19.7		3.8	22.9	22.9
Actuated g/C Ratio		0.17	0.17	0.06	0.06		0.01	0.38		0.07	0.44	0.44
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		297	262	207	104		20	1304		246	1203	683
v/s Ratio Prot	0.03		c0.01	0.01			0.01	0.17		c0.03		
v/s Ratio Perm		c0.05									c0.20	0.02
v/c Ratio	0.18	0.27	0.21	0.11	0.55	0.45				0.40	0.45	0.04
Uniform Delay, d1	18.3	18.6	22.9	22.8	25.3	11.8				22.8	9.9	8.1
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	0.6	0.5	0.5	28.9	1.1				1.1	0.3	0.0
Delay (s)	18.6	19.1	23.4	23.3	54.2	13.0				23.8	10.2	8.1
Level of Service	B	B	C	C	D	B				C	B	A
Approach Delay (s)	19.0			23.4		13.7				12.0		
Approach LOS	B			C		B				B		

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
127: Old Hundred Rd & Market Square

8/27/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	30	20	520	20	20	520
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)	33	22	565	22	22	565
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			916			
pX, platoon unblocked						
vC, conflicting volume	1174	565			587	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1174	565			587	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	96			98	
cM capacity (veh/h)	204	519			973	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	54	565	22	22	565
Volume Left	33	0	0	22	0
Volume Right	22	0	22	0	0
cSH	270	1700	1700	973	1700
Volume to Capacity	0.20	0.33	0.01	0.02	0.33
Queue Length 95th (ft)	18	0	0	2	0
Control Delay (s)	21.7	0.0	0.0	8.8	0.0
Lane LOS	C			A	
Approach Delay (s)	21.7	0.0		0.3	
Approach LOS	C				

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
128: Bailey Bridge Connector & Brad McNeer Pkwy

8/27/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	100	650	170	340	530	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1719	1810	1810	1538	1719	1538
Flt Permitted	0.54	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	969	1810	1810	1538	1719	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	707	185	370	576	174
RTOR Reduction (vph)	0	0	0	233	0	106
Lane Group Flow (vph)	109	707	185	137	576	68
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	41.8	41.8	32.8	32.8	34.7	34.7
Effective Green, g (s)	41.8	41.8	32.8	32.8	34.7	34.7
Actuated g/C Ratio	0.47	0.47	0.37	0.37	0.39	0.39
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	483	854	670	570	674	603
v/s Ratio Prot	0.01	c0.39	0.10		c0.34	
v/s Ratio Perm	0.10			0.09		0.04
v/c Ratio	0.23	0.83	0.28	0.24	0.85	0.11
Uniform Delay, d1	13.6	20.2	19.5	19.2	24.6	17.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	6.6	0.2	0.2	10.3	0.1
Delay (s)	13.8	26.9	19.8	19.5	34.9	17.2
Level of Service	B	C	B	B	C	B
Approach Delay (s)		25.1	19.6		30.8	
Approach LOS		C	B		C	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 10: 360 WB On Ramp & Commonwealth Centre Pkwy Overpass & Old Hundred Rd & Old H

Movement	EB	EB	EB	B52	B52	NW	NW
Directions Served	T	T	>	T	T	R	R
Maximum Queue (ft)	211	146	87	203	98	97	89
Average Queue (ft)	182	57	55	89	14	80	58
95th Queue (ft)	263	139	89	222	97	115	95
Link Distance (ft)	146	146	146	403	403	8	8
Upstream Blk Time (%)	51	0				27	24
Queuing Penalty (veh)	157	2				62	54
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 17: Old Hundred Rd. Overpass & Old Hundred Rd Overpass & 360 WB Off Ramp

Movement	EB	SB	SB
Directions Served	R	L	L
Maximum Queue (ft)	41	31	85
Average Queue (ft)	24	4	46
95th Queue (ft)	47	22	86
Link Distance (ft)	2	70	70
Upstream Blk Time (%)	0		2
Queuing Penalty (veh)	1		2
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 28: Route 360 & Mockingbird Ln. EB U-turn

Movement	EB	WB	WB	WB	WB
Directions Served	U	T	T	T	T
Maximum Queue (ft)	63	14	54	76	95
Average Queue (ft)	31	2	19	32	38
95th Queue (ft)	65	14	58	82	104
Link Distance (ft)		600	600	600	600
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	300				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 39: Route 360 & Deer Run Dr. EB U-turn

Movement	EB	WB	WB	WB	WB
Directions Served	U	T	T	T	T
Maximum Queue (ft)	83	41	37	24	52
Average Queue (ft)	33	6	7	3	14
95th Queue (ft)	78	31	31	18	46
Link Distance (ft)	462	1531	1531	1531	1531
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 40: Harbour Pointe Pkwy. WB U-turn & Route 360

Movement	EB	EB	EB	EB	EB	WB
Directions Served	T	T	T	T	T	U
Maximum Queue (ft)	121	157	244	256	29	95
Average Queue (ft)	65	106	180	193	13	64
95th Queue (ft)	130	188	249	254	35	120
Link Distance (ft)	1531	1531	1531	1531	1531	396
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 47: Commonwealth Centre Pkwy & Commonwealth Centre Pkwy Overpass & Old Hundred F

Movement	WB	WB	SB	SB
Directions Served	T	T	L	L
Maximum Queue (ft)	63	65	31	69
Average Queue (ft)	38	36	11	56
95th Queue (ft)	70	69	35	75
Link Distance (ft)	60	60	-6	-6
Upstream Blk Time (%)	1	1		
Queuing Penalty (veh)	1	1		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 48: Commonwealth Centre Pkwy Overpass & 360 WB On Ramp

Movement	NW
Directions Served	LT
Maximum Queue (ft)	77
Average Queue (ft)	26
95th Queue (ft)	78
Link Distance (ft)	7
Upstream Blk Time (%)	2
Queuing Penalty (veh)	3
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 54: Old Hundred Rd & WB Ramp

Movement	NB	SW
Directions Served	L	R
Maximum Queue (ft)	25	41
Average Queue (ft)	7	10
95th Queue (ft)	35	41
Link Distance (ft)	35	28
Upstream Blk Time (%)	0	1
Queuing Penalty (veh)	1	2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 62: 360 WB Off Ramp & WB Ramp

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)

Intersection: 65: 360 WB On Ramp

Movement	SB
Directions Served	R
Maximum Queue (ft)	75
Average Queue (ft)	61
95th Queue (ft)	75
Link Distance (ft)	18
Upstream Blk Time (%)	0
Queuing Penalty (veh)	2
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 67: Commonwealth Centre Pkwy & 360 EB On Ramp

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)

Intersection: 68: Commonwealth Centre Pkwy & 360 EB Off Ramp

Movement	EB
Directions Served	R
Maximum Queue (ft)	14
Average Queue (ft)	2
95th Queue (ft)	14
Link Distance (ft)	45
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 69: 360 EB On Ramp

Movement	EB	NB
Directions Served	L	R
Maximum Queue (ft)	36	43
Average Queue (ft)	8	26
95th Queue (ft)	32	53
Link Distance (ft)	31	78
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	1	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 70: Old Hundred Rd. Overpass & 360 EB On Ramp

Movement	SE
Directions Served	R
Maximum Queue (ft)	79
Average Queue (ft)	39
95th Queue (ft)	89
Link Distance (ft)	47
Upstream Blk Time (%)	6
Queuing Penalty (veh)	22
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 71: 360 EB Off Ramp & Commonwealth Centre Pkwy Overpass

Movement	WB	WB	NB	NB
Directions Served	R	R	L	L
Maximum Queue (ft)	16	16	83	51
Average Queue (ft)	2	2	61	35
95th Queue (ft)	15	16	94	58
Link Distance (ft)	8	8	37	37
Upstream Blk Time (%)	0	0	20	6
Queuing Penalty (veh)	0	0	38	11
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 72: 360 EB Off Ramp

Movement	NE
Directions Served	L
Maximum Queue (ft)	59
Average Queue (ft)	14
95th Queue (ft)	51
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 80: Route 360 & Chital Dr. EB U-turn

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB
Directions Served	U	T	T	T	T	T	T	T	T
Maximum Queue (ft)	92	242	386	260	263	63	75	23	52
Average Queue (ft)	31	189	210	204	211	17	17	3	11
95th Queue (ft)	79	501	530	526	516	58	64	16	43
Link Distance (ft)	404	404	404	404	404	763	763	763	763
Upstream Blk Time (%)		1	1	2	1				
Queuing Penalty (veh)		6	10	16	11				
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 81: Harbour View Ct. WB U-turn & Route 360

Movement	EB	EB	EB	EB	WB	WB
Directions Served	T	T	T	T	U	U
Maximum Queue (ft)	801	799	777	773	327	340
Average Queue (ft)	631	653	638	649	263	262
95th Queue (ft)	976	970	934	924	360	358
Link Distance (ft)	763	763	763	763	460	460
Upstream Blk Time (%)	6	13	8	9		
Queuing Penalty (veh)	64	143	88	100		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 85: Chital Dr. WB U-turn/N. Spring Run Rd. EB U-turn & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	U	T	T	T	T	U	T	T	T	T
Maximum Queue (ft)	114	330	314	343	329	44	152	92	89	52
Average Queue (ft)	58	163	171	181	191	15	52	34	43	25
95th Queue (ft)	116	416	441	445	459	40	133	89	92	59
Link Distance (ft)	385	385	385	385	385		382	382	382	382
Upstream Blk Time (%)		2	2	3	4					
Queuing Penalty (veh)		16	22	26	37					
Storage Bay Dist (ft)						300				
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 89: Temie Lee Pkwy. WB U-turn & Route 360

Movement	EB	EB	EB	EB	WB	WB
Directions Served	T	T	T	T	U	U
Maximum Queue (ft)	176	232	236	242	216	186
Average Queue (ft)	68	119	136	110	175	158
95th Queue (ft)	143	191	218	197	218	198
Link Distance (ft)	286	286	286	286	508	508
Upstream Blk Time (%)		0	0	1		
Queuing Penalty (veh)		3	5	7		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 90: Route 360 & Winterpock Rd. EB U-turn

Movement	EB	WB	WB	WB	WB	B2
Directions Served	U	T	T	T	T	T
Maximum Queue (ft)	136	105	155	94	28	12
Average Queue (ft)	96	54	60	55	4	2
95th Queue (ft)	138	109	124	98	21	11
Link Distance (ft)		101	101	101	101	286
Upstream Blk Time (%)		2	2	0		
Queuing Penalty (veh)		8	8	2		
Storage Bay Dist (ft)	200					
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 93: Lake Harbour Dr. WB U-turn & Route 360

Movement	EB	EB	EB	EB	WB
Directions Served	T	T	T	T	U
Maximum Queue (ft)	73	27	54	62	94
Average Queue (ft)	19	9	20	28	37
95th Queue (ft)	64	30	54	70	91
Link Distance (ft)	702	702	702	702	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					250
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 96: Craig Rath Blvd. WB U-turn & Route 360

Movement	EB	EB	EB	EB	WB
Directions Served	T	T	T	T	U
Maximum Queue (ft)	50	49	53	86	47
Average Queue (ft)	9	9	9	25	15
95th Queue (ft)	43	42	40	83	42
Link Distance (ft)	600	600	600	600	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					350
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	LTR
Maximum Queue (ft)	93	150	173	179	207	11	57	249	261	356	95	390
Average Queue (ft)	54	88	84	106	120	2	18	161	197	262	28	298
95th Queue (ft)	103	157	168	178	220	11	53	254	269	379	87	538
Link Distance (ft)			1521	1521	1521			5220	5220	5220		1540
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	205	205				90	190				200	
Storage Blk Time (%)					25			3		16		
Queuing Penalty (veh)					13			1		21		

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	39	113	38	148
Average Queue (ft)	11	70	12	73
95th Queue (ft)	38	122	37	137
Link Distance (ft)			1263	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		250
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	L	L	T	T	T	T	R
Maximum Queue (ft)	102	128	207	217	232	36	55	53	82	105	94	14
Average Queue (ft)	69	92	126	144	162	11	39	23	28	52	38	4
95th Queue (ft)	115	136	198	229	240	35	68	55	67	103	87	14
Link Distance (ft)			635	635	635			1521	1521	1521		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	420	420				200	200				200	200
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 102: Lonas Pkwy & Route 360

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	L	L	T	T
Maximum Queue (ft)	101	138	61	74	83	27	23	13
Average Queue (ft)	31	89	20	41	46	10	7	3
95th Queue (ft)	94	139	61	70	80	29	30	14
Link Distance (ft)			402	402	257	257	257	257
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	240	240						
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

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)	

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

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)	

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB	B77	B77	B77	B77
Directions Served	T	T	T	T	T
Maximum Queue (ft)	227	22	168	228	163
Average Queue (ft)	32	3	24	33	23
95th Queue (ft)	225	22	143	226	162
Link Distance (ft)	502	324	324	324	324
Upstream Blk Time (%)				2	0
Queuing Penalty (veh)				18	3
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 107:

Movement	NE
Directions Served	T
Maximum Queue (ft)	75
Average Queue (ft)	11
95th Queue (ft)	60
Link Distance (ft)	1064
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 109:

Movement	NE	NE	NE	NE
Directions Served	T	T	T	T
Maximum Queue (ft)	333	804	840	795
Average Queue (ft)	48	267	313	217
95th Queue (ft)	330	858	905	784
Link Distance (ft)	772	772	772	772
Upstream Blk Time (%)		1	2	1
Queuing Penalty (veh)		6	17	5
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	B94	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	T	R	T	L	L	T	T	L
Maximum Queue (ft)	478	484	512	509	443	236	28	201	242	274	228	102
Average Queue (ft)	360	395	422	389	283	72	4	137	147	135	75	38
95th Queue (ft)	523	590	616	582	521	226	28	243	260	298	206	104
Link Distance (ft)	633	633	633	633	633		189			772	772	403
Upstream Blk Time (%)	0	0	1	0	0							
Queuing Penalty (veh)	0	0	8	0	0							
Storage Bay Dist (ft)						200		500	500			
Storage Blk Time (%)					4							
Queuing Penalty (veh)					13							

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	127	240
Average Queue (ft)	83	144
95th Queue (ft)	128	248
Link Distance (ft)	403	403
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	EB	NB
Directions Served	T	R
Maximum Queue (ft)	14	367
Average Queue (ft)	2	214
95th Queue (ft)	14	351
Link Distance (ft)	535	1061
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	L	T	T	T	T	R	R
Maximum Queue (ft)	111	146	112	88	69	83	95	108	105	198	722	300
Average Queue (ft)	58	60	49	43	41	43	34	31	43	53	607	292
95th Queue (ft)	105	139	101	88	76	80	93	101	105	166	1023	316
Link Distance (ft)		396	396	396	396		402	402	402	402	880	
Upstream Blk Time (%)											22	
Queuing Penalty (veh)											0	
Storage Bay Dist (ft)	140					150						200
Storage Blk Time (%)		0									77	68
Queuing Penalty (veh)		0									155	137

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	SB	SB	SB
Directions Served	R	R	R
Maximum Queue (ft)	269	174	94
Average Queue (ft)	218	78	50
95th Queue (ft)	300	152	89
Link Distance (ft)	597		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		400	400
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	73	237	502	501	504	508	430	103	130	112	94	73
Average Queue (ft)	41	125	473	484	485	478	92	50	65	67	44	37
95th Queue (ft)	70	335	527	502	508	507	381	112	119	118	89	76
Link Distance (ft)			460	460	460	460				462	462	462
Upstream Blk Time (%)			13	17	13	11						
Queuing Penalty (veh)			146	195	149	128						
Storage Bay Dist (ft)	200	200					360	280	280			
Storage Blk Time (%)			11			27						
Queuing Penalty (veh)			17			11						

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	WB	NB	NB	SB	SB	SB	SB
Directions Served	T	R	R	R	R	R	R
Maximum Queue (ft)	103	340	1288	79	144	135	95
Average Queue (ft)	62	267	1237	38	93	103	57
95th Queue (ft)	108	479	1409	80	147	170	124
Link Distance (ft)	462		1273		809		
Upstream Blk Time (%)			53				
Queuing Penalty (veh)			0				
Storage Bay Dist (ft)		300		400		400	400
Storage Blk Time (%)		0	93				
Queuing Penalty (veh)		0	186				

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T	R	L	L	T	T	T	T
Maximum Queue (ft)	26	345	355	352	351	150	61	89	60	46	48	56
Average Queue (ft)	11	234	278	281	298	43	17	47	23	12	23	9
95th Queue (ft)	29	436	437	452	443	216	48	90	60	42	63	42
Link Distance (ft)		382	382	382	382				404	404	404	404
Upstream Blk Time (%)		4	7	7	7							
Queuing Penalty (veh)		47	72	76	71							
Storage Bay Dist (ft)	220					200	170	170				
Storage Blk Time (%)		12			25							
Queuing Penalty (veh)		1			31							

Intersection: 115: Chital Dr & Route 360

Movement	NB	NB	SB	SB
Directions Served	R	R	R	R
Maximum Queue (ft)	180	1017	63	31
Average Queue (ft)	67	790	32	6
95th Queue (ft)	201	997	63	24
Link Distance (ft)		1002	621	621
Upstream Blk Time (%)		13		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)	110			
Storage Blk Time (%)		94		
Queuing Penalty (veh)		112		

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	70	268	391	359	330	335	193	54	83	158	149	179
Average Queue (ft)	25	46	192	195	190	172	31	22	47	100	105	133
95th Queue (ft)	69	99	384	370	382	386	195	54	85	150	152	194
Link Distance (ft)			508	508	508	508				385	385	385
Upstream Blk Time (%)			0	0	0	1						
Queuing Penalty (veh)			4	4	4	6						
Storage Bay Dist (ft)	220	220					230	115	115			
Storage Blk Time (%)			10			13			0	2		
Queuing Penalty (veh)			10			15			0	2		

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	R	R	R	R	R	R	R	R
Maximum Queue (ft)	94	90	185	248	238	263	228	84	52
Average Queue (ft)	48	25	80	190	196	200	176	40	29
95th Queue (ft)	103	125	200	293	301	264	236	68	61
Link Distance (ft)	385		2179			975			
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		200		500	500		500	500	500
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	L	L	L	T	T	T	R
Maximum Queue (ft)	20	183	214	209	201	32	66	87	57	91	92	308
Average Queue (ft)	8	128	142	115	110	5	31	58	23	44	44	264
95th Queue (ft)	23	200	251	230	245	24	64	94	58	92	110	334
Link Distance (ft)		379	379	379	379				601	601	601	1863
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	180					280	280	280				
Storage Blk Time (%)		2			1							
Queuing Penalty (veh)		0			1							

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	NB	SB	SB
Directions Served	R	R	R
Maximum Queue (ft)	318	73	47
Average Queue (ft)	268	34	17
95th Queue (ft)	356	70	45
Link Distance (ft)	1863	484	484
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	L	T	T	T	R	L
Maximum Queue (ft)	49	155	181	193	66	57	66	130	180	211	26	83
Average Queue (ft)	22	92	146	159	25	15	29	53	99	130	5	44
95th Queue (ft)	61	187	193	215	63	50	70	147	218	238	22	84
Link Distance (ft)		1184	1184	1184				702	702	702		1064
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				200	300	300				400	
Storage Blk Time (%)				2								
Queuing Penalty (veh)				3								

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (ft)	72	135	86	29	23
Average Queue (ft)	30	68	37	9	5
95th Queue (ft)	72	127	86	28	20
Link Distance (ft)	1064	1064	959	959	959
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 119: Ashlake Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	R	L	L	T	T	T	L	L	R
Maximum Queue (ft)	429	489	467	27	15	32	130	187	193	45	72	386
Average Queue (ft)	236	280	289	7	3	20	83	113	134	16	46	265
95th Queue (ft)	393	450	435	26	17	37	140	186	212	41	75	462
Link Distance (ft)	942	942	942				1184	1184	1184		2574	2574
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				400	400	400				200		
Storage Blk Time (%)			4									
Queuing Penalty (veh)			1									

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	L	L	R
Maximum Queue (ft)	62	240	240	248	212	210	146	389	342	61
Average Queue (ft)	30	133	159	179	120	122	101	294	279	26
95th Queue (ft)	61	225	224	249	209	212	164	386	362	63
Link Distance (ft)		4668	4668	4668	942	942	942	1148	1148	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200									150
Storage Blk Time (%)		2							32	
Queuing Penalty (veh)		1							22	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	T	T	R	L	T	T	T	LT	R	L	L
Maximum Queue (ft)	577	563	526	13	187	25	71	91	91	266	351	360
Average Queue (ft)	479	481	363	2	120	4	17	47	47	212	247	280
95th Queue (ft)	752	781	801	13	260	18	58	96	92	293	377	400
Link Distance (ft)	2656	2656	2656			4668	4668	4668	747	747		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				200	230						240	240
Storage Blk Time (%)			7		2						21	38
Queuing Penalty (veh)			1		7						19	35

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	164	29
Average Queue (ft)	67	18
95th Queue (ft)	215	35
Link Distance (ft)	1429	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		130
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	T	L	T	T	R
Maximum Queue (ft)	83	122	141	153	156	45	60	79	23	38	26	96
Average Queue (ft)	33	92	105	64	99	7	15	35	10	12	4	58
95th Queue (ft)	82	131	159	142	158	36	51	83	27	37	19	99
Link Distance (ft)		3646	3646	3646		2656	2656	2656		1017	1017	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				375				200			200
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 122: Otterdale Rd & Route 360

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	122	21	24	25
Average Queue (ft)	77	5	7	13
95th Queue (ft)	113	18	24	32
Link Distance (ft)		1585	1585	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	200			200
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 123: Bailey Bridge Road & Bailey Bridge Connector

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	131	121	138	97	82	105
Average Queue (ft)	68	83	83	52	51	56
95th Queue (ft)	132	137	136	89	85	110
Link Distance (ft)	1170		1128			930
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		200		200	200	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	53	22	142	56
Average Queue (ft)	30	5	87	17
95th Queue (ft)	59	19	148	46
Link Distance (ft)				826
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	225	275	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LTR	LTR
Maximum Queue (ft)	51	26	73	61	688	100
Average Queue (ft)	46	4	48	7	461	58
95th Queue (ft)	59	25	77	35	755	90
Link Distance (ft)	778	778	840		663	544
Upstream Blk Time (%)					20	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)				400		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	L	T	R	L	TR	L	TR
Maximum Queue (ft)	79	47	34	78	15	132	162	54	73
Average Queue (ft)	45	22	17	48	1	79	92	24	34
95th Queue (ft)	83	52	40	82	15	132	175	55	76
Link Distance (ft)		778		840			663		545
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200		200		400	200		200	
Storage Blk Time (%)							0		
Queuing Penalty (veh)							1		

Network Summary

Network wide Queuing Penalty: 1

Intersection: 126: Millridge Pkwy/Market Square Ent & Old Hundred Rd

Movement	EB	EB	WB	WB	WB	SB	SB	SB	NW	NW	NW	NW
Directions Served	LT	>	L	L	TR	<	T	TR	L	L	R	R
Maximum Queue (ft)	37	131	35	18	17	34	92	111	30	48	180	149
Average Queue (ft)	18	78	18	6	7	11	58	69	13	31	120	70
95th Queue (ft)	39	135	40	19	19	34	91	112	36	51	207	141
Link Distance (ft)	1688	1688			1459		823	823			510	510
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			200	200		200			300	300		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 126: Millridge Pkwy/Market Square Ent & Old Hundred Rd

Movement	NW
Directions Served	>
Maximum Queue (ft)	33
Average Queue (ft)	11
95th Queue (ft)	32
Link Distance (ft)	510
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 127: Old Hundred Rd & Market Square

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	80	23
Average Queue (ft)	26	5
95th Queue (ft)	77	21
Link Distance (ft)	566	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 128: Bailey Bridge Connector & Brad McNeer Pkwy

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	186	397	133	119	340	46
Average Queue (ft)	63	226	81	60	202	26
95th Queue (ft)	176	382	133	114	324	51
Link Distance (ft)		548	624	624	696	696
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200					
Storage Blk Time (%)		9				
Queuing Penalty (veh)		9				

Network Summary

Network wide Queuing Penalty: 2711

HCM Signalized Intersection Capacity Analysis
10: 360 WB On Ramp & Commonwealth Centre Pkwy Overpass & Old Hundred Rd & Old Hundred Rd O

8/27/2014

Movement	EBT	EBR2	NWR
Lane Configurations			
Volume (vph)	600	570	940
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.88
Frt	1.00	0.85	0.85
Flt Protected	1.00	1.00	1.00
Satd. Flow (prot)	3539	1583	2787
Flt Permitted	1.00	1.00	1.00
Satd. Flow (perm)	3539	1583	2787
Peak-hour factor, PHF	0.92	0.92	0.92
Adj. Flow (vph)	652	620	1022
RTOR Reduction (vph)	0	422	0
Lane Group Flow (vph)	652	198	1022
Heavy Vehicles (%)	2%	2%	2%
Turn Type	NA	Perm	Perm
Protected Phases	4		
Permitted Phases		4	2
Actuated Green, G (s)	16.0	16.0	26.0
Effective Green, g (s)	16.0	16.0	26.0
Actuated g/C Ratio	0.32	0.32	0.52
Clearance Time (s)	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0
Lane Grp Cap (vph)	1132	506	1449
v/s Ratio Prot	c0.18		
v/s Ratio Perm		0.13	c0.37
v/c Ratio	0.58	0.39	0.71
Uniform Delay, d1	14.2	13.2	9.1
Progression Factor	1.00	1.00	1.26
Incremental Delay, d2	0.7	0.5	2.6
Delay (s)	14.9	13.7	14.0
Level of Service	B	B	B
Approach Delay (s)	14.3		
Approach LOS	B		

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: Old Hundred Rd. Overpass & Old Hundred Rd Overpass & 360 WB Off Ramp

8/27/2014

Movement	EBL	EBR	SBL	SBR	NWL	NWR
Lane Configurations						
Volume (vph)	0	600	600	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		0.88	0.97			
Frt		0.85	1.00			
Flt Protected		1.00	0.95			
Satd. Flow (prot)		2787	3433			
Flt Permitted		1.00	0.95			
Satd. Flow (perm)		2787	3433			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	652	652	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	652	652	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		Free	Perm			
Protected Phases						
Permitted Phases		Free	2			
Actuated Green, G (s)		50.0	26.0			
Effective Green, g (s)		50.0	26.0			
Actuated g/C Ratio		1.00	0.52			
Clearance Time (s)			4.0			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)		2787	1785			
v/s Ratio Prot						
v/s Ratio Perm		c0.23	c0.19			
v/c Ratio		0.23	0.37			
Uniform Delay, d1		0.0	7.1			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.2	0.6			
Delay (s)		0.2	7.7			
Level of Service		A	A			
Approach Delay (s)	0.2		7.7		0.0	
Approach LOS	A		A		A	

Intersection Summary			
HCM 2000 Control Delay	3.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Route 360 & Mockingbird Ln. EB U-turn

8/27/2014

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	60	0	3270	5640	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		4.0	6.6			
Lane Util. Factor	1.00		0.86	0.86			
Frt	1.00		1.00	1.00			
Flt Protected	0.95		1.00	1.00			
Satd. Flow (prot)	1770		6408	6408			
Flt Permitted	0.95		1.00	1.00			
Satd. Flow (perm)	1770		6408	6408			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	0	3554	6130	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	65	0	3554	6130	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA	NA			
Protected Phases	5		Free	6			
Permitted Phases							
Actuated Green, G (s)	5.5		140.0	121.4			
Effective Green, g (s)	5.5		140.0	121.4			
Actuated g/C Ratio	0.04		1.00	0.87			
Clearance Time (s)	6.5			6.6			
Vehicle Extension (s)	2.5			8.0			
Lane Grp Cap (vph)	69		6408	5556			
v/s Ratio Prot	0.04		0.55	c0.96			
v/s Ratio Perm							
v/c Ratio	0.94		0.55	1.10			
Uniform Delay, d1	67.1		0.0	9.3			
Progression Factor	1.39		1.00	1.04			
Incremental Delay, d2	85.3		0.2	47.4			
Delay (s)	178.6		0.2	57.0			
Level of Service	F		A	E			
Approach Delay (s)			3.4	57.0	0.0		
Approach LOS			A	E	A		

Intersection Summary			
HCM 2000 Control Delay	37.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Route 360 & Deer Run Dr. EB U-turn

8/27/2014

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	80	0	2930	5350	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		4.0	6.4			
Lane Util. Factor	1.00		0.81	0.86			
Frt	1.00		1.00	1.00			
Flt Protected	0.95		1.00	1.00			
Satd. Flow (prot)	1770		7544	6408			
Flt Permitted	0.95		1.00	1.00			
Satd. Flow (perm)	1770		7544	6408			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	0	3185	5815	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	87	0	3185	5815	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA	NA			
Protected Phases	5		Free	6			
Permitted Phases							
Actuated Green, G (s)	7.2		140.0	119.9			
Effective Green, g (s)	7.2		140.0	119.9			
Actuated g/C Ratio	0.05		1.00	0.86			
Clearance Time (s)	6.5			6.4			
Vehicle Extension (s)	2.5			8.0			
Lane Grp Cap (vph)	91		7544	5487			
v/s Ratio Prot	c0.05		0.42	c0.91			
v/s Ratio Perm							
v/c Ratio	0.96		0.42	1.06			
Uniform Delay, d1	66.2		0.0	10.0			
Progression Factor	0.63		1.00	0.66			
Incremental Delay, d2	78.1		0.1	29.1			
Delay (s)	120.1		0.1	35.7			
Level of Service	F		A	D			
Approach Delay (s)			3.3	35.7	0.0		
Approach LOS			A	D	A		

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	2930	0	290	0	5350	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6		6.5		4.0		
Lane Util. Factor	0.81		1.00		0.86		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	7544		1770		6408		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	7544		1770		6408		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3185	0	315	0	5815	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	3185	0	315	0	5815	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	82.4		44.5		140.0		
Effective Green, g (s)	82.4		44.5		140.0		
Actuated g/C Ratio	0.59		0.32		1.00		
Clearance Time (s)	6.6		6.5				
Vehicle Extension (s)	8.0		2.5				
Lane Grp Cap (vph)	4440		562		6408		
v/s Ratio Prot	0.42		0.18		0.91		
v/s Ratio Perm							
v/c Ratio	0.72		0.56		0.91		
Uniform Delay, d1	20.5		39.6		0.0		
Progression Factor	0.52		0.44		1.00		
Incremental Delay, d2	0.9		0.4		0.2		
Delay (s)	11.6		17.8		0.2		
Level of Service	B		B		A		
Approach Delay (s)	11.6				1.1	0.0	
Approach LOS	B				A	A	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	82.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NWL	NWR
Lane Configurations										
Volume (vph)	0	0	0	0	1260	0	790	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0			
Lane Util. Factor					0.95		0.97			
Frt					1.00		1.00			
Flt Protected					1.00		0.95			
Satd. Flow (prot)					3539		3433			
Flt Permitted					1.00		0.95			
Satd. Flow (perm)					3539		3433			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	1370	0	859	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1370	0	859	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type					NA		Prot			
Protected Phases					2		4			
Permitted Phases										
Actuated Green, G (s)					26.0		16.0			
Effective Green, g (s)					26.0		16.0			
Actuated g/C Ratio					0.52		0.32			
Clearance Time (s)					4.0		4.0			
Vehicle Extension (s)					3.0		3.0			
Lane Grp Cap (vph)					1840		1098			
v/s Ratio Prot					c0.39		c0.25			
v/s Ratio Perm										
v/c Ratio					0.74		0.78			
Uniform Delay, d1					9.4		15.4			
Progression Factor					1.00		1.29			
Incremental Delay, d2					2.8		3.6			
Delay (s)					12.2		23.5			
Level of Service					B		C			
Approach Delay (s)	0.0				12.2		23.5		0.0	
Approach LOS	A				B		C		A	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	0	0	940	0	0	420
Sign Control	Stop		Free		Yield	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	1022	0	0	457
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			
Median storage veh)						
Upstream signal (ft)			65			
pX, platoon unblocked						
vC, conflicting volume	2043	0	0		2043	2043
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2043	0	0		2043	2043
tC, single (s)	6.5	6.2	4.1		7.1	6.5
tC, 2 stage (s)						
tF (s)	4.0	3.3	2.2		3.5	4.0
p0 queue free %	100	100	36		100	0
cM capacity (veh/h)	20	1076	1604		20	20

Direction, Lane #	NB 1	NB 2	SW 1
Volume Total	511	511	457
Volume Left	511	511	0
Volume Right	0	0	0
cSH	1604	1604	20
Volume to Capacity	0.64	0.64	22.80
Queue Length 95th (ft)	123	123	Err
Control Delay (s)	11.1	11.1	Err
Lane LOS	B	B	F
Approach Delay (s)	11.1		Err
Approach LOS			F

Intersection Summary			
Average Delay	3095.6		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Movement	EBL	EBR	SET	SER	NWL	NWT
Lane Configurations						
Volume (veh/h)	0	470	790	0	0	0
Sign Control	Yield		Free			Stop
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	511	859	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			
Median storage veh)						
Upstream signal (ft)			116			
pX, platoon unblocked						
vC, conflicting volume	1717	1717	0		1717	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1717	1717	0		1717	0
tC, single (s)	7.1	6.5	4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)	3.5	4.0	2.2		4.0	3.3
p0 queue free %	100	0	47		100	100
cM capacity (veh/h)	41	42	1623		42	1085

Direction, Lane #	EB 1	SE 1	SE 2
Volume Total	511	429	429
Volume Left	0	429	429
Volume Right	0	0	0
cSH	42	1623	1623
Volume to Capacity	12.08	0.53	0.53
Queue Length 95th (ft)	Err	81	81
Control Delay (s)	Err	9.7	9.7
Lane LOS	F	A	A
Approach Delay (s)	Err	9.7	
Approach LOS	F		

Intersection Summary			
Average Delay	3735.9		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
69: 360 EB On Ramp

8/27/2014

Movement	EBL	EBR	NBL	NBR	SWL	SWR
Lane Configurations						
Volume (veh/h)	410	0	0	560	0	0
Sign Control	Free		Yield		Stop	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	446	0	0	609	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		891	891	891	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		891	891	891	0
tC, single (s)	4.1		7.1	6.5	6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2		3.5	4.0	4.0	3.3
p0 queue free %	73		100	0	100	100
cM capacity (veh/h)	1623		207	204	204	1085

Direction, Lane #	EB 1	NB 1
Volume Total	446	609
Volume Left	446	0
Volume Right	0	0
cSH	1623	204
Volume to Capacity	0.27	2.98
Queue Length 95th (ft)	28	1368
Control Delay (s)	8.1	939.7
Lane LOS	A	F
Approach Delay (s)	8.1	939.7
Approach LOS		F

Intersection Summary			
Average Delay	545.9		
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
70: Old Hundred Rd. Overpass & 360 EB On Ramp

8/27/2014

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
71: 360 EB Off Ramp & Commonwealth Centre Pkwy Overpass

8/27/2014

Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations						
Volume (vph)	0	1260	480	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			
Lane Util. Factor		0.88	0.97			
Frt		0.85	1.00			
Flt Protected		1.00	0.95			
Satd. Flow (prot)		2787	3433			
Flt Permitted		1.00	0.95			
Satd. Flow (perm)		2787	3433			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1370	522	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1370	522	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		custom	Prot			
Protected Phases		Free!	4!			
Permitted Phases						
Actuated Green, G (s)		50.0	16.0			
Effective Green, g (s)		50.0	16.0			
Actuated g/C Ratio		1.00	0.32			
Clearance Time (s)			4.0			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)		2787	1098			
v/s Ratio Prot		0.49	0.15			
v/s Ratio Perm						
v/c Ratio		0.49	0.48			
Uniform Delay, d1		0.0	13.6			
Progression Factor		1.00	1.00			
Incremental Delay, d2		0.4	0.3			
Delay (s)		0.4	14.0			
Level of Service		A	B			
Approach Delay (s)	0.4		14.0	0.0		
Approach LOS	A		B	A		

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
72: 360 EB Off Ramp

8/27/2014

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
80: Route 360 & Chital Dr. EB U-turn

8/27/2014

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	110	0	2720	5160	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		4.0	6.9			
Lane Util. Factor	1.00		0.86	0.86			
Frt	1.00		1.00	1.00			
Flt Protected	0.95		1.00	1.00			
Satd. Flow (prot)	1770		6408	6408			
Flt Permitted	0.95		1.00	1.00			
Satd. Flow (perm)	1770		6408	6408			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	0	2957	5609	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	120	0	2957	5609	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA	NA			
Protected Phases	5		Free	6			
Permitted Phases							
Actuated Green, G (s)	9.5		140.0	117.1			
Effective Green, g (s)	9.5		140.0	117.1			
Actuated g/C Ratio	0.07		1.00	0.84			
Clearance Time (s)	6.5			6.9			
Vehicle Extension (s)	2.5			8.0			
Lane Grp Cap (vph)	120		6408	5359			
v/s Ratio Prot	c0.07		0.46	c0.88			
v/s Ratio Perm							
v/c Ratio	1.00		0.46	1.05			
Uniform Delay, d1	65.2		0.0	11.5			
Progression Factor	0.81		1.00	0.44			
Incremental Delay, d2	82.1		0.2	24.0			
Delay (s)	134.9		0.2	29.0			
Level of Service	F		A	C			
Approach Delay (s)			5.5	29.0	0.0		
Approach LOS			A	C	A		

Intersection Summary			
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
81: Harbour View Ct. WB U-turn & Route 360

8/27/2014

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	2720	0	350	0	5160	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		6.5		4.0		
Lane Util. Factor	0.86		0.97		0.86		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	6408		3433		6408		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	6408		3433		6408		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2957	0	380	0	5609	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	2957	0	380	0	5609	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	106.7		20.3		140.0		
Effective Green, g (s)	106.7		20.3		140.0		
Actuated g/C Ratio	0.76		0.15		1.00		
Clearance Time (s)	6.5		6.5				
Vehicle Extension (s)	8.0		2.5				
Lane Grp Cap (vph)	4883		497		6408		
v/s Ratio Prot	0.46		0.11		0.88		
v/s Ratio Perm							
v/c Ratio	0.61		0.76		0.88		
Uniform Delay, d1	7.4		57.6		0.0		
Progression Factor	0.29		0.18		1.00		
Incremental Delay, d2	0.5		0.6		0.2		
Delay (s)	2.6		10.8		0.2		
Level of Service	A		B		A		
Approach Delay (s)	2.6				0.9	0.0	
Approach LOS	A				A	A	

Intersection Summary			
HCM 2000 Control Delay	1.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Volume (vph)	150	0	2840	0	30	0	4920	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		6.3		6.5		6.9					
Lane Util. Factor	1.00		0.86		1.00		0.86					
Frt	1.00		1.00		1.00		1.00					
Flt Protected	0.95		1.00		0.95		1.00					
Satd. Flow (prot)	1770		6408		1770		6408					
Flt Permitted	0.95		1.00		0.95		1.00					
Satd. Flow (perm)	1770		6408		1770		6408					
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)	163	0	3087	0	33	0	5348	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	163	0	3087	0	33	0	5348	0	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA		Prot		NA					
Protected Phases	5		2		1		6					
Permitted Phases												
Actuated Green, G (s)	13.2		123.1		4.1		113.4					
Effective Green, g (s)	13.2		123.1		4.1		113.4					
Actuated g/C Ratio	0.09		0.88		0.03		0.81					
Clearance Time (s)	6.5		6.3		6.5		6.9					
Vehicle Extension (s)	2.5		8.0		5.0		8.0					
Lane Grp Cap (vph)	166		5634		51		5190					
v/s Ratio Prot	c0.09		0.48		0.02		c0.83					
v/s Ratio Perm												
v/c Ratio	0.98		0.55		0.65		1.03					
Uniform Delay, d1	63.3		2.0		67.2		13.3					
Progression Factor	0.49		0.15		0.00		0.29					
Incremental Delay, d2	61.5		0.3		32.6		16.4					
Delay (s)	92.2		0.6		32.6		20.3					
Level of Service	F		A		C		C					
Approach Delay (s)			5.2				20.3			0.0		
Approach LOS			A				C			A		

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Volume (vph)	0	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	0	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Heavy Vehicles (%)	2%	2%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)	0.0	
Approach LOS	A	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
89: Temie Lee Pkwy. WB U-turn & Route 360

8/27/2014

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Volume (vph)	2600	0	390	0	4390	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3		6.5		4.0		
Lane Util. Factor	0.86		0.97		0.86		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	6408		3433		6408		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	6408		3433		6408		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2826	0	424	0	4772	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	2826	0	424	0	4772	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	102.6		24.6		140.0		
Effective Green, g (s)	102.6		24.6		140.0		
Actuated g/C Ratio	0.73		0.18		1.00		
Clearance Time (s)	6.3		6.5				
Vehicle Extension (s)	8.0		5.0				
Lane Grp Cap (vph)	4696		603		6408		
v/s Ratio Prot	0.44		0.12		0.74		
v/s Ratio Perm							
v/c Ratio	0.60		0.70		0.74		
Uniform Delay, d1	8.9		54.3		0.0		
Progression Factor	0.28		0.14		1.00		
Incremental Delay, d2	0.5		1.6		0.2		
Delay (s)	3.0		9.1		0.2		
Level of Service	A		A		A		
Approach Delay (s)	3.0				0.9	0.0	
Approach LOS	A				A	A	

Intersection Summary			
HCM 2000 Control Delay	1.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.8
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
90: Route 360 & Winterpock Rd. EB U-turn

8/27/2014

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	200	0	2600	4390	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5		4.0	7.2			
Lane Util. Factor	1.00		0.86	0.86			
Frt	1.00		1.00	1.00			
Flt Protected	0.95		1.00	1.00			
Satd. Flow (prot)	1770		6408	6408			
Flt Permitted	0.95		1.00	1.00			
Satd. Flow (perm)	1770		6408	6408			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	0	2826	4772	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	217	0	2826	4772	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		NA	NA			
Protected Phases	5		Free	6			
Permitted Phases							
Actuated Green, G (s)	18.5		140.0	107.8			
Effective Green, g (s)	18.5		140.0	107.8			
Actuated g/C Ratio	0.13		1.00	0.77			
Clearance Time (s)	6.5			7.2			
Vehicle Extension (s)	3.0			8.0			
Lane Grp Cap (vph)	233		6408	4934			
v/s Ratio Prot	c0.12		0.44	c0.74			
v/s Ratio Perm							
v/c Ratio	0.93		0.44	0.97			
Uniform Delay, d1	60.1		0.0	14.5			
Progression Factor	0.28		1.00	0.18			
Incremental Delay, d2	32.4		0.2	5.2			
Delay (s)	48.9		0.2	7.8			
Level of Service	D		A	A			
Approach Delay (s)			3.6	7.8	0.0		
Approach LOS			A	A	A		

Intersection Summary			
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
93: Lake Harbour Dr. WB U-turn & Route 360

8/27/2014

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑		↰		↑↑↑		
Volume (vph)	2280	0	230	0	3530	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8		6.5		4.0		
Lane Util. Factor	0.86		1.00		0.91		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	6408		1770		5085		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	6408		1770		5085		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2478	0	250	0	3837	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	2478	0	250	0	3837	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	100.6		26.1		140.0		
Effective Green, g (s)	100.6		26.1		140.0		
Actuated g/C Ratio	0.72		0.19		1.00		
Clearance Time (s)	6.8		6.5				
Vehicle Extension (s)	8.0		4.0				
Lane Grp Cap (vph)	4604		329		5085		
v/s Ratio Prot	0.39		0.14		0.75		
v/s Ratio Perm							
v/c Ratio	0.54		0.76		0.75		
Uniform Delay, d1	9.0		54.0		0.0		
Progression Factor	0.08		0.33		1.00		
Incremental Delay, d2	0.3		5.6		0.3		
Delay (s)	1.0		23.3		0.3		
Level of Service	A		C		A		
Approach Delay (s)	1.0				1.7	0.0	
Approach LOS	A				A	A	

Intersection Summary			
HCM 2000 Control Delay	1.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.3
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
96: Craig Rath Blvd. WB U-turn & Route 360

8/27/2014

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑		↰		↑↑↑↑		
Volume (vph)	3270	0	90	0	5640	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0		
Lane Util. Factor	0.86		1.00		0.86		
Frt	1.00		1.00		1.00		
Flt Protected	1.00		0.95		1.00		
Satd. Flow (prot)	6225		1719		6225		
Flt Permitted	1.00		0.95		1.00		
Satd. Flow (perm)	6225		1719		6225		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3554	0	98	0	6130	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0
Lane Group Flow (vph)	3554	0	98	0	6130	0	0
Turn Type	NA		Prot		NA		
Protected Phases	2		1		Free		
Permitted Phases							
Actuated Green, G (s)	118.7		13.3		140.0		
Effective Green, g (s)	118.7		13.3		140.0		
Actuated g/C Ratio	0.85		0.10		1.00		
Clearance Time (s)	4.0		4.0				
Vehicle Extension (s)	3.0		3.0				
Lane Grp Cap (vph)	5277		163		6225		
v/s Ratio Prot	0.57		0.06		0.98		
v/s Ratio Perm							
v/c Ratio	0.67		0.60		0.98		
Uniform Delay, d1	3.8		60.8		0.0		
Progression Factor	0.39		1.00		1.00		
Incremental Delay, d2	0.6		2.3		4.3		
Delay (s)	2.0		63.2		4.3		
Level of Service	A		E		A		
Approach Delay (s)	2.0				5.2	0.0	
Approach LOS	A				A	A	

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
101: Bridgewood Rd/Warbro Rd & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1730	140	40	2400	280	110	40	40	360	80	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	3155	5036	1583	1770	5036	1455		1759		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	3155	5036	1583	1770	5036	1455		1759		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	1880	152	43	2500	304	120	43	43	391	87	315
RTOR Reduction (vph)	0	0	60	0	0	78	0	7	0	0	0	97
Lane Group Flow (vph)	261	1880	92	43	2500	226	0	199	0	391	87	218
Heavy Vehicles (%)	11%	3%	2%	2%	3%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	13.6	74.4	74.4	6.7	67.8	67.8		15.5		17.5	17.5	31.1
Effective Green, g (s)	13.6	74.4	74.4	6.7	67.8	67.8		15.5		17.5	17.5	31.1
Actuated g/C Ratio	0.10	0.53	0.53	0.05	0.48	0.48		0.11		0.12	0.12	0.22
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	306	2676	841	84	2438	704		194		394	214	323
v/s Ratio Prot	c0.08	0.37		0.02	c0.50			c0.11		c0.12	0.05	0.07
v/s Ratio Perm			0.06			0.16						0.08
v/c Ratio	0.85	0.70	0.11	0.51	1.03	0.32		1.03		0.99	0.41	0.67
Uniform Delay, d1	62.2	24.5	16.3	65.1	36.1	22.0		62.2		61.2	56.5	49.8
Progression Factor	0.81	0.51	0.14	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	17.5	1.3	0.2	3.9	25.0	1.2		71.3		43.4	3.5	5.7
Delay (s)	68.0	13.8	2.5	68.9	61.1	23.2		133.6		104.5	60.0	55.5
Level of Service	E	B	A	E	E	C		F		F	E	E
Approach Delay (s)		19.2			57.2			133.6			80.2	
Approach LOS		B			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	48.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.9
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
102: Lonas Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	460	1890	130	100	2610	100	110	20	70	150	10	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5036	1583	3433	6346	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5036	1583	3433	6346	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	500	1989	141	109	2806	109	120	22	76	163	11	348
RTOR Reduction (vph)	0	0	49	0	0	44	0	0	72	0	0	255
Lane Group Flow (vph)	500	1989	92	109	2806	65	120	22	4	163	11	93
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	23.6	90.6	90.6	8.0	75.0	75.0	7.0	7.0	7.0	13.4	13.4	13.4
Effective Green, g (s)	23.6	90.6	90.6	8.0	75.0	75.0	7.0	7.0	7.0	13.4	13.4	13.4
Actuated g/C Ratio	0.17	0.65	0.65	0.06	0.54	0.54	0.05	0.05	0.05	0.10	0.10	0.10
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	578	3259	1024	196	3399	848	171	93	79	328	338	151
v/s Ratio Prot	c0.15	0.39		0.03	c0.44		c0.03	0.01		0.05	0.00	
v/s Ratio Perm			0.06			0.04			0.00			c0.06
v/c Ratio	0.87	0.61	0.09	0.56	0.83	0.08	0.70	0.24	0.05	0.50	0.03	0.62
Uniform Delay, d1	56.7	14.4	9.3	64.3	27.1	15.7	65.5	63.9	63.3	60.1	57.4	60.8
Progression Factor	1.00	1.00	1.00	0.62	0.25	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.7	0.9	0.2	0.9	0.8	0.1	11.4	1.0	0.2	0.9	0.0	6.2
Delay (s)	69.3	15.3	9.4	41.0	7.5	0.1	76.9	64.9	63.5	61.0	57.4	67.1
Level of Service	E	B	A	D	A	A	E	E	E	E	E	E
Approach Delay (s)		25.2			8.4			71.0			65.0	
Approach LOS		C			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection has too many legs for HCM analysis.

Intersection has too many legs for HCM analysis.

HCM Signalized Intersection Capacity Analysis
111: Brad McNeer Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	2940	230	680	5170	0	560	0	370	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.3	6.3	6.5	4.0		6.5		6.5			
Lane Util. Factor		0.81	1.00	0.97	0.86		0.97		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		7192	1583	3433	6108		3433		1583			
Flt Permitted		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)		7192	1583	3433	6108		3433		1583			
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	3128	250	739	5620	0	609	0	402	0	0	0
RTOR Reduction (vph)	0	0	75	0	0	0	0	0	295	0	0	0
Lane Group Flow (vph)	0	3128	175	739	5620	0	609	0	107	0	0	0
Heavy Vehicles (%)	5%	7%	2%	2%	7%	5%	2%	5%	2%	5%	5%	5%
Turn Type		NA	Perm	Prot	NA	Perm	Prot		Perm			
Protected Phases		2		1	Free!		4!					
Permitted Phases			2			Free			4			
Actuated Green, G (s)		63.5	63.5	31.3	140.0		25.9		25.9			
Effective Green, g (s)		63.5	63.5	31.3	140.0		25.9		25.9			
Actuated g/C Ratio		0.45	0.45	0.22	1.00		0.18		0.18			
Clearance Time (s)		6.3	6.3	6.5			6.5		6.5			
Vehicle Extension (s)		8.0	8.0	2.5			2.5		2.5			
Lane Grp Cap (vph)	3262	718	767	6108		635		292				
v/s Ratio Prot	0.43		0.22	0.92		0.18						
v/s Ratio Perm		0.11						0.07				
v/c Ratio	0.96	0.24	0.96	0.92		0.96		0.37				
Uniform Delay, d1	37.0	23.5	53.8	0.0		56.5		49.9				
Progression Factor	0.54	0.26	1.00	1.00		1.00		1.00				
Incremental Delay, d2	7.0	0.6	23.7	3.1		25.6		0.6				
Delay (s)	27.1	6.7	77.5	3.1		82.1		50.4				
Level of Service	C	A	E	A		F		D				
Approach Delay (s)	25.6			11.8			69.5			0.0		
Approach LOS	C			B			E			A		

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
112: Craig Rath Boulevard & Route 360

8/27/2014

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

HCM Signalized Intersection Capacity Analysis
113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	3090	50	320	5220	170	0	0	240	0	0	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.6	6.6	6.5	6.6	6.6			6.5			6.5
Lane Util. Factor	1.00	0.86	1.00	1.00	0.86	1.00			0.88			0.76
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	1770	6108	1583	1770	6108	1583			2787			3610
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	1770	6108	1583	1770	6108	1583			2787			3610
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)	87	3359	54	348	5674	185	0	0	261	0	0	457
RTOR Reduction (vph)	0	0	15	0	0	21	0	0	62	0	0	72
Lane Group Flow (vph)	87	3359	39	348	5674	164	0	0	199	0	0	385
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	12.5	96.5	96.5	30.4	114.4	114.4			30.4			12.5
Effective Green, g (s)	12.5	96.5	96.5	30.4	114.4	114.4			30.4			12.5
Actuated g/C Ratio	0.09	0.69	0.69	0.22	0.82	0.82			0.22			0.09
Clearance Time (s)	6.5	6.6	6.6	6.5	6.6	6.6			6.5			6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0			2.5			2.5
Lane Grp Cap (vph)	158	4210	1091	384	4991	1293			605			322
v/s Ratio Prot	0.05	0.55		0.20	c0.93				0.07			c0.11
v/s Ratio Perm			0.02			0.10						
v/c Ratio	0.55	0.80	0.04	0.91	1.14	0.13			0.33			1.20
Uniform Delay, d1	61.1	15.0	6.9	53.4	12.8	2.6			46.2			63.8
Progression Factor	0.73	0.28	0.00	1.06	0.34	0.08			1.00			1.00
Incremental Delay, d2	2.3	1.2	0.0	3.2	61.8	0.0			0.2			114.4
Delay (s)	47.2	5.3	0.0	60.0	66.2	0.2			46.4			178.2
Level of Service	D	A	A	E	E	A			D			F
Approach Delay (s)		6.3			63.9			46.4			178.2	
Approach LOS		A			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	49.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.1
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
114: Deer Run Dr/Harbour View Ct & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	2660	200	530	4770	130	0	0	350	0	0	740
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	6.4	6.4			6.5			6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00			0.88			0.64
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	3433	6108	1583	3433	6108	1583			2787			4053
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	3433	6108	1583	3433	6108	1583			2787			4053
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	2742	217	576	5185	141	0	0	380	0	0	804
RTOR Reduction (vph)	0	0	12	0	0	35	0	0	60	0	0	66
Lane Group Flow (vph)	228	2742	205	576	5185	106	0	0	320	0	0	738
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	21.5	94.6	94.6	32.4	105.6	105.6			32.4			21.5
Effective Green, g (s)	21.5	94.6	94.6	32.4	105.6	105.6			32.4			21.5
Actuated g/C Ratio	0.15	0.68	0.68	0.23	0.75	0.75			0.23			0.15
Clearance Time (s)	6.5	6.5	6.5	6.5	6.4	6.4			6.5			6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0			2.5			2.5
Lane Grp Cap (vph)	527	4127	1069	794	4607	1194			644			622
v/s Ratio Prot	0.07	0.45		0.17	c0.85				0.11			c0.18
v/s Ratio Perm			0.13			0.07						
v/c Ratio	0.43	0.66	0.19	0.73	1.13	0.09			0.50			1.19
Uniform Delay, d1	53.7	13.4	8.5	49.7	17.2	4.5			46.7			59.2
Progression Factor	1.06	0.87	1.02	0.82	0.47	0.28			1.00			1.00
Incremental Delay, d2	0.3	0.7	0.3	0.3	56.8	0.0			0.4			99.4
Delay (s)	57.4	12.4	8.9	41.1	64.9	1.3			47.2			158.7
Level of Service	E	B	A	D	E	A			D			F
Approach Delay (s)		15.3			61.0			47.2			158.7	
Approach LOS		B			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	54.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	92.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
115: Chital Dr & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	2670	180	350	4910	20	0	0	160	0	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3	6.3	6.5	6.9	6.9			6.5			6.5
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86	1.00			0.88			0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	1770	6108	1583	3433	6108	1583			2787			2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	1770	6108	1583	3433	6108	1583			2787			2787
Peak-hour factor, PHF	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2781	196	380	5337	22	0	0	174	0	0	43
RTOR Reduction (vph)	0	0	13	0	0	3	0	0	63	0	0	42
Lane Group Flow (vph)	22	2781	183	380	5337	19	0	0	111	0	0	1
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	4.0	102.9	102.9	24.3	122.6	122.6			24.3			4.0
Effective Green, g (s)	4.0	102.9	102.9	24.3	122.6	122.6			24.3			4.0
Actuated g/C Ratio	0.03	0.74	0.74	0.17	0.88	0.88			0.17			0.03
Clearance Time (s)	6.5	6.3	6.3	6.5	6.9	6.9			6.5			6.5
Vehicle Extension (s)	2.5	8.0	8.0	5.0	8.0	8.0			5.0			2.5
Lane Grp Cap (vph)	50	4489	1163	595	5348	1386			483			79
v/s Ratio Prot	0.01	c0.46		0.11	c0.87				0.04			0.00
v/s Ratio Perm			0.12			0.01						
v/c Ratio	0.44	0.62	0.16	0.64	1.00	0.01			0.23			0.02
Uniform Delay, d1	66.9	9.0	5.6	53.8	8.6	1.1			49.8			66.1
Progression Factor	1.02	0.65	0.85	0.82	0.14	0.00			1.00			1.00
Incremental Delay, d2	3.8	0.6	0.2	0.3	3.3	0.0			0.5			0.1
Delay (s)	72.3	6.4	5.0	44.4	4.4	0.0			50.3			66.1
Level of Service	E	A	A	D	A	A			D			E
Approach Delay (s)		6.8			7.1			50.3			66.1	
Approach LOS		A			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	2620	200	400	4210	460	0	0	370	0	0	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3	6.3	6.5	6.9	6.9			6.5			6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00			0.76			0.64
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	3433	6108	1583	3433	6108	1583			3610			4053
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	3433	6108	1583	3433	6108	1583			3610			4053
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	2787	217	435	4576	489	0	0	402	0	0	620
RTOR Reduction (vph)	0	0	12	0	0	45	0	0	62	0	0	68
Lane Group Flow (vph)	185	2787	205	435	4576	444	0	0	340	0	0	552
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	19.5	101.6	101.6	25.6	107.1	107.1			25.6			19.5
Effective Green, g (s)	19.5	101.6	101.6	25.6	107.1	107.1			25.6			19.5
Actuated g/C Ratio	0.14	0.73	0.73	0.18	0.76	0.76			0.18			0.14
Clearance Time (s)	6.5	6.3	6.3	6.5	6.9	6.9			6.5			6.5
Vehicle Extension (s)	2.5	8.0	8.0	5.0	8.0	8.0			5.0			2.5
Lane Grp Cap (vph)	478	4432	1148	627	4672	1210			660			564
v/s Ratio Prot	0.05	0.46		0.13	c0.75				0.09			c0.14
v/s Ratio Perm			0.13			0.28						
v/c Ratio	0.39	0.63	0.18	0.69	0.98	0.37			0.51			0.98
Uniform Delay, d1	54.8	9.7	6.1	53.5	15.4	5.4			51.6			60.0
Progression Factor	1.10	0.71	0.91	0.80	0.30	0.05			1.00			1.00
Incremental Delay, d2	0.3	0.6	0.3	0.4	1.4	0.1			1.4			32.1
Delay (s)	60.8	7.5	5.8	43.3	6.0	0.3			53.0			92.2
Level of Service	E	A	A	D	A	A			D			F
Approach Delay (s)		10.4			8.5			53.0			92.2	
Approach LOS		B			A			D			F	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
117: Winterpock Rd/Lake Harbour Dr & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	2270	220	940	3490	170	0	0	530	0	0	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2			6.5			6.5
Lane Util. Factor	1.00	0.86	1.00	0.94	0.91	1.00			0.88			0.88
Frt	1.00	1.00	0.85	1.00	1.00	0.85			0.85			0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (prot)	1770	6108	1583	4990	4848	1583			2787			2787
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00			1.00			1.00
Satd. Flow (perm)	1770	6108	1583	4990	4848	1583			2787			2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	22	2467	239	1022	3793	185	0	0	564	0	0	293
RTOR Reduction (vph)	0	0	30	0	0	34	0	0	22	0	0	79
Lane Group Flow (vph)	22	2467	209	1022	3793	151	0	0	542	0	0	214
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm			Over			Over
Protected Phases	5	2		1	6				1			5
Permitted Phases			2			6						
Actuated Green, G (s)	11.9	88.8	88.8	37.9	114.4	114.4			37.9			11.9
Effective Green, g (s)	11.9	88.8	88.8	37.9	114.4	114.4			37.9			11.9
Actuated g/C Ratio	0.09	0.63	0.63	0.27	0.82	0.82			0.27			0.09
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2			6.5			6.5
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0			4.0			3.0
Lane Grp Cap (vph)	150	3874	1004	1350	3961	1293			754			236
v/s Ratio Prot	0.01	0.40		c0.20	c0.78				0.19			0.08
v/s Ratio Perm			0.13			0.10						
v/c Ratio	0.15	0.64	0.21	0.76	0.96	0.12			0.72			0.91
Uniform Delay, d1	59.3	15.7	10.8	46.8	10.8	2.6			46.2			63.5
Progression Factor	1.12	0.37	0.30	0.87	0.33	0.94			1.00			1.00
Incremental Delay, d2	0.4	0.7	0.4	0.8	2.7	0.1			3.5			34.5
Delay (s)	66.7	6.4	3.6	41.6	6.3	2.5			49.8			98.0
Level of Service	E	A	A	D	A	A			D			F
Approach Delay (s)		6.7			13.4			49.8			98.0	
Approach LOS		A			B			D			F	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
118: Hancock Village/Duckridge Blvd & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	2110	140	270	3220	30	280	20	150	20	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1617		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1617		1770	1863	1583
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)	43	2293	152	293	3500	33	304	22	163	22	11	54
RTOR Reduction (vph)	0	0	63	0	0	11	0	148	0	0	0	52
Lane Group Flow (vph)	43	2293	89	293	3500	22	304	37	0	22	11	2
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	4.0	81.8	81.8	16.2	93.3	93.3	13.7	12.7		3.0	2.0	6.0
Effective Green, g (s)	4.0	81.8	81.8	16.2	93.3	93.3	13.7	12.7		3.0	2.0	6.0
Actuated g/C Ratio	0.03	0.58	0.58	0.12	0.67	0.67	0.10	0.09		0.02	0.01	0.04
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5		6.5	6.5	6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	50	2971	924	397	3388	1054	335	146		37	26	67
v/s Ratio Prot	0.02	c0.45		0.09	c0.69		c0.09	c0.02		0.01	0.01	0.00
v/s Ratio Perm			0.06			0.01						0.00
v/c Ratio	0.86	0.77	0.10	0.74	1.03	0.02	0.91	0.25		0.59	0.42	0.03
Uniform Delay, d1	67.7	22.0	12.8	59.8	23.4	7.9	62.5	59.2		67.9	68.4	64.2
Progression Factor	0.69	0.17	0.21	0.86	1.09	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	53.7	1.2	0.1	4.3	22.0	0.0	26.9	0.7		19.6	7.9	0.2
Delay (s)	100.3	5.1	2.8	55.9	47.5	7.9	89.4	59.9		87.5	76.3	64.4
Level of Service	F	A	A	E	D	A	F	E		F	E	E
Approach Delay (s)		6.6			47.8			78.2			71.7	
Approach LOS		A			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
119: Ashlake Pkwy & Route 360

8/27/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2150	120	260	3290	160	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	6.5	6.8	6.5	6.5
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	4577	1425	3090	4577	3090	1425
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	4577	1425	3090	4577	3090	1425
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2337	130	283	3576	174	141
RTOR Reduction (vph)	0	47	0	0	0	130
Lane Group Flow (vph)	2337	83	283	3576	174	11
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	89.7	89.7	20.0	115.8	10.9	10.9
Effective Green, g (s)	89.7	89.7	20.0	115.8	10.9	10.9
Actuated g/C Ratio	0.64	0.64	0.14	0.83	0.08	0.08
Clearance Time (s)	6.4	6.4	6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0	6.0	2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	2932	913	441	3785	240	110
v/s Ratio Prot	0.51		0.09	c0.78	c0.06	
v/s Ratio Perm		0.06				0.01
v/c Ratio	0.80	0.09	0.64	0.94	0.72	0.10
Uniform Delay, d1	18.5	9.6	56.6	9.6	63.1	60.0
Progression Factor	0.55	0.42	0.74	0.67	1.00	1.00
Incremental Delay, d2	1.8	0.1	0.9	2.2	9.8	0.3
Delay (s)	12.0	4.2	43.0	8.6	72.8	60.3
Level of Service	B	A	D	A	E	E
Approach Delay (s)	11.6			11.1	67.2	
Approach LOS	B			B	E	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
120: Route 360 & Woodlake Village Pkwy

8/27/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	80	1550	2490	950	720	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	4848	4848	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	4848	4848	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	1685	2707	1033	783	54
RTOR Reduction (vph)	0	0	0	389	0	24
Lane Group Flow (vph)	87	1685	2707	644	783	30
Heavy Vehicles (%)	2%	7%	7%	2%	2%	2%
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	7.9	93.9	79.9	79.9	32.9	32.9
Effective Green, g (s)	7.9	93.9	79.9	79.9	32.9	32.9
Actuated g/C Ratio	0.06	0.67	0.57	0.57	0.23	0.23
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	99	3251	2766	903	806	372
v/s Ratio Prot	c0.05	0.35	c0.56		c0.23	
v/s Ratio Perm				0.41		0.02
v/c Ratio	0.88	0.52	0.98	0.71	0.97	0.08
Uniform Delay, d1	65.6	11.6	29.2	21.7	53.1	41.8
Progression Factor	1.09	0.69	0.68	1.13	1.00	1.00
Incremental Delay, d2	8.1	0.1	6.4	1.7	24.8	0.1
Delay (s)	79.5	8.1	26.4	26.4	77.9	41.9
Level of Service	E	A	C	C	E	D
Approach Delay (s)		11.6	26.4		75.6	
Approach LOS		B	C		E	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
121: Hampton Park Dr/Fox Club Pkwy & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1050	10	270	2010	260	10	40	230	350	70	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor		0.91	1.00	1.00	0.91	1.00		1.00	1.00	0.97	1.00	1.00
Frt		1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)		4847	1583	1770	4848	1583		1844	1583	3433	1863	1583
Flt Permitted		0.72	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3495	1583	1770	4848	1583		1844	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.96	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1094	11	293	2094	283	11	43	250	380	76	65
RTOR Reduction (vph)	0	0	5	0	0	68	0	0	238	0	0	59
Lane Group Flow (vph)	0	1137	6	293	2094	215	0	54	12	380	76	6
Heavy Vehicles (%)	2%	7%	2%	2%	7%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)		73.1	73.1	20.5	100.2	100.2		6.5	6.5	13.5	13.5	13.5
Effective Green, g (s)		73.1	73.1	20.5	100.2	100.2		6.5	6.5	13.5	13.5	13.5
Actuated g/C Ratio		0.52	0.52	0.15	0.72	0.72		0.05	0.05	0.10	0.10	0.10
Clearance Time (s)		6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)		7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1824	826	259	3469	1132		85	73	331	179	152	
v/s Ratio Prot			c0.17	c0.43			c0.03		c0.11	0.04		
v/s Ratio Perm	0.33	0.00			0.14			0.01				0.00
v/c Ratio	0.62	0.01	1.13	0.60	0.19		0.64	0.16	1.15	0.42	0.04	
Uniform Delay, d1	23.7	16.0	59.8	10.0	6.5		65.6	64.1	63.2	59.6	57.4	
Progression Factor	0.71	1.00	0.54	0.04	0.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.0	73.5	0.2	0.1		14.5	1.0	95.9	1.6	0.1	
Delay (s)	17.4	16.1	105.6	0.6	0.1		80.1	65.1	159.2	61.2	57.5	
Level of Service	B	B	F	A	A		F	E	F	E	E	
Approach Delay (s)	17.4			12.1			67.8			132.2		
Approach LOS	B			B			E			F		

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
122: Otterdale Rd & Route 360

8/27/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	870	20	270	1660	150	20	10	160	80	30	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3		6.5	7.4	7.4	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1719	4836		1593	4848	1538	1770	3539	1583	1719	3438	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1719	4836		1593	4848	1538	1770	3539	1583	1719	3438	1538
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	897	22	293	1804	156	22	11	174	87	33	87
RTOR Reduction (vph)	0	2	0	0	0	58	0	0	109	0	0	80
Lane Group Flow (vph)	43	917	0	293	1804	98	22	11	65	87	33	7
Heavy Vehicles (%)	5%	7%	2%	2%	7%	5%	2%	2%	2%	5%	5%	5%
Parking (#/hr)				0								
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	9.2	66.1		30.9	87.7	87.7	4.4	4.4	35.3	11.8	11.8	11.8
Effective Green, g (s)	9.2	66.1		30.9	87.7	87.7	4.4	4.4	35.3	11.8	11.8	11.8
Actuated g/C Ratio	0.07	0.47		0.22	0.63	0.63	0.03	0.03	0.25	0.08	0.08	0.08
Clearance Time (s)	6.5	7.3		6.5	7.4	7.4	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0		2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	112	2283		351	3036	963	55	111	472	144	289	129
v/s Ratio Prot	0.03	c0.19		c0.18	c0.37		c0.01	0.00	0.03	c0.05	0.01	
v/s Ratio Perm						0.06			0.01			0.00
v/c Ratio	0.38	0.40		0.83	0.59	0.10	0.40	0.10	0.14	0.60	0.11	0.06
Uniform Delay, d1	62.7	24.1		52.1	15.6	10.4	66.5	65.9	40.6	61.8	59.3	59.0
Progression Factor	1.00	1.00		1.07	0.16	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.5		13.1	0.7	0.2	3.4	0.3	0.1	5.9	0.1	0.1
Delay (s)	64.3	24.6		68.7	3.2	1.4	70.0	66.2	40.7	67.8	59.4	59.1
Level of Service	E	C		E	A	A	E	E	D	E	E	E
Approach Delay (s)		26.4			11.6			45.1			62.8	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.9
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
123: Bailey Bridge Road & Bailey Bridge Connector

8/27/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	270	200	290	290	390	510
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.56	1.00
Satd. Flow (perm)	1770	1583	1863	1583	1047	1863
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	293	217	315	315	424	554
RTOR Reduction (vph)	0	159	0	138	0	0
Lane Group Flow (vph)	293	58	315	177	424	554
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	12.4	12.4	26.0	26.0	26.0	26.0
Effective Green, g (s)	12.4	12.4	26.0	26.0	26.0	26.0
Actuated g/C Ratio	0.27	0.27	0.56	0.56	0.56	0.56
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	473	423	1043	887	586	1043
v/s Ratio Prot	c0.17		0.17			0.30
v/s Ratio Perm		0.04		0.11	c0.41	
v/c Ratio	0.62	0.14	0.30	0.20	0.72	0.53
Uniform Delay, d1	14.9	12.9	5.4	5.0	7.5	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.1	0.2	0.1	4.4	0.5
Delay (s)	17.3	13.1	5.6	5.2	12.0	6.9
Level of Service	B	B	A	A	B	A
Approach Delay (s)	15.5		5.4			9.1
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	46.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
124: Bailey Bridge Road & Deer Run Drive

8/27/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	80	400	570	220	180	140
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	435	620	239	196	152
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	859				1228	620
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	859				1228	620
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				0	69
cM capacity (veh/h)	782				175	488

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	SB 2
Volume Total	87	435	620	239	196	152
Volume Left	87	0	0	0	196	0
Volume Right	0	0	0	239	0	152
cSH	782	1700	1700	1700	175	488
Volume to Capacity	0.11	0.26	0.36	0.14	1.12	0.31
Queue Length 95th (ft)	9	0	0	0	249	33
Control Delay (s)	10.2	0.0	0.0	0.0	157.9	15.7
Lane LOS	B				F	C
Approach Delay (s)	1.7		0.0		95.7	
Approach LOS					F	

Intersection Summary			
Average Delay	19.8		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
125: Springford Parkway/Bailey Bridge Road & Spring Run Road

8/28/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	160	220	60	150	90	130	350	30	70	580	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1840		1770	1833	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.22	1.00		0.45	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	408	1840		847	1833	
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)	54	174	239	65	163	98	141	380	33	76	630	76
RTOR Reduction (vph)	0	0	175	0	0	77	0	5	0	0	7	0
Lane Group Flow (vph)	54	174	64	65	163	21	141	408	0	76	699	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	2.0	10.8	10.8	2.0	10.8	10.8	26.8	26.8		26.8	26.8	
Effective Green, g (s)	2.0	10.8	10.8	2.0	10.8	10.8	26.8	26.8		26.8	26.8	
Actuated g/C Ratio	0.04	0.21	0.21	0.04	0.21	0.21	0.52	0.52		0.52	0.52	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	68	389	331	68	389	331	211	955		439	952	
v/s Ratio Prot	0.03	c0.09		c0.04	0.09			0.22			c0.38	
v/s Ratio Perm			0.04			0.01	0.35			0.09		
v/c Ratio	0.79	0.45	0.19	0.96	0.42	0.06	0.67	0.43		0.17	0.73	
Uniform Delay, d1	24.6	17.8	16.8	24.8	17.7	16.3	9.1	7.7		6.5	9.6	
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	45.6	0.8	0.3	92.9	0.7	0.1	7.8	0.3		0.2	3.0	
Delay (s)	70.2	18.6	17.1	117.7	18.4	16.4	16.9	8.0		6.7	12.6	
Level of Service	E	B	B	F	B	B	B	A		A	B	
Approach Delay (s)		23.8			37.6			10.2			12.0	
Approach LOS		C			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	51.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
126: Millridge Pkwy/Market Square Ent & Old Hundred Rd

8/27/2014

Movement	EBL	EBT	EBR2	WBL	WBT	WBR	SBL2	SBT	SBR	NWL	NWR	NWR2
Lane Configurations												
Volume (vph)	20	20	270	140	40	20	20	760	30	390	870	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	1.00	0.97	1.00		1.00	0.95		0.97	0.88	1.00
Frt		1.00	0.85	1.00	0.95		1.00	0.99		1.00	0.85	0.85
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1765	1538	3335	1718		1719	3418		3335	2707	1538
Flt Permitted		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1765	1538	3335	1718		1719	3418		3335	2707	1538
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)	22	22	293	152	43	22	22	826	33	424	946	120
RTOR Reduction (vph)	0	0	256	0	20	0	0	3	0	0	0	59
Lane Group Flow (vph)	0	44	37	152	45	0	22	856	0	424	946	61
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	Perm	Perm
Protected Phases	4	4		3	3		1	6		5		
Permitted Phases			4								2	2
Actuated Green, G (s)		8.0	8.0	6.6	6.6		0.7	20.1		12.7	32.1	32.1
Effective Green, g (s)		8.0	8.0	6.6	6.6		0.7	20.1		12.7	32.1	32.1
Actuated g/C Ratio		0.13	0.13	0.10	0.10		0.01	0.32		0.20	0.51	0.51
Clearance Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		222	194	347	178		18	1083		668	1370	778
v/s Ratio Prot	c0.02		c0.05	0.03			0.01	c0.25		c0.13		
v/s Ratio Perm		0.02									0.35	0.04
v/c Ratio	0.20	0.19	0.44	0.25	1.22	0.79				0.63	0.69	0.08
Uniform Delay, d1	24.8	24.8	26.7	26.1	31.3	19.7				23.2	11.9	8.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.4	0.5	0.9	0.8	289.8	5.9				2.0	1.5	0.0
Delay (s)	25.3	25.3	27.5	26.9	321.1	25.6				25.2	13.4	8.1
Level of Service	C	C	C	C	F	C				C	B	A
Approach Delay (s)	25.3			27.4		33.0				16.3		
Approach LOS	C			C		C				B		

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	63.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
127: Old Hundred Rd & Market Square

8/27/2014

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	60	30	890	10	20	750
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)	65	33	967	11	22	815
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)			916			
pX, platoon unblocked						
vC, conflicting volume	1826	967			978	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1826	967			978	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	19	89			97	
cM capacity (veh/h)	80	304			694	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	98	967	11	22	815
Volume Left	65	0	0	22	0
Volume Right	33	0	11	0	0
cSH	107	1700	1700	694	1700
Volume to Capacity	0.92	0.57	0.01	0.03	0.48
Queue Length 95th (ft)	138	0	0	2	0
Control Delay (s)	139.9	0.0	0.0	10.4	0.0
Lane LOS	F			B	
Approach Delay (s)	139.9	0.0		0.3	
Approach LOS	F				

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
128: Bailey Bridge Connector & Brad McNeer Pkwy

8/27/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	250	240	770	600	470	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1719	1810	1810	1538	1719	1538
Flt Permitted	0.07	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	132	1810	1810	1538	1719	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	261	837	652	511	152
RTOR Reduction (vph)	0	0	0	281	0	107
Lane Group Flow (vph)	272	261	837	371	511	45
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	67.0	67.0	49.0	49.0	31.0	31.0
Effective Green, g (s)	67.0	67.0	49.0	49.0	31.0	31.0
Actuated g/C Ratio	0.61	0.61	0.45	0.45	0.28	0.28
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	253	1102	806	685	484	433
v/s Ratio Prot	c0.12	0.14	0.46		c0.30	
v/s Ratio Perm	c0.54			0.24		0.03
v/c Ratio	1.08	0.24	1.04	0.54	1.06	0.10
Uniform Delay, d1	35.7	9.8	30.5	22.3	39.5	29.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	78.0	0.1	42.1	0.9	56.4	0.1
Delay (s)	113.7	9.9	72.6	23.2	95.9	29.3
Level of Service	F	A	E	C	F	C
Approach Delay (s)		62.9	51.0		80.7	
Approach LOS		E	D		F	

Intersection Summary			
HCM 2000 Control Delay	60.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 10: 360 WB On Ramp & Commonwealth Centre Pkwy Overpass & Old Hundred Rd & Old H

Movement	EB	EB	EB	B52	B52	NW	NW
Directions Served	T	T	>	T	T	R	R
Maximum Queue (ft)	202	154	189	106	90	97	101
Average Queue (ft)	160	79	127	25	13	97	90
95th Queue (ft)	232	149	190	103	69	97	108
Link Distance (ft)	146	146	146	403	403	8	8
Upstream Blk Time (%)	24	1	8			33	35
Queuing Penalty (veh)	95	5	30			157	165
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 17: Old Hundred Rd. Overpass & Old Hundred Rd Overpass & 360 WB Off Ramp

Movement	EB	EB	SB	SB
Directions Served	R	R	L	L
Maximum Queue (ft)	35	29	120	132
Average Queue (ft)	25	20	88	110
95th Queue (ft)	46	38	135	152
Link Distance (ft)	2	2	70	70
Upstream Blk Time (%)	2	2	27	51
Queuing Penalty (veh)	5	6	82	153
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 28: Route 360 & Mockingbird Ln. EB U-turn

Movement	EB	WB	WB	WB	WB
Directions Served	U	T	T	T	T
Maximum Queue (ft)	105	635	643	641	645
Average Queue (ft)	61	616	627	626	622
95th Queue (ft)	116	641	650	652	651
Link Distance (ft)		600	600	600	600
Upstream Blk Time (%)		9	19	13	11
Queuing Penalty (veh)		129	270	182	155
Storage Bay Dist (ft)	300				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 39: Route 360 & Deer Run Dr. EB U-turn

Movement	EB	WB	WB	WB	WB
Directions Served	U	T	T	T	T
Maximum Queue (ft)	235	192	207	226	188
Average Queue (ft)	159	120	108	130	129
95th Queue (ft)	392	228	210	249	231
Link Distance (ft)	462	1531	1531	1531	1531
Upstream Blk Time (%)	4				
Queuing Penalty (veh)	20				
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 40: Harbour Pointe Pkwy. WB U-turn & Route 360

Movement	EB	EB	EB	EB	EB	WB
Directions Served	T	T	T	T	T	U
Maximum Queue (ft)	161	227	280	321	103	123
Average Queue (ft)	86	151	204	242	27	83
95th Queue (ft)	175	241	307	356	89	133
Link Distance (ft)	1531	1531	1531	1531	1531	396
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 47: Commonwealth Centre Pkwy & Commonwealth Centre Pkwy Overpass & Old Hundred F

Movement	WB	WB	SB	SB
Directions Served	T	T	L	L
Maximum Queue (ft)	133	139	69	72
Average Queue (ft)	123	127	58	62
95th Queue (ft)	143	151	76	71
Link Distance (ft)	60	60	-6	-6
Upstream Blk Time (%)	60	39		
Queuing Penalty (veh)	381	246		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 48: Commonwealth Centre Pkwy Overpass & 360 WB On Ramp

Movement	NW	NW	NW
Directions Served	L	LT	T
Maximum Queue (ft)	15	59	68
Average Queue (ft)	2	55	33
95th Queue (ft)	20	72	76
Link Distance (ft)	7	7	7
Upstream Blk Time (%)	0	7	2
Queuing Penalty (veh)	1	39	13
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 54: Old Hundred Rd & WB Ramp

Movement	NB	NB	SW
Directions Served	L	L	R
Maximum Queue (ft)	81	13	80
Average Queue (ft)	21	4	49
95th Queue (ft)	75	25	96
Link Distance (ft)	35	35	28
Upstream Blk Time (%)	1	0	8
Queuing Penalty (veh)	3	1	33
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 62: 360 WB Off Ramp & WB Ramp

Movement	SW	SW	SW
Directions Served	L	L	R
Maximum Queue (ft)	65	72	35
Average Queue (ft)	17	27	7
95th Queue (ft)	55	75	36
Link Distance (ft)			400
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	200	200	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 65: 360 WB On Ramp

Movement	WB	WB	SB
Directions Served	L	L	R
Maximum Queue (ft)	48	7	82
Average Queue (ft)	9	1	64
95th Queue (ft)	56	10	82
Link Distance (ft)	62	62	18
Upstream Blk Time (%)	4		17
Queuing Penalty (veh)	17		98
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 67: Commonwealth Centre Pkwy & 360 EB On Ramp

Movement	NW	NW	NW
Directions Served	L	L	R
Maximum Queue (ft)	208	204	109
Average Queue (ft)	89	72	15
95th Queue (ft)	189	182	96
Link Distance (ft)	1302	1302	1302
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 68: Commonwealth Centre Pkwy & 360 EB Off Ramp

Movement	EB
Directions Served	R
Maximum Queue (ft)	77
Average Queue (ft)	25
95th Queue (ft)	77
Link Distance (ft)	45
Upstream Blk Time (%)	2
Queuing Penalty (veh)	9
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 69: 360 EB On Ramp

Movement	EB	NB
Directions Served	L	R
Maximum Queue (ft)	62	159
Average Queue (ft)	27	104
95th Queue (ft)	63	172
Link Distance (ft)	31	78
Upstream Blk Time (%)	2	11
Queuing Penalty (veh)	6	62
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 70: Old Hundred Rd. Overpass & 360 EB On Ramp

Movement	SE	SE
Directions Served	LR	R
Maximum Queue (ft)	110	120
Average Queue (ft)	76	105
95th Queue (ft)	130	129
Link Distance (ft)	47	47
Upstream Blk Time (%)	26	48
Queuing Penalty (veh)	154	285
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 71: 360 EB Off Ramp & Commonwealth Centre Pkwy Overpass

Movement	WB	WB	NB	NB
Directions Served	R	R	L	L
Maximum Queue (ft)	41	31	89	88
Average Queue (ft)	25	21	84	55
95th Queue (ft)	50	44	92	92
Link Distance (ft)	8	8	37	37
Upstream Blk Time (%)	2	2	50	18
Queuing Penalty (veh)	11	14	119	43
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 72: 360 EB Off Ramp

Movement	NE	NE	NE
Directions Served	L	L	R
Maximum Queue (ft)	142	91	11
Average Queue (ft)	77	14	2
95th Queue (ft)	140	78	11
Link Distance (ft)			373
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	200	200	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 80: Route 360 & Chital Dr. EB U-turn

Movement	EB	WB	WB	WB	WB
Directions Served	U	T	T	T	T
Maximum Queue (ft)	169	184	155	157	148
Average Queue (ft)	105	121	90	84	79
95th Queue (ft)	199	230	170	169	157
Link Distance (ft)	404	763	763	763	763
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 81: Harbour View Ct. WB U-turn & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB
Directions Served	T	T	T	T	U	U	T	T
Maximum Queue (ft)	204	234	274	301	181	156	13	10
Average Queue (ft)	83	118	151	162	125	110	2	1
95th Queue (ft)	236	275	328	352	206	184	18	14
Link Distance (ft)	763	763	763	763	460	460	460	460
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 85: Chital Dr. WB U-turn/N. Spring Run Rd. EB U-turn & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	U	T	T	T	T	U	T	T	T	T
Maximum Queue (ft)	245	54	60	54	87	45	226	202	196	172
Average Queue (ft)	174	14	18	15	27	16	156	135	133	113
95th Queue (ft)	322	58	61	61	88	51	367	355	353	331
Link Distance (ft)	385	385	385	385	385		382	382	382	382
Upstream Blk Time (%)	0						2	1	1	0
Queuing Penalty (veh)	0						21	11	14	5
Storage Bay Dist (ft)						300				
Storage Blk Time (%)							5			
Queuing Penalty (veh)							2			

Intersection: 89: Temie Lee Pkwy. WB U-turn & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB
Directions Served	T	T	T	T	U	U	T
Maximum Queue (ft)	127	132	170	147	188	158	5
Average Queue (ft)	67	88	112	105	140	124	1
95th Queue (ft)	136	154	186	147	217	193	7
Link Distance (ft)	286	286	286	286	508	508	508
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 90: Route 360 & Winterpock Rd. EB U-turn

Movement	EB	EB	WB	WB	WB	WB	B2	B2	B2
Directions Served	U	T	T	T	T	T	T	T	T
Maximum Queue (ft)	240	170	164	164	170	31	79	37	35
Average Queue (ft)	157	38	130	129	125	7	25	12	10
95th Queue (ft)	266	173	190	194	188	29	105	48	43
Link Distance (ft)		601	101	101	101	101	286	286	286
Upstream Blk Time (%)			10	8	10				
Queuing Penalty (veh)			114	88	110				
Storage Bay Dist (ft)	200								
Storage Blk Time (%)	6	0							
Queuing Penalty (veh)	36	0							

Intersection: 93: Lake Harbour Dr. WB U-turn & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB
Directions Served	T	T	T	T	U	T	T	T
Maximum Queue (ft)	47	48	82	100	198	191	185	179
Average Queue (ft)	10	12	33	54	147	63	45	34
95th Queue (ft)	41	48	91	104	218	290	224	199
Link Distance (ft)	702	702	702	702		379	379	379
Upstream Blk Time (%)						1	0	0
Queuing Penalty (veh)						14	0	0
Storage Bay Dist (ft)					250			
Storage Blk Time (%)						4		
Queuing Penalty (veh)						9		

Intersection: 96: Craig Rath Blvd. WB U-turn & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	B15	B15	B15
Directions Served	T	T	T	T	U	T	T	T	T		T	T
Maximum Queue (ft)	90	67	82	132	449	592	600	594	607	575	594	584
Average Queue (ft)	27	21	22	42	230	557	570	563	573	462	510	506
95th Queue (ft)	86	66	79	135	544	661	670	676	650	819	802	761
Link Distance (ft)	600	600	600	600		495	495	495	495	535	535	535
Upstream Blk Time (%)						24	64	50	59	11	38	16
Queuing Penalty (veh)						347	915	714	851	125	440	182
Storage Bay Dist (ft)					350							
Storage Blk Time (%)						24						
Queuing Penalty (veh)						21						

Intersection: 96: Craig Rath Blvd. WB U-turn & Route 360

Movement	B15	B15
Directions Served	T	T
Maximum Queue (ft)	573	571
Average Queue (ft)	505	510
95th Queue (ft)	714	692
Link Distance (ft)	535	535
Upstream Blk Time (%)	7	7
Queuing Penalty (veh)	77	86
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	LTR
Maximum Queue (ft)	169	194	133	158	158	43	279	635	716	765	450	280
Average Queue (ft)	124	139	79	103	103	17	92	520	571	629	312	206
95th Queue (ft)	222	229	149	174	160	45	329	720	810	891	617	348
Link Distance (ft)			1521	1521	1521			5220	5220	5220		1540
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	205	205				90	190				200	
Storage Blk Time (%)	3	4			19		0	38		43		
Queuing Penalty (veh)	16	23			27		0	15		120		

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	232	271	162	277
Average Queue (ft)	169	204	81	176
95th Queue (ft)	249	291	182	283
Link Distance (ft)			1263	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		250
Storage Blk Time (%)	0	7	0	3
Queuing Penalty (veh)	1	25	1	13

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	L	L	T	T	T	T	R
Maximum Queue (ft)	250	235	173	207	221	53	88	272	909	316	287	41
Average Queue (ft)	171	186	112	131	147	24	51	224	340	260	200	21
95th Queue (ft)	254	251	191	226	240	53	93	309	865	327	297	46
Link Distance (ft)			635	635	635			1521	1521	1521		
Upstream Blk Time (%)									0			
Queuing Penalty (veh)									0			
Storage Bay Dist (ft)	420	420				200	200				200	200
Storage Blk Time (%)								15		25	3	
Queuing Penalty (veh)								15		190	17	

Intersection: 102: Lonas Pkwy & Route 360

Movement	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	L	T	R	L	L	T	R
Maximum Queue (ft)	99	124	51	66	137	101	37	52
Average Queue (ft)	41	90	25	35	92	61	8	7
95th Queue (ft)	101	134	61	66	144	128	29	71
Link Distance (ft)			402	402	257	257	257	257
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	240	240						
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

Movement	WB	B53	B53
Directions Served	T	T	T
Maximum Queue (ft)	15	304	313
Average Queue (ft)	2	43	45
95th Queue (ft)	16	302	311
Link Distance (ft)	1000	635	635
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	WB	SB
Directions Served	T	T	R
Maximum Queue (ft)	26	136	26
Average Queue (ft)	4	34	4
95th Queue (ft)	35	124	28
Link Distance (ft)	290	290	1044
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	WB	WB
Directions Served	T	R
Maximum Queue (ft)	663	482
Average Queue (ft)	117	69
95th Queue (ft)	529	398
Link Distance (ft)	632	632
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	7	2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	B77	B77	WB	WB	SB	SB	B55	B55
Directions Served	T	T	T	T	R	R	T	T
Maximum Queue (ft)	17	86	77	92	838	806	174	154
Average Queue (ft)	2	11	9	32	417	434	39	35
95th Queue (ft)	16	95	72	103	1097	1042	263	248
Link Distance (ft)	324	324	331	331	1139	1139	3562	3562
Upstream Blk Time (%)					9	7		
Queuing Penalty (veh)					0	0		
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 107:

Movement	SW	SW	SW	SW	B77	B77	B77	B77	B77
Directions Served	T	T	T	T	T	T	T	T	T
Maximum Queue (ft)	67	70	65	61	121	375	600	665	251
Average Queue (ft)	3	3	7	7	17	123	461	461	66
95th Queue (ft)	24	28	72	70	165	476	820	943	335
Link Distance (ft)	324	324	324	324	502	502	502	502	502
Upstream Blk Time (%)						0	20	48	0
Queuing Penalty (veh)						2	216	528	0
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 109:

Movement	SB	B66	B66	NE	NE	SW	SW	SW	SW
Directions Served	R	T	T	T	R	T	T	T	T
Maximum Queue (ft)	99	160	161	8	179	546	536	539	564
Average Queue (ft)	35	48	35	1	50	198	191	192	193
95th Queue (ft)	146	249	222	11	346	681	682	698	714
Link Distance (ft)	111	404	404	772	772	1064	1064	1064	1064
Upstream Blk Time (%)	15	5	4			0	1	2	3
Queuing Penalty (veh)	100	36	27			5	16	26	35
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	R	L	L	T	T	T	T
Maximum Queue (ft)	317	342	323	377	433	345	542	700	824	818	824	821
Average Queue (ft)	244	261	271	310	345	147	444	570	641	633	678	639
95th Queue (ft)	338	378	363	410	454	370	645	832	973	999	1012	1027
Link Distance (ft)	633	633	633	633	633				772	772	772	772
Upstream Blk Time (%)									17	17	25	30
Queuing Penalty (veh)									170	168	240	292
Storage Bay Dist (ft)						200	500	500				
Storage Blk Time (%)					34	0	9	26	51			
Queuing Penalty (veh)					78	0	115	342	347			

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	WB	WB	NB	NB	NB	B84	B84	B84
Directions Served	R	R	L	L	R	T	T	T
Maximum Queue (ft)	826	406	487	494	321	616	676	206
Average Queue (ft)	577	165	468	474	233	370	430	59
95th Queue (ft)	1050	645	503	490	354	702	762	409
Link Distance (ft)	772	772	403	403	403	810	810	810
Upstream Blk Time (%)	22	1	78	96	1	1	5	1
Queuing Penalty (veh)	212	7	0	0	0	0	0	0
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	WB	WB	WB	WB	WB	B94	B94	B94	B94	B94	B94	NB
Directions Served	T	T	T	T	T		T	T	T	T	T	R
Maximum Queue (ft)	297	292	304	292	305	138	630	673	672	623	642	40
Average Queue (ft)	234	241	242	228	244	57	420	468	486	434	412	16
95th Queue (ft)	397	395	401	392	410	331	849	907	887	849	821	91
Link Distance (ft)	189	189	189	189	189	633	633	633	633	633	633	1061
Upstream Blk Time (%)	49	74	51	42	50		2	6	3	3	2	
Queuing Penalty (veh)	559	850	589	482	577		18	60	29	29	15	
Storage Bay Dist (ft)												
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	L	T	T	T	T	R	R
Maximum Queue (ft)	112	159	113	114	123	321	449	452	451	441	97	158
Average Queue (ft)	53	74	67	58	84	201	310	427	411	366	14	107
95th Queue (ft)	116	180	122	126	125	349	586	467	526	507	133	161
Link Distance (ft)		396	396	396	396		402	402	402	402		880
Upstream Blk Time (%)						0	3	13	6	2	0	
Queuing Penalty (veh)						0	42	182	80	33	0	
Storage Bay Dist (ft)	140					150					160	
Storage Blk Time (%)		2				15	1			15		
Queuing Penalty (veh)		2				193	4			25		

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	NB	SB	SB	SB
Directions Served	R	R	R	R
Maximum Queue (ft)	147	351	319	301
Average Queue (ft)	87	273	177	146
95th Queue (ft)	157	463	311	255
Link Distance (ft)		597		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	200		400	400
Storage Blk Time (%)		6	0	0
Queuing Penalty (veh)		16	0	0

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	122	210	356	397	405	417	233	212	267	312	335	405
Average Queue (ft)	64	99	146	304	317	331	55	142	162	177	206	217
95th Queue (ft)	123	205	391	452	458	458	269	225	271	326	368	444
Link Distance (ft)			460	460	460	460				462	462	462
Upstream Blk Time (%)			1	2	2	2				0	0	0
Queuing Penalty (veh)			10	16	13	14				1	1	6
Storage Bay Dist (ft)	200	200					360	280	280			
Storage Blk Time (%)			2			6				0		
Queuing Penalty (veh)			4			12				1		

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	WB	NB	NB	SB	SB	SB	SB
Directions Served	T	R	R	R	R	R	R
Maximum Queue (ft)	267	155	295	269	344	388	349
Average Queue (ft)	150	79	212	146	225	305	263
95th Queue (ft)	287	211	323	279	356	406	365
Link Distance (ft)	462		1273		809		
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		300		400		400	400
Storage Blk Time (%)			3		0	1	
Queuing Penalty (veh)			5		1	2	

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T	R	L	L	T	T	T	T
Maximum Queue (ft)	62	225	243	248	225	37	154	232	231	225	152	112
Average Queue (ft)	26	127	140	134	133	7	101	130	128	80	82	47
95th Queue (ft)	67	231	249	234	231	37	160	234	296	215	197	150
Link Distance (ft)		382	382	382	382				404	404	404	404
Upstream Blk Time (%)								0	0	0		
Queuing Penalty (veh)								0	6	2		
Storage Bay Dist (ft)	220					200	170	170				
Storage Blk Time (%)		2			2		0	2	5			0
Queuing Penalty (veh)		0			3		1	19	18			0

Intersection: 115: Chital Dr & Route 360

Movement	NB	NB	SB	SB
Directions Served	R	R	R	R
Maximum Queue (ft)	94	128	62	35
Average Queue (ft)	49	87	31	10
95th Queue (ft)	103	141	66	35
Link Distance (ft)		1002	621	621
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	110			
Storage Blk Time (%)	1	7		
Queuing Penalty (veh)	1	6		

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	84	88	240	215	233	267	50	175	254	304	254	186
Average Queue (ft)	51	62	143	157	167	183	13	117	165	188	138	142
95th Queue (ft)	92	96	238	234	248	274	42	176	291	400	325	339
Link Distance (ft)			508	508	508	508				385	385	385
Upstream Blk Time (%)										1	0	0
Queuing Penalty (veh)										10	1	1
Storage Bay Dist (ft)	220	220					230	115	115			
Storage Blk Time (%)			1			2		10	16	7		
Queuing Penalty (veh)			1			3		103	167	29		

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	R	R	R	R	R	R	R	R
Maximum Queue (ft)	136	54	167	141	148	306	282	252	201
Average Queue (ft)	86	18	91	93	100	228	212	177	124
95th Queue (ft)	306	109	166	146	151	406	382	295	215
Link Distance (ft)	385		2179			975			
Upstream Blk Time (%)	0								
Queuing Penalty (veh)	1								
Storage Bay Dist (ft)		200		500	500		500	500	500
Storage Blk Time (%)	1	0				0			
Queuing Penalty (veh)	5	2				1			

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	T	L	L	L	T	T	T	R
Maximum Queue (ft)	37	171	157	139	142	204	273	276	208	252	212	267
Average Queue (ft)	10	99	109	103	104	145	215	222	123	146	148	185
95th Queue (ft)	29	173	160	148	153	224	279	282	220	257	221	265
Link Distance (ft)		379	379	379	379				601	601	601	1863
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	180					280	280	280				
Storage Blk Time (%)		1			0		0	0	0			
Queuing Penalty (veh)		0			1		4	5	3			

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	NB	SB	SB
Directions Served	R	R	R
Maximum Queue (ft)	238	368	296
Average Queue (ft)	166	294	223
95th Queue (ft)	238	467	424
Link Distance (ft)	1863	484	484
Upstream Blk Time (%)		2	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	R	L	L	T	T	T	R	L
Maximum Queue (ft)	63	61	98	134	30	126	143	384	449	486	35	188
Average Queue (ft)	33	24	62	100	10	69	94	319	364	414	11	126
95th Queue (ft)	73	66	102	140	32	126	140	430	461	517	41	191
Link Distance (ft)		1184	1184	1184				702	702	702		1064
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				200	300	300				400	
Storage Blk Time (%)								8		9		
Queuing Penalty (veh)								21		3		

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (ft)	174	160	36	28	67
Average Queue (ft)	105	99	16	8	22
95th Queue (ft)	184	175	45	26	69
Link Distance (ft)	1064	1064	959	959	959
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 119: Ashlake Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	R	L	L	T	T	T	L	L	R
Maximum Queue (ft)	218	277	321	63	126	138	130	148	260	102	152	118
Average Queue (ft)	129	182	222	28	79	96	54	83	170	55	87	71
95th Queue (ft)	220	283	322	64	132	145	117	154	264	127	169	130
Link Distance (ft)	942	942	942				1184	1184	1184		2574	2574
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				400	400	400				200		
Storage Blk Time (%)										0	1	
Queuing Penalty (veh)										0	1	

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	T	T	L	L	R
Maximum Queue (ft)	101	88	106	108	313	295	280	393	384	205
Average Queue (ft)	62	48	72	70	215	214	206	318	317	67
95th Queue (ft)	114	99	113	124	331	309	303	443	445	211
Link Distance (ft)		4668	4668	4668	942	942	942	1148	1148	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200									150
Storage Blk Time (%)									59	
Queuing Penalty (veh)									30	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	SB
Directions Served	LT	T	T	R	L	T	T	T	R	LT	R	L
Maximum Queue (ft)	526	520	438	20	282	278	241	229	46	116	196	223
Average Queue (ft)	375	319	157	5	220	152	105	113	7	66	117	146
95th Queue (ft)	488	498	324	21	371	434	295	240	63	128	201	239
Link Distance (ft)	2656	2656	2656			4668	4668	4668		747	747	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					200	230			210			240
Storage Blk Time (%)			2		23	0		1				
Queuing Penalty (veh)			0		152	0		2				

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	263	128	66
Average Queue (ft)	183	59	35
95th Queue (ft)	261	138	71
Link Distance (ft)		1429	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	240		130
Storage Blk Time (%)	2	0	
Queuing Penalty (veh)	3	0	

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	T	R	L	T	T
Maximum Queue (ft)	45	140	143	133	273	12	51	60	8	66	20	14
Average Queue (ft)	21	80	79	49	171	3	18	22	1	28	6	3
95th Queue (ft)	59	154	154	136	292	17	53	60	11	65	23	16
Link Distance (ft)		3646	3646	3646		2656	2656	2656			1017	1017
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				375				400	200		
Storage Blk Time (%)		0										
Queuing Penalty (veh)		0										

Intersection: 122: Otterdale Rd & Route 360

Movement	NB	SB	SB	SB	SB
Directions Served	R	L	T	T	R
Maximum Queue (ft)	74	96	38	62	98
Average Queue (ft)	44	53	17	10	52
95th Queue (ft)	74	107	47	64	97
Link Distance (ft)			1585	1585	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	200			200
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 123: Bailey Bridge Road & Bailey Bridge Connector

Movement	WB	WB	NB	NB	SB	SB
Directions Served	L	R	T	R	L	T
Maximum Queue (ft)	180	64	79	78	285	378
Average Queue (ft)	99	39	57	43	206	150
95th Queue (ft)	168	68	89	74	310	459
Link Distance (ft)	1170		1128			930
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		200		200	200	
Storage Blk Time (%)	1				20	
Queuing Penalty (veh)	1				104	

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	75	10	181	71
Average Queue (ft)	33	2	99	39
95th Queue (ft)	77	13	186	73
Link Distance (ft)				826
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	225	275	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LTR	LTR
Maximum Queue (ft)	135	84	92	50	463	586
Average Queue (ft)	69	33	63	13	341	568
95th Queue (ft)	137	86	99	57	706	591
Link Distance (ft)	778	778	840		663	544
Upstream Blk Time (%)					11	100
Queuing Penalty (veh)					0	0
Storage Bay Dist (ft)				400		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	TR	L	TR
Maximum Queue (ft)	67	111	100	71	96	10	133	143	74	270
Average Queue (ft)	34	71	44	42	58	2	78	81	31	153
95th Queue (ft)	75	116	110	75	102	16	146	144	92	311
Link Distance (ft)		778	778		840			663		545
Upstream Blk Time (%)										0
Queuing Penalty (veh)										0
Storage Bay Dist (ft)	200			200		400	200		200	
Storage Blk Time (%)							0	0		5
Queuing Penalty (veh)							2	0		3

Network Summary

Network wide Queuing Penalty: 5

Intersection: 126: Millridge Pkwy/Market Square Ent & Old Hundred Rd

Movement	EB	EB	WB	WB	WB	SB	SB	SB	NW	NW	NW	NW
Directions Served	LT	>	L	L	TR	<	T	TR	L	L	R	R
Maximum Queue (ft)	48	135	41	61	61	23	296	346	111	139	277	211
Average Queue (ft)	31	81	21	40	27	5	185	232	76	99	199	117
95th Queue (ft)	59	135	48	71	64	21	347	406	122	139	284	215
Link Distance (ft)	1688	1688			1459		823	823			510	510
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			200	200		200			300	300		
Storage Blk Time (%)							3				2	
Queuing Penalty (veh)							1				7	

Intersection: 126: Millridge Pkwy/Market Square Ent & Old Hundred Rd

Movement	NW
Directions Served	>
Maximum Queue (ft)	170
Average Queue (ft)	39
95th Queue (ft)	210
Link Distance (ft)	510
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 127: Old Hundred Rd & Market Square

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	81	10
Average Queue (ft)	39	2
95th Queue (ft)	77	10
Link Distance (ft)	566	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		200
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 128: Bailey Bridge Connector & Brad McNeer Pkwy

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	211	151	654	660	586	203
Average Queue (ft)	143	70	578	505	427	64
95th Queue (ft)	217	149	805	882	623	203
Link Distance (ft)		548	624	624	696	696
Upstream Blk Time (%)			42	26		
Queuing Penalty (veh)			0	0		
Storage Bay Dist (ft)	200					
Storage Blk Time (%)	3					
Queuing Penalty (veh)	7					

Network Summary

Network wide Queuing Penalty: 15200

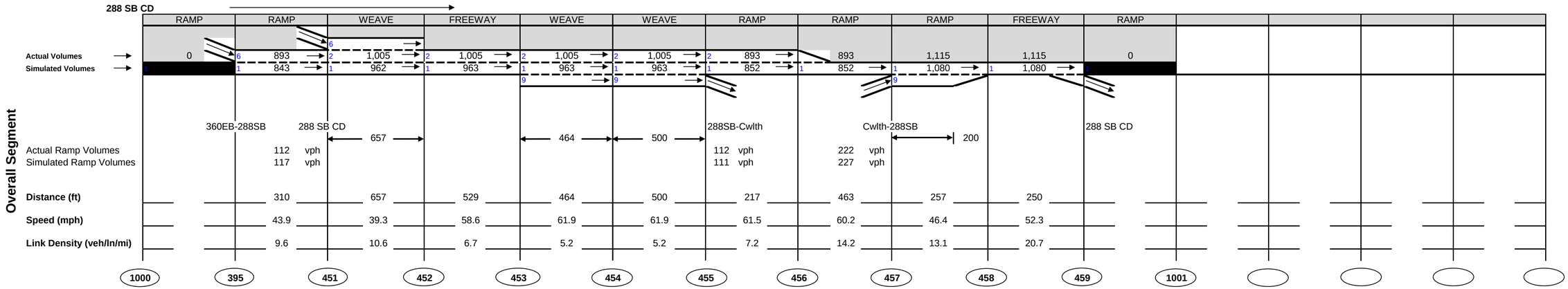
C-5 – Existing (2012) CORSIM Results

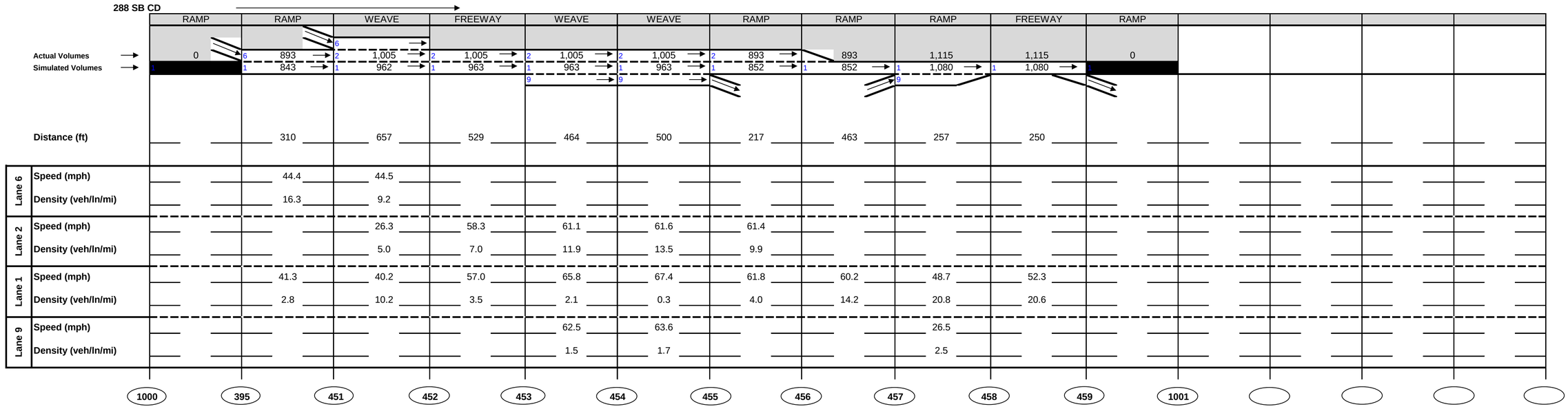
CORSIM Calibration - Existing AM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 SB CD	1000	395	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
	394	395	Ramp	893	843	-5.6%	65	46.5	-28.5%
	395	451	Freeway	893	843	-5.6%	65	43.9	-32.5%
	450	451	Ramp	112	117	4.5%	65	62.6	-3.7%
	451	452	Freeway	1005	962	-4.3%	65	39.3	-39.5%
	452	453	Freeway	1005	963	-4.2%	65	58.6	-9.8%
	453	454	Freeway	1005	963	-4.2%	65	61.9	-4.8%
	454	455	Freeway	1005	963	-4.2%	65	61.9	-4.8%
	455	475	Ramp	112	111	-0.9%	65	64.3	-1.1%
	455	456	Freeway	893	852	-4.6%	65	61.5	-5.4%
	456	457	Freeway	893	852	-4.6%	65	60.2	-7.4%
	480	457	Ramp	222	227	2.3%	65	48.8	-24.9%
	457	458	Freeway	1115	1080	-3.1%	65	46.4	-28.6%
	458	459	Freeway	1115	1080	-3.1%	65	52.3	-19.5%
	459	330	Ramp	1115	1081	-3.0%	65	56.5	-13.1%
	459	1001	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
Route 288 SB	300	301	Freeway	1684	1684	0.0%	65	63.7	-2.0%
	301	302	Freeway	1684	1684	0.0%	65	64.1	-1.4%
	302	303	Freeway	1684	1684	0.0%	65	63.7	-2.0%
	303	304	Freeway	1684	1685	0.1%	65	63.4	-2.5%
	304	305	Freeway	1684	1687	0.2%	65	63.3	-2.6%
	305	306	Freeway	1684	1685	0.1%	65	63.1	-2.9%
	306	307	Freeway	1684	1685	0.1%	65	63	-3.1%
	307	308	Freeway	1684	1684	0.0%	65	62.9	-3.2%
	308	309	Freeway	1684	1683	-0.1%	65	62.9	-3.2%
	309	310	Freeway	1684	1684	0.0%	65	62.8	-3.4%
	310	311	Freeway	1684	1683	-0.1%	65	62.7	-3.5%
	311	312	Freeway	1684	1685	0.1%	65	62.7	-3.5%
	312	313	Freeway	1684	1684	0.0%	65	62.5	-3.8%
	313	314	Freeway	1684	1683	-0.1%	65	62.2	-4.3%
	314	315	Freeway	1684	1683	-0.1%	65	62	-4.6%
	315	316	Freeway	1684	1684	0.0%	65	62	-4.6%
	316	317	Freeway	1684	1683	-0.1%	65	62.8	-3.4%
	317	390	Ramp	562	561	-0.2%	65	62.8	-3.4%
	317	318	Freeway	1122	1122	0.0%	65	63.3	-2.6%
	318	319	Freeway	1122	1121	-0.1%	65	63.2	-2.8%
	392	319	Ramp	236	241	2.1%	65	44.1	-32.2%
	319	320	Freeway	1358	1362	0.3%	65	61.5	-5.4%
	320	393	Ramp	165	161	-2.4%	65	62	-4.6%
	320	321	Freeway	1193	1202	0.8%	65	62.9	-3.2%
	321	322	Freeway	1193	1202	0.8%	65	63.2	-2.8%
	322	450	Ramp	112	117	4.5%	65	62.5	-3.8%
	322	323	Freeway	1081	1085	0.4%	65	63.5	-2.3%
	323	324	Freeway	1081	1085	0.4%	65	63.6	-2.2%
	324	325	Freeway	1081	1085	0.4%	65	63.6	-2.2%
	325	326	Freeway	1081	1084	0.3%	65	63.6	-2.2%
	326	327	Freeway	1081	1085	0.4%	65	63.6	-2.2%
	327	328	Freeway	1081	1085	0.4%	65	63.5	-2.3%
	328	329	Freeway	1081	1085	0.4%	65	63.4	-2.5%
	329	330	Freeway	1081	1086	0.5%	65	63.2	-2.8%
	459	330	Ramp	1115	1081	-3.0%	65	56.5	-13.1%
	330	331	Freeway	2196	2168	-1.3%	65	56.7	-12.8%
	331	332	Freeway	2196	2169	-1.2%	65	59.4	-8.6%
	332	333	Freeway	2196	2169	-1.2%	65	61.6	-5.2%
	333	334	Freeway	2196	2169	-1.2%	65	62.6	-3.7%
	334	335	Freeway	2196	2170	-1.2%	65	62.7	-3.5%
	335	336	Freeway	2196	2169	-1.2%	65	62.6	-3.7%
	336	337	Freeway	2196	2167	-1.3%	65	62.4	-4.0%
	337	338	Freeway	2196	2168	-1.3%	65	62.3	-4.2%
	338	339	Freeway	2196	2169	-1.2%	65	62.3	-4.2%
Cwlth-288	7002	271	Freeway	464	463	-0.2%	35	34.7	-0.9%
	271	272	Freeway	464	463	-0.2%	35	34.7	-0.9%
	272	273	Freeway	464	463	-0.2%	35	34.5	-1.4%
	273	274	Freeway	464	463	-0.2%	35	34.5	-1.4%
	274	480	Ramp	222	227	2.3%	65	40.9	-37.1%
	274	275	Freeway	242	237	-2.1%	45	39	-13.3%
	275	276	Freeway	242	237	-2.1%	45	44.5	-1.1%
	276	277	Freeway	242	236	-2.5%	45	44.4	-1.3%
	277	278	Freeway	242	236	-2.5%	65	47	-27.7%
	278	251	Freeway	242	236	-2.5%	65	58.8	-9.5%
	250	251	Ramp	188	196	4.3%	65	64.2	-1.2%
	251	252	Freeway	430	432	0.5%	65	64	-1.5%
	252	253	Freeway	430	432	0.5%	65	64.1	-1.4%
	253	254	Freeway	430	431	0.2%	65	64.1	-1.4%
	254	116	Ramp	242	238	-1.7%	65	62.3	-4.2%
	254	255	Freeway	188	193	2.7%	65	64.1	-1.4%
	255	7008	Ramp	188	193	2.7%	65	64.2	-1.2%

CORSIM Calibration - Existing AM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
	255	1002	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
	100	101	Freeway	1953	1951	-0.1%	65	63.5	-2.3%
	101	102	Freeway	1953	1952	-0.1%	65	64.1	-1.4%
	102	103	Freeway	1953	1952	-0.1%	65	63.6	-2.2%
	103	104	Freeway	1953	1953	0.0%	65	63.2	-2.8%
	104	105	Freeway	1953	1953	0.0%	65	63	-3.1%
	105	106	Freeway	1953	1953	0.0%	65	62.8	-3.4%
	106	107	Freeway	1953	1954	0.1%	65	62.7	-3.5%
	107	108	Freeway	1953	1955	0.1%	65	62.6	-3.7%
	108	109	Freeway	1953	1953	0.0%	65	62.4	-4.0%
	109	110	Freeway	1953	1954	0.1%	65	62.4	-4.0%
	110	111	Freeway	1953	1955	0.1%	65	62.4	-4.0%
	111	250	Ramp	188	196	4.3%	65	63	-3.1%
	111	112	Freeway	1765	1759	-0.3%	65	62.6	-3.7%
	112	113	Freeway	1765	1758	-0.4%	65	62.6	-3.7%
	113	114	Freeway	1765	1758	-0.4%	65	62.6	-3.7%
	114	115	Freeway	1765	1758	-0.4%	65	62.5	-3.8%
	115	116	Freeway	1765	1758	-0.4%	65	62.3	-4.2%
	254	116	Ramp	242	238	-1.7%	65	62.3	-4.2%
	116	117	Freeway	2007	1997	-0.5%	65	58.7	-9.7%
Route 288 NB	117	118	Freeway	2007	1996	-0.5%	65	59.5	-8.5%
	191	118	Ramp	1838	1649	-10.3%	65	42.5	-34.6%
	118	119	Freeway	3845	3643	-5.3%	65	54.5	-16.2%
	119	192	Ramp	534	522	-2.2%	65	57	-12.3%
	119	120	Freeway	3311	3122	-5.7%	65	58.1	-10.6%
	120	121	Freeway	3311	3122	-5.7%	65	60.7	-6.6%
	603	121	Ramp	511	492	-3.7%	65	52.8	-18.8%
	121	122	Freeway	3822	3613	-5.5%	65	59.3	-8.8%
	122	123	Freeway	3822	3612	-5.5%	65	58.6	-9.8%
	123	124	Freeway	3822	3612	-5.5%	65	59.9	-7.8%
	124	125	Freeway	3822	3611	-5.5%	65	60.9	-6.3%
	125	126	Freeway	3822	3610	-5.5%	65	61	-6.2%
	126	127	Freeway	3822	3609	-5.6%	65	60.9	-6.3%
	127	128	Freeway	3822	3607	-5.6%	65	60.7	-6.6%
	128	129	Freeway	3822	3608	-5.6%	65	60.6	-6.8%
	129	130	Freeway	3822	3607	-5.6%	65	60.5	-6.9%
	130	131	Freeway	3822	3606	-5.7%	65	60.4	-7.1%
	131	132	Freeway	3822	3605	-5.7%	65	60.4	-7.1%
	132	133	Freeway	3822	3606	-5.7%	65	60.3	-7.2%
	133	134	Freeway	3822	3607	-5.6%	65	60.3	-7.2%
	134	135	Freeway	3822	3608	-5.6%	65	60.2	-7.4%
	135	136	Freeway	3822	3609	-5.6%	65	60.2	-7.4%
	136	137	Freeway	3822	3610	-5.5%	65	60.3	-7.2%





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

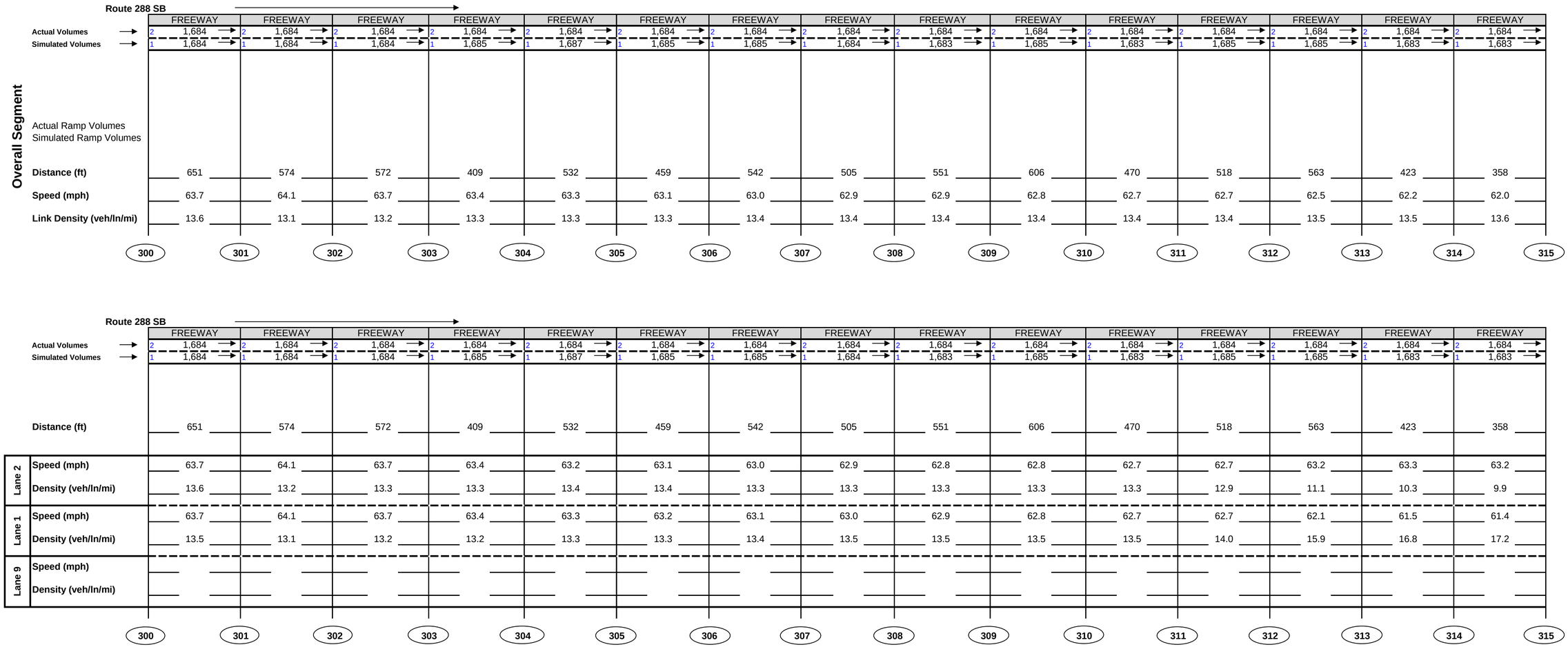
VDOT Virginia Department of Transportation

Figure 1

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

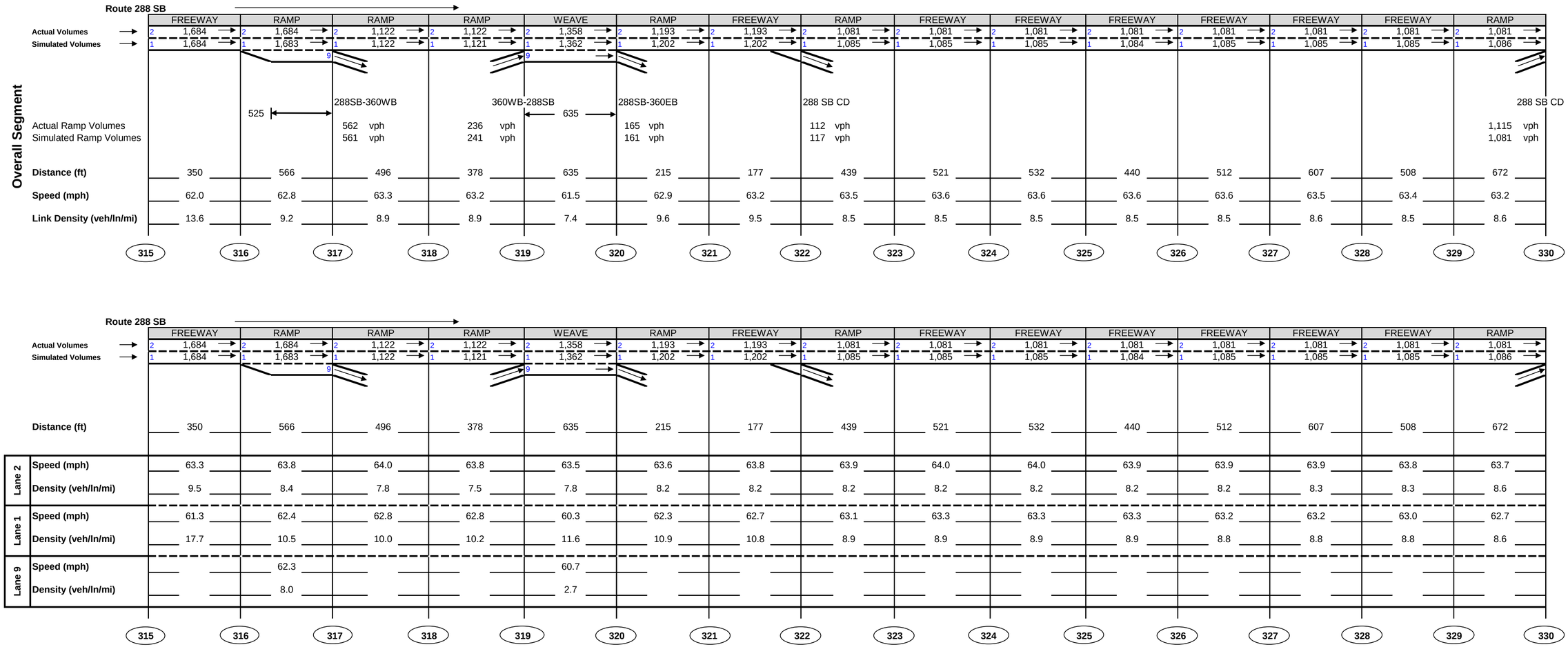
Virginia Department of Transportation

Figure 2

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

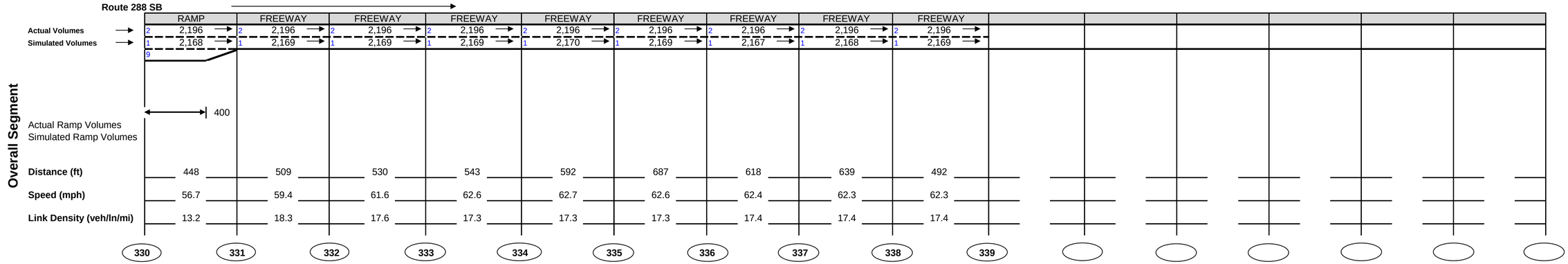
Virginia Department of Transportation

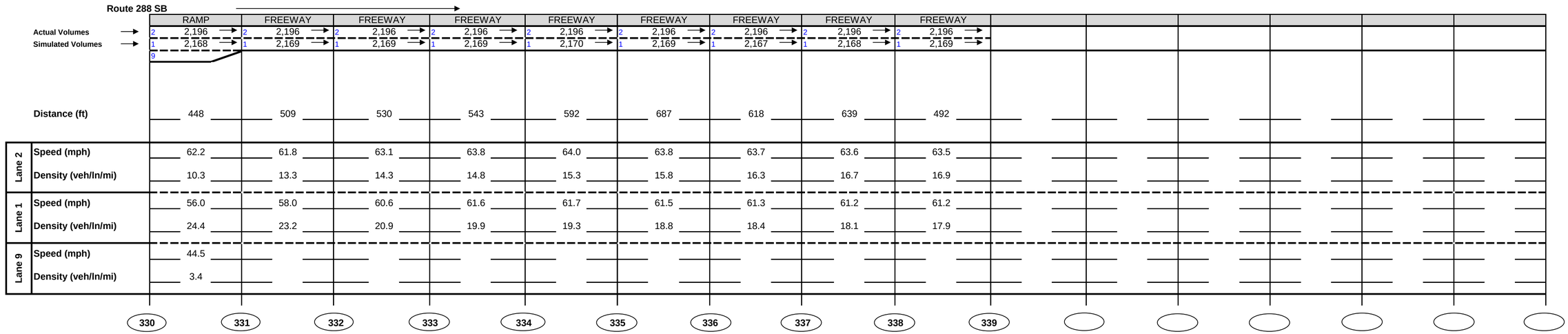
Figure 3

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

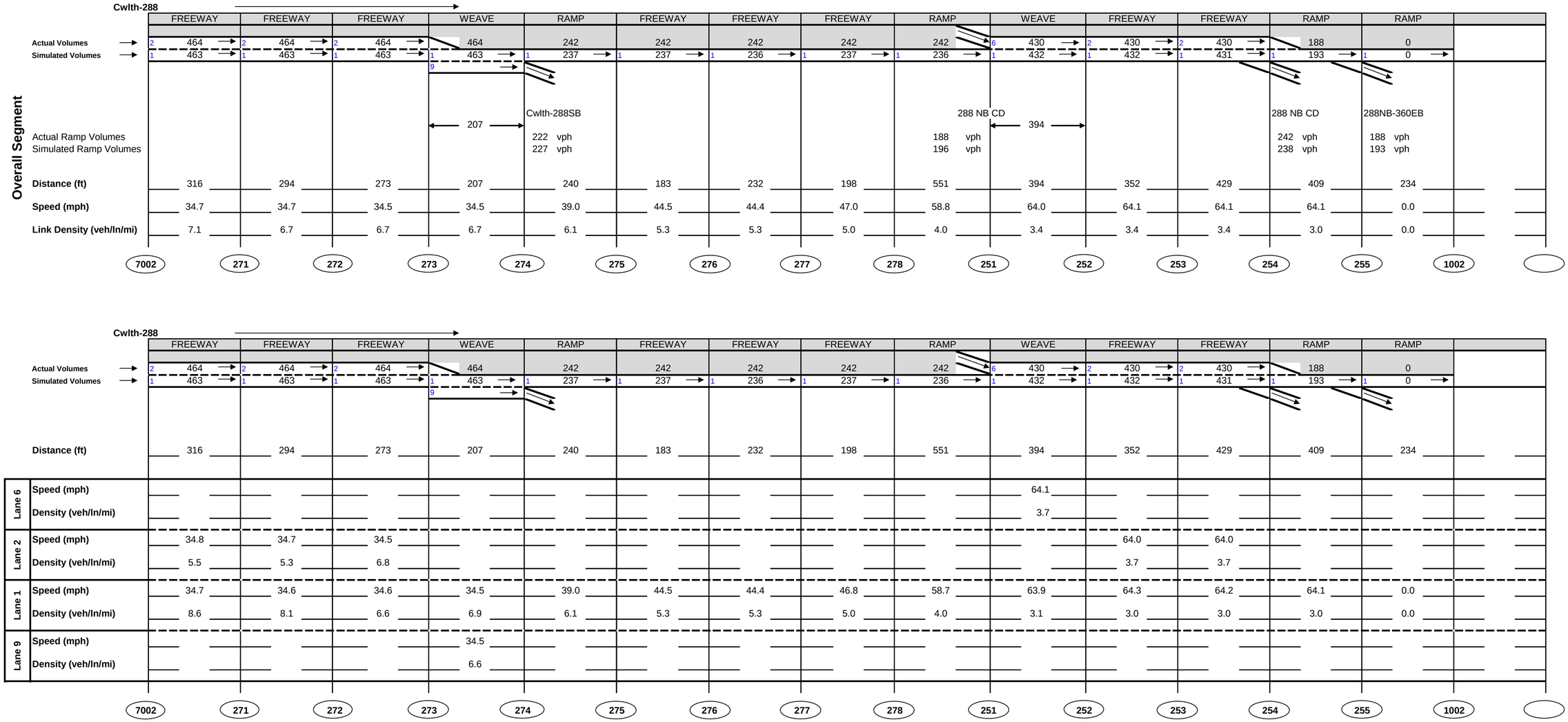
Virginia Department of Transportation

Figure 4

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

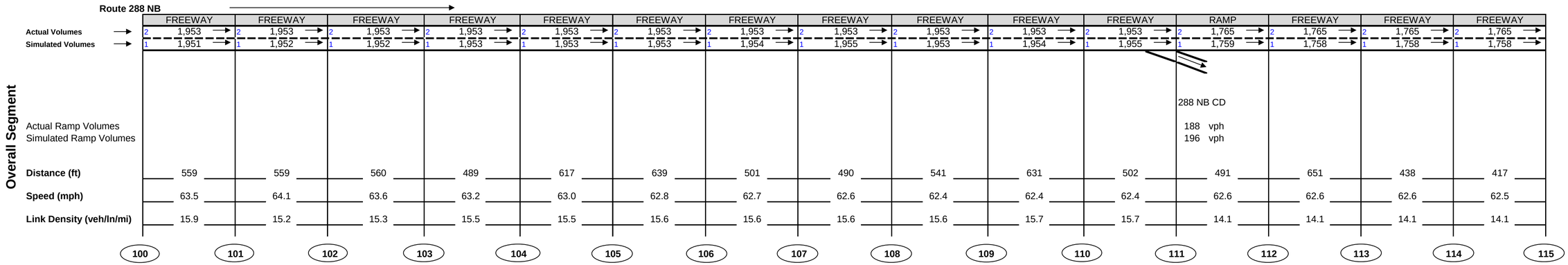
100 Node Number — Auxiliary Lane Length

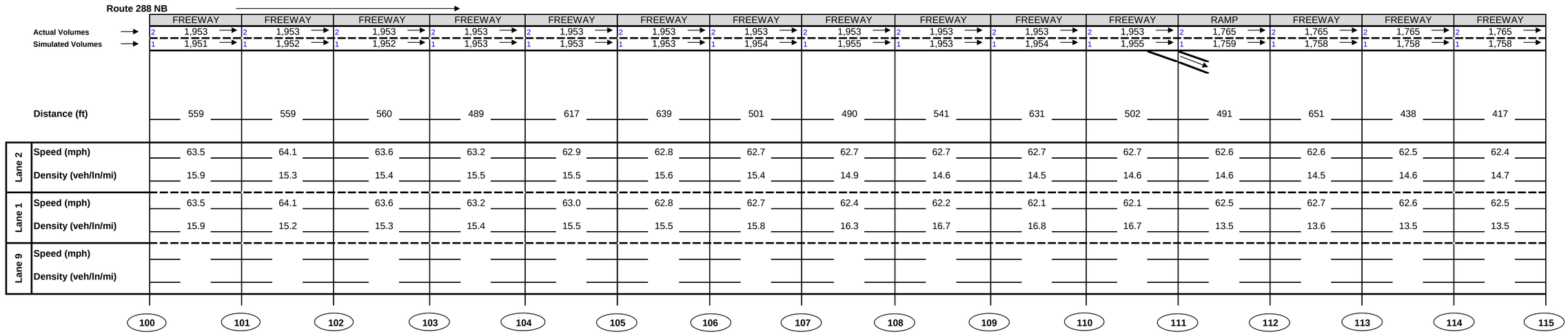
Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 5
Commonwealth Centre Parkway at Route 288 - AM Peak
US 360/Route 288 Interchange Study
Existing (2012)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

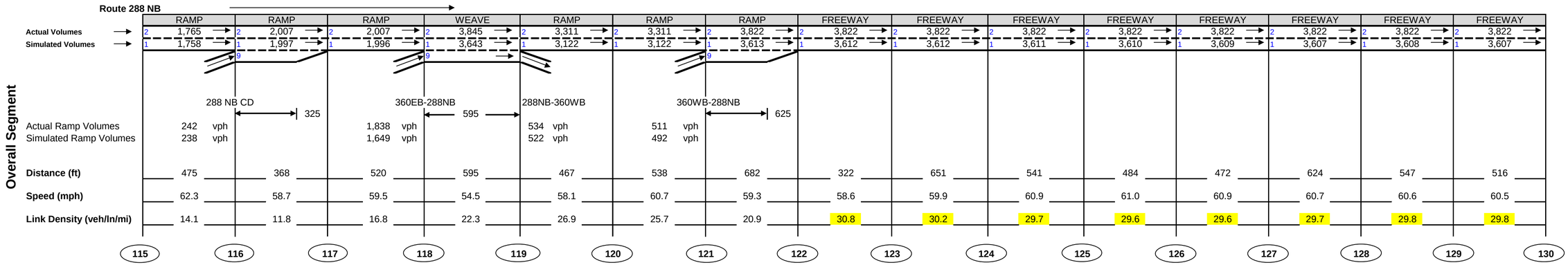
Virginia Department of Transportation

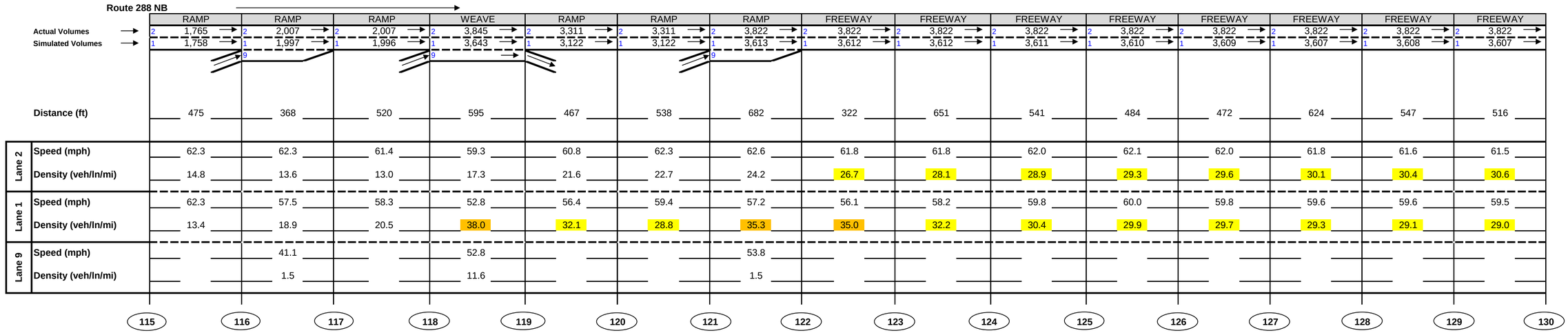
Figure 6

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

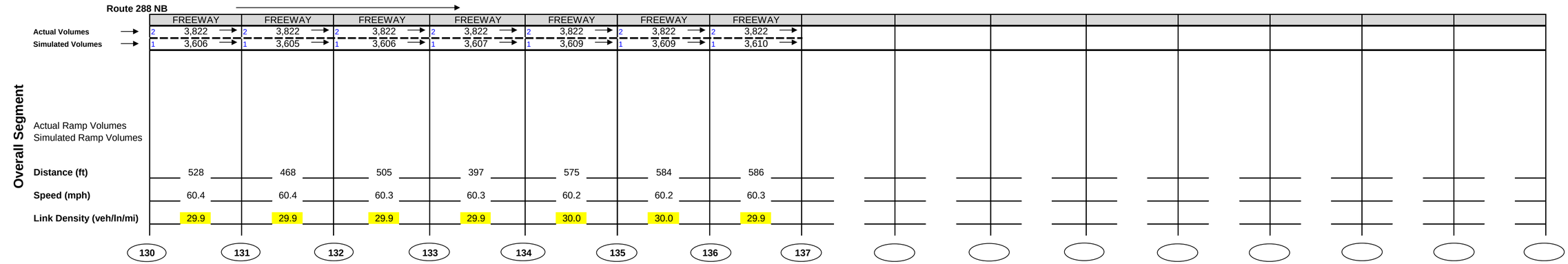
Virginia Department of Transportation

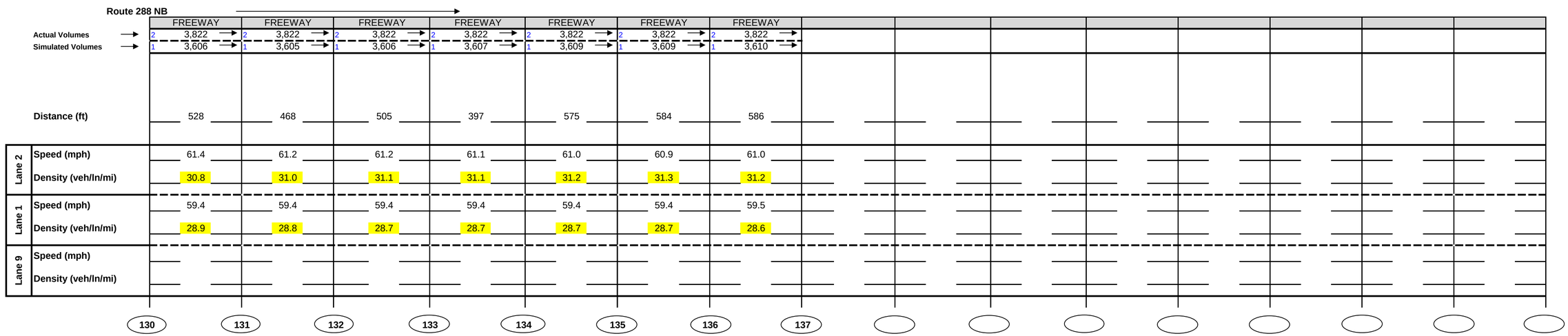
Figure 7

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

Virginia Department of Transportation

Figure 8

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

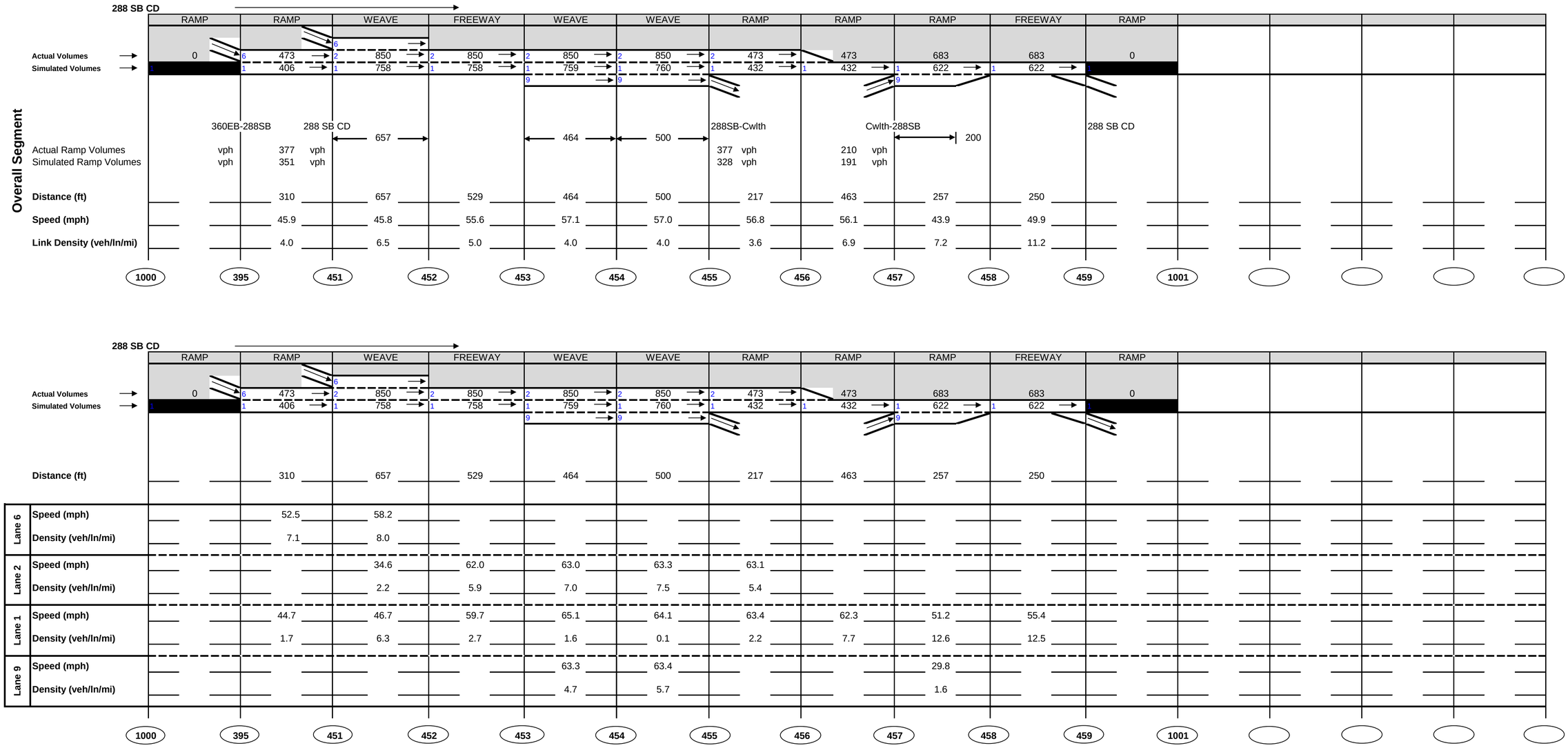
Existing (2012)

CORSIM Calibration - Existing PM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 SB CD	1000	395	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
	394	395	Ramp	473	406	-14.2%	65	44.8	-31.1%
	395	451	Freeway	473	406	-14.2%	65	45.9	-29.4%
	450	451	Ramp	377	351	-6.9%	65	56.6	-12.9%
	451	452	Freeway	850	758	-10.8%	65	45.8	-29.5%
	452	453	Freeway	850	758	-10.8%	65	55.6	-14.5%
	453	454	Freeway	850	759	-10.7%	65	57.1	-12.2%
	454	455	Freeway	850	760	-10.6%	65	57	-12.3%
	455	475	Ramp	377	328	-13.0%	65	57.1	-12.2%
	455	456	Freeway	473	432	-8.7%	65	56.8	-12.6%
	456	457	Freeway	473	432	-8.7%	65	56.1	-13.7%
	480	457	Ramp	210	191	-9.0%	65	44.5	-31.5%
	457	458	Freeway	683	622	-8.9%	65	43.9	-32.5%
	458	459	Freeway	683	622	-8.9%	65	49.9	-23.2%
	459	330	Ramp	683	622	-8.9%	65	53.7	-17.4%
	459	1001	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
Route 288 SB	300	301	Freeway	3884	3492	-10.1%	65	55.4	-14.8%
	301	302	Freeway	3884	3491	-10.1%	65	56.5	-13.1%
	302	303	Freeway	3884	3491	-10.1%	65	55.5	-14.6%
	303	304	Freeway	3884	3491	-10.1%	65	54.7	-15.8%
	304	305	Freeway	3884	3489	-10.2%	65	54.6	-16.0%
	305	306	Freeway	3884	3489	-10.2%	65	54.5	-16.2%
	306	307	Freeway	3884	3490	-10.1%	65	54.3	-16.5%
	307	308	Freeway	3884	3489	-10.2%	65	54.1	-16.8%
	308	309	Freeway	3884	3488	-10.2%	65	54	-16.9%
	309	310	Freeway	3884	3488	-10.2%	65	54	-16.9%
	310	311	Freeway	3884	3487	-10.2%	65	53.9	-17.1%
	311	312	Freeway	3884	3487	-10.2%	65	53.9	-17.1%
	312	313	Freeway	3884	3488	-10.2%	65	53.2	-18.2%
	313	314	Freeway	3884	3489	-10.2%	65	50.7	-22.0%
	314	315	Freeway	3884	3490	-10.1%	65	48.7	-25.1%
	315	316	Freeway	3884	3491	-10.1%	65	48.1	-26.0%
	316	317	Freeway	3884	3490	-10.1%	65	52.1	-19.8%
	317	390	Ramp	1722	1525	-11.4%	65	52.3	-19.5%
	317	318	Freeway	2162	1963	-9.2%	65	55.8	-14.2%
	318	319	Freeway	2162	1965	-9.1%	65	55.8	-14.2%
	392	319	Ramp	194	172	-11.3%	65	39.5	-39.2%
	319	320	Freeway	2356	2137	-9.3%	65	55.4	-14.8%
	320	393	Ramp	444	419	-5.6%	65	55.7	-14.3%
	320	321	Freeway	1912	1720	-10.0%	65	56.1	-13.7%
	321	322	Freeway	1912	1720	-10.0%	65	56.3	-13.4%
	322	450	Ramp	377	351	-6.9%	65	56	-13.8%
	322	323	Freeway	1535	1368	-10.9%	65	56.8	-12.6%
	323	324	Freeway	1535	1369	-10.8%	65	56.9	-12.5%
	324	325	Freeway	1535	1369	-10.8%	65	56.9	-12.5%
	325	326	Freeway	1535	1370	-10.7%	65	56.8	-12.6%
	326	327	Freeway	1535	1371	-10.7%	65	56.7	-12.8%
	327	328	Freeway	1535	1372	-10.6%	65	56.7	-12.8%
	328	329	Freeway	1535	1374	-10.5%	65	56.7	-12.8%
	329	330	Freeway	1535	1373	-10.6%	65	56.5	-13.1%
	459	330	Ramp	683	622	-8.9%	65	53.7	-17.4%
	330	331	Freeway	2218	1998	-9.9%	65	53.1	-18.3%
	331	332	Freeway	2218	1998	-9.9%	65	54.2	-16.6%
	332	333	Freeway	2218	1997	-10.0%	65	55.5	-14.6%
	333	334	Freeway	2218	1998	-9.9%	65	56	-13.8%
	334	335	Freeway	2218	1998	-9.9%	65	56.1	-13.7%
	335	336	Freeway	2218	1998	-9.9%	65	56	-13.8%
	336	337	Freeway	2218	1997	-10.0%	65	55.9	-14.0%
	337	338	Freeway	2218	1997	-10.0%	65	55.8	-14.2%
	338	339	Freeway	2218	1996	-10.0%	65	55.8	-14.2%
Cwlth-288	7002	271	Freeway	381	343	-10.0%	35	31.3	-10.6%
	271	272	Freeway	381	343	-10.0%	35	31.3	-10.6%
	272	273	Freeway	381	343	-10.0%	35	31.1	-11.1%
	273	274	Freeway	381	343	-10.0%	35	31.1	-11.1%
	274	480	Ramp	210	191	-9.0%	65	36.9	-43.2%
	274	275	Freeway	171	152	-11.1%	45	35.2	-21.8%
	275	276	Freeway	171	152	-11.1%	45	40.1	-10.9%
	276	277	Freeway	171	152	-11.1%	45	40.2	-10.7%
	277	278	Freeway	171	152	-11.1%	65	42.3	-34.9%
	278	251	Freeway	171	152	-11.1%	65	53.1	-18.3%
	250	251	Ramp	245	230	-6.1%	65	57.3	-11.8%
	251	252	Freeway	416	381	-8.4%	65	57.6	-11.4%
	252	253	Freeway	416	382	-8.2%	65	57.6	-11.4%
	253	254	Freeway	416	382	-8.2%	65	57.5	-11.5%
	254	116	Ramp	171	152	-11.1%	65	56.3	-13.4%
	254	255	Freeway	245	230	-6.1%	65	57.3	-11.8%
	255	7008	Ramp	245	230	-6.1%	65	57.3	-11.8%

CORSIM Calibration - Existing PM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
	255	1002	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
	100	101	Freeway	1920	1729	-9.9%	65	56.9	-12.5%
	101	102	Freeway	1920	1728	-10.0%	65	57.6	-11.4%
	102	103	Freeway	1920	1728	-10.0%	65	57.3	-11.8%
	103	104	Freeway	1920	1728	-10.0%	65	56.9	-12.5%
	104	105	Freeway	1920	1728	-10.0%	65	56.7	-12.8%
	105	106	Freeway	1920	1727	-10.1%	65	56.6	-12.9%
	106	107	Freeway	1920	1727	-10.1%	65	56.5	-13.1%
	107	108	Freeway	1920	1727	-10.1%	65	56.3	-13.4%
	108	109	Freeway	1920	1728	-10.0%	65	56.2	-13.5%
	109	110	Freeway	1920	1727	-10.1%	65	56.2	-13.5%
	110	111	Freeway	1920	1727	-10.1%	65	56.2	-13.5%
	111	250	Ramp	245	230	-6.1%	65	56.4	-13.2%
	111	112	Freeway	1675	1496	-10.7%	65	56.5	-13.1%
	112	113	Freeway	1675	1496	-10.7%	65	56.5	-13.1%
	113	114	Freeway	1675	1496	-10.7%	65	56.5	-13.1%
	114	115	Freeway	1675	1495	-10.7%	65	56.4	-13.2%
	115	116	Freeway	1675	1496	-10.7%	65	56.3	-13.4%
	254	116	Ramp	171	152	-11.1%	65	56.3	-13.4%
	116	117	Freeway	1846	1648	-10.7%	65	53.8	-17.2%
Route 288 NB	117	118	Freeway	1846	1649	-10.7%	65	52.8	-18.8%
	191	118	Ramp	812	695	-14.4%	65	39.8	-38.8%
	118	119	Freeway	2658	2342	-11.9%	65	51.1	-21.4%
	119	192	Ramp	1170	1043	-10.9%	65	50.6	-22.2%
	119	120	Freeway	1488	1298	-12.8%	65	55.6	-14.5%
	120	121	Freeway	1488	1298	-12.8%	65	56.9	-12.5%
	603	121	Ramp	249	217	-12.9%	65	48.8	-24.9%
	121	122	Freeway	1737	1515	-12.8%	65	56.5	-13.1%
	122	123	Freeway	1737	1514	-12.8%	65	56.6	-12.9%
	123	124	Freeway	1737	1514	-12.8%	65	56.8	-12.6%
	124	125	Freeway	1737	1514	-12.8%	65	56.9	-12.5%
	125	126	Freeway	1737	1514	-12.8%	65	56.8	-12.6%
	126	127	Freeway	1737	1513	-12.9%	65	56.7	-12.8%
	127	128	Freeway	1737	1514	-12.8%	65	56.6	-12.9%
	128	129	Freeway	1737	1512	-13.0%	65	56.6	-12.9%
	129	130	Freeway	1737	1512	-13.0%	65	56.6	-12.9%
	130	131	Freeway	1737	1512	-13.0%	65	56.5	-13.1%
	131	132	Freeway	1737	1513	-12.9%	65	56.5	-13.1%
	132	133	Freeway	1737	1513	-12.9%	65	56.5	-13.1%
	133	134	Freeway	1737	1512	-13.0%	65	56.5	-13.1%
	134	135	Freeway	1737	1513	-12.9%	65	56.5	-13.1%
	135	136	Freeway	1737	1513	-12.9%	65	56.4	-13.2%
	136	137	Freeway	1737	1514	-12.8%	65	56.5	-13.1%



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

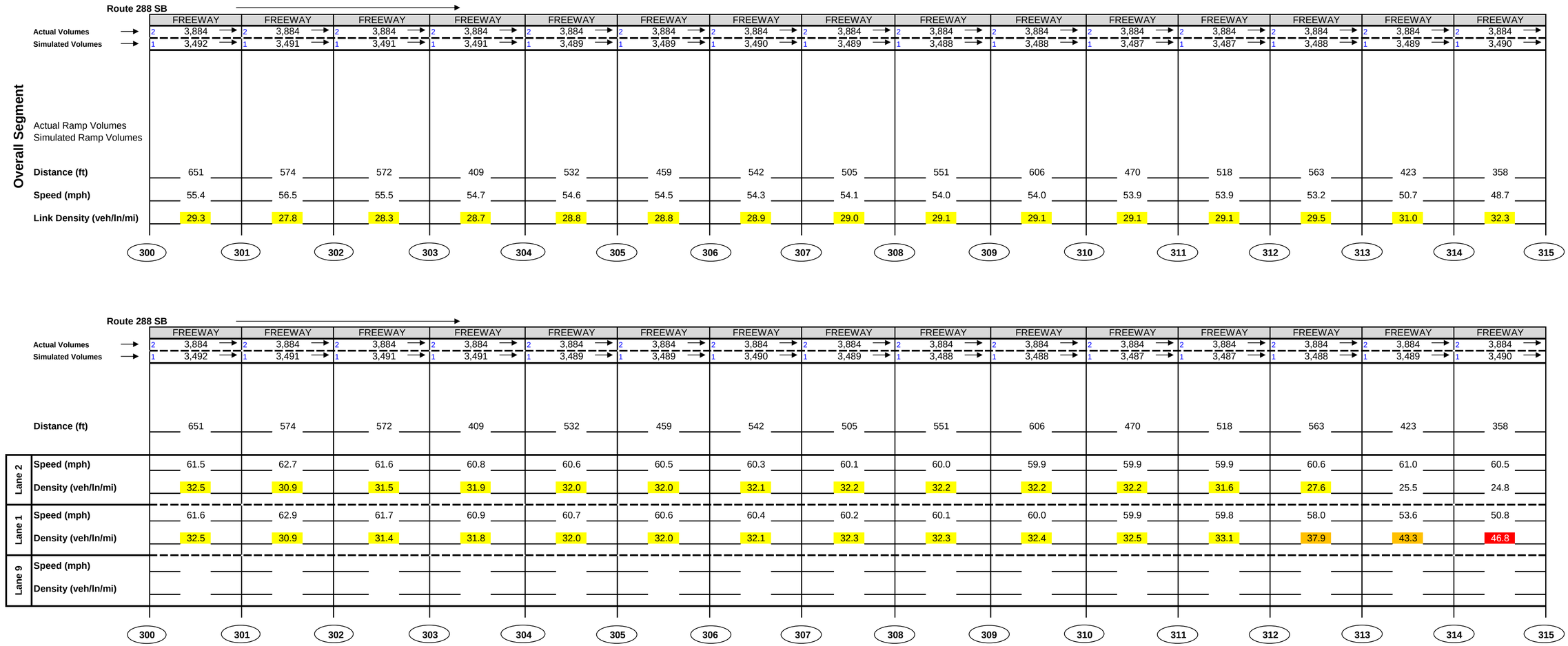
VDOT Virginia Department of Transportation

Figure 1

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

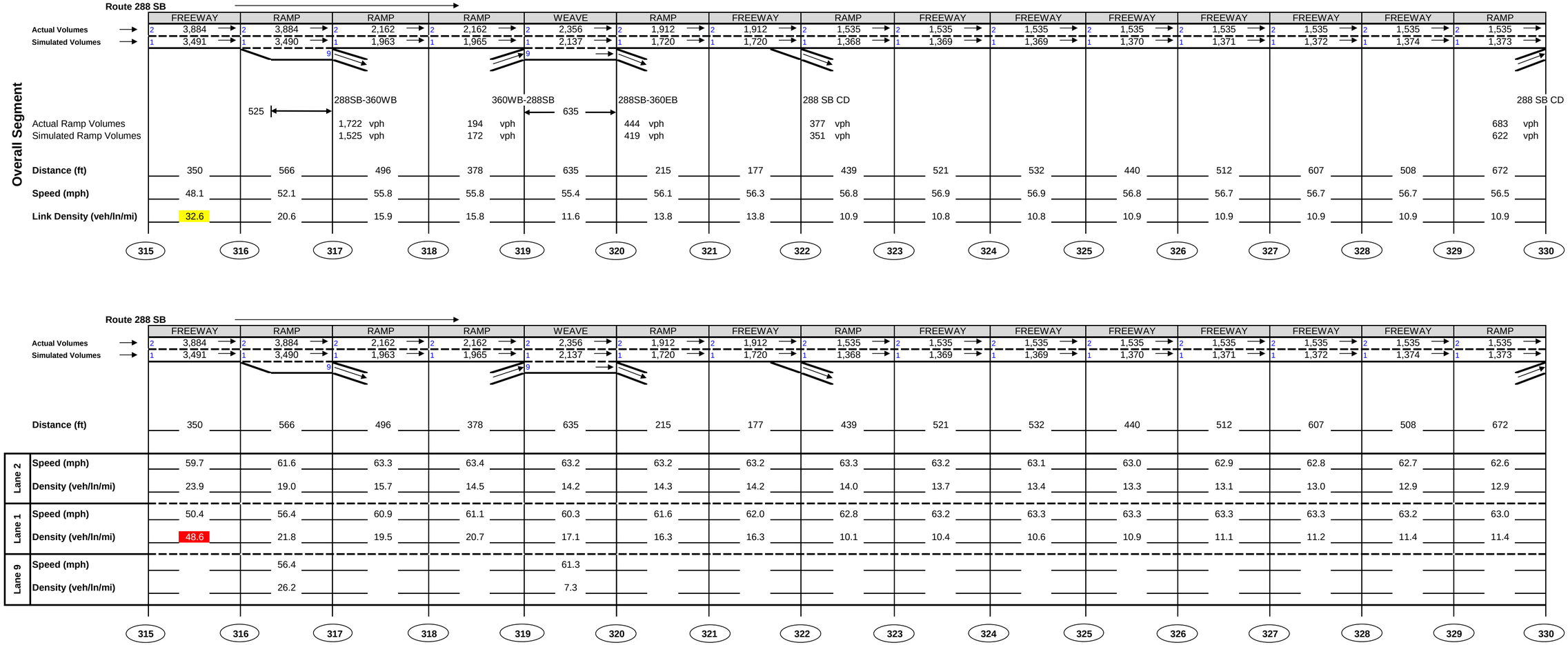
Virginia Department of Transportation

Figure 2

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

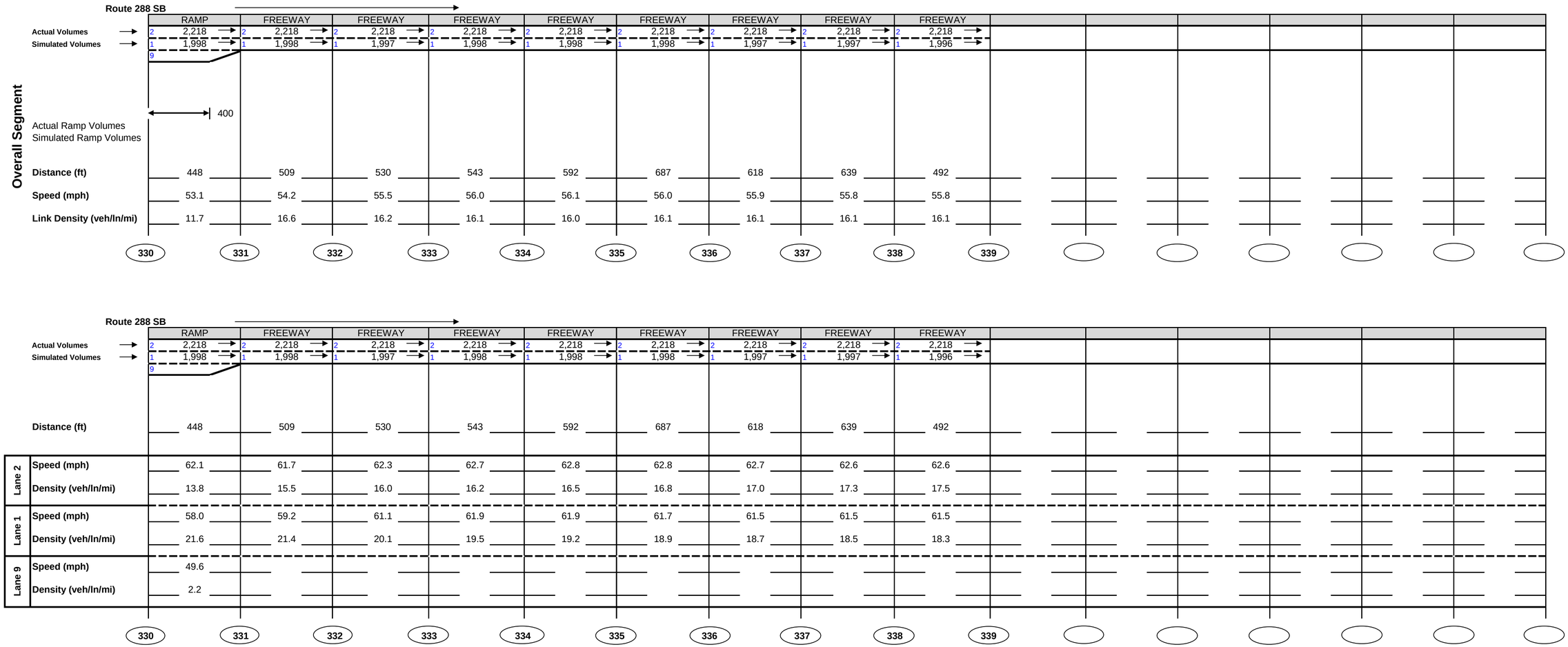
Virginia Department of Transportation

Figure 3

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

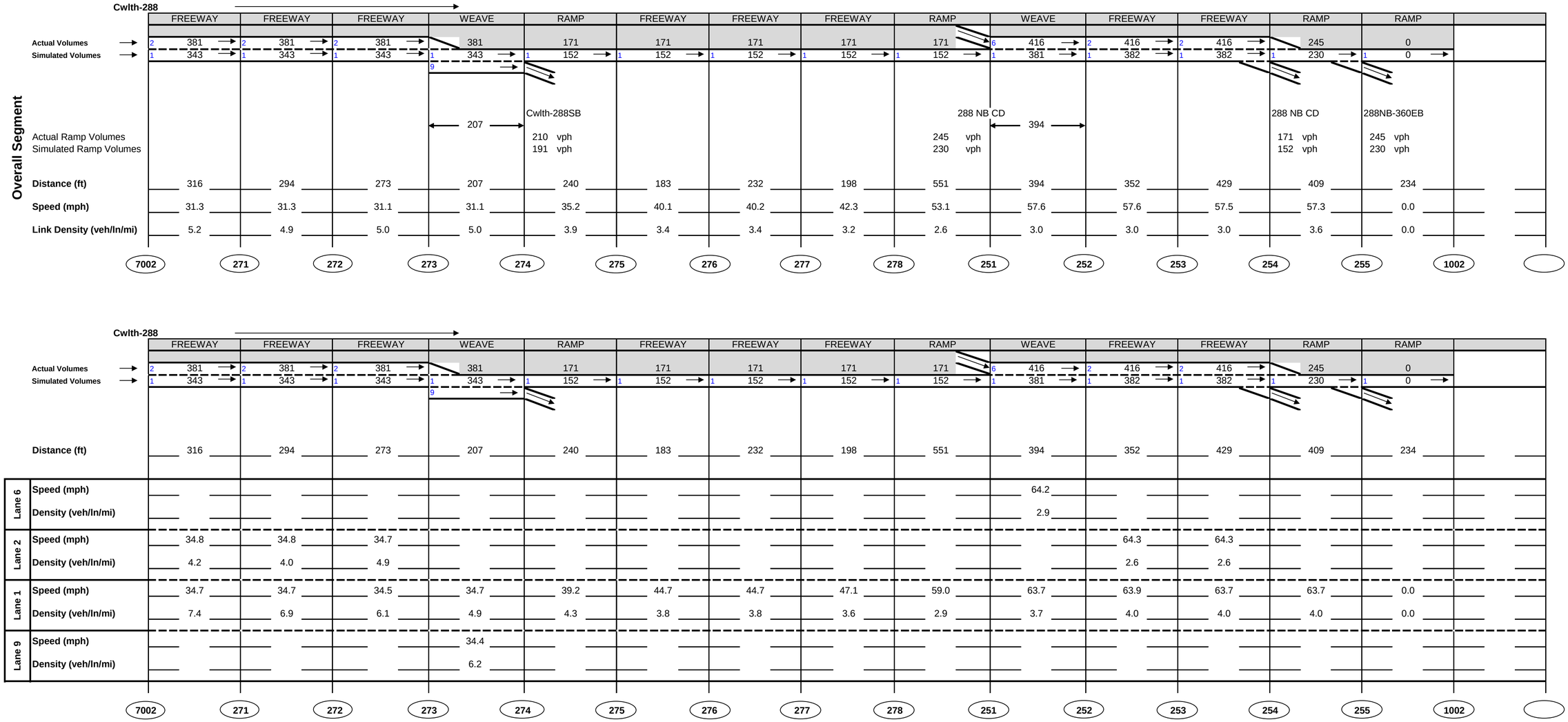
Virginia Department of Transportation

Figure 4

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

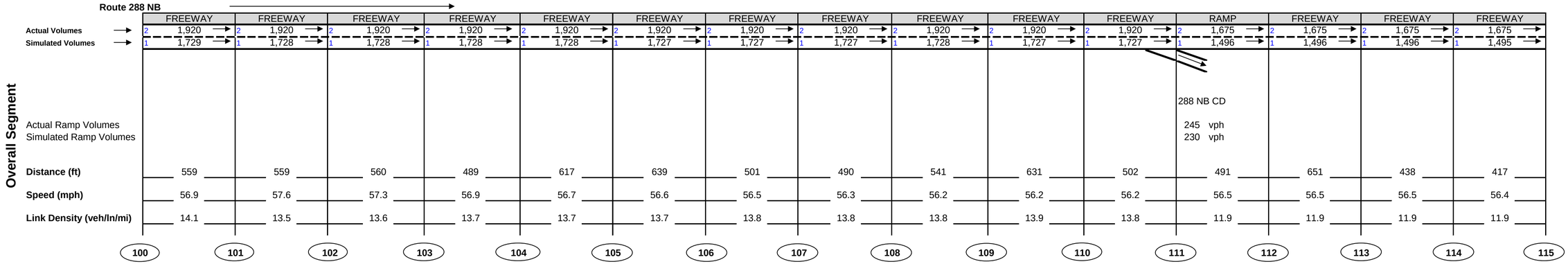
VDOT Virginia Department of Transportation

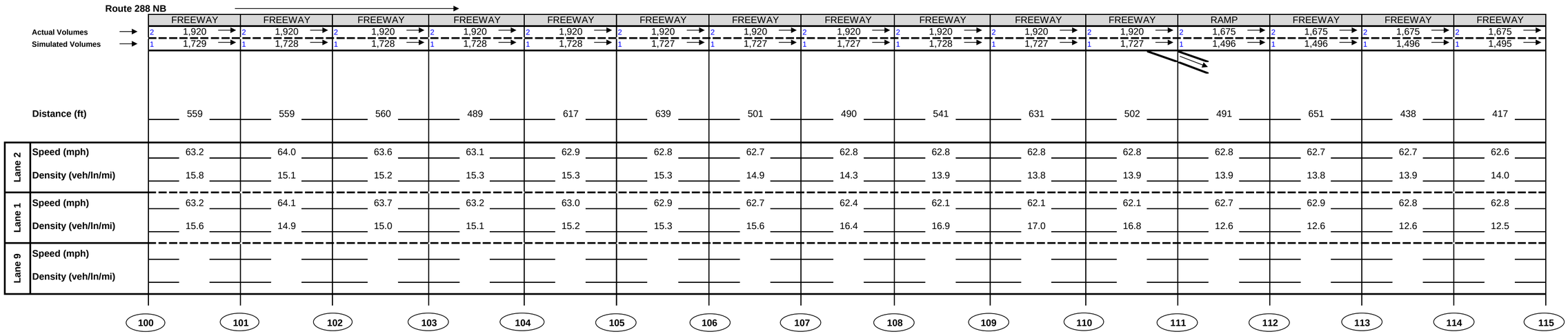
Figure 5

Commonwealth Centre Parkway at Route 288 - PM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

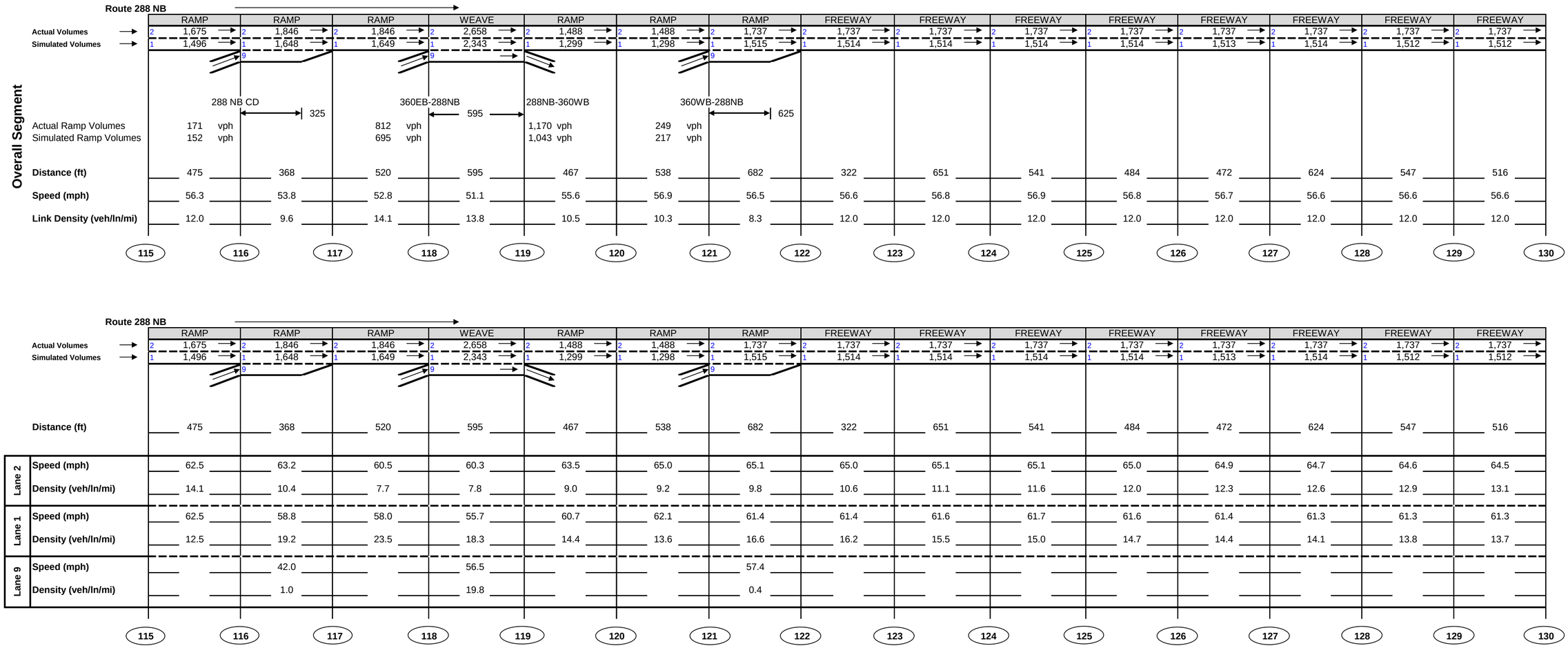
Virginia Department of Transportation

Figure 6

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

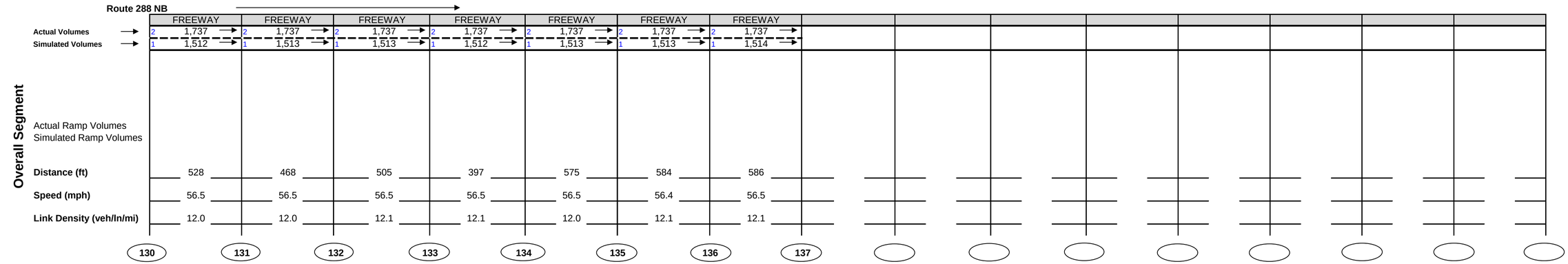
Virginia Department of Transportation

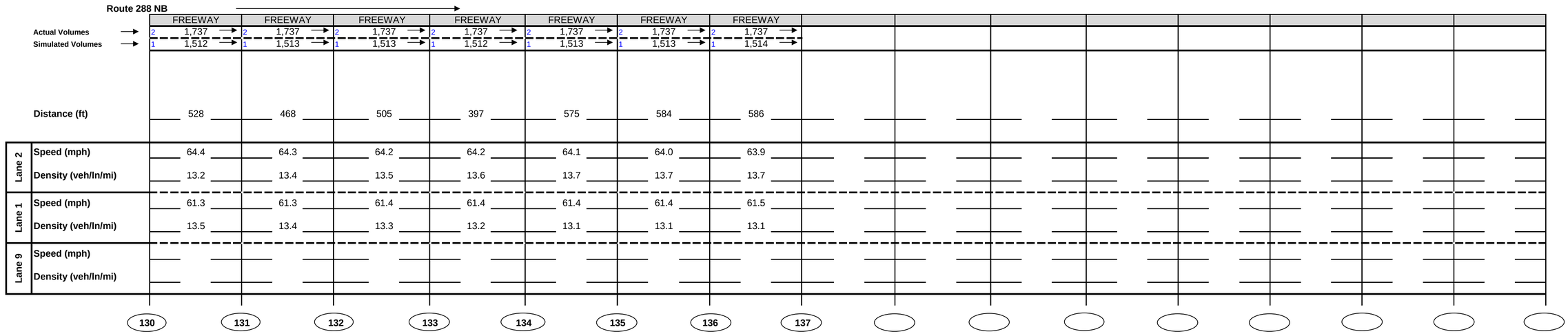
Figure 7

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

Virginia Department of Transportation

Figure 8

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Existing (2012)

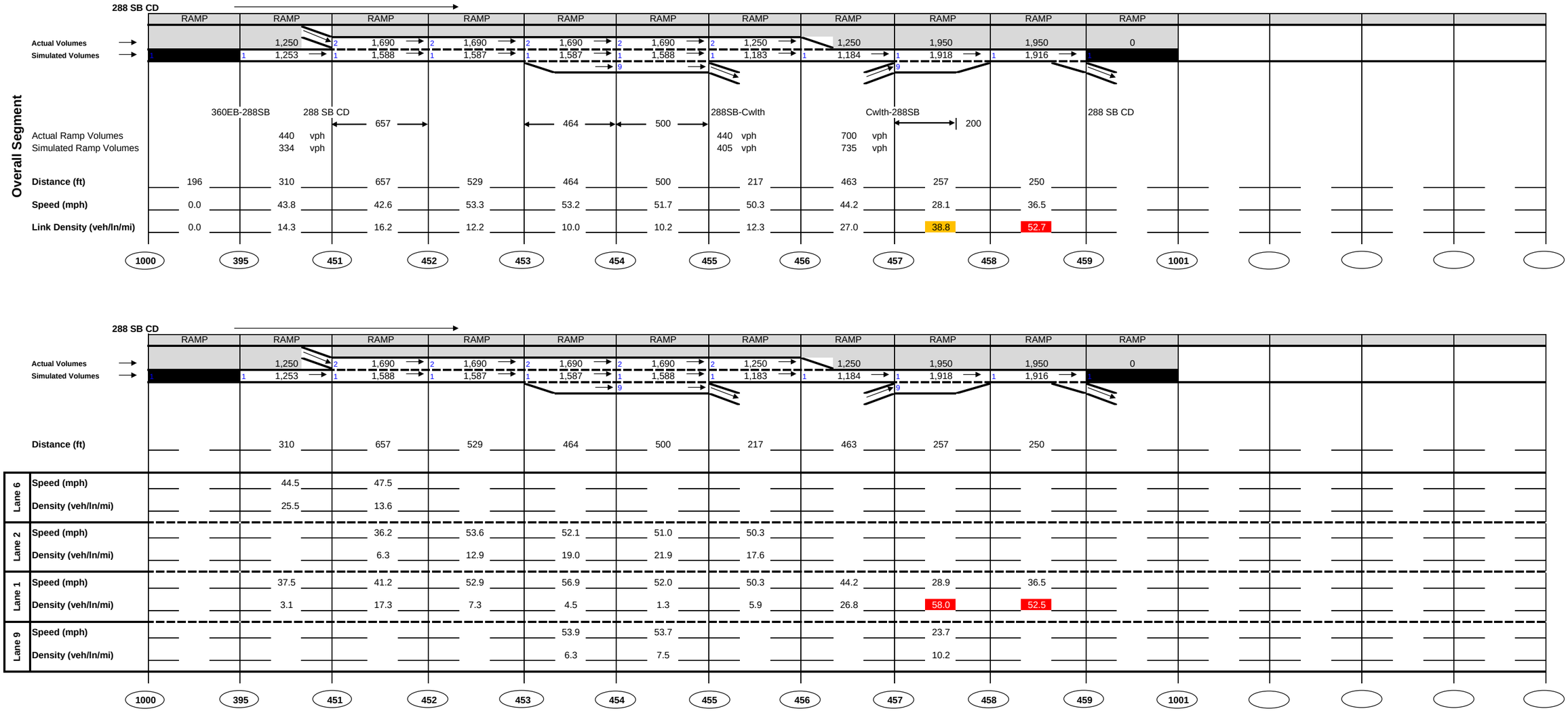
C-6 – No-Build (2040) CORSIM Results

CORSIM Calibration - 2040 No Build AM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 SB CD	1000	395	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
	394	395	Ramp	1250	1252	0.2%	55	46.2	-16.0%
	395	451	Freeway	1250	1253	0.2%	55	43.8	-20.4%
	450	451	Ramp	440	334	-24.1%	55	53.9	-2.0%
	451	452	Freeway	1690	1588	-6.0%	55	42.6	-22.5%
	452	453	Freeway	1690	1587	-6.1%	55	53.3	-3.1%
	453	454	Freeway	1690	1587	-6.1%	55	53.2	-3.3%
	454	455	Freeway	1690	1588	-6.0%	55	51.7	-6.0%
	455	475	Ramp	440	405	-8.0%	55	53.9	-2.0%
	455	456	Freeway	1250	1183	-5.4%	55	50.3	-8.5%
	456	457	Freeway	1250	1184	-5.3%	55	44.2	-19.6%
	480	457	Ramp	700	735	5.0%	55	48.1	-12.5%
	457	458	Freeway	1950	1918	-1.6%	55	28.1	-48.9%
	458	459	Freeway	1950	1916	-1.7%	55	36.5	-33.6%
	459	330	Ramp	1950	1915	-1.8%	55	43.9	-20.2%
	459	1001	Freeway	0	0	#DIV/0!	55	0	-100.0%
Route 288 SB	300	301	Freeway	2530	2530	0.0%	65	63.1	-2.9%
	301	302	Freeway	2530	2529	0.0%	65	63.6	-2.2%
	302	303	Freeway	2530	2529	0.0%	65	62.9	-3.2%
	303	304	Freeway	2530	2529	0.0%	65	62.4	-4.0%
	304	305	Freeway	2530	2530	0.0%	65	62.2	-4.3%
	305	306	Freeway	2530	2530	0.0%	65	62.1	-4.5%
	306	307	Freeway	2530	2531	0.0%	65	62	-4.6%
	307	308	Freeway	2530	2531	0.0%	65	61.9	-4.8%
	308	309	Freeway	2530	2532	0.1%	65	61.8	-4.9%
	309	310	Freeway	2530	2532	0.1%	65	61.7	-5.1%
	310	311	Freeway	2530	2532	0.1%	65	61.6	-5.2%
	311	312	Freeway	2530	2532	0.1%	65	61.6	-5.2%
	312	313	Freeway	2530	2532	0.1%	65	61.3	-5.7%
	313	314	Freeway	2530	2532	0.1%	65	60.6	-6.8%
	314	315	Freeway	2530	2531	0.0%	65	60.2	-7.4%
	315	316	Freeway	2530	2532	0.1%	65	60	-7.7%
	316	317	Freeway	2530	2532	0.1%	65	61.7	-5.1%
	317	390	Ramp	940	940	0.0%	65	61.8	-4.9%
	317	318	Freeway	1590	1593	0.2%	65	62.8	-3.4%
	318	319	Freeway	1590	1593	0.2%	65	62.6	-3.7%
	392	319	Ramp	510	269	-47.3%	65	44	-32.3%
	319	320	Freeway	2100	1862	-11.3%	65	61.2	-5.8%
	320	393	Ramp	320	251	-21.6%	65	62.1	-4.5%
	320	321	Freeway	1780	1610	-9.6%	65	62.3	-4.2%
	321	322	Freeway	1780	1610	-9.6%	65	62.5	-3.8%
	322	450	Ramp	440	334	-24.1%	65	56.5	-13.1%
	322	323	Freeway	1340	1276	-4.8%	65	63.3	-2.6%
	323	324	Freeway	1340	1277	-4.7%	65	63.5	-2.3%
	324	325	Freeway	1340	1277	-4.7%	65	63.5	-2.3%
	325	326	Freeway	1340	1276	-4.8%	65	63.4	-2.5%
	326	327	Freeway	1340	1277	-4.7%	65	63.4	-2.5%
	327	328	Freeway	1340	1277	-4.7%	65	63.3	-2.6%
	328	329	Freeway	1340	1277	-4.7%	65	63.1	-2.9%
	329	330	Freeway	1340	1276	-4.8%	65	62.5	-3.8%
	459	330	Ramp	1950	1915	-1.8%	65	43.9	-32.5%
	330	331	Freeway	3290	3192	-3.0%	65	49.5	-23.8%
	331	332	Freeway	3290	3192	-3.0%	65	54.3	-16.5%
	332	333	Freeway	3290	3192	-3.0%	65	59	-9.2%
	333	334	Freeway	3290	3193	-2.9%	65	61.2	-5.8%
	334	335	Freeway	3290	3193	-2.9%	65	61.7	-5.1%
	335	336	Freeway	3290	3193	-2.9%	65	61.6	-5.2%
	336	337	Freeway	3290	3192	-3.0%	65	61.4	-5.5%
	337	338	Freeway	3290	3192	-3.0%	65	61.2	-5.8%
	338	339	Freeway	3290	3191	-3.0%	65	61.3	-5.7%
Cwlth-288	7002	271	Freeway	1700	1699	-0.1%	55	41.1	-25.3%
	271	272	Freeway	1700	1700	0.0%	55	51.2	-6.9%
	272	273	Freeway	1700	1700	0.0%	55	49.7	-9.6%
	273	274	Freeway	1700	1699	-0.1%	55	38.7	-29.6%
	274	480	Ramp	700	735	5.0%	45	51.2	13.8%
	274	275	Freeway	1000	962	-3.8%	45	25.6	-43.1%
	275	276	Freeway	1000	958	-4.2%	45	19.6	-56.4%
	276	277	Freeway	1000	954	-4.6%	45	16.7	-62.9%
	277	278	Freeway	1000	948	-5.2%	45	15.2	-66.2%
	278	251	Freeway	1000	938	-6.2%	55	14.1	-74.4%
	250	251	Ramp	700	582	-16.9%	55	13.6	-75.3%
	251	252	Freeway	1700	1502	-11.6%	55	12.4	-77.5%
	252	253	Freeway	1700	1487	-12.5%	55	11	-80.0%
	253	254	Freeway	1700	1474	-13.3%	55	9.2	-83.3%
	254	116	Ramp	1000	857	-14.3%	55	6.2	-88.7%
	254	255	Freeway	700	606	-13.4%	55	47.8	-13.1%
	255	7008	Ramp	700	606	-13.4%	55	50.8	-7.6%

CORSIM Calibration - 2040 No Build AM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
	255	1002	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
Route 288 NB	100	101	Freeway	3490	3268	-6.4%	65	26.8	-58.8%
	101	102	Freeway	3490	3242	-7.1%	65	23.8	-63.4%
	102	103	Freeway	3490	3214	-7.9%	65	21.6	-66.8%
	103	104	Freeway	3490	3188	-8.7%	65	19.9	-69.4%
	104	105	Freeway	3490	3161	-9.4%	65	18.7	-71.2%
	105	106	Freeway	3490	3131	-10.3%	65	17.6	-72.9%
	106	107	Freeway	3490	3102	-11.1%	65	16.8	-74.2%
	107	108	Freeway	3490	3078	-11.8%	65	16.8	-74.2%
	108	109	Freeway	3490	3055	-12.5%	65	16.4	-74.8%
	109	110	Freeway	3490	3030	-13.2%	65	16	-75.4%
	110	111	Freeway	3490	3007	-13.8%	65	15.3	-76.5%
	111	250	Ramp	700	586	-16.3%	65	24.2	-62.8%
	111	112	Freeway	2790	2398	-14.1%	65	11.7	-82.0%
	112	113	Freeway	2790	2371	-15.0%	65	10.1	-84.5%
	113	114	Freeway	2790	2344	-16.0%	65	9.4	-85.5%
	114	115	Freeway	2790	2321	-16.8%	65	9	-86.2%
	115	116	Freeway	2790	2296	-17.7%	65	8.9	-86.3%
	254	116	Ramp	1000	857	-14.3%	65	6.2	-90.5%
	116	117	Freeway	3790	3125	-17.5%	65	9.6	-85.2%
	117	118	Freeway	3790	3107	-18.0%	65	12	-81.5%
	191	118	Ramp	2570	1532	-40.4%	65	11.1	-82.9%
	118	119	Freeway	6360	4619	-27.4%	65	17.5	-73.1%
	119	192	Ramp	930	356	-61.7%	65	42.6	-34.5%
	119	120	Freeway	5430	4253	-21.7%	65	20.6	-68.3%
	120	121	Freeway	5430	4249	-21.7%	65	20	-69.2%
	603	121	Ramp	890	860	-3.4%	65	49.5	-23.8%
	121	122	Freeway	6320	5106	-19.2%	65	22.2	-65.8%
	122	123	Freeway	6320	5103	-19.3%	65	33.2	-48.9%
	123	124	Freeway	6320	5103	-19.3%	65	41.6	-36.0%
	124	125	Freeway	6320	5103	-19.3%	65	49.7	-23.5%
	125	126	Freeway	6320	5104	-19.2%	65	54.6	-16.0%
	126	127	Freeway	6320	5104	-19.2%	65	56.7	-12.8%
	127	128	Freeway	6320	5106	-19.2%	65	57.2	-12.0%
	128	129	Freeway	6320	5107	-19.2%	65	56.6	-12.9%
	129	130	Freeway	6320	5107	-19.2%	65	55.4	-14.8%
	130	131	Freeway	6320	5107	-19.2%	65	54.9	-15.5%
	131	132	Freeway	6320	5106	-19.2%	65	54.7	-15.8%
	132	133	Freeway	6320	5105	-19.2%	65	54.2	-16.6%
	133	134	Freeway	6320	5104	-19.2%	65	54	-16.9%
	134	135	Freeway	6320	5102	-19.3%	65	54.1	-16.8%
	135	136	Freeway	6320	5101	-19.3%	65	53.9	-17.1%
	136	137	Freeway	6320	5099	-19.3%	65	55.4	-14.8%



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

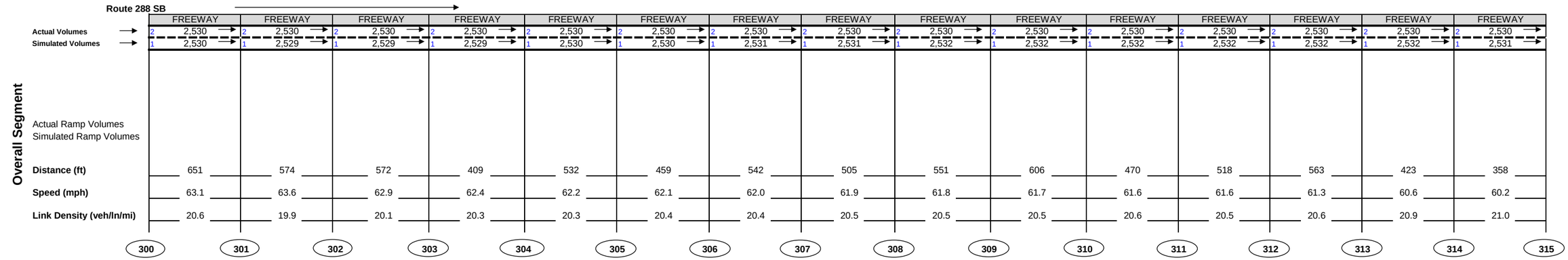
VDOT Virginia Department of Transportation

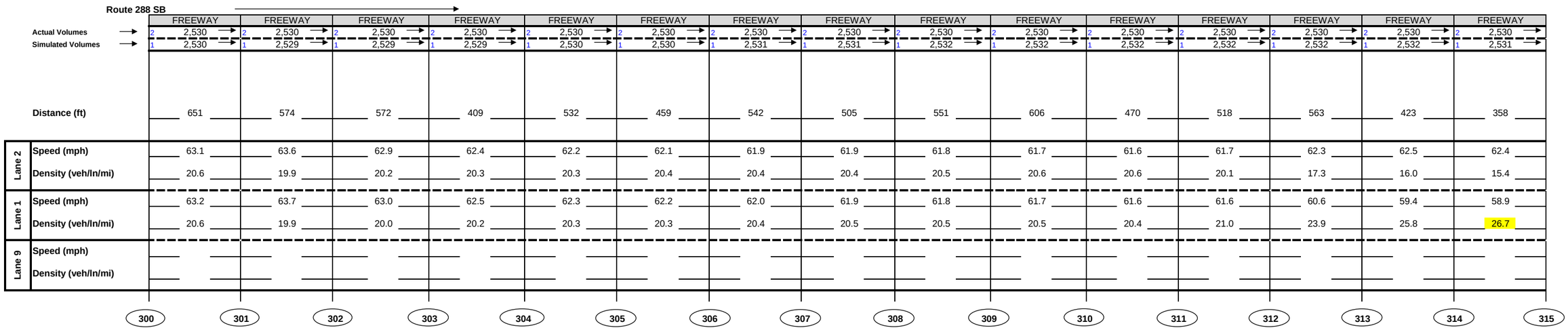
Figure 1

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

No Build (2040)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

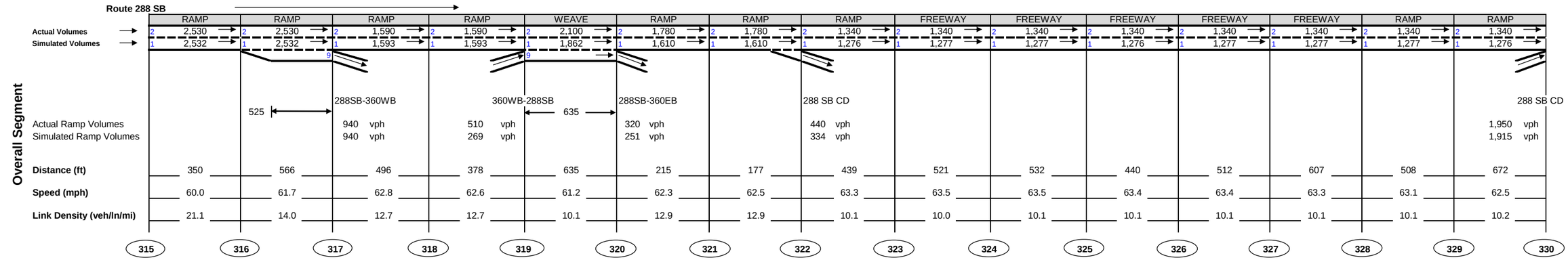
Weave/Ramp Density (veh/ln/mi)
45 and above
35 to 45
28 to 35
20 to 28
10 to 20
0 to 10

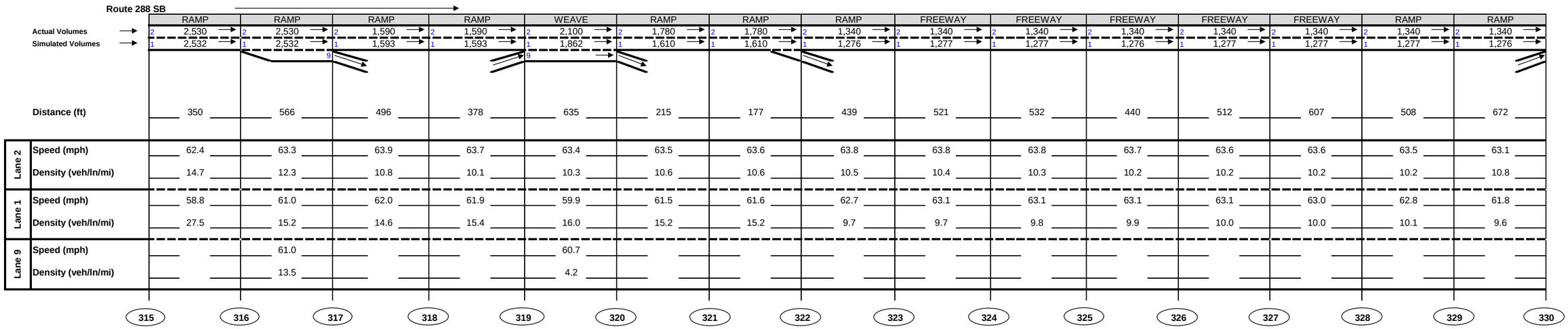
CD Road Weave Density (veh/ln/mi)
45 and above
36 to 45
32 to 36
24 to 32
12 to 24
0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 2
Southbound - AM Peak Hour
US 360/Route 288 Interchange Study
No Build (2040)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

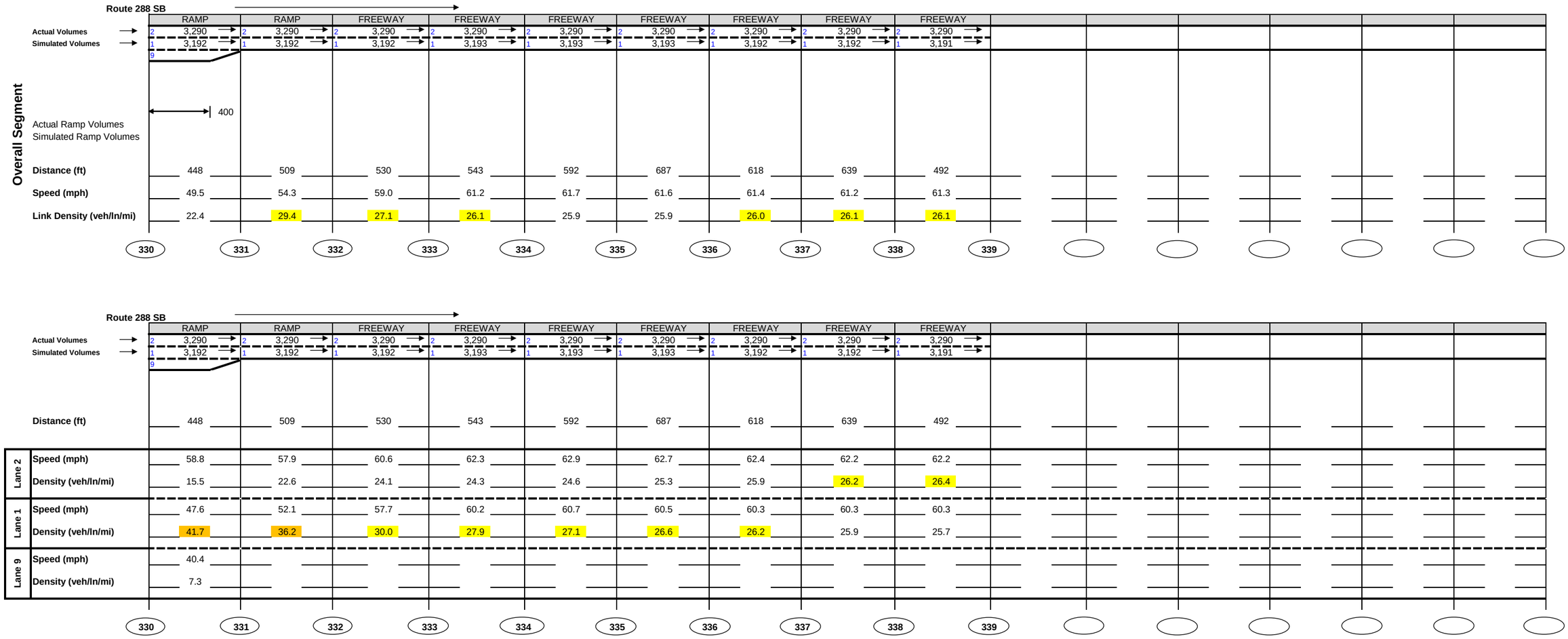
Weave/Ramp Density (veh/ln/mi)
45 and above
35 to 45
28 to 35
20 to 28
10 to 20
0 to 10

CD Road Weave Density (veh/ln/mi)
45 and above
36 to 45
32 to 36
24 to 32
12 to 24
0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

Virginia Department of Transportation

Figure 3
Southbound - AM Peak Hour
US 360/Route 288 Interchange Study
No Build (2040)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

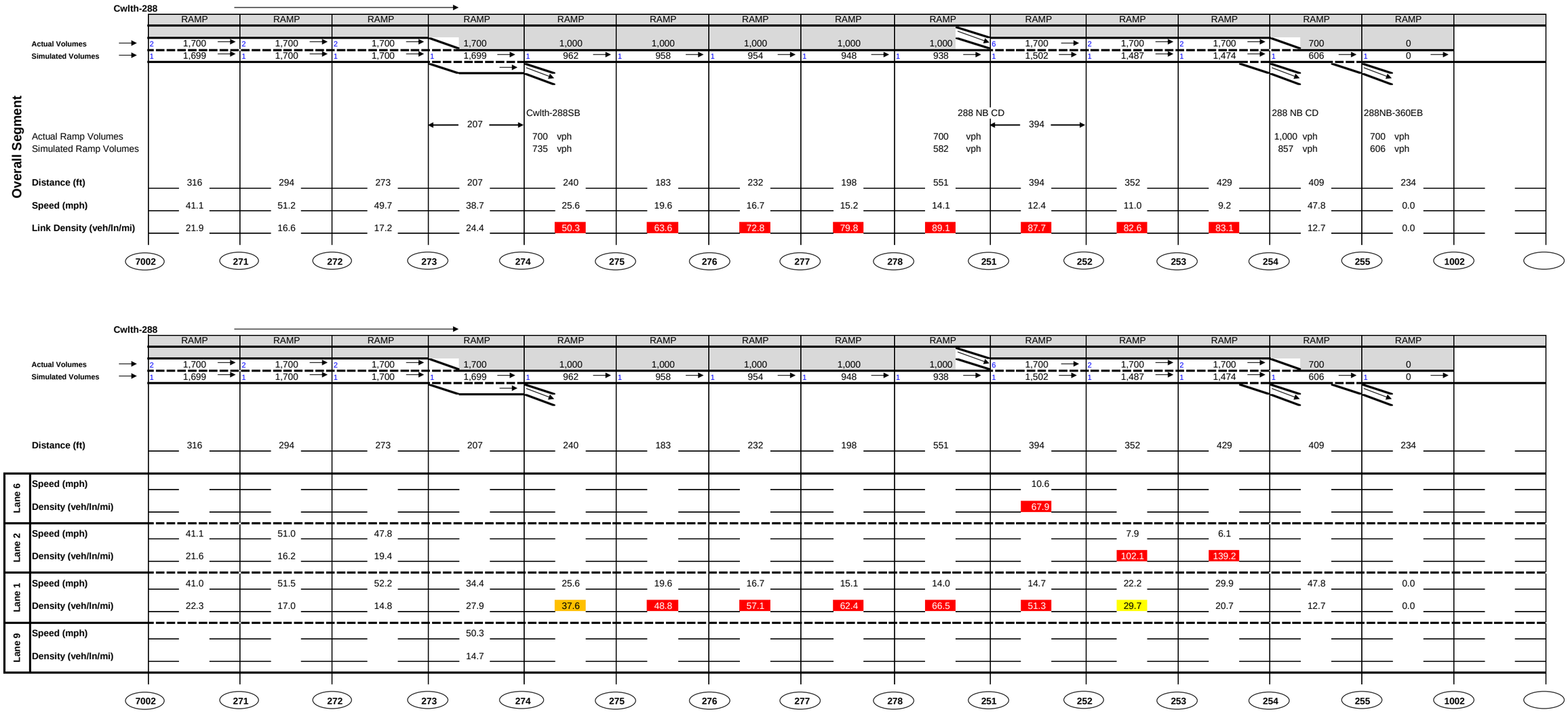
Virginia Department of Transportation

Figure 4

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

No Build (2040)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

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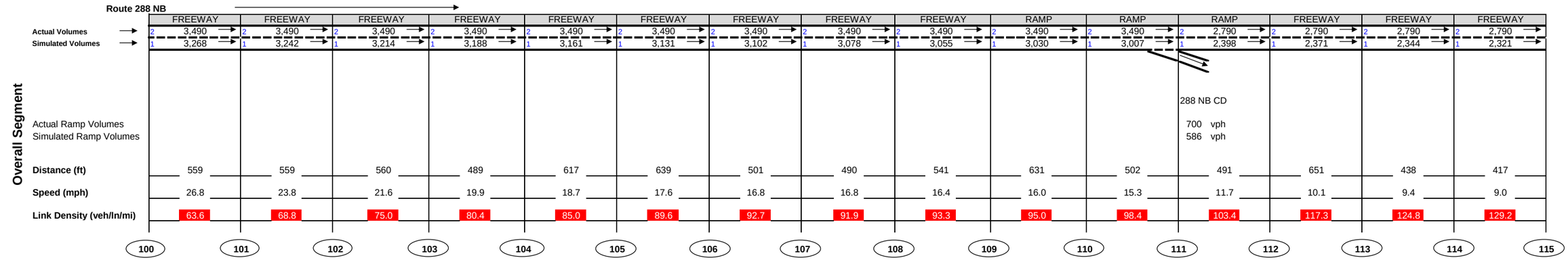
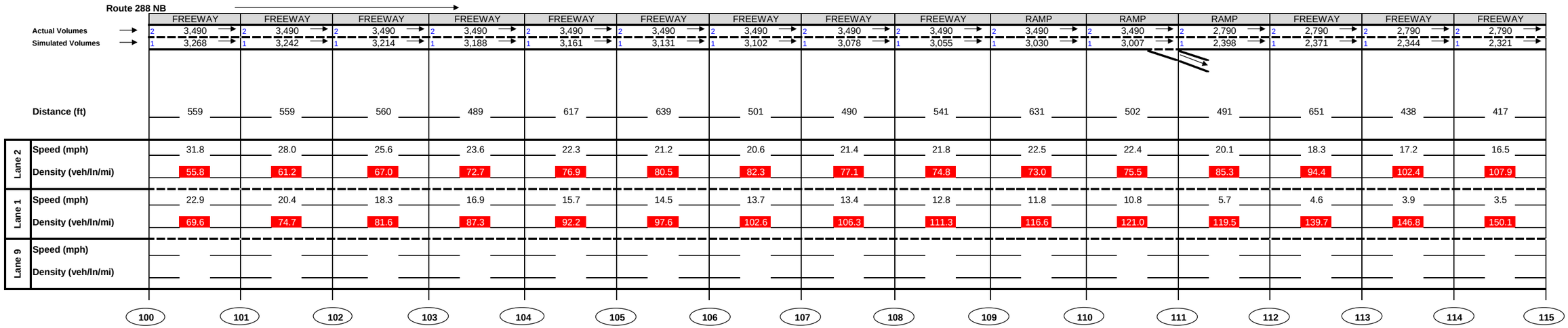
Figure 5

Commonwealth Centre Parkway at Route 288 - AM Peak Hour

US 360/Route 288 Interchange Study

No Build (2040)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

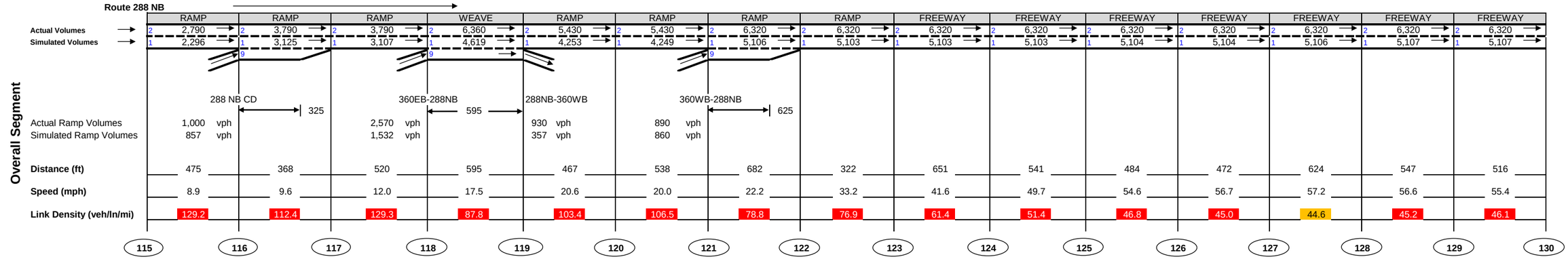
Virginia Department of Transportation

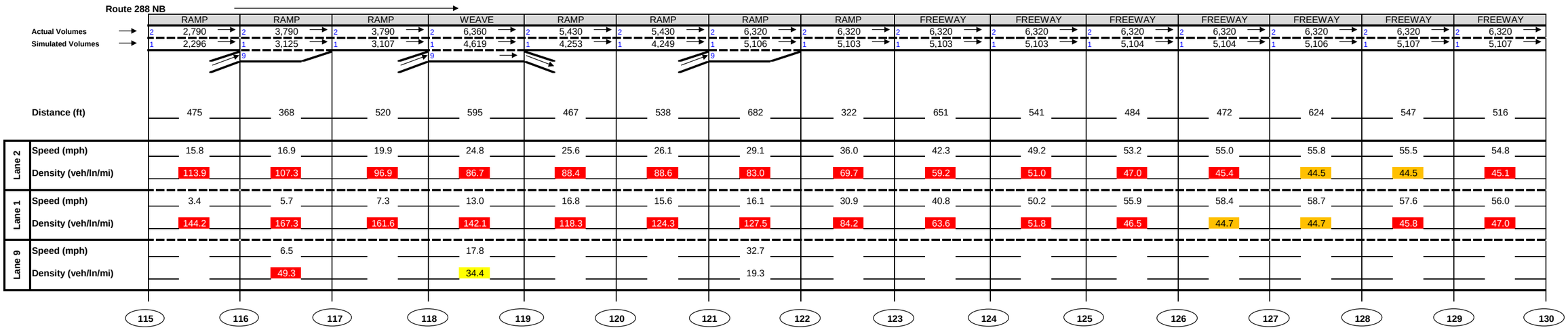
Figure 6

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

No Build (2040)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

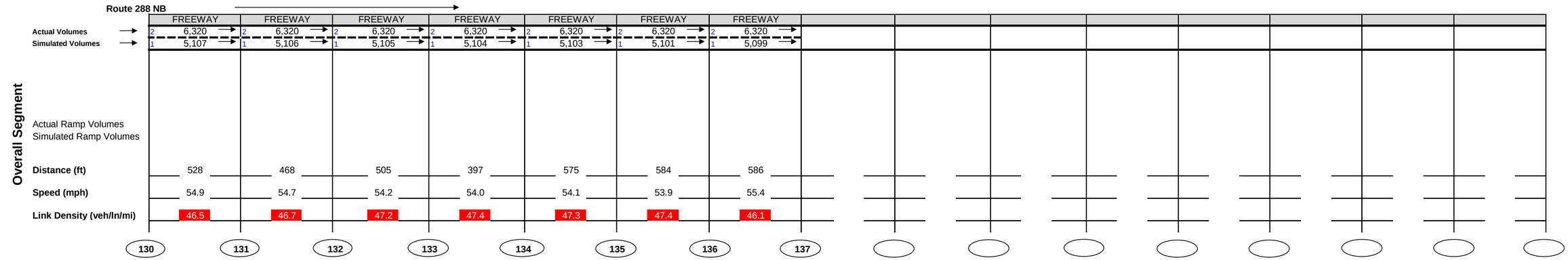
Auxiliary Lane Length

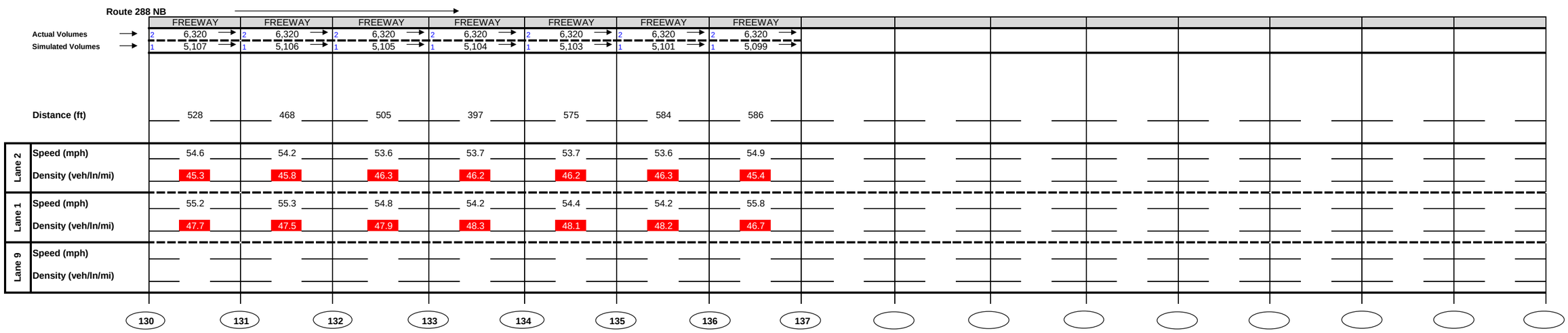
Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 7
Northbound - AM Peak Hour
US 360/Route 288 Interchange Study
No Build (2040)





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

Virginia Department of Transportation

Figure 8

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

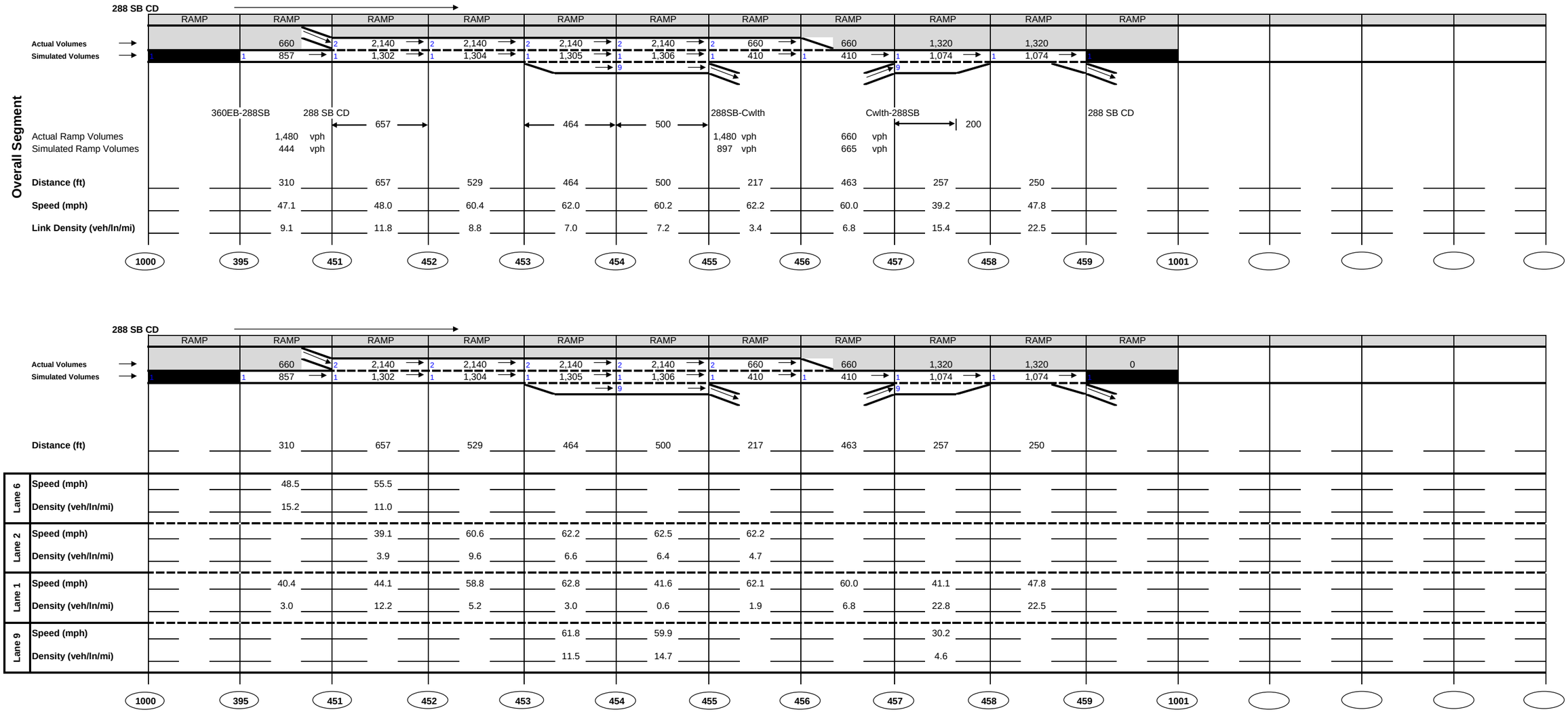
No Build (2040)

CORSIM Calibration - 2040 No Build PM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 SB CD	1000	395	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
	394	395	Ramp	660	857	29.8%	55	47.4	-13.8%
	395	451	Freeway	660	857	29.8%	55	47.1	-14.4%
	450	451	Ramp	1480	444	-70.0%	55	60.1	9.3%
	451	452	Freeway	2140	1302	-39.2%	55	48	-12.7%
	452	453	Freeway	2140	1304	-39.1%	55	60.4	9.8%
	453	454	Freeway	2140	1305	-39.0%	55	62	12.7%
	454	455	Freeway	2140	1306	-39.0%	55	60.2	9.5%
	455	475	Ramp	1480	897	-39.4%	55	59.4	8.0%
	455	456	Freeway	660	410	-37.9%	55	62.2	13.1%
	456	457	Freeway	660	410	-37.9%	55	60	9.1%
	480	457	Ramp	660	665	0.8%	55	47.6	-13.5%
	457	458	Freeway	1320	1074	-18.6%	55	39.2	-28.7%
	458	459	Freeway	1320	1074	-18.6%	55	47.8	-13.1%
	459	330	Ramp	1320	1074	-18.6%	55	54.4	-1.1%
	459	1001	Freeway	0	0	#DIV/0!	55	0	-100.0%
Route 288 SB	300	301	Freeway	5730	2310	-59.7%	65	7.9	-87.8%
	301	302	Freeway	5730	2275	-60.3%	65	7.5	-88.5%
	302	303	Freeway	5730	2242	-60.9%	65	7.3	-88.8%
	303	304	Freeway	5730	2214	-61.4%	65	7.2	-88.9%
	304	305	Freeway	5730	2188	-61.8%	65	7.1	-89.1%
	305	306	Freeway	5730	2161	-62.3%	65	7	-89.2%
	306	307	Freeway	5730	2134	-62.8%	65	6.9	-89.4%
	307	308	Freeway	5730	2105	-63.3%	65	6.9	-89.4%
	308	309	Freeway	5730	2076	-63.8%	65	6.9	-89.4%
	309	310	Freeway	5730	2043	-64.3%	65	7	-89.2%
	310	311	Freeway	5730	2012	-64.9%	65	7.1	-89.1%
	311	312	Freeway	5730	1985	-65.4%	65	7.6	-88.3%
	312	313	Freeway	5730	1958	-65.8%	65	8.2	-87.4%
	313	314	Freeway	5730	1939	-66.2%	65	8.4	-87.1%
	314	315	Freeway	5730	1926	-66.4%	65	8.8	-86.5%
	315	316	Freeway	5730	1917	-66.5%	65	9.8	-84.9%
	316	317	Freeway	5730	1907	-66.7%	65	9.1	-86.0%
	317	390	Ramp	2760	891	-67.7%	65	5.1	-92.2%
	317	318	Freeway	2970	1008	-66.1%	65	54.3	-16.5%
	318	319	Freeway	2970	1010	-66.0%	65	58	-10.8%
	392	319	Ramp	420	456	8.6%	65	38.5	-40.8%
	319	320	Freeway	3390	1468	-56.7%	65	55.3	-14.9%
	320	393	Ramp	860	254	-70.5%	65	59.4	-8.6%
	320	321	Freeway	2530	1217	-51.9%	65	57.9	-10.9%
	321	322	Freeway	2530	1218	-51.9%	65	59	-9.2%
	322	450	Ramp	1480	444	-70.0%	65	59.1	-9.1%
	322	323	Freeway	1050	775	-26.2%	65	61.1	-6.0%
	323	324	Freeway	1050	775	-26.2%	65	62.2	-4.3%
	324	325	Freeway	1050	776	-26.1%	65	62.6	-3.7%
	325	326	Freeway	1050	776	-26.1%	65	62.9	-3.2%
	326	327	Freeway	1050	777	-26.0%	65	63	-3.1%
	327	328	Freeway	1050	778	-25.9%	65	63.1	-2.9%
	328	329	Freeway	1050	778	-25.9%	65	63.2	-2.8%
	329	330	Freeway	1050	778	-25.9%	65	63.2	-2.8%
	459	330	Ramp	1320	1074	-18.6%	65	54.4	-16.3%
	330	331	Freeway	2370	1852	-21.9%	65	57.4	-11.7%
	331	332	Freeway	2370	1853	-21.8%	65	60.4	-7.1%
	332	333	Freeway	2370	1852	-21.9%	65	62.1	-4.5%
	333	334	Freeway	2370	1852	-21.9%	65	62.9	-3.2%
	334	335	Freeway	2370	1853	-21.8%	65	63	-3.1%
	335	336	Freeway	2370	1854	-21.8%	65	62.9	-3.2%
	336	337	Freeway	2370	1855	-21.7%	65	62.8	-3.4%
	337	338	Freeway	2370	1856	-21.7%	65	62.8	-3.4%
	338	339	Freeway	2370	1856	-21.7%	65	62.8	-3.4%
Cwlth-288	7002	271	Freeway	1370	1370	0.0%	55	34.3	-37.6%
	271	272	Freeway	1370	1370	0.0%	55	34.1	-38.0%
	272	273	Freeway	1370	1370	0.0%	55	33.6	-38.9%
	273	274	Freeway	1370	1370	0.0%	55	33.7	-38.7%
	274	480	Ramp	660	665	0.8%	45	40.1	-10.9%
	274	275	Freeway	710	704	-0.8%	45	38.4	-14.7%
	275	276	Freeway	710	704	-0.8%	45	43.4	-3.6%
	276	277	Freeway	710	704	-0.8%	45	43.8	-2.7%
	277	278	Freeway	710	704	-0.8%	45	45.8	1.8%
	278	251	Freeway	710	704	-0.8%	55	56.4	2.5%
	250	251	Ramp	710	896	26.2%	55	62.5	13.6%
	251	252	Freeway	1420	1601	12.7%	55	62.3	13.3%
	252	253	Freeway	1420	1601	12.7%	55	62.4	13.5%
	253	254	Freeway	1420	1601	12.7%	55	62.2	13.1%
	254	116	Ramp	1000	724	-27.6%	55	60.1	9.3%
	254	255	Freeway	420	877	108.8%	55	62.1	12.9%
	255	7008	Ramp	420	877	108.8%	55	61.9	12.5%

CORSIM Calibration - 2040 No Build PM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
	255	1002	Freeway	0	0	#DIV/0!	0	0	#DIV/0!
Route 288 NB	100	101	Freeway	3490	3434	-1.6%	65	62	-4.6%
	101	102	Freeway	3490	3434	-1.6%	65	63.1	-2.9%
	102	103	Freeway	3490	3435	-1.6%	65	62.3	-4.2%
	103	104	Freeway	3490	3437	-1.5%	65	61.4	-5.5%
	104	105	Freeway	3490	3438	-1.5%	65	61.2	-5.8%
	105	106	Freeway	3490	3439	-1.5%	65	61	-6.2%
	106	107	Freeway	3490	3439	-1.5%	65	60.8	-6.5%
	107	108	Freeway	3490	3438	-1.5%	65	60.5	-6.9%
	108	109	Freeway	3490	3437	-1.5%	65	59.7	-8.2%
	109	110	Freeway	3490	3436	-1.5%	65	59.3	-8.8%
	110	111	Freeway	3490	3435	-1.6%	65	59.5	-8.5%
	111	250	Ramp	700	896	28.0%	65	60.7	-6.6%
	111	112	Freeway	2790	2538	-9.0%	65	61.3	-5.7%
	112	113	Freeway	2790	2537	-9.1%	65	61.9	-4.8%
	113	114	Freeway	2790	2537	-9.1%	65	61.8	-4.9%
	114	115	Freeway	2790	2536	-9.1%	65	61.5	-5.4%
	115	116	Freeway	2790	2534	-9.2%	65	60.7	-6.6%
	254	116	Ramp	1000	724	-27.6%	65	60.1	-7.5%
	116	117	Freeway	3790	3259	-14.0%	65	50.1	-22.9%
	117	118	Freeway	3790	3260	-14.0%	65	51.1	-21.4%
	191	118	Ramp	2570	1533	-40.4%	65	42.6	-34.5%
	118	119	Freeway	6360	4793	-24.6%	65	50.3	-22.6%
	119	192	Ramp	930	1186	27.5%	65	51.3	-21.1%
	119	120	Freeway	5430	3608	-33.6%	65	56	-13.8%
	120	121	Freeway	5430	3610	-33.5%	65	59.2	-8.9%
	603	121	Ramp	890	665	-25.3%	65	54.2	-16.6%
	121	122	Freeway	6320	4274	-32.4%	65	56.4	-13.2%
	122	123	Freeway	6320	4273	-32.4%	65	55	-15.4%
	123	124	Freeway	6320	4273	-32.4%	65	57	-12.3%
	124	125	Freeway	6320	4272	-32.4%	65	58.9	-9.4%
	125	126	Freeway	6320	4272	-32.4%	65	59.6	-8.3%
	126	127	Freeway	6320	4272	-32.4%	65	59.8	-8.0%
	127	128	Freeway	6320	4272	-32.4%	65	59.6	-8.3%
	128	129	Freeway	6320	4271	-32.4%	65	59.6	-8.3%
	129	130	Freeway	6320	4272	-32.4%	65	59.6	-8.3%
	130	131	Freeway	6320	4273	-32.4%	65	59.5	-8.5%
	131	132	Freeway	6320	4273	-32.4%	65	59.5	-8.5%
	132	133	Freeway	6320	4271	-32.4%	65	59.4	-8.6%
	133	134	Freeway	6320	4270	-32.4%	65	59.4	-8.6%
	134	135	Freeway	6320	4268	-32.5%	65	59.4	-8.6%
	135	136	Freeway	6320	4265	-32.5%	65	59.3	-8.8%
	136	137	Freeway	6320	4264	-32.5%	65	59.4	-8.6%



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

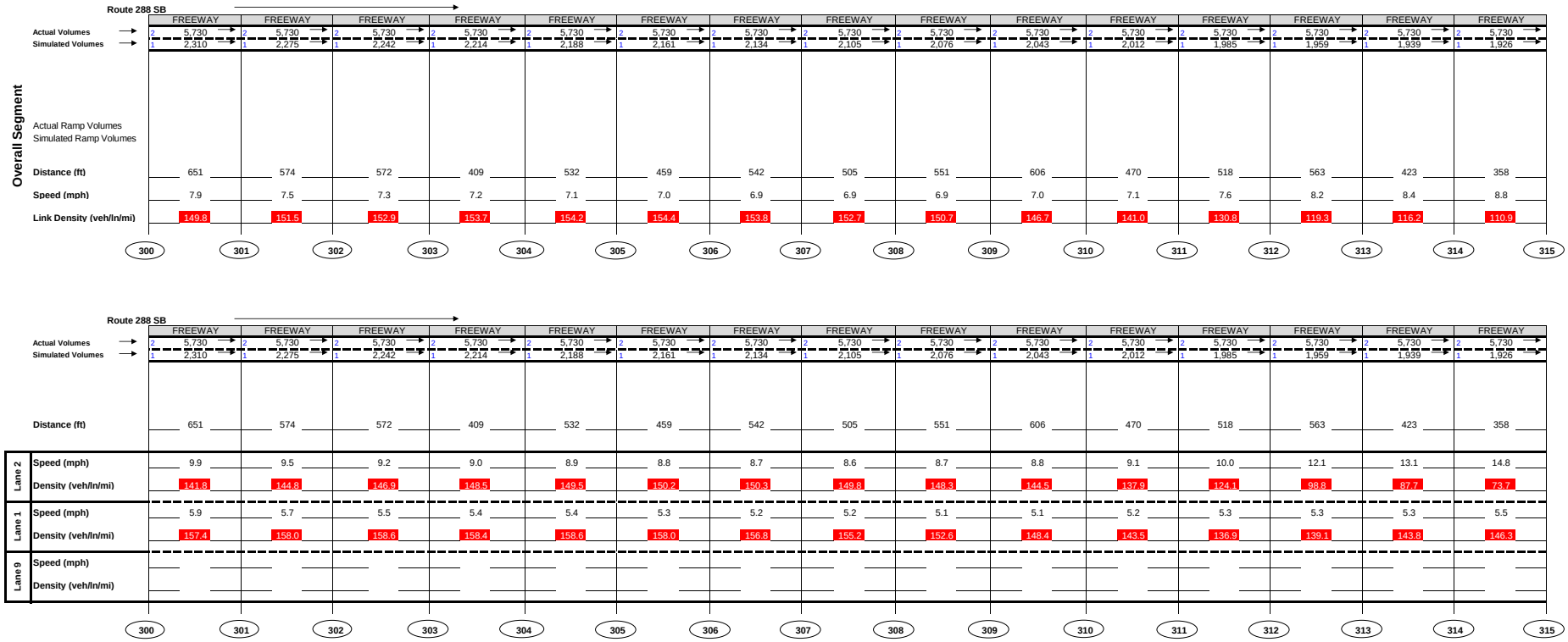
VDOT Virginia Department of Transportation

Figure 1

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

No Build (2040)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

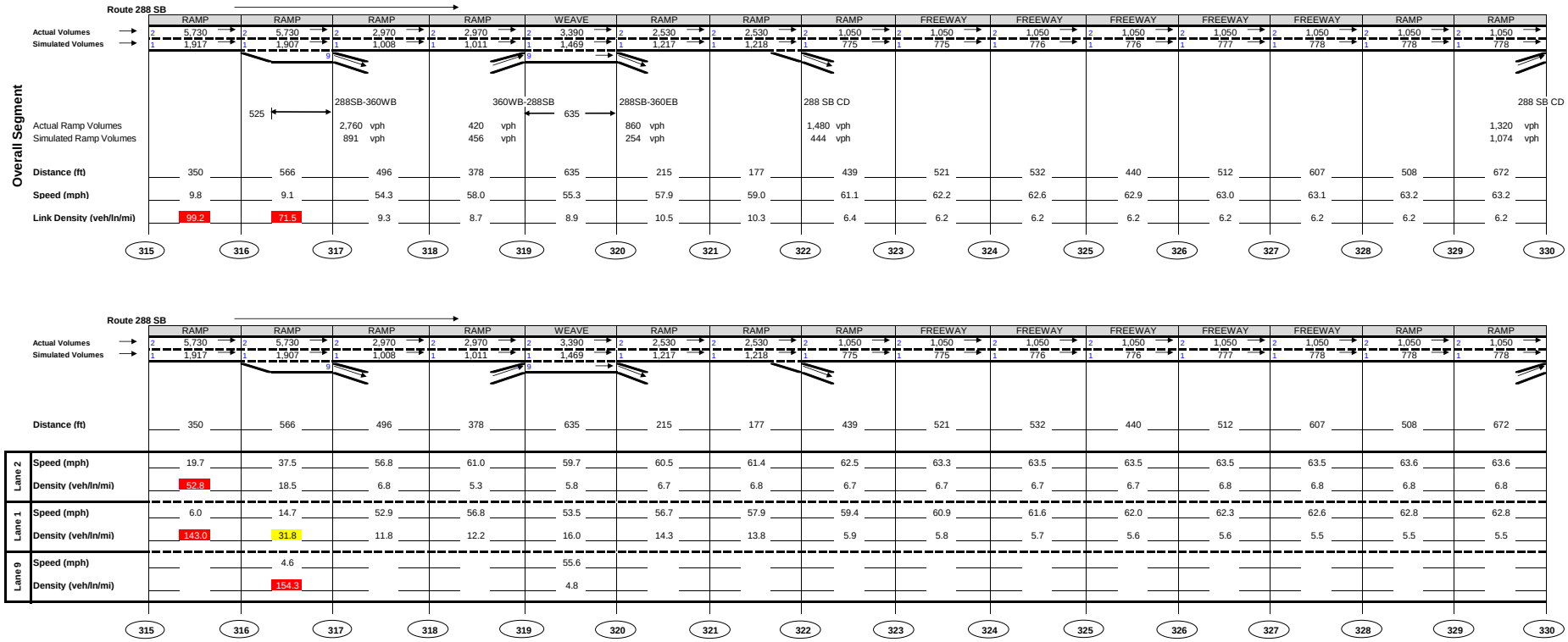
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 2
Southbound - PM Peak Hour
US 360/Route 288 Interchange Study
No Build (2040)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

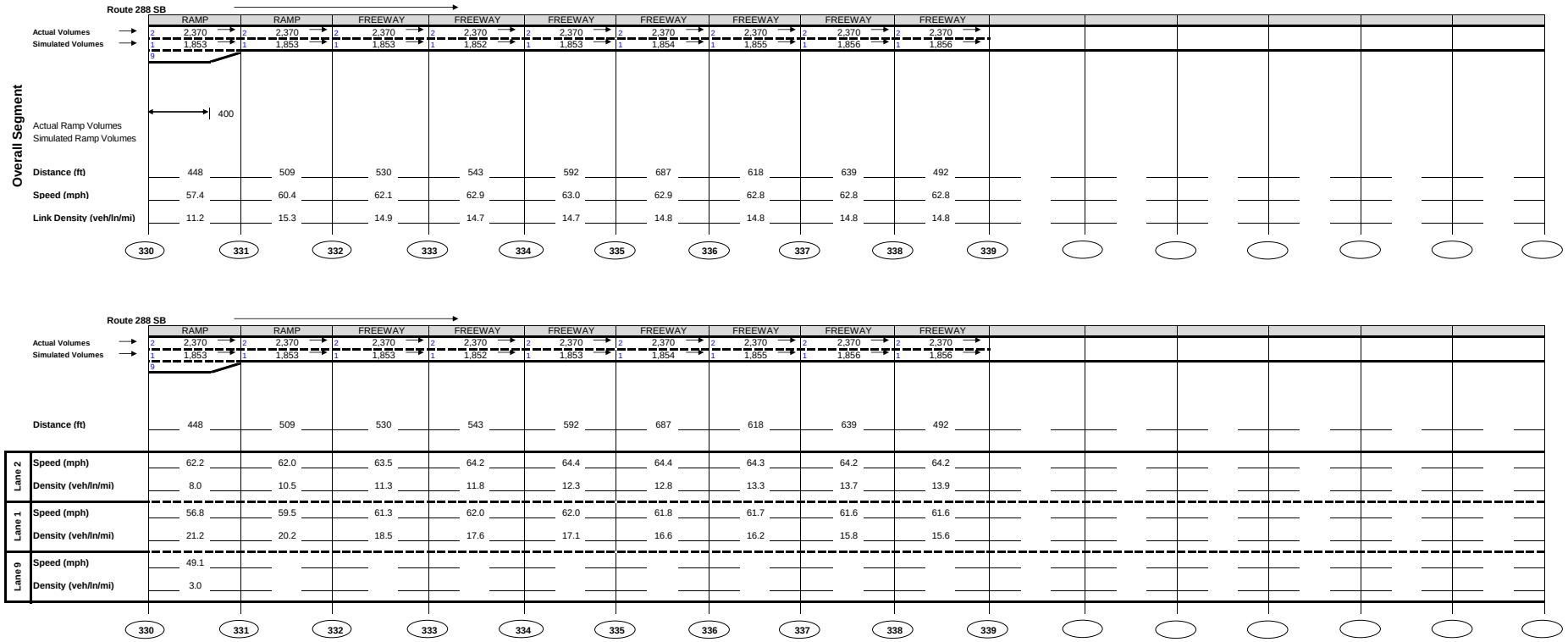
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 3
Southbound - PM Peak Hour
US 360/Route 288 Interchange Study
No Build (2040)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

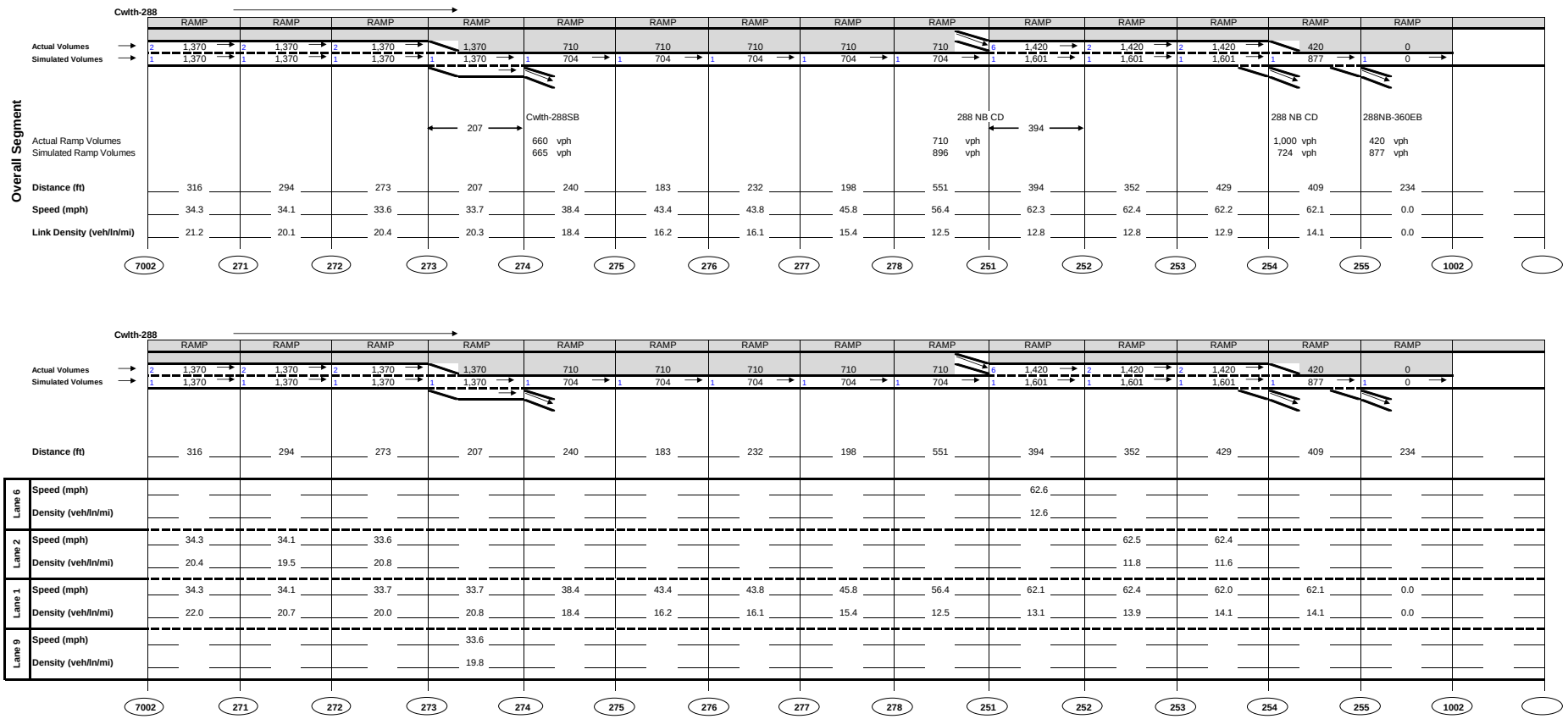
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 4
Southbound - PM Peak Hour
US 360/Route 288 Interchange Study
No Build (2040)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

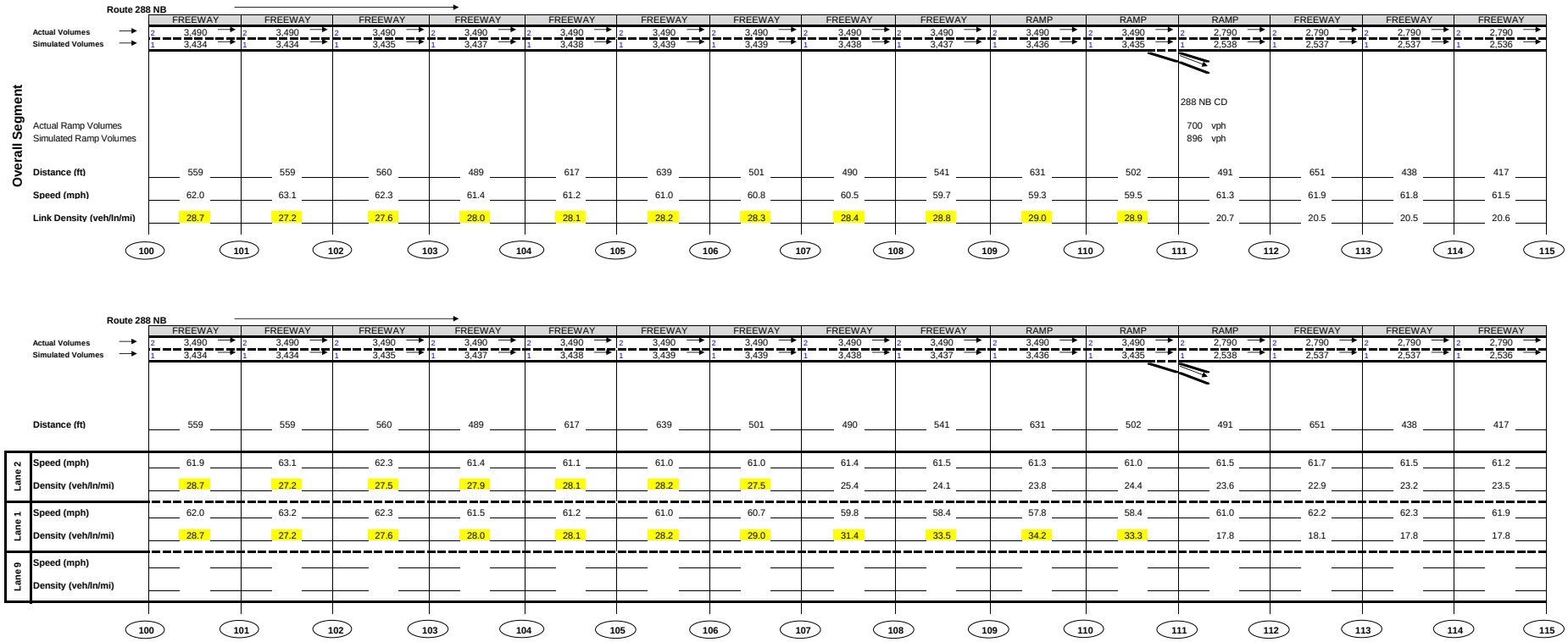
VDOT Virginia Department of Transportation

Figure 5

Commonwealth Centre Parkway at Route 288 - PM Peak Hour

US 360/Route 288 Interchange Study

No Build (2040)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

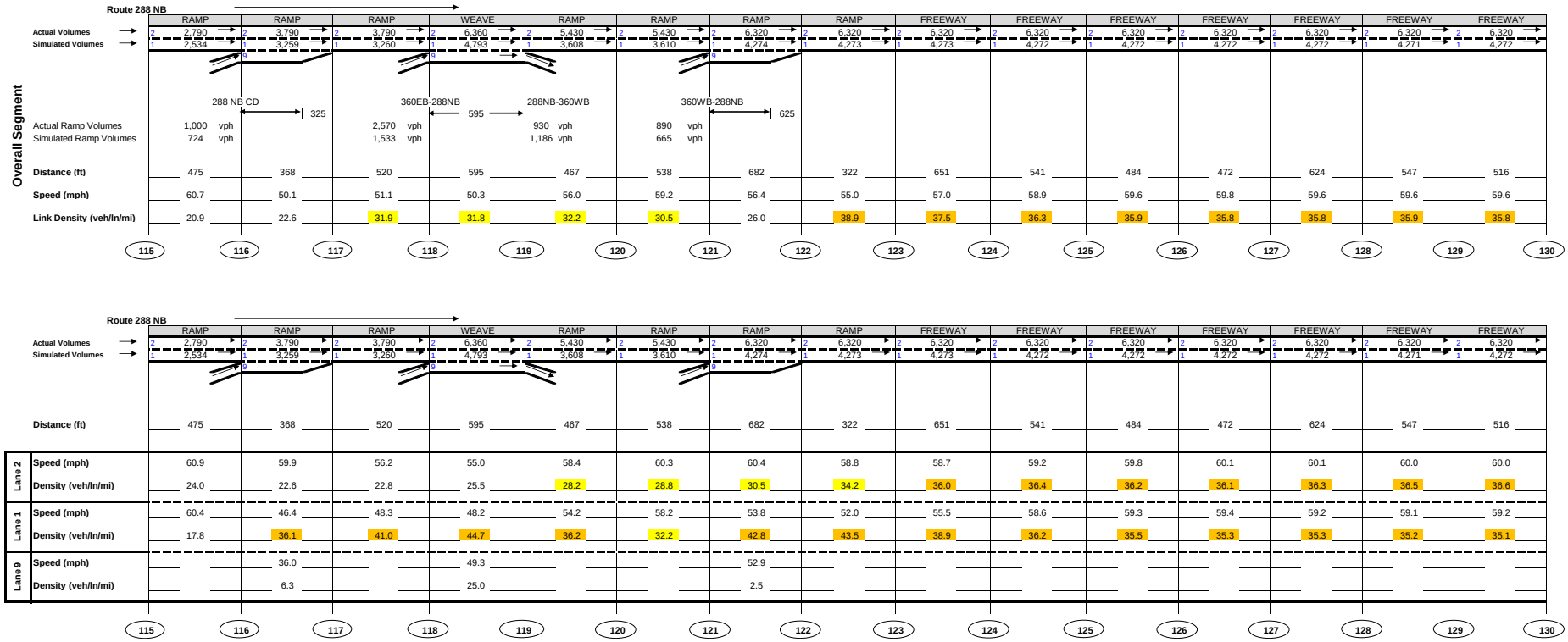
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 6
Northbound - PM Peak Hour
US 360/Route 288 Interchange Study
No Build (2040)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

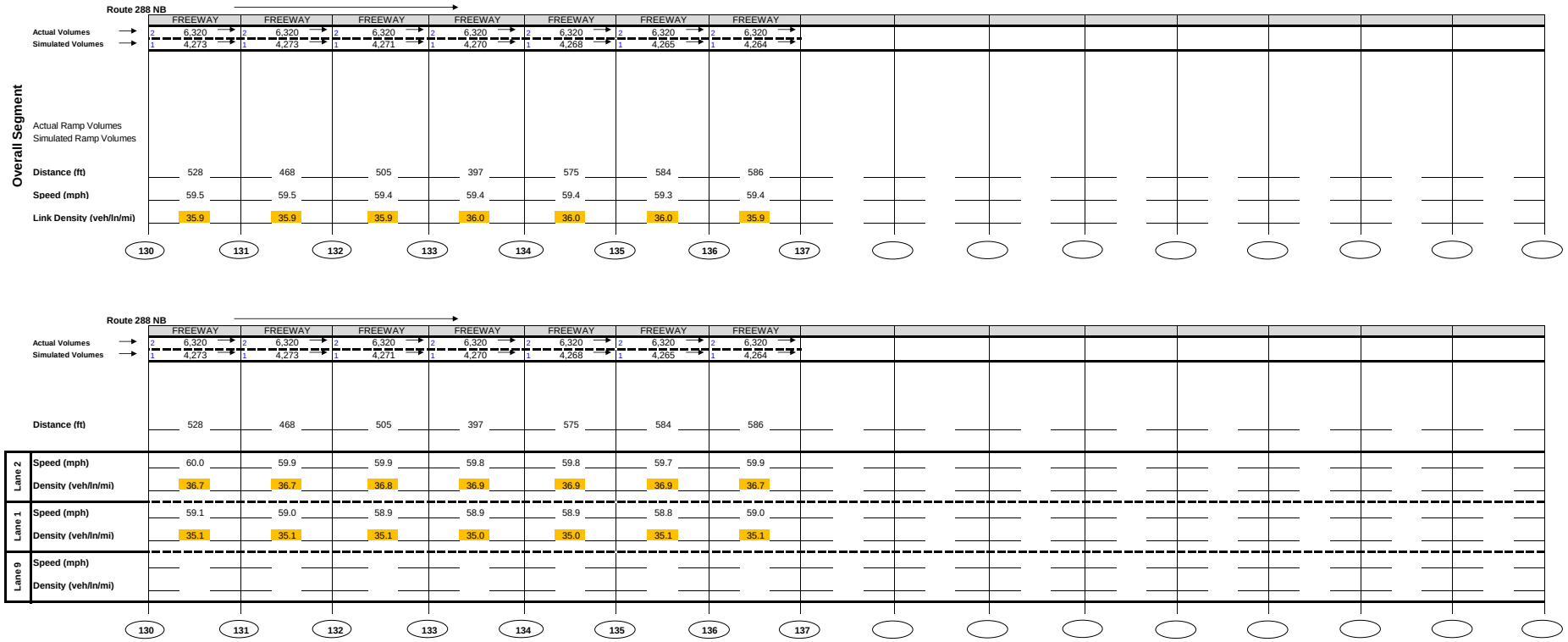
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 7
Northbound - PM Peak Hour
US 360/Route 288 Interchange Study
No Build (2040)



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 8
Northbound - PM Peak Hour
US 360/Route 288 Interchange Study
No Build (2040)

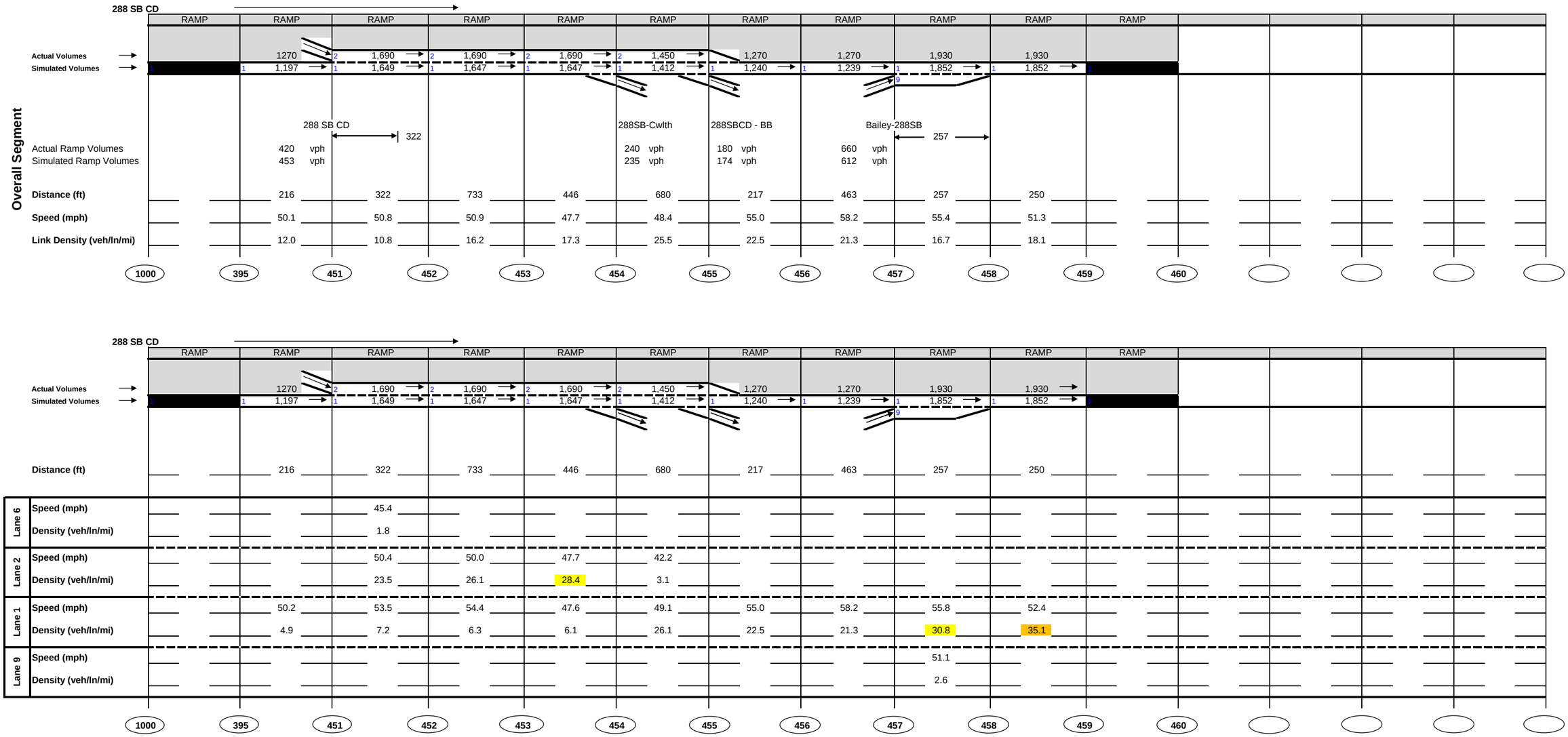
C-7 – Concept 1 (2040) CORSIM Results

CORSIM Calibration - 2040 Concept 1 AM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 SB CD	1000	395	Freeway	0	0	#DIV/0!	55	0	-100.0%
	394	395	Ramp	1270	1198	-5.7%	55	47	-14.5%
	395	451	Freeway	1270	1197	-5.7%	55	50.1	-8.9%
	450	451	Ramp	420	453	7.9%	55	53.5	-2.7%
	451	452	Freeway	1690	1649	-2.4%	55	50.8	-7.6%
	452	453	Freeway	1690	1647	-2.5%	55	50.9	-7.5%
	453	454	Freeway	1690	1647	-2.5%	55	47.7	-13.3%
	454	48	Ramp	240	235	-2.1%	55	51.2	-6.9%
	454	455	Freeway	1450	1412	-2.6%	55	48.4	-12.0%
	455	7	Ramp	180	174	-3.3%	55	39.5	-28.2%
	455	456	Freeway	1270	1240	-2.4%	55	55	0.0%
	456	457	Freeway	1270	1239	-2.4%	55	58.2	5.8%
	480	457	Ramp	660	612	-7.3%	55	52.5	-4.5%
	457	458	Freeway	1930	1852	-4.0%	55	55.4	0.7%
	458	459	Freeway	1930	1852	-4.0%	55	51.3	-6.7%
	459	330	Ramp	1930	1851	-4.1%	55	52.7	-4.2%
	459	460	Freeway	0	1	#DIV/0!	55	14.4	-73.8%
Route 288 SB	300	301	Freeway	2360	2361	0.0%	65	63.9	-1.7%
	301	302	Freeway	2360	2361	0.0%	65	64.3	-1.1%
	302	303	Freeway	2360	2361	0.0%	65	63.9	-1.7%
	303	304	Freeway	2360	2361	0.0%	65	63.7	-2.0%
	304	305	Freeway	2360	2361	0.0%	65	63.5	-2.3%
	305	306	Freeway	2360	2361	0.0%	65	63.4	-2.5%
	306	307	Freeway	2360	2361	0.0%	65	63.4	-2.5%
	307	308	Freeway	2360	2361	0.0%	65	63.3	-2.6%
	308	309	Freeway	2360	2360	0.0%	65	63.3	-2.6%
	309	310	Freeway	2360	2359	0.0%	65	63.2	-2.8%
	310	311	Freeway	2360	2358	-0.1%	65	63.1	-2.9%
	311	312	Freeway	2360	2358	-0.1%	65	63.2	-2.8%
	312	313	Freeway	2360	2359	0.0%	65	63.1	-2.9%
	313	314	Freeway	2360	2360	0.0%	65	62.7	-3.5%
	314	315	Freeway	2360	2361	0.0%	65	62.5	-3.8%
	315	316	Freeway	2360	2362	0.1%	65	62.4	-4.0%
	316	317	Freeway	2360	2362	0.1%	65	63.1	-2.9%
	317	390	Ramp	670	663	-1.0%	65	63.8	-1.8%
	317	318	Freeway	1690	1699	0.5%	65	63.4	-2.5%
	318	319	Freeway	1690	1699	0.5%	65	62.6	-3.7%
	392	319	Ramp	170	185	8.8%	65	44.8	-31.1%
	319	320	Freeway	1860	1884	1.3%	65	61.3	-5.7%
	320	393	Ramp	110	127	15.5%	65	62.4	-4.0%
	320	322	Freeway	1750	1756	0.3%	65	60.9	-6.3%
	322	450	Ramp	420	453	7.9%	65	53.6	-17.5%
	322	323	Freeway	1330	1303	-2.0%	65	63	-3.1%
	323	324	Freeway	1330	1303	-2.0%	65	63.5	-2.3%
	324	325	Freeway	1330	1304	-2.0%	65	63.6	-2.2%
	325	326	Freeway	1330	1303	-2.0%	65	63.5	-2.3%
	326	327	Freeway	1330	1303	-2.0%	65	63.4	-2.5%
	327	328	Freeway	1330	1303	-2.0%	65	63.3	-2.6%
	328	329	Freeway	1330	1303	-2.0%	65	63	-3.1%
	329	330	Freeway	1330	1303	-2.0%	65	62.1	-4.5%
	459	330	Ramp	1930	1851	-4.1%	65	52.7	-18.9%
	330	331	Freeway	3260	3151	-3.3%	65	49.2	-24.3%
	331	332	Freeway	3260	3149	-3.4%	65	53.8	-17.2%
	332	333	Freeway	3260	3149	-3.4%	65	58.7	-9.7%
	333	334	Freeway	3260	3148	-3.4%	65	61.1	-6.0%
	334	335	Freeway	3260	3147	-3.5%	65	61.7	-5.1%
	335	336	Freeway	3260	3146	-3.5%	65	61.5	-5.4%
	336	337	Freeway	3260	3147	-3.5%	65	61.2	-5.8%
	337	338	Freeway	3260	3148	-3.4%	65	61.2	-5.8%
	338	339	Freeway	3260	3150	-3.4%	65	61.2	-5.8%
288 NB CD	1	248	Freeway	0	0	#DIV/0!	55	0	-100.0%
	108	248	Ramp	520	583	12.1%	55	53.9	-2.0%
	248	249	Freeway	520	583	12.1%	55	50.9	-7.5%
	249	4	Ramp	320	364	13.8%	55	44.1	-19.8%
	249	250	Freeway	200	219	9.5%	55	54.5	-0.9%
	250	251	Freeway	200	219	9.5%	55	54.3	-1.3%
	16	251	Ramp	520	477	-8.3%	55	43.5	-20.9%
	251	252	Freeway	720	696	-3.3%	55	49.1	-10.7%
	252	253	Freeway	720	696	-3.3%	55	52.1	-5.3%
	253	254	Freeway	720	696	-3.3%	55	52.3	-4.9%
	254	116	Ramp	520	508	-2.3%	55	52.7	-4.2%
	254	255	Freeway	200	188	-6.0%	55	54	-1.8%
	255	7008	Ramp	200	188	-6.0%	55	54.2	-1.5%
	255	1002	Freeway	0	0	#DIV/0!	55	0	-100.0%
	100	101	Freeway	3410	3405	-0.1%	65	62.4	-4.0%
	101	102	Freeway	3410	3405	-0.1%	65	63.2	-2.8%
	102	103	Freeway	3410	3405	-0.1%	65	62.3	-4.2%

CORSIM Calibration - 2040 Concept 1 AM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
Route 288 NB	103	104	Freeway	3410	3406	-0.1%	65	61.5	-5.4%
	104	105	Freeway	3410	3407	-0.1%	65	61.1	-6.0%
	105	106	Freeway	3410	3408	-0.1%	65	60.6	-6.8%
	106	107	Freeway	3410	3408	-0.1%	65	60.3	-7.2%
	107	108	Freeway	3410	3409	0.0%	65	60.7	-6.6%
	108	248	Ramp	520	583	12.1%	65	53.9	-17.1%
	108	109	Freeway	2890	2826	-2.2%	65	61.6	-5.2%
	109	110	Freeway	2890	2826	-2.2%	65	61.7	-5.1%
	110	111	Freeway	2890	2826	-2.2%	65	61.5	-5.4%
	111	112	Freeway	2890	2826	-2.2%	65	61.3	-5.7%
	112	113	Freeway	2890	2826	-2.2%	65	61.3	-5.7%
	113	114	Freeway	2890	2826	-2.2%	65	61.2	-5.8%
	114	115	Freeway	2890	2826	-2.2%	65	61.1	-6.0%
	115	116	Freeway	2890	2826	-2.2%	65	60.6	-6.8%
	254	116	Ramp	520	508	-2.3%	65	52.7	-18.9%
	116	117	Freeway	3410	3334	-2.2%	65	54.2	-16.6%
	117	118	Freeway	3410	3332	-2.3%	65	55.9	-14.0%
	191	118	Ramp	1740	1670	-4.0%	65	44.1	-32.2%
	118	119	Freeway	5150	5000	-2.9%	65	51.3	-21.1%
	119	192	Ramp	380	433	13.9%	65	58.1	-10.6%
	119	120	Freeway	4770	4566	-4.3%	65	51.4	-20.9%
	120	121	Freeway	4770	4564	-4.3%	65	54.7	-15.8%
	603	121	Ramp	530	507	-4.3%	65	53	-18.5%
	121	122	Freeway	5300	5070	-4.3%	65	58.3	-10.3%
	122	123	Freeway	5300	5069	-4.4%	65	60.3	-7.2%
	123	124	Freeway	5300	5069	-4.4%	65	60.9	-6.3%
	124	125	Freeway	5300	5069	-4.4%	65	61	-6.2%
	125	126	Freeway	5300	5070	-4.3%	65	61	-6.2%
	126	127	Freeway	5300	5071	-4.3%	65	61	-6.2%
	127	128	Freeway	5300	5070	-4.3%	65	61	-6.2%
	128	129	Freeway	5300	5070	-4.3%	65	61	-6.2%
	129	130	Freeway	5300	5070	-4.3%	65	61	-6.2%
	130	131	Freeway	5300	5070	-4.3%	65	60.9	-6.3%
	131	132	Freeway	5300	5072	-4.3%	65	60.9	-6.3%
	132	133	Freeway	5300	5073	-4.3%	65	60.9	-6.3%
	133	134	Freeway	5300	5074	-4.3%	65	60.8	-6.5%
	134	135	Freeway	5300	5074	-4.3%	65	60.8	-6.5%
	135	136	Freeway	5300	5074	-4.3%	65	60.7	-6.6%
	136	137	Freeway	5300	5074	-4.3%	65	60.8	-6.5%
BB Conn EB	7002	273	Freeway	1170	1083	-7.4%	55	52.7	-4.2%
	273	274	Freeway	1170	1085	-7.3%	55	51	-7.3%
	274	480	Ramp	660	612	-7.3%	55	52.1	-5.3%
	274	275	Freeway	510	474	-7.1%	55	49.7	-9.6%
	275	276	Ramp	510	475	-6.9%	55	43.7	-20.5%
	275	18	Freeway	0	0	#DIV/0!	55	0	-100.0%
Dummy	2	7	Freeway	0	0	#DIV/0!	55	0	-100.0%
	455	7	Ramp	180	174	-3.3%	55	39.5	-28.2%
	7	49	Freeway	180	174	-3.3%	55	28.4	-48.4%
	6	49	Ramp	320	363	13.4%	55	43.9	-20.2%
	49	51	Freeway	500	537	7.4%	55	45.2	-17.8%
	51	7011	Ramp	500	537	7.4%	55	52.8	-4.0%
	51	50	Freeway	0	0	#DIV/0!	55	0	-100.0%



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

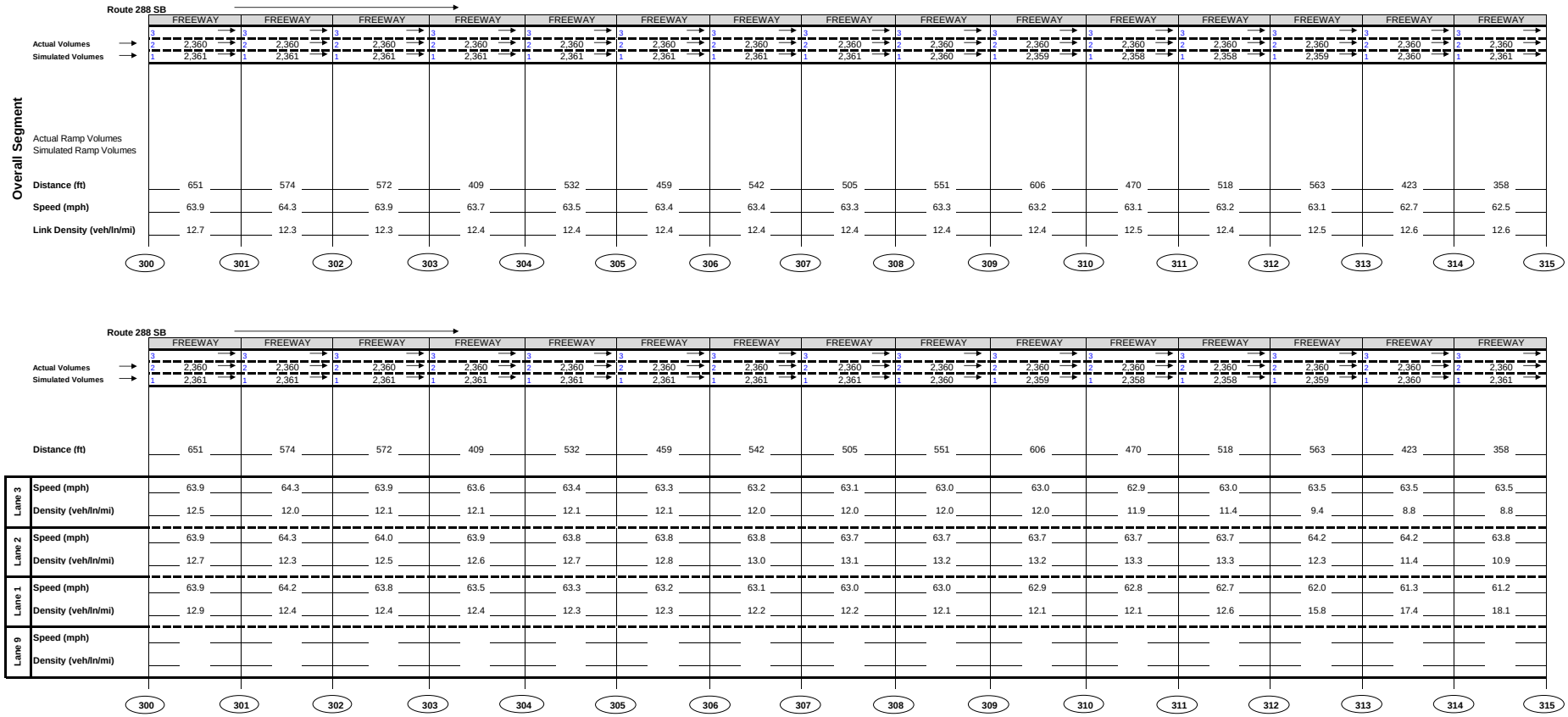
VDOT Virginia Department of Transportation

Figure 1

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

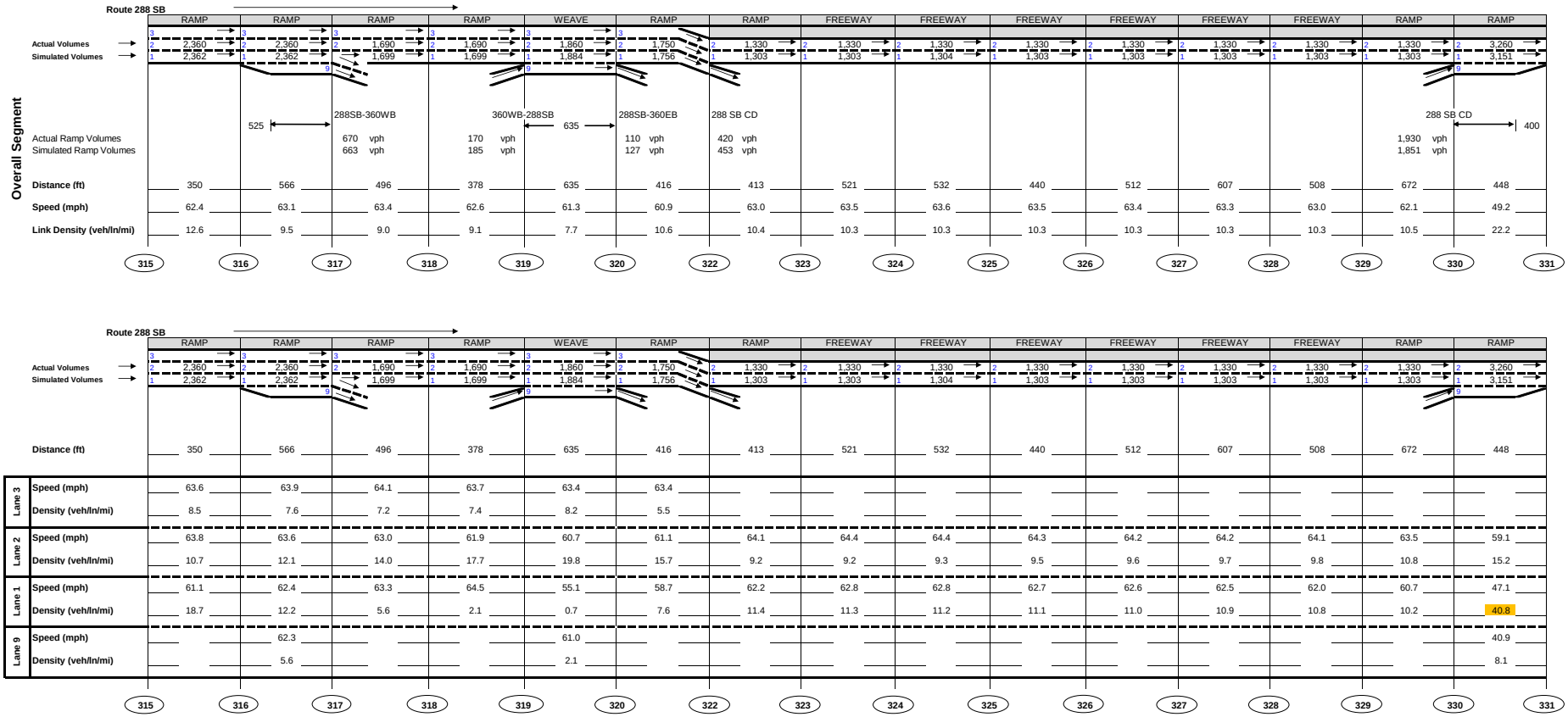
Virginia Department of Transportation

Figure 2

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

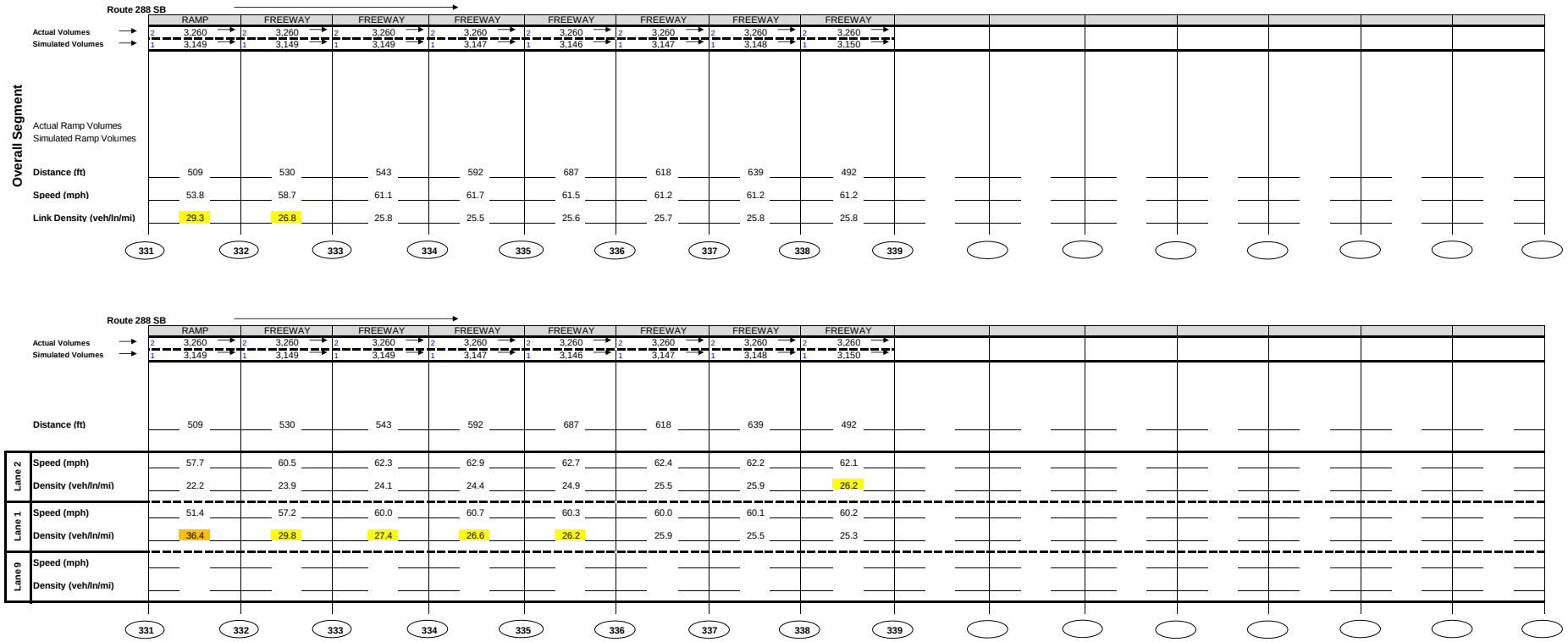
100 Node Number — Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 3
Southbound - AM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

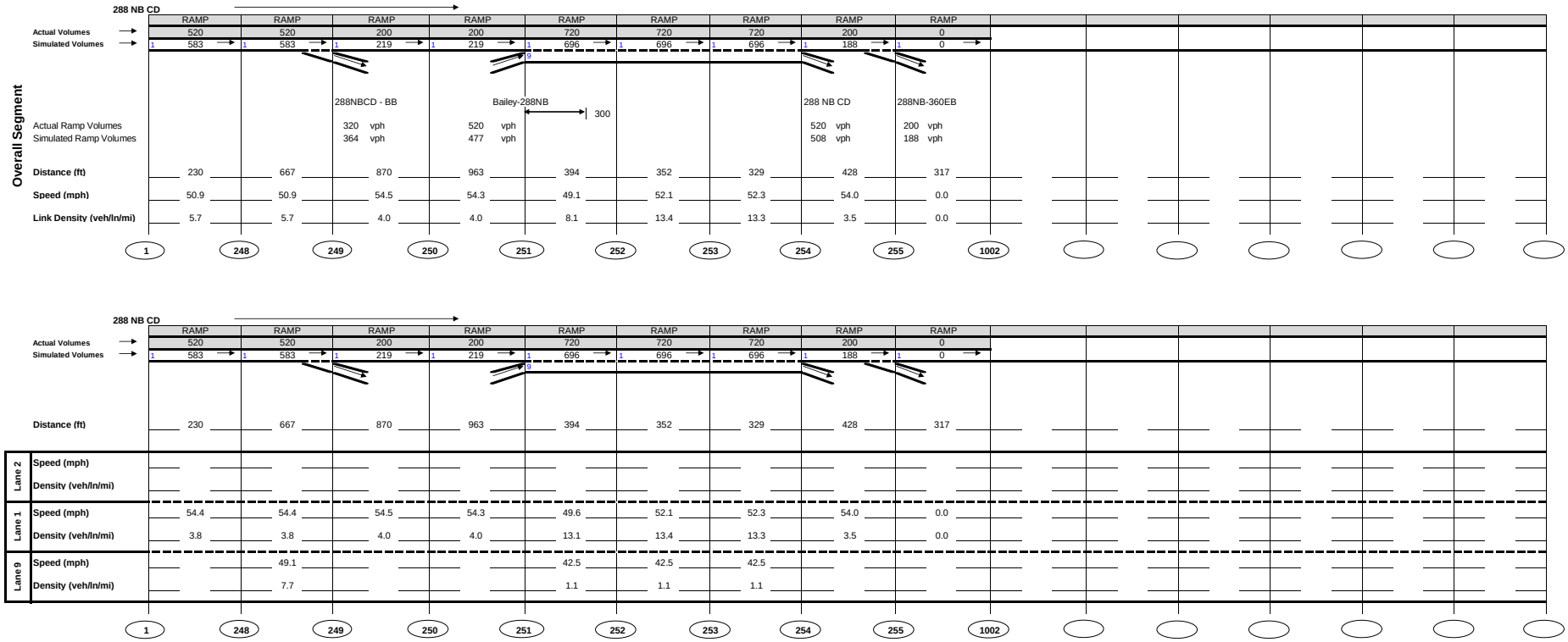
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 4
Southbound - AM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

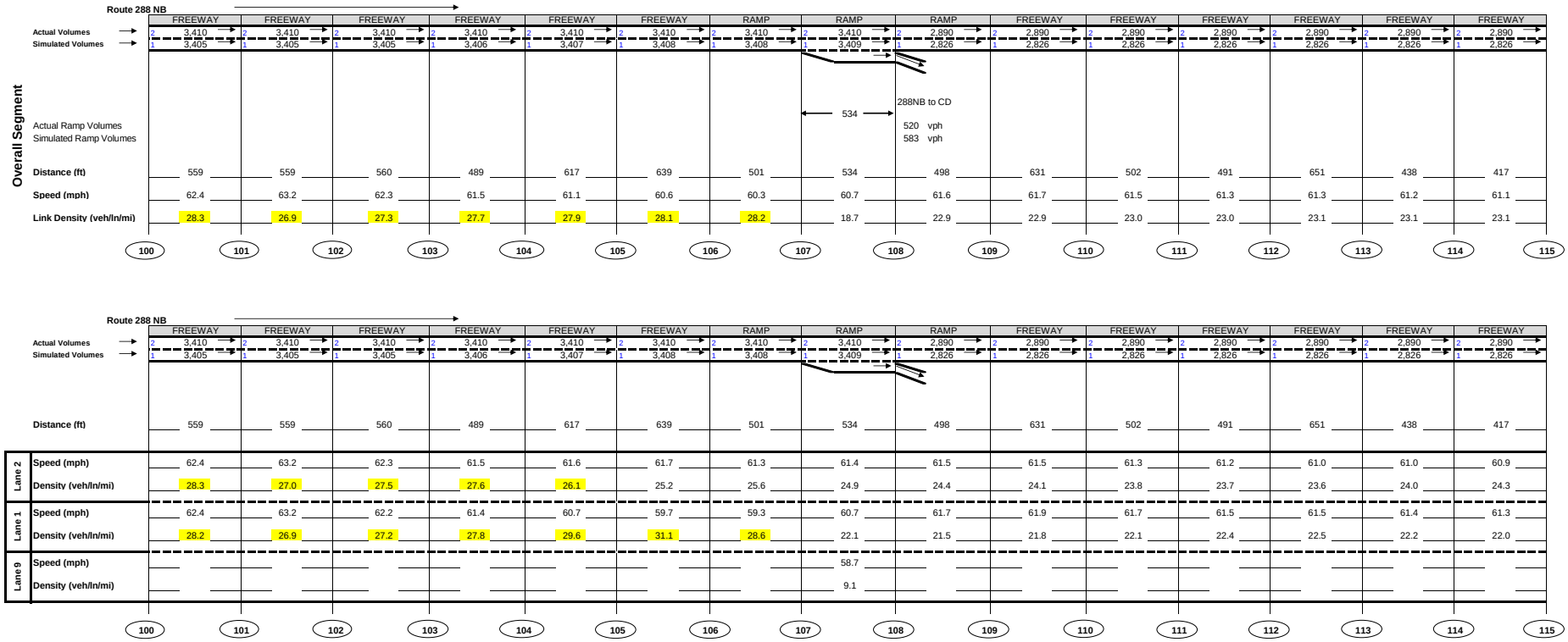
VDOT Virginia Department of Transportation

Figure 5

Commonwealth Centre Parkway at Route 288 - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

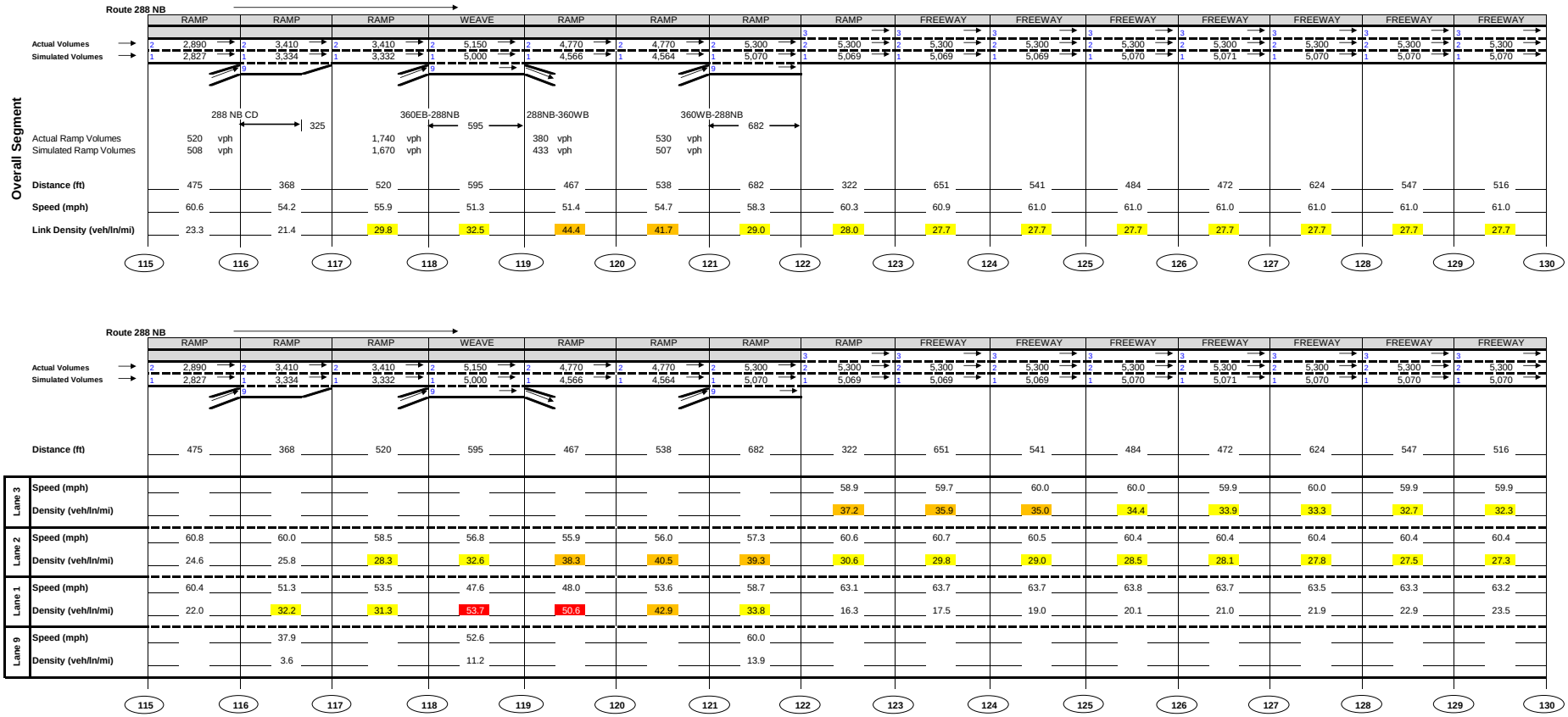
VDOT Virginia Department of Transportation

Figure 6

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

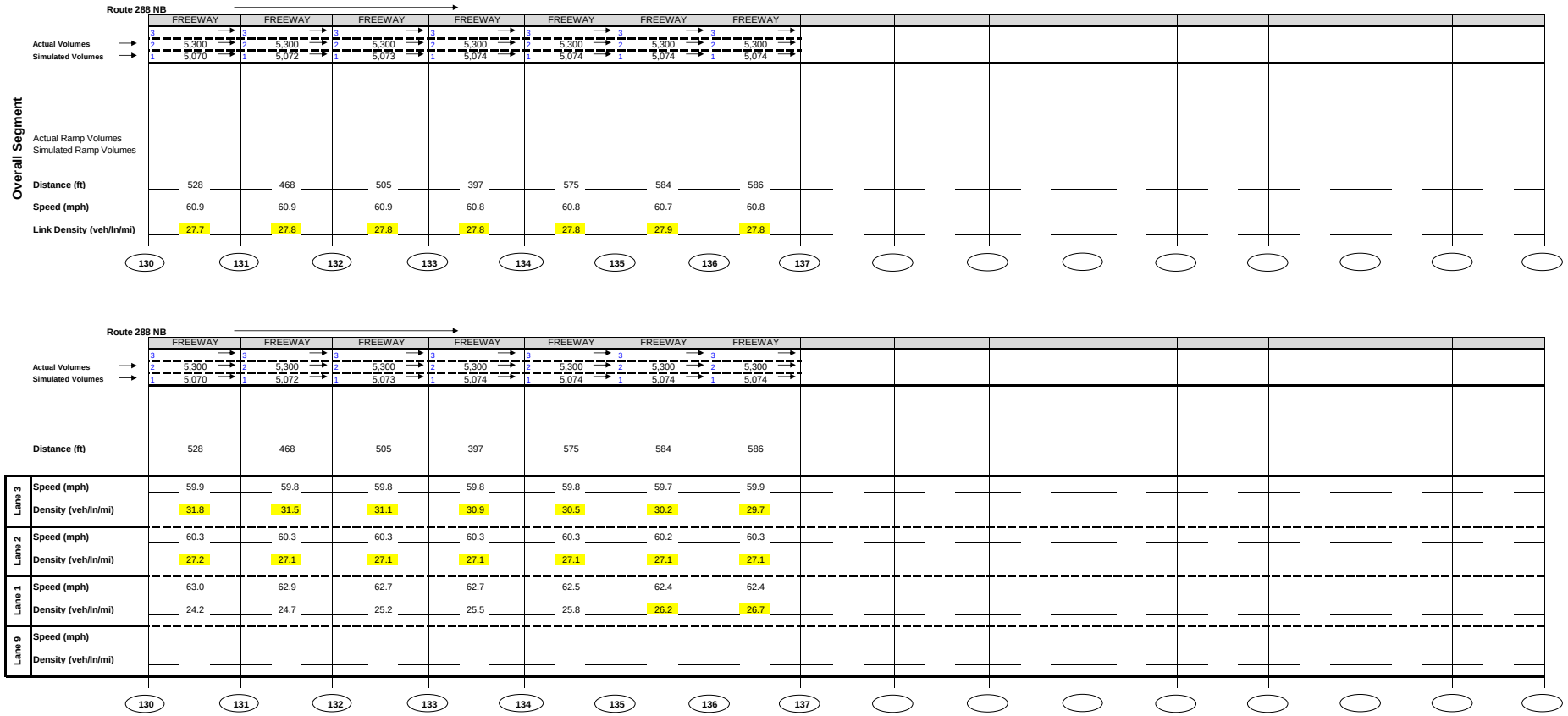
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 7
Northbound - AM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

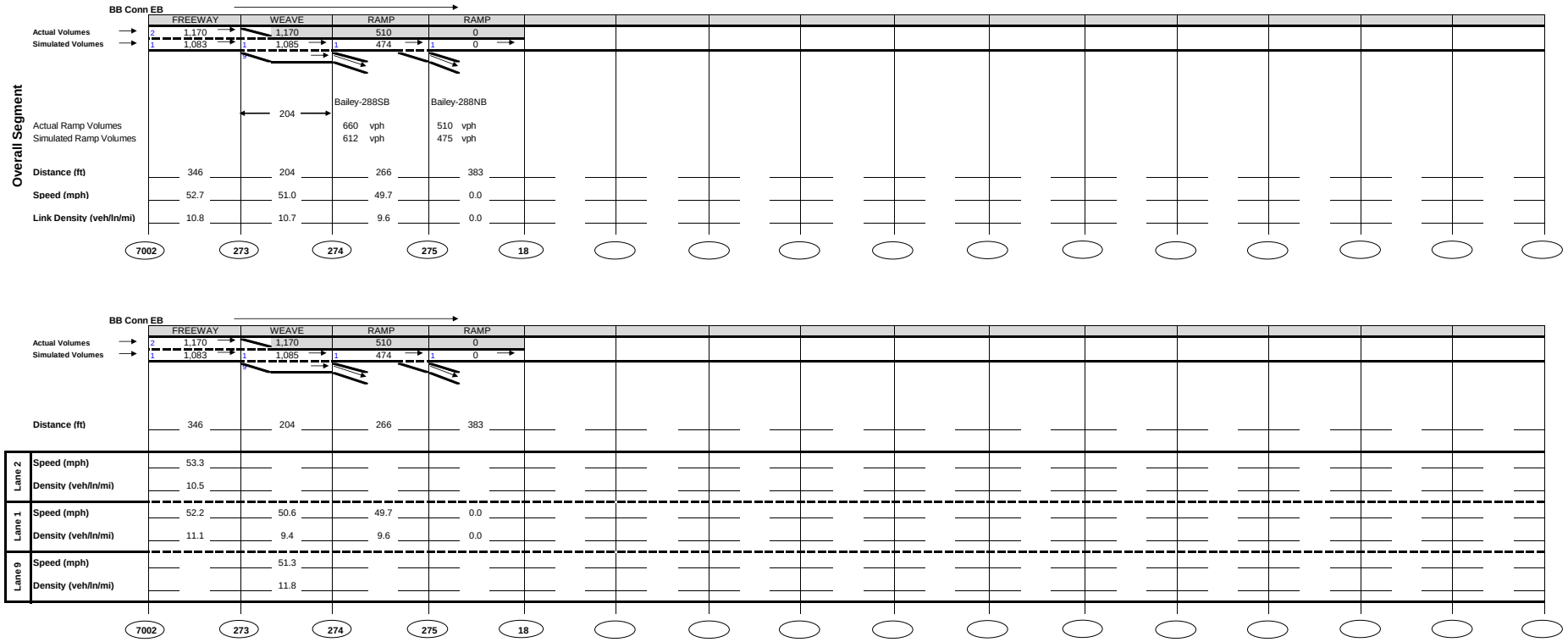
Virginia Department of Transportation

Figure 8

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
45 and above
35 to 45
28 to 35
20 to 28
10 to 20
0 to 10

CD Road Weave Density (veh/ln/mi)
45 and above
36 to 45
32 to 36
24 to 32
12 to 24
0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

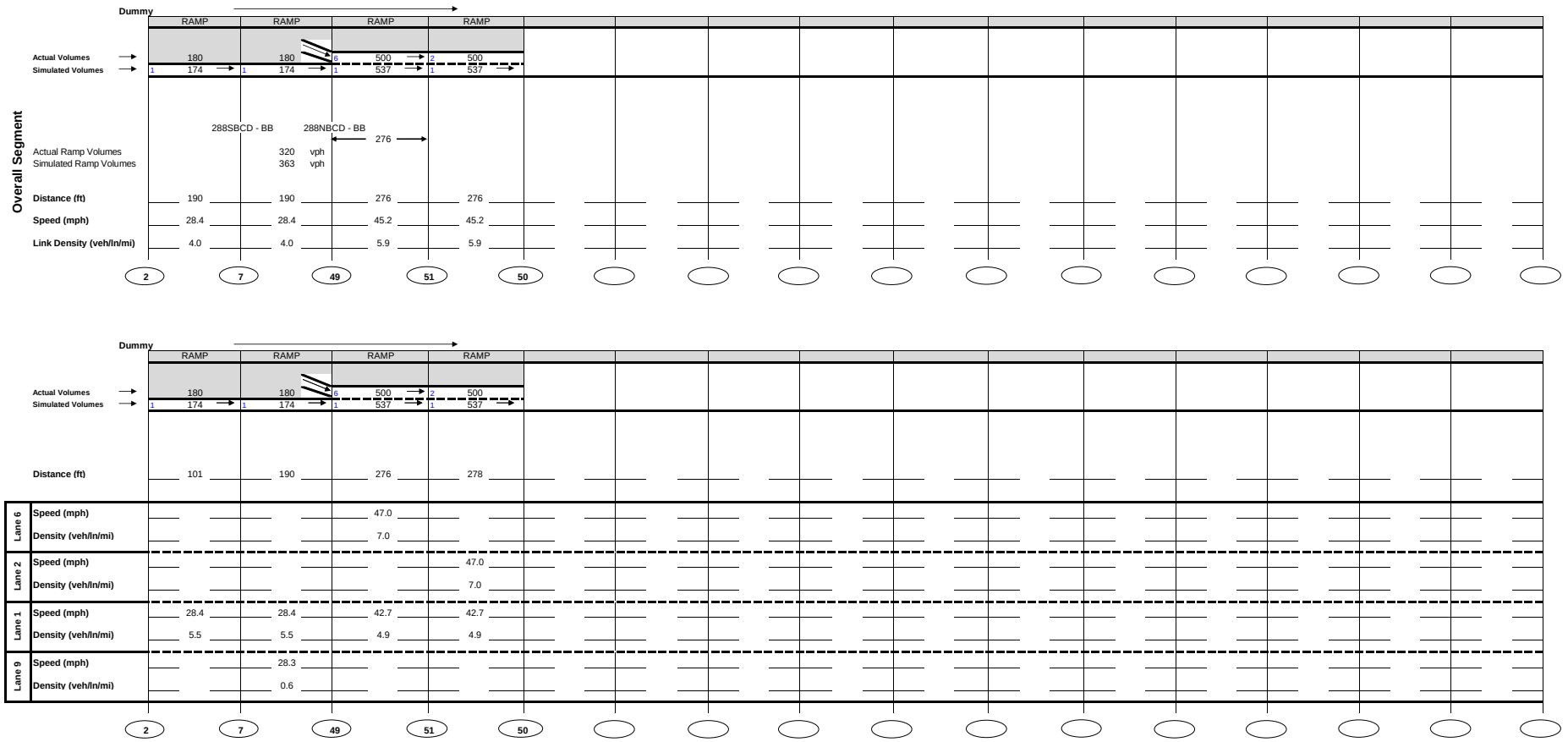
VDOT Virginia Department of Transportation

Figure 9

EB Bailey Bridge Connector to NB Route 288 CD Road - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

Virginia Department of Transportation

Figure 10

SB Route 288 CD Road to WB Bailey Bridge Connector - AM Peak Hour

US 360/Route 288 Interchange Study

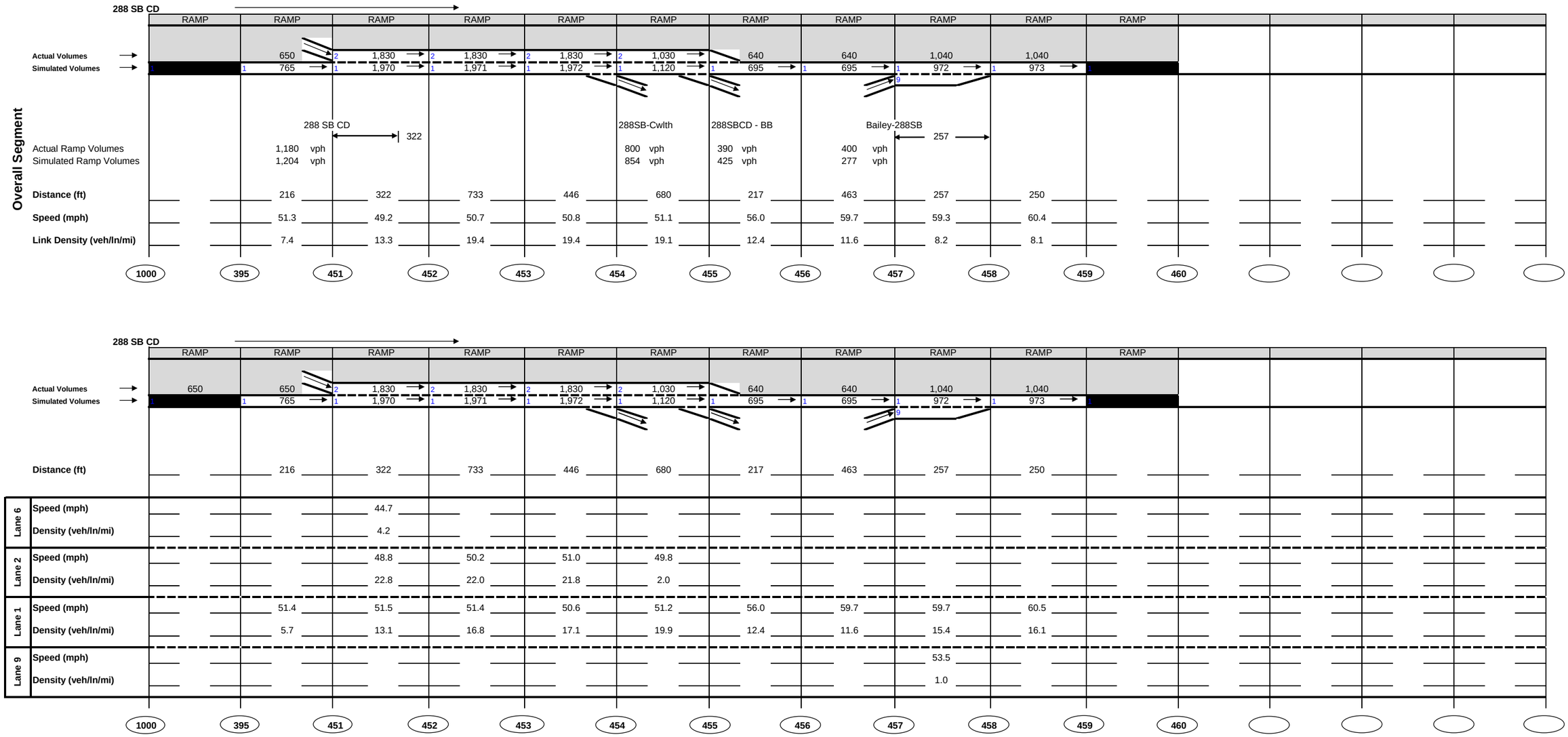
Build (2040) - Concept 1

CORSIM Calibration - 2040 Concept 1 PM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 SB CD	1000	395	Freeway	0	0	#DIV/0!	55	0	-100.0%
	394	395	Ramp	650	1199	84.5%	55	46.9	-14.7%
	395	451	Freeway	650	1198	84.3%	55	50.1	-8.9%
	450	451	Ramp	1180	458	-61.2%	55	53.4	-2.9%
	451	452	Freeway	1830	1655	-9.6%	55	50.7	-7.8%
	452	453	Freeway	1830	1655	-9.6%	55	50.7	-7.8%
	453	454	Freeway	1830	1655	-9.6%	55	47.1	-14.4%
	454	48	Ramp	800	236	-70.5%	55	50.8	-7.6%
	454	455	Freeway	1030	1418	37.7%	55	48	-12.7%
	455	7	Ramp	390	172	-55.9%	55	39.5	-28.2%
	455	456	Freeway	640	1246	94.7%	55	54.8	-0.4%
	456	457	Freeway	640	1246	94.7%	55	57.9	5.3%
	480	457	Ramp	400	611	52.8%	55	52.5	-4.5%
	457	458	Freeway	1040	1858	78.7%	55	55	0.0%
	458	459	Freeway	1040	1858	78.7%	55	50.5	-8.2%
	459	330	Ramp	1040	1856	78.5%	55	52.4	-4.7%
	459	460	Freeway	0	0	#DIV/0!	55	28.1	-48.9%
Route 288 SB	300	301	Freeway	5430	2359	-56.6%	65	64	-1.5%
	301	302	Freeway	5430	2360	-56.5%	65	64.3	-1.1%
	302	303	Freeway	5430	2360	-56.5%	65	64	-1.5%
	303	304	Freeway	5430	2360	-56.5%	65	63.7	-2.0%
	304	305	Freeway	5430	2359	-56.6%	65	63.6	-2.2%
	305	306	Freeway	5430	2359	-56.6%	65	63.5	-2.3%
	306	307	Freeway	5430	2360	-56.5%	65	63.4	-2.5%
	307	308	Freeway	5430	2360	-56.5%	65	63.4	-2.5%
	308	309	Freeway	5430	2359	-56.6%	65	63.3	-2.6%
	309	310	Freeway	5430	2359	-56.6%	65	63.3	-2.6%
	310	311	Freeway	5430	2359	-56.6%	65	63.2	-2.8%
	311	312	Freeway	5430	2360	-56.5%	65	63.2	-2.8%
	312	313	Freeway	5430	2360	-56.5%	65	63.2	-2.8%
	313	314	Freeway	5430	2360	-56.5%	65	62.9	-3.2%
	314	315	Freeway	5430	2360	-56.5%	65	62.6	-3.7%
	315	316	Freeway	5430	2360	-56.5%	65	62.5	-3.8%
	316	317	Freeway	5430	2360	-56.5%	65	63.2	-2.8%
	317	390	Ramp	2040	663	-67.5%	65	63.9	-1.7%
	317	318	Freeway	3390	1697	-49.9%	65	63.4	-2.5%
	318	319	Freeway	3390	1696	-50.0%	65	62.7	-3.5%
	392	319	Ramp	140	180	28.6%	65	44.8	-31.1%
	319	320	Freeway	3530	1876	-46.9%	65	61.5	-5.4%
	320	393	Ramp	290	125	-56.9%	65	62.7	-3.5%
	320	322	Freeway	3240	1751	-46.0%	65	61	-6.2%
	322	450	Ramp	650	458	-29.5%	65	53.5	-17.7%
	322	323	Freeway	2590	1293	-50.1%	65	63.1	-2.9%
	323	324	Freeway	2590	1293	-50.1%	65	63.5	-2.3%
	324	325	Freeway	2590	1293	-50.1%	65	63.6	-2.2%
	325	326	Freeway	2590	1293	-50.1%	65	63.5	-2.3%
	326	327	Freeway	2590	1293	-50.1%	65	63.4	-2.5%
	327	328	Freeway	2590	1292	-50.1%	65	63.3	-2.6%
	328	329	Freeway	2590	1293	-50.1%	65	63.1	-2.9%
	329	330	Freeway	2590	1293	-50.1%	65	62.3	-4.2%
	459	330	Ramp	1040	1856	78.5%	65	52.4	-19.4%
	330	331	Freeway	3630	3147	-13.3%	65	50	-23.1%
	331	332	Freeway	3630	3147	-13.3%	65	53.9	-17.1%
	332	333	Freeway	3630	3146	-13.3%	65	58.7	-9.7%
	333	334	Freeway	3630	3145	-13.4%	65	61.1	-6.0%
	334	335	Freeway	3630	3144	-13.4%	65	61.7	-5.1%
	335	336	Freeway	3630	3142	-13.4%	65	61.6	-5.2%
	336	337	Freeway	3630	3141	-13.5%	65	61.3	-5.7%
	337	338	Freeway	3630	3141	-13.5%	65	61.2	-5.8%
	338	339	Freeway	3630	3141	-13.5%	65	61.3	-5.7%
288 NB CD	1	248	Freeway	0	0	#DIV/0!	55	0	-100.0%
	108	248	Ramp	1230	517	-58.0%	55	53.8	-2.2%
	248	249	Freeway	1230	517	-58.0%	55	50.7	-7.8%
	249	4	Ramp	970	325	-66.5%	55	44.1	-19.8%
	249	250	Freeway	260	192	-26.2%	55	54.3	-1.3%
	250	251	Freeway	260	192	-26.2%	55	54.1	-1.6%
	16	251	Ramp	320	481	50.3%	55	43.6	-20.7%
	251	252	Freeway	580	674	16.2%	55	49	-10.9%
	252	253	Freeway	580	673	16.0%	55	52.1	-5.3%
	253	254	Freeway	580	673	16.0%	55	52.3	-4.9%
	254	116	Ramp	320	501	56.6%	55	52.8	-4.0%
	254	255	Freeway	260	172	-33.8%	55	53.9	-2.0%
	255	7008	Ramp	260	172	-33.8%	55	54.1	-1.6%
	255	1002	Freeway	0	0	#DIV/0!	55	0	-100.0%
	100	101	Freeway	3350	3406	1.7%	65	62.3	-4.2%
	101	102	Freeway	3350	3406	1.7%	65	63.2	-2.8%
	102	103	Freeway	3350	3406	1.7%	65	62.2	-4.3%

CORSIM Calibration - 2040 Concept 1 PM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
Route 288 NB	103	104	Freeway	3350	3407	1.7%	65	61.4	-5.5%
	104	105	Freeway	3350	3407	1.7%	65	61.1	-6.0%
	105	106	Freeway	3350	3406	1.7%	65	60.6	-6.8%
	106	107	Freeway	3350	3407	1.7%	65	60.3	-7.2%
	107	108	Freeway	3350	3406	1.7%	65	60.6	-6.8%
	108	248	Ramp	1230	517	-58.0%	65	53.8	-17.2%
	108	109	Freeway	2120	2890	36.3%	65	61.5	-5.4%
	109	110	Freeway	2120	2891	36.4%	65	61.5	-5.4%
	110	111	Freeway	2120	2891	36.4%	65	61.4	-5.5%
	111	112	Freeway	2120	2891	36.4%	65	61.2	-5.8%
	112	113	Freeway	2120	2892	36.4%	65	61.1	-6.0%
	113	114	Freeway	2120	2893	36.5%	65	61	-6.2%
	114	115	Freeway	2120	2892	36.4%	65	60.9	-6.3%
	115	116	Freeway	2120	2892	36.4%	65	60.4	-7.1%
	254	116	Ramp	320	501	56.6%	65	52.8	-18.8%
	116	117	Freeway	2440	3394	39.1%	65	54	-16.9%
	117	118	Freeway	2440	3393	39.1%	65	55.7	-14.3%
	191	118	Ramp	750	1672	122.9%	65	44.1	-32.2%
	118	119	Freeway	3190	5064	58.7%	65	52.4	-19.4%
	119	192	Ramp	820	618	-24.6%	65	58.5	-10.0%
	119	120	Freeway	2370	4444	87.5%	65	53	-18.5%
	120	121	Freeway	2370	4444	87.5%	65	55.9	-14.0%
	603	121	Ramp	260	485	86.5%	65	53	-18.5%
	121	122	Freeway	2630	4928	87.4%	65	58.9	-9.4%
	122	123	Freeway	2630	4929	87.4%	65	60.5	-6.9%
	123	124	Freeway	2630	4930	87.5%	65	61.1	-6.0%
	124	125	Freeway	2630	4932	87.5%	65	61.1	-6.0%
	125	126	Freeway	2630	4933	87.6%	65	61.2	-5.8%
	126	127	Freeway	2630	4932	87.5%	65	61.1	-6.0%
	127	128	Freeway	2630	4931	87.5%	65	61.1	-6.0%
	128	129	Freeway	2630	4929	87.4%	65	61.1	-6.0%
	129	130	Freeway	2630	4928	87.4%	65	61.1	-6.0%
	130	131	Freeway	2630	4930	87.5%	65	61.1	-6.0%
	131	132	Freeway	2630	4930	87.5%	65	61	-6.2%
	132	133	Freeway	2630	4930	87.5%	65	61	-6.2%
	133	134	Freeway	2630	4930	87.5%	65	61	-6.2%
	134	135	Freeway	2630	4930	87.5%	65	61	-6.2%
	135	136	Freeway	2630	4931	87.5%	65	60.9	-6.3%
	136	137	Freeway	2630	4932	87.5%	65	61	-6.2%
BB Conn EB	7002	273	Freeway	710	1087	53.1%	55	52.7	-4.2%
	273	274	Freeway	710	1089	53.4%	55	51.1	-7.1%
	274	480	Ramp	400	610	52.5%	55	52.2	-5.1%
	274	275	Freeway	310	480	54.8%	55	49.8	-9.5%
	275	276	Ramp	310	480	54.8%	55	43.7	-20.5%
	275	18	Freeway	0	0	#DIV/0!	55	0	-100.0%
Dummy	2	7	Freeway	0	0	#DIV/0!	55	0	-100.0%
	455	7	Ramp	390	172	-55.9%	55	39.5	-28.2%
	7	49	Freeway	390	171	-56.2%	55	28.4	-48.4%
	6	49	Ramp	970	325	-66.5%	55	43.9	-20.2%
	49	51	Freeway	1360	496	-63.5%	55	45.2	-17.8%
	51	7011	Ramp	1360	496	-63.5%	55	52.9	-3.8%
	51	50	Freeway	0	0	#DIV/0!	55	0	-100.0%



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

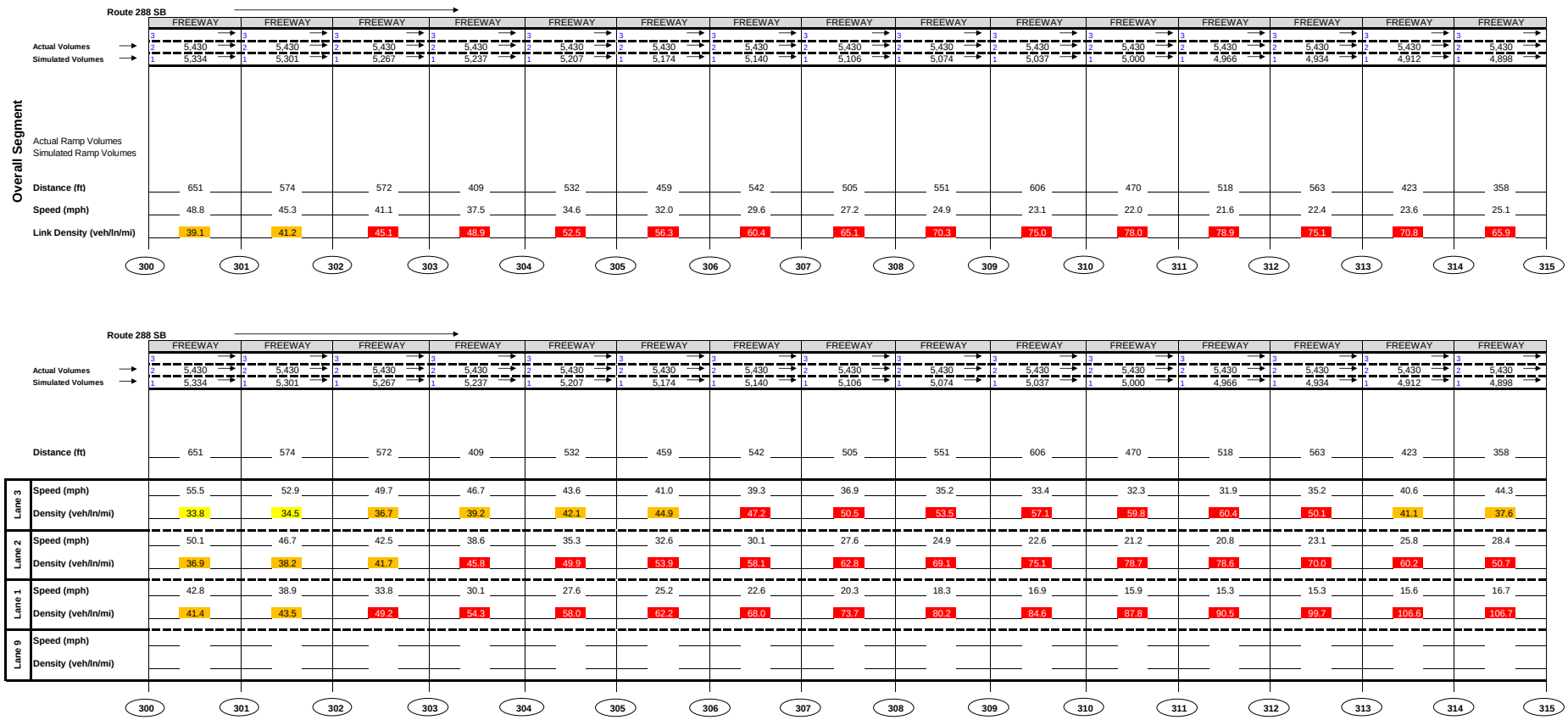
Virginia Department of Transportation

Figure 1

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

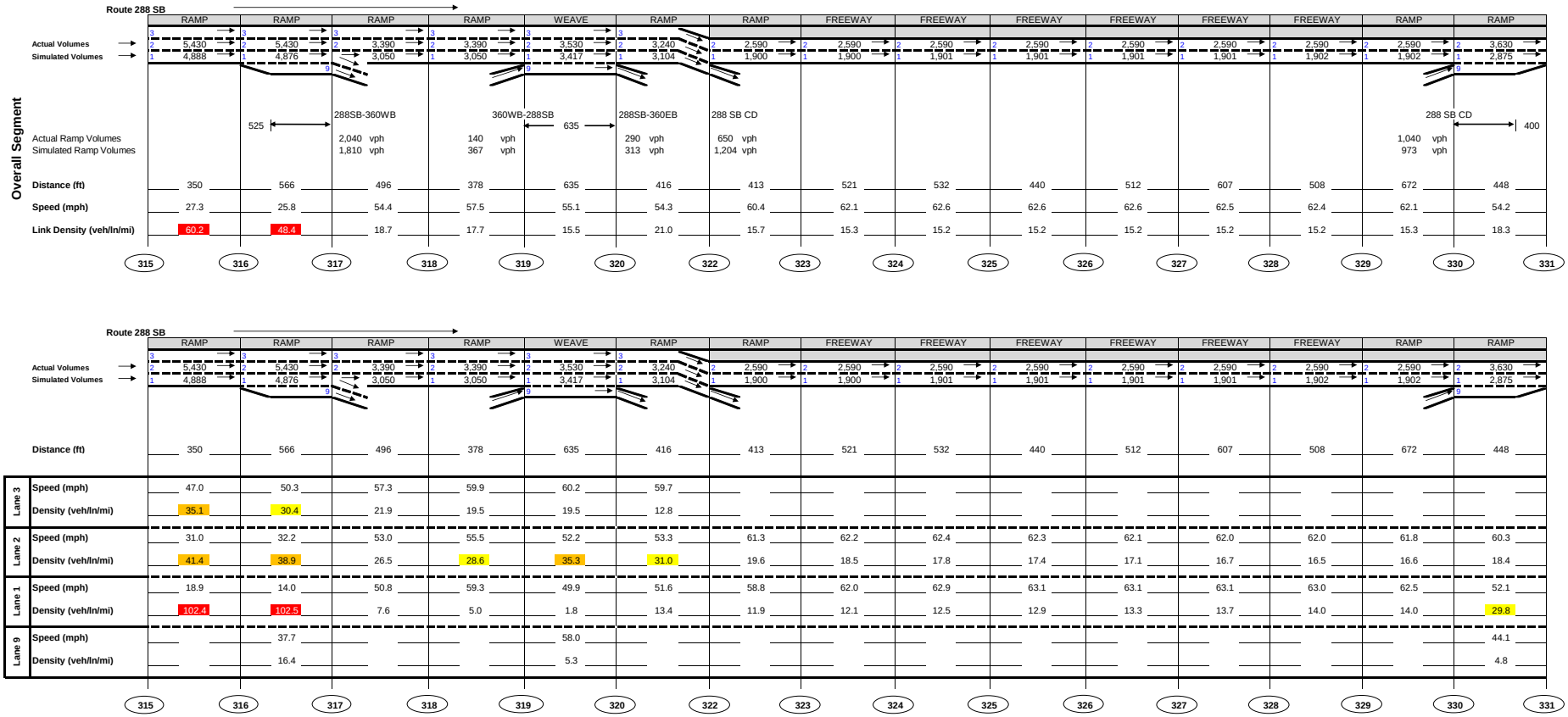
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

Virginia Department of Transportation

Figure 2
Southbound - PM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

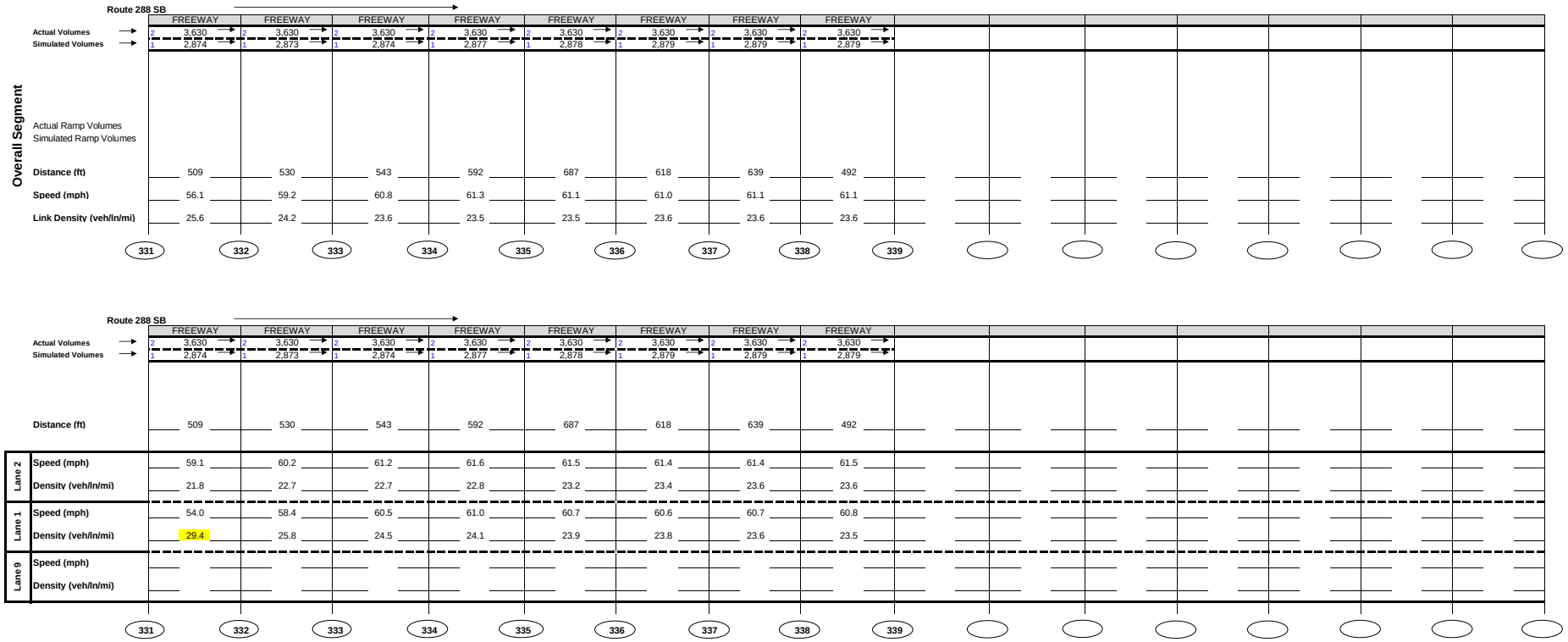
Weave/Ramp Density (veh/ln/mi)
45 and above
35 to 45
28 to 35
20 to 28
10 to 20
0 to 10

CD Road Weave Density (veh/ln/mi)
45 and above
36 to 45
32 to 36
24 to 32
12 to 24
0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 3
Southbound - PM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

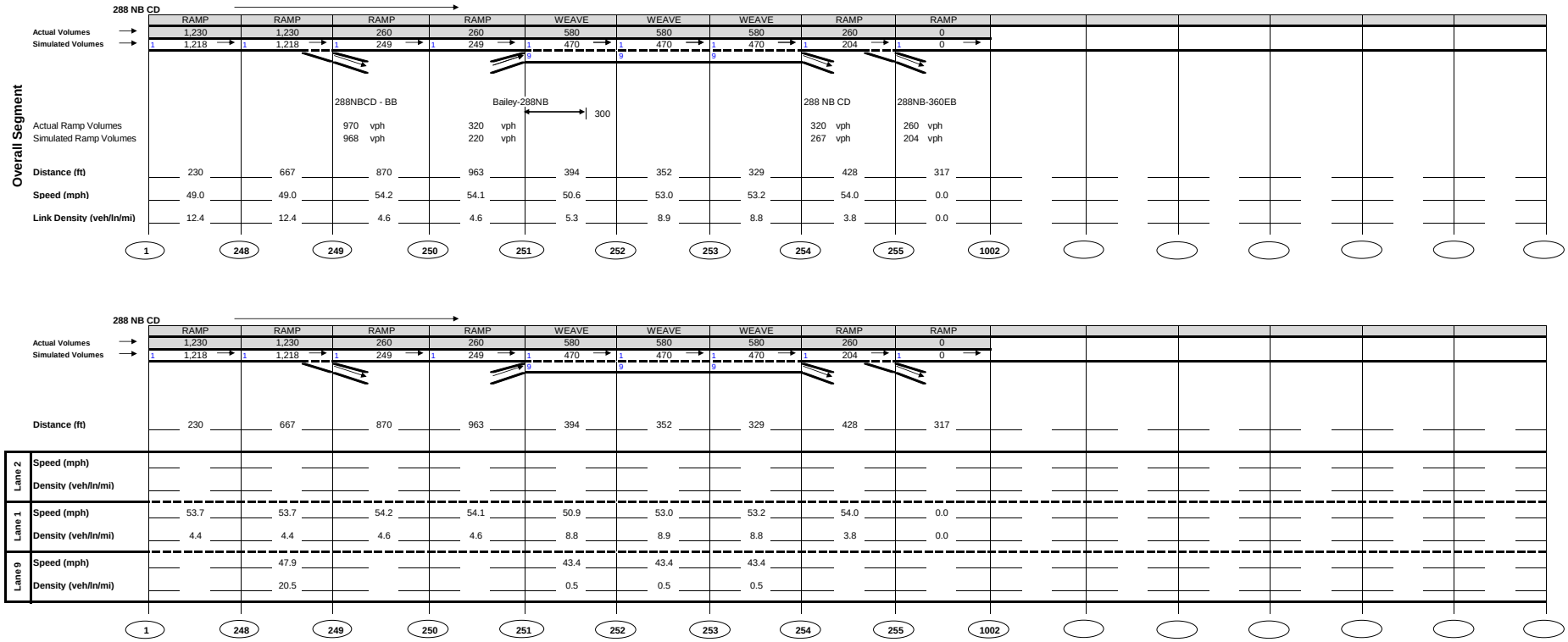
VDOT Virginia Department of Transportation

Figure 4

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

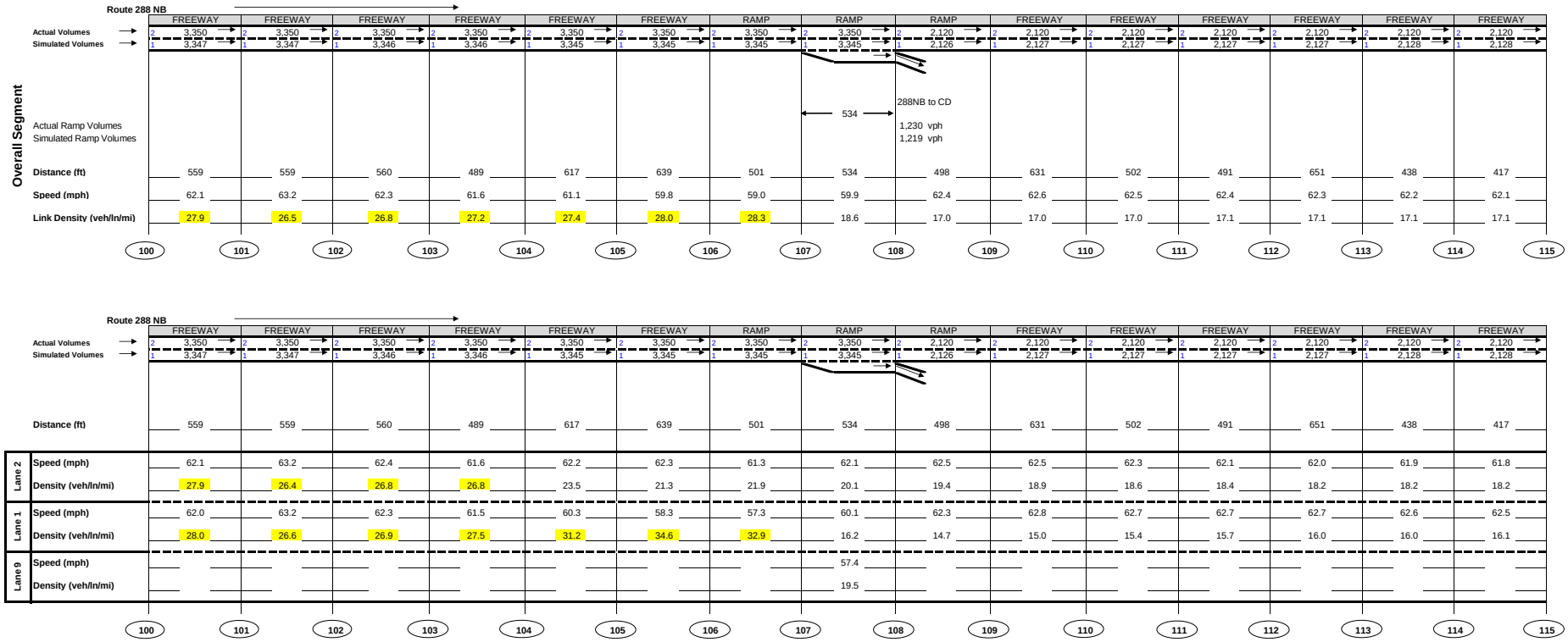
VDOT Virginia Department of Transportation

Figure 5

Commonwealth Centre Parkway at Route 288 - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

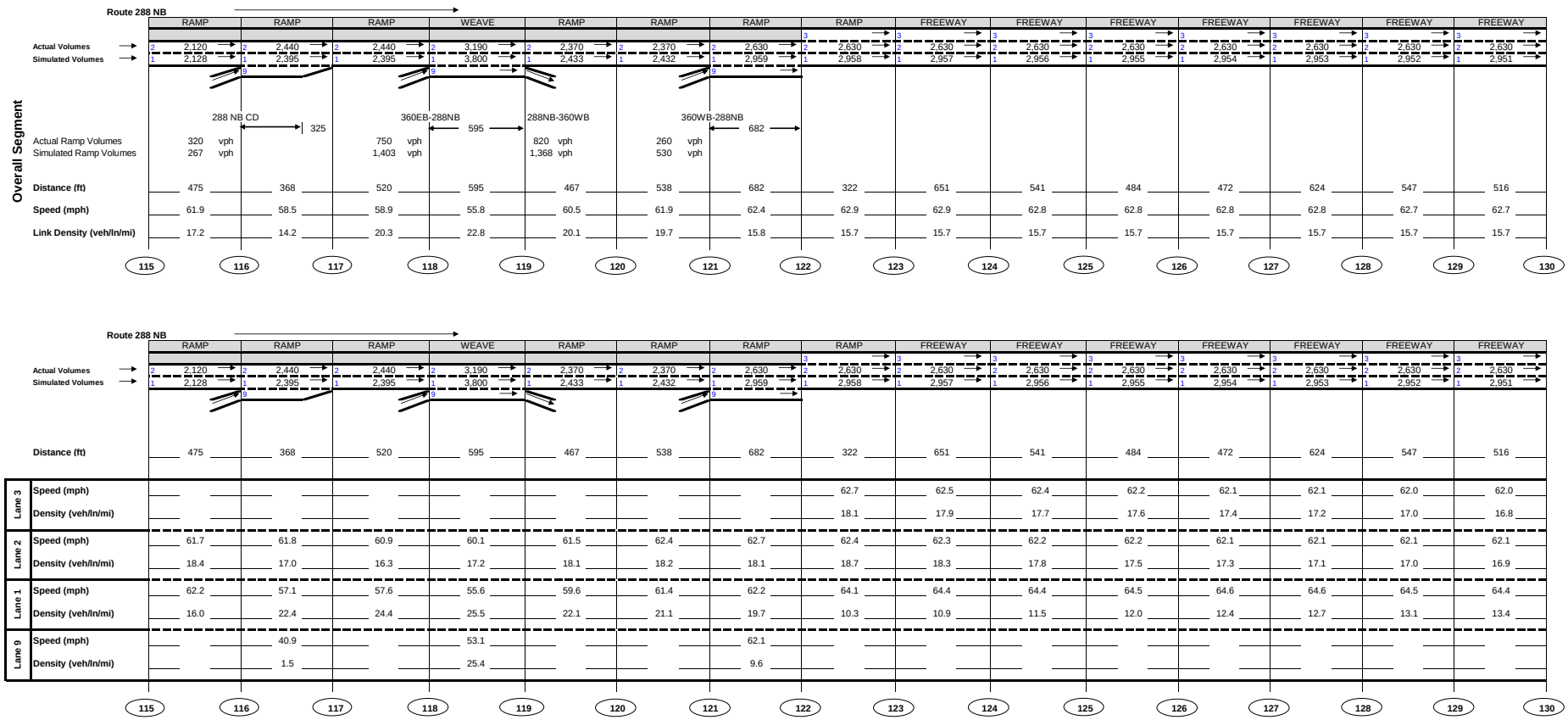
Virginia Department of Transportation

Figure 6

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

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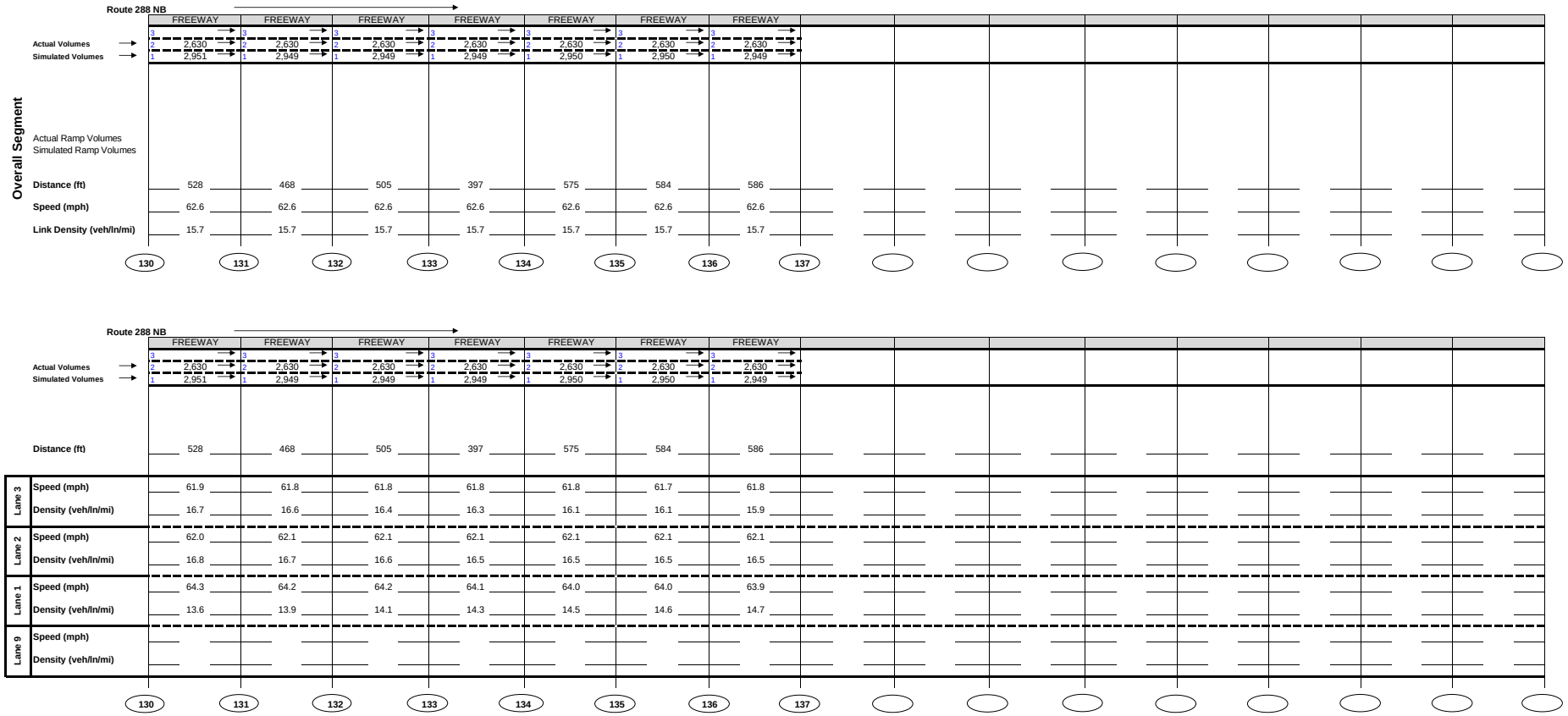
Figure 7

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

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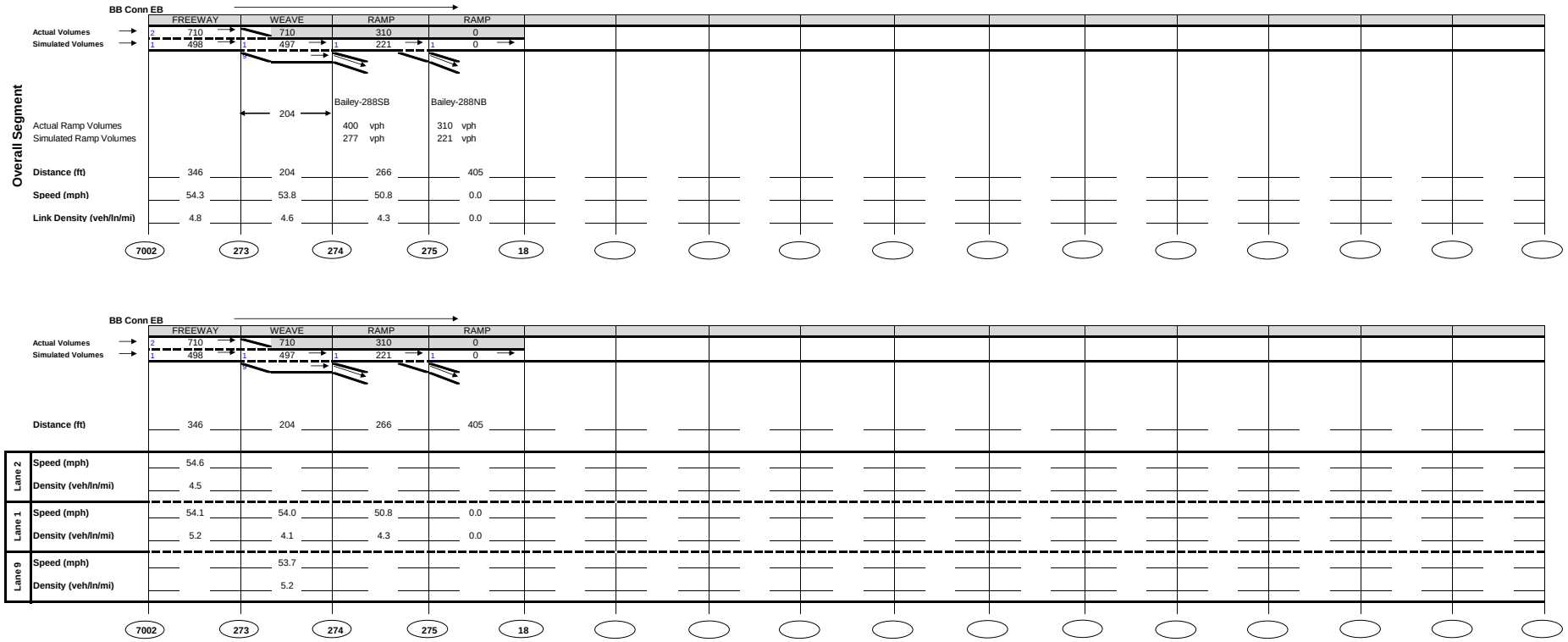
Figure 8

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

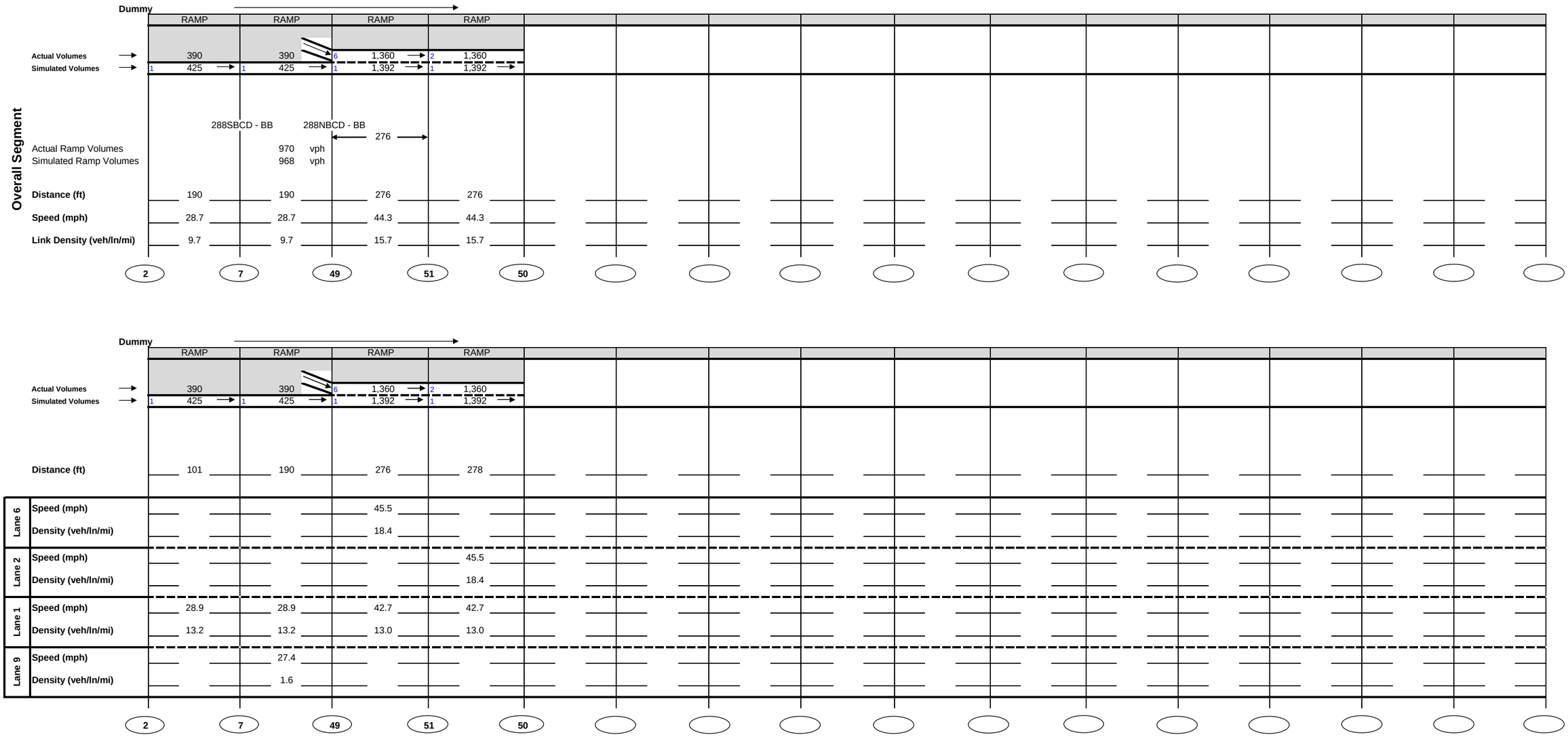
VDOT Virginia Department of Transportation

Figure 9

EB Bailey Bridge Connector to NB Route 288 CD Road - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

Virginia Department of Transportation

Figure 10

SB Route 288 CD Road to WB Bailey Bridge Connector - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 1

C-8 – Concept 2 (2040) CORSIM Results

CORSIM Calibration - 2040 Concept 2 AM

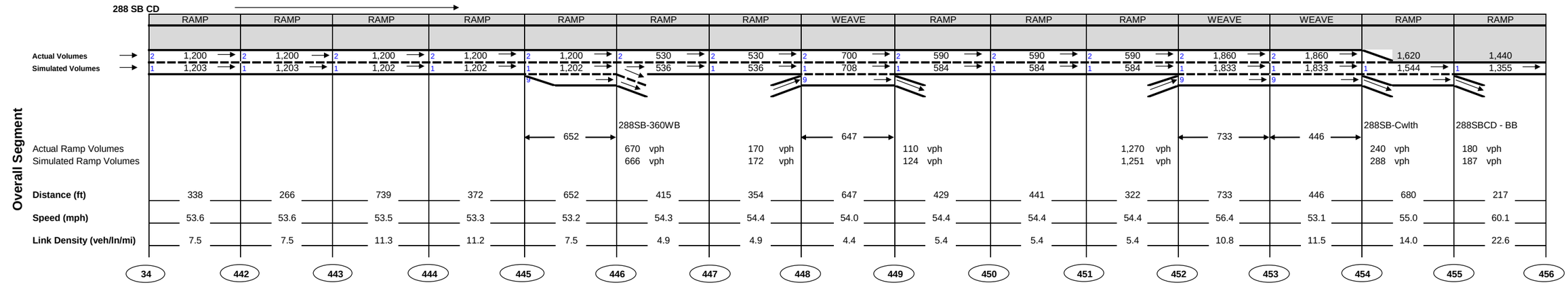
Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 SB CD	34	442	Freeway	0	0	#DIV/0!	55	0	-100.0%
	312	442	Ramp	1200	1203	0.3%	55	53.3	-3.1%
	442	443	Freeway	1200	1203	0.3%	55	53.6	-2.5%
	443	444	Freeway	1200	1202	0.2%	55	53.5	-2.7%
	444	445	Freeway	1200	1202	0.2%	55	53.3	-3.1%
	445	446	Freeway	1200	1202	0.2%	55	53.2	-3.3%
	446	390	Ramp	670	666	-0.6%	55	52.9	-3.8%
	446	447	Freeway	530	536	1.1%	55	54.3	-1.3%
	447	448	Freeway	530	536	1.1%	55	54.4	-1.1%
	392	448	Ramp	170	172	1.2%	55	44.2	-19.6%
	448	449	Freeway	700	708	1.1%	55	54	-1.8%
	449	393	Ramp	110	124	12.7%	55	55.3	0.5%
	449	450	Freeway	590	584	-1.0%	55	54.4	-1.1%
	450	451	Freeway	590	584	-1.0%	55	54.4	-1.1%
	451	452	Freeway	590	584	-1.0%	55	54.4	-1.1%
	395	452	Ramp	1270	1251	-1.5%	55	59.9	8.9%
	452	453	Freeway	1860	1833	-1.5%	55	56.4	2.5%
	453	454	Freeway	1860	1833	-1.5%	55	53.1	-3.5%
	454	48	Ramp	240	288	20.0%	55	54.4	-1.1%
	454	455	Freeway	1620	1544	-4.7%	55	55	0.0%
	455	7	Ramp	180	187	3.9%	55	38.1	-30.7%
	455	456	Freeway	1440	1355	-5.9%	55	60.1	9.3%
	456	457	Freeway	1440	1355	-5.9%	55	61.1	11.1%
	480	457	Ramp	660	657	-0.5%	55	52.9	-3.8%
	457	458	Freeway	2100	2013	-4.1%	55	56.3	2.4%
	458	459	Freeway	2100	2013	-4.1%	55	51.3	-6.7%
	459	330	Ramp	2100	2012	-4.2%	55	52.9	-3.8%
	459	460	Freeway	0	1	#DIV/0!	55	27.8	-49.5%
Route 288 SB	300	301	Freeway	2360	2362	0.1%	65	63.8	-1.8%
	301	302	Freeway	2360	2363	0.1%	65	64.2	-1.2%
	302	303	Freeway	2360	2364	0.2%	65	63.9	-1.7%
	303	304	Freeway	2360	2364	0.2%	65	63.6	-2.2%
	304	305	Freeway	2360	2363	0.1%	65	63.5	-2.3%
	305	306	Freeway	2360	2363	0.1%	65	63.4	-2.5%
	306	307	Freeway	2360	2363	0.1%	65	63.3	-2.6%
	307	308	Freeway	2360	2363	0.1%	65	63.3	-2.6%
	308	309	Freeway	2360	2364	0.2%	65	63.2	-2.8%
	309	310	Freeway	2360	2365	0.2%	65	62.5	-3.8%
	310	311	Freeway	2360	2365	0.2%	65	62.3	-4.2%
	311	312	Freeway	2360	2365	0.2%	65	60.3	-7.2%
	312	442	Ramp	1200	1203	0.3%	65	53.3	-18.0%
	312	313	Freeway	1160	1161	0.1%	65	63.6	-2.2%
	313	314	Freeway	1160	1161	0.1%	65	63.5	-2.3%
	314	315	Freeway	1160	1160	0.0%	65	63.5	-2.3%
	315	316	Freeway	1160	1159	-0.1%	65	63.5	-2.3%
	316	317	Freeway	1160	1159	-0.1%	65	63.5	-2.3%
	317	318	Freeway	1160	1159	-0.1%	65	63.4	-2.5%
	318	319	Freeway	1160	1159	-0.1%	65	63.4	-2.5%
	319	320	Freeway	1160	1159	-0.1%	65	63.4	-2.5%
	320	322	Freeway	1160	1159	-0.1%	65	63.4	-2.5%
	322	323	Freeway	1160	1159	-0.1%	65	63.4	-2.5%
	323	324	Freeway	1160	1159	-0.1%	65	63.3	-2.6%
	324	325	Freeway	1160	1158	-0.2%	65	63.3	-2.6%
	325	326	Freeway	1160	1158	-0.2%	65	63.3	-2.6%
	326	327	Freeway	1160	1159	-0.1%	65	63.3	-2.6%
	327	328	Freeway	1160	1159	-0.1%	65	63.2	-2.8%
	328	329	Freeway	1160	1160	0.0%	65	63	-3.1%
	329	330	Freeway	1160	1160	0.0%	65	62.2	-4.3%
	459	330	Ramp	2100	2012	-4.2%	65	52.9	-18.6%
	330	331	Freeway	3260	3174	-2.6%	65	50.1	-22.9%
	331	332	Freeway	3260	3174	-2.6%	65	54.1	-16.8%
	332	333	Freeway	3260	3175	-2.6%	65	58.9	-9.4%
	333	334	Freeway	3260	3176	-2.6%	65	61.3	-5.7%
	334	335	Freeway	3260	3176	-2.6%	65	61.8	-4.9%
	335	336	Freeway	3260	3176	-2.6%	65	61.6	-5.2%
	336	337	Freeway	3260	3176	-2.6%	65	61.4	-5.5%
	337	338	Freeway	3260	3176	-2.6%	65	61.3	-5.7%
	338	339	Freeway	3260	3174	-2.6%	65	61.3	-5.7%
	1	248	Freeway		0	#DIV/0!	55	0	-100.0%
	108	248	Ramp	900	892	-0.9%	55	53.3	-3.1%
	248	249	Freeway	900	892	-0.9%	55	51.9	-5.6%
	249	4	Ramp	320	310	-3.1%	55	44.4	-19.3%
	249	250	Freeway	580	582	0.3%	55	53.1	-3.5%
	250	251	Freeway	580	582	0.3%	55	52.9	-3.8%
	16	251	Ramp	520	509	-2.1%	55	43.7	-20.5%
	251	252	Freeway	1100	1092	-0.7%	55	50.5	-8.2%
	252	253	Freeway	1100	1093	-0.6%	55	52.4	-4.7%

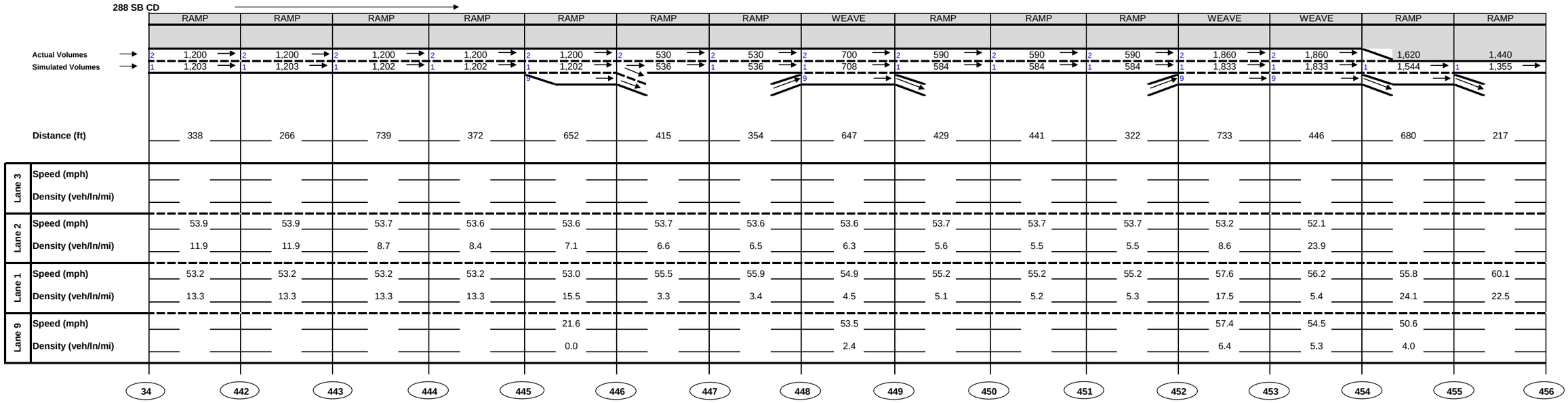
CORSIM Calibration - 2040 Concept 2 AM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 NB CD	253	255	Freeway	1100	1093	-0.6%	55	52.5	-4.5%
	255	7008	Ramp	200	229	14.5%	55	58.9	7.1%
	255	256	Freeway	900	863	-4.1%	55	52.4	-4.7%
	256	257	Freeway	900	863	-4.1%	55	52.3	-4.9%
	257	258	Freeway	900	863	-4.1%	55	52	-5.5%
	258	259	Freeway	900	863	-4.1%	55	52.6	-4.4%
	259	192	Ramp	380	376	-1.1%	55	54	-1.8%
	259	260	Freeway	520	487	-6.3%	55	53.3	-3.1%
	260	261	Freeway	520	487	-6.3%	55	53.1	-3.5%
	261	262	Freeway	520	487	-6.3%	55	52.8	-4.0%
	603	262	Ramp	2270	2127	-6.3%	55	49.5	-10.0%
	262	263	Freeway	2790	2613	-6.3%	55	45.8	-16.7%
	263	264	Freeway	2790	2612	-6.4%	55	51.7	-6.0%
	264	265	Freeway	2790	2611	-6.4%	55	53	-3.6%
	265	125	Ramp	2790	2610	-6.5%	55	55.6	1.1%
	265	35	Freeway	0	0	#DIV/0!	55	0	-100.0%
Route 288 NB	100	101	Freeway	3410	3403	-0.2%	65	62.4	-4.0%
	101	102	Freeway	3410	3403	-0.2%	65	63.2	-2.8%
	102	103	Freeway	3410	3404	-0.2%	65	62.2	-4.3%
	103	104	Freeway	3410	3405	-0.1%	65	61.5	-5.4%
	104	105	Freeway	3410	3404	-0.2%	65	61.1	-6.0%
	105	106	Freeway	3410	3404	-0.2%	65	60.1	-7.5%
	106	107	Freeway	3410	3404	-0.2%	65	59.6	-8.3%
	107	108	Freeway	3410	3405	-0.1%	65	60.2	-7.4%
	108	248	Ramp	900	892	-0.9%	65	53.3	-18.0%
	108	109	Freeway	2510	2513	0.1%	65	62	-4.6%
	109	110	Freeway	2510	2514	0.2%	65	62.1	-4.5%
	110	111	Freeway	2510	2513	0.1%	65	61.9	-4.8%
	111	112	Freeway	2510	2513	0.1%	65	61.8	-4.9%
	112	113	Freeway	2510	2514	0.2%	65	61.7	-5.1%
	113	114	Freeway	2510	2514	0.2%	65	61.6	-5.2%
	114	115	Freeway	2510	2513	0.1%	65	61.5	-5.4%
	115	116	Freeway	2510	2513	0.1%	65	61.5	-5.4%
	116	117	Freeway	2510	2512	0.1%	65	61.4	-5.5%
	117	118	Freeway	2510	2512	0.1%	65	61.4	-5.5%
	118	119	Freeway	2510	2512	0.1%	65	61.3	-5.7%
	119	120	Freeway	2510	2512	0.1%	65	61.2	-5.8%
	120	121	Freeway	2510	2511	0.0%	65	61.2	-5.8%
	121	122	Freeway	2510	2511	0.0%	65	61.2	-5.8%
	122	123	Freeway	2510	2512	0.1%	65	61.1	-6.0%
	123	124	Freeway	2510	2512	0.1%	65	61	-6.2%
	124	125	Freeway	2510	2513	0.1%	65	60.9	-6.3%
	265	125	Ramp	2790	2610	-6.5%	65	55.6	-14.5%
	125	126	Freeway	5300	5122	-3.4%	65	48.7	-25.1%
	126	127	Freeway	5300	5122	-3.4%	65	53.5	-17.7%
	127	128	Freeway	5300	5122	-3.4%	65	58.6	-9.8%
	128	129	Freeway	5300	5122	-3.4%	65	60.8	-6.5%
	129	130	Freeway	5300	5124	-3.3%	65	61.3	-5.7%
	130	131	Freeway	5300	5124	-3.3%	65	61.1	-6.0%
	131	132	Freeway	5300	5124	-3.3%	65	61	-6.2%
	132	133	Freeway	5300	5123	-3.3%	65	60.9	-6.3%
	133	134	Freeway	5300	5122	-3.4%	65	60.9	-6.3%
	134	135	Freeway	5300	5119	-3.4%	65	60.8	-6.5%
	135	136	Freeway	5300	5118	-3.4%	65	60.8	-6.5%
	136	137	Freeway	5300	5119	-3.4%	65	60.9	-6.3%
Bailey-288NB	7002	46	Freeway	1170	1165	-0.4%	45	53.2	18.2%
	46	274	Freeway	1170	1166	-0.3%	45	52.8	17.3%
	274	480	Ramp	660	657	-0.5%	45	53	17.8%
	274	275	Freeway	510	509	-0.2%	45	54.6	21.3%
	275	276	Ramp	510	508	-0.4%	45	47.4	5.3%
	275	36	Freeway	0	0	#DIV/0!	45	0	-100.0%
Dummy	2	7	Freeway	0	0	#DIV/0!	45	0	-100.0%
	455	7	Ramp	180	187	3.9%	45	38.1	-15.3%
	7	49	Freeway	180	187	3.9%	45	27.5	-38.9%
	6	49	Ramp	320	310	-3.1%	45	44.2	-1.8%
	49	38	Freeway	500	497	-0.6%	45	45.2	0.4%
	38	7011	Ramp	500	497	-0.6%	45	53.1	18.0%
	38	8	Freeway	0	0	#DIV/0!	45	0	-100.0%
60WB-288	22	550	Freeway	0	0	#DIV/0!	45	0	-100.0%
	23	550	Ramp	3010	2865	-4.8%	45	39.6	-12.0%
	550	551	Freeway	3010	2865	-4.8%	45	36.7	-18.4%
	551	394	Ramp	1270	1252	-1.4%	45	46.5	3.3%
	551	41	Freeway	1740	1614	-7.2%	45	39.2	-12.9%
	41	42	Freeway	1740	1613	-7.3%	45	40.7	-9.6%
	42	43	Freeway	1740	1612	-7.4%	45	42	-6.7%
	43	44	Freeway	1740	1612	-7.4%	45	42.2	-6.2%
	44	45	Freeway	1740	1613	-7.3%	45	41.5	-7.8%

CORSIM Calibration - 2040 Concept 2 AM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
3	45	18	Freeway	1740	1614	-7.2%	45	41.2	-8.4%
	20	18	Ramp	530	512	-3.4%	45	43.4	-3.6%
	18	19	Freeway	2270	2126	-6.3%	45	42.9	-4.7%
	19	603	Freeway	2270	2126	-6.3%	45	44.4	-1.3%
	603	262	Ramp	2270	2127	-6.3%	45	49.5	10.0%
	603	10	Freeway	0	0	#DIV/0!	45	0	-100.0%





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

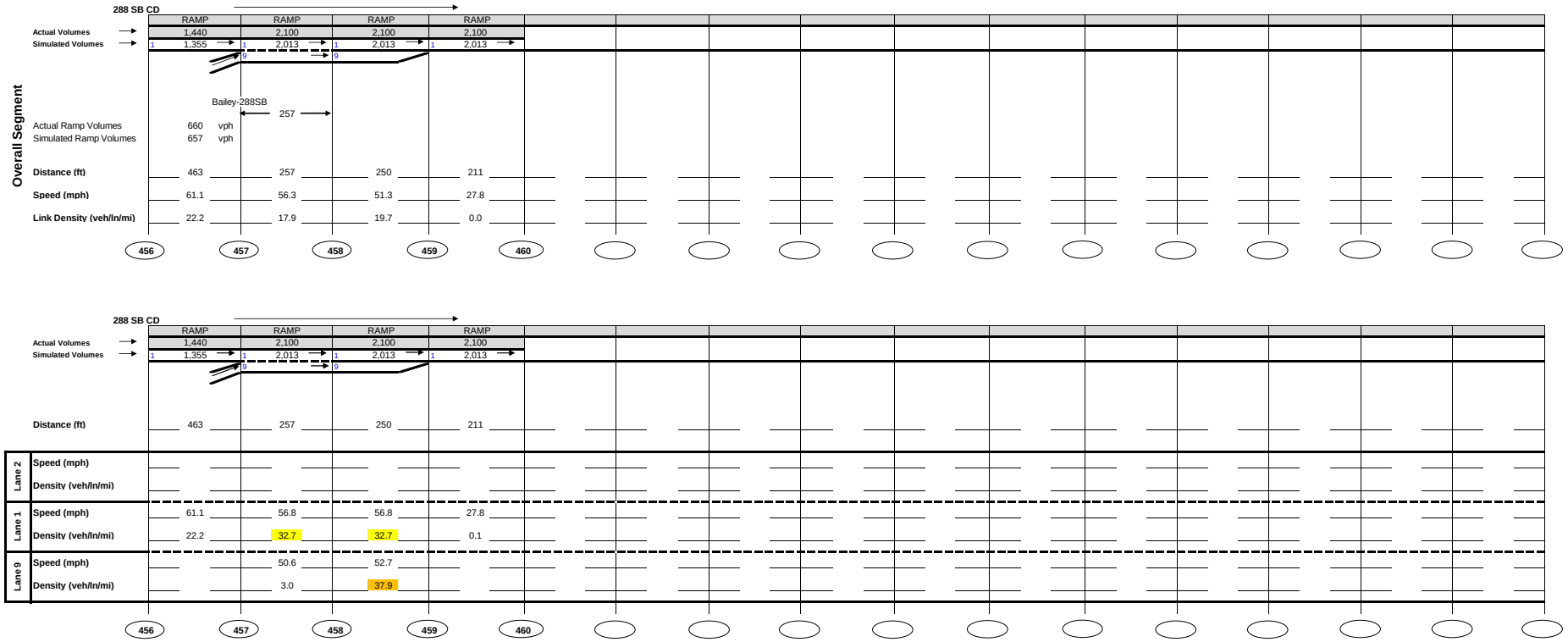
VDOT Virginia Department of Transportation

Figure 1

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

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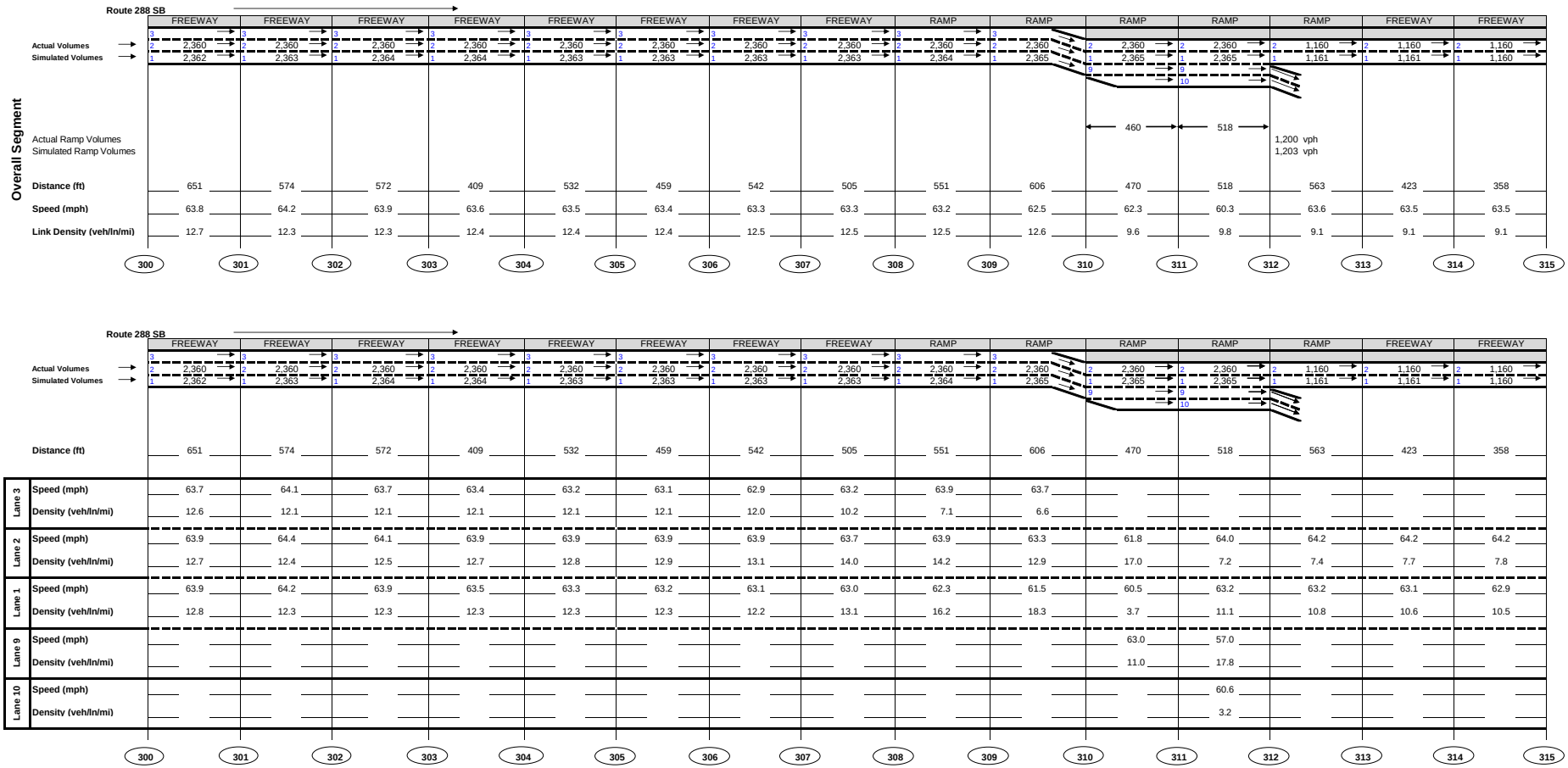
Figure 2

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

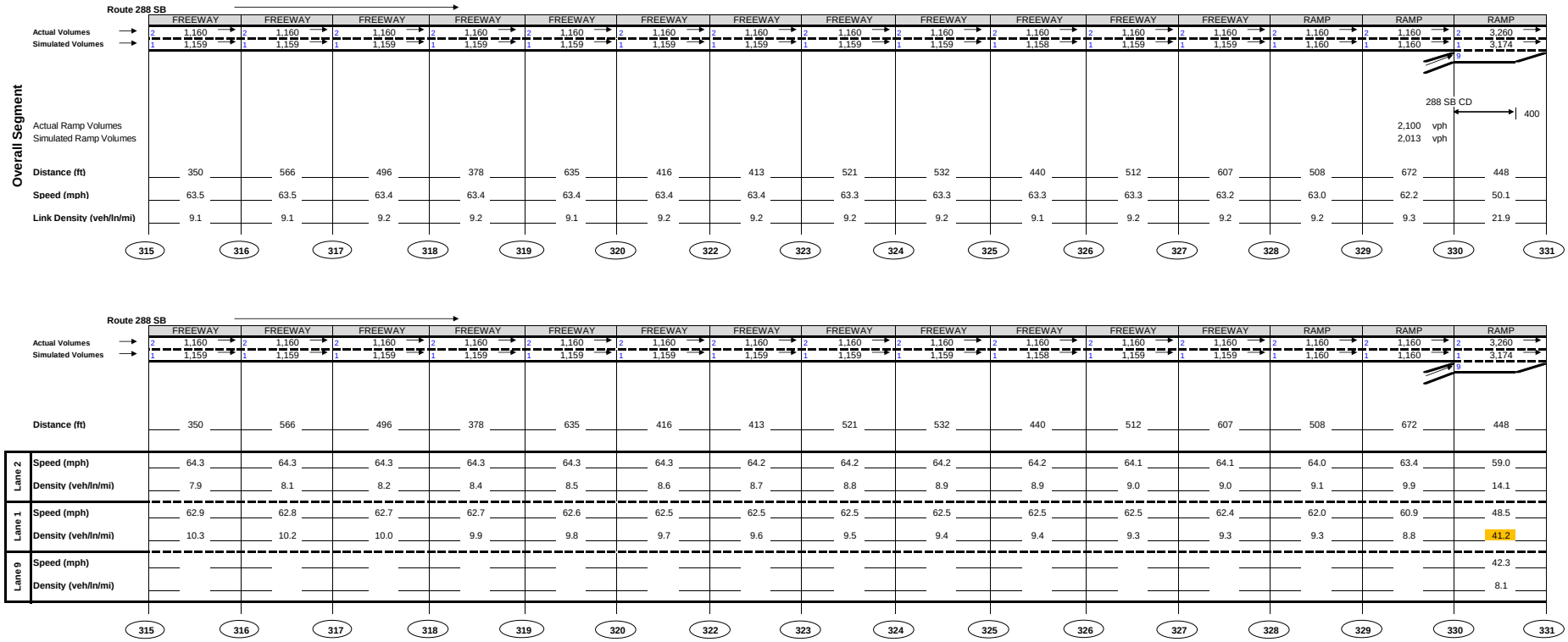
Weave/Ramp Density (veh/ln/mi)
45 and above
35 to 45
28 to 35
20 to 28
10 to 20
0 to 10

CD Road Weave Density (veh/ln/mi)
45 and above
36 to 45
32 to 36
24 to 32
12 to 24
0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 3
Southbound - AM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

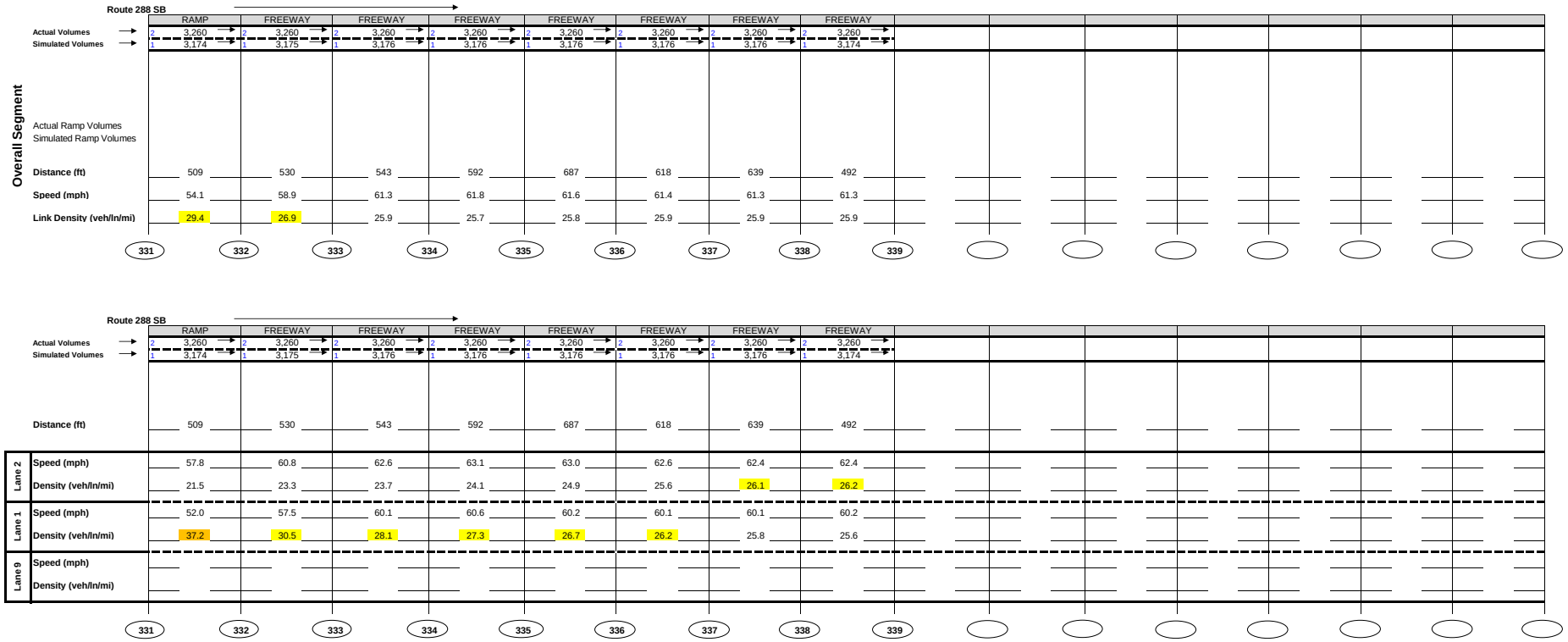
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 4
Southbound - AM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

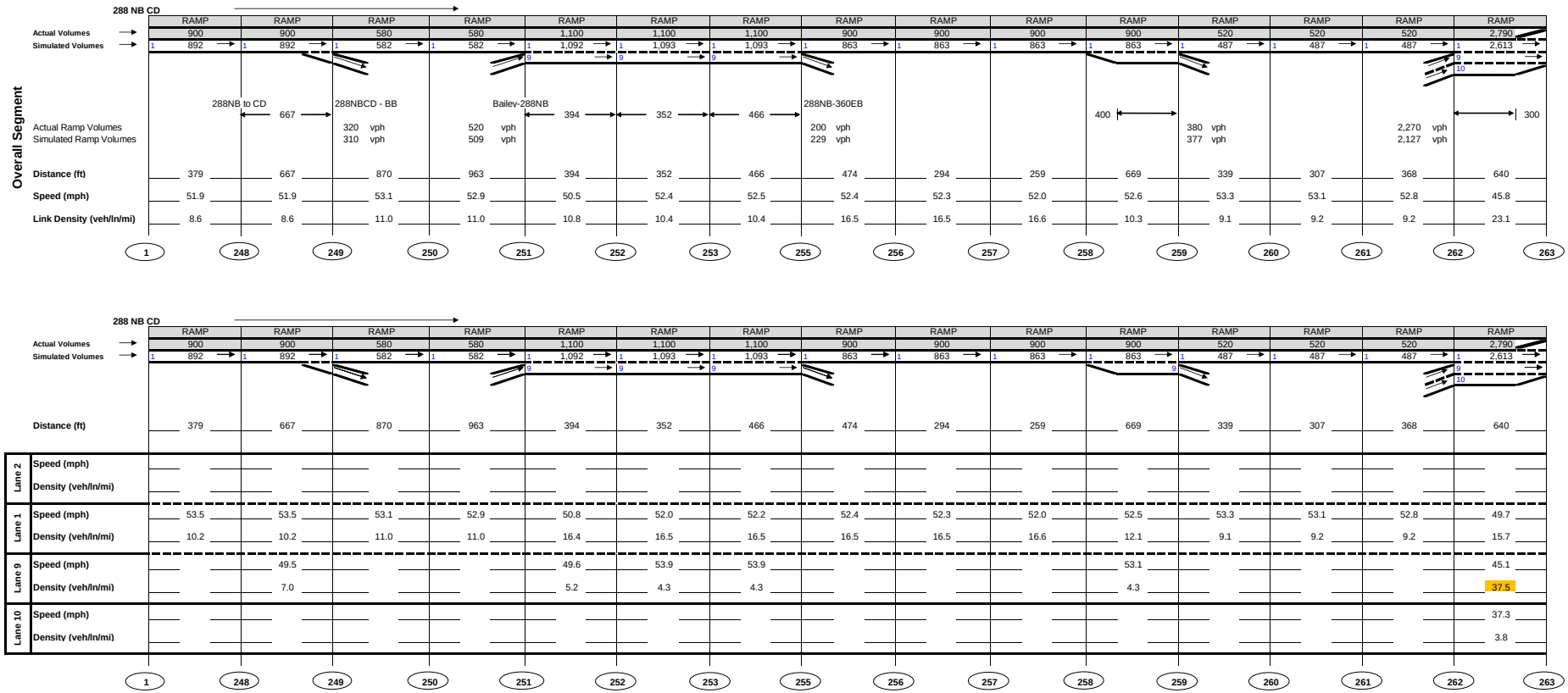
VDOT Virginia Department of Transportation

Figure 5

Southbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

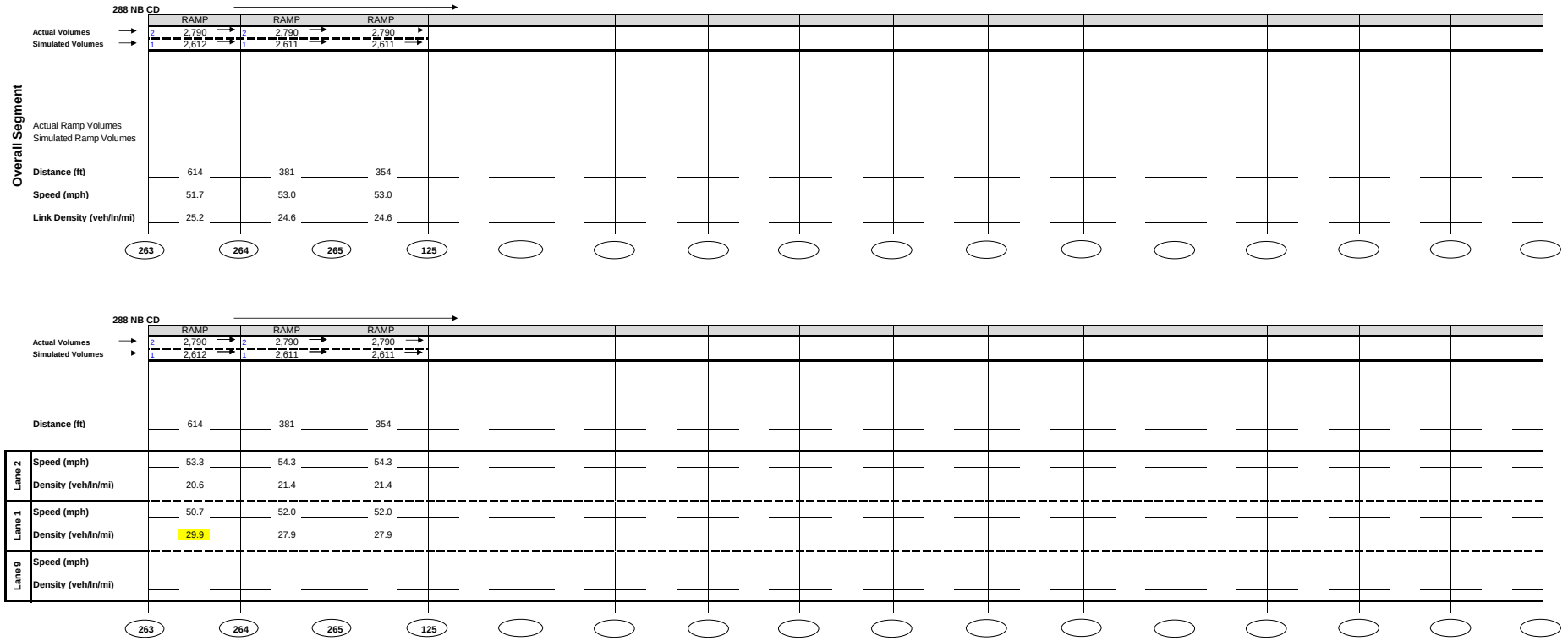
VDOT Virginia Department of Transportation

Figure 6

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

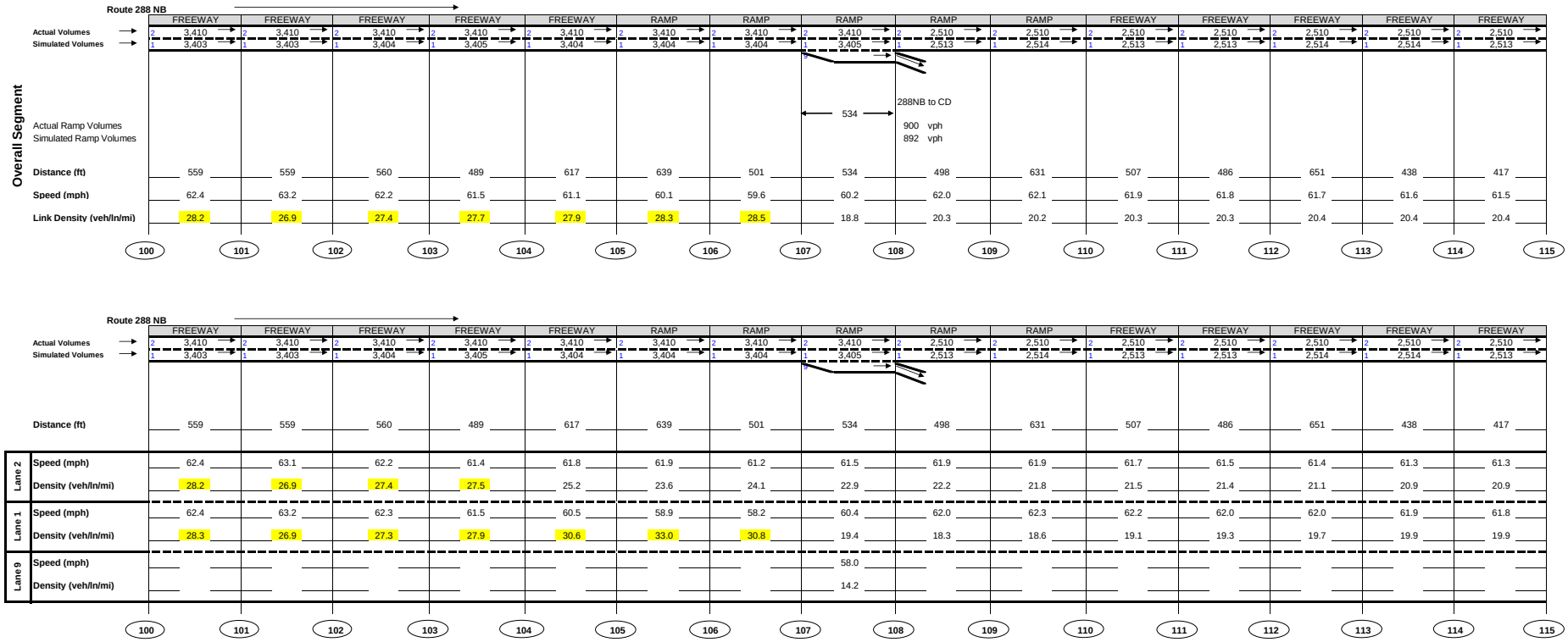
VDOT Virginia Department of Transportation

Figure 7

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

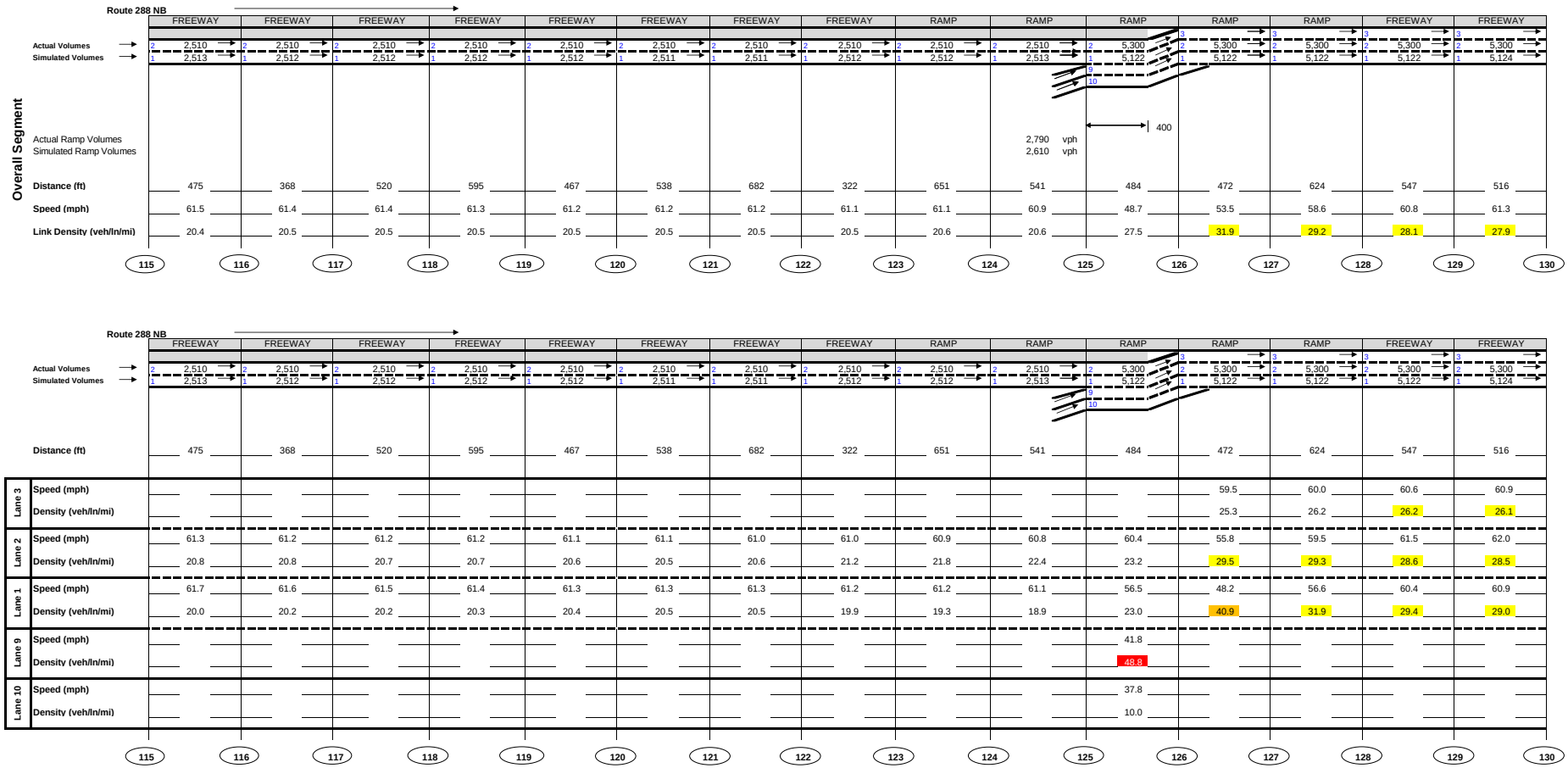
VDOT Virginia Department of Transportation

Figure 8

Northbound - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

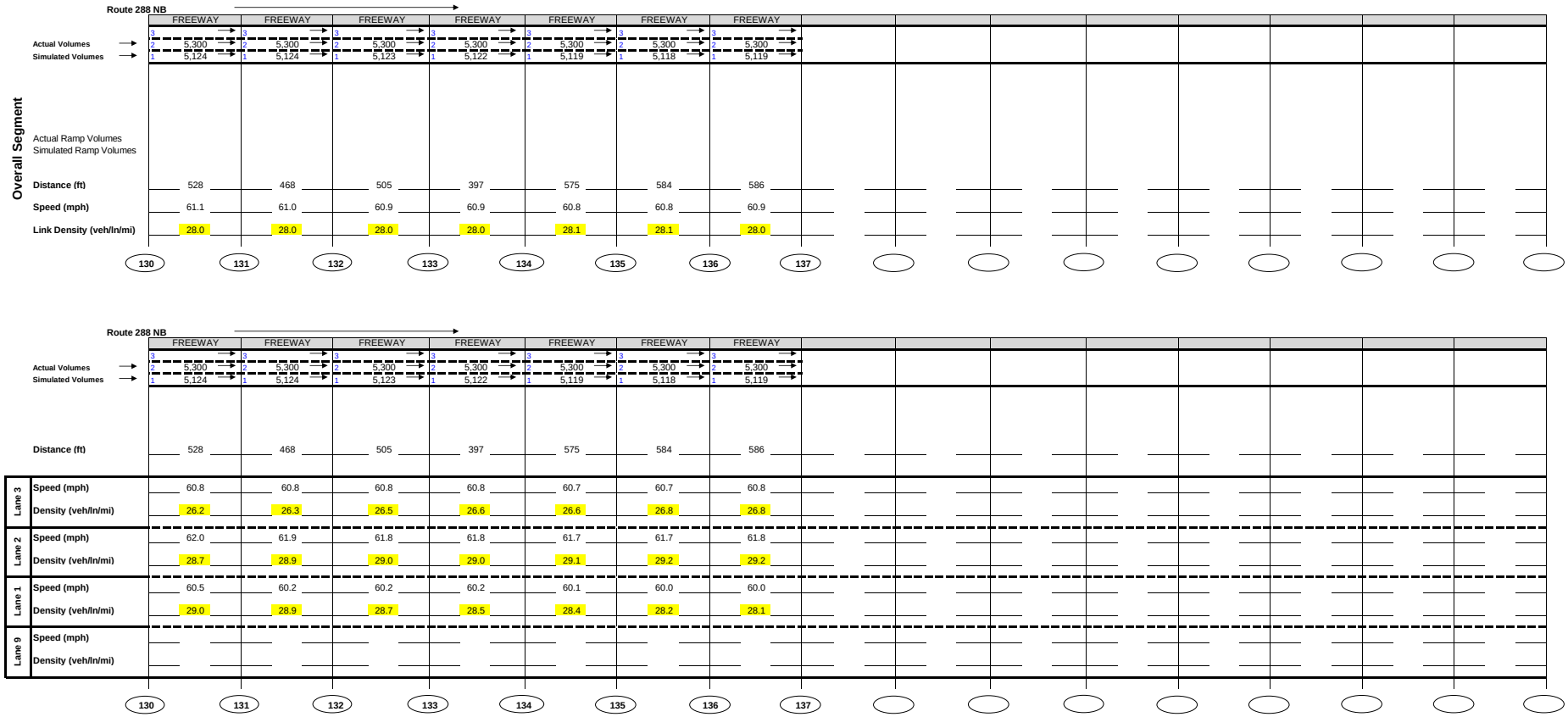
Weave/Ramp Density (veh/ln/mi)
45 and above
35 to 45
28 to 35
20 to 28
10 to 20
0 to 10

CD Road Weave Density (veh/ln/mi)
45 and above
36 to 45
32 to 36
24 to 32
12 to 24
0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 9
Northbound - AM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

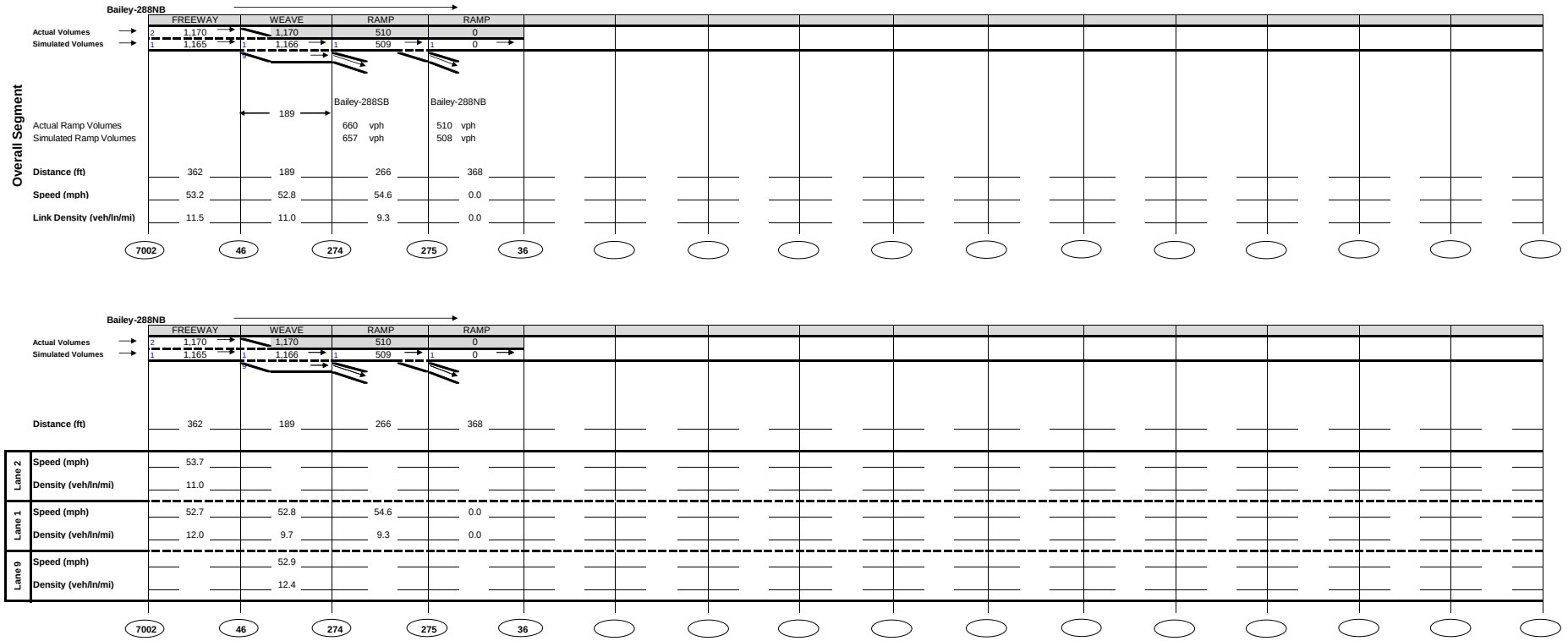
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 10
Northbound - AM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

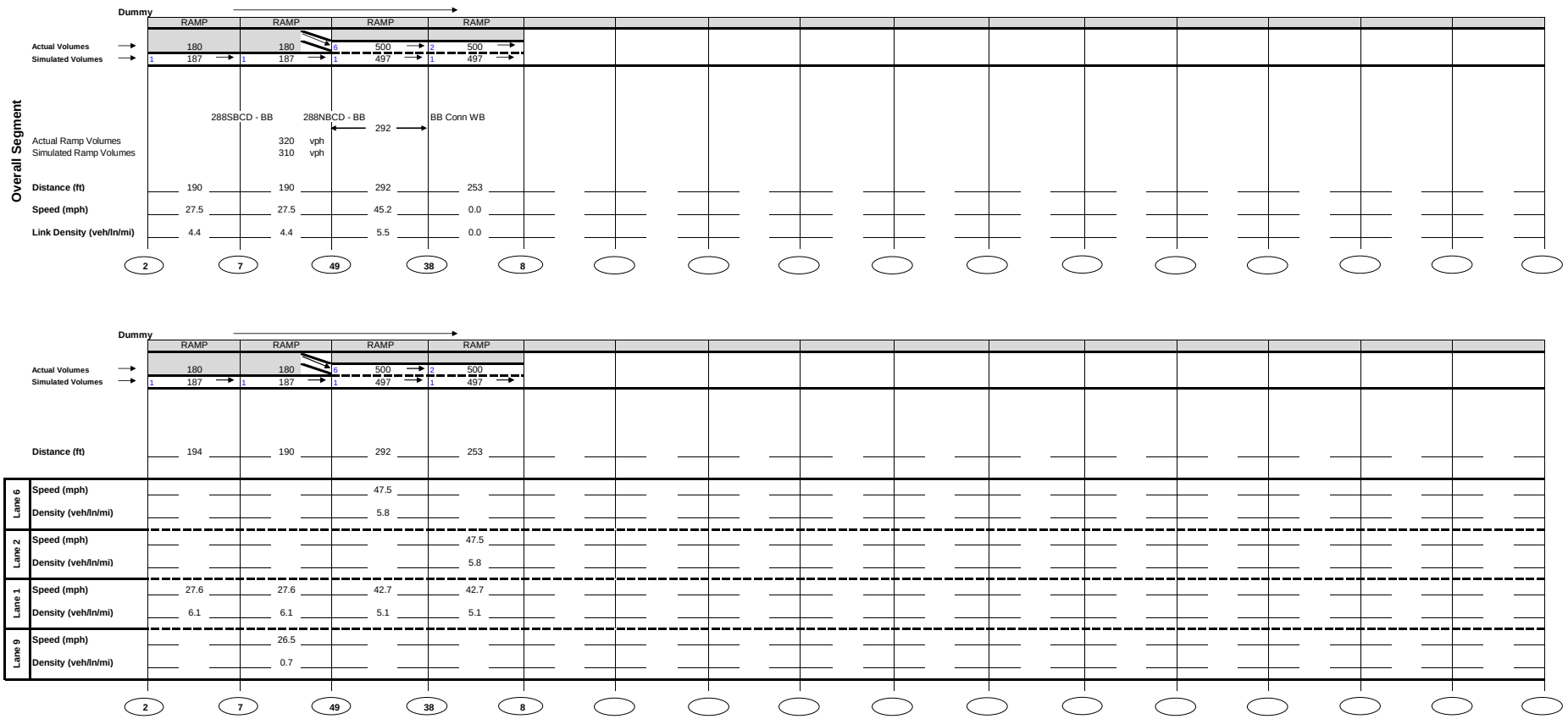
VDOT Virginia Department of Transportation

Figure 11

EB Bailey Bridge Connector to NB Route 288 CD Road - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

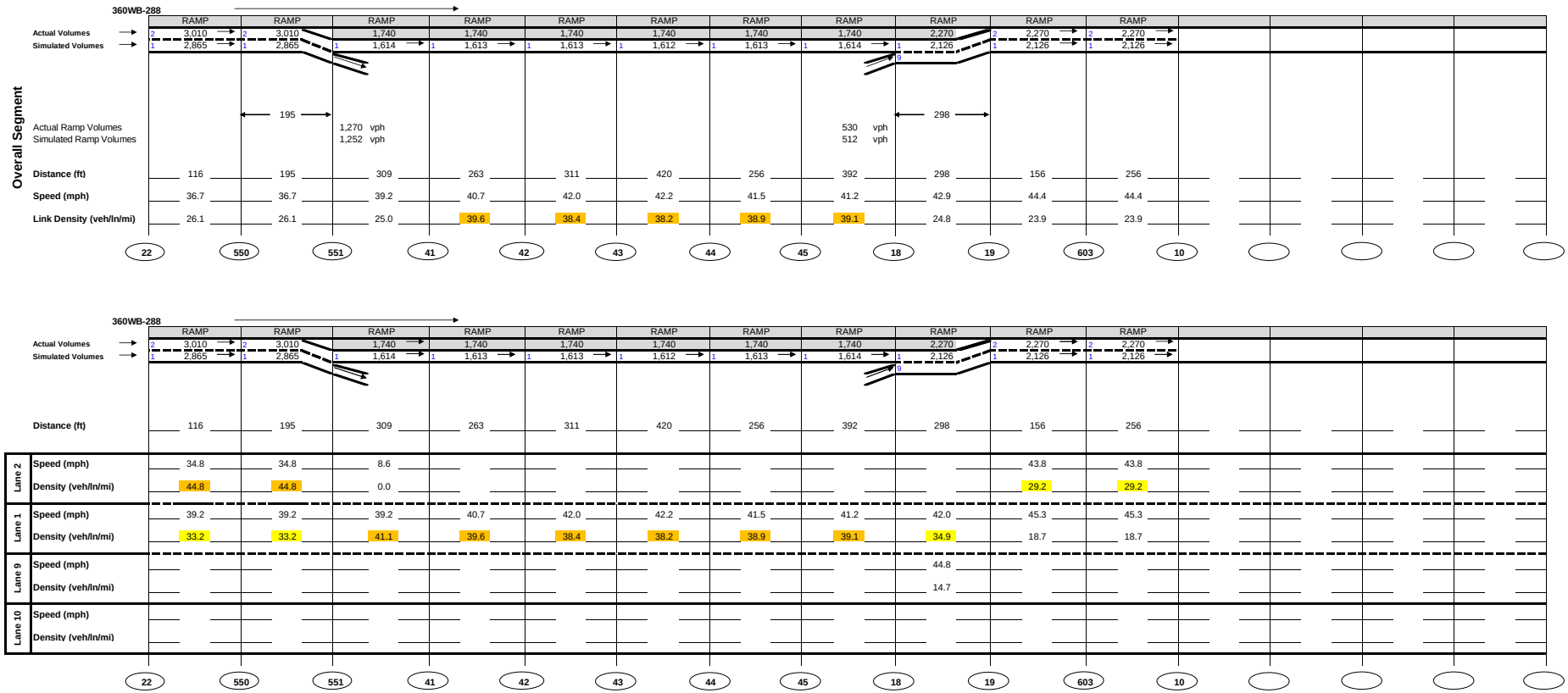
VDOT Virginia Department of Transportation

Figure 12

SB Route 288 CD Road to WB Bailey Bridge Connector - AM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 13
EB US 360 to NB Route 288 - AM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 2

CORSIM Calibration - 2040 Concept 2 PM

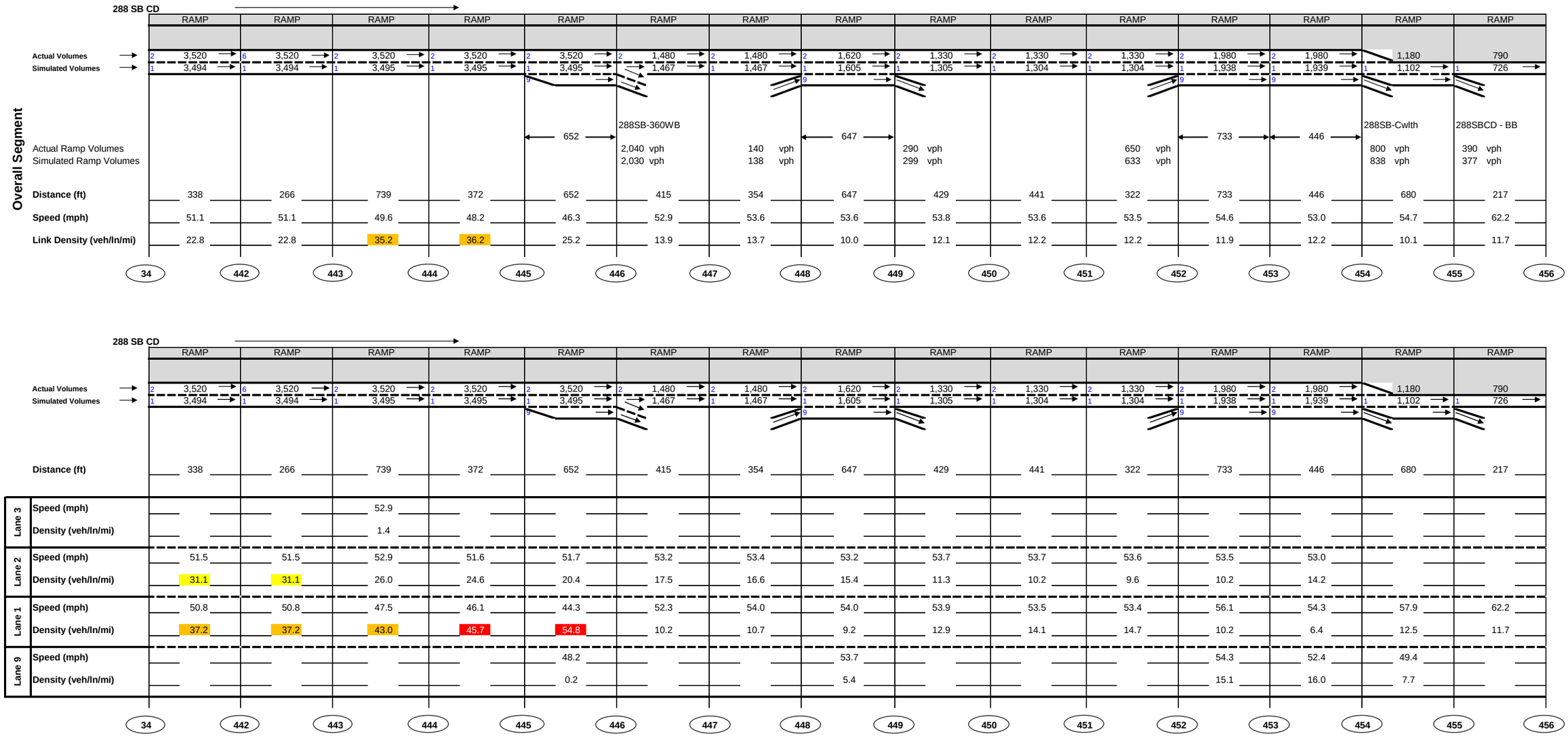
Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 SB CD	34	442	Freeway	0	0	#DIV/0!	55	0	-100.0%
	312	442	Ramp	3520	3494	-0.7%	55	50.3	-8.5%
	442	443	Freeway	3520	3494	-0.7%	55	51.1	-7.1%
	443	444	Freeway	3520	3495	-0.7%	55	49.6	-9.8%
	444	445	Freeway	3520	3495	-0.7%	55	48.2	-12.4%
	445	446	Freeway	3520	3495	-0.7%	55	46.3	-15.8%
	446	390	Ramp	2040	2030	-0.5%	55	48.7	-11.5%
	446	447	Freeway	1480	1467	-0.9%	55	52.9	-3.8%
	447	448	Freeway	1480	1467	-0.9%	55	53.6	-2.5%
	392	448	Ramp	140	138	-1.4%	55	43.1	-21.6%
	448	449	Freeway	1620	1605	-0.9%	55	53.6	-2.5%
	449	393	Ramp	290	299	3.1%	55	55.1	0.2%
	449	450	Freeway	1330	1305	-1.9%	55	53.8	-2.2%
	450	451	Freeway	1330	1304	-2.0%	55	53.6	-2.5%
	451	452	Freeway	1330	1304	-2.0%	55	53.5	-2.7%
	395	452	Ramp	650	633	-2.6%	55	62	12.7%
	452	453	Freeway	1980	1938	-2.1%	55	54.6	-0.7%
	453	454	Freeway	1980	1939	-2.1%	55	53	-3.6%
	454	48	Ramp	800	838	4.8%	55	52.7	-4.2%
	454	455	Freeway	1180	1102	-6.6%	55	54.7	-0.5%
	455	7	Ramp	390	377	-3.3%	55	37.1	-32.5%
	455	456	Freeway	790	726	-8.1%	55	62.2	13.1%
	456	457	Freeway	790	726	-8.1%	55	62.7	14.0%
	480	457	Ramp	400	390	-2.5%	55	53.4	-2.9%
	457	458	Freeway	1190	1116	-6.2%	55	59.3	7.8%
	458	459	Freeway	1190	1116	-6.2%	55	59.8	8.7%
	459	330	Ramp	1190	1115	-6.3%	55	60.1	9.3%
	459	460	Freeway	0	0	#DIV/0!	55	3.1	-94.4%
Route 288 SB	300	301	Freeway	5430	5426	-0.1%	65	62.1	-4.5%
	301	302	Freeway	5430	5424	-0.1%	65	63	-3.1%
	302	303	Freeway	5430	5424	-0.1%	65	62	-4.6%
	303	304	Freeway	5430	5424	-0.1%	65	61.2	-5.8%
	304	305	Freeway	5430	5422	-0.1%	65	60.3	-7.2%
	305	306	Freeway	5430	5419	-0.2%	65	59.1	-9.1%
	306	307	Freeway	5430	5415	-0.3%	65	57	-12.3%
	307	308	Freeway	5430	5409	-0.4%	65	53.9	-17.1%
	308	309	Freeway	5430	5404	-0.5%	65	46.8	-28.0%
	309	310	Freeway	5430	5401	-0.5%	65	41.3	-36.5%
	310	311	Freeway	5430	5400	-0.6%	65	48.7	-25.1%
	311	312	Freeway	5430	5401	-0.5%	65	53.5	-17.7%
	312	442	Ramp	3520	3494	-0.7%	65	50.3	-22.6%
	312	313	Freeway	1910	1907	-0.2%	65	62.4	-4.0%
	313	314	Freeway	1910	1908	-0.1%	65	62.8	-3.4%
	314	315	Freeway	1910	1908	-0.1%	65	62.7	-3.5%
	315	316	Freeway	1910	1907	-0.2%	65	62.6	-3.7%
	316	317	Freeway	1910	1906	-0.2%	65	62.6	-3.7%
	317	318	Freeway	1910	1906	-0.2%	65	62.5	-3.8%
	318	319	Freeway	1910	1907	-0.2%	65	62.5	-3.8%
	319	320	Freeway	1910	1907	-0.2%	65	62.4	-4.0%
	320	322	Freeway	1910	1907	-0.2%	65	62.4	-4.0%
	322	323	Freeway	1910	1906	-0.2%	65	62.4	-4.0%
	323	324	Freeway	1910	1905	-0.3%	65	62.3	-4.2%
	324	325	Freeway	1910	1904	-0.3%	65	62.3	-4.2%
	325	326	Freeway	1910	1905	-0.3%	65	62.3	-4.2%
	326	327	Freeway	1910	1905	-0.3%	65	62.2	-4.3%
	327	328	Freeway	1910	1905	-0.3%	65	62.2	-4.3%
	328	329	Freeway	1910	1905	-0.3%	65	62.1	-4.5%
	329	330	Freeway	1910	1905	-0.3%	65	61.8	-4.9%
	459	330	Ramp	1190	1115	-6.3%	65	60.1	-7.5%
	330	331	Freeway	3100	3022	-2.5%	65	54.3	-16.5%
	331	332	Freeway	3100	3023	-2.5%	65	55.9	-14.0%
	332	333	Freeway	3100	3024	-2.5%	65	59.1	-9.1%
	333	334	Freeway	3100	3023	-2.5%	65	60.7	-6.6%
	334	335	Freeway	3100	3022	-2.5%	65	61.2	-5.8%
	335	336	Freeway	3100	3021	-2.5%	65	61	-6.2%
	336	337	Freeway	3100	3020	-2.6%	65	60.9	-6.3%
	337	338	Freeway	3100	3021	-2.5%	65	60.9	-6.3%
	338	339	Freeway	3100	3023	-2.5%	65	61	-6.2%
	1	248	Freeway		0	#DIV/0!	55	0	-100.0%
	108	248	Ramp	2050	2039	-0.5%	55	50.1	-8.9%
	248	249	Freeway	2050	2039	-0.5%	55	50.1	-8.9%
	249	4	Ramp	970	959	-1.1%	55	43.1	-21.6%
	249	250	Freeway	1080	1080	0.0%	55	52.1	-5.3%
	250	251	Freeway	1080	1080	0.0%	55	51.9	-5.6%
	16	251	Ramp	320	305	-4.7%	55	44	-20.0%
	251	252	Freeway	1400	1386	-1.0%	55	50.9	-7.5%
	252	253	Freeway	1400	1387	-0.9%	55	51.8	-5.8%

CORSIM Calibration - 2040 Concept 2 PM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
288 NB CD	253	255	Freeway	1400	1387	-0.9%	55	51.9	-5.6%
	255	7008	Ramp	260	265	1.9%	55	59.1	7.5%
	255	256	Freeway	1140	1122	-1.6%	55	51.5	-6.4%
	256	257	Freeway	1140	1122	-1.6%	55	51.4	-6.5%
	257	258	Freeway	1140	1122	-1.6%	55	51.2	-6.9%
	258	259	Freeway	1140	1122	-1.6%	55	52.1	-5.3%
	259	192	Ramp	820	818	-0.2%	55	51.6	-6.2%
	259	260	Freeway	320	304	-5.0%	55	53.9	-2.0%
	260	261	Freeway	320	304	-5.0%	55	53.8	-2.2%
	261	262	Freeway	320	304	-5.0%	55	53.6	-2.5%
	603	262	Ramp	1010	983	-2.7%	55	51.6	-6.2%
	262	263	Freeway	1330	1286	-3.3%	55	51.1	-7.1%
	263	264	Freeway	1330	1285	-3.4%	55	53.4	-2.9%
	264	265	Freeway	1330	1284	-3.5%	55	53.8	-2.2%
	265	125	Ramp	1330	1284	-3.5%	55	57.8	5.1%
	265	35	Freeway	0	0	#DIV/0!	55	0	-100.0%
Route 288 NB	100	101	Freeway	3350	3347	-0.1%	65	62.1	-4.5%
	101	102	Freeway	3350	3346	-0.1%	65	63.2	-2.8%
	102	103	Freeway	3350	3347	-0.1%	65	62.3	-4.2%
	103	104	Freeway	3350	3348	-0.1%	65	61.5	-5.4%
	104	105	Freeway	3350	3349	0.0%	65	60.6	-6.8%
	105	106	Freeway	3350	3350	0.0%	65	57.1	-12.2%
	106	107	Freeway	3350	3351	0.0%	65	54.3	-16.5%
	107	108	Freeway	3350	3353	0.1%	65	56.7	-12.8%
	108	248	Ramp	2050	2039	-0.5%	65	50.1	-22.9%
	108	109	Freeway	1300	1313	1.0%	65	63.2	-2.8%
	109	110	Freeway	1300	1313	1.0%	65	63.5	-2.3%
	110	111	Freeway	1300	1313	1.0%	65	63.5	-2.3%
	111	112	Freeway	1300	1313	1.0%	65	63.4	-2.5%
	112	113	Freeway	1300	1312	0.9%	65	63.4	-2.5%
	113	114	Freeway	1300	1312	0.9%	65	63.3	-2.6%
	114	115	Freeway	1300	1312	0.9%	65	63.3	-2.6%
	115	116	Freeway	1300	1312	0.9%	65	63.3	-2.6%
	116	117	Freeway	1300	1312	0.9%	65	63.3	-2.6%
	117	118	Freeway	1300	1312	0.9%	65	63.2	-2.8%
	118	119	Freeway	1300	1312	0.9%	65	63.2	-2.8%
	119	120	Freeway	1300	1311	0.8%	65	63.2	-2.8%
	120	121	Freeway	1300	1311	0.8%	65	63.2	-2.8%
	121	122	Freeway	1300	1311	0.8%	65	63.2	-2.8%
	122	123	Freeway	1300	1311	0.8%	65	63.1	-2.9%
	123	124	Freeway	1300	1311	0.8%	65	63.1	-2.9%
	124	125	Freeway	1300	1310	0.8%	65	63.1	-2.9%
	265	125	Ramp	1330	1284	-3.5%	65	57.8	-11.1%
	125	126	Freeway	2630	2595	-1.3%	65	60.2	-7.4%
	126	127	Freeway	2630	2596	-1.3%	65	61.5	-5.4%
	127	128	Freeway	2630	2595	-1.3%	65	62.6	-3.7%
	128	129	Freeway	2630	2595	-1.3%	65	63.1	-2.9%
	129	130	Freeway	2630	2596	-1.3%	65	63.1	-2.9%
	130	131	Freeway	2630	2596	-1.3%	65	63	-3.1%
	131	132	Freeway	2630	2596	-1.3%	65	63	-3.1%
	132	133	Freeway	2630	2598	-1.2%	65	63	-3.1%
	133	134	Freeway	2630	2599	-1.2%	65	62.9	-3.2%
	134	135	Freeway	2630	2599	-1.2%	65	62.9	-3.2%
	135	136	Freeway	2630	2599	-1.2%	65	62.9	-3.2%
	136	137	Freeway	2630	2599	-1.2%	65	62.9	-3.2%
Bailey-288NB	7002	46	Freeway	710	697	-1.8%	45	53.4	18.7%
	46	274	Freeway	710	697	-1.8%	45	53.5	18.9%
	274	480	Ramp	400	390	-2.5%	45	53.4	18.7%
	274	275	Freeway	310	306	-1.3%	45	54.9	22.0%
	275	276	Ramp	310	306	-1.3%	45	47.7	6.0%
	275	36	Freeway	0	0	#DIV/0!	45	0	-100.0%
Dummy	2	7	Freeway	0	0	#DIV/0!	45	0	-100.0%
	455	7	Ramp	390	377	-3.3%	45	37.1	-17.6%
	7	49	Freeway	390	376	-3.6%	45	27.8	-38.2%
	6	49	Ramp	970	958	-1.2%	45	42.8	-4.9%
	49	38	Freeway	1360	1334	-1.9%	45	44.8	-0.4%
	38	7011	Ramp	1360	1335	-1.8%	45	52.2	16.0%
	38	8	Freeway	0	0	#DIV/0!	45	0	-100.0%
60WB-288	22	550	Freeway	0	0	#DIV/0!	45	0	-100.0%
	23	550	Ramp	1400	1358	-3.0%	45	44	-2.2%
	550	551	Freeway	1400	1358	-3.0%	45	43.5	-3.3%
	551	394	Ramp	650	632	-2.8%	45	49.4	9.8%
	551	41	Freeway	750	726	-3.2%	45	43.2	-4.0%
	41	42	Freeway	750	726	-3.2%	45	43.3	-3.8%
	42	43	Freeway	750	726	-3.2%	45	43.6	-3.1%
	43	44	Freeway	750	726	-3.2%	45	43.4	-3.6%
	44	45	Freeway	750	726	-3.2%	45	43.1	-4.2%

CORSIM Calibration - 2040 Concept 2 PM

Route	From Node	To Node	Type	Actual Volumes	Simulated Volumes	Percent Difference	Actual Speeds	Simulated Speeds	Percent Difference
3	45	18	Freeway	750	726	-3.2%	45	43	-4.4%
	20	18	Ramp	260	257	-1.2%	45	44.8	-0.4%
	18	19	Freeway	1010	984	-2.6%	45	44	-2.2%
	19	603	Freeway	1010	983	-2.7%	45	45.2	0.4%
	603	262	Ramp	1010	983	-2.7%	45	51.6	14.7%
	603	10	Freeway	0	0	#DIV/0!	45	0	-100.0%



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

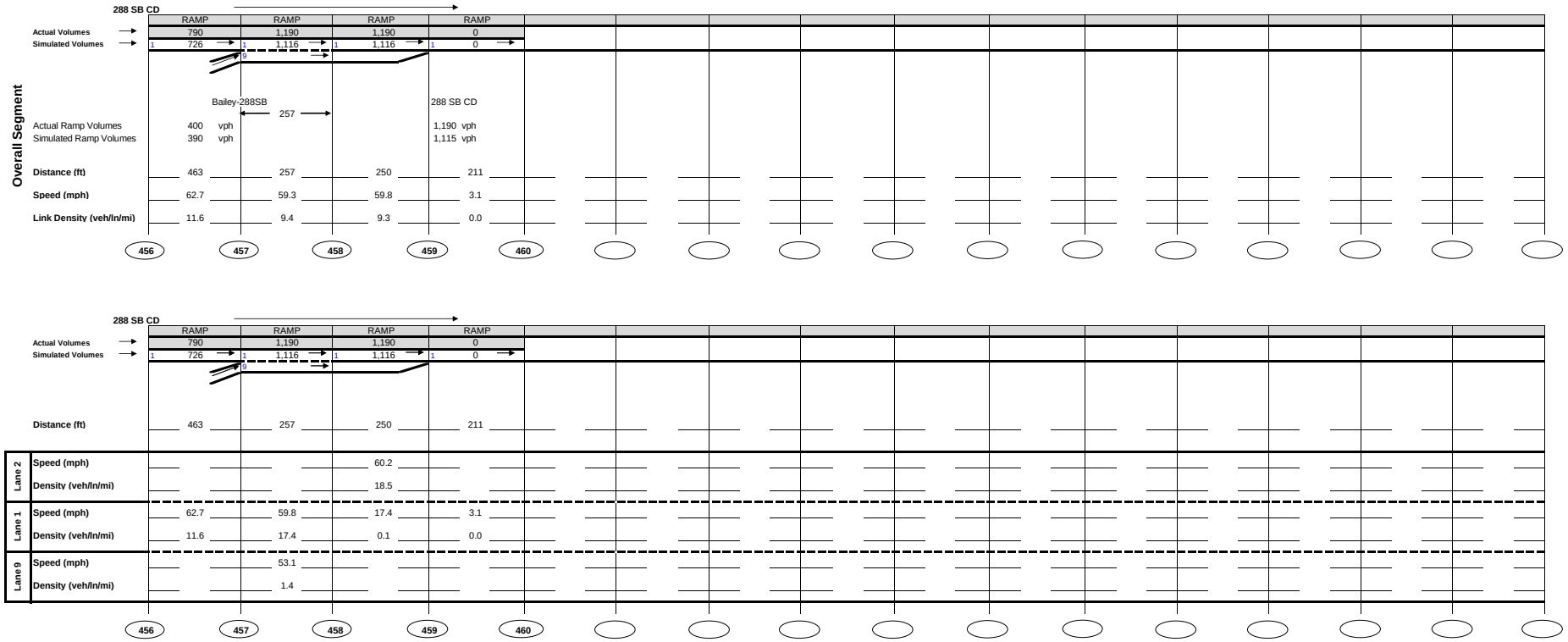
Virginia Department of Transportation

Figure 1

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

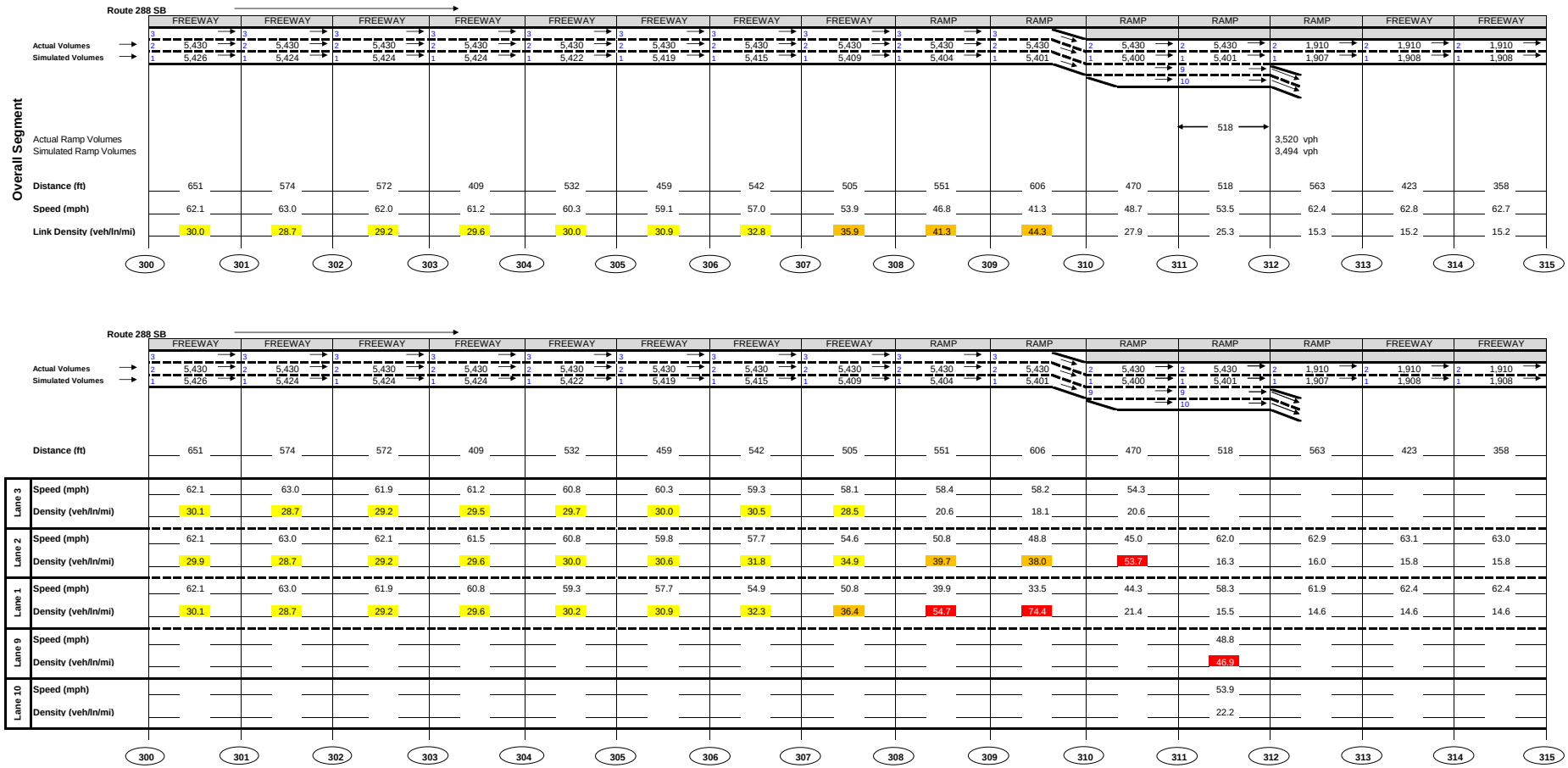
VDOT Virginia Department of Transportation

Figure 2

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

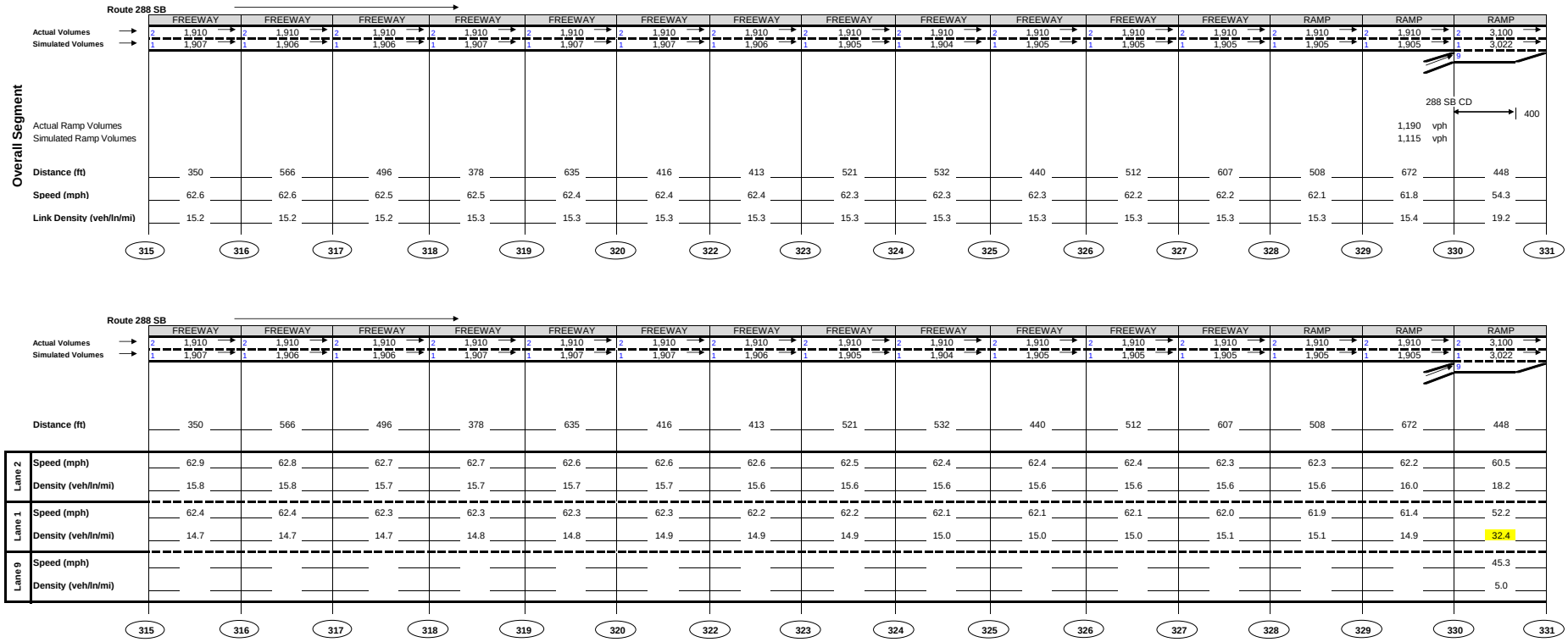
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

Virginia Department of Transportation

Figure 3
Southbound - PM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

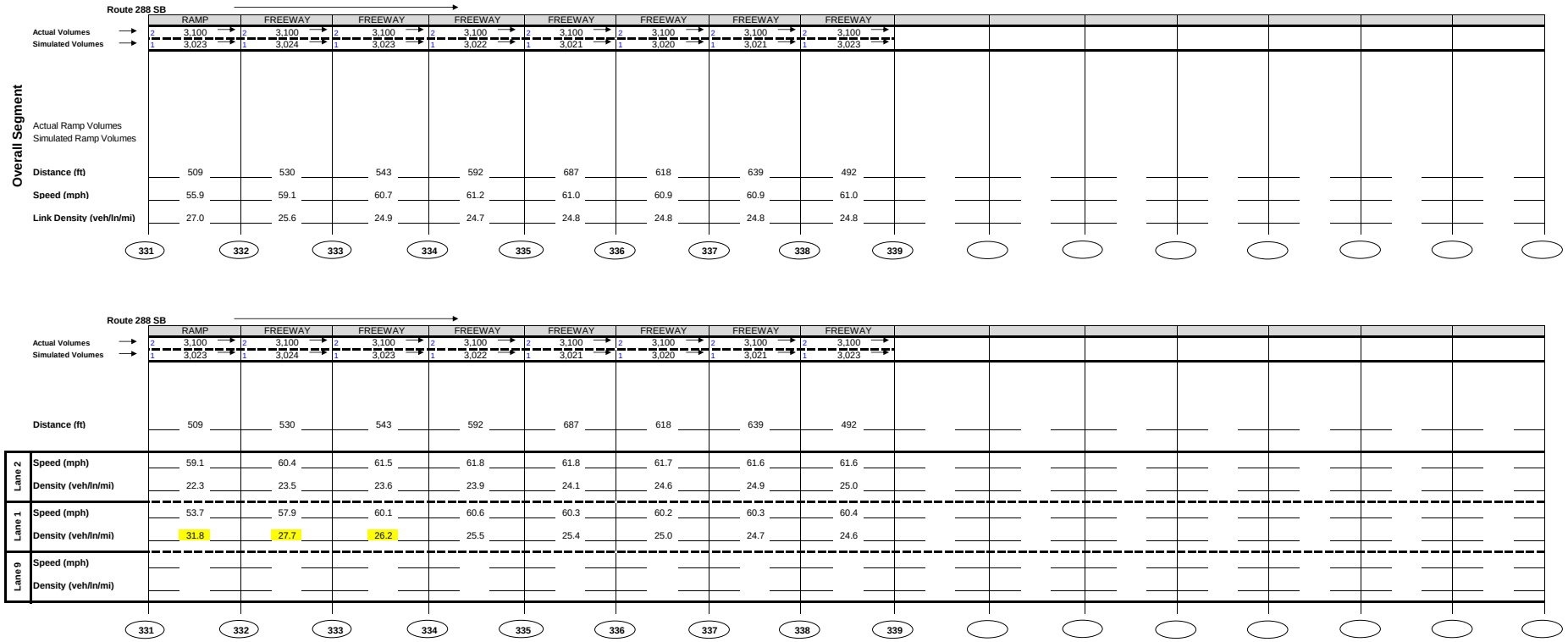
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 4
Southbound - PM Peak Hour
US 360/Route 288 Interchange Study
Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

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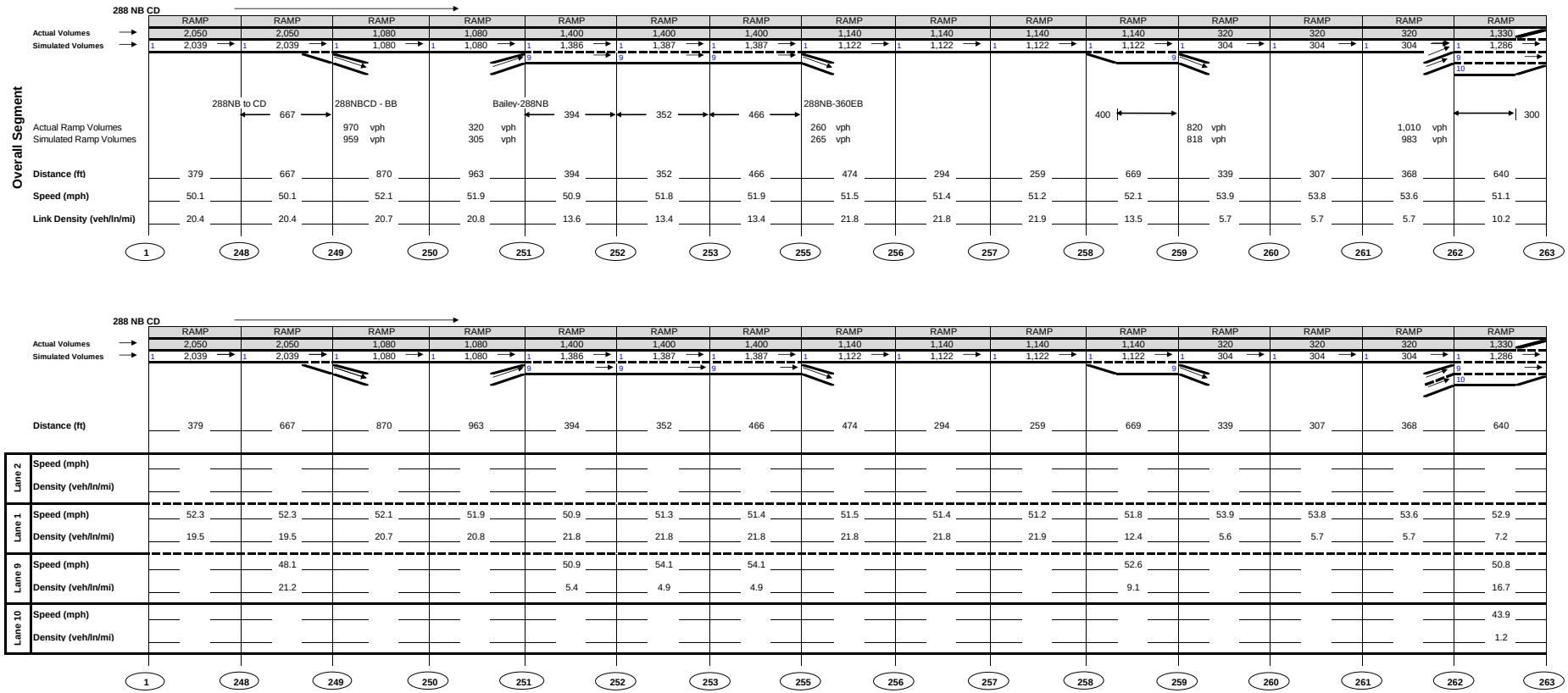
Figure 5

Southbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

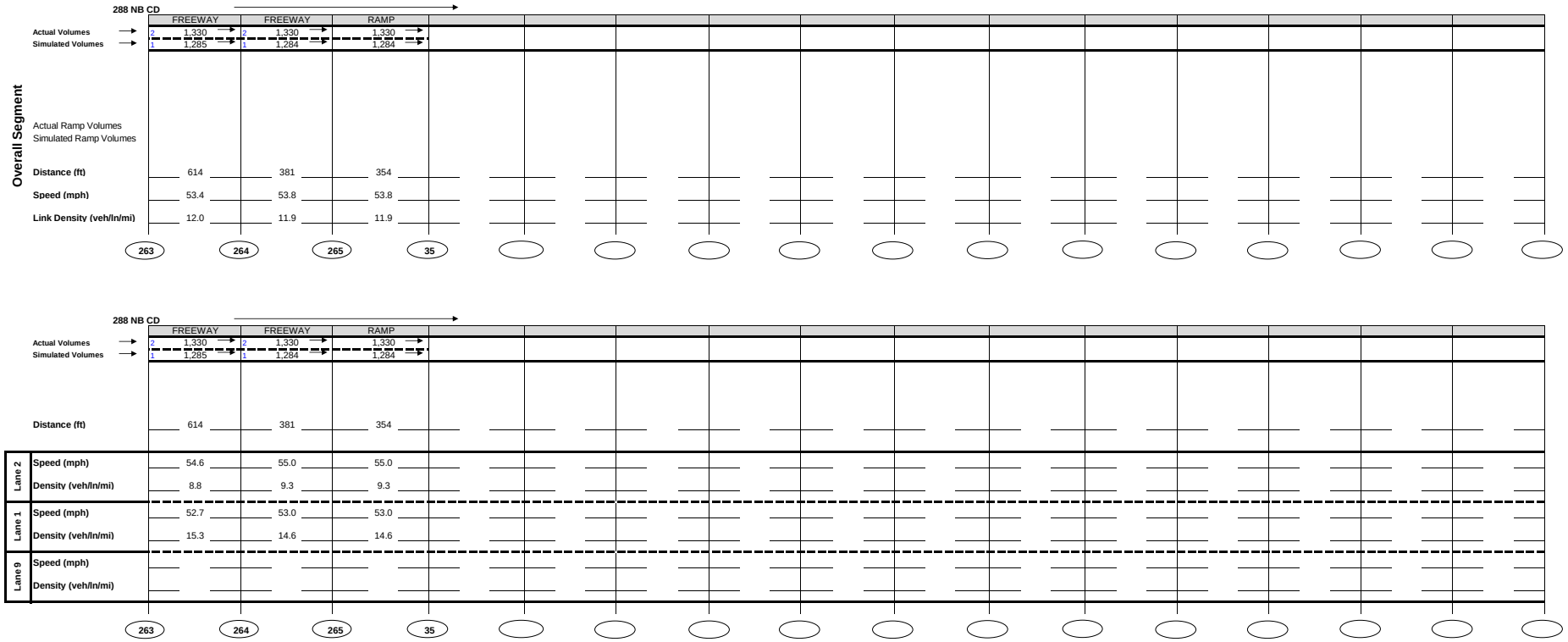
VDOT Virginia Department of Transportation

Figure 6

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

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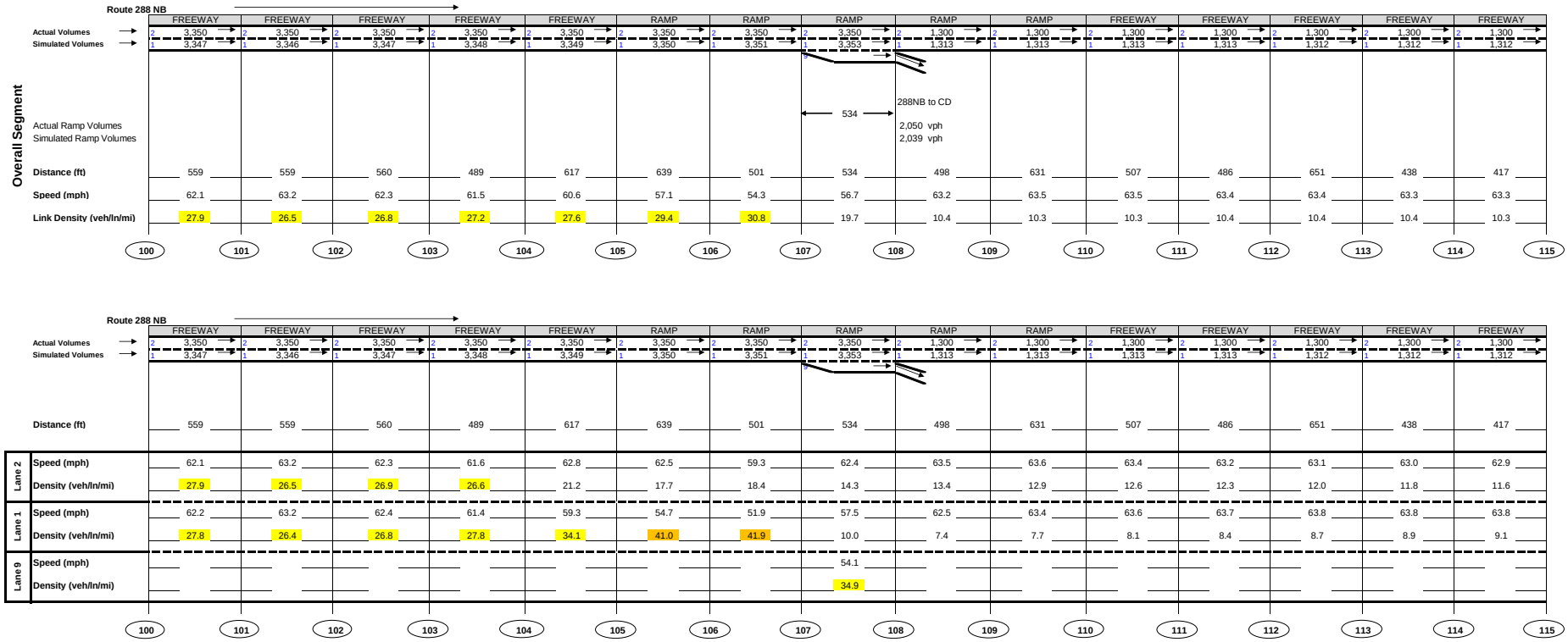
Figure 7

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

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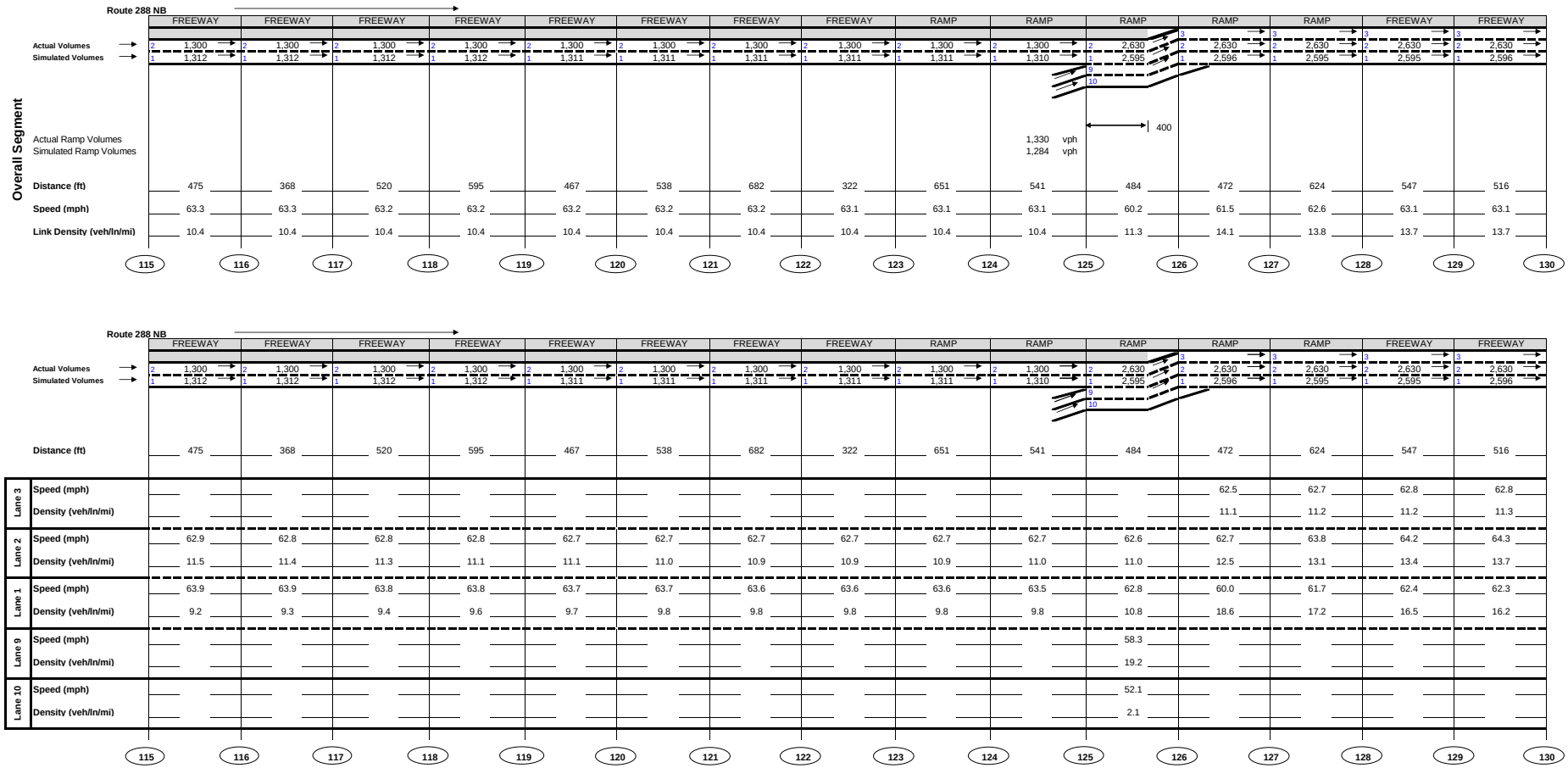
Figure 8

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
45 and above
35 to 45
28 to 35
20 to 28
10 to 20
0 to 10

CD Road Weave Density (veh/ln/mi)
45 and above
36 to 45
32 to 36
24 to 32
12 to 24
0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

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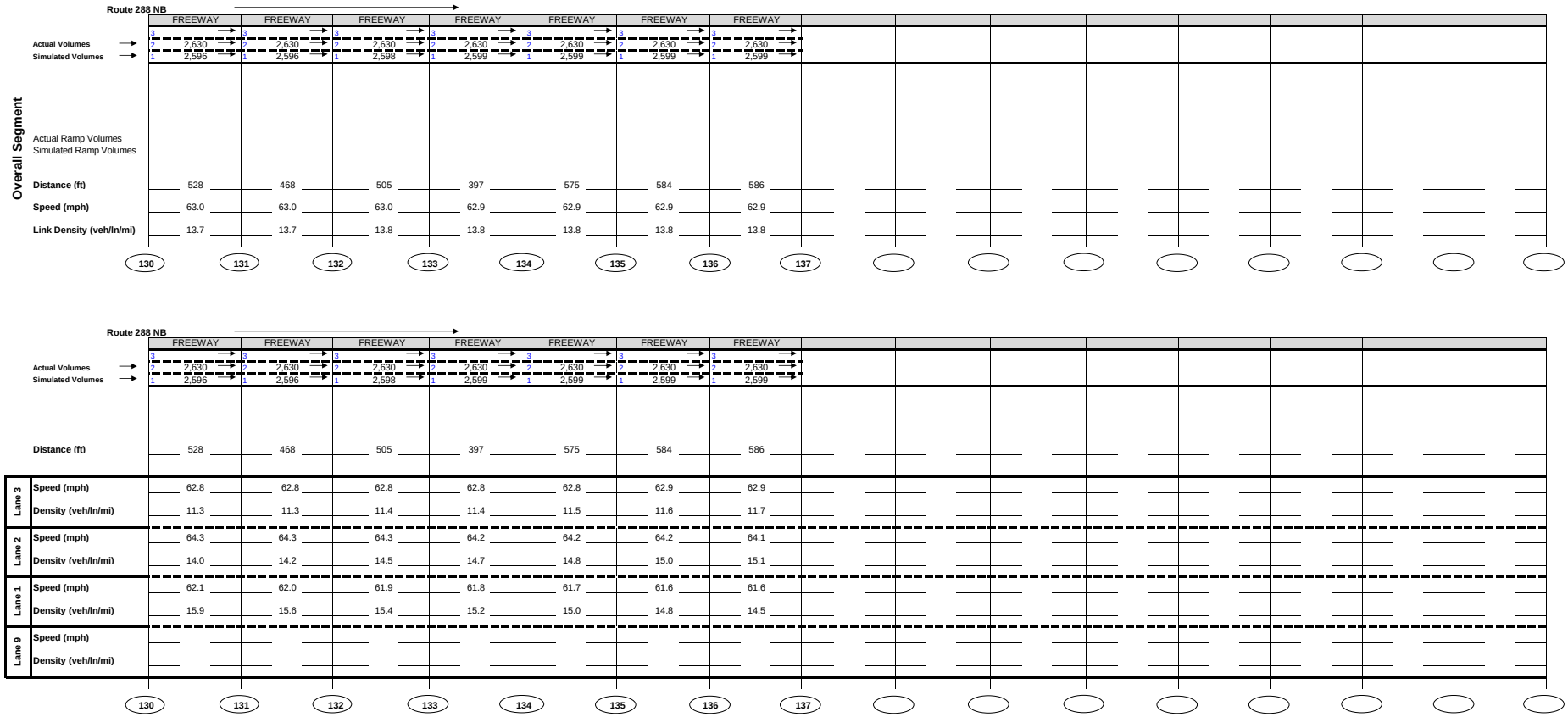
Figure 9

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

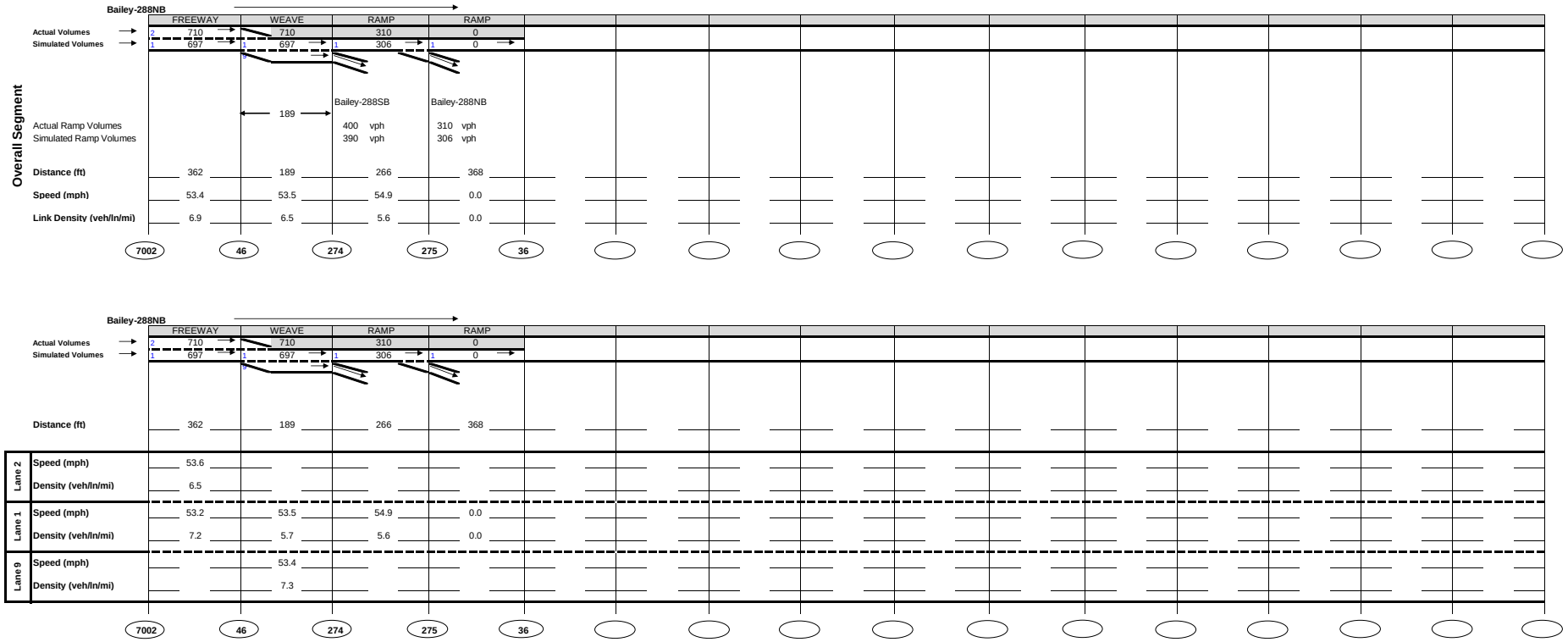
Virginia Department of Transportation

Figure 10

Northbound - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

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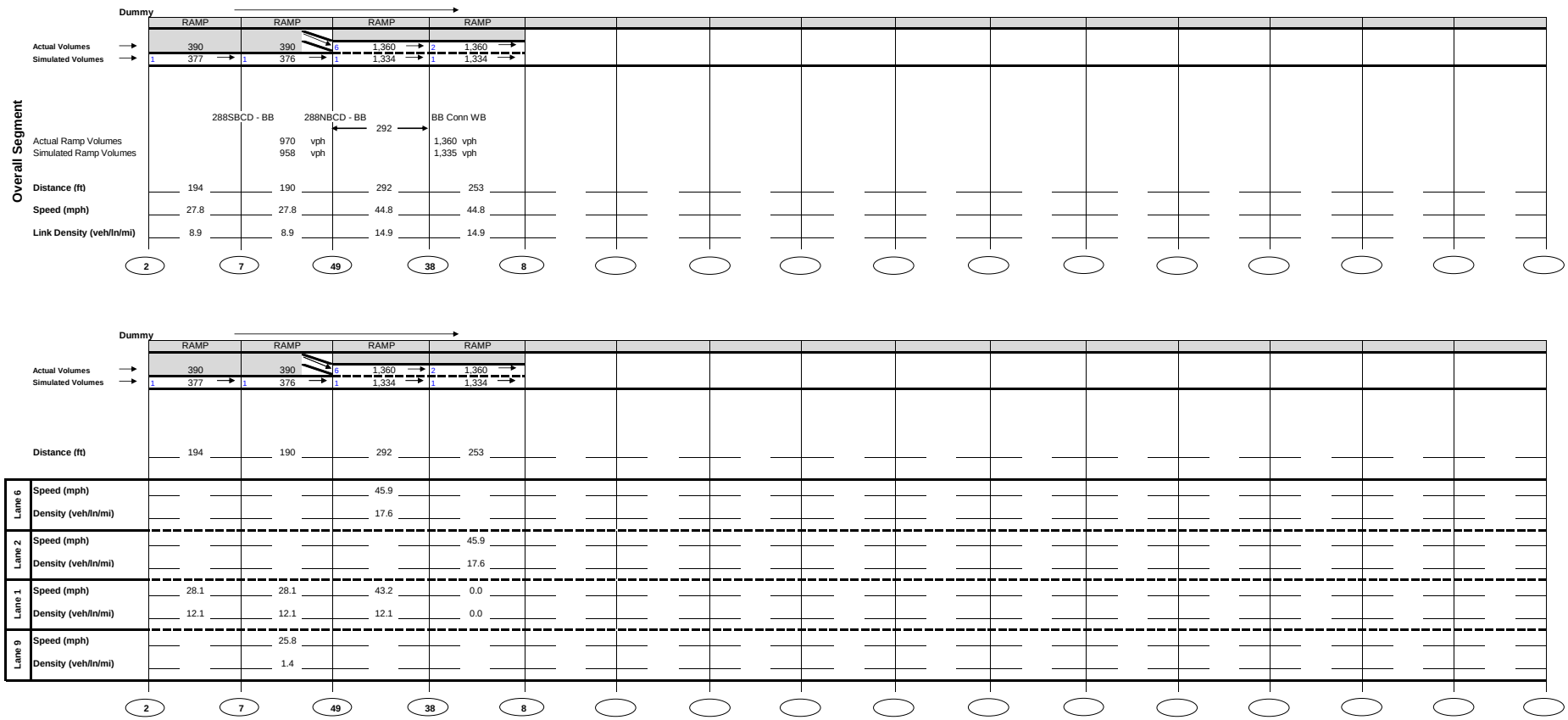
Figure 11

EB Bailey Bridge Connector to NB Route 288 CD Road - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

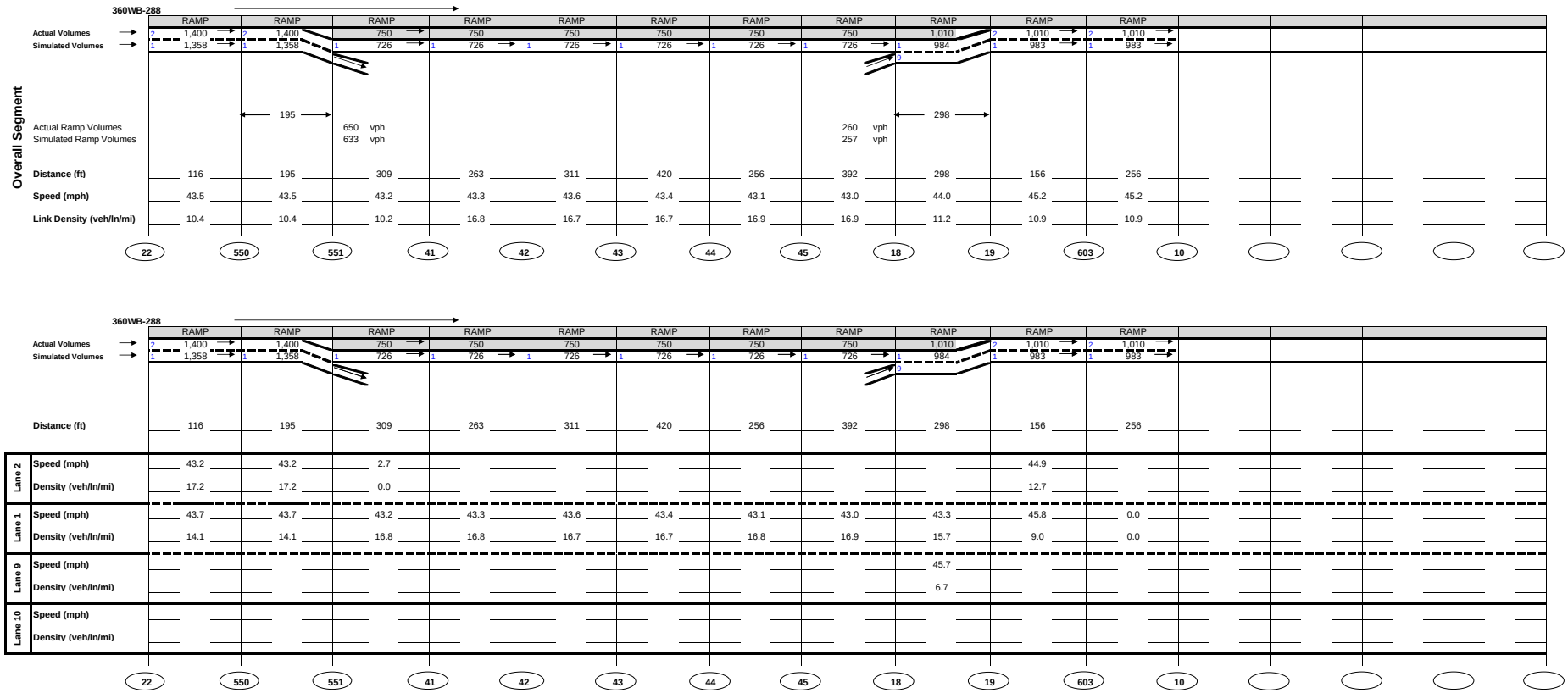
VDOT Virginia Department of Transportation

Figure 12

SB Route 288 CD Road to WB Bailey Bridge Connector - PM Peak Hour

US 360/Route 288 Interchange Study

Build (2040) - Concept 2



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)	CD Road Weave Density (veh/ln/mi)
45 and above	45 and above	45 and above
35 to 45	35 to 45	36 to 45
26 to 35	28 to 35	32 to 36
18 to 26	20 to 28	24 to 32
11 to 18	10 to 20	12 to 24
0 to 11	0 to 10	0 to 12

This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.1).

VDOT Virginia Department of Transportation

Figure 13

EB US 360 to NB Route 288 - PM Peak Hour

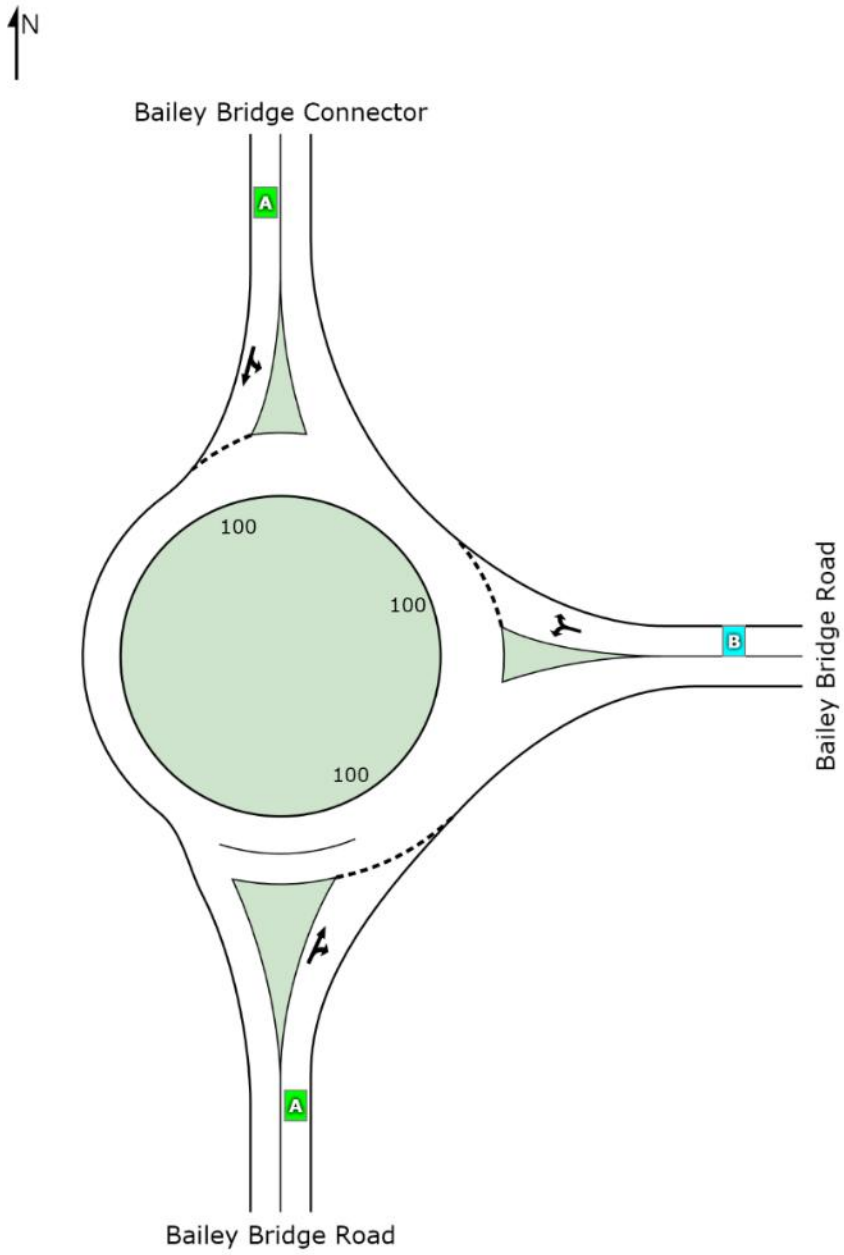
US 360/Route 288 Interchange Study

Build (2040) - Concept 2

C-9 – Concepts 1 & 2 (2040) SIDRA Results

LEVEL OF SERVICE SUMMARY

Bailey Bridge Connector at Bailey Bridge Roundabout



	South	East	North	Intersection
LOS	A	B	A	A

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

\Bailey Bridge Roundabouts.sip
8000965, KIMLEY-HORN & ASSOCIATES INC, ENTERPRISE

MOVEMENT SUMMARY

Site: 2040 AM Bailey Bridge

Bailey Bridge Connector at Bailey Bridge Roundabout

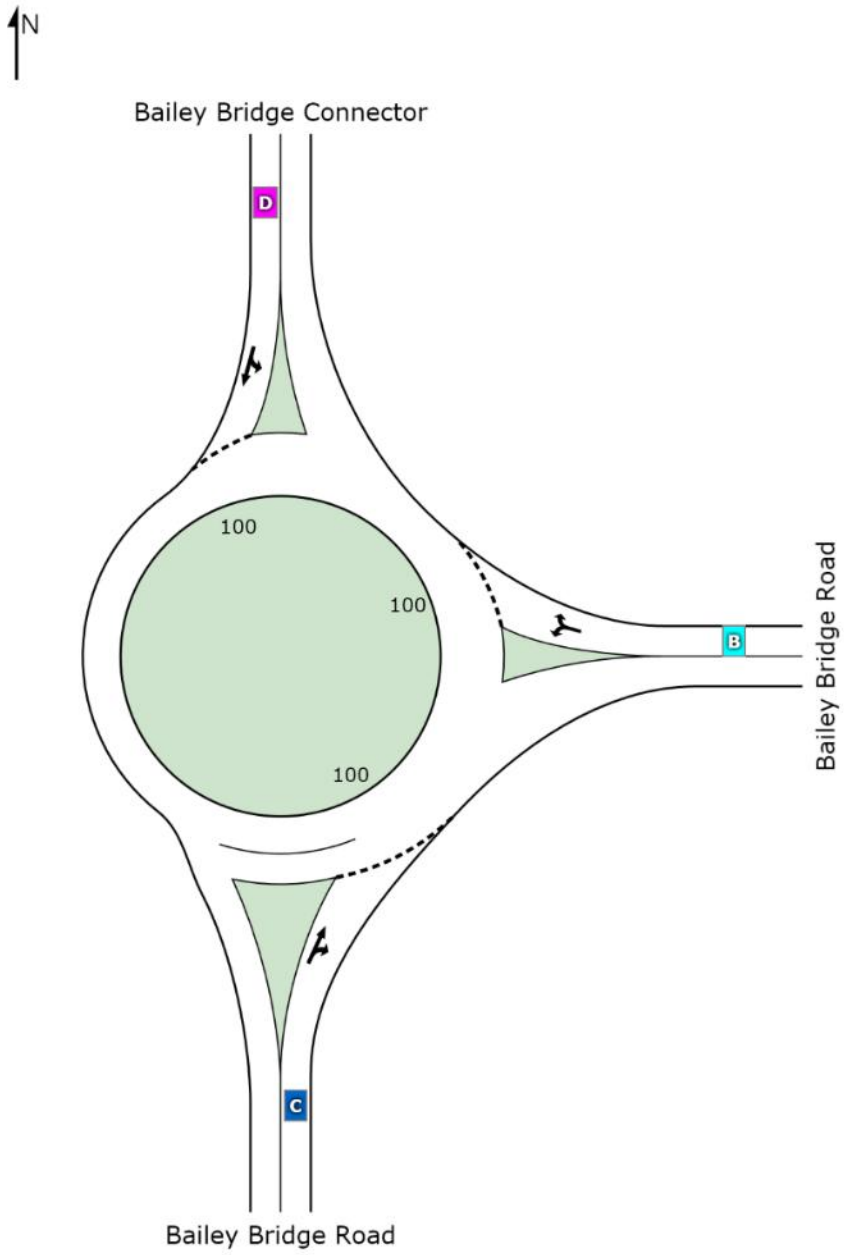
Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Bailey Bridge Road											
8	T	380	2.0	0.747	5.4	LOS A	8.1	205.2	0.66	0.54	28.7
18	R	326	2.0	0.747	6.5	LOS A	8.1	205.2	0.66	0.58	28.7
Approach		707	2.0	0.747	5.9	LOS A	8.1	205.2	0.66	0.56	28.7
East: Bailey Bridge Road											
1	L	207	2.0	0.772	19.5	LOS B	10.7	271.5	0.95	1.06	24.0
16	R	435	2.0	0.772	13.8	LOS B	10.7	271.5	0.95	1.04	25.3
Approach		641	2.0	0.772	15.6	LOS B	10.7	271.5	0.95	1.05	24.9
North: Bailey Bridge Connector											
7	L	109	2.0	0.356	12.0	LOS B	2.5	63.8	0.55	0.79	27.5
4	T	239	2.0	0.356	5.2	LOS A	2.5	63.8	0.55	0.51	29.1
Approach		348	2.0	0.356	7.3	LOS A	2.5	63.8	0.55	0.60	28.5
All Vehicles		1696	2.0	0.772	9.9	LOS A	10.7	271.5	0.75	0.75	27.1

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

LEVEL OF SERVICE SUMMARY

Bailey Bridge Connector at Bailey Bridge Roundabout



	South	East	North	Intersection
LOS	C	B	D	C

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

\Bailey Bridge Roundabouts.sip
8000965, KIMLEY-HORN & ASSOCIATES INC, ENTERPRISE

MOVEMENT SUMMARY

Site: 2040 PM Bailey Bridge

Bailey Bridge Connector at Bailey Bridge Roundabout

Movement Performance - Vehicles

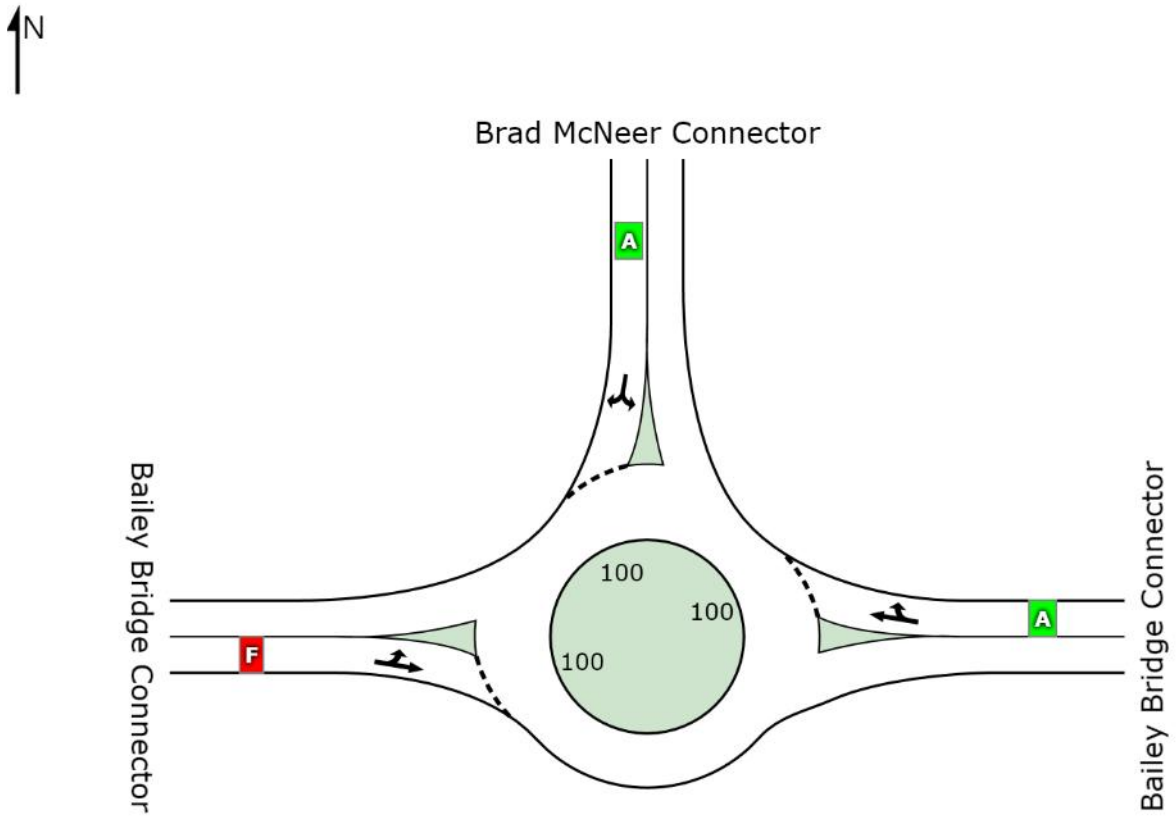
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Bailey Bridge Road											
8	T	315	2.0	0.935	24.2	LOS C	18.3	465.7	1.00	1.40	21.1
18	R	315	2.0	0.935	25.3	LOS C	18.3	465.7	1.00	1.40	21.0
Approach		630	2.0	0.935	24.8	LOS C	18.3	465.7	1.00	1.40	21.1
East: Bailey Bridge Road											
1	L	293	2.0	0.593	14.4	LOS B	5.6	142.7	0.80	0.85	26.1
16	R	217	2.0	0.593	8.7	LOS A	5.6	142.7	0.80	0.78	27.6
Approach		511	2.0	0.593	12.0	LOS B	5.6	142.7	0.80	0.82	26.7
North: Bailey Bridge Connector											
7	L	424	2.0	1.035	49.1	LOS D	43.1	1093.8	1.00	1.70	16.1
4	T	554	2.0	1.035	42.3	LOS D	43.1	1093.8	1.00	1.70	16.2
Approach		978	2.0	1.035	45.3	LOS D	43.1	1093.8	1.00	1.70	16.2
All Vehicles		2120	2.0	1.035	31.1	LOS C	43.1	1093.8	0.95	1.40	19.3

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

LEVEL OF SERVICE SUMMARY

Site: 2040 AM Brad McNeer

Bailey Bridge Connector at Brad McNeer Connector
Roundabout



	East	North	West	Intersection
LOS	A	A	F	D

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

MOVEMENT SUMMARY

Site: 2040 AM Brad McNeer

Bailey Bridge Connector at Brad McNeer Connector
Roundabout

Movement Performance - Vehicles

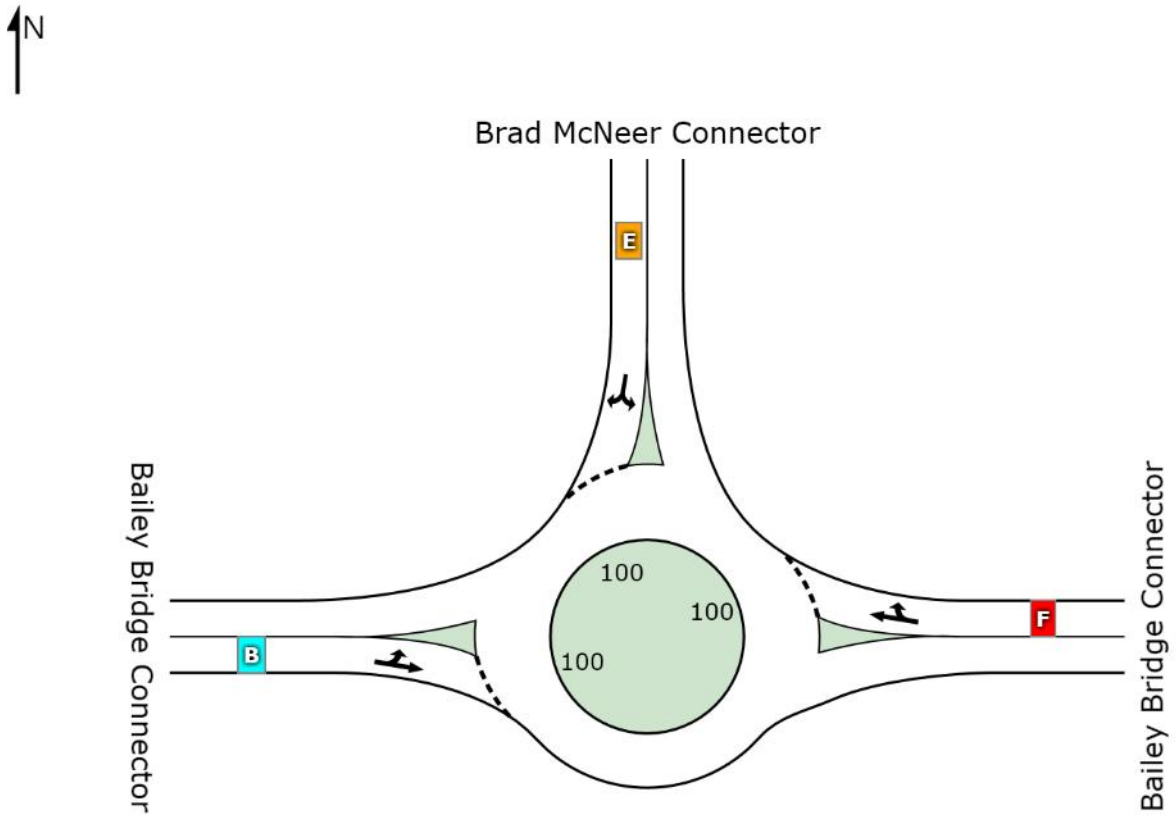
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: Bailey Bridge Connector											
6	T	185	2.0	0.453	4.3	LOS A	3.9	100.1	0.41	0.40	29.8
16	R	370	2.0	0.453	4.3	LOS A	3.9	100.1	0.41	0.44	29.5
Approach		554	2.0	0.453	4.3	LOS A	3.9	100.1	0.41	0.43	29.6
North: Brad McNeer Connector											
7	L	576	2.0	0.686	10.9	LOS B	7.2	183.9	0.71	0.71	21.9
14	R	174	2.0	0.686	5.1	LOS A	7.2	183.9	0.71	0.59	22.6
Approach		750	2.0	0.686	9.5	LOS A	7.2	183.9	0.71	0.68	22.1
West: Bailey Bridge Connector											
5	L	109	2.0	1.238	134.8	LOS F	69.1	1754.3	1.00	3.16	7.7
2	T	707	2.0	1.238	130.3	LOS F	69.1	1754.3	1.00	3.16	7.8
Approach		815	2.0	1.238	130.9	LOS F	69.1	1754.3	1.00	3.16	7.8
All Vehicles		2120	2.0	1.238	54.9	LOS D	69.1	1754.3	0.74	1.57	13.5

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

LEVEL OF SERVICE SUMMARY

Site: 2040 PM Brad McNeer

Bailey Bridge Connector at Brad McNeer Connector
Roundabout



	East	North	West	Intersection
LOS	F	E	B	F

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.

MOVEMENT SUMMARY

Site: 2040 PM Brad McNeer

Bailey Bridge Connector at Brad McNeer Connector
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
East: Bailey Bridge Connector											
6	T	837	2.0	1.507	239.7	LOS F	185.7	4716.4	1.00	4.51	4.7
16	R	652	2.0	1.507	239.8	LOS F	185.7	4716.4	1.00	4.51	4.4
Approach		1489	2.0	1.507	239.7	LOS F	185.7	4716.4	1.00	4.51	4.6
North: Brad McNeer Connector											
7	L	511	2.0	1.047	62.1	LOS E	33.2	843.2	1.00	2.31	12.3
14	R	152	2.0	1.047	56.3	LOS E	33.2	843.2	1.00	2.31	12.1
Approach		663	2.0	1.047	60.8	LOS E	33.2	843.2	1.00	2.31	12.3
West: Bailey Bridge Connector											
5	L	272	2.0	0.773	19.7	LOS B	10.3	260.7	1.00	1.16	22.8
2	T	261	2.0	0.773	15.3	LOS B	10.3	260.7	1.00	1.16	24.3
Approach		533	2.0	0.773	17.6	LOS B	10.3	260.7	1.00	1.16	23.5
All Vehicles		2685	2.0	1.507	151.5	LOS F	185.7	4716.4	1.00	3.30	6.8

Level of Service (LOS) Method: Delay (HCM 2000).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model used.

C-10 – Supplemental Synchro/SimTraffic Results – Bailey Bridge Connector Improvements Only

HCM Signalized Intersection Capacity Analysis
101: Bridgewood Rd/Warbro Rd & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	2080	50	20	1150	130	190	60	60	100	10	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	3155	5085	1583	1770	5085	1455		1760		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (perm)	3155	5085	1583	1770	5085	1455		1760		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.96	0.92	0.93	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	2261	54	22	1198	141	204	65	65	109	11	196
RTOR Reduction (vph)	0	0	26	0	0	78	0	6	0	0	0	112
Lane Group Flow (vph)	239	2261	28	22	1198	63	0	328	0	109	11	84
Heavy Vehicles (%)	11%	2%	2%	2%	2%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	21.1	73.2	73.2	3.1	55.5	55.5		29.0		8.8	8.8	29.9
Effective Green, g (s)	21.1	73.2	73.2	3.1	55.5	55.5		29.0		8.8	8.8	29.9
Actuated g/C Ratio	0.15	0.52	0.52	0.02	0.40	0.40		0.21		0.06	0.06	0.21
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	475	2658	827	39	2015	576		364		198	107	310
v/s Ratio Prot	0.08	c0.44		0.01	c0.24			c0.19		c0.03	0.01	0.04
v/s Ratio Perm			0.02			0.04						0.02
v/c Ratio	0.50	0.85	0.03	0.56	0.59	0.11		0.90		0.55	0.10	0.27
Uniform Delay, d1	54.6	28.7	16.2	67.8	33.4	26.7		54.1		63.7	61.9	46.0
Progression Factor	0.64	0.33	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	3.0	0.1	14.3	1.3	0.4		24.3		7.0	1.2	0.6
Delay (s)	35.9	12.4	16.3	82.0	34.7	27.0		78.4		70.7	63.1	46.5
Level of Service	D	B	B	F	C	C		E		E	E	D
Approach Delay (s)		14.7			34.6			78.4			55.4	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.9
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
102: Lonas Pkwy & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	2190	40	50	1410	50	120	10	90	60	10	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	239	2305	43	54	1516	54	130	11	98	65	11	152
RTOR Reduction (vph)	0	0	13	0	0	22	0	0	91	0	0	143
Lane Group Flow (vph)	239	2305	30	54	1516	32	130	11	7	65	11	9
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	16.7	96.8	96.8	4.0	84.1	84.1	10.0	10.0	10.0	8.2	8.2	8.2
Effective Green, g (s)	16.7	96.8	96.8	4.0	84.1	84.1	10.0	10.0	10.0	8.2	8.2	8.2
Actuated g/C Ratio	0.12	0.69	0.69	0.03	0.60	0.60	0.07	0.07	0.07	0.06	0.06	0.06
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	409	3515	1094	98	3849	950	245	133	113	201	207	92
v/s Ratio Prot	c0.07	c0.45		0.02	0.24		c0.04	0.01		c0.02	0.00	
v/s Ratio Perm			0.02			0.02			0.00			0.01
v/c Ratio	0.58	0.66	0.03	0.55	0.39	0.03	0.53	0.08	0.06	0.32	0.05	0.10
Uniform Delay, d1	58.4	12.2	6.8	67.1	14.6	11.4	62.7	60.7	60.6	63.2	62.2	62.4
Progression Factor	1.01	0.67	1.00	0.82	0.43	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.0	4.3	0.2	0.1	1.7	0.2	0.2	0.7	0.1	0.3
Delay (s)	59.2	8.4	6.8	59.3	6.5	11.4	64.4	60.9	60.8	63.9	62.3	62.7
Level of Service	E	A	A	E	A	B	E	E	E	E	E	E
Approach Delay (s)		13.1			8.4			62.8			63.0	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	4580	200	130	1710	180	90	80	110	450	120	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	402	4722	217	141	1859	196	98	87	120	489	130	380
RTOR Reduction (vph)	0	0	69	0	0	99	0	0	115	0	0	62
Lane Group Flow (vph)	402	4722	148	141	1859	97	98	87	5	489	130	318
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	22.1	86.0	86.0	5.5	69.2	69.2	8.5	5.5	5.5	16.5	13.5	35.6
Effective Green, g (s)	22.1	86.0	86.0	5.5	69.2	69.2	8.5	5.5	5.5	16.5	13.5	35.6
Actuated g/C Ratio	0.16	0.61	0.61	0.04	0.49	0.49	0.06	0.04	0.04	0.12	0.10	0.25
Clearance Time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	541	3936	972	134	3167	782	208	139	62	404	179	402
v/s Ratio Prot	0.12	c0.74		0.04	0.29		0.03	0.02		c0.14	0.07	c0.12
v/s Ratio Perm			0.09			0.06			0.00			0.08
v/c Ratio	0.74	1.20	0.15	1.05	0.59	0.12	0.47	0.63	0.08	1.21	0.73	0.79
Uniform Delay, d1	56.2	27.0	11.5	67.2	25.2	19.1	63.6	66.2	64.8	61.8	61.5	48.7
Progression Factor	1.25	0.42	0.13	1.02	0.71	0.11	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	90.1	0.0	92.0	0.8	0.3	1.2	7.4	0.4	115.7	12.9	9.9
Delay (s)	70.8	101.5	1.5	160.9	18.7	2.5	64.8	73.6	65.2	177.4	74.3	58.6
Level of Service	E	F	A	F	B	A	E	E	E	F	E	E
Approach Delay (s)		95.1			26.4			67.5			118.8	
Approach LOS		F			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	79.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	106.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
111: Brad McNeer Pkwy & Route 360

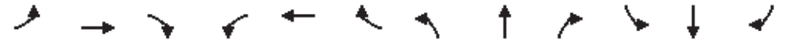
9/18/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	4850	330	230	1910	130	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Lane Util. Factor	0.86	1.00	0.97	0.86	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6408	1583	3433	6408	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6408	1583	3433	6408	3433	1583
Peak-hour factor, PHF	0.94	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5160	359	250	2076	141	326
RTOR Reduction (vph)	0	55	0	0	0	86
Lane Group Flow (vph)	5160	304	250	2076	141	240
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	95.7	95.7	9.5	111.3	15.5	15.5
Effective Green, g (s)	95.7	95.7	9.5	111.3	15.5	15.5
Actuated g/C Ratio	0.68	0.68	0.07	0.79	0.11	0.11
Clearance Time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Vehicle Extension (s)	8.0	8.0	2.5	8.0	2.5	2.5
Lane Grp Cap (vph)	4380	1082	232	5094	380	175
v/s Ratio Prot	c0.81		c0.07	0.32	0.04	
v/s Ratio Perm		0.19				c0.15
v/c Ratio	1.18	0.28	1.08	0.41	0.37	1.37
Uniform Delay, d1	22.1	8.7	65.2	4.4	57.7	62.2
Progression Factor	0.57	0.00	0.81	0.98	1.00	1.00
Incremental Delay, d2	80.4	0.1	75.4	0.2	0.4	198.4
Delay (s)	93.1	0.1	128.1	4.5	58.2	260.7
Level of Service	F	A	F	A	E	F
Approach Delay (s)	87.0			17.8	199.5	
Approach LOS	F			B	F	

Intersection Summary			
HCM 2000 Control Delay	74.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

9/18/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	4670	20	70	1910	50	20	10	370	200	10	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	6404		1770	6408	1583		1803	1583	1681	1693	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.83	1.00	0.13	0.12	1.00
Satd. Flow (perm)	1770	6404		1770	6408	1583		1552	1583	225	214	1583
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)	87	5076	22	76	2076	54	22	11	402	217	11	43
RTOR Reduction (vph)	0	1	0	0	0	29	0	0	89	0	0	33
Lane Group Flow (vph)	87	5097	0	76	2076	25	0	33	313	113	115	10
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			4	1		3	
Permitted Phases						6	4		4	3		3
Actuated Green, G (s)	13.4	64.9		13.5	65.0	65.0		4.0	17.5	31.5	31.5	31.5
Effective Green, g (s)	13.4	64.9		13.5	65.0	65.0		4.0	17.5	31.5	31.5	31.5
Actuated g/C Ratio	0.10	0.46		0.10	0.46	0.46		0.03	0.12	0.22	0.22	0.22
Clearance Time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	169	2968		170	2975	734		44	197	50	48	356
v/s Ratio Prot	0.05	c0.80		0.04	0.32				c0.15			
v/s Ratio Perm						0.02		0.02	0.05	0.50	c0.54	0.01
v/c Ratio	0.51	1.72		0.45	0.70	0.03		0.75	1.59	2.26	2.40	0.03
Uniform Delay, d1	60.2	37.5		59.7	29.7	20.4		67.5	61.2	54.2	54.2	42.3
Progression Factor	0.73	0.85		1.03	0.70	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	323.0		1.7	1.3	0.1		51.4	287.1	625.5	687.0	0.0
Delay (s)	44.4	355.0		63.0	22.0	20.5		118.9	348.4	679.8	741.2	42.3
Level of Service	D	F		E	C	C		F	F	F	F	D
Approach Delay (s)		349.8			23.4			331.0			604.7	
Approach LOS		F			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	268.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.1
Intersection Capacity Utilization	113.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
114: Deer Run Dr/Harbour View Ct & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	160	4200	30	130	1740	90	20	30	350	220	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86		1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	6408	1583	3433	6360		1770	1863	1583	1681	1692	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1770	6408	1583	3433	6360		1770	1863	1583	1681	1692	1583
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	174	4330	33	141	1891	98	22	33	380	239	11	120
RTOR Reduction (vph)	0	0	14	0	5	0	0	0	106	0	0	112
Lane Group Flow (vph)	174	4330	19	141	1984	0	22	33	274	124	126	8
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	18.1	79.0	79.0	21.5	82.5		4.0	4.0	25.5	9.5	9.5	9.5
Effective Green, g (s)	18.1	79.0	79.0	21.5	82.5		4.0	4.0	25.5	9.5	9.5	9.5
Actuated g/C Ratio	0.13	0.56	0.56	0.15	0.59		0.03	0.03	0.18	0.07	0.07	0.07
Clearance Time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	228	3615	893	527	3747		50	53	288	114	114	107
v/s Ratio Prot	0.10	c0.68		0.04	0.31		0.01	0.02	c0.15	0.07	c0.07	
v/s Ratio Perm			0.01						0.03			0.01
v/c Ratio	0.76	1.20	0.02	0.27	0.53		0.44	0.62	0.95	1.09	1.11	0.08
Uniform Delay, d1	58.9	30.5	13.4	52.3	17.2		66.9	67.3	56.7	65.2	65.2	61.1
Progression Factor	1.13	0.26	1.00	0.49	0.46		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	89.3	0.0	0.1	0.4		4.4	18.0	40.2	109.8	115.4	0.2
Delay (s)	67.8	97.1	13.5	25.6	8.4		71.3	85.3	96.9	175.1	180.7	61.4
Level of Service	E	F	B	C	A		E	F	F	F	F	E
Approach Delay (s)		95.4			9.5			94.7			140.1	
Approach LOS		F			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	73.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
115: Chital Dr & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	4200	110	120	1740	10	50	10	180	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.86		0.97	0.86	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00
Satd. Flow (prot)	1770	6383		3433	6408	1583	1770	1863	1583		1817	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.98	1.00
Satd. Flow (perm)	1770	6383		3433	6408	1583	1770	1863	1583		1817	1583
Peak-hour factor, PHF	0.92	0.96	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	4375	118	130	1891	11	54	11	196	11	11	11
RTOR Reduction (vph)	0	2	0	0	0	3	0	0	171	0	0	11
Lane Group Flow (vph)	11	4491	0	130	1891	8	54	11	25	0	22	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	3	4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	2.0	92.9		8.3	98.6	102.8	8.8	8.8	8.8		4.2	4.2
Effective Green, g (s)	2.0	92.9		8.3	98.6	102.8	8.8	8.8	8.8		4.2	4.2
Actuated g/C Ratio	0.01	0.66		0.06	0.70	0.73	0.06	0.06	0.06		0.03	0.03
Clearance Time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	8.0		5.0	8.0	2.5	3.5	3.5	3.5		2.5	2.5
Lane Grp Cap (vph)	25	4235		203	4513	1162	111	117	99		54	47
v/s Ratio Prot	0.01	c0.70		c0.04	0.30	0.00	c0.03	0.01			c0.01	
v/s Ratio Perm						0.00			0.02			0.00
v/c Ratio	0.44	1.06		0.64	0.42	0.01	0.49	0.09	0.26		0.41	0.01
Uniform Delay, d1	68.4	23.5		64.4	8.7	5.0	63.4	61.8	62.5		66.7	65.9
Progression Factor	0.67	0.22		1.42	0.68	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	27.8		8.0	0.2	0.0	3.9	0.4	1.6		3.6	0.0
Delay (s)	46.7	33.0		99.5	6.2	5.0	67.3	62.3	64.1		70.3	65.9
Level of Service	D	C		F	A	A	E	E	E		E	E
Approach Delay (s)		33.0			12.2			64.7			68.8	
Approach LOS		C			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	3660	60	130	1490	180	30	50	340	330	50	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86			1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00	0.95	0.96	1.00
Satd. Flow (prot)	3433	5085	1583	1770	6306			1828	1583	1681	1706	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00	0.95	0.96	1.00
Satd. Flow (perm)	3433	5085	1583	1770	6306			1828	1583	1681	1706	1583
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	3894	65	141	1620	191	33	54	370	359	54	43
RTOR Reduction (vph)	0	0	30	0	15	0	0	0	111	0	0	39
Lane Group Flow (vph)	109	3894	35	141	1796	0	0	87	259	205	208	4
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	8.8	76.0	76.0	9.5	75.8			15.5	15.5	13.5	13.5	13.5
Effective Green, g (s)	8.8	76.0	76.0	9.5	75.8			15.5	15.5	13.5	13.5	13.5
Actuated g/C Ratio	0.06	0.54	0.54	0.07	0.54			0.11	0.11	0.10	0.10	0.10
Clearance Time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	4.0	8.0			3.5	3.5	2.5	2.5	2.5
Lane Grp Cap (vph)	215	2760	859	120	3414			202	175	162	164	152
v/s Ratio Prot	0.03	c0.77		c0.08	0.28			0.05		c0.12	0.12	
v/s Ratio Perm			0.02						c0.16			0.00
v/c Ratio	0.51	1.41	0.04	1.18	0.53			0.43	1.48	1.27	1.27	0.03
Uniform Delay, d1	63.5	32.0	15.0	65.2	20.6			58.1	62.2	63.2	63.2	57.3
Progression Factor	0.85	0.44	1.00	1.01	0.18			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	185.1	0.0	134.1	0.5			1.7	243.7	159.2	159.9	0.1
Delay (s)	54.2	199.1	15.0	200.1	4.3			59.9	305.9	222.4	223.2	57.4
Level of Service	D	F	B	F	A			E	F	F	F	E
Approach Delay (s)		192.2			18.4			259.1			207.2	
Approach LOS		F			B			F			F	

Intersection Summary			
HCM 2000 Control Delay	148.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	118.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
117: Winterpock Rd/Lake Harbour Dr & Route 360

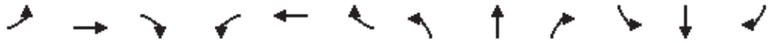
9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	3220	60	160	1390	10	130	10	570	30	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00		1.00	0.88	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583		1780	2787	1770	1723	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583		1780	2787	1770	1723	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	11	3500	65	174	1511	11	141	11	606	33	11	11
RTOR Reduction (vph)	0	0	28	0	0	4	0	0	103	0	11	0
Lane Group Flow (vph)	11	3500	37	174	1511	7	0	152	503	33	11	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	2.0	79.5	79.5	17.4	94.5	94.5		12.8	30.2	4.0	4.0	
Effective Green, g (s)	2.0	79.5	79.5	17.4	94.5	94.5		12.8	30.2	4.0	4.0	
Actuated g/C Ratio	0.01	0.57	0.57	0.12	0.68	0.68		0.09	0.22	0.03	0.03	
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0		3.0	4.0	3.0	3.0	
Lane Grp Cap (vph)	25	2887	898	426	3432	1068		162	601	50	49	
v/s Ratio Prot	0.01	c0.69		0.05	0.30			c0.09	c0.10	c0.02	0.01	
v/s Ratio Perm			0.02			0.00			0.08			
v/c Ratio	0.44	1.21	0.04	0.41	0.44	0.01		0.94	0.84	0.66	0.23	
Uniform Delay, d1	68.4	30.2	13.4	56.6	10.5	7.4		63.2	52.5	67.3	66.5	
Progression Factor	1.26	0.33	1.00	0.38	0.25	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.9	96.7	0.0	0.8	0.4	0.0		52.1	10.3	28.1	2.4	
Delay (s)	89.8	106.6	13.4	22.3	3.0	7.4		115.3	62.9	95.4	68.9	
Level of Service	F	F	B	C	A	A		F	E	F	E	
Approach Delay (s)		104.9			5.0			73.4			84.8	
Approach LOS		F			A			E			F	

Intersection Summary			
HCM 2000 Control Delay	73.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
118: Hancock Village/Duckridge Blvd & Route 360

9/18/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	3110	140	50	1460	20	70	10	130	50	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1681	1706	1583		1788	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1681	1706	1583		1788	1583
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)	22	3380	152	54	1587	22	76	11	141	54	11	11
RTOR Reduction (vph)	0	0	41	0	0	7	0	0	127	0	0	11
Lane Group Flow (vph)	22	3380	111	54	1587	15	43	44	14	0	65	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	3.6	95.8	95.8	6.8	98.3	98.3	5.0	5.0	11.8		6.1	6.1
Effective Green, g (s)	3.6	95.8	95.8	6.8	98.3	98.3	5.0	5.0	11.8		6.1	6.1
Actuated g/C Ratio	0.03	0.68	0.68	0.05	0.70	0.70	0.04	0.04	0.08		0.04	0.04
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	45	3479	1083	166	2484	1111	60	60	133		77	68
v/s Ratio Prot	0.01	c0.66		0.02	c0.45		0.03	c0.03	0.00		c0.04	
v/s Ratio Perm			0.07			0.01			0.00			0.00
v/c Ratio	0.49	0.97	0.10	0.33	0.64	0.01	0.72	0.73	0.10		0.84	0.01
Uniform Delay, d1	67.3	20.8	7.5	64.4	11.3	6.3	66.8	66.8	59.2		66.5	64.1
Progression Factor	0.72	0.14	0.00	0.91	1.92	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	3.8	0.1	0.8	1.2	0.0	31.4	35.0	0.2		52.9	0.0
Delay (s)	49.9	6.6	0.1	59.0	22.7	6.3	98.2	101.8	59.5		119.3	64.1
Level of Service	D	A	A	E	C	A	F	F	E		F	E
Approach Delay (s)		6.6			23.7			74.9			111.3	
Approach LOS		A			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
119: Ashlake & Route 360

9/18/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2940	30	50	1490	110	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4		6.5	6.8	6.5	6.5
Lane Util. Factor	0.91		0.97	0.95	0.97	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5077		3433	3539	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	5077		3433	3539	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3196	33	54	1620	120	348
RTOR Reduction (vph)	1	0	0	0	0	56
Lane Group Flow (vph)	3228	0	54	1620	120	292
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	90.2		4.9	101.2	25.5	25.5
Effective Green, g (s)	90.2		4.9	101.2	25.5	25.5
Actuated g/C Ratio	0.64		0.04	0.72	0.18	0.18
Clearance Time (s)	6.4		6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0		2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	3271		120	2558	625	288
v/s Ratio Prot	c0.64		0.02	c0.46	0.03	
v/s Ratio Perm						c0.18
v/c Ratio	0.99		0.45	0.63	0.19	1.02
Uniform Delay, d1	24.3		66.2	9.9	48.5	57.2
Progression Factor	0.87		0.81	0.23	1.00	1.00
Incremental Delay, d2	2.6		1.5	0.9	0.1	57.0
Delay (s)	23.6		54.9	3.3	48.6	114.2
Level of Service	C		D	A	D	F
Approach Delay (s)	23.6			4.9	97.4	
Approach LOS	C			A	F	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
120: Route 360 & Woodlake Village Pkwy

9/18/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	50	2000	1090	510	980	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	2174	1185	554	1065	76
RTOR Reduction (vph)	0	0	0	276	0	25
Lane Group Flow (vph)	54	2174	1185	278	1065	51
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	7.9	84.3	70.3	70.3	42.5	42.5
Effective Green, g (s)	7.9	84.3	70.3	70.3	42.5	42.5
Actuated g/C Ratio	0.06	0.60	0.50	0.50	0.30	0.30
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	99	2130	1777	794	1042	480
v/s Ratio Prot	0.03	c0.61	0.33		c0.31	
v/s Ratio Perm				0.18		0.03
v/c Ratio	0.55	1.02	0.67	0.35	1.02	0.11
Uniform Delay, d1	64.3	27.9	26.1	21.1	48.8	35.1
Progression Factor	0.76	0.47	0.71	1.07	1.00	1.00
Incremental Delay, d2	2.3	19.0	1.6	1.0	33.6	0.1
Delay (s)	51.4	32.2	20.1	23.5	82.3	35.2
Level of Service	D	C	C	C	F	D
Approach Delay (s)		32.6	21.2		79.2	
Approach LOS		C	C		E	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
121: Hampton Park Dr/Fox Club Pkwy & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1400	10	90	990	80	10	50	370	290	40	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1847	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1847	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.96	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1458	11	98	1031	87	11	54	402	315	43	54
RTOR Reduction (vph)	0	0	6	0	0	45	0	0	153	0	0	48
Lane Group Flow (vph)	43	1458	5	98	1031	42	0	65	249	315	43	6
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	7.2	64.5	64.5	9.6	67.0	67.0		24.5	24.5	15.0	15.0	15.0
Effective Green, g (s)	7.2	64.5	64.5	9.6	67.0	67.0		24.5	24.5	15.0	15.0	15.0
Actuated g/C Ratio	0.05	0.46	0.46	0.07	0.48	0.48		0.18	0.18	0.11	0.11	0.11
Clearance Time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	91	1630	729	121	1693	757		323	277	367	199	169
v/s Ratio Prot	0.02	c0.41		0.06	c0.29			0.04		c0.09	0.02	
v/s Ratio Perm			0.00			0.03			c0.16			0.00
v/c Ratio	0.47	0.89	0.01	0.81	0.61	0.06		0.20	0.90	0.86	0.22	0.03
Uniform Delay, d1	64.6	34.6	20.4	64.3	26.9	19.5		49.4	56.6	61.5	57.1	56.0
Progression Factor	0.68	0.51	1.00	1.05	0.30	0.95		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	6.5	0.0	25.8	1.3	0.1		0.3	29.7	17.7	0.5	0.1
Delay (s)	46.9	24.1	20.4	93.7	9.2	18.7		49.7	86.2	79.1	57.7	56.1
Level of Service	D	C	C	F	A	B		D	F	E	E	E
Approach Delay (s)		24.7			16.7			81.1			73.9	
Approach LOS		C			B			F			E	

Intersection Summary			
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
122: Otterdale Rd & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	1120	20	110	880	70	10	20	210	110	20	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.97	
Satd. Flow (prot)	1719	3539	1583	1770	3494			1832	1583		1705	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.98	1.00		0.97	
Satd. Flow (perm)	1719	3539	1583	1770	3494			1832	1583		1705	
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	1155	22	120	957	73	11	22	228	120	22	33
RTOR Reduction (vph)	0	0	11	0	4	0	0	0	126	0	6	0
Lane Group Flow (vph)	98	1155	11	120	1026	0	0	33	102	0	169	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	2%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			
Actuated Green, G (s)	12.5	70.0	70.0	20.5	77.9			4.5	25.0		18.2	
Effective Green, g (s)	12.5	70.0	70.0	20.5	77.9			4.5	25.0		18.2	
Actuated g/C Ratio	0.09	0.50	0.50	0.15	0.56			0.03	0.18		0.13	
Clearance Time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	153	1769	791	259	1944			58	282		221	
v/s Ratio Prot	0.06	c0.33		0.07	c0.29			c0.02	0.05		c0.10	
v/s Ratio Perm			0.01						0.01			
v/c Ratio	0.64	0.65	0.01	0.46	0.53			0.57	0.36		0.76	
Uniform Delay, d1	61.6	26.0	17.6	54.7	19.5			66.8	50.5		58.8	
Progression Factor	1.00	1.00	1.00	0.49	0.37			1.00	1.00		1.00	
Incremental Delay, d2	7.8	1.9	0.0	0.8	0.9			10.0	0.6		13.9	
Delay (s)	69.4	27.9	17.7	27.8	8.1			76.8	51.1		72.7	
Level of Service	E	C	B	C	A			E	D		E	
Approach Delay (s)		30.9			10.1			54.3			72.7	
Approach LOS		C			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.9
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	LTR
Maximum Queue (ft)	144	144	180	200	204	56	33	244	290	332	61	381
Average Queue (ft)	72	96	115	133	138	13	11	167	202	251	20	261
95th Queue (ft)	147	156	191	208	209	67	33	251	294	355	67	397
Link Distance (ft)			1521	1521	1521			5220	5220	5220		1540
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	205	205				90	190				200	
Storage Blk Time (%)		0	0		27			4		16		
Queuing Penalty (veh)		1	0		15			1		23		

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	88	131	39	139
Average Queue (ft)	28	88	12	84
95th Queue (ft)	94	148	41	148
Link Distance (ft)			1263	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		250
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	L	L	T	T	T	T	R
Maximum Queue (ft)	102	114	147	142	167	37	69	100	143	170	161	47
Average Queue (ft)	61	88	87	94	107	11	37	46	81	108	102	17
95th Queue (ft)	107	125	150	158	175	39	73	106	149	178	176	51
Link Distance (ft)			635	635	635			1521	1521	1521		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	420	420				200	200				200	200
Storage Blk Time (%)										0	0	
Queuing Penalty (veh)										1	0	

Intersection: 102: Lonas Pkwy & Route 360

Movement	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	L	T	R	L	L	T
Maximum Queue (ft)	110	138	34	83	86	46	25
Average Queue (ft)	44	93	12	47	53	15	10
95th Queue (ft)	113	144	38	86	95	58	32
Link Distance (ft)			402	402	256	256	256
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	240	240					
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

Movement	B53	B53
Directions Served	T	T
Maximum Queue (ft)	59	64
Average Queue (ft)	8	9
95th Queue (ft)	123	133
Link Distance (ft)	635	635
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

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)

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

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)

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB
Directions Served	T
Maximum Queue (ft)	159
Average Queue (ft)	23
95th Queue (ft)	241
Link Distance (ft)	834
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 107: Route 360 & Market Square Ln

Movement	EB	EB	EB
Directions Served	T	T	T
Maximum Queue (ft)	277	462	443
Average Queue (ft)	63	132	114
95th Queue (ft)	336	490	476
Link Distance (ft)	576	576	576
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	0	1	2
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	169	229	566	643	651	644	450	102	115	205	221	240
Average Queue (ft)	118	147	403	525	564	542	242	66	83	138	150	173
95th Queue (ft)	185	255	637	719	736	727	585	119	128	222	230	250
Link Distance (ft)			619	619	619	619		576	576	576	576	576
Upstream Blk Time (%)			0	3	9	6						
Queuing Penalty (veh)			2	34	117	80						
Storage Bay Dist (ft)	300	300					250					
Storage Blk Time (%)			14			40						
Queuing Penalty (veh)			57			87						

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	WB	NB	NB	NB	NB	NB	SB	SB	SB	SB	B996	B996
Directions Served	T	L	L	T	T	R	L	L	T	R	T	T
Maximum Queue (ft)	260	76	97	93	76	112	587	802	574	420	199	205
Average Queue (ft)	182	30	53	57	27	57	533	691	346	230	80	64
95th Queue (ft)	265	78	102	103	76	115	666	929	854	447	307	299
Link Distance (ft)	576			704	704			756	756		795	795
Upstream Blk Time (%)								30	9			
Queuing Penalty (veh)								0	0			
Storage Bay Dist (ft)		390	390			250	430			430		
Storage Blk Time (%)							15	82		2		
Queuing Penalty (veh)							37	199		2		

Intersection: 109: Route 360 & Village Green Dr

Movement	EB	EB	EB	EB
Directions Served	T	T	T	T
Maximum Queue (ft)	234	292	355	285
Average Queue (ft)	48	110	152	115
95th Queue (ft)	226	340	406	333
Link Distance (ft)	358	358	358	358
Upstream Blk Time (%)	0	0	1	0
Queuing Penalty (veh)	2	7	15	6
Storage Bay Dist (ft)				
Storage Blk Time (%)	0			
Queuing Penalty (veh)	0			

Intersection: 110: Route 360

Movement	EB	EB	EB	EB	WB	WB	WB
Directions Served	T	T	T	T	T	T	T
Maximum Queue (ft)	182	189	241	170	30	38	11
Average Queue (ft)	26	55	87	43	10	15	2
95th Queue (ft)	140	209	263	177	51	64	23
Link Distance (ft)	241	241	241	241			358
Upstream Blk Time (%)	0	0	1	0			
Queuing Penalty (veh)	3	4	10	2			
Storage Bay Dist (ft)					150	150	
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R	L	L	T	T	T	T	L
Maximum Queue (ft)	441	553	566	546	351	203	211	110	126	148	171	119
Average Queue (ft)	271	370	419	380	153	157	168	60	72	93	110	75
95th Queue (ft)	466	585	620	593	397	251	258	117	131	155	178	128
Link Distance (ft)	876	876	876	876		241	241	241	241	241	241	410
Upstream Blk Time (%)			0	1		9	12					
Queuing Penalty (veh)			3	8		35	48					
Storage Bay Dist (ft)					200							
Storage Blk Time (%)				25	0							
Queuing Penalty (veh)				90	0							

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	NB	NB	B61	B61
Directions Served	L	R	T	T
Maximum Queue (ft)	105	435	5	118
Average Queue (ft)	55	336	1	31
95th Queue (ft)	113	514	11	190
Link Distance (ft)	410	410	810	810
Upstream Blk Time (%)		20		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	EB	EB	EB	EB	WB	NB
Directions Served	T	T	T	T	L	R
Maximum Queue (ft)	636	852	417	206	82	14
Average Queue (ft)	90	119	58	28	46	0
95th Queue (ft)	793	917	598	412	113	0
Link Distance (ft)	2140	2140	2140	2140		1052
Upstream Blk Time (%)	0	0				
Queuing Penalty (veh)	1	0				
Storage Bay Dist (ft)					600	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	R	LT
Maximum Queue (ft)	280	1083	1152	1208	1253	106	208	224	247	245	38	299
Average Queue (ft)	102	737	790	846	872	60	132	133	151	163	13	114
95th Queue (ft)	326	1194	1253	1312	1347	117	210	223	254	258	39	330
Link Distance (ft)		2493	2493	2493	2493		2140	2140	2140	2140		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140					150					160	200
Storage Blk Time (%)		40				0	5			8		
Queuing Penalty (veh)		35				0	3			4		

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	NB	SB	SB	SB
Directions Served	R	L	LT	R
Maximum Queue (ft)	712	135	158	40
Average Queue (ft)	579	82	105	16
95th Queue (ft)	981	139	162	44
Link Distance (ft)	874		588	
Upstream Blk Time (%)	11			
Queuing Penalty (veh)	0			
Storage Bay Dist (ft)		120		120
Storage Blk Time (%)	78	2	9	
Queuing Penalty (veh)	26	3	14	

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T	R	L	L	T	T	T	TR
Maximum Queue (ft)	156	193	243	261	287	26	66	84	161	163	202	224
Average Queue (ft)	103	129	163	187	200	5	29	55	100	105	139	161
95th Queue (ft)	163	222	255	277	310	23	69	90	181	185	219	243
Link Distance (ft)		1713	1713	1713	1713				2493	2493	2493	2493
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200					360	280	280				
Storage Blk Time (%)	1	1			0							
Queuing Penalty (veh)	9	1			0							

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	LT	R
Maximum Queue (ft)	55	69	425	220	255	151
Average Queue (ft)	19	33	338	160	200	58
95th Queue (ft)	53	93	558	255	293	142
Link Distance (ft)		1289	1289		830	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	190			200		250
Storage Blk Time (%)				4	18	
Queuing Penalty (veh)				11	44	

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	21	96	130	174	170	76	96	216	210	213	175	7
Average Queue (ft)	7	55	73	111	123	40	62	111	123	128	76	1
95th Queue (ft)	27	103	128	176	177	84	105	224	227	230	167	6
Link Distance (ft)		840	840	840	840			1713	1713	1713	1713	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	540					170	170					190
Storage Blk Time (%)								2			0	
Queuing Penalty (veh)								3			0	

Intersection: 115: Chital Dr & Route 360

Movement	NB	NB	NB	SB	SB
Directions Served	L	T	R	LT	R
Maximum Queue (ft)	87	32	158	48	27
Average Queue (ft)	47	9	97	25	8
95th Queue (ft)	89	34	184	55	29
Link Distance (ft)		1010	1010	610	610
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	B1	B1	B1	WB	WB	WB
Directions Served	L	L	T	T	T	R	T	T	T	L	T	T
Maximum Queue (ft)	40	437	958	966	955	390	747	767	748	230	241	169
Average Queue (ft)	13	167	930	936	935	129	586	604	611	158	120	63
95th Queue (ft)	40	516	1005	1002	1004	429	978	990	990	300	306	170
Link Distance (ft)			869	869	869		736	736	736		840	840
Upstream Blk Time (%)			43	48	54		1	2	3			
Queuing Penalty (veh)			600	663	742		17	32	37			
Storage Bay Dist (ft)	220	220				230				115		
Storage Blk Time (%)			46		50					40	1	
Queuing Penalty (veh)			50		33					161	1	

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	WB	WB	NB	NB	SB	SB	SB
Directions Served	T	TR	LT	R	L	LT	R
Maximum Queue (ft)	90	62	137	202	239	548	178
Average Queue (ft)	39	19	70	110	221	378	71
95th Queue (ft)	89	59	149	226	281	660	237
Link Distance (ft)	840	840		2183		996	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			130		90		170
Storage Blk Time (%)			1	8	67	83	
Queuing Penalty (veh)			2	7	184	184	

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	B1
Directions Served	L	T	T	T	R	L	L	T	T	T	R	T
Maximum Queue (ft)	141	1113	1114	1113	235	87	98	294	351	247	12	5
Average Queue (ft)	23	613	644	653	65	46	69	196	233	115	3	1
95th Queue (ft)	148	1253	1280	1284	283	91	108	320	378	257	15	10
Link Distance (ft)		1112	1112	1112				736	736	736		869
Upstream Blk Time (%)		1	2	2								
Queuing Penalty (veh)		17	25	22								
Storage Bay Dist (ft)	180				170	280	280				575	
Storage Blk Time (%)		39		45				1				
Queuing Penalty (veh)		4		29				2				

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	NB	NB	NB	SB	SB
Directions Served	LT	R	R	L	TR
Maximum Queue (ft)	253	282	262	57	23
Average Queue (ft)	161	198	186	24	7
95th Queue (ft)	285	304	288	59	29
Link Distance (ft)		1868		470	470
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	430		1000		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	L	T	T	R	L	LT
Maximum Queue (ft)	146	641	674	723	250	33	57	242	274	7	81	76
Average Queue (ft)	26	159	206	221	59	10	28	78	104	1	44	33
95th Queue (ft)	125	466	509	560	223	38	63	222	261	8	101	82
Link Distance (ft)		1172	1172	1172				1112	1112	1112	796	796
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				200	300	300					
Storage Blk Time (%)		13		18				0				
Queuing Penalty (veh)		3		28				0				

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	SB	SB
Directions Served	R	LT	R
Maximum Queue (ft)	186	99	8
Average Queue (ft)	107	52	2
95th Queue (ft)	198	111	9
Link Distance (ft)	796	958	958
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 119: Ashlake & Route 360

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	TR	L	L	T	T	L	L	R
Maximum Queue (ft)	611	592	300	36	65	171	201	72	100	323
Average Queue (ft)	426	437	276	13	40	94	127	31	64	233
95th Queue (ft)	661	664	358	41	73	189	222	72	108	358
Link Distance (ft)	931	931				1172	1172		2592	2592
Upstream Blk Time (%)	0									
Queuing Penalty (veh)	0									
Storage Bay Dist (ft)			200	400	400			200		
Storage Blk Time (%)		18	14							
Queuing Penalty (veh)		202	152							

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	L	L	R
Maximum Queue (ft)	254	1114	1120	240	244	1041	1039	232
Average Queue (ft)	87	776	785	161	172	854	840	106
95th Queue (ft)	284	1197	1213	248	259	1249	1238	285
Link Distance (ft)		4676	4676	931	931	1161	1161	
Upstream Blk Time (%)						12	11	
Queuing Penalty (veh)						0	0	
Storage Bay Dist (ft)	200							150
Storage Blk Time (%)		38					74	
Queuing Penalty (veh)		21					57	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	SB
Directions Served	L	T	T	R	L	T	T	LT	R	L	L	T
Maximum Queue (ft)	80	398	403	51	132	70	77	99	434	244	268	95
Average Queue (ft)	34	281	289	8	82	26	36	54	323	180	204	40
95th Queue (ft)	75	468	487	83	149	66	78	107	517	295	317	116
Link Distance (ft)		2671	2671			4676	4676	759	759			1442
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	240			200	230					240	240	
Storage Blk Time (%)		21	27							5	11	0
Queuing Penalty (veh)		9	3							5	11	1

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB
Directions Served	R
Maximum Queue (ft)	42
Average Queue (ft)	26
95th Queue (ft)	51
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	130
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	157	304	311	3	111	154	154	76	162	225
Average Queue (ft)	75	203	213	0	52	94	105	37	86	143
95th Queue (ft)	162	315	328	5	114	170	175	79	162	249
Link Distance (ft)		3682	3682			2671	2671	1022		1606
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			200	375				500	
Storage Blk Time (%)	0	9	11							
Queuing Penalty (veh)	2	9	3							

Intersection: 123: Bailey Bridge Road & Bailey Bridge Connector

Movement	WB
Directions Served	R
Maximum Queue (ft)	82
Average Queue (ft)	53
95th Queue (ft)	84
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	50	16	229	53
Average Queue (ft)	26	3	121	17
95th Queue (ft)	56	16	259	71
Link Distance (ft)				826
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	225	275	
Storage Blk Time (%)			3	0
Queuing Penalty (veh)			1	0

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LTR	LTR
Maximum Queue (ft)	602	244	76	10	502	114
Average Queue (ft)	445	171	49	1	376	62
95th Queue (ft)	821	706	79	15	724	121
Link Distance (ft)	778	778	840		663	544
Upstream Blk Time (%)	20	17			18	
Queuing Penalty (veh)	0	0			0	
Storage Bay Dist (ft)				400		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Network Summary

Network wide Queuing Penalty: 4362

HCM Signalized Intersection Capacity Analysis
101: Bridgewood Rd/Warbro Rd & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	1730	140	40	2400	280	110	40	70	360	80	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00		1.00		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (prot)	3155	5085	1583	1770	5085	1455		1739		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (perm)	3155	5085	1583	1770	5085	1455		1739		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.96	0.92	0.93	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	1880	152	43	2500	304	118	43	76	391	87	315
RTOR Reduction (vph)	0	0	62	0	0	78	0	12	0	0	0	97
Lane Group Flow (vph)	261	1880	90	43	2500	226	0	225	0	391	87	218
Heavy Vehicles (%)	11%	2%	2%	2%	2%	11%	2%	2%	2%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2			6						4
Actuated Green, G (s)	13.8	72.8	72.8	6.7	66.0	66.0		17.3		17.3	17.3	31.1
Effective Green, g (s)	13.8	72.8	72.8	6.7	66.0	66.0		17.3		17.3	17.3	31.1
Actuated g/C Ratio	0.10	0.52	0.52	0.05	0.47	0.47		0.12		0.12	0.12	0.22
Clearance Time (s)	6.5	6.4	6.4	6.5	6.1	6.1		6.5		6.5	6.5	6.5
Vehicle Extension (s)	3.5	5.0	5.0	2.5	5.0	5.0		2.5		6.0	6.0	3.5
Lane Grp Cap (vph)	310	2644	823	84	2397	685		214		389	211	323
v/s Ratio Prot	0.08	c0.37		0.02	c0.49			c0.13		c0.12	0.05	0.07
v/s Ratio Perm			0.06			0.16						0.08
v/c Ratio	0.84	0.71	0.11	0.51	1.04	0.33		1.05		1.01	0.41	0.67
Uniform Delay, d1	62.0	25.6	17.1	65.1	37.0	23.2		61.4		61.4	56.7	49.8
Progression Factor	0.69	0.27	0.06	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	16.1	1.4	0.2	3.9	30.8	1.3		75.3		46.9	3.7	5.7
Delay (s)	59.1	8.3	1.2	68.9	67.8	24.4		136.7		108.3	60.3	55.5
Level of Service	E	A	A	E	E	C		F		F	E	E
Approach Delay (s)		13.7			63.2			136.7			82.0	
Approach LOS		B			E			F			F	

Intersection Summary				
HCM 2000 Control Delay	50.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.9	
Intersection Capacity Utilization	92.7%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
102: Lonas Pkwy & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	460	1890	130	100	2610	100	110	20	70	150	10	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.86	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	6408	1583	3433	1863	1583	3433	3539	1583
Peak-hour factor, PHF	0.92	0.95	0.92	0.92	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	500	1989	141	109	2806	109	120	22	76	163	11	348
RTOR Reduction (vph)	0	0	48	0	0	44	0	0	72	0	0	258
Lane Group Flow (vph)	500	1989	93	109	2806	65	120	22	4	163	11	90
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	23.9	90.6	90.6	8.0	74.7	74.7	7.0	7.0	7.0	13.4	13.4	13.4
Effective Green, g (s)	23.9	90.6	90.6	8.0	74.7	74.7	7.0	7.0	7.0	13.4	13.4	13.4
Actuated g/C Ratio	0.17	0.65	0.65	0.06	0.53	0.53	0.05	0.05	0.05	0.10	0.10	0.10
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0	6.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	2.5	8.0	8.0	2.5	3.0	3.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	586	3290	1024	196	3419	844	171	93	79	328	338	151
v/s Ratio Prot	c0.15	0.39		0.03	c0.44		c0.03	0.01		0.05	0.00	
v/s Ratio Perm			0.06			0.04			0.00			c0.06
v/c Ratio	0.85	0.60	0.09	0.56	0.82	0.08	0.70	0.24	0.05	0.50	0.03	0.60
Uniform Delay, d1	56.3	14.3	9.3	64.3	27.1	15.9	65.5	63.9	63.3	60.1	57.4	60.7
Progression Factor	0.74	1.18	1.59	0.62	0.24	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.9	0.5	0.1	0.8	0.7	0.1	11.4	1.0	0.2	0.9	0.0	5.2
Delay (s)	48.4	17.4	14.8	40.9	7.2	0.1	76.9	64.9	63.5	61.0	57.4	66.0
Level of Service	D	B	B	D	A	A	E	E	E	E	E	E
Approach Delay (s)		23.1			8.1			71.0			64.2	
Approach LOS		C			A			E			E	

Intersection Summary				
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.0	
Intersection Capacity Utilization	75.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	480	2360	470	600	4490	420	800	460	560	410	190	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.86	1.00	0.97	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	6408	1583	3433	6408	1583	3433	3539	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	522	2433	511	652	4880	457	870	500	609	446	207	620
RTOR Reduction (vph)	0	0	205	0	0	91	0	0	288	0	0	105
Lane Group Flow (vph)	522	2433	306	652	4880	366	870	500	321	446	207	515
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	pm+ov
Protected Phases	5	2		1	6		3	8		7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.5	56.2	56.2	26.3	62.8	62.8	20.5	19.5	19.5	11.5	10.5	30.0
Effective Green, g (s)	19.5	56.2	56.2	26.3	62.8	62.8	20.5	19.5	19.5	11.5	10.5	30.0
Actuated g/C Ratio	0.14	0.40	0.40	0.19	0.45	0.45	0.15	0.14	0.14	0.08	0.08	0.21
Clearance Time (s)	6.5	7.0	7.0	6.5	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0	8.0	2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	478	2572	635	644	2874	710	502	492	220	281	139	339
v/s Ratio Prot	0.15	0.38		0.19	c0.76		c0.25	0.14		c0.13	0.11	c0.21
v/s Ratio Perm			0.19			0.23			0.20			0.11
v/c Ratio	1.09	0.95	0.48	1.01	1.70	0.52	1.73	1.02	1.46	1.59	1.49	1.52
Uniform Delay, d1	60.2	40.4	31.1	56.9	38.6	27.7	59.8	60.2	60.2	64.2	64.8	55.0
Progression Factor	0.53	0.31	0.15	0.81	0.97	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	54.6	4.1	1.0	37.5	315.5	2.5	338.2	44.7	229.3	280.5	254.3	247.9
Delay (s)	86.7	16.4	5.6	83.4	353.1	25.3	397.9	105.0	289.6	344.8	319.0	302.9
Level of Service	F	B	A	F	F	C	F	F	F	F	F	F
Approach Delay (s)		25.4			298.7			290.5			320.2	
Approach LOS		C			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	225.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.68		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	140.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
111: Brad McNeer Pkwy & Route 360

9/18/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2940	230	590	5260	560	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Lane Util. Factor	0.86	1.00	0.97	0.86	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	6408	1583	3433	6408	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	6408	1583	3433	6408	3433	1583
Peak-hour factor, PHF	0.94	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3128	250	641	5717	609	402
RTOR Reduction (vph)	0	64	0	0	0	251
Lane Group Flow (vph)	3128	186	641	5717	609	151
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases		2				4
Actuated Green, G (s)	72.1	72.1	27.1	105.3	21.5	21.5
Effective Green, g (s)	72.1	72.1	27.1	105.3	21.5	21.5
Actuated g/C Ratio	0.51	0.51	0.19	0.75	0.15	0.15
Clearance Time (s)	6.3	6.3	6.5	6.7	6.5	6.5
Vehicle Extension (s)	8.0	8.0	2.5	8.0	2.5	2.5
Lane Grp Cap (vph)	3300	815	664	4819	527	243
v/s Ratio Prot	0.49		0.19	c0.89	c0.18	
v/s Ratio Perm		0.12				0.10
v/c Ratio	0.95	0.23	0.97	1.19	1.16	0.62
Uniform Delay, d1	32.2	18.7	56.0	17.4	59.2	55.4
Progression Factor	0.28	0.00	0.84	0.77	1.00	1.00
Incremental Delay, d2	0.9	0.1	4.9	84.1	89.8	4.0
Delay (s)	9.8	0.1	51.7	97.5	149.0	59.4
Level of Service	A	A	D	F	F	E
Approach Delay (s)	9.1			92.8	113.4	
Approach LOS	A			F	F	

Intersection Summary			
HCM 2000 Control Delay	68.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	2820	30	320	5170	160	50	10	180	270	20	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86		1.00	0.86	1.00		1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1770	6398		1770	6408	1583		1788	1583	1681	1697	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.67	1.00	0.09	0.09	1.00
Satd. Flow (perm)	1770	6398		1770	6408	1583		1240	1583	163	151	1583
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)	87	3065	33	348	5620	174	54	11	196	293	22	141
RTOR Reduction (vph)	0	1	0	0	0	74	0	0	126	0	0	97
Lane Group Flow (vph)	87	3097	0	348	5620	100	0	65	70	158	157	44
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	Perm
Protected Phases	5	2		1	6			4	1		3	
Permitted Phases						6	4		4	3		3
Actuated Green, G (s)	5.5	50.4		14.5	59.4	59.4		5.5	20.0	43.5	43.5	43.5
Effective Green, g (s)	5.5	50.4		14.5	59.4	59.4		5.5	20.0	43.5	43.5	43.5
Actuated g/C Ratio	0.04	0.36		0.10	0.42	0.42		0.04	0.14	0.31	0.31	0.31
Clearance Time (s)	6.5	6.6		6.5	6.6	6.6		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	69	2303		183	2718	671		48	299	50	46	491
v/s Ratio Prot	0.05	0.48		c0.20	c0.88				0.02			
v/s Ratio Perm						0.06		c0.05	0.02	0.97	c1.04	0.03
v/c Ratio	1.26	1.34		1.90	2.07	0.15		1.35	0.23	3.16	3.41	0.09
Uniform Delay, d1	67.2	44.8		62.8	40.3	24.8		67.2	53.2	48.2	48.2	34.2
Progression Factor	1.10	0.72		1.02	0.75	0.50		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	172.6	157.0		407.6	480.6	0.0		250.6	0.4	1022.1	1138.7	0.1
Delay (s)	246.9	189.4		471.7	510.7	12.5		317.8	53.6	1070.3	1186.9	34.3
Level of Service	F	F		F	F	B		F	D	F	F	C
Approach Delay (s)		190.9			494.4			119.4			790.1	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	401.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	2.58		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.1
Intersection Capacity Utilization	110.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
114: Deer Run Dr/Harbour View Ct & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	2430	80	530	4730	90	40	40	270	230	120	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.86	1.00	0.97	0.86		1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (prot)	1770	6408	1583	3433	6390		1770	1863	1583	1681	1741	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (perm)	1770	6408	1583	3433	6390		1770	1863	1583	1681	1741	1583
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	228	2505	87	576	5141	98	43	43	293	250	130	424
RTOR Reduction (vph)	0	0	44	0	2	0	0	0	100	0	0	160
Lane Group Flow (vph)	228	2505	43	576	5237	0	43	43	193	187	193	264
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	13.5	69.3	69.3	26.2	82.1		4.0	4.0	30.2	14.5	14.5	14.5
Effective Green, g (s)	13.5	69.3	69.3	26.2	82.1		4.0	4.0	30.2	14.5	14.5	14.5
Actuated g/C Ratio	0.10	0.49	0.49	0.19	0.59		0.03	0.03	0.22	0.10	0.10	0.10
Clearance Time (s)	6.5	6.5	6.5	6.5	6.4		6.5	6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0		2.5	2.5	2.5	2.5	2.5	2.5
Lane Grp Cap (vph)	170	3171	783	642	3747		50	53	414	174	180	163
v/s Ratio Prot	c0.13	0.39		0.17	c0.82		0.02	0.02	c0.09	0.11	0.11	
v/s Ratio Perm			0.03						0.03			c0.17
v/c Ratio	1.34	0.79	0.06	0.90	1.40		0.86	0.81	0.47	1.07	1.07	1.62
Uniform Delay, d1	63.2	29.3	18.4	55.6	29.0		67.7	67.6	47.9	62.8	62.8	62.8
Progression Factor	0.52	0.12	0.07	1.13	0.47		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	175.3	1.3	0.1	1.7	179.1		75.5	58.6	0.6	89.5	87.6	306.4
Delay (s)	208.4	4.7	1.4	64.5	192.8		143.2	126.2	48.5	152.3	150.3	369.1
Level of Service	F	A	A	E	F		F	F	D	F	F	F
Approach Delay (s)		21.1			180.1			68.0			266.2	
Approach LOS		C			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	137.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.40		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	114.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
115: Chital Dr & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	2650	170	350	4810	10	100	10	50	20	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.86		0.97	0.86	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	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (prot)	1770	6348		3433	6408	1583	1770	1863	1583		1803	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (perm)	1770	6348		3433	6408	1583	1770	1863	1583		1803	1583
Peak-hour factor, PHF	0.92	0.96	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	2760	183	380	5228	11	109	11	54	22	11	11
RTOR Reduction (vph)	0	7	0	0	0	3	0	0	50	0	0	11
Lane Group Flow (vph)	22	2936	0	380	5228	8	109	11	4	0	33	0
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6	3	4	4		3	3	
Permitted Phases						6			4			3
Actuated Green, G (s)	3.0	77.1		21.7	95.2	100.8	9.8	9.8	9.8		5.6	5.6
Effective Green, g (s)	3.0	77.1		21.7	95.2	100.8	9.8	9.8	9.8		5.6	5.6
Actuated g/C Ratio	0.02	0.55		0.15	0.68	0.72	0.07	0.07	0.07		0.04	0.04
Clearance Time (s)	6.5	6.3		6.5	6.9	6.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	8.0		5.0	8.0	2.5	3.5	3.5	3.5		2.5	2.5
Lane Grp Cap (vph)	37	3495		532	4357	1139	123	130	110		72	63
v/s Ratio Prot	0.01	c0.46		0.11	c0.82	0.00	c0.06	0.01			c0.02	
v/s Ratio Perm						0.00			0.00			0.00
v/c Ratio	0.59	0.84		0.71	1.20	0.01	0.89	0.08	0.03		0.46	0.01
Uniform Delay, d1	67.9	26.3		56.2	22.4	5.5	64.5	60.9	60.7		65.7	64.5
Progression Factor	1.33	0.10		0.59	0.49	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.2		0.5	90.2	0.0	48.5	0.3	0.2		3.3	0.0
Delay (s)	92.2	2.8		33.5	101.2	5.5	113.0	61.2	60.8		69.1	64.6
Level of Service	F	A		C	F	A	F	E	E		E	E
Approach Delay (s)		3.4			96.4			93.6			67.9	
Approach LOS		A			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	64.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	2330	100	400	4100	420	110	40	220	290	100	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	0.97	0.91	1.00	1.00	0.86			1.00	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3433	5085	1583	1770	6320			1797	1583	1681	1727	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.96	1.00	0.95	0.98	1.00
Satd. Flow (perm)	3433	5085	1583	1770	6320			1797	1583	1681	1727	1583
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	185	2479	109	435	4457	447	120	43	239	315	109	196
RTOR Reduction (vph)	0	0	59	0	12	0	0	0	221	0	0	160
Lane Group Flow (vph)	185	2479	50	435	4892	0	0	163	18	208	216	36
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2						4			3
Actuated Green, G (s)	6.5	64.0	64.0	25.5	82.1			10.5	10.5	14.5	14.5	14.5
Effective Green, g (s)	6.5	64.0	64.0	25.5	82.1			10.5	10.5	14.5	14.5	14.5
Actuated g/C Ratio	0.05	0.46	0.46	0.18	0.59			0.08	0.08	0.10	0.10	0.10
Clearance Time (s)	6.5	6.0	6.0	6.5	6.9			6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	4.0	8.0			3.5	3.5	2.5	2.5	2.5
Lane Grp Cap (vph)	159	2324	723	322	3706			134	118	174	178	163
v/s Ratio Prot	0.05	c0.49		0.25	c0.77			c0.09		0.12	c0.13	
v/s Ratio Perm			0.03						0.01			0.02
v/c Ratio	1.16	1.07	0.07	1.35	1.32			1.22	0.15	1.20	1.21	0.22
Uniform Delay, d1	66.8	38.0	21.3	57.2	29.0			64.8	60.6	62.8	62.8	57.6
Progression Factor	0.80	0.92	2.55	0.87	0.74			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	80.2	31.1	0.0	159.8	144.2			147.3	0.7	130.6	136.5	0.5
Delay (s)	133.6	66.0	54.2	209.5	165.7			212.1	61.3	193.3	199.3	58.1
Level of Service	F	E	D	F	F			F	E	F	F	E
Approach Delay (s)		70.1			169.2			122.4			152.6	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	135.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
117: Winterpock Rd/Lake Harbour Dr & Route 360

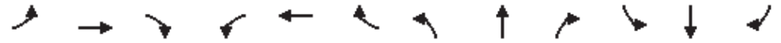
9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	2150	110	940	3320	140	170	30	330	120	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00		1.00	0.88	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583		1787	2787	1770	1789	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583		1787	2787	1770	1789	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.92	0.92	0.92
Adj. Flow (vph)	22	2337	120	1022	3609	152	185	33	351	130	120	43
RTOR Reduction (vph)	0	0	73	0	0	58	0	0	88	0	9	0
Lane Group Flow (vph)	22	2337	47	1022	3609	94	0	218	263	130	154	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2			6			4			
Actuated Green, G (s)	3.0	55.2	55.2	34.5	86.3	86.3		14.5	49.0	9.5	9.5	
Effective Green, g (s)	3.0	55.2	55.2	34.5	86.3	86.3		14.5	49.0	9.5	9.5	
Actuated g/C Ratio	0.02	0.39	0.39	0.25	0.62	0.62		0.10	0.35	0.07	0.07	
Clearance Time (s)	6.5	6.8	6.8	6.5	7.2	7.2		6.5	6.5	6.5	6.5	
Vehicle Extension (s)	3.0	8.0	8.0	4.0	8.0	8.0		3.0	4.0	3.0	3.0	
Lane Grp Cap (vph)	37	2004	624	845	3134	975		185	1104	120	121	
v/s Ratio Prot	0.01	c0.46		0.30	c0.71			c0.12	0.06	0.07	c0.09	
v/s Ratio Perm			0.03			0.06			0.04			
v/c Ratio	0.59	1.17	0.08	1.21	1.15	0.10		1.18	0.24	1.08	1.27	
Uniform Delay, d1	67.9	42.4	26.5	52.8	26.9	10.9		62.8	32.3	65.2	65.2	
Progression Factor	0.72	0.52	0.20	1.10	0.15	0.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.1	78.6	0.1	95.4	68.6	0.0		122.4	0.2	106.3	171.2	
Delay (s)	64.2	100.6	5.6	153.6	72.8	0.0		185.2	32.4	171.5	236.4	
Level of Service	E	F	A	F	E	A		F	C	F	F	
Approach Delay (s)		95.7			87.7			90.9			207.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	94.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.7
Intersection Capacity Utilization	109.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
118: Hancock Village/Duckridge Blvd & Route 360

9/18/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	2110	140	270	3220	30	280	20	150	20	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5		6.5	6.5
Lane Util. Factor	1.00	0.91	1.00	0.97	0.95	1.00	0.95	0.95	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	5085	1583	3433	3539	1583	1681	1696	1583		1803	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	5085	1583	3433	3539	1583	1681	1696	1583		1803	1583
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)	43	2293	152	293	3500	33	304	22	163	22	11	54
RTOR Reduction (vph)	0	0	68	0	0	12	0	0	61	0	0	52
Lane Group Flow (vph)	43	2293	84	293	3500	21	161	165	102	0	33	2
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	pm+ov	Split	NA	Perm
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases			2			6			3			4
Actuated Green, G (s)	4.0	77.1	77.1	18.6	91.0	91.0	14.0	14.0	32.6		4.0	4.0
Effective Green, g (s)	4.0	77.1	77.1	18.6	91.0	91.0	14.0	14.0	32.6		4.0	4.0
Actuated g/C Ratio	0.03	0.55	0.55	0.13	0.65	0.65	0.10	0.10	0.23		0.03	0.03
Clearance Time (s)	6.5	6.8	6.8	6.5	7.5	7.5	6.5	6.5	6.5		6.5	6.5
Vehicle Extension (s)	2.5	6.0	6.0	2.5	6.0	6.0	2.5	2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	50	2800	871	456	2300	1028	168	169	368		51	45
v/s Ratio Prot	0.02	0.45		c0.09	c0.99		0.10	c0.10	0.04		c0.02	
v/s Ratio Perm			0.05			0.01			0.03			0.00
v/c Ratio	0.86	0.82	0.10	0.64	1.52	0.02	0.96	0.98	0.28		0.65	0.03
Uniform Delay, d1	67.7	25.7	14.9	57.5	24.5	8.7	62.7	62.8	44.0		67.3	66.1
Progression Factor	0.87	0.45	0.37	0.81	0.17	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	57.6	1.9	0.1	0.2	235.0	0.0	56.5	61.6	0.3		22.2	0.2
Delay (s)	116.3	13.6	5.6	46.8	239.2	8.7	119.2	124.5	44.3		89.5	66.3
Level of Service	F	B	A	D	F	A	F	F	D		F	E
Approach Delay (s)		14.8			222.5			96.0			75.1	
Approach LOS		B			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	136.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	125.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
119: Ashlake & Route 360

9/18/2014

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2150	120	260	3290	160	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4		6.5	6.8	6.5	6.5
Lane Util. Factor	0.91		0.97	0.95	0.97	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5045		3433	3539	3433	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	5045		3433	3539	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2337	130	283	3576	174	141
RTOR Reduction (vph)	4	0	0	0	0	130
Lane Group Flow (vph)	2463	0	283	3576	174	11
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	91.8		18.1	116.0	10.7	10.7
Effective Green, g (s)	91.8		18.1	116.0	10.7	10.7
Actuated g/C Ratio	0.66		0.13	0.83	0.08	0.08
Clearance Time (s)	6.4		6.5	6.8	6.5	6.5
Vehicle Extension (s)	6.0		2.5	6.0	2.5	2.5
Lane Grp Cap (vph)	3308		443	2932	262	120
v/s Ratio Prot	0.49		0.08	c1.01	c0.05	
v/s Ratio Perm						0.01
v/c Ratio	0.74		0.64	1.22	0.66	0.09
Uniform Delay, d1	16.2		57.8	12.0	62.9	60.1
Progression Factor	0.63		0.76	0.98	1.00	1.00
Incremental Delay, d2	0.8		0.2	99.1	5.6	0.2
Delay (s)	11.1		44.1	110.9	68.5	60.4
Level of Service	B		D	F	E	E
Approach Delay (s)	11.1			106.0	64.9	
Approach LOS	B			F	E	

Intersection Summary			
HCM 2000 Control Delay	68.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.4
Intersection Capacity Utilization	107.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
120: Route 360 & Woodlake Village Pkwy

9/18/2014

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	80	1550	2490	950	720	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	1685	2707	1033	783	54
RTOR Reduction (vph)	0	0	0	336	0	24
Lane Group Flow (vph)	87	1685	2707	697	783	30
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	6.5	100.3	87.7	87.7	26.5	26.5
Effective Green, g (s)	6.5	100.3	87.7	87.7	26.5	26.5
Actuated g/C Ratio	0.05	0.72	0.63	0.63	0.19	0.19
Clearance Time (s)	6.5	6.7	6.3	6.3	6.5	6.5
Vehicle Extension (s)	2.5	8.0	8.0	8.0	3.5	3.5
Lane Grp Cap (vph)	82	2535	2216	991	649	299
v/s Ratio Prot	c0.05	0.48	c0.76		c0.23	
v/s Ratio Perm				0.44		0.02
v/c Ratio	1.06	0.66	1.22	0.70	1.21	0.10
Uniform Delay, d1	66.8	10.7	26.1	17.5	56.8	46.9
Progression Factor	0.97	0.85	0.92	1.20	1.00	1.00
Incremental Delay, d2	98.3	0.9	100.1	0.4	107.0	0.2
Delay (s)	163.2	10.0	124.1	21.3	163.7	47.1
Level of Service	F	B	F	C	F	D
Approach Delay (s)		17.6	95.7		156.2	
Approach LOS		B	F		F	

Intersection Summary			
HCM 2000 Control Delay	81.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.3
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
121: Hampton Park Dr/Fox Club Pkwy & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	1050	10	270	2010	260	10	40	230	350	70	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583		1844	1583	3433	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.99	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583		1844	1583	3433	1863	1583
Peak-hour factor, PHF	0.92	0.96	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	1094	11	293	2094	283	11	43	250	380	76	65
RTOR Reduction (vph)	0	0	6	0	0	61	0	0	237	0	0	57
Lane Group Flow (vph)	43	1094	5	293	2094	222	0	54	13	380	76	8
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		4	4		3	3	
Permitted Phases			2			6			4			3
Actuated Green, G (s)	4.8	63.7	63.7	26.2	85.2	85.2		7.3	7.3	16.4	16.4	16.4
Effective Green, g (s)	4.8	63.7	63.7	26.2	85.2	85.2		7.3	7.3	16.4	16.4	16.4
Actuated g/C Ratio	0.03	0.46	0.46	0.19	0.61	0.61		0.05	0.05	0.12	0.12	0.12
Clearance Time (s)	6.5	6.9	6.9	6.5	6.8	6.8		6.5	6.5	6.5	6.5	6.5
Vehicle Extension (s)	3.0	7.0	7.0	3.0	7.0	7.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	60	1610	720	331	2153	963		96	82	402	218	185
v/s Ratio Prot	0.02	c0.31		0.17	c0.59			c0.03		c0.11	0.04	
v/s Ratio Perm			0.00			0.14			0.01			0.00
v/c Ratio	0.72	0.68	0.01	0.89	0.97	0.23		0.56	0.16	0.95	0.35	0.04
Uniform Delay, d1	66.9	30.1	20.9	55.4	26.3	12.5		64.8	63.4	61.4	56.9	54.8
Progression Factor	0.60	0.38	1.00	1.29	0.36	0.42		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.0	1.9	0.0	2.9	2.3	0.1		7.3	0.9	31.0	1.0	0.1
Delay (s)	68.5	13.3	20.9	74.6	11.6	5.3		72.1	64.3	92.3	57.9	54.9
Level of Service	E	B	C	E	B	A		E	E	F	E	D
Approach Delay (s)		15.4			17.9			65.7			82.6	
Approach LOS		B			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.4
Intersection Capacity Utilization	93.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
122: Otterdale Rd & Route 360

9/18/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	870	20	270	1660	150	20	10	160	80	30	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.98	
Satd. Flow (prot)	1719	3539	1583	1770	3489			1803	1583		1672	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.98	
Satd. Flow (perm)	1719	3539	1583	1770	3489			1803	1583		1672	
Peak-hour factor, PHF	0.92	0.97	0.92	0.92	0.92	0.96	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	897	22	293	1804	156	22	11	174	87	33	87
RTOR Reduction (vph)	0	0	13	0	5	0	0	0	110	0	18	0
Lane Group Flow (vph)	43	897	9	293	1956	0	0	33	64	0	189	0
Heavy Vehicles (%)	5%	2%	2%	2%	2%	5%	2%	2%	2%	5%	5%	5%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6		4	4	1	3	3	
Permitted Phases			2						4			
Actuated Green, G (s)	4.4	55.6	55.6	36.4	87.5			4.1	40.5		17.1	
Effective Green, g (s)	4.4	55.6	55.6	36.4	87.5			4.1	40.5		17.1	
Actuated g/C Ratio	0.03	0.40	0.40	0.26	0.62			0.03	0.29		0.12	
Clearance Time (s)	6.5	7.3	7.3	6.5	7.4			6.5	6.5		6.5	
Vehicle Extension (s)	2.5	8.0	8.0	2.5	8.0			2.5	2.5		2.5	
Lane Grp Cap (vph)	54	1405	628	460	2180			52	457		204	
v/s Ratio Prot	0.03	c0.25		0.17	c0.56			c0.02	0.04		c0.11	
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.80	0.64	0.01	0.64	0.90			0.63	0.14		0.92	
Uniform Delay, d1	67.4	34.1	25.6	45.9	22.4			67.2	36.8		60.8	
Progression Factor	1.00	1.00	1.00	0.50	0.11			1.00	1.00		1.00	
Incremental Delay, d2	53.1	2.2	0.0	1.1	2.9			20.0	0.1		42.1	
Delay (s)	120.5	36.3	25.6	24.1	5.2			87.3	36.9		102.9	
Level of Service	F	D	C	C	A			F	D		F	
Approach Delay (s)		39.8			7.7			45.0			102.9	
Approach LOS		D			A			D			F	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	26.9
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	LTR
Maximum Queue (ft)	173	186	110	130	124	40	359	738	782	795	450	418
Average Queue (ft)	117	129	68	88	81	18	83	581	615	648	371	312
95th Queue (ft)	192	206	120	137	130	41	294	905	945	1015	624	544
Link Distance (ft)			1521	1521	1521			5220	5220	5220		1540
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	205	205				90	190				200	
Storage Blk Time (%)	1	1			10		0	45		48	1	
Queuing Penalty (veh)	4	7			15		1	19		147	6	

Intersection: 101: Bridgewood Rd/Warbro Rd & Route 360

Movement	SB	SB	SB	SB
Directions Served	L	L	T	R
Maximum Queue (ft)	276	315	252	258
Average Queue (ft)	210	249	108	176
95th Queue (ft)	330	368	240	275
Link Distance (ft)			1263	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	220	220		250
Storage Blk Time (%)	7	22	0	2
Queuing Penalty (veh)	29	88	3	8

Intersection: 102: Lonas Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	L	L	T	T	T	T	R
Maximum Queue (ft)	202	207	178	212	231	72	87	335	466	458	307	47
Average Queue (ft)	145	154	97	131	149	30	53	261	293	291	220	23
95th Queue (ft)	219	223	179	210	229	72	93	341	557	550	310	50
Link Distance (ft)			635	635	635			1521	1521	1521		
Upstream Blk Time (%)									0	0		
Queuing Penalty (veh)									0	0		
Storage Bay Dist (ft)	420	420				200	200				200	200
Storage Blk Time (%)								28		35	4	
Queuing Penalty (veh)								30		280	28	

Intersection: 102: Lonas Pkwy & Route 360

Movement	NB	NB	NB	NB	SB	SB	SB	SB	SB
Directions Served	L	L	T	R	L	L	T	T	R
Maximum Queue (ft)	115	128	59	80	154	120	27	2	35
Average Queue (ft)	47	86	24	44	101	65	7	0	7
95th Queue (ft)	113	140	63	84	164	133	28	5	65
Link Distance (ft)			402	402	256	256	256	256	256
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	240	240							
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

Movement	WB	WB	WB	WB	B53	B53	B53	B53
Directions Served	T	T	T	R	T	T	T	T
Maximum Queue (ft)	1085	1092	1088	1055	508	572	537	445
Average Queue (ft)	544	568	587	409	70	119	115	52
95th Queue (ft)	1251	1274	1300	1132	331	468	443	259
Link Distance (ft)	1000	1000	1000	1000	635	635	635	635
Upstream Blk Time (%)	19	21	24	6	0	0	0	1
Queuing Penalty (veh)	154	172	199	49	0	1	0	5
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	WB	WB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	334	340	336	992
Average Queue (ft)	254	269	279	505
95th Queue (ft)	454	457	436	1146
Link Distance (ft)	290	290	290	1044
Upstream Blk Time (%)	32	46	62	17
Queuing Penalty (veh)	324	458	623	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (ft)	672	690	693	709
Average Queue (ft)	605	644	660	653
95th Queue (ft)	788	774	787	919
Link Distance (ft)	632	632	632	632
Upstream Blk Time (%)	16	26	58	44
Queuing Penalty (veh)	160	254	565	428
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB	WB	WB	SB	B55
Directions Served	T	T	T	R	T
Maximum Queue (ft)	360	370	361	1247	3611
Average Queue (ft)	344	349	341	1220	3266
95th Queue (ft)	363	373	360	1320	4258
Link Distance (ft)	331	331	331	1141	3562
Upstream Blk Time (%)	18	18	19	69	61
Queuing Penalty (veh)	222	224	235	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 107: Route 360 & Market Square Ln

Movement	EB	WB	WB	WB	WB	WB	WB	SB
Directions Served	T	T	T	T	T	T	T	R
Maximum Queue (ft)	7	137	350	880	894	902	897	128
Average Queue (ft)	1	24	340	862	877	890	872	75
95th Queue (ft)	16	130	420	879	901	906	951	158
Link Distance (ft)	576			834	834	834	834	262
Upstream Blk Time (%)				38	34	46	19	
Queuing Penalty (veh)				564	506	687	281	
Storage Bay Dist (ft)		50	50					
Storage Blk Time (%)			9	63			53	
Queuing Penalty (veh)			88	1249			0	

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	R	L	L	T	T	T
Maximum Queue (ft)	325	334	237	265	331	254	108	378	556	605	608	611
Average Queue (ft)	226	245	162	208	256	201	66	210	332	588	590	591
95th Queue (ft)	375	375	259	293	358	278	114	369	630	606	609	613
Link Distance (ft)			619	619	619	619		576	576	576	576	576
Upstream Blk Time (%)									2	48	45	44
Queuing Penalty (veh)									13	411	385	375
Storage Bay Dist (ft)	300	300					250					
Storage Blk Time (%)	5	6	0			2						
Queuing Penalty (veh)	29	39	0			9						

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	WB	WB	NB	NB	NB	NB	NB	B995	B995	SB	SB	SB
Directions Served	T	R	L	L	T	T	R	T	T	L	L	T
Maximum Queue (ft)	602	58	515	640	792	378	392	505	503	587	819	859
Average Queue (ft)	588	16	513	639	778	207	250	496	472	485	693	843
95th Queue (ft)	603	174	521	644	791	483	420	507	617	667	932	860
Link Distance (ft)	576	576			704	704		479	479		756	756
Upstream Blk Time (%)	44	1			76	1		80	25		19	84
Queuing Penalty (veh)	377	4			0	0		0	0		0	0
Storage Bay Dist (ft)			390	390			250			430		
Storage Blk Time (%)			88	92		2	18			40	65	37
Queuing Penalty (veh)			220	230		10	46			89	145	229

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Rd & Route 360

Movement	SB	B996	B996
Directions Served	R	T	T
Maximum Queue (ft)	530	817	826
Average Queue (ft)	530	649	701
95th Queue (ft)	530	1094	1062
Link Distance (ft)		795	795
Upstream Blk Time (%)		28	58
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)	430		
Storage Blk Time (%)	73		
Queuing Penalty (veh)	151		

Intersection: 109: Route 360 & Village Green Dr

Movement	EB	WB	WB	WB	WB
Directions Served	T	T	T	T	TR
Maximum Queue (ft)	26	65	65	62	125
Average Queue (ft)	4	9	9	9	18
95th Queue (ft)	44	136	137	129	190
Link Distance (ft)	358	619	619	619	619
Upstream Blk Time (%)		0	0		0
Queuing Penalty (veh)		1	0		1
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 110: Route 360

Movement	EB
Directions Served	T
Maximum Queue (ft)	26
Average Queue (ft)	4
95th Queue (ft)	48
Link Distance (ft)	241
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	R	L	L	T	T	T	T	L
Maximum Queue (ft)	228	286	314	330	147	177	182	96	123	123	111	474
Average Queue (ft)	148	197	230	247	76	110	129	50	75	88	80	427
95th Queue (ft)	251	299	324	343	132	179	193	103	130	131	117	559
Link Distance (ft)	876	876	876	876		241	241	241	241	241	241	410
Upstream Blk Time (%)												42
Queuing Penalty (veh)												0
Storage Bay Dist (ft)					200							
Storage Blk Time (%)				27								
Queuing Penalty (veh)				67								

Intersection: 111: Brad McNeer Pkwy & Route 360

Movement	NB	NB	B61	B61	B61
Directions Served	L	R	T	T	T
Maximum Queue (ft)	457	382	193	161	2
Average Queue (ft)	402	256	79	55	0
95th Queue (ft)	532	395	236	196	4
Link Distance (ft)	410	410	810	810	810
Upstream Blk Time (%)	29	1			
Queuing Penalty (veh)	0	0			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 112: Craig Rath Boulevard & Route 360

Movement	EB	EB	WB
Directions Served	T	T	L
Maximum Queue (ft)	216	220	141
Average Queue (ft)	31	31	72
95th Queue (ft)	453	457	142
Link Distance (ft)	2140	2140	
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			600
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	L	T	T	T	T	R	LT
Maximum Queue (ft)	232	467	522	584	608	400	949	906	895	903	390	96
Average Queue (ft)	72	289	339	393	439	276	600	587	589	598	170	50
95th Queue (ft)	218	563	643	698	735	465	1027	1015	1022	1035	465	102
Link Distance (ft)		2493	2493	2493	2493		2140	2140	2140	2140		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	140					150					160	200
Storage Blk Time (%)	1	26				26	42			41		
Queuing Penalty (veh)	6	22				361	146			72		

Intersection: 113: Mockingbird Ln/Harbour Pointe Pkwy & Route 360

Movement	NB	SB	SB	SB
Directions Served	R	L	LT	R
Maximum Queue (ft)	164	176	201	161
Average Queue (ft)	95	106	144	78
95th Queue (ft)	169	189	214	163
Link Distance (ft)	874		588	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		120		120
Storage Blk Time (%)	1	4	19	3
Queuing Penalty (veh)	1	11	55	11

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	T	R	L	L	T	T	T	TR
Maximum Queue (ft)	329	462	411	200	158	37	168	229	472	676	1154	741
Average Queue (ft)	274	303	209	99	109	14	124	139	175	182	253	200
95th Queue (ft)	465	734	598	170	178	38	179	195	603	813	1147	871
Link Distance (ft)		1713	1713	1713	1713				2493	2493	2493	2493
Upstream Blk Time (%)											0	0
Queuing Penalty (veh)											0	1
Storage Bay Dist (ft)	200					360	280	280				
Storage Blk Time (%)	56	0							1			
Queuing Penalty (veh)	353	0							8			

Intersection: 114: Deer Run Dr/Harbour View Ct & Route 360

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	LT	R
Maximum Queue (ft)	92	87	238	271	861	325
Average Queue (ft)	43	45	159	149	786	324
95th Queue (ft)	97	97	263	292	988	328
Link Distance (ft)		1289	1289		830	
Upstream Blk Time (%)					43	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	190			200		250
Storage Blk Time (%)				5	22	83
Queuing Penalty (veh)				37	120	315

Intersection: 115: Chital Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	L	L	T	T	T	T	R
Maximum Queue (ft)	46	41	23	73	97	131	208	348	534	561	380	9
Average Queue (ft)	20	10	4	24	47	83	115	255	239	261	172	1
95th Queue (ft)	58	37	21	70	104	144	230	402	638	820	492	8
Link Distance (ft)		840	840	840	840			1713	1713	1713	1713	
Upstream Blk Time (%)									0	0		
Queuing Penalty (veh)									0	1		
Storage Bay Dist (ft)	540					170	170					190
Storage Blk Time (%)						0	0	20			3	
Queuing Penalty (veh)						3	3	74			0	

Intersection: 115: Chital Dr & Route 360

Movement	NB	NB	NB	SB	SB
Directions Served	L	T	R	LT	R
Maximum Queue (ft)	155	109	55	73	32
Average Queue (ft)	109	36	29	34	9
95th Queue (ft)	179	163	57	80	32
Link Distance (ft)		1010	1010	610	610
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	110				
Storage Blk Time (%)	25	0			
Queuing Penalty (veh)	3	0			

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	TR	LT
Maximum Queue (ft)	103	121	332	384	364	86	314	640	527	468	356	218
Average Queue (ft)	60	80	212	246	279	13	274	442	384	331	263	195
95th Queue (ft)	114	135	327	381	367	119	387	658	566	482	368	279
Link Distance (ft)			869	869	869			840	840	840	840	
Upstream Blk Time (%)								0	0	0		
Queuing Penalty (veh)								4	0	0		
Storage Bay Dist (ft)	220	220				230	115					130
Storage Blk Time (%)			4		12		48	41				69
Queuing Penalty (veh)			7		13		534	176				166

Intersection: 116: N. Spring Run Rd/Temie Lee Pkwy & Route 360

Movement	NB	SB	SB	SB
Directions Served	R	L	LT	R
Maximum Queue (ft)	651	240	838	270
Average Queue (ft)	464	230	618	196
95th Queue (ft)	1082	264	1033	352
Link Distance (ft)	2183		996	
Upstream Blk Time (%)			9	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)		90		170
Storage Blk Time (%)	8	76	89	5
Queuing Penalty (veh)	14	349	314	19

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	B1
Directions Served	L	T	T	T	R	L	L	T	T	T	R	T
Maximum Queue (ft)	154	615	642	671	308	313	326	388	372	335	36	90
Average Queue (ft)	31	401	422	437	110	251	265	273	288	212	15	13
95th Queue (ft)	169	763	776	799	354	329	342	413	398	342	40	188
Link Distance (ft)		1112	1112	1112				736	736	736		869
Upstream Blk Time (%)		0	0	0								0
Queuing Penalty (veh)		0	1	1								0
Storage Bay Dist (ft)	180				170	280	280				575	
Storage Blk Time (%)		43		53		6	9	9				
Queuing Penalty (veh)		9		64		67	111	96				

Intersection: 117: Winterpock Rd/Lake Harbour Dr & Route 360

Movement	B1	B1	NB	NB	NB	SB	SB
Directions Served	T	T	LT	R	R	L	TR
Maximum Queue (ft)	441	133	388	319	201	237	330
Average Queue (ft)	64	19	296	116	57	168	252
95th Queue (ft)	439	209	527	377	212	292	447
Link Distance (ft)	869	869		1868		470	470
Upstream Blk Time (%)	0	0					0
Queuing Penalty (veh)	1	0					0
Storage Bay Dist (ft)			430		1000		
Storage Blk Time (%)			14	0			
Queuing Penalty (veh)			48	0			

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	R	L	L	T	T	R	L	LT
Maximum Queue (ft)	77	128	157	174	57	101	269	1079	1093	519	336	329
Average Queue (ft)	38	80	104	119	23	60	124	606	657	110	248	234
95th Queue (ft)	82	135	162	185	57	113	369	1223	1274	616	407	403
Link Distance (ft)		1172	1172	1172				1112	1112	1112	796	796
Upstream Blk Time (%)								1	2	0		
Queuing Penalty (veh)								12	22	4		
Storage Bay Dist (ft)	200				200	300	300					
Storage Blk Time (%)				1				15				
Queuing Penalty (veh)				2				45				

Intersection: 118: Hancock Village/Duckridge Blvd & Route 360

Movement	NB	SB	SB
Directions Served	R	LT	R
Maximum Queue (ft)	175	58	57
Average Queue (ft)	98	22	22
95th Queue (ft)	184	56	57
Link Distance (ft)	796	958	958
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 119: Ashlake & Route 360

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	TR	L	L	T	T	L	L	R
Maximum Queue (ft)	221	227	197	108	129	226	256	81	118	110
Average Queue (ft)	164	160	147	64	85	171	200	51	85	57
95th Queue (ft)	235	231	207	116	136	249	271	91	127	115
Link Distance (ft)	931	931				1172	1172		2592	2592
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			200	400	400			200		
Storage Blk Time (%)		1	1							
Queuing Penalty (veh)		9	6							

Intersection: 120: Route 360 & Woodlake Village Pkwy

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	L	T	T	T	T	L	L	R
Maximum Queue (ft)	135	213	222	352	365	1167	1167	250
Average Queue (ft)	91	157	174	272	286	879	866	127
95th Queue (ft)	170	230	238	378	384	1267	1249	319
Link Distance (ft)		4676	4676	931	931	1161	1161	
Upstream Blk Time (%)						15	14	
Queuing Penalty (veh)						0	0	
Storage Bay Dist (ft)	200							150
Storage Blk Time (%)	1	1					87	
Queuing Penalty (veh)	11	1					47	

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	LT	R	L	L
Maximum Queue (ft)	66	217	218	19	257	257	256	17	109	186	289	342
Average Queue (ft)	33	141	144	3	168	151	161	2	54	105	230	263
95th Queue (ft)	75	226	227	17	268	272	275	35	114	210	359	423
Link Distance (ft)		2671	2671			4676	4676		759	759		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	240			200	230			210			240	240
Storage Blk Time (%)		1	4		5	2	6				15	26
Queuing Penalty (veh)		0	0		54	5	17				22	36

Intersection: 121: Hampton Park Dr/Fox Club Pkwy & Route 360

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	269	72
Average Queue (ft)	104	37
95th Queue (ft)	336	74
Link Distance (ft)	1442	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		130
Storage Blk Time (%)	0	
Queuing Penalty (veh)	2	

Intersection: 122: Otterdale Rd & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LT	R	LTR
Maximum Queue (ft)	66	275	289	1	142	173	185	73	96	281
Average Queue (ft)	27	186	194	0	94	87	91	34	49	183
95th Queue (ft)	67	276	289	1	158	188	203	80	99	306
Link Distance (ft)		3682	3682			2671	2671	1022		1606
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	200			200	375				500	
Storage Blk Time (%)		6	9							
Queuing Penalty (veh)		3	2							

Intersection: 123: Bailey Bridge Road & Bailey Bridge Connector

Movement	WB
Directions Served	R
Maximum Queue (ft)	46
Average Queue (ft)	31
95th Queue (ft)	50
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 124: Bailey Bridge Road & Deer Run Drive

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	66	24	319	490
Average Queue (ft)	37	4	250	254
95th Queue (ft)	71	23	434	749
Link Distance (ft)				826
Upstream Blk Time (%)				9
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	150	225	275	
Storage Blk Time (%)			40	0
Queuing Penalty (veh)			61	1

Intersection: 125: Springford Parkway/Bailey Bridge Road & Spring Run Road

Movement	EB	EB	WB	WB	NB	SB
Directions Served	LT	R	LT	R	LTR	LTR
Maximum Queue (ft)	528	79	887	500	296	450
Average Queue (ft)	320	11	835	343	177	336
95th Queue (ft)	582	167	1009	726	331	629
Link Distance (ft)	778	778	840		663	544
Upstream Blk Time (%)	2	1	90			16
Queuing Penalty (veh)	0	0	0			0
Storage Bay Dist (ft)				400		
Storage Blk Time (%)			96			
Queuing Penalty (veh)			73			

Network Summary

Network wide Queuing Penalty: 14973

C-11 – Supplemental Synchro/SimTraffic Results – US 360 at Old Hundred Road/Commonwealth Centre Parkway – DLT, without Bailey Bridge Connector Improvements

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/12/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	5950	0	150	2310	0	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	6467	0	163	2511	0	109
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	6467	0	163	2511	0	109
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	106.3		30.0	150.0		30.0
Effective Green, g (s)	106.3		30.0	150.0		30.0
Actuated g/C Ratio	0.71		0.20	1.00		0.20
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4411		686	7329		322
v/s Ratio Prot	c1.04		0.05	0.34		0.07
v/s Ratio Perm						
v/c Ratio	1.47		0.24	0.34		0.34
Uniform Delay, d1	21.9		50.4	0.0		51.5
Progression Factor	0.44		1.00	1.00		0.88
Incremental Delay, d2	209.9		0.2	0.1		0.5
Delay (s)	219.4		50.6	0.1		46.0
Level of Service	F		D	A		D
Approach Delay (s)	219.4			3.2	46.0	
Approach LOS	F			A	D	

Intersection Summary			
HCM 2000 Control Delay	154.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	103.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/12/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	5430	240	2090	220	70	70	100	520	130	400	440	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	5902	261	2272	239	76	76	109	565	141	435	478	163
RTOR Reduction (vph)	0	40	0	70	0	0	105	0	0	388	0	0
Lane Group Flow (vph)	5902	221	2272	169	76	76	4	565	141	47	478	163
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	106.3	106.3	106.3	106.3	7.3	5.0	5.0	18.5	16.2	16.2	106.3	106.3
Effective Green, g (s)	106.3	106.3	106.3	106.3	7.3	5.0	5.0	18.5	16.2	16.2	106.3	106.3
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.05	0.03	0.03	0.12	0.11	0.11	0.71	0.71
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4411	1089	4411	1089	167	117	51	411	201	170	2363	2363
v/s Ratio Prot	c0.95		0.36		0.02	0.02		c0.17	c0.08		0.14	0.05
v/s Ratio Perm		0.14		0.11			0.00			0.03		
v/c Ratio	1.34	0.20	0.52	0.16	0.46	0.65	0.07	1.37	0.70	0.28	0.20	0.07
Uniform Delay, d1	21.9	7.4	10.0	7.2	69.4	71.6	70.3	65.8	64.6	61.5	7.4	6.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.46	3.04
Incremental Delay, d2	152.5	0.1	0.4	0.3	2.0	11.8	0.6	183.4	10.5	0.9	0.1	0.1
Delay (s)	174.4	7.5	10.4	7.4	71.4	83.4	70.8	249.1	75.1	62.4	25.8	20.4
Level of Service	F	A	B	A	E	F	E	F	E	E	C	C
Approach Delay (s)	167.3		10.2			74.7			156.4			
Approach LOS	F		B			E			F			

Intersection Summary			
HCM 2000 Control Delay	118.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	133.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	440	5670	2160	0	0	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	478	6163	2348	0	0	426
RTOR Reduction (vph)	0	0	0	0	0	16
Lane Group Flow (vph)	478	6163	2348	0	0	410
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	30.0	150.0	106.3			30.0
Effective Green, g (s)	30.0	150.0	106.3			30.0
Actuated g/C Ratio	0.20	1.00	0.71			0.20
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	667	6225	4411			541
v/s Ratio Prot	0.14	0.99	0.38			
v/s Ratio Perm						0.15
v/c Ratio	0.72	0.99	0.53			0.76
Uniform Delay, d1	56.0	0.0	10.2			56.6
Progression Factor	1.00	1.00	0.25			0.91
Incremental Delay, d2	3.7	9.3	0.4			3.7
Delay (s)	59.7	9.3	3.0			55.0
Level of Service	E	A	A			D
Approach Delay (s)		13.0	3.0	55.0		
Approach LOS		B	A	D		

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	EB	EB	SB
Directions Served	T	R	R
Maximum Queue (ft)	68	63	9
Average Queue (ft)	10	9	1
95th Queue (ft)	143	133	19
Link Distance (ft)	632	632	1044
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	1	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	EB	WB
Directions Served	T	T
Maximum Queue (ft)	45	61
Average Queue (ft)	9	9
95th Queue (ft)	51	128
Link Distance (ft)	326	632
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB	EB	EB
Directions Served	T	T	R
Maximum Queue (ft)	179	591	134
Average Queue (ft)	26	122	19
95th Queue (ft)	225	541	204
Link Distance (ft)	660	660	660
Upstream Blk Time (%)		1	0
Queuing Penalty (veh)		10	1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	NW	B9
Directions Served	T	T	T	T	L	L	R	T
Maximum Queue (ft)	693	727	739	740	96	112	76	2
Average Queue (ft)	452	678	714	713	46	73	39	0
95th Queue (ft)	859	814	753	762	99	116	73	4
Link Distance (ft)	705	705	705	705			22	689
Upstream Blk Time (%)	1	4	11	9			31	
Queuing Penalty (veh)	11	64	157	133			31	
Storage Bay Dist (ft)					500	500		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	<	<	T
Maximum Queue (ft)	437	460	457	465	412	138	158	191	210	27	80	92
Average Queue (ft)	379	435	439	437	228	84	105	147	171	7	45	53
95th Queue (ft)	517	461	460	465	562	145	165	209	230	39	101	101
Link Distance (ft)	412	412	412	412		705	705	705	705			1190
Upstream Blk Time (%)	8	30	44	27	1							
Queuing Penalty (veh)	116	431	628	388	0							
Storage Bay Dist (ft)					250					390	390	
Storage Blk Time (%)				76								
Queuing Penalty (veh)				182								

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	SB	SB	SB	SB	SE	SE	NW	NW
Directions Served	T	<	<	T	>	<	<	<	<
Maximum Queue (ft)	54	590	1153	994	702	144	167	100	106
Average Queue (ft)	18	563	1036	731	468	85	116	50	72
95th Queue (ft)	57	714	1394	1591	1415	153	166	102	116
Link Distance (ft)	1190		1170	1170	1170	397	397	689	689
Upstream Blk Time (%)			51	33	6				
Queuing Penalty (veh)			0	0	0				
Storage Bay Dist (ft)		430							
Storage Blk Time (%)		24	93						
Queuing Penalty (veh)		63	243						

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	132	551	1452	1473	1473	1475	64	79	87	80	94	106
Average Queue (ft)	81	279	1429	1452	1456	1459	26	42	45	48	71	86
95th Queue (ft)	140	671	1506	1473	1478	1481	65	87	90	81	111	124
Link Distance (ft)			1427	1427	1427	1427	412	412	412	412	11	11
Upstream Blk Time (%)			13	56	88	87					47	54
Queuing Penalty (veh)			0	0	0	0					94	108
Storage Bay Dist (ft)	500	500										
Storage Blk Time (%)			9									
Queuing Penalty (veh)			40									

Intersection: 109: Route 360 & 360 EB LT

Movement	B10	B10
Directions Served	T	T
Maximum Queue (ft)	84	70
Average Queue (ft)	25	21
95th Queue (ft)	80	69
Link Distance (ft)	397	397
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2700

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/12/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	3270	0	730	6720	0	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3554	0	793	7304	0	543
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	3554	0	793	7304	0	543
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	96.8		39.5	150.0		39.5
Effective Green, g (s)	96.8		39.5	150.0		39.5
Actuated g/C Ratio	0.65		0.26	1.00		0.26
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4017		904	7329		424
v/s Ratio Prot	0.57		0.23	1.00		c0.34
v/s Ratio Perm						
v/c Ratio	0.88		0.88	1.00		1.28
Uniform Delay, d1	22.0		52.9	0.0		55.2
Progression Factor	0.41		1.00	1.00		0.94
Incremental Delay, d2	1.5		9.6	9.8		136.2
Delay (s)	10.7		62.5	9.8		188.2
Level of Service	B		E	A		F
Approach Delay (s)	10.7			14.9	188.2	
Approach LOS	B			B	F	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/12/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2810	510	6210	510	710	410	500	460	220	650	580	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	3054	554	6750	554	772	446	543	500	239	707	630	793
RTOR Reduction (vph)	0	165	0	74	0	0	476	0	0	648	0	0
Lane Group Flow (vph)	3054	389	6750	480	772	446	67	500	239	59	630	793
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	96.8	96.8	96.8	96.8	20.5	18.5	18.5	14.5	12.5	12.5	96.8	96.8
Effective Green, g (s)	96.8	96.8	96.8	96.8	20.5	18.5	18.5	14.5	12.5	12.5	96.8	96.8
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.14	0.12	0.12	0.10	0.08	0.08	0.65	0.65
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4017	992	4017	992	469	436	189	322	155	131	2152	2152
v/s Ratio Prot	0.49		c1.08		c0.22	0.13		0.15	c0.13		0.19	0.24
v/s Ratio Perm		0.25		0.31			0.04			0.04		
v/c Ratio	0.76	0.39	1.68	0.48	1.65	1.02	0.35	1.55	1.54	0.45	0.29	0.37
Uniform Delay, d1	18.5	12.6	26.6	13.7	64.8	65.8	60.3	67.8	68.8	65.5	11.6	12.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	2.58
Incremental Delay, d2	1.2	1.0	306.4	0.4	300.2	49.1	1.1	263.6	273.3	2.4	0.2	0.2
Delay (s)	19.7	13.6	333.0	14.1	364.9	114.8	61.4	331.3	342.1	67.9	35.1	32.2
Level of Service	B	B	F	B	F	F	E	F	F	E	D	C
Approach Delay (s)	18.7		308.8			208.0			204.3			
Approach LOS	B		F			F			F			

Intersection Summary			
HCM 2000 Control Delay	195.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.66		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	165.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	580	3320	6920	0	0	650
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	630	3609	7522	0	0	691
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	630	3609	7522	0	0	691
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	39.5	150.0	96.8			39.5
Effective Green, g (s)	39.5	150.0	96.8			39.5
Actuated g/C Ratio	0.26	1.00	0.65			0.26
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	878	6225	4017			712
v/s Ratio Prot	0.19	0.58	c1.21			
v/s Ratio Perm						c0.26
v/c Ratio	0.72	0.58	1.87			0.97
Uniform Delay, d1	50.2	0.0	26.6			54.7
Progression Factor	1.00	1.00	0.38			0.96
Incremental Delay, d2	2.8	0.4	392.7			15.0
Delay (s)	53.0	0.4	402.8			67.6
Level of Service	D	A	F			E
Approach Delay (s)		8.2	402.8	67.6		
Approach LOS		A	F	E		

Intersection Summary			
HCM 2000 Control Delay	249.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.69		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	134.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (ft)	546	719	832	439
Average Queue (ft)	159	261	335	103
95th Queue (ft)	523	738	857	563
Link Distance (ft)	1030	1030	1030	1030
Upstream Blk Time (%)		0	2	1
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	EB	EB	WB	WB	WB	SB
Directions Served	T	R	T	T	T	R
Maximum Queue (ft)	694	690	325	346	334	1101
Average Queue (ft)	490	436	216	283	303	1084
95th Queue (ft)	984	957	419	396	373	1105
Link Distance (ft)	632	632	290	290	290	1044
Upstream Blk Time (%)	5	4	7	18	48	97
Queuing Penalty (veh)	50	42	72	192	505	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	EB	EB	EB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	T	T	R	R
Maximum Queue (ft)	29	205	347	663	678	701	719	335
Average Queue (ft)	4	41	318	610	637	685	699	157
95th Queue (ft)	61	196	415	723	714	707	724	407
Link Distance (ft)	326	326	326	632	632	632	632	948
Upstream Blk Time (%)			12	3	8	46	39	
Queuing Penalty (veh)			121	42	103	598	502	
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	SB	SB	B55	B55
Directions Served	T	T	T	R	T	T	T	R	R	T	T
Maximum Queue (ft)	161	522	553	407	351	359	343	1242	1244	3612	3612
Average Queue (ft)	40	260	367	134	323	340	332	1222	1221	3459	3447
95th Queue (ft)	272	732	795	551	357	368	345	1247	1246	3981	3985
Link Distance (ft)	660	660	660	660	326	326	326	1135	1135	3562	3562
Upstream Blk Time (%)	0	0	3	1	3	8	11	98	81	75	68
Queuing Penalty (veh)	0	2	24	10	55	124	170	0	0	0	0
Storage Bay Dist (ft)											
Storage Blk Time (%)											
Queuing Penalty (veh)											

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB	NW
Directions Served	T	T	T	T	L	L	T	T	T	T	T	R
Maximum Queue (ft)	291	455	528	376	248	659	720	729	738	834	784	139
Average Queue (ft)	158	246	299	205	140	604	701	710	726	813	697	111
95th Queue (ft)	443	572	638	541	260	849	723	730	742	834	814	143
Link Distance (ft)	705	705	705	705			660	660	660	660	660	22
Upstream Blk Time (%)	0	0	0	0		1	21	32	55	67	13	51
Queuing Penalty (veh)	0	1	1	1		0	321	485	834	1007	203	254
Storage Bay Dist (ft)					500	500						
Storage Blk Time (%)						0	37					
Queuing Penalty (veh)						1	269					

Intersection: 107: 360 WB LT & Route 360

Movement	B9
Directions Served	T
Maximum Queue (ft)	283
Average Queue (ft)	134
95th Queue (ft)	336
Link Distance (ft)	689
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	>	<	<
Maximum Queue (ft)	310	354	392	361	142	726	733	737	735	723	515	640
Average Queue (ft)	213	268	293	241	31	714	717	716	718	453	513	639
95th Queue (ft)	332	379	407	371	156	728	734	738	736	1000	519	642
Link Distance (ft)	412	412	412	412		705	705	705	705	705		
Upstream Blk Time (%)		0	0	0		20	22	23	29	8		
Queuing Penalty (veh)		0	2	1		272	290	308	386	109		
Storage Bay Dist (ft)					250						390	390
Storage Blk Time (%)				2	0						87	94
Queuing Penalty (veh)				8	3						178	193

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	SB	SB	SB	SB	SE	SE	NW	NW
Directions Served	T	T	<	<	T	>	<	<	<	<
Maximum Queue (ft)	1225	1219	590	1040	917	403	327	351	258	269
Average Queue (ft)	1183	1121	562	856	694	50	245	265	157	178
95th Queue (ft)	1419	1541	648	1266	1221	440	359	377	271	286
Link Distance (ft)	1190	1190		1170	1170	1170	397	397	689	689
Upstream Blk Time (%)	80	18		13	7	0		0		
Queuing Penalty (veh)	0	0		0	0	0		1		
Storage Bay Dist (ft)			430							
Storage Blk Time (%)		1	63	90						
Queuing Penalty (veh)		3	145	208						

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	B10
Directions Served	L	L	T	T	T	T	T	T	T	R	R	T
Maximum Queue (ft)	282	324	6	29	4	321	314	329	289	94	109	196
Average Queue (ft)	213	250	1	6	1	250	254	233	228	90	104	138
95th Queue (ft)	287	335	9	39	9	338	330	324	294	98	113	212
Link Distance (ft)			1427	1427	1427	412	412	412	412	11	11	397
Upstream Blk Time (%)						0	0	0	0	61	67	
Queuing Penalty (veh)						0	0	1	0	200	217	
Storage Bay Dist (ft)	500	500										
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 109: Route 360 & 360 EB LT

Movement	B10
Directions Served	T
Maximum Queue (ft)	194
Average Queue (ft)	130
95th Queue (ft)	207
Link Distance (ft)	397
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 8516

C-13 – Supplemental Synchro/SimTraffic Results – US 360 at Old Hundred Road/Commonwealth Centre Parkway – DLT, with Bailey Bridge Connector Improvements

HCM Unsignalized Intersection Capacity Analysis
103: 288 NB to 360 WB/360 WB to 288 NB & Route 360 9/8/2014

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB 9/8/2014

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/8/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	4332	0	108	1662	0	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4709	0	117	1807	0	78
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	4709	0	117	1807	0	78
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	106.7		29.6	150.0		29.6
Effective Green, g (s)	106.7		29.6	150.0		29.6
Actuated g/C Ratio	0.71		0.20	1.00		0.20
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4428		677	7329		317
v/s Ratio Prot	c0.76		0.03	0.25		0.05
v/s Ratio Perm						
v/c Ratio	1.06		0.17	0.25		0.25
Uniform Delay, d1	21.6		50.0	0.0		50.8
Progression Factor	0.40		1.00	1.00		0.98
Incremental Delay, d2	30.3		0.1	0.1		0.4
Delay (s)	38.9		50.1	0.1		50.1
Level of Service	D		D	A		D
Approach Delay (s)	38.9			3.1	50.1	
Approach LOS	D			A	D	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/8/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	3945	176	1503	159	53	49	72	387	97	297	324	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	4288	191	1634	173	58	53	78	421	105	323	352	117
RTOR Reduction (vph)	0	40	0	50	0	0	75	0	0	287	0	0
Lane Group Flow (vph)	4288	151	1634	123	58	53	3	421	105	36	352	117
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	106.7	106.7	106.7	106.7	6.6	5.1	5.1	18.0	16.5	16.5	106.7	106.7
Effective Green, g (s)	106.7	106.7	106.7	106.7	6.6	5.1	5.1	18.0	16.5	16.5	106.7	106.7
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.04	0.03	0.03	0.12	0.11	0.11	0.71	0.71
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4428	1094	4428	1094	151	120	52	400	204	174	2372	2372
v/s Ratio Prot	c0.69		0.26		0.02	0.01		c0.13	c0.06		0.11	0.04
v/s Ratio Perm		0.10		0.08			0.00			0.02		
v/c Ratio	0.97	0.14	0.37	0.11	0.38	0.44	0.05	1.05	0.51	0.20	0.15	0.05
Uniform Delay, d1	20.1	6.9	8.5	6.8	69.7	71.1	70.1	66.0	63.0	60.8	7.0	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.57	3.05
Incremental Delay, d2	6.0	0.2	0.2	0.2	1.6	2.6	0.4	59.5	2.2	0.6	0.1	0.0
Delay (s)	26.0	7.1	8.7	7.0	71.3	73.6	70.5	125.5	65.2	61.4	25.0	19.8
Level of Service	C	A	A	A	E	E	E	F	E	E	C	B
Approach Delay (s)	25.2		8.5			71.6			93.6			
Approach LOS	C		A			E			F			

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	324	4121	1556	0	0	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	352	4479	1691	0	0	316
RTOR Reduction (vph)	0	0	0	0	0	63
Lane Group Flow (vph)	352	4479	1691	0	0	253
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	29.6	150.0	106.7			29.6
Effective Green, g (s)	29.6	150.0	106.7			29.6
Actuated g/C Ratio	0.20	1.00	0.71			0.20
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	658	6225	4428			534
v/s Ratio Prot	0.11	0.72	0.27			
v/s Ratio Perm						0.09
v/c Ratio	0.53	0.72	0.38			0.47
Uniform Delay, d1	54.0	0.0	8.6			53.3
Progression Factor	1.00	1.00	0.29			0.85
Incremental Delay, d2	0.8	0.7	0.2			0.5
Delay (s)	54.9	0.7	2.7			45.9
Level of Service	D	A	A			D
Approach Delay (s)		4.7	2.7	45.9		
Approach LOS		A	A	D		

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

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)

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

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)

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB	EB	EB
Directions Served	T	T	R
Maximum Queue (ft)	66	594	136
Average Queue (ft)	9	155	19
95th Queue (ft)	138	608	207
Link Distance (ft)	660	660	660
Upstream Blk Time (%)	0	1	0
Queuing Penalty (veh)	0	6	1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	NW
Directions Served	T	T	T	T	L	L	R
Maximum Queue (ft)	705	730	730	731	63	94	77
Average Queue (ft)	380	641	701	698	28	58	40
95th Queue (ft)	782	819	751	755	68	97	80
Link Distance (ft)	705	705	705	705			22
Upstream Blk Time (%)	1	3	5	4			31
Queuing Penalty (veh)	9	34	53	43			22
Storage Bay Dist (ft)					500	500	
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	<	<	T
Maximum Queue (ft)	441	462	453	466	411	123	114	124	151	12	69	76
Average Queue (ft)	380	432	432	432	204	70	70	86	102	3	32	38
95th Queue (ft)	525	467	454	459	541	126	125	139	168	14	74	81
Link Distance (ft)	412	412	412	412		705	705	705	705			1190
Upstream Blk Time (%)	7	24	35	24	1							
Queuing Penalty (veh)	76	245	360	247	0							
Storage Bay Dist (ft)					250					390	390	
Storage Blk Time (%)				66								
Queuing Penalty (veh)				117								

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	T	<	<	T	<	<	<	<
Maximum Queue (ft)	36	436	524	132	176	204	59	90
Average Queue (ft)	14	328	421	77	98	120	24	51
95th Queue (ft)	43	600	715	147	199	229	65	100
Link Distance (ft)	1190		1170	1170	397	397	689	689
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		430						
Storage Blk Time (%)		2	26					
Queuing Penalty (veh)		3	50					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	161	599	1444	1469	1472	1480	56	58	62	68	67	92
Average Queue (ft)	93	340	1261	1354	1382	1363	18	25	28	32	38	56
95th Queue (ft)	172	734	1754	1757	1742	1768	51	62	64	67	70	96
Link Distance (ft)			1427	1427	1427	1427	412	412	412	412	11	11
Upstream Blk Time (%)			4	33	68	64					28	43
Queuing Penalty (veh)			0	0	0	0					41	65
Storage Bay Dist (ft)	500	500										
Storage Blk Time (%)			10									
Queuing Penalty (veh)			33									

Intersection: 109: Route 360 & 360 EB LT

Movement	B10	B10
Directions Served	T	T
Maximum Queue (ft)	6	19
Average Queue (ft)	1	3
95th Queue (ft)	9	22
Link Distance (ft)	397	397
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1407

HCM Unsignalized Intersection Capacity Analysis
103: 288 NB to 360 WB/360 WB to 288 NB & Route 360 9/8/2014

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB 9/8/2014

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/8/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	2407	0	531	4606	0	367
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2616	0	577	5007	0	399
RTOR Reduction (vph)	0	0	0	0	0	3
Lane Group Flow (vph)	2616	0	577	5007	0	396
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	98.8		37.5	150.0		37.5
Effective Green, g (s)	98.8		37.5	150.0		37.5
Actuated g/C Ratio	0.66		0.25	1.00		0.25
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4100		858	7329		402
v/s Ratio Prot	0.42		0.17	0.68		c0.25
v/s Ratio Perm						
v/c Ratio	0.64		0.67	0.68		0.99
Uniform Delay, d1	15.1		50.7	0.0		56.0
Progression Factor	0.38		1.00	1.00		0.92
Incremental Delay, d2	0.6		2.1	0.5		30.6
Delay (s)	6.3		52.8	0.5		82.3
Level of Service	A		D	A		F
Approach Delay (s)	6.3			5.9	82.3	
Approach LOS	A			A	F	

Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/8/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2062	373	4236	370	524	302	367	345	163	486	423	531
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	2241	405	4604	402	570	328	399	375	177	528	460	577
RTOR Reduction (vph)	0	138	0	79	0	0	360	0	0	488	0	0
Lane Group Flow (vph)	2241	267	4604	323	570	328	39	375	177	40	460	577
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	98.8	98.8	98.8	98.8	19.5	14.5	14.5	16.5	11.5	11.5	98.8	98.8
Effective Green, g (s)	98.8	98.8	98.8	98.8	19.5	14.5	14.5	16.5	11.5	11.5	98.8	98.8
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.13	0.10	0.10	0.11	0.08	0.08	0.66	0.66
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4100	1013	4100	1013	446	342	148	366	142	121	2196	2196
v/s Ratio Prot	0.36		c0.74		c0.17	0.09		0.11	c0.10		0.14	0.17
v/s Ratio Perm		0.17		0.21			0.03			0.03		
v/c Ratio	0.55	0.26	1.12	0.32	1.28	0.96	0.26	1.02	1.25	0.33	0.21	0.26
Uniform Delay, d1	13.7	10.6	25.6	11.1	65.2	67.5	62.8	66.8	69.2	65.6	10.1	10.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.19	2.75
Incremental Delay, d2	0.5	0.6	58.1	0.6	141.5	37.4	0.9	53.5	156.4	1.6	0.2	0.2
Delay (s)	14.1	11.2	83.7	11.7	206.8	104.9	63.7	120.2	225.6	67.3	32.5	29.3
Level of Service	B	B	F	B	F	F	E	F	F	E	C	C
Approach Delay (s)	13.7		77.9			137.0			111.6			
Approach LOS	B		E			F			F			

Intersection Summary			
HCM 2000 Control Delay	68.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	122.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	423	2435	4760	0	0	486
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	460	2647	5174	0	0	517
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	460	2647	5174	0	0	517
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	37.5	150.0	98.8			37.5
Effective Green, g (s)	37.5	150.0	98.8			37.5
Actuated g/C Ratio	0.25	1.00	0.66			0.25
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	833	6225	4100			676
v/s Ratio Prot	0.14	0.43	c0.83			
v/s Ratio Perm						c0.19
v/c Ratio	0.55	0.43	1.26			0.76
Uniform Delay, d1	48.9	0.0	25.6			52.2
Progression Factor	1.00	1.00	0.40			0.94
Incremental Delay, d2	0.8	0.2	118.1			2.5
Delay (s)	49.7	0.2	128.4			51.7
Level of Service	D	A	F			D
Approach Delay (s)		7.5	128.4	51.7		
Approach LOS		A	F	D		

Intersection Summary			
HCM 2000 Control Delay	81.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)				

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

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)												

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (ft)	4	5	6	8
Average Queue (ft)	0	0	0	0
95th Queue (ft)	0	0	0	0
Link Distance (ft)	632	632	632	632
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB	WB	WB	SB	SB	B55	B55
Directions Served	T	T	T	R	R	T	T
Maximum Queue (ft)	107	146	156	704	669	146	133
Average Queue (ft)	26	42	56	253	229	32	27
95th Queue (ft)	118	173	192	951	890	266	235
Link Distance (ft)	326	326	326	1135	1135	3562	3562
Upstream Blk Time (%)		0		8	3		
Queuing Penalty (veh)		0		0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB	NW
Directions Served	T	T	T	T	L	L	T	T	T	T	T	R
Maximum Queue (ft)	84	100	130	108	233	551	598	633	668	717	628	130
Average Queue (ft)	42	60	78	45	167	313	403	460	496	520	396	106
95th Queue (ft)	86	105	136	101	246	624	850	894	914	977	885	142
Link Distance (ft)	705	705	705	705			660	660	660	660	660	22
Upstream Blk Time (%)						0	3	6	18	26	10	61
Queuing Penalty (veh)						0	29	57	178	258	99	223
Storage Bay Dist (ft)					500	500						
Storage Blk Time (%)						0	11					
Queuing Penalty (veh)						0	58					

Intersection: 107: 360 WB LT & Route 360

Movement	B9
Directions Served	T
Maximum Queue (ft)	153
Average Queue (ft)	73
95th Queue (ft)	184
Link Distance (ft)	689
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	>	<	<
Maximum Queue (ft)	198	220	234	208	19	723	741	738	740	724	499	601
Average Queue (ft)	126	158	173	133	5	696	707	712	717	402	436	517
95th Queue (ft)	209	234	254	228	56	773	772	749	748	948	601	738
Link Distance (ft)	412	412	412	412		705	705	705	705	705		
Upstream Blk Time (%)						12	15	16	22	3		
Queuing Penalty (veh)						114	134	149	207	27		
Storage Bay Dist (ft)					250						390	390
Storage Blk Time (%)				0							48	61
Queuing Penalty (veh)				0							72	92

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	T	T	<	<	T	<	<	<	<
Maximum Queue (ft)	809	695	302	347	361	281	284	255	268
Average Queue (ft)	429	244	210	264	245	169	190	171	193
95th Queue (ft)	985	712	357	405	411	290	306	290	300
Link Distance (ft)	1190	1190		1170	1170	397	397	689	689
Upstream Blk Time (%)	3	0							
Queuing Penalty (veh)	0	0							
Storage Bay Dist (ft)			430						
Storage Blk Time (%)	0	0	0	3					
Queuing Penalty (veh)	0	1	0	4					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	WB	WB	WB	WB	SB	SB	B10	B10
Directions Served	L	L	T	T	T	T	R	R	T	T
Maximum Queue (ft)	265	283	335	328	290	275	93	110	150	148
Average Queue (ft)	173	205	255	259	220	223	88	104	88	87
95th Queue (ft)	271	289	344	343	300	279	99	113	172	166
Link Distance (ft)			412	412	412	412	11	11	397	397
Upstream Blk Time (%)			0	0	0		64	69		
Queuing Penalty (veh)			0	0	0		155	167		
Storage Bay Dist (ft)	500	500								
Storage Blk Time (%)										
Queuing Penalty (veh)										

Network Summary

Network wide Queuing Penalty: 2026

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/8/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	4513	0	112	1729	0	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4905	0	122	1879	0	89
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	4905	0	122	1879	0	89
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	99.3		27.0	140.0		27.0
Effective Green, g (s)	99.3		27.0	140.0		27.0
Actuated g/C Ratio	0.71		0.19	1.00		0.19
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4415		662	7329		310
v/s Ratio Prot	c0.79		0.04	0.26		c0.06
v/s Ratio Perm						
v/c Ratio	1.11		0.18	0.26		0.29
Uniform Delay, d1	20.4		47.3	0.0		48.3
Progression Factor	0.42		1.00	1.00		0.96
Incremental Delay, d2	50.3		0.1	0.1		0.5
Delay (s)	58.9		47.4	0.1		46.9
Level of Service	E		D	A		D
Approach Delay (s)	58.9			3.0	46.9	
Approach LOS	E			A	D	

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/8/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	4106	184	1564	165	61	56	82	407	102	312	337	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	4463	200	1700	179	66	61	89	442	111	339	366	122
RTOR Reduction (vph)	0	44	0	52	0	0	86	0	0	304	0	0
Lane Group Flow (vph)	4463	156	1700	127	66	61	3	442	111	35	366	122
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	99.3	99.3	99.3	99.3	5.9	5.0	5.0	15.5	14.6	14.6	99.3	99.3
Effective Green, g (s)	99.3	99.3	99.3	99.3	5.9	5.0	5.0	15.5	14.6	14.6	99.3	99.3
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.04	0.04	0.04	0.11	0.10	0.10	0.71	0.71
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4415	1090	4415	1090	144	126	54	369	194	165	2365	2365
v/s Ratio Prot	c0.72		0.27		0.02	0.02		c0.13	c0.06		0.11	0.04
v/s Ratio Perm		0.10		0.08			0.00			0.02		
v/c Ratio	1.01	0.14	0.39	0.12	0.46	0.48	0.06	1.20	0.57	0.21	0.15	0.05
Uniform Delay, d1	20.4	6.6	8.1	6.4	65.5	66.2	65.2	62.2	59.7	57.4	6.6	6.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.38	2.83
Incremental Delay, d2	13.6	0.2	0.2	0.2	2.3	2.9	0.5	112.4	4.0	0.7	0.1	0.0
Delay (s)	34.0	6.8	8.4	6.7	67.8	69.1	65.7	174.7	63.8	58.1	22.6	17.4
Level of Service	C	A	A	A	E	E	E	F	E	E	C	B
Approach Delay (s)	32.8		8.2			67.3			116.6			
Approach LOS	C		A			E			F			

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	337	4290	1625	0	0	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	366	4663	1766	0	0	332
RTOR Reduction (vph)	0	0	0	0	0	54
Lane Group Flow (vph)	366	4663	1766	0	0	278
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	27.0	140.0	99.3			27.0
Effective Green, g (s)	27.0	140.0	99.3			27.0
Actuated g/C Ratio	0.19	1.00	0.71			0.19
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	643	6225	4415			522
v/s Ratio Prot	0.11	0.75	0.28			
v/s Ratio Perm						0.10
v/c Ratio	0.57	0.75	0.40			0.53
Uniform Delay, d1	51.2	0.0	8.3			50.8
Progression Factor	1.00	1.00	0.30			0.86
Incremental Delay, d2	1.2	0.9	0.3			0.7
Delay (s)	52.4	0.9	2.7			44.4
Level of Service	D	A	A			D
Approach Delay (s)		4.6	2.7	44.4		
Approach LOS		A	A	D		

Intersection Summary			
HCM 2000 Control Delay	6.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

Movement	EB
Directions Served	T
Maximum Queue (ft)	5
Average Queue (ft)	1
95th Queue (ft)	7
Link Distance (ft)	290
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

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)	

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

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)	

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB	EB	EB	WB
Directions Served	T	T	R	T
Maximum Queue (ft)	63	331	71	4
Average Queue (ft)	9	66	10	1
95th Queue (ft)	132	391	149	9
Link Distance (ft)	660	660	660	326
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		3	0	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	NW	B9
Directions Served	T	T	T	T	L	L	R	T
Maximum Queue (ft)	688	719	730	737	64	100	96	12
Average Queue (ft)	358	595	676	668	30	64	45	1
95th Queue (ft)	717	844	787	800	71	105	95	12
Link Distance (ft)	705	705	705	705			22	689
Upstream Blk Time (%)	0	1	3	3			39	
Queuing Penalty (veh)	2	11	35	32			32	
Storage Bay Dist (ft)					500	500		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	<	<	T
Maximum Queue (ft)	441	454	458	454	411	104	114	138	161	14	68	68
Average Queue (ft)	408	434	437	431	175	66	75	93	105	3	39	35
95th Queue (ft)	467	458	458	454	508	117	120	147	172	15	76	71
Link Distance (ft)	412	412	412	412		705	705	705	705			1190
Upstream Blk Time (%)	7	22	29	20	0							
Queuing Penalty (veh)	75	235	316	212	0							
Storage Bay Dist (ft)					250					390	390	
Storage Blk Time (%)				60								
Queuing Penalty (veh)				110								

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	T	<	<	T	<	<	<	<
Maximum Queue (ft)	36	521	684	134	161	174	66	85
Average Queue (ft)	9	432	529	78	97	126	27	54
95th Queue (ft)	32	635	813	151	166	190	71	95
Link Distance (ft)	1190		1170	1170	397	397	689	689
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		430						
Storage Blk Time (%)		5	44					
Queuing Penalty (veh)		11	89					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	163	599	1444	1472	1481	1471	56	62	62	65	84	102
Average Queue (ft)	102	359	1182	1290	1321	1290	22	27	29	36	50	61
95th Queue (ft)	181	741	1808	1837	1836	1845	55	67	67	73	86	106
Link Distance (ft)			1427	1427	1427	1427	412	412	412	412	11	11
Upstream Blk Time (%)			4	28	57	57					33	48
Queuing Penalty (veh)			0	0	0	0					51	75
Storage Bay Dist (ft)	500	500										
Storage Blk Time (%)			8									
Queuing Penalty (veh)			27									

Intersection: 109: Route 360 & 360 EB LT

Movement	B10	B10
Directions Served	T	T
Maximum Queue (ft)	20	23
Average Queue (ft)	4	5
95th Queue (ft)	25	25
Link Distance (ft)	397	397
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1316

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/8/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	2508	0	553	4794	0	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2726	0	601	5211	0	458
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	2726	0	601	5211	0	456
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	97.8		38.5	150.0		38.5
Effective Green, g (s)	97.8		38.5	150.0		38.5
Actuated g/C Ratio	0.65		0.26	1.00		0.26
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4058		881	7329		413
v/s Ratio Prot	0.44		0.18	0.71		c0.28
v/s Ratio Perm						
v/c Ratio	0.67		0.68	0.71		1.10
Uniform Delay, d1	16.2		50.2	0.0		55.8
Progression Factor	0.36		1.00	1.00		0.93
Incremental Delay, d2	0.7		2.2	0.6		66.4
Delay (s)	6.5		52.4	0.6		118.0
Level of Service	A		D	A		F
Approach Delay (s)	6.5			6.0	118.0	
Approach LOS	A			A	F	

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/8/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2146	388	4408	386	602	347	421	362	171	511	440	553
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	2333	422	4791	420	654	377	458	393	186	555	478	601
RTOR Reduction (vph)	0	147	0	80	0	0	402	0	0	512	0	0
Lane Group Flow (vph)	2333	275	4791	340	654	377	56	393	186	43	478	601
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	97.8	97.8	97.8	97.8	20.5	18.5	18.5	13.5	11.5	11.5	97.8	97.8
Effective Green, g (s)	97.8	97.8	97.8	97.8	20.5	18.5	18.5	13.5	11.5	11.5	97.8	97.8
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.14	0.12	0.12	0.09	0.08	0.08	0.65	0.65
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4058	1002	4058	1002	469	436	189	300	142	121	2174	2174
v/s Ratio Prot	0.37		c0.77		c0.19	0.11		0.12	c0.10		0.14	0.18
v/s Ratio Perm		0.18		0.22			0.04			0.03		
v/c Ratio	0.57	0.27	1.18	0.34	1.39	0.86	0.30	1.31	1.31	0.35	0.22	0.28
Uniform Delay, d1	14.5	11.1	26.1	11.7	64.8	64.5	59.8	68.2	69.2	65.7	10.6	11.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.14	2.72
Incremental Delay, d2	0.5	0.6	83.2	0.6	190.2	16.2	0.9	161.4	180.8	1.8	0.2	0.2
Delay (s)	15.1	11.7	109.3	12.3	254.9	80.7	60.7	229.7	250.0	67.5	33.5	30.3
Level of Service	B	B	F	B	F	F	E	F	F	E	C	C
Approach Delay (s)	14.6		101.5			151.1			153.6			
Approach LOS	B		F			F			F			

Intersection Summary			
HCM 2000 Control Delay	85.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	128.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	440	2534	5010	0	0	511
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	478	2754	5446	0	0	544
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	478	2754	5446	0	0	544
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	38.5	150.0	97.8			38.5
Effective Green, g (s)	38.5	150.0	97.8			38.5
Actuated g/C Ratio	0.26	1.00	0.65			0.26
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	855	6225	4058			694
v/s Ratio Prot	0.14	0.44	c0.87			
v/s Ratio Perm						c0.20
v/c Ratio	0.56	0.44	1.34			0.78
Uniform Delay, d1	48.4	0.0	26.1			51.9
Progression Factor	1.00	1.00	0.42			0.95
Incremental Delay, d2	0.8	0.2	154.1			2.7
Delay (s)	49.2	0.2	165.0			51.9
Level of Service	D	A	F			D
Approach Delay (s)		7.5	165.0	51.9		
Approach LOS		A	F	D		

Intersection Summary			
HCM 2000 Control Delay	103.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	SB
Directions Served	R
Maximum Queue (ft)	11
Average Queue (ft)	2
95th Queue (ft)	29
Link Distance (ft)	1044
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	EB	WB	WB
Directions Served	T	T	R
Maximum Queue (ft)	9	133	133
Average Queue (ft)	2	39	40
95th Queue (ft)	24	296	301
Link Distance (ft)	326	632	632
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		1	1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB	WB	WB
Directions Served	T	T	T
Maximum Queue (ft)	28	42	36
Average Queue (ft)	6	9	7
95th Queue (ft)	51	66	53
Link Distance (ft)	326	326	326
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB	NW
Directions Served	T	T	T	T	L	L	T	T	T	T	T	R
Maximum Queue (ft)	58	99	178	87	244	305	413	602	594	566	403	125
Average Queue (ft)	37	58	82	50	180	208	143	214	261	243	152	112
95th Queue (ft)	66	114	241	102	264	345	483	645	712	701	513	134
Link Distance (ft)	705	705	705	705			660	660	660	660	660	22
Upstream Blk Time (%)			0				0	0	2	1		66
Queuing Penalty (veh)			0				2	5	17	13		277
Storage Bay Dist (ft)					500	500						
Storage Blk Time (%)							0					
Queuing Penalty (veh)							0					

Intersection: 107: 360 WB LT & Route 360

Movement	B9
Directions Served	T
Maximum Queue (ft)	191
Average Queue (ft)	96
95th Queue (ft)	227
Link Distance (ft)	689
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	>	<	<
Maximum Queue (ft)	187	214	237	218	54	698	721	718	721	547	481	538
Average Queue (ft)	129	153	172	138	13	527	561	589	594	172	371	419
95th Queue (ft)	215	241	268	237	80	845	858	864	852	653	533	587
Link Distance (ft)	412	412	412	412		705	705	705	705	705		
Upstream Blk Time (%)						7	9	9	12	2		
Queuing Penalty (veh)						66	82	90	114	18		
Storage Bay Dist (ft)					250						390	390
Storage Blk Time (%)				0							10	27
Queuing Penalty (veh)				2							18	47

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	T	T	<	<	T	<	<	<	<
Maximum Queue (ft)	425	209	338	406	241	264	273	266	280
Average Queue (ft)	215	165	256	317	188	177	191	169	186
95th Queue (ft)	518	246	381	452	335	288	307	310	317
Link Distance (ft)	1190	1190		1170	1170	397	397	689	689
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			430						
Storage Blk Time (%)	0	0	0	3					
Queuing Penalty (veh)	0	2	0	5					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	WB	WB	WB	WB	SB	SB	B10	B10
Directions Served	L	L	T	T	T	T	R	R	T	T
Maximum Queue (ft)	232	268	322	317	280	254	98	108	149	151
Average Queue (ft)	176	209	238	241	209	206	91	105	96	96
95th Queue (ft)	275	295	359	356	308	283	102	119	169	174
Link Distance (ft)			412	412	412	412	11	11	397	397
Upstream Blk Time (%)				0	0		62	68		
Queuing Penalty (veh)				1	0		159	175		
Storage Bay Dist (ft)	500	500								
Storage Blk Time (%)										
Queuing Penalty (veh)										

Network Summary

Network wide Queuing Penalty: 1096

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/8/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	4699	0	117	1800	0	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5108	0	127	1957	0	102
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	5108	0	127	1957	0	102
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	106.7		29.6	150.0		29.6
Effective Green, g (s)	106.7		29.6	150.0		29.6
Actuated g/C Ratio	0.71		0.20	1.00		0.20
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4428		677	7329		317
v/s Ratio Prot	c0.82		0.04	0.27		c0.06
v/s Ratio Perm						
v/c Ratio	1.15		0.19	0.27		0.32
Uniform Delay, d1	21.6		50.2	0.0		51.6
Progression Factor	0.43		1.00	1.00		0.91
Incremental Delay, d2	69.4		0.1	0.1		0.5
Delay (s)	78.6		50.3	0.1		47.4
Level of Service	E		D	A		D
Approach Delay (s)	78.6			3.2	47.4	
Approach LOS	E			A	D	

Intersection Summary			
HCM 2000 Control Delay	56.6	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)	20.2
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/8/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	4272	191	1628	172	70	64	94	427	107	328	351	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	4643	208	1770	187	76	70	102	464	116	357	382	127
RTOR Reduction (vph)	0	41	0	54	0	0	99	0	0	317	0	0
Lane Group Flow (vph)	4643	167	1770	133	76	70	3	464	116	40	382	127
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	106.7	106.7	106.7	106.7	6.3	5.1	5.1	18.0	16.8	16.8	106.7	106.7
Effective Green, g (s)	106.7	106.7	106.7	106.7	6.3	5.1	5.1	18.0	16.8	16.8	106.7	106.7
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.04	0.03	0.03	0.12	0.11	0.11	0.71	0.71
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4428	1094	4428	1094	144	120	52	400	208	177	2372	2372
v/s Ratio Prot	c0.75		0.28		0.02	0.02		c0.14	c0.06		0.11	0.04
v/s Ratio Perm		0.11		0.09			0.00			0.03		
v/c Ratio	1.05	0.15	0.40	0.12	0.53	0.58	0.07	1.16	0.56	0.23	0.16	0.05
Uniform Delay, d1	21.6	7.0	8.7	6.8	70.4	71.4	70.1	66.0	63.1	60.7	7.1	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.55	3.04
Incremental Delay, d2	26.2	0.2	0.3	0.2	3.5	7.0	0.5	96.4	3.2	0.7	0.1	0.0
Delay (s)	47.9	7.2	9.0	7.1	73.9	78.4	70.7	162.4	66.3	61.3	25.2	19.8
Level of Service	D	A	A	A	E	E	E	F	E	E	C	B
Approach Delay (s)	46.2		8.8			73.8			112.0			
Approach LOS	D		A			E			F			

Intersection Summary			
HCM 2000 Control Delay	44.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	351	4463	1698	0	0	328
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	382	4851	1846	0	0	349
RTOR Reduction (vph)	0	0	0	0	0	47
Lane Group Flow (vph)	382	4851	1846	0	0	302
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	29.6	150.0	106.7			29.6
Effective Green, g (s)	29.6	150.0	106.7			29.6
Actuated g/C Ratio	0.20	1.00	0.71			0.20
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	658	6225	4428			534
v/s Ratio Prot	0.11	0.78	0.30			
v/s Ratio Perm						0.11
v/c Ratio	0.58	0.78	0.42			0.57
Uniform Delay, d1	54.6	0.0	8.9			54.4
Progression Factor	1.00	1.00	0.28			0.87
Incremental Delay, d2	1.3	1.0	0.3			0.9
Delay (s)	55.9	1.0	2.8			48.5
Level of Service	E	A	A			D
Approach Delay (s)		5.0	2.8	48.5		
Approach LOS		A	A	D		

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	EB
Directions Served	R
Maximum Queue (ft)	55
Average Queue (ft)	8
95th Queue (ft)	116
Link Distance (ft)	632
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

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)

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB	EB
Directions Served	T	R
Maximum Queue (ft)	416	128
Average Queue (ft)	51	18
95th Queue (ft)	329	197
Link Distance (ft)	660	660
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	1	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NW	B9
Directions Served	T	T	T	T	L	L	T	T	R	T
Maximum Queue (ft)	656	711	723	727	90	106	18	18	102	40
Average Queue (ft)	303	576	676	673	43	71	14	11	57	9
95th Queue (ft)	648	850	779	792	95	118	84	77	117	47
Link Distance (ft)	705	705	705	705			660	660	22	689
Upstream Blk Time (%)	0	1	2	2					37	
Queuing Penalty (veh)	1	11	29	24					35	
Storage Bay Dist (ft)					500	500				
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	<	<	T
Maximum Queue (ft)	432	448	454	460	412	123	135	144	168	17	88	77
Average Queue (ft)	408	430	435	435	164	70	82	90	104	4	53	37
95th Queue (ft)	470	452	456	465	495	134	144	161	180	15	99	81
Link Distance (ft)	412	412	412	412		705	705	705	705			1190
Upstream Blk Time (%)	8	21	29	22	0							
Queuing Penalty (veh)	91	235	325	244	0							
Storage Bay Dist (ft)					250					390	390	
Storage Blk Time (%)				61								
Queuing Penalty (veh)				117								

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	T	<	<	T	<	<	<	<
Maximum Queue (ft)	48	507	684	141	188	203	80	88
Average Queue (ft)	18	411	523	78	103	119	31	52
95th Queue (ft)	52	660	883	148	211	225	82	106
Link Distance (ft)	1190		1170	1170	397	397	689	689
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		430						
Storage Blk Time (%)		13	42					
Queuing Penalty (veh)		28	89					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB
Directions Served	L	L	T	T	T	T	T	T	T	T	R	R
Maximum Queue (ft)	175	556	1455	1476	1471	1476	63	64	76	76	77	86
Average Queue (ft)	99	295	1288	1367	1385	1374	21	27	34	33	49	54
95th Queue (ft)	176	670	1703	1723	1717	1738	60	65	81	74	84	91
Link Distance (ft)			1427	1427	1427	1427	412	412	412	412	11	11
Upstream Blk Time (%)			4	33	62	61					38	46
Queuing Penalty (veh)			0	0	0	0					62	76
Storage Bay Dist (ft)	500	500										
Storage Blk Time (%)			7									
Queuing Penalty (veh)			26									

Intersection: 109: Route 360 & 360 EB LT

Movement	B10	B10
Directions Served	T	T
Maximum Queue (ft)	10	17
Average Queue (ft)	1	2
95th Queue (ft)	12	15
Link Distance (ft)	397	397
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1393

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/8/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	2614	0	575	4988	0	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.86		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	6225		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	6225		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2841	0	625	5422	0	525
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	2841	0	625	5422	0	524
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	95.8		40.5	150.0		40.5
Effective Green, g (s)	95.8		40.5	150.0		40.5
Actuated g/C Ratio	0.64		0.27	1.00		0.27
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	3975		926	7329		434
v/s Ratio Prot	0.46		0.18	0.74		c0.32
v/s Ratio Perm						
v/c Ratio	0.71		0.67	0.74		1.21
Uniform Delay, d1	18.0		48.9	0.0		54.8
Progression Factor	0.36		1.00	1.00		0.93
Incremental Delay, d2	0.8		2.0	0.7		105.3
Delay (s)	7.2		50.8	0.7		156.4
Level of Service	A		D	A		F
Approach Delay (s)	7.2			5.9		156.4
Approach LOS	A			A		F

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/8/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2233	404	4587	401	691	398	483	381	180	537	458	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.86	1.00	0.86	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	6225	1538	6225	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	2427	439	4986	436	751	433	525	414	196	584	498	625
RTOR Reduction (vph)	0	159	0	79	0	0	453	0	0	539	0	0
Lane Group Flow (vph)	2427	280	4986	357	751	433	72	414	196	45	498	625
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	95.8	95.8	95.8	95.8	22.5	20.5	20.5	13.5	11.5	11.5	95.8	95.8
Effective Green, g (s)	95.8	95.8	95.8	95.8	22.5	20.5	20.5	13.5	11.5	11.5	95.8	95.8
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.15	0.14	0.14	0.09	0.08	0.08	0.64	0.64
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3975	982	3975	982	514	483	210	300	142	121	2129	2129
v/s Ratio Prot	0.39		c0.80		c0.22	0.12		0.12	c0.11		0.15	0.19
v/s Ratio Perm		0.18		0.23			0.05			0.03		
v/c Ratio	0.61	0.29	1.25	0.36	1.46	0.90	0.34	1.38	1.38	0.37	0.23	0.29
Uniform Delay, d1	16.1	12.0	27.1	12.7	63.8	63.7	58.6	68.2	69.2	65.8	11.5	12.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.06	2.66
Incremental Delay, d2	0.6	0.7	115.9	0.7	218.0	18.9	1.0	190.6	208.8	1.9	0.2	0.3
Delay (s)	16.7	12.6	143.0	13.4	281.8	82.6	59.6	258.8	278.1	67.7	35.4	32.3
Level of Service	B	B	F	B	F	F	E	F	F	E	D	C
Approach Delay (s)	16.1		132.6			163.1			168.5			
Approach LOS	B		F			F			F			

Intersection Summary			
HCM 2000 Control Delay	104.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	134.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	458	2637	5278	0	0	537
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.86	0.86			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	6225	6225			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	6225	6225			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	498	2866	5737	0	0	571
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	498	2866	5737	0	0	571
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	40.5	150.0	95.8			40.5
Effective Green, g (s)	40.5	150.0	95.8			40.5
Actuated g/C Ratio	0.27	1.00	0.64			0.27
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	900	6225	3975			730
v/s Ratio Prot	0.15	0.46	c0.92			
v/s Ratio Perm						c0.21
v/c Ratio	0.55	0.46	1.44			0.78
Uniform Delay, d1	47.0	0.0	27.1			50.7
Progression Factor	1.00	1.00	0.43			0.95
Incremental Delay, d2	0.7	0.2	199.6			2.5
Delay (s)	47.7	0.2	211.4			50.7
Level of Service	D	A	F			D
Approach Delay (s)		7.3	211.4	50.7		
Approach LOS		A	F	D		

Intersection Summary			
HCM 2000 Control Delay	130.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	106.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

Movement	WB	WB	WB
Directions Served	T	T	T
Maximum Queue (ft)	28	50	59
Average Queue (ft)	8	16	19
95th Queue (ft)	78	143	155
Link Distance (ft)	1030	1030	1030
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	WB	WB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	101	137	172	282
Average Queue (ft)	35	46	61	64
95th Queue (ft)	172	204	241	287
Link Distance (ft)	290	290	290	1044
Upstream Blk Time (%)	1	2	5	
Queuing Penalty (veh)	9	19	46	
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (ft)	505	520	548	495
Average Queue (ft)	299	328	359	218
95th Queue (ft)	689	740	779	739
Link Distance (ft)	632	632	632	632
Upstream Blk Time (%)	1	3	15	11
Queuing Penalty (veh)	12	27	132	97
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB	WB	WB	SB	SB	B55	B55
Directions Served	T	T	T	R	R	T	T
Maximum Queue (ft)	352	362	337	1237	1234	1806	1805
Average Queue (ft)	308	321	322	1190	1180	796	779
95th Queue (ft)	401	399	373	1355	1350	1830	1829
Link Distance (ft)	326	326	326	1135	1135	3562	3562
Upstream Blk Time (%)	4	7	10	83	61		
Queuing Penalty (veh)	42	77	112	0	0		
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB	NW
Directions Served	T	T	T	T	L	L	T	T	T	T	T	R
Maximum Queue (ft)	98	118	141	102	221	659	720	725	741	835	804	143
Average Queue (ft)	48	63	81	59	146	601	699	709	730	813	739	112
95th Queue (ft)	90	118	141	111	229	845	724	728	745	838	849	150
Link Distance (ft)	705	705	705	705			660	660	660	660	660	22
Upstream Blk Time (%)						0	20	32	64	77	29	54
Queuing Penalty (veh)						0	216	339	676	822	312	260
Storage Bay Dist (ft)					500	500						
Storage Blk Time (%)						0	40					
Queuing Penalty (veh)						0	227					

Intersection: 107: 360 WB LT & Route 360

Movement	B9
Directions Served	T
Maximum Queue (ft)	283
Average Queue (ft)	145
95th Queue (ft)	387
Link Distance (ft)	689
Upstream Blk Time (%)	1
Queuing Penalty (veh)	4
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	>	T	T	T	T	>	<	<
Maximum Queue (ft)	208	241	260	245	75	719	731	736	742	721	514	640
Average Queue (ft)	154	179	188	165	12	712	713	718	718	402	511	637
95th Queue (ft)	216	252	274	266	79	721	730	739	741	963	527	657
Link Distance (ft)	412	412	412	412		705	705	705	705	705		
Upstream Blk Time (%)						20	22	24	28	6		
Queuing Penalty (veh)						199	219	243	283	61		
Storage Bay Dist (ft)					250						390	390
Storage Blk Time (%)				0							84	91
Queuing Penalty (veh)				2							168	182

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	T	T	>	<	<	T	<	<	<	<
Maximum Queue (ft)	1221	1212	8	536	804	561	270	290	251	267
Average Queue (ft)	1145	1049	2	456	600	349	182	207	178	194
95th Queue (ft)	1459	1532	21	669	1026	660	278	300	277	292
Link Distance (ft)	1190	1190			1170	1170	397	397	689	689
Upstream Blk Time (%)	61	10			1	0				
Queuing Penalty (veh)	0	0			0	0				
Storage Bay Dist (ft)			250	430						
Storage Blk Time (%)	0	1		22	55					
Queuing Penalty (veh)	0	5		42	104					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	WB	WB	WB	WB	SB	SB	B10	B10
Directions Served	L	L	T	T	T	T	R	R	T	T
Maximum Queue (ft)	235	279	309	327	302	295	100	118	156	151
Average Queue (ft)	164	206	261	269	236	238	90	106	97	97
95th Queue (ft)	248	294	332	346	309	301	107	119	178	168
Link Distance (ft)			412	412	412	412	11	11	397	397
Upstream Blk Time (%)				0	0		60	67		
Queuing Penalty (veh)				0	0		162	180		
Storage Bay Dist (ft)	500	500								
Storage Blk Time (%)										
Queuing Penalty (veh)										

Network Summary

Network wide Queuing Penalty: 5279

C-14 – Supplemental Synchro/SimTraffic Results – US 360 at Old Hundred Road/Commonwealth Centre Parkway – DLT with Additional Capacity, without Bailey Bridge Connector Improvements

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	EB	EB	WB	WB	SB
Directions Served	T	R	T	T	R
Maximum Queue (ft)	260	194	31	140	1090
Average Queue (ft)	37	28	7	52	861
95th Queue (ft)	286	244	46	135	1442
Link Distance (ft)	632	632	290	290	1044
Upstream Blk Time (%)	0	0			22
Queuing Penalty (veh)	1	0			0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	EB	WB	WB	WB	NB
Directions Served	T	T	T	R	R
Maximum Queue (ft)	68	245	679	704	8
Average Queue (ft)	14	44	473	415	2
95th Queue (ft)	75	304	966	960	16
Link Distance (ft)	326	632	632	632	948
Upstream Blk Time (%)		0	5	3	
Queuing Penalty (veh)		0	51	35	
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	5	20
Average Queue (ft)	1	4
95th Queue (ft)	10	41
Link Distance (ft)	326	326
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	L	L	T	T	T	T	T
Maximum Queue (ft)	91	172	211	103	62	268	329	216	342	343	460	66
Average Queue (ft)	46	71	107	51	18	198	227	38	78	85	74	9
95th Queue (ft)	95	191	231	106	61	267	339	266	415	452	414	138
Link Distance (ft)	706	706	706	706	706			658	658	658	658	658
Upstream Blk Time (%)								0	0	1	0	0
Queuing Penalty (veh)								1	1	7	3	0
Storage Bay Dist (ft)						500	500					
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 107: 360 WB LT & Route 360

Movement	NW	B9
Directions Served	R	T
Maximum Queue (ft)	119	173
Average Queue (ft)	99	82
95th Queue (ft)	125	185
Link Distance (ft)	10	668
Upstream Blk Time (%)	55	
Queuing Penalty (veh)	190	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	T	>	T	T	T	T	T	<
Maximum Queue (ft)	161	210	226	196	102	85	399	409	420	443	445	509
Average Queue (ft)	101	135	164	128	35	24	311	329	358	377	371	429
95th Queue (ft)	178	219	245	220	102	83	437	453	475	485	493	576
Link Distance (ft)	367	367	367	367	367		706	706	706	706	706	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)						250						390
Storage Blk Time (%)												31
Queuing Penalty (veh)												45

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	<	T	T	<	<	T	<	<	<	<
Maximum Queue (ft)	606	628	397	291	340	358	273	294	304	312
Average Queue (ft)	493	279	208	214	274	283	180	213	224	247
95th Queue (ft)	675	760	581	320	371	476	300	307	339	321
Link Distance (ft)		1176	1176		1171	1171	350	350	668	668
Upstream Blk Time (%)							0	0		
Queuing Penalty (veh)							0	0		
Storage Bay Dist (ft)	390			430						
Storage Blk Time (%)	52	0	1		0					
Queuing Penalty (veh)	75	0	2		0					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	WB	WB	WB	WB	WB	SB	SB	B10	B10
Directions Served	L	L	T	T	T	T	T	R	R	T	T
Maximum Queue (ft)	244	276	211	213	200	186	188	101	119	170	177
Average Queue (ft)	171	204	155	152	140	127	127	94	111	110	110
95th Queue (ft)	257	283	251	248	226	220	218	111	123	233	236
Link Distance (ft)			367	367	367	367	367	14	14	350	350
Upstream Blk Time (%)					0	0	0	72	79	0	0
Queuing Penalty (veh)					0	0	0	187	204	0	0
Storage Bay Dist (ft)	500	500									
Storage Blk Time (%)											
Queuing Penalty (veh)											

Network Summary

Network wide Queuing Penalty: 804

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/19/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	2624	0	581	5040	0	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.81		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	7329		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	7329		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2852	0	632	5478	0	378
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	2852	0	632	5478	0	377
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	96.8		39.5	150.0		39.5
Effective Green, g (s)	96.8		39.5	150.0		39.5
Actuated g/C Ratio	0.65		0.26	1.00		0.26
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4729		904	7329		424
v/s Ratio Prot	0.39		0.18	0.75		c0.23
v/s Ratio Perm						
v/c Ratio	0.60		0.70	0.75		0.89
Uniform Delay, d1	15.4		49.9	0.0		53.1
Progression Factor	0.35		1.00	1.00		0.91
Incremental Delay, d2	0.5		2.4	0.7		13.3
Delay (s)	5.8		52.3	0.7		61.8
Level of Service	A		D	A		E
Approach Delay (s)	5.8			6.1	61.8	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/19/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2256	408	4635	405	498	287	348	368	174	518	462	581
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.81	1.00	0.81	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	7329	1538	7329	1538	3433	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	7329	1538	7329	1538	3433	3539	1538	3335	1863	1583	3335	3335
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)	2452	443	5038	440	541	312	378	400	189	563	502	632
RTOR Reduction (vph)	0	157	0	93	0	0	340	0	0	512	0	0
Lane Group Flow (vph)	2452	286	5038	347	541	312	38	400	189	51	502	632
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	96.8	96.8	96.8	96.8	19.5	14.9	14.9	18.1	13.5	13.5	96.8	96.8
Effective Green, g (s)	96.8	96.8	96.8	96.8	19.5	14.9	14.9	18.1	13.5	13.5	96.8	96.8
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.13	0.10	0.10	0.12	0.09	0.09	0.65	0.65
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4729	992	4729	992	446	351	152	402	167	142	2152	2152
v/s Ratio Prot	0.33		c0.69		c0.16	0.09		0.12	c0.10		0.15	0.19
v/s Ratio Perm		0.19		0.23			0.02			0.03		
v/c Ratio	0.52	0.29	1.07	0.35	1.21	0.89	0.25	1.00	1.13	0.36	0.23	0.29
Uniform Delay, d1	14.2	11.6	26.6	12.2	65.2	66.7	62.4	65.9	68.2	64.2	11.1	11.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.05	2.67
Incremental Delay, d2	0.4	0.7	33.0	0.6	115.0	22.8	0.9	43.3	109.4	1.5	0.2	0.2
Delay (s)	14.6	12.3	59.6	12.8	180.3	89.5	63.2	109.2	177.7	65.7	34.1	31.4
Level of Service	B	B	E	B	F	F	E	F	F	E	C	C
Approach Delay (s)	14.2		55.8			121.3			99.2			
Approach LOS	B		E			F			F			

Intersection Summary			
HCM 2000 Control Delay	54.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	116.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	462	2664	5133	0	0	518
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.81	0.81			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	7329	7329			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	7329	7329			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	502	2896	5579	0	0	551
RTOR Reduction (vph)	0	0	0	0	0	275
Lane Group Flow (vph)	502	2896	5579	0	0	276
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						4
Actuated Green, G (s)	39.5	150.0	96.8			13.5
Effective Green, g (s)	39.5	150.0	96.8			13.5
Actuated g/C Ratio	0.26	1.00	0.65			0.09
Clearance Time (s)			7.2			6.5
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)	878	7329	4729			243
v/s Ratio Prot	c0.15	0.40	c0.76			
v/s Ratio Perm						c0.10
v/c Ratio	0.57	0.40	1.18			1.14
Uniform Delay, d1	47.9	0.0	26.6			68.2
Progression Factor	1.00	1.00	0.35			1.07
Incremental Delay, d2	0.9	0.2	81.1			83.4
Delay (s)	48.8	0.2	90.4			156.3
Level of Service	D	A	F			F
Approach Delay (s)		7.3	90.4	156.3		
Approach LOS		A	F	F		

Intersection Summary			
HCM 2000 Control Delay	64.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	WB	WB	SB
Directions Served	T	T	T	R
Maximum Queue (ft)	3	50	110	1092
Average Queue (ft)	0	5	42	909
95th Queue (ft)	7	44	119	1412
Link Distance (ft)	290	290	290	1044
Upstream Blk Time (%)				28
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	EB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (ft)	46	310	679	704
Average Queue (ft)	10	62	432	421
95th Queue (ft)	54	369	947	972
Link Distance (ft)	326	632	632	632
Upstream Blk Time (%)		0	4	3
Queuing Penalty (veh)		1	39	35
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	3	3
Average Queue (ft)	0	0
95th Queue (ft)	0	6
Link Distance (ft)	326	326
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	L	L	T	T	T	T	T
Maximum Queue (ft)	83	127	222	118	68	266	275	155	306	522	328	122
Average Queue (ft)	42	66	112	55	21	196	217	22	53	121	83	26
95th Queue (ft)	86	134	252	128	67	269	281	202	336	540	438	225
Link Distance (ft)	706	706	706	706	706			658	658	658	658	658
Upstream Blk Time (%)			0						0	0	0	
Queuing Penalty (veh)			0						0	5	2	
Storage Bay Dist (ft)						500	500					
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 107: 360 WB LT & Route 360

Movement	NW	B9
Directions Served	R	T
Maximum Queue (ft)	120	202
Average Queue (ft)	102	93
95th Queue (ft)	128	213
Link Distance (ft)	10	668
Upstream Blk Time (%)	54	
Queuing Penalty (veh)	190	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	T	>	T	T	T	T	T	<
Maximum Queue (ft)	168	194	238	210	105	96	363	388	390	405	412	394
Average Queue (ft)	103	139	155	119	35	22	264	286	304	327	323	306
95th Queue (ft)	185	223	257	215	106	85	388	408	408	431	443	437
Link Distance (ft)	367	367	367	367	367		706	706	706	706	706	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)						250						390
Storage Blk Time (%)												3
Queuing Penalty (veh)												4

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	NB	NB	SB	SB	SB	SE	SE	NW	NW	
Directions Served	<	<	T	T	<	<	T	<	<	<	<	
Maximum Queue (ft)	504	551	363	251	450	536	228	270	279	278	303	
Average Queue (ft)	395	435	150	142	344	405	163	171	204	196	218	
95th Queue (ft)	541	574	296	223	541	625	264	285	297	306	337	
Link Distance (ft)			1176	1176		1171	1171	350	350	668	668	
Upstream Blk Time (%)								0	0			
Queuing Penalty (veh)								0	0			
Storage Bay Dist (ft)	390	390			430							
Storage Blk Time (%)	16	39	0	0	5	18						
Queuing Penalty (veh)	23	56	0	2	9	34						

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	WB	WB	WB	WB	WB	SB	SB	B10	B10	
Directions Served	L	L	T	T	T	T	T	R	R	T	T	
Maximum Queue (ft)	236	261	170	139	160	141	135	107	113	181	185	
Average Queue (ft)	176	207	92	85	98	84	90	96	110	117	117	
95th Queue (ft)	257	277	175	155	167	145	144	110	116	222	216	
Link Distance (ft)			367	367	367	367	367	14	14	350	350	
Upstream Blk Time (%)								75	77			
Queuing Penalty (veh)								194	199			
Storage Bay Dist (ft)	500	500										
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 792

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/19/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	2624	0	581	5040	0	348
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.81		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	7329		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	7329		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2852	0	632	5478	0	378
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	2852	0	632	5478	0	376
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	99.8		36.5	150.0		36.5
Effective Green, g (s)	99.8		36.5	150.0		36.5
Actuated g/C Ratio	0.67		0.24	1.00		0.24
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4876		835	7329		392
v/s Ratio Prot	0.39		0.18	0.75		c0.23
v/s Ratio Perm						
v/c Ratio	0.58		0.76	0.75		0.96
Uniform Delay, d1	13.8		52.6	0.0		56.0
Progression Factor	0.36		1.00	1.00		0.92
Incremental Delay, d2	0.4		4.0	0.7		25.0
Delay (s)	5.4		56.6	0.7		76.5
Level of Service	A		E	A		E
Approach Delay (s)	5.4			6.5	76.5	
Approach LOS	A			A	E	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/19/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2256	408	4635	405	498	287	348	368	174	518	462	581
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.81	1.00	0.81	1.00	0.94	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
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)	2452	443	5038	440	541	312	378	400	189	563	502	632
RTOR Reduction (vph)	0	148	0	93	0	0	343	0	0	501	0	0
Lane Group Flow (vph)	2452	295	5038	347	541	312	35	400	189	62	502	632
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	99.8	99.8	99.8	99.8	13.5	13.7	13.7	16.3	16.5	16.5	99.8	99.8
Effective Green, g (s)	99.8	99.8	99.8	99.8	13.5	13.7	13.7	16.3	16.5	16.5	99.8	99.8
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.09	0.09	0.09	0.11	0.11	0.11	0.67	0.67
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4876	1023	4876	1023	449	323	140	362	204	174	2218	2218
v/s Ratio Prot	0.33		c0.69		0.11	0.09		c0.12	c0.10		0.15	0.19
v/s Ratio Perm		0.19		0.23			0.02			0.04		
v/c Ratio	0.50	0.29	1.03	0.34	1.20	0.97	0.25	1.10	0.93	0.36	0.23	0.28
Uniform Delay, d1	12.6	10.4	25.1	10.8	68.2	67.9	63.4	66.8	66.1	61.8	9.9	10.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.17	2.74
Incremental Delay, d2	0.3	0.7	20.4	0.6	111.7	40.6	0.9	78.7	42.5	1.3	0.2	0.2
Delay (s)	13.0	11.1	45.5	11.4	179.9	108.5	64.3	145.5	108.6	63.1	31.5	28.6
Level of Service	B	B	D	B	F	F	E	F	F	E	C	C
Approach Delay (s)	12.7		42.7			126.3			99.2			
Approach LOS	B		D			F			F			

Intersection Summary			
HCM 2000 Control Delay	48.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	111.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	462	2664	5133	0	0	518
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.81	0.81			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	7329	7329			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	7329	7329			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	502	2896	5579	0	0	551
RTOR Reduction (vph)	0	0	0	0	0	204
Lane Group Flow (vph)	502	2896	5579	0	0	347
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						4
Actuated Green, G (s)	36.5	150.0	99.8			16.5
Effective Green, g (s)	36.5	150.0	99.8			16.5
Actuated g/C Ratio	0.24	1.00	0.67			0.11
Clearance Time (s)			7.2			6.5
Vehicle Extension (s)			3.0			3.0
Lane Grp Cap (vph)	811	7329	4876			297
v/s Ratio Prot	c0.15	0.40	c0.76			
v/s Ratio Perm						c0.13
v/c Ratio	0.62	0.40	1.14			1.17
Uniform Delay, d1	50.6	0.0	25.1			66.8
Progression Factor	1.00	1.00	0.35			1.01
Incremental Delay, d2	1.4	0.2	65.1			93.8
Delay (s)	52.0	0.2	74.0			161.2
Level of Service	D	A	E			F
Approach Delay (s)		7.8	74.0	161.2		
Approach LOS		A	E	F		

Intersection Summary			
HCM 2000 Control Delay	55.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

C-15 – Supplemental Synchro/SimTraffic Results – US 360 at Old Hundred Road/Commonwealth Centre Parkway – DLT with Additional Capacity, with Bailey Bridge Connector Improvements

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	SB
Directions Served	T	R
Maximum Queue (ft)	3	10
Average Queue (ft)	0	1
95th Queue (ft)	6	15
Link Distance (ft)	290	1044
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	WB	WB	WB
Directions Served	T	T	R
Maximum Queue (ft)	60	129	136
Average Queue (ft)	9	27	19
95th Queue (ft)	126	240	206
Link Distance (ft)	632	632	632
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

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)

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NW
Directions Served	T	T	T	T	T	L	L	T	T	T	T	R
Maximum Queue (ft)	93	121	187	85	46	269	290	163	117	136	5	128
Average Queue (ft)	48	62	83	37	11	198	218	30	10	23	1	100
95th Queue (ft)	95	122	210	80	43	281	308	177	79	212	10	135
Link Distance (ft)	706	706	706	706	706			658	658	658	658	10
Upstream Blk Time (%)										0		58
Queuing Penalty (veh)										1		245
Storage Bay Dist (ft)						500	500					
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 107: 360 WB LT & Route 360

Movement	B9
Directions Served	T
Maximum Queue (ft)	258
Average Queue (ft)	131
95th Queue (ft)	300
Link Distance (ft)	669
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	T	>	T	T	T	T	T	<
Maximum Queue (ft)	156	187	197	161	71	68	346	373	374	414	392	436
Average Queue (ft)	95	120	130	93	26	19	258	287	297	319	313	363
95th Queue (ft)	168	190	212	175	73	70	368	398	407	447	435	508
Link Distance (ft)	363	363	363	363	363		706	706	706	706	706	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)						250						390
Storage Blk Time (%)												15
Queuing Penalty (veh)												27

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	<	<	T	T	>	<	<	T	<	<	<	<
Maximum Queue (ft)	536	605	764	664	42	338	389	310	260	284	260	280
Average Queue (ft)	472	528	365	290	24	250	314	221	170	198	193	207
95th Queue (ft)	625	700	883	672	186	385	428	385	264	290	288	308
Link Distance (ft)			1178	1178			1171	1171	344	344	669	669
Upstream Blk Time (%)			1						0	0		
Queuing Penalty (veh)			0						0	0		
Storage Bay Dist (ft)	390	390			250	430						
Storage Blk Time (%)	39	66	2	11			1					
Queuing Penalty (veh)	67	115	14	48			1					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	WB	WB	WB	WB	WB	SB	SB	B10	B10
Directions Served	L	L	T	T	T	T	T	R	R	T	T
Maximum Queue (ft)	224	262	199	201	172	153	140	97	116	169	178
Average Queue (ft)	165	203	124	119	111	102	96	89	106	98	107
95th Queue (ft)	244	276	215	206	176	159	146	103	116	196	191
Link Distance (ft)			363	363	363	363	363	10	10	344	344
Upstream Blk Time (%)								62	69		
Queuing Penalty (veh)								159	176		
Storage Bay Dist (ft)	500	500									
Storage Blk Time (%)											
Queuing Penalty (veh)											

Network Summary

Network wide Queuing Penalty: 854

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/19/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	2508	0	553	4794	0	421
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.81		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	7329		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	7329		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2726	0	601	5211	0	458
RTOR Reduction (vph)	0	0	0	0	0	3
Lane Group Flow (vph)	2726	0	601	5211	0	455
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	99.8		36.5	150.0		36.5
Effective Green, g (s)	99.8		36.5	150.0		36.5
Actuated g/C Ratio	0.67		0.24	1.00		0.24
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4876		835	7329		392
v/s Ratio Prot	0.37		0.18	0.71		c0.28
v/s Ratio Perm						
v/c Ratio	0.56		0.72	0.71		1.16
Uniform Delay, d1	13.4		52.1	0.0		56.8
Progression Factor	0.36		1.00	1.00		0.94
Incremental Delay, d2	0.4		3.0	0.6		87.4
Delay (s)	5.2		55.1	0.6		140.5
Level of Service	A		E	A		F
Approach Delay (s)	5.2			6.2	140.5	
Approach LOS	A			A	F	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/19/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2146	388	4408	386	602	347	421	362	171	511	440	553
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.81	1.00	0.81	1.00	0.94	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
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)	2333	422	4791	420	654	377	458	393	186	555	478	601
RTOR Reduction (vph)	0	141	0	94	0	0	414	0	0	505	0	0
Lane Group Flow (vph)	2333	281	4791	326	654	377	44	393	186	50	478	601
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	99.8	99.8	99.8	99.8	16.5	14.5	14.5	15.5	13.5	13.5	99.8	99.8
Effective Green, g (s)	99.8	99.8	99.8	99.8	16.5	14.5	14.5	15.5	13.5	13.5	99.8	99.8
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.11	0.10	0.10	0.10	0.09	0.09	0.67	0.67
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4876	1023	4876	1023	548	342	148	344	167	142	2218	2218
v/s Ratio Prot	0.32		c0.65		c0.13	c0.11		0.12	0.10		0.14	0.18
v/s Ratio Perm		0.18		0.21			0.03			0.03		
v/c Ratio	0.48	0.27	0.98	0.32	1.19	1.10	0.30	1.14	1.11	0.35	0.22	0.27
Uniform Delay, d1	12.3	10.3	24.3	10.7	66.8	67.8	63.0	67.2	68.2	64.1	9.8	10.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.19	2.76
Incremental Delay, d2	0.3	0.6	7.4	0.6	104.0	79.1	1.1	93.0	103.4	1.5	0.2	0.2
Delay (s)	12.6	10.9	31.6	11.2	170.8	146.8	64.2	160.3	171.7	65.6	31.5	28.5
Level of Service	B	B	C	B	F	F	E	F	F	E	C	C
Approach Delay (s)	12.4		30.0			131.9			115.8			
Approach LOS	B		C			F			F			

Intersection Summary			
HCM 2000 Control Delay	47.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	110.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	440	2534	5010	0	0	511
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.81	0.81			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	7329	7329			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	7329	7329			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	478	2754	5446	0	0	544
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	478	2754	5446	0	0	544
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	36.5	150.0	99.8			36.5
Effective Green, g (s)	36.5	150.0	99.8			36.5
Actuated g/C Ratio	0.24	1.00	0.67			0.24
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	811	7329	4876			658
v/s Ratio Prot	0.14	0.38	c0.74			
v/s Ratio Perm						c0.20
v/c Ratio	0.59	0.38	1.12			0.83
Uniform Delay, d1	50.1	0.0	25.1			53.8
Progression Factor	1.00	1.00	0.40			0.94
Incremental Delay, d2	1.1	0.1	52.9			4.3
Delay (s)	51.2	0.1	62.9			55.0
Level of Service	D	A	E			D
Approach Delay (s)		7.7	62.9	55.0		
Approach LOS		A	E	D		

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

Movement	WB	SB
Directions Served	T	R
Maximum Queue (ft)	15	7
Average Queue (ft)	3	1
95th Queue (ft)	36	16
Link Distance (ft)	290	1044
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	60	129
Average Queue (ft)	9	28
95th Queue (ft)	126	240
Link Distance (ft)	632	632
Upstream Blk Time (%)		0
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	6	13
Average Queue (ft)	0	3
95th Queue (ft)	0	21
Link Distance (ft)	326	326
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	WB
Directions Served	T	T	T	T	T	L	L	T	T	T	T	T
Maximum Queue (ft)	98	138	126	101	49	282	291	226	418	543	401	142
Average Queue (ft)	49	62	75	48	13	204	225	50	109	152	108	39
95th Queue (ft)	103	156	133	107	47	285	297	246	457	595	472	194
Link Distance (ft)	706	706	706	706	706			658	658	658	658	658
Upstream Blk Time (%)								0	0	1	0	
Queuing Penalty (veh)								0	1	10	3	
Storage Bay Dist (ft)						500	500					
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 107: 360 WB LT & Route 360

Movement	NW	B9
Directions Served	R	T
Maximum Queue (ft)	120	353
Average Queue (ft)	103	207
95th Queue (ft)	122	395
Link Distance (ft)	10	669
Upstream Blk Time (%)	61	
Queuing Penalty (veh)	292	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	T	>	T	T	T	T	T	<
Maximum Queue (ft)	183	194	204	148	94	98	542	559	580	597	601	469
Average Queue (ft)	124	132	140	98	30	25	462	479	493	512	511	419
95th Queue (ft)	196	208	218	174	92	95	732	748	751	758	762	514
Link Distance (ft)	363	363	363	363	363		706	706	706	706	706	
Upstream Blk Time (%)							1	1	2	2	1	
Queuing Penalty (veh)							7	12	14	18	12	
Storage Bay Dist (ft)						250						390
Storage Blk Time (%)												25
Queuing Penalty (veh)												49

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	<	<	T	T	>	<	<	T	<	<	<	<
Maximum Queue (ft)	556	639	1009	929	255	333	380	296	262	283	323	323
Average Queue (ft)	511	581	646	574	145	238	295	220	172	201	234	253
95th Queue (ft)	615	713	1198	1109	476	374	428	404	295	302	348	345
Link Distance (ft)			1178	1178			1171	1171	344	344	669	669
Upstream Blk Time (%)			10	1					0	0		
Queuing Penalty (veh)			0	0					0	0		
Storage Bay Dist (ft)	390	390			250	430						
Storage Blk Time (%)	58	82	17	51		0	4					
Queuing Penalty (veh)	115	162	121	244		1	7					

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	WB	WB	WB	WB	WB	SB	SB	B10	B10
Directions Served	L	L	T	T	T	T	T	R	R	T	T
Maximum Queue (ft)	233	258	282	306	283	220	213	96	106	181	181
Average Queue (ft)	159	196	212	222	204	172	173	89	104	95	99
95th Queue (ft)	244	279	317	334	304	245	239	104	113	187	190
Link Distance (ft)			363	363	363	363	363	10	10	344	344
Upstream Blk Time (%)				0	0			61	65		
Queuing Penalty (veh)				1	0			165	174		
Storage Bay Dist (ft)	500	500									
Storage Blk Time (%)											
Queuing Penalty (veh)											

Network Summary

Network wide Queuing Penalty: 1410

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

9/19/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	2614	0	575	4988	0	483
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.81		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	7329		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	7329		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2841	0	625	5422	0	525
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	2841	0	625	5422	0	524
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	96.8		39.5	150.0		39.5
Effective Green, g (s)	96.8		39.5	150.0		39.5
Actuated g/C Ratio	0.65		0.26	1.00		0.26
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4729		904	7329		424
v/s Ratio Prot	0.39		0.18	0.74		c0.32
v/s Ratio Perm						
v/c Ratio	0.60		0.69	0.74		1.23
Uniform Delay, d1	15.4		49.8	0.0		55.2
Progression Factor	0.35		1.00	1.00		0.94
Incremental Delay, d2	0.5		2.3	0.7		116.3
Delay (s)	5.9		52.1	0.7		168.4
Level of Service	A		D	A		F
Approach Delay (s)	5.9			6.0		168.4
Approach LOS	A			A		F

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

9/19/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2233	404	4587	401	691	398	483	381	180	537	458	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.81	1.00	0.81	1.00	0.94	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
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)	2427	439	4986	436	751	433	525	414	196	584	498	625
RTOR Reduction (vph)	0	156	0	94	0	0	471	0	0	528	0	0
Lane Group Flow (vph)	2427	283	4986	342	751	433	54	414	196	56	498	625
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	96.8	96.8	96.8	96.8	18.5	15.5	15.5	17.5	14.5	14.5	96.8	96.8
Effective Green, g (s)	96.8	96.8	96.8	96.8	18.5	15.5	15.5	17.5	14.5	14.5	96.8	96.8
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.12	0.10	0.10	0.12	0.10	0.10	0.65	0.65
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4729	992	4729	992	615	365	158	389	180	153	2152	2152
v/s Ratio Prot	0.33		c0.68		c0.15	c0.12		0.12	0.11		0.15	0.19
v/s Ratio Perm		0.18		0.22			0.04			0.04		
v/c Ratio	0.51	0.29	1.05	0.35	1.22	1.19	0.34	1.06	1.09	0.37	0.23	0.29
Uniform Delay, d1	14.1	11.6	26.6	12.1	65.8	67.2	62.5	66.2	67.8	63.5	11.1	11.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.07	2.68
Incremental Delay, d2	0.4	0.7	28.6	0.6	113.7	108.2	1.3	63.7	92.8	1.5	0.2	0.2
Delay (s)	14.5	12.2	55.2	12.8	179.4	175.4	63.8	130.0	160.6	65.0	34.2	31.3
Level of Service	B	B	E	B	F	F	E	F	F	E	C	C
Approach Delay (s)	14.1		51.8			142.9			103.2			
Approach LOS	B		D			F			F			

Intersection Summary			
HCM 2000 Control Delay	58.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	115.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	458	2637	5278	0	0	537
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.81	0.81			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	7329	7329			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	7329	7329			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	498	2866	5737	0	0	571
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	498	2866	5737	0	0	571
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	39.5	150.0	96.8			39.5
Effective Green, g (s)	39.5	150.0	96.8			39.5
Actuated g/C Ratio	0.26	1.00	0.65			0.26
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	878	7329	4729			712
v/s Ratio Prot	0.15	0.39	c0.78			
v/s Ratio Perm						c0.21
v/c Ratio	0.57	0.39	1.21			0.80
Uniform Delay, d1	47.8	0.0	26.6			51.6
Progression Factor	1.00	1.00	0.41			0.94
Incremental Delay, d2	0.8	0.2	96.1			3.3
Delay (s)	48.7	0.2	107.1			51.9
Level of Service	D	A	F			D
Approach Delay (s)		7.3	107.1	51.9		
Approach LOS		A	F	D		

Intersection Summary			
HCM 2000 Control Delay	69.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

11/11/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	5030	0	130	1890	0	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.81		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	7329		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	7329		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5467	0	141	2054	0	120
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	5467	0	141	2054	0	120
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	93.8		39.6	147.1		39.6
Effective Green, g (s)	93.8		39.6	147.1		39.6
Actuated g/C Ratio	0.64		0.27	1.00		0.27
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4673		924	7329		433
v/s Ratio Prot	c0.75		0.04	0.28		0.07
v/s Ratio Perm						
v/c Ratio	1.17		0.15	0.28		0.28
Uniform Delay, d1	26.6		41.0	0.0		42.4
Progression Factor	0.38		1.00	1.00		0.82
Incremental Delay, d2	76.7		0.1	0.1		0.3
Delay (s)	87.0		41.0	0.1		35.3
Level of Service	F		D	A		D
Approach Delay (s)	87.0			2.7	35.3	
Approach LOS	F			A	D	

Intersection Summary			
HCM 2000 Control Delay	62.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	147.1	Sum of lost time (s)	20.2
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

11/11/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	4580	200	1710	180	90	80	110	450	120	350	370	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.81	1.00	0.81	1.00	0.94	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
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)	4978	217	1859	196	98	87	120	489	130	380	402	141
RTOR Reduction (vph)	0	45	0	71	0	0	109	0	0	337	0	0
Lane Group Flow (vph)	4978	172	1859	125	98	87	11	489	130	43	402	141
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	93.8	93.8	93.8	93.8	16.6	13.6	13.6	19.5	16.5	16.5	93.8	93.8
Effective Green, g (s)	93.8	93.8	93.8	93.8	16.6	13.6	13.6	19.5	16.5	16.5	93.8	93.8
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.11	0.09	0.09	0.13	0.11	0.11	0.64	0.64
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4673	980	4673	980	563	327	142	442	208	177	2126	2126
v/s Ratio Prot	c0.68		0.25		0.02	0.02		c0.15	c0.07		0.12	0.04
v/s Ratio Perm		0.11		0.08			0.01			0.03		
v/c Ratio	1.07	0.18	0.40	0.13	0.17	0.27	0.08	1.11	0.62	0.24	0.19	0.07
Uniform Delay, d1	26.6	10.9	12.9	10.5	59.0	62.1	61.0	63.8	62.3	59.6	11.0	10.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.03	2.76
Incremental Delay, d2	33.2	0.3	0.2	0.3	0.1	0.4	0.2	74.9	5.7	0.7	0.2	0.1
Delay (s)	59.9	11.1	13.2	10.8	59.2	62.5	61.3	138.7	68.1	60.3	33.5	27.8
Level of Service	E	B	B	B	E	E	E	F	E	E	C	C
Approach Delay (s)	57.8		13.0			61.0			99.7			
Approach LOS	E		B			E			F			

Intersection Summary			
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	147.1	Sum of lost time (s)	20.2
Intersection Capacity Utilization	100.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	370	4780	1800	0	0	350
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.81	0.81			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	7329	7329			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	7329	7329			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	402	5196	1957	0	0	372
RTOR Reduction (vph)	0	0	0	0	0	20
Lane Group Flow (vph)	402	5196	1957	0	0	352
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	39.6	147.1	93.8			39.6
Effective Green, g (s)	39.6	147.1	93.8			39.6
Actuated g/C Ratio	0.27	1.00	0.64			0.27
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	897	7329	4673			728
v/s Ratio Prot	0.12	0.71	0.27			
v/s Ratio Perm						0.13
v/c Ratio	0.45	0.71	0.42			0.48
Uniform Delay, d1	44.7	0.0	13.2			45.2
Progression Factor	1.00	1.00	0.27			0.89
Incremental Delay, d2	0.4	0.6	0.3			0.3
Delay (s)	45.0	0.6	3.9			40.6
Level of Service	D	A	A			D
Approach Delay (s)		3.8	3.9	40.6		
Approach LOS		A	A	D		

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	147.1	Sum of lost time (s)	20.2
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

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)

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

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)

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	EB
Directions Served	T
Maximum Queue (ft)	683
Average Queue (ft)	98
95th Queue (ft)	492
Link Distance (ft)	658
Upstream Blk Time (%)	1
Queuing Penalty (veh)	7
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	NW	B9
Directions Served	T	T	T	T	T	L	L	R	T
Maximum Queue (ft)	712	743	738	755	716	51	94	100	31
Average Queue (ft)	632	711	724	733	677	30	66	45	4
95th Queue (ft)	915	742	737	758	736	64	91	85	22
Link Distance (ft)	706	706	706	706	706			10	669
Upstream Blk Time (%)	0	2	14	9	2			29	
Queuing Penalty (veh)	5	25	138	92	18			32	
Storage Bay Dist (ft)						500	500		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	T	>	T	T	T	T	T	<
Maximum Queue (ft)	401	402	414	408	401	363	113	150	112	129	147	11
Average Queue (ft)	377	388	398	396	377	206	84	85	81	96	96	4
95th Queue (ft)	396	403	414	414	417	501	125	148	128	141	144	12
Link Distance (ft)	363	363	363	363	363		706	706	706	706	706	
Upstream Blk Time (%)	23	37	58	44	16	1						
Queuing Penalty (veh)	218	353	551	420	151	0						
Storage Bay Dist (ft)						250						390
Storage Blk Time (%)					31							
Queuing Penalty (veh)					61							

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	<	T	T	<	<	T	<	<	<	<
Maximum Queue (ft)	58	104	49	357	372	180	130	170	114	115
Average Queue (ft)	35	66	28	262	332	113	87	107	46	60
95th Queue (ft)	58	110	55	395	409	198	144	164	97	114
Link Distance (ft)		1178	1178		1171	1171	344	344	669	669
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	390			430						
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB
Directions Served	L	L	T	T	T	T	T	T	T	T	T	T
Maximum Queue (ft)	97	600	1462	1461	1479	1461	1461	52	79	80	81	78
Average Queue (ft)	74	308	1449	1455	1450	1452	1447	32	40	41	44	35
95th Queue (ft)	127	725	1467	1469	1472	1467	1461	53	70	79	90	73
Link Distance (ft)			1427	1427	1427	1427	1427	363	363	363	363	363
Upstream Blk Time (%)			33	66	82	68	43					
Queuing Penalty (veh)			0	0	0	0	0					
Storage Bay Dist (ft)	500	500										
Storage Blk Time (%)			22									
Queuing Penalty (veh)			80									

Intersection: 109: Route 360 & 360 EB LT

Movement	SB	SB	B10
Directions Served	R	R	T
Maximum Queue (ft)	90	103	21
Average Queue (ft)	64	73	6
95th Queue (ft)	93	106	21
Link Distance (ft)	10	10	344
Upstream Blk Time (%)	38	48	
Queuing Penalty (veh)	67	83	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 2302

HCM Signalized Intersection Capacity Analysis
107: 360 WB LT & Route 360

11/11/2014

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Volume (vph)	2770	0	600	4890	0	560
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		6.5	4.0		6.5
Lane Util. Factor	0.81		0.97	0.81		1.00
Frt	1.00		1.00	1.00		0.86
Flt Protected	1.00		0.95	1.00		1.00
Satd. Flow (prot)	7329		3433	7329		1611
Flt Permitted	1.00		0.95	1.00		1.00
Satd. Flow (perm)	7329		3433	7329		1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3011	0	652	5315	0	609
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	3011	0	652	5315	0	608
Heavy Vehicles (%)	5%	5%	2%	5%	2%	2%
Turn Type	NA		Prot	NA		pt+ov
Protected Phases	2		7 8	Free		7 8
Permitted Phases						8
Actuated Green, G (s)	93.8		42.5	150.0		42.5
Effective Green, g (s)	93.8		42.5	150.0		42.5
Actuated g/C Ratio	0.63		0.28	1.00		0.28
Clearance Time (s)	7.2					
Vehicle Extension (s)	3.0					
Lane Grp Cap (vph)	4583		972	7329		456
v/s Ratio Prot	0.41		0.19	0.73		c0.38
v/s Ratio Perm						
v/c Ratio	0.66		0.67	0.73		1.33
Uniform Delay, d1	17.9		47.6	0.0		53.8
Progression Factor	0.35		1.00	1.00		0.95
Incremental Delay, d2	0.6		1.8	0.6		157.6
Delay (s)	6.9		49.4	0.6		208.8
Level of Service	A		D	A		F
Approach Delay (s)	6.9			6.0		208.8
Approach LOS	A			A		F

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

11/11/2014

Movement	EBT	EBR2	WBT	WBR2	NBL2	NBT	NBR2	SBL2	SBT	SBR2	SEL2	NWL2
Lane Configurations												
Volume (vph)	2360	470	4470	420	800	460	560	410	190	590	480	600
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Lane Util. Factor	0.81	1.00	0.81	1.00	0.94	0.95	1.00	0.97	1.00	1.00	0.97	0.97
Frt	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (prot)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
Flt Permitted	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Satd. Flow (perm)	7329	1538	7329	1538	4990	3539	1538	3335	1863	1583	3335	3335
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)	2565	511	4859	457	870	500	609	446	207	641	522	652
RTOR Reduction (vph)	0	191	0	100	0	0	542	0	0	570	0	0
Lane Group Flow (vph)	2565	320	4859	357	870	500	67	446	207	71	522	652
Heavy Vehicles (%)	5%	5%	5%	5%	2%	2%	5%	5%	2%	2%	5%	5%
Turn Type	NA	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	Prot
Protected Phases	2		6		3	8		7	4		2	6
Permitted Phases		2		6			8			4		
Actuated Green, G (s)	93.8	93.8	93.8	93.8	19.5	16.5	16.5	19.5	16.5	16.5	93.8	93.8
Effective Green, g (s)	93.8	93.8	93.8	93.8	19.5	16.5	16.5	19.5	16.5	16.5	93.8	93.8
Actuated g/C Ratio	0.63	0.63	0.63	0.63	0.13	0.11	0.11	0.13	0.11	0.11	0.63	0.63
Clearance Time (s)	7.2	7.2	7.2	7.2	6.5	6.5	6.5	6.5	6.5	6.5	7.2	7.2
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	4583	961	4583	961	648	389	169	433	204	174	2085	2085
v/s Ratio Prot	0.35		c0.66		c0.17	c0.14		0.13	0.11		0.16	0.20
v/s Ratio Perm		0.21		0.23			0.04			0.04		
v/c Ratio	0.56	0.33	1.06	0.37	1.34	1.29	0.40	1.03	1.01	0.41	0.25	0.31
Uniform Delay, d1	16.2	13.3	28.1	13.7	65.2	66.8	62.1	65.2	66.8	62.2	12.5	13.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.94	2.59
Incremental Delay, d2	0.5	0.9	31.1	0.7	164.4	146.7	1.5	51.2	66.9	1.5	0.2	0.3
Delay (s)	16.7	14.2	59.2	14.4	229.6	213.4	63.6	116.4	133.6	63.7	37.0	34.2
Level of Service	B	B	E	B	F	F	E	F	F	E	D	C
Approach Delay (s)	16.2		55.4			174.5			93.1			
Approach LOS	B		E			F			F			

Intersection Summary			
HCM 2000 Control Delay	66.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	117.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	480	2830	5270	0	0	590
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	4.0	7.2			6.5
Lane Util. Factor	0.97	0.81	0.81			0.88
Frt	1.00	1.00	1.00			0.85
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3335	7329	7329			2707
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3335	7329	7329			2707
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.94
Adj. Flow (vph)	522	3076	5728	0	0	628
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	522	3076	5728	0	0	628
Heavy Vehicles (%)	5%	5%	5%	5%	2%	5%
Turn Type	Prot	NA	NA			Perm
Protected Phases	3 4	Free	6			
Permitted Phases						3 4
Actuated Green, G (s)	42.5	150.0	93.8			42.5
Effective Green, g (s)	42.5	150.0	93.8			42.5
Actuated g/C Ratio	0.28	1.00	0.63			0.28
Clearance Time (s)			7.2			
Vehicle Extension (s)			3.0			
Lane Grp Cap (vph)	944	7329	4583			766
v/s Ratio Prot	0.16	0.42	c0.78			
v/s Ratio Perm						c0.23
v/c Ratio	0.55	0.42	1.25			0.82
Uniform Delay, d1	45.7	0.0	28.1			50.2
Progression Factor	1.00	1.00	0.43			0.95
Incremental Delay, d2	0.7	0.2	112.6			3.4
Delay (s)	46.4	0.2	124.7			50.9
Level of Service	D	A	F			D
Approach Delay (s)		6.9	124.7	50.9		
Approach LOS		A	F	D		

Intersection Summary			
HCM 2000 Control Delay	77.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 103: 288 NB to 360 WB/360 WB to 288 NB & Route 360

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)

Intersection: 104: 360 EB to 288 NB & Route 360 & 288 NB to 360 WB

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)

Intersection: 105: 288 SB to 360 EB/360 WB to 288 SB & Route 360

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)

Intersection: 106: 360 EB to 288 SB/288 SB to 360 WB & Route 360

Movement	WB
Directions Served	T
Maximum Queue (ft)	150
Average Queue (ft)	21
95th Queue (ft)	108
Link Distance (ft)	326
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 107: 360 WB LT & Route 360

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	WB	NW
Directions Served	T	T	T	T	T	L	L	T	T	T	T	R
Maximum Queue (ft)	75	80	134	80	36	230	234	665	707	731	658	124
Average Queue (ft)	35	53	93	56	14	190	213	95	199	292	177	104
95th Queue (ft)	85	89	148	89	41	238	261	479	718	851	641	117
Link Distance (ft)	706	706	706	706	706			658	658	658	658	10
Upstream Blk Time (%)								1	3	3	0	65
Queuing Penalty (veh)								7	37	31	1	363
Storage Bay Dist (ft)						500	500					
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 107: 360 WB LT & Route 360

Movement	B9
Directions Served	T
Maximum Queue (ft)	660
Average Queue (ft)	553
95th Queue (ft)	675
Link Distance (ft)	669
Upstream Blk Time (%)	0
Queuing Penalty (veh)	1
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	T	T	T	T	T	>	T	T	T	T	T	<
Maximum Queue (ft)	207	176	153	188	141	133	534	615	607	547	573	473
Average Queue (ft)	118	112	114	111	68	41	408	435	462	444	462	444
95th Queue (ft)	215	194	175	186	147	114	555	610	598	581	590	516
Link Distance (ft)	363	363	363	363	363		706	706	706	706	706	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)						250						390
Storage Blk Time (%)												50
Queuing Penalty (veh)												115

Intersection: 108: Commonwealth Centre Pkwy/Old Hundred Road & 360 WB LT/360 EB LT & Route 360

Movement	NB	NB	NB	NB	NB	SB	SB	SB	SE	SE	NW	NW
Directions Served	<	<	T	T	>	<	<	T	<	<	<	<
Maximum Queue (ft)	556	640	1216	1193	425	364	440	239	260	294	286	302
Average Queue (ft)	540	625	939	733	243	263	357	143	179	218	230	261
95th Queue (ft)	603	681	1488	1334	590	373	500	186	283	296	339	309
Link Distance (ft)			1178	1178			1171	1171	344	344	669	669
Upstream Blk Time (%)			28	2								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (ft)	390	390			250	430						
Storage Blk Time (%)	77	94	36	74			1					
Queuing Penalty (veh)	177	216	287	414			2					

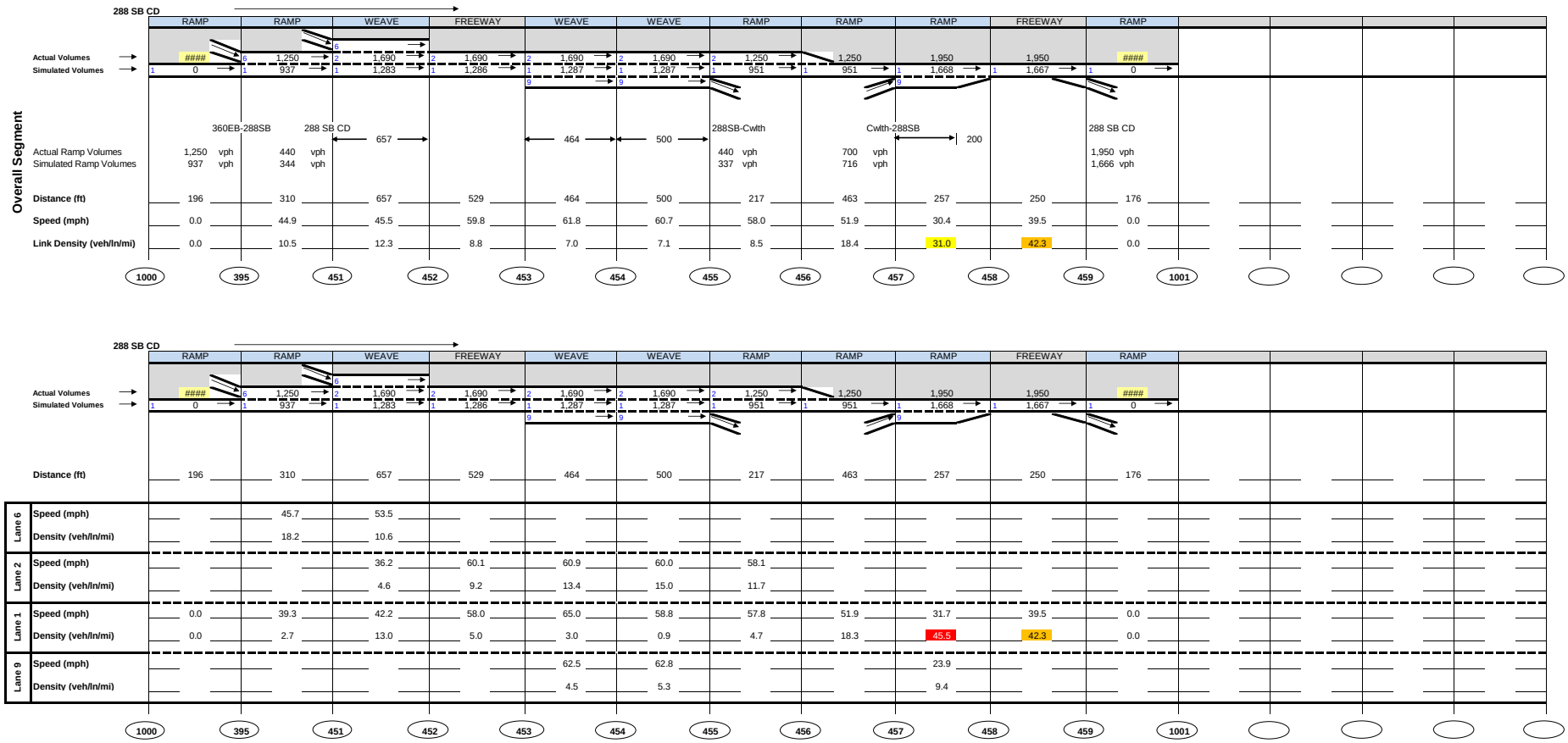
Intersection: 109: Route 360 & 360 EB LT

Movement	EB	EB	WB	WB	WB	WB	WB	SB	SB	B10	B10
Directions Served	L	L	T	T	T	T	T	R	R	T	T
Maximum Queue (ft)	249	306	294	293	236	238	228	91	106	219	207
Average Queue (ft)	172	224	235	236	204	181	190	90	105	142	134
95th Queue (ft)	287	321	331	339	242	242	231	91	106	221	200
Link Distance (ft)			363	363	363	363	363	10	10	344	344
Upstream Blk Time (%)								62	67		
Queuing Penalty (veh)								184	197		
Storage Bay Dist (ft)	500	500									
Storage Blk Time (%)											
Queuing Penalty (veh)											

Network Summary

Network wide Queuing Penalty: 2031

C-16 – Supplemental CORSIM Results - US 360 at Old Hundred Road/Commonwealth Centre Parkway – DLT without Bailey Bridge Connector Improvements



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

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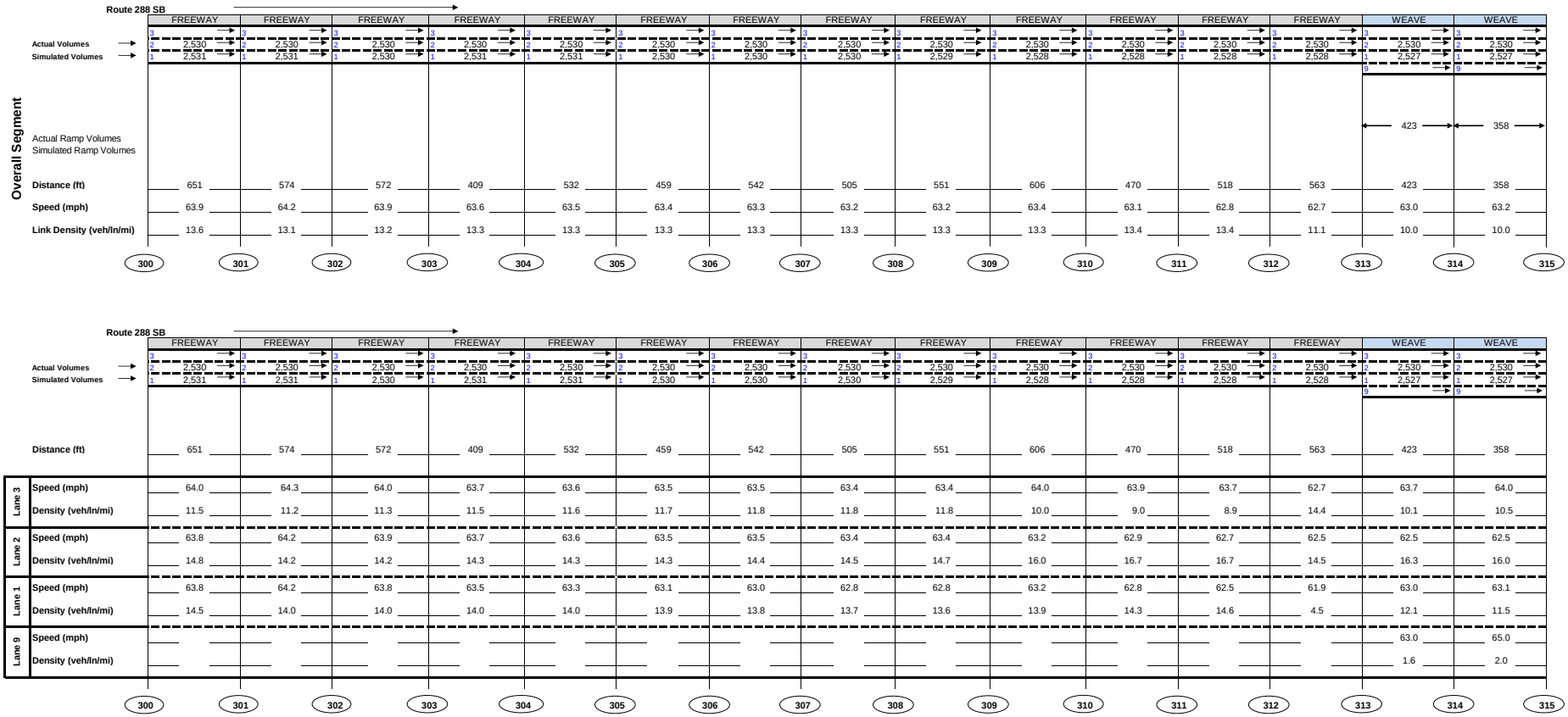
Figure XX

Route 288 at US 360 Interchange Existing Conditions PM

288 SB CD

2040 No Build AM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

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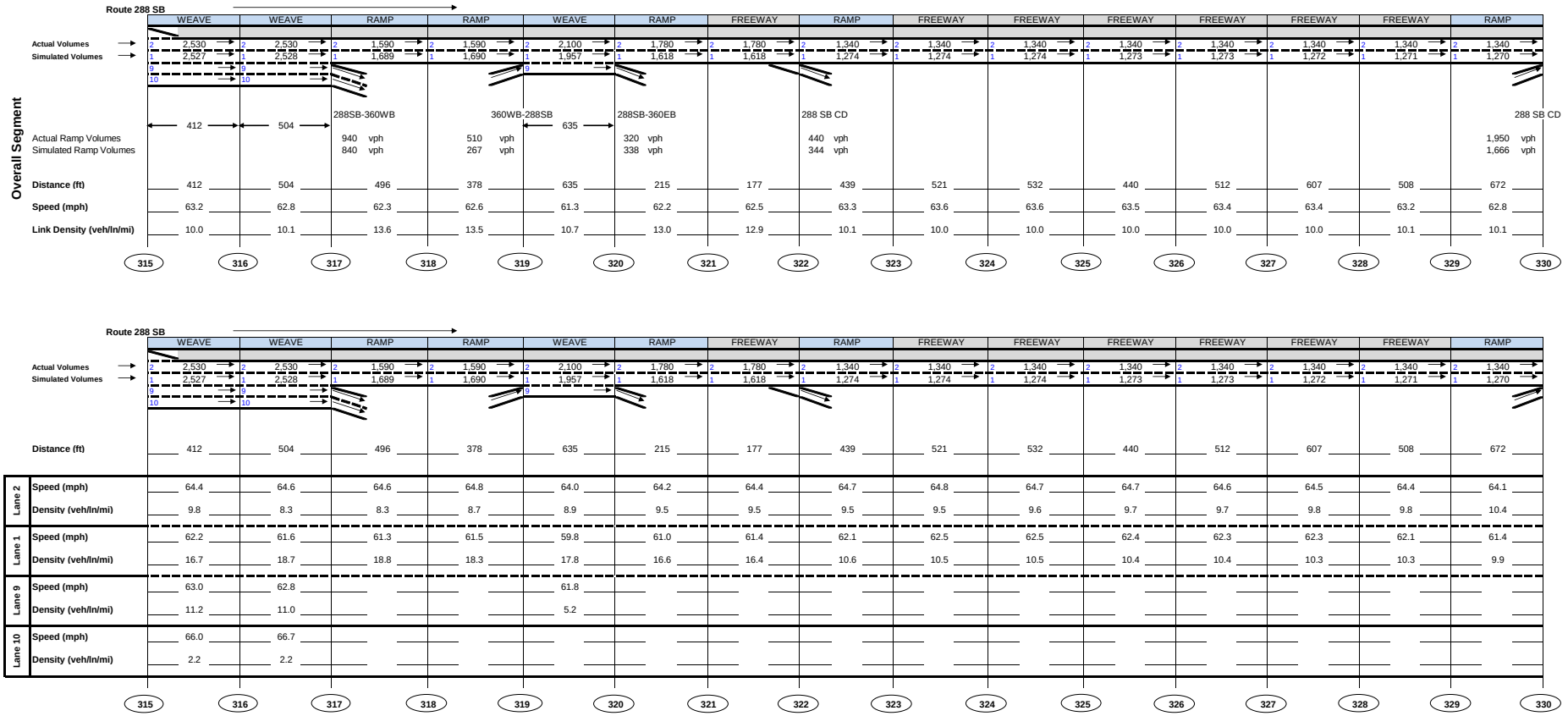
Figure XX

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 No Build AM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number ←→ Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

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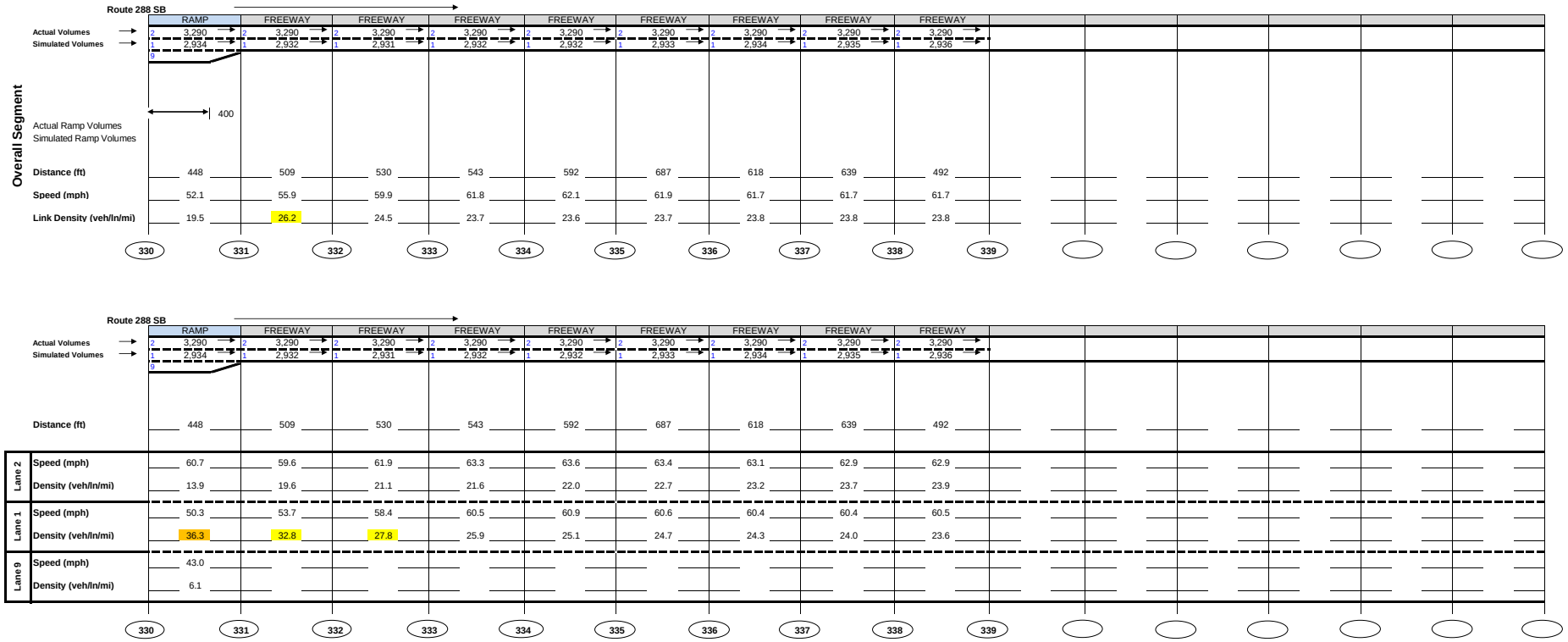
Figure XX
Route 288 at US 360 Interchange Existing Conditions PM
Route 288 SB
2040 No Build AM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

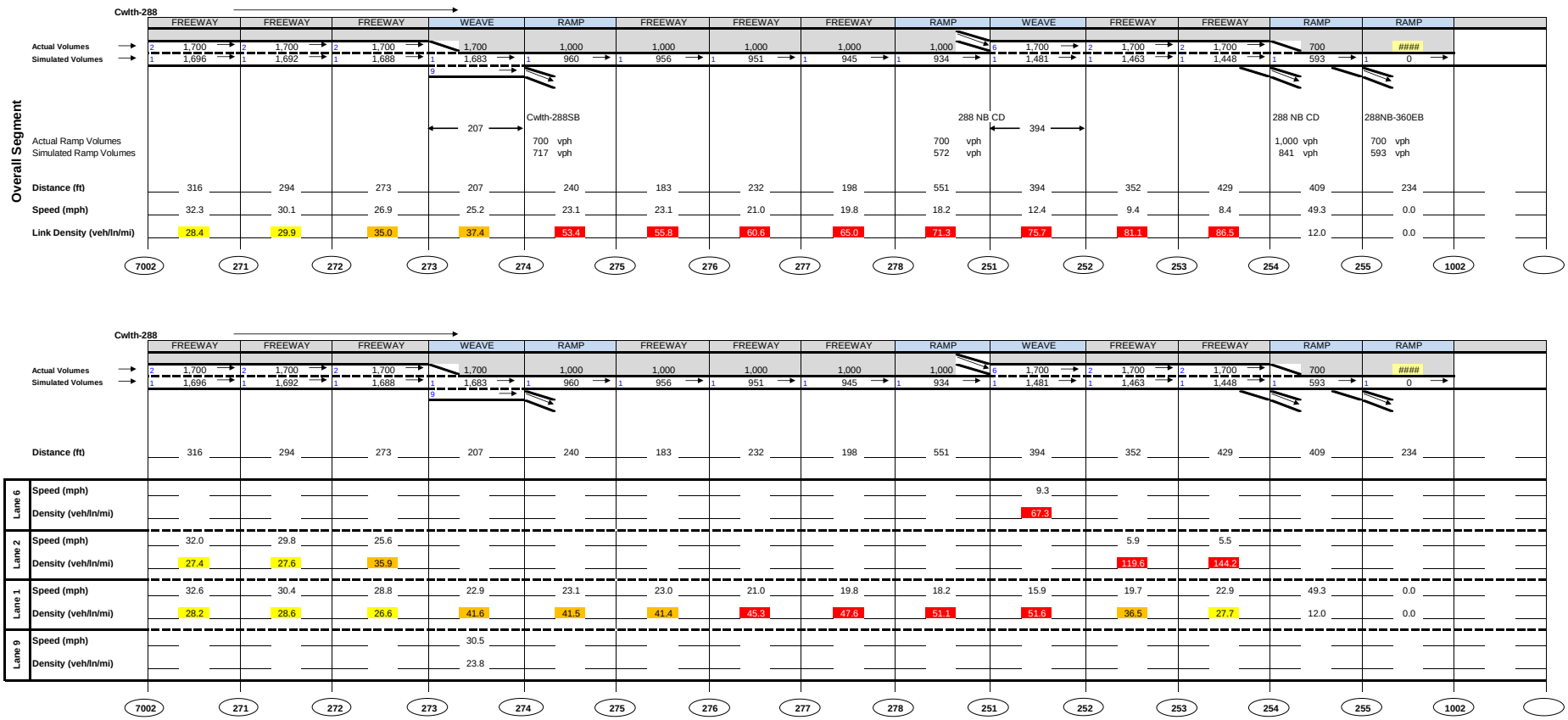
Virginia Department of Transportation

Figure XX

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 No Build AM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

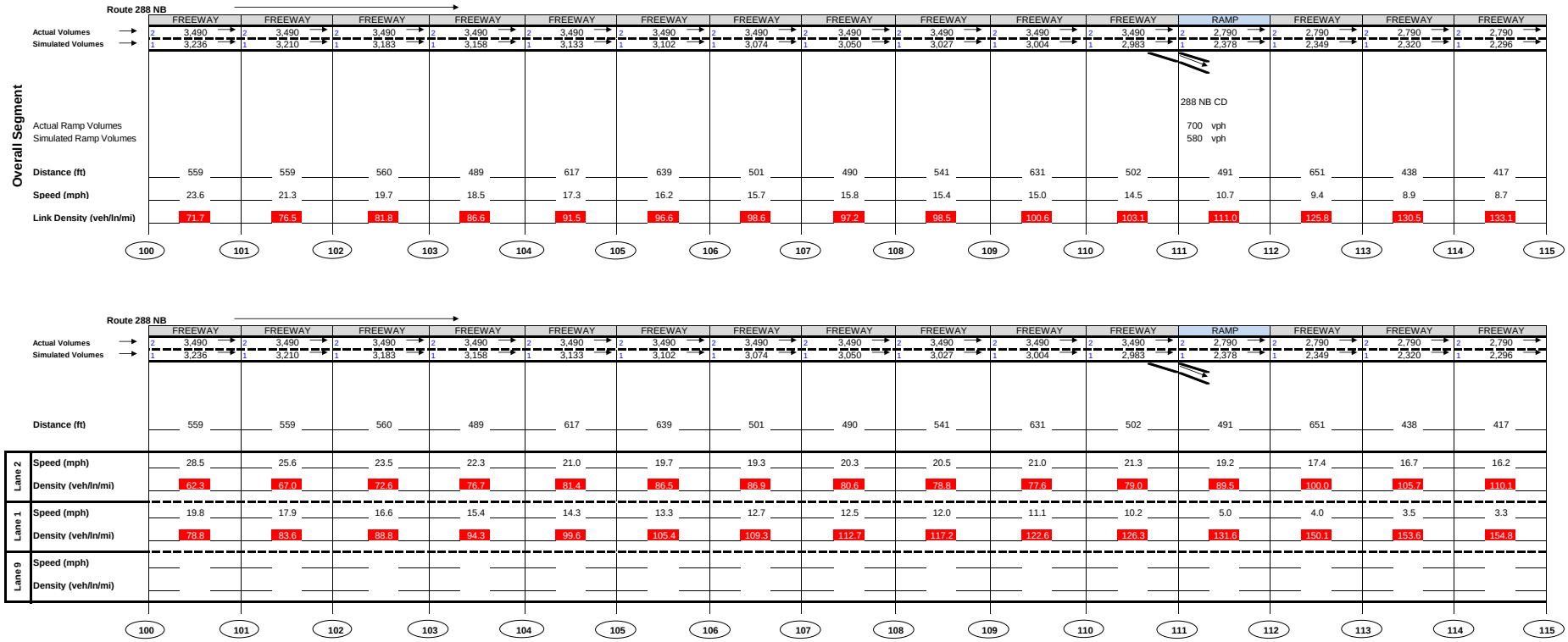
VDOT Virginia Department of Transportation

Figure XX

Route 288 at US 360 Interchange Existing Conditions PM

Cwlth-288

2040 No Build AM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

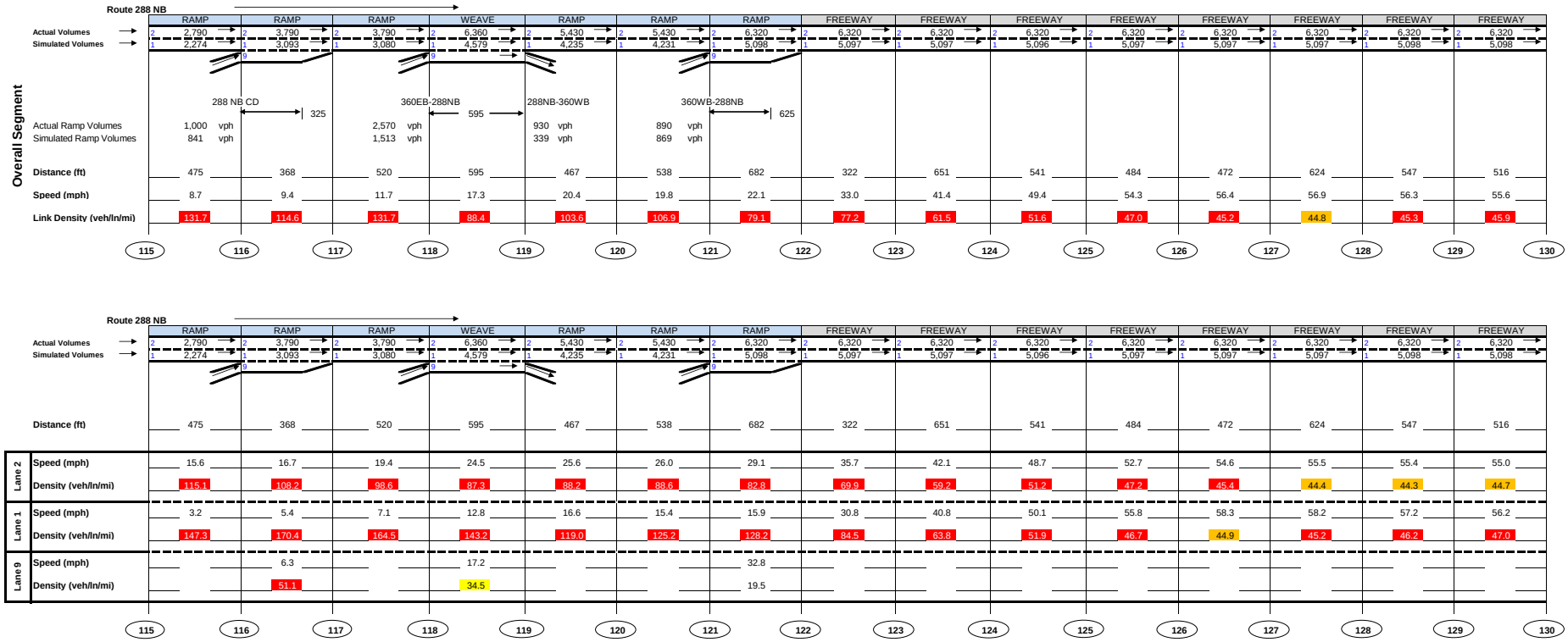
VDOT Virginia Department of Transportation

Figure XX

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 No Build AM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

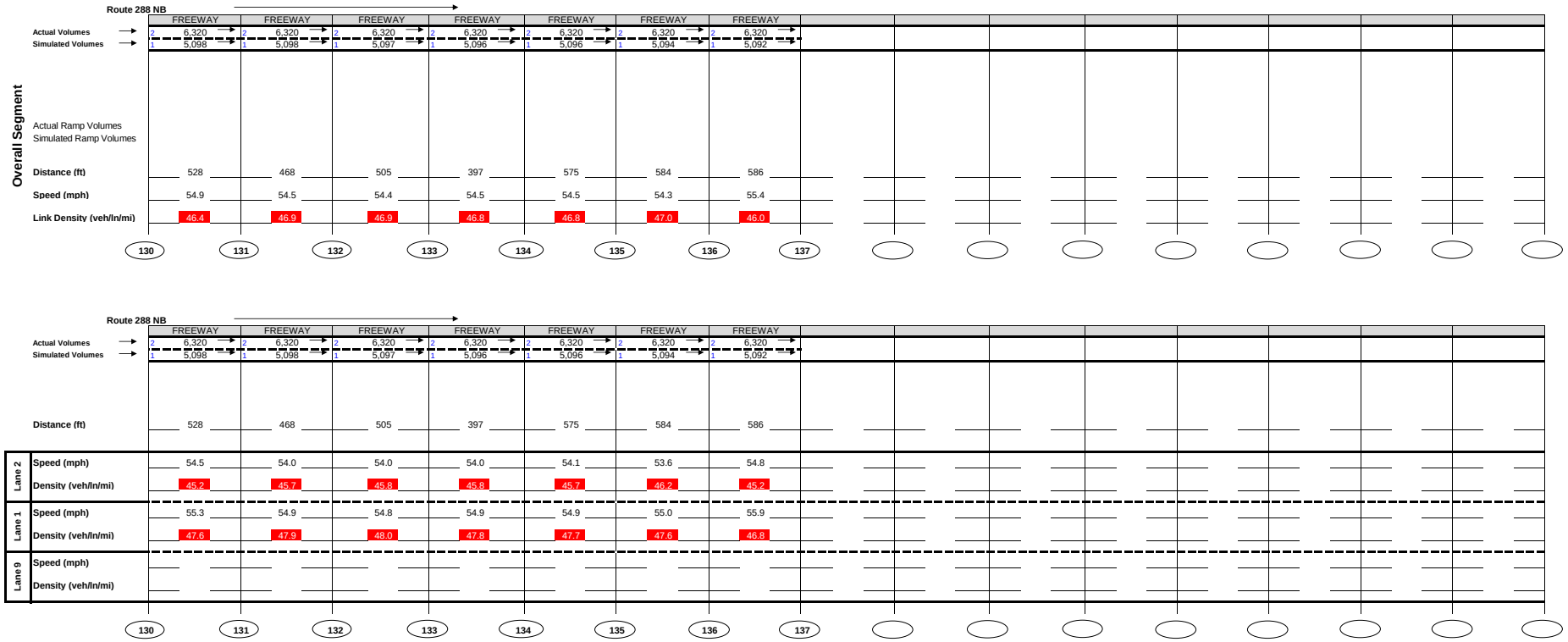
VDOT Virginia Department of Transportation

Figure XX

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 No Build AM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

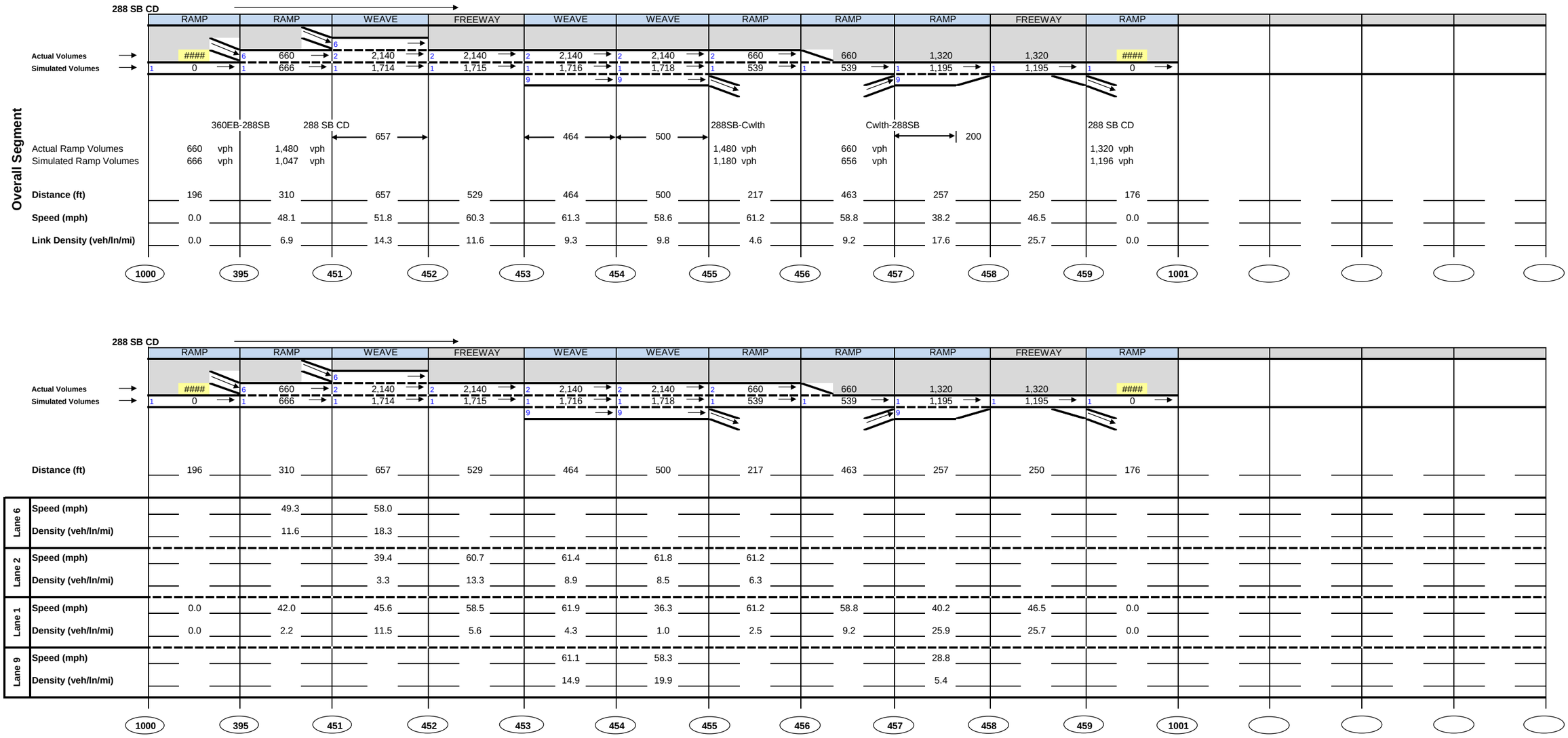
Virginia Department of Transportation

Figure XX

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 No Build AM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

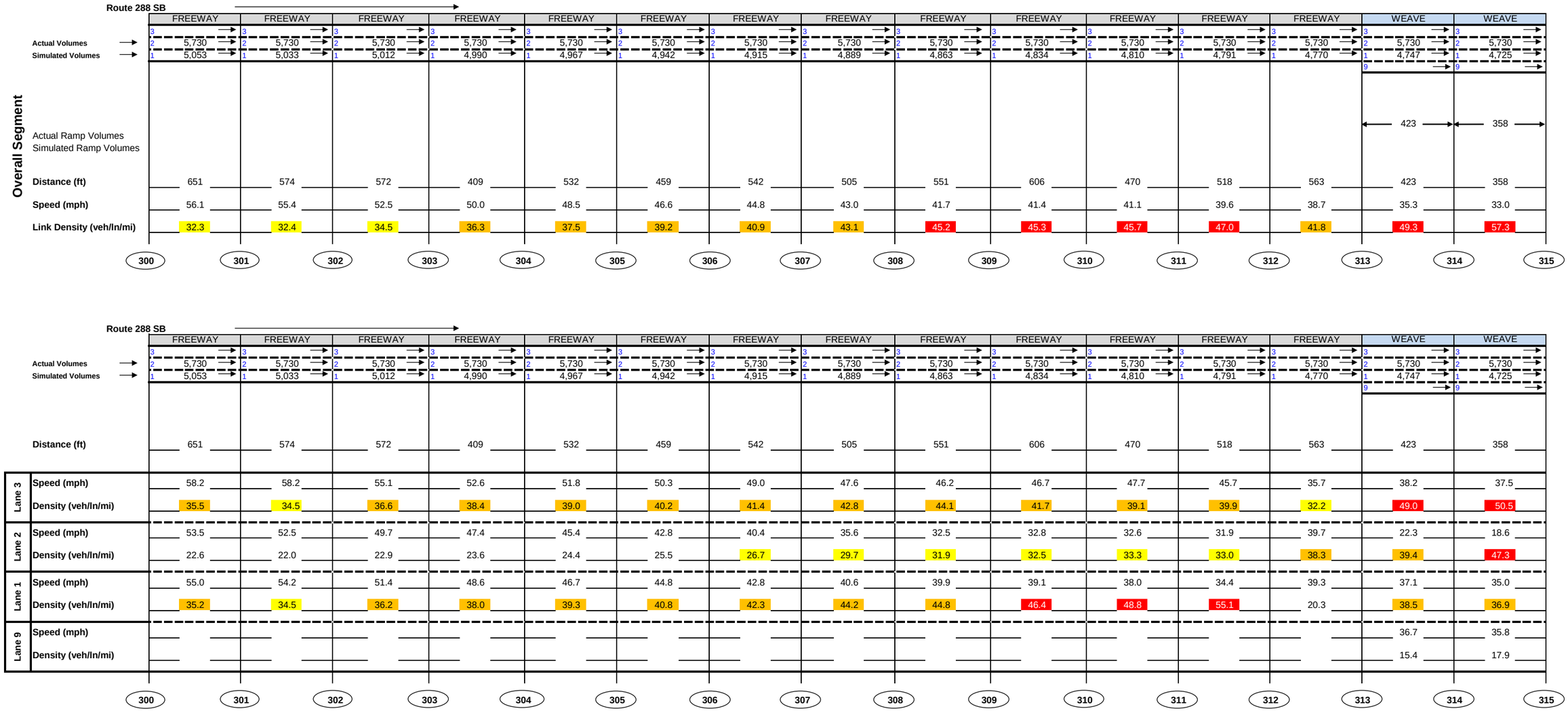
Virginia Department of Transportation

Figure 1

Route 288 at US 360 Interchange Existing Conditions PM

288 SB CD

2040 No Build PM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

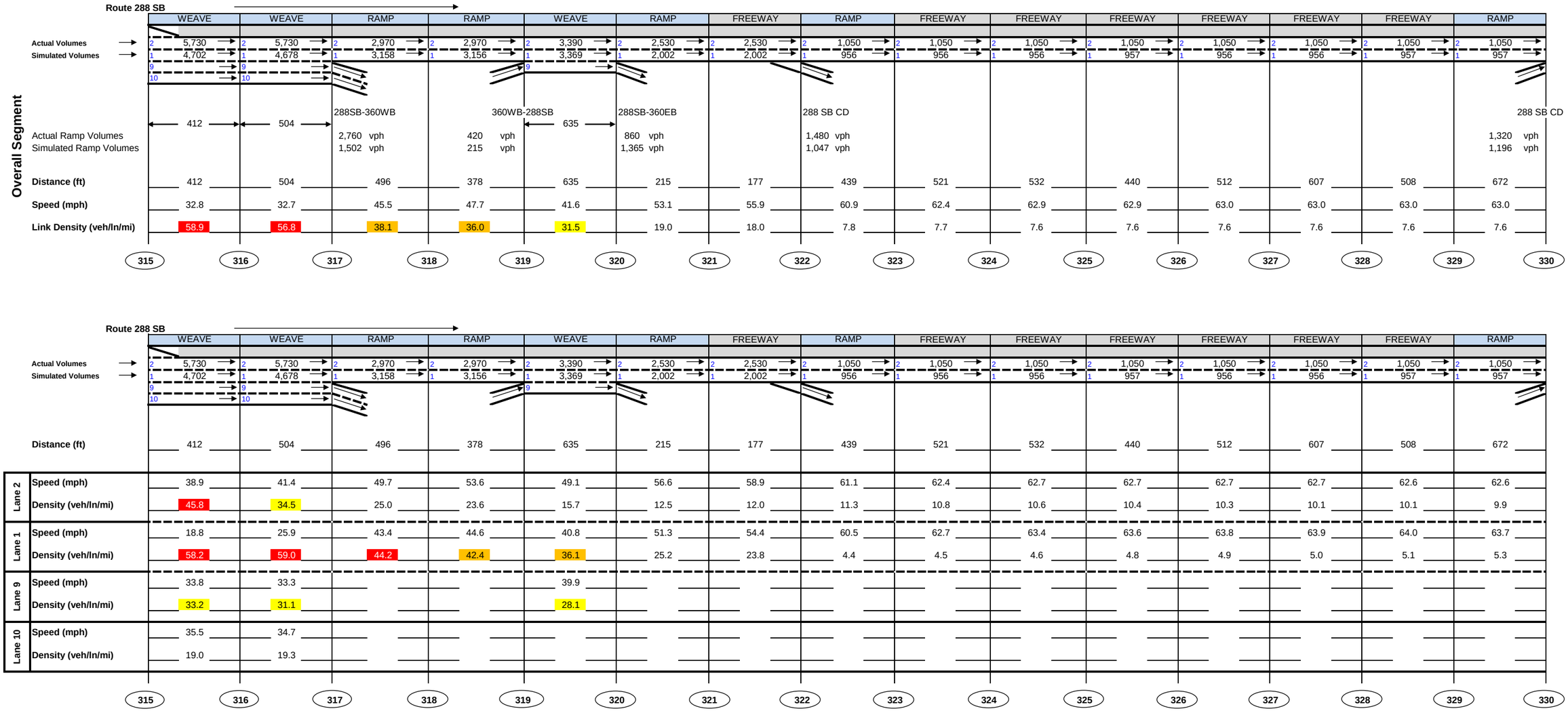
Virginia Department of Transportation

Figure 2

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 No Build PM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

Virginia Department of Transportation

Figure 3

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 No Build PM_1

Route 288 SB

Overall Segment

		RAMP	FREEWAY	FREEWAY	FREEWAY	FREEWAY	FREEWAY	FREEWAY	FREEWAY	FREEWAY
Actual Volumes		2,370	2,370	2,370	2,370	2,370	2,370	2,370	2,370	2,370
Simulated Volumes		2,154	2,155	2,155	2,156	2,156	2,155	2,155	2,155	2,155
Actual Ramp Volumes		400								
Simulated Ramp Volumes										
Distance (ft)		448	509	530	543	592	687	618	639	492
Speed (mph)		57.3	59.8	61.7	62.5	62.7	62.5	62.4	62.3	62.3
Link Density (veh/ln/mi)		13.0	18.0	17.5	17.2	17.2	17.2	17.3	17.3	17.3
		330	331	332	333	334	335	336	337	338	339

Route 288 SB

		RAMP	FREEWAY	FREEWAY	FREEWAY	FREEWAY	FREEWAY	FREEWAY	FREEWAY	FREEWAY
Actual Volumes		2,370	2,370	2,370	2,370	2,370	2,370	2,370	2,370	2,370
Simulated Volumes		2,154	2,155	2,155	2,156	2,156	2,155	2,155	2,155	2,155
Distance (ft)		448	509	530	543	592	687	618	639	492
Lane 2	**Speed (mph)**	61.7	61.4	62.6	63.3	63.5	63.4	63.3	63.2	63.2
	Density (veh/ln/mi)	11.0	13.5	14.4	14.8	15.2	15.7	16.1	16.5	16.7
Lane 1	**Speed (mph)**	56.3	58.9	61.1	61.9	62.0	61.8	61.6	61.5	61.5
	Density (veh/ln/mi)	23.3	22.5	20.6	19.7	19.2	18.7	18.4	18.1	17.9
Lane 9	**Speed (mph)**	49.5								
	Density (veh/ln/mi)	3.3								
		330	331	332	333	334	335	336	337	338	339

NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

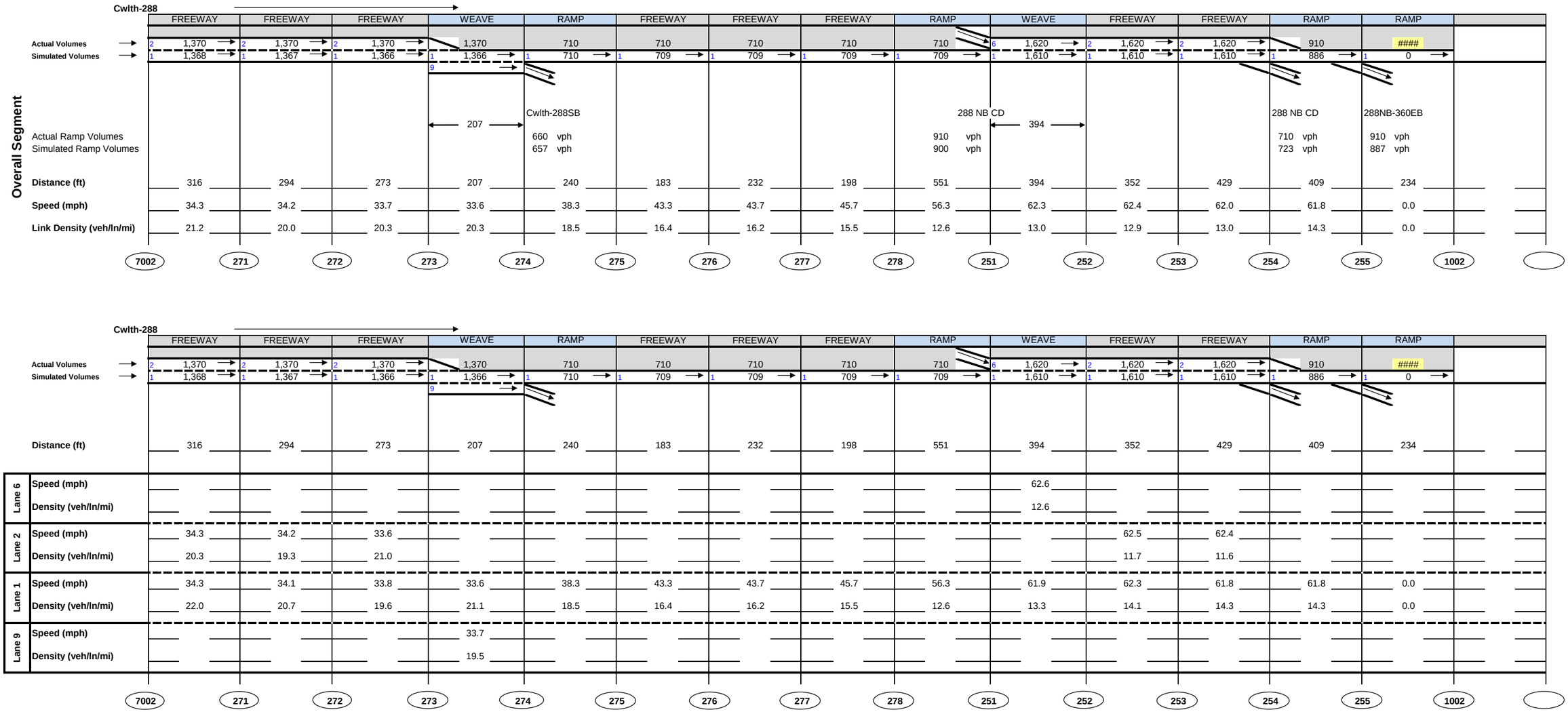
VDOT Virginia Department of Transportation

Figure 4

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 No Build PM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

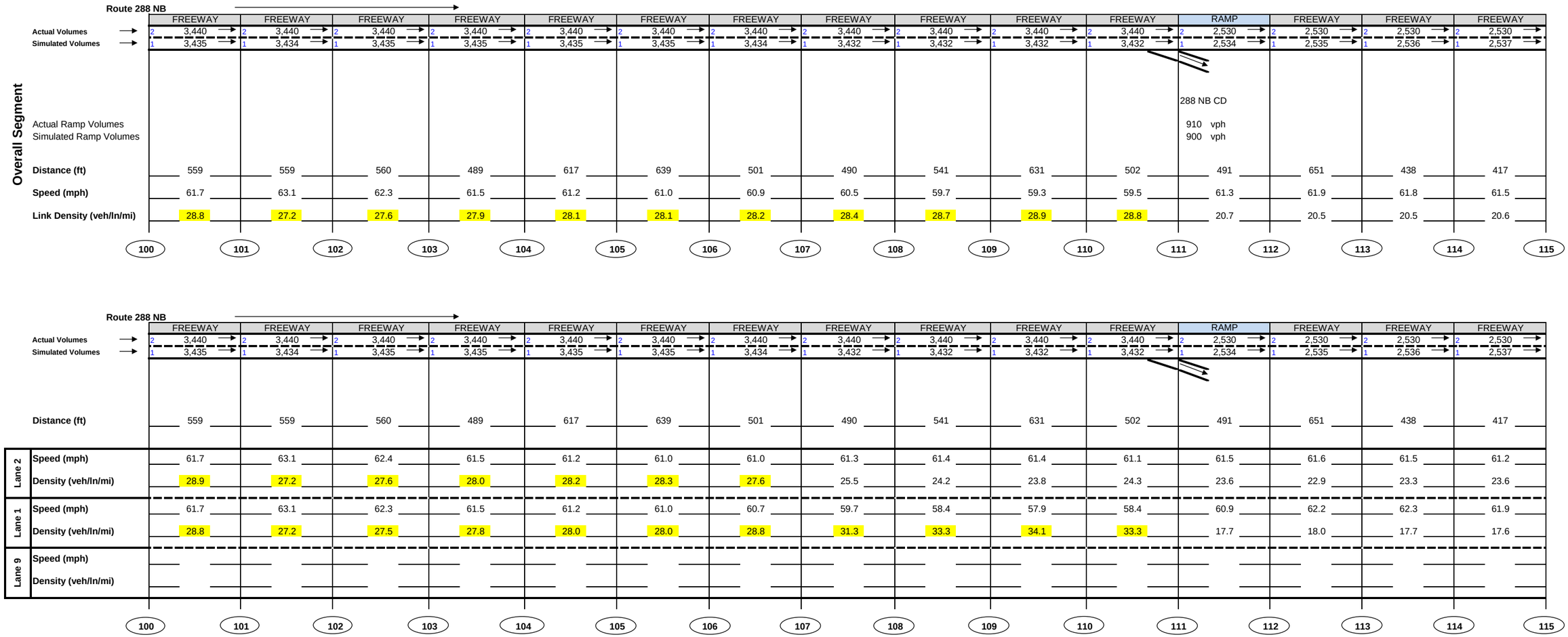
Virginia Department of Transportation

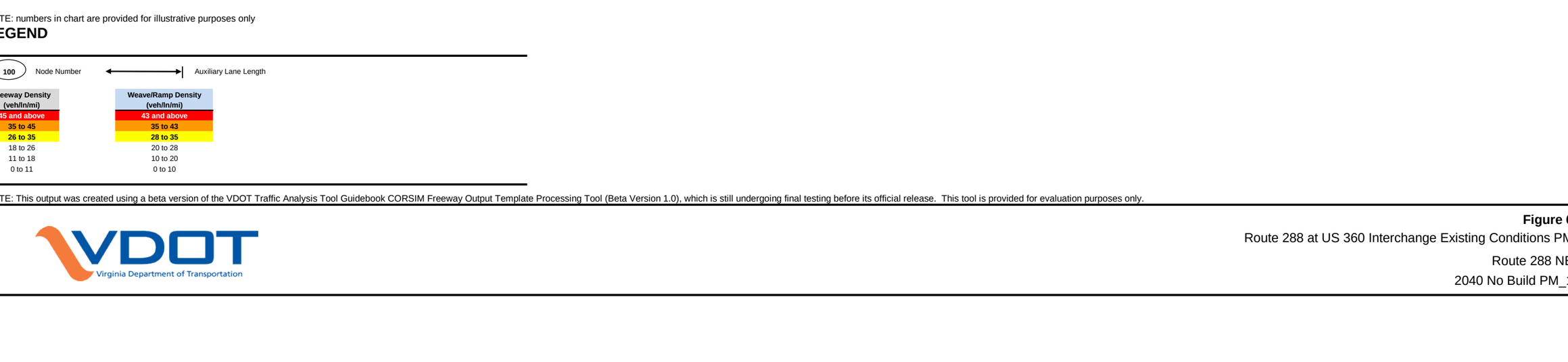
Figure 5

Route 288 at US 360 Interchange Existing Conditions PM

Cwlth-288

2040 No Build PM_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

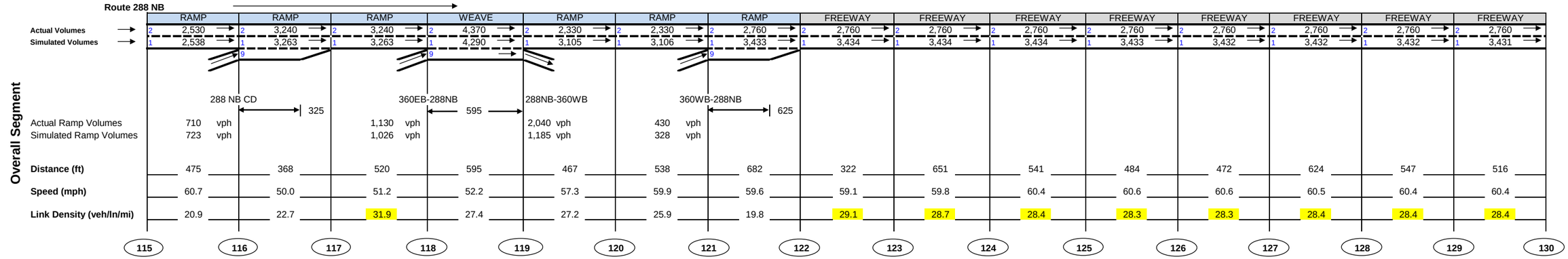
VDOT Virginia Department of Transportation

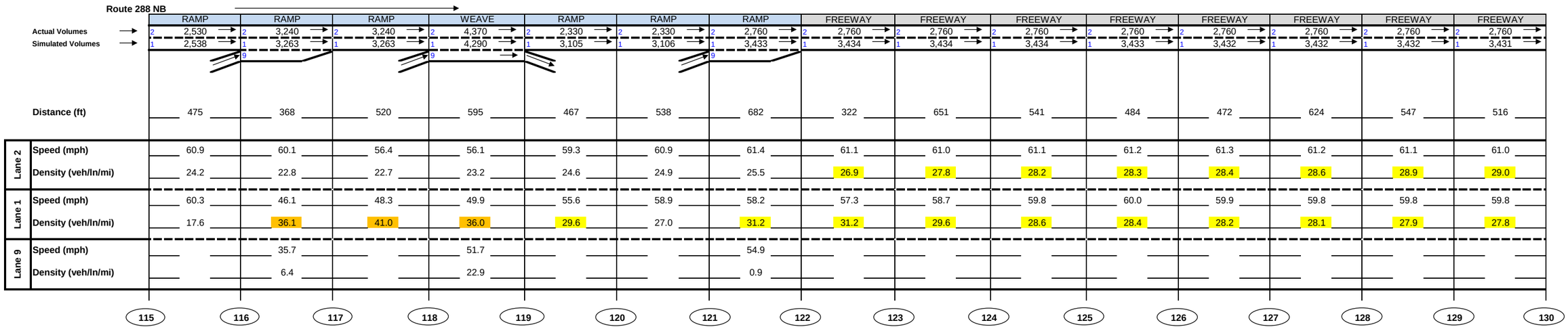
Figure 6

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 No Build PM_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

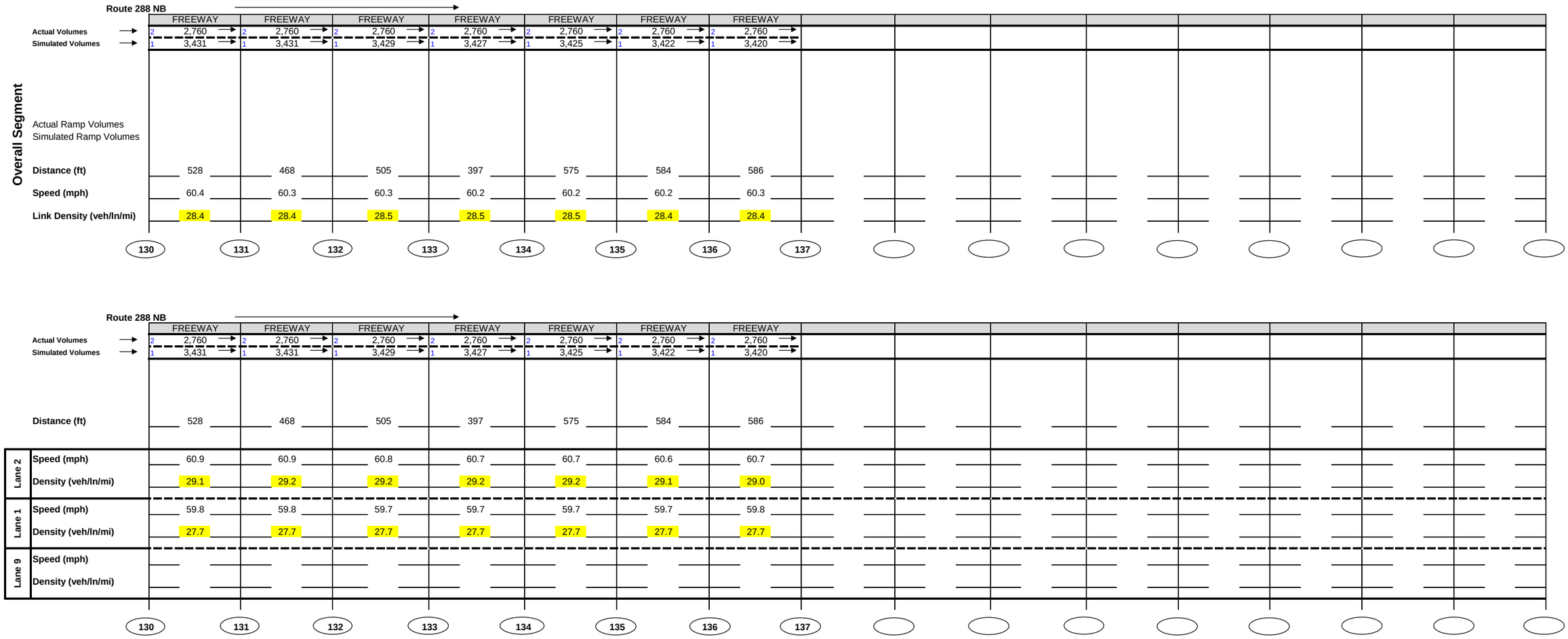
VDOT Virginia Department of Transportation

Figure 7

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 No Build PM_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

VDOT Virginia Department of Transportation

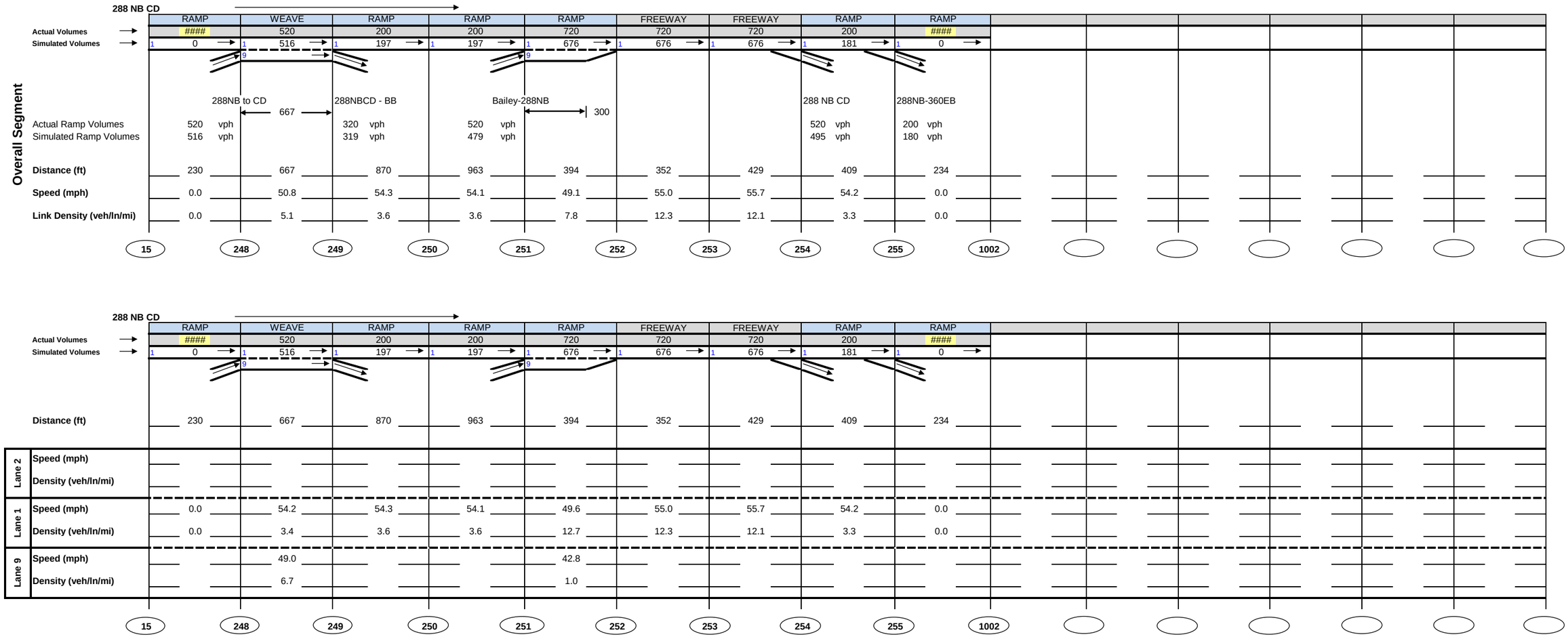
Figure 8

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 No Build PM_1

C-17 – Supplemental CORSIM Results - Bailey Bridge Connector Improvements Only



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number ⟷ Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

Virginia Department of Transportation

Figure 1
Route 288 at US 360 Interchange Existing Conditions PM
288 NB CD
2040 AM 3 Lanes_1

NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

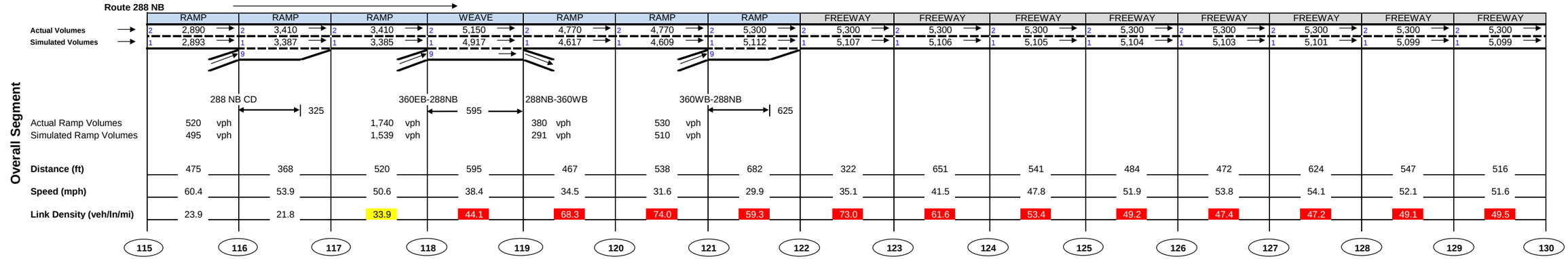
Figure 2

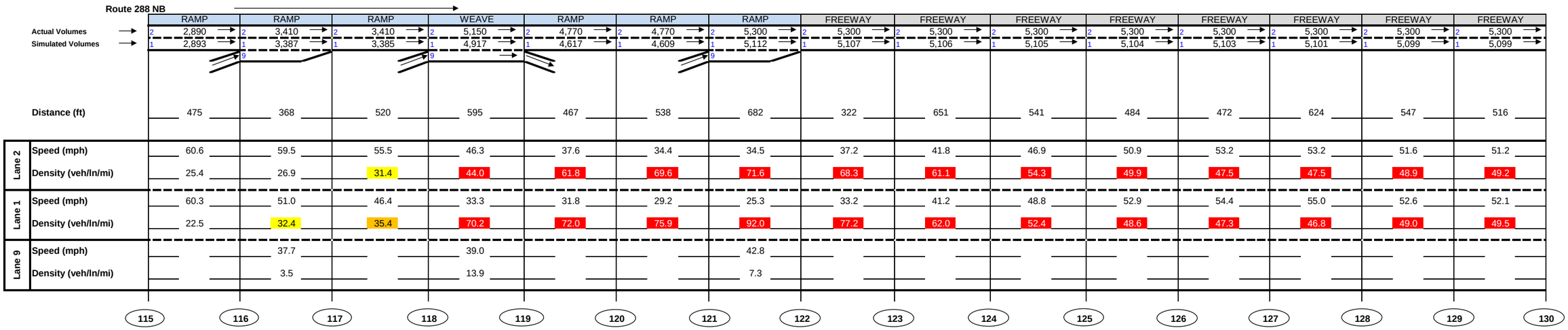
Virginia Department of Transportation

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 AM 3 Lanes_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

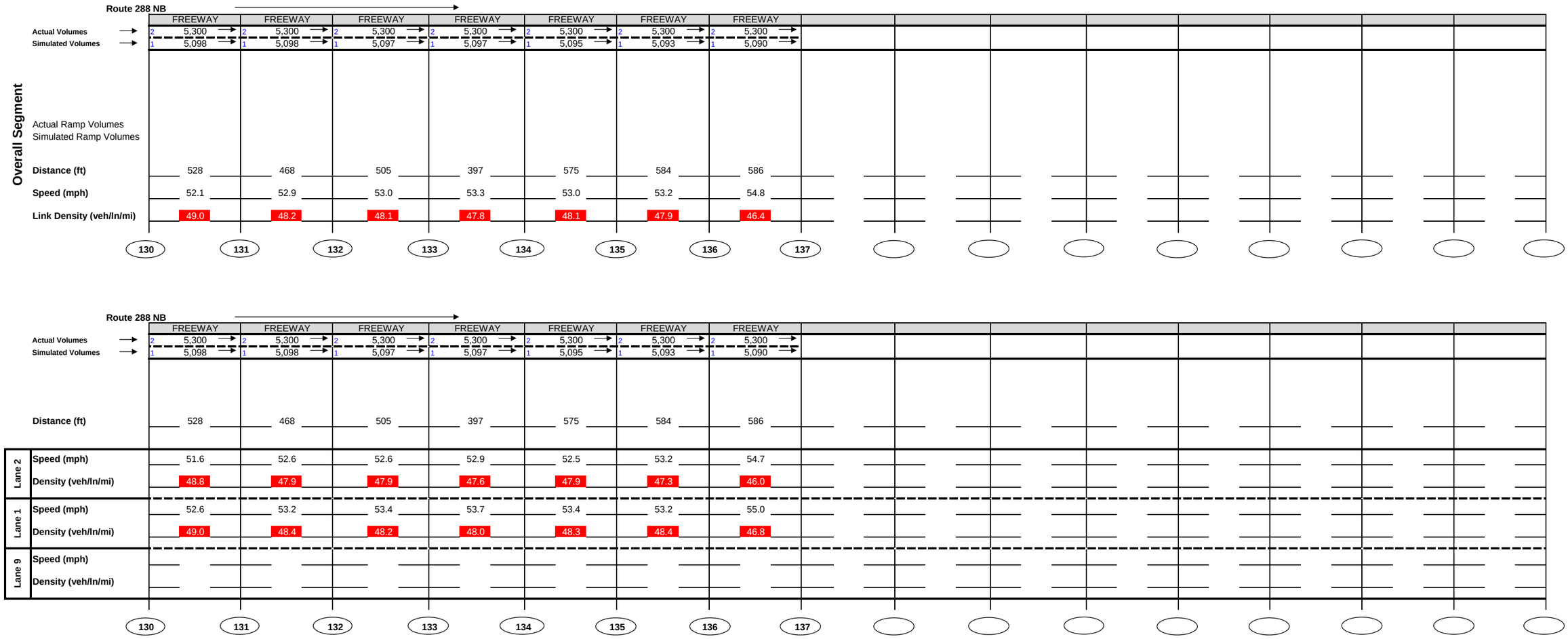
VDOT Virginia Department of Transportation

Figure 3

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 AM 3 Lanes_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

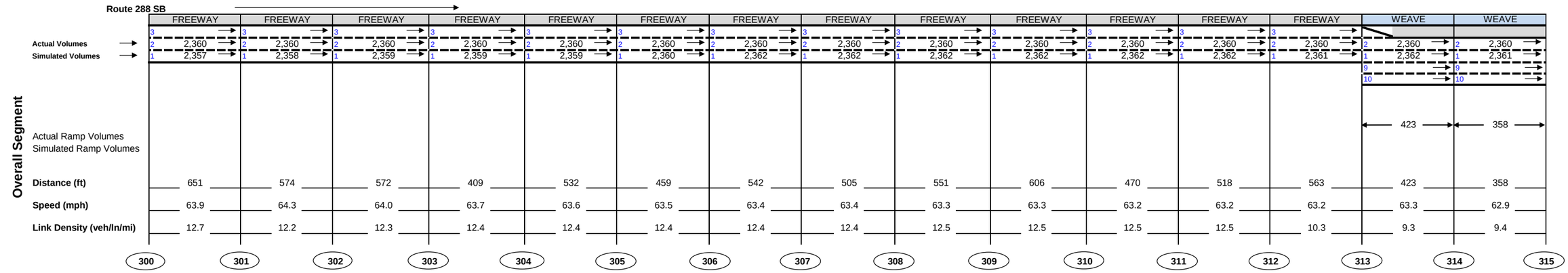
Virginia Department of Transportation

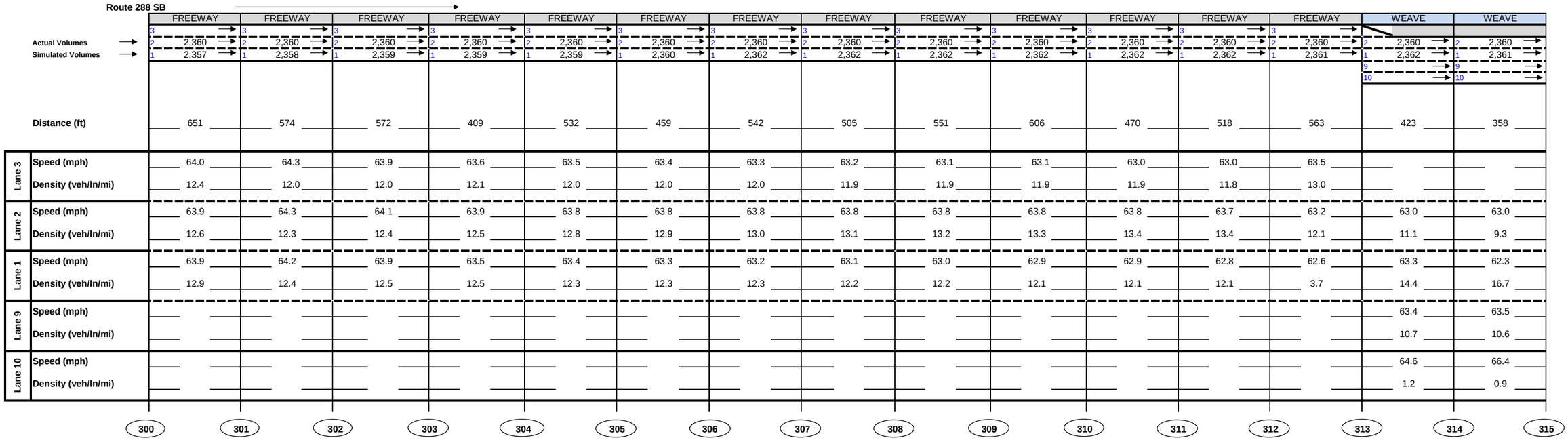
Figure 4

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 AM 3 Lanes_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

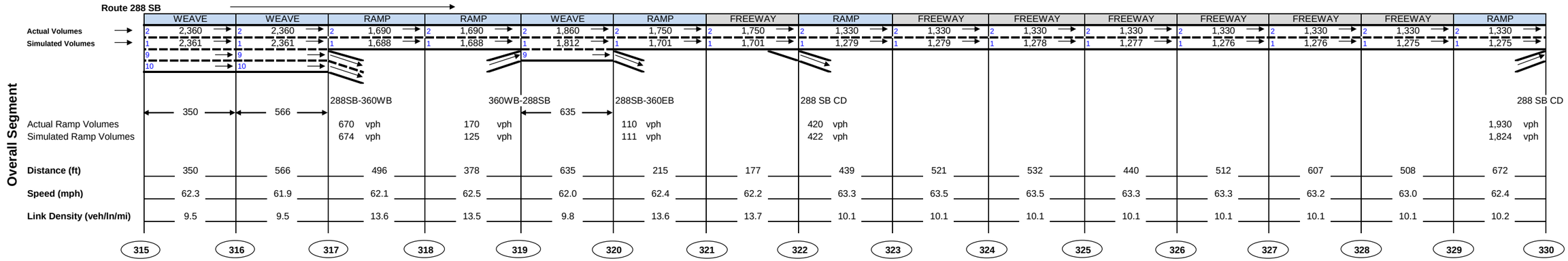
Virginia Department of Transportation

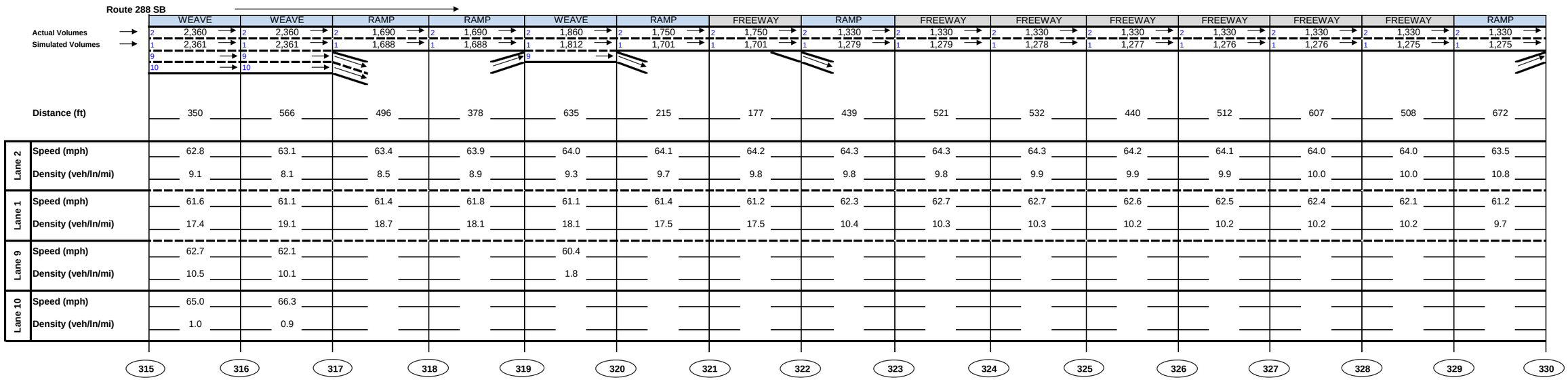
Figure 5

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 AM 3 Lanes_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

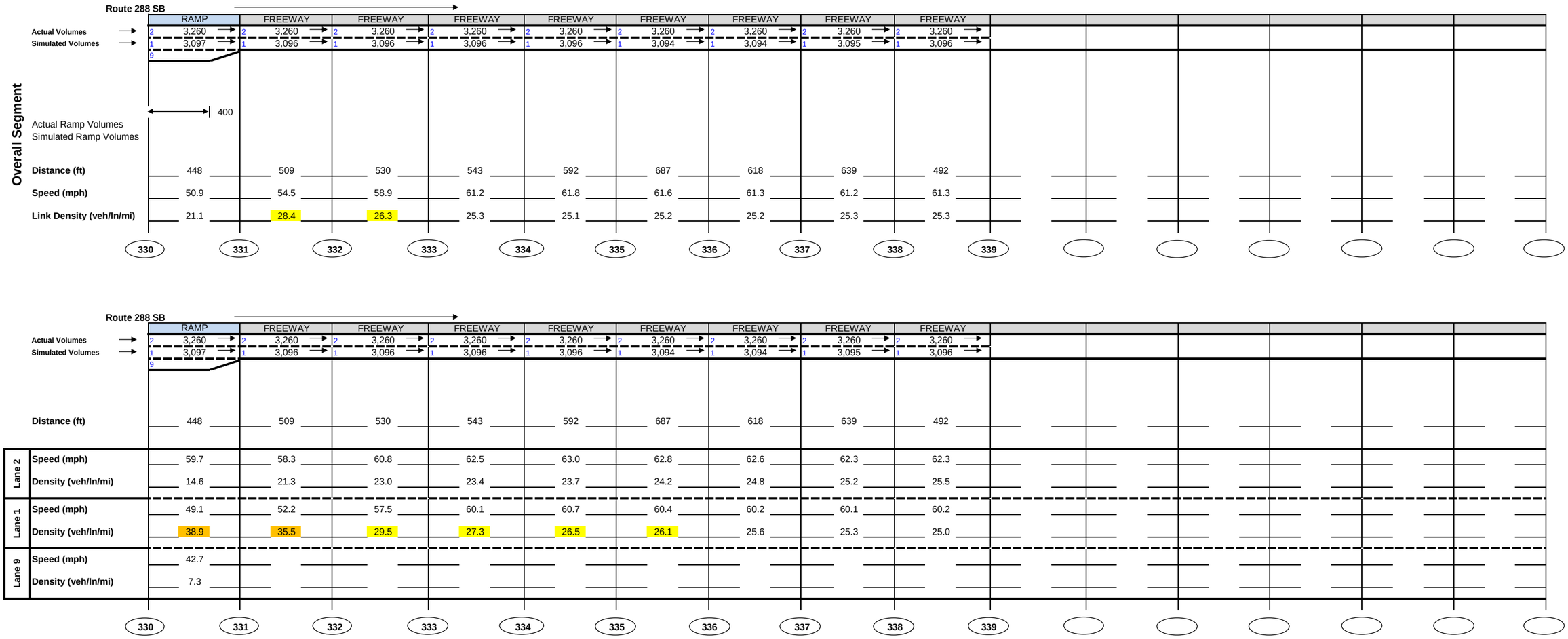
VDOT Virginia Department of Transportation

Figure 6

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 AM 3 Lanes_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

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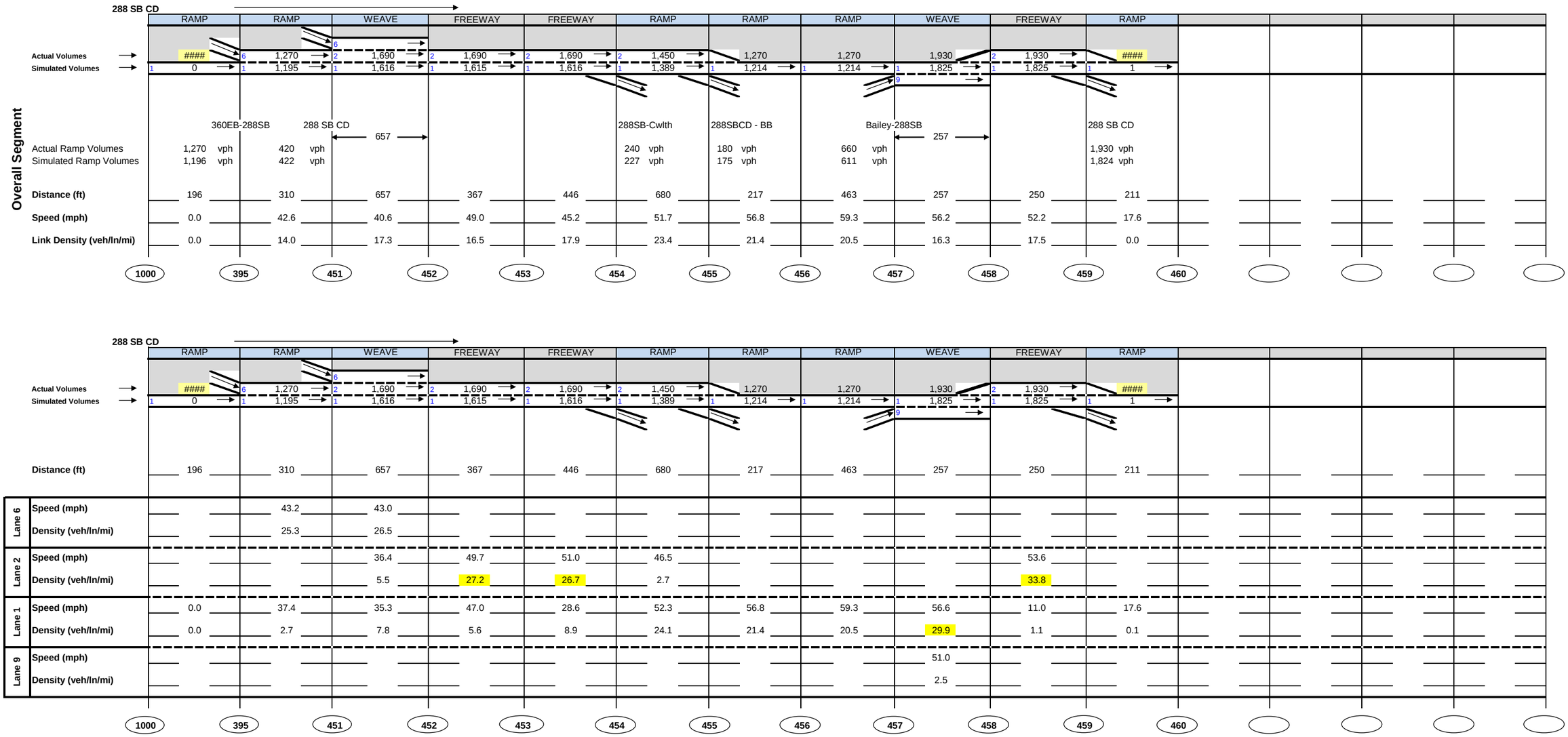
Virginia Department of Transportation

Figure 7

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 AM 3 Lanes_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

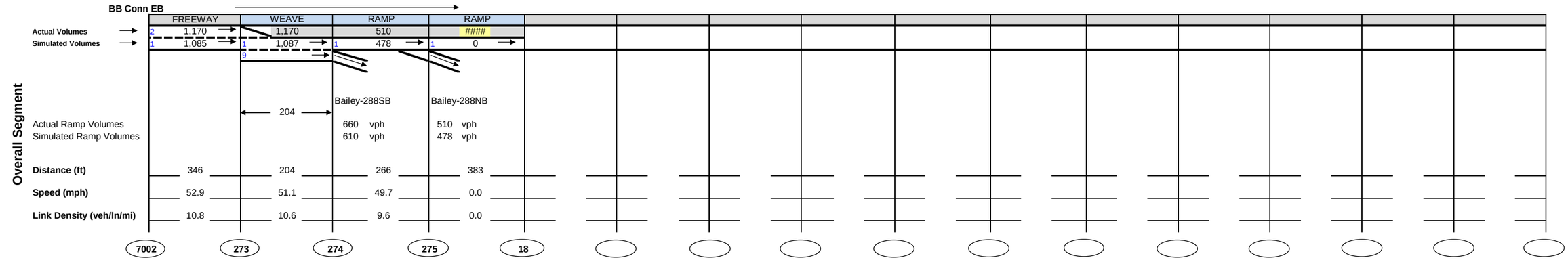
VDOT Virginia Department of Transportation

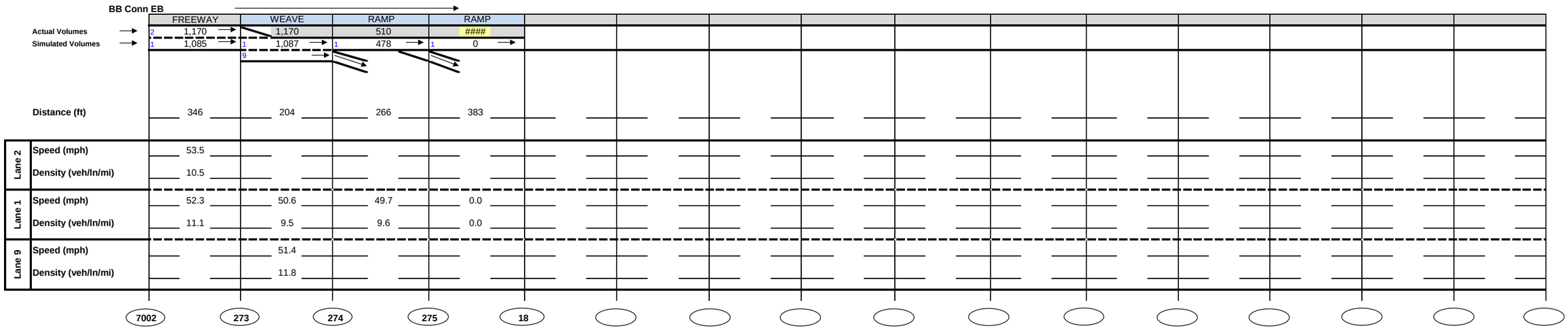
Figure 8

Route 288 at US 360 Interchange Existing Conditions PM

288 SB CD

2040 AM 3 Lanes_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

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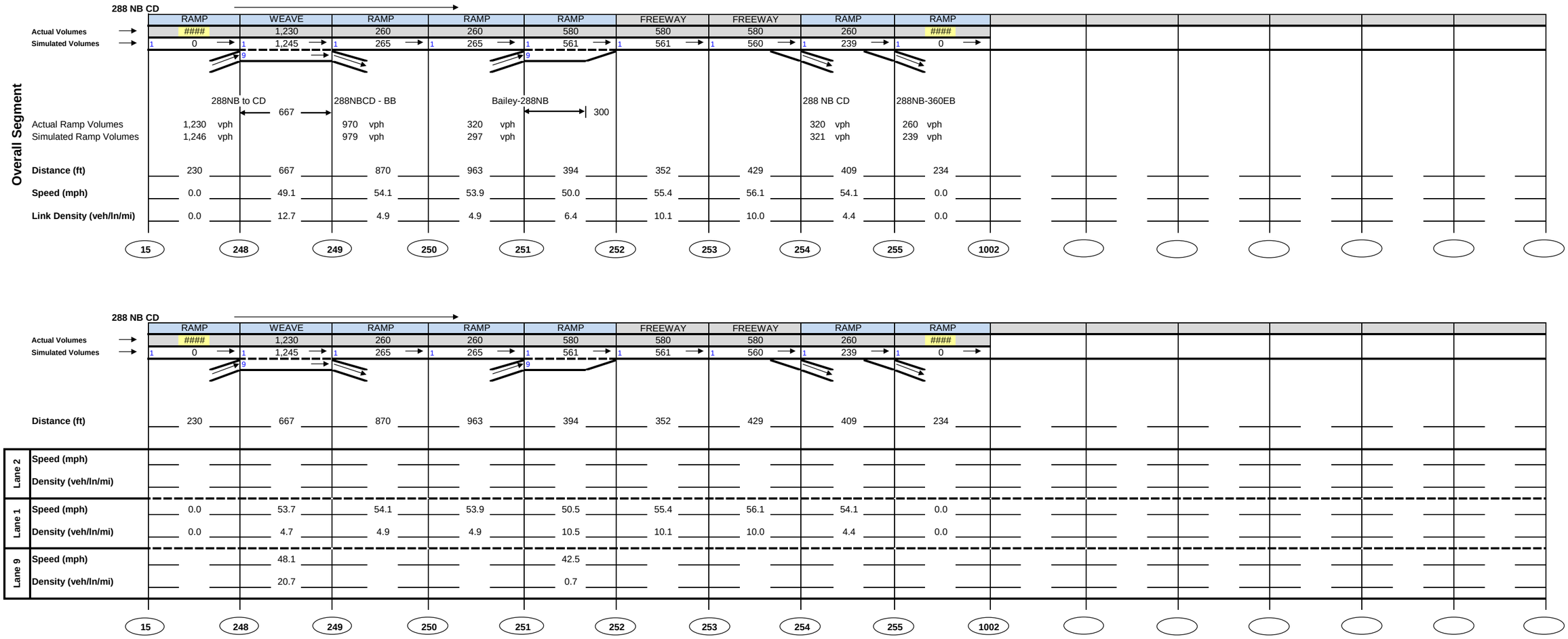
Figure 9

Route 288 at US 360 Interchange Existing Conditions PM

BB Conn EB

2040 AM 3 Lanes_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number ⟷ Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

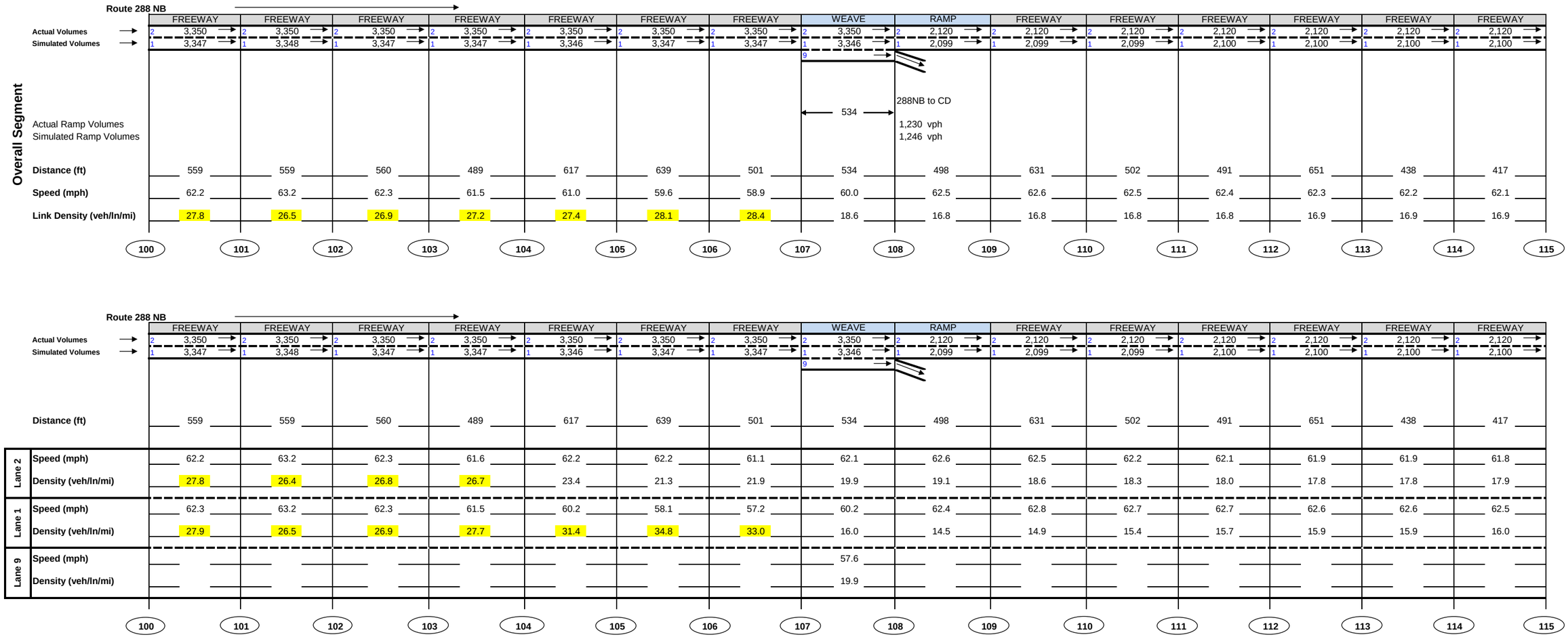
Virginia Department of Transportation

Figure 1

Route 288 at US 360 Interchange Existing Conditions PM

288 NB CD

2040 PM 3 Lanes_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

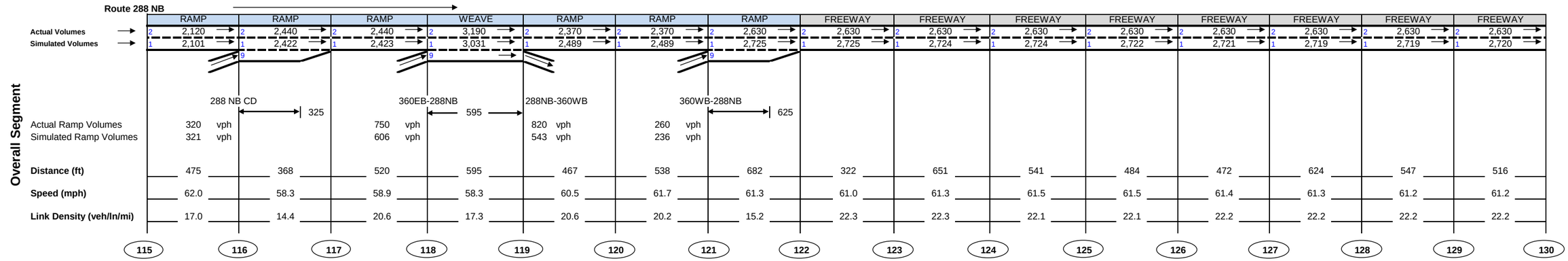
Virginia Department of Transportation

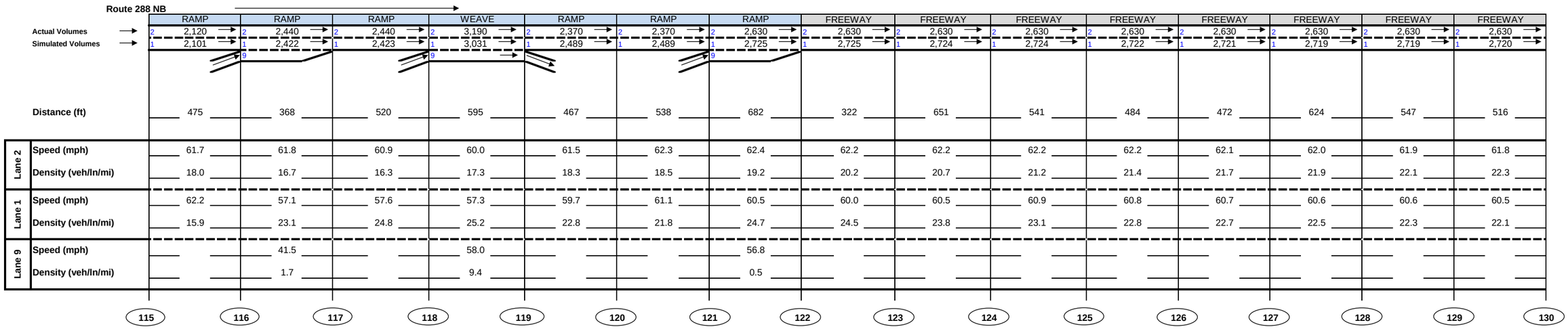
Figure 2

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 PM 3 Lanes_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

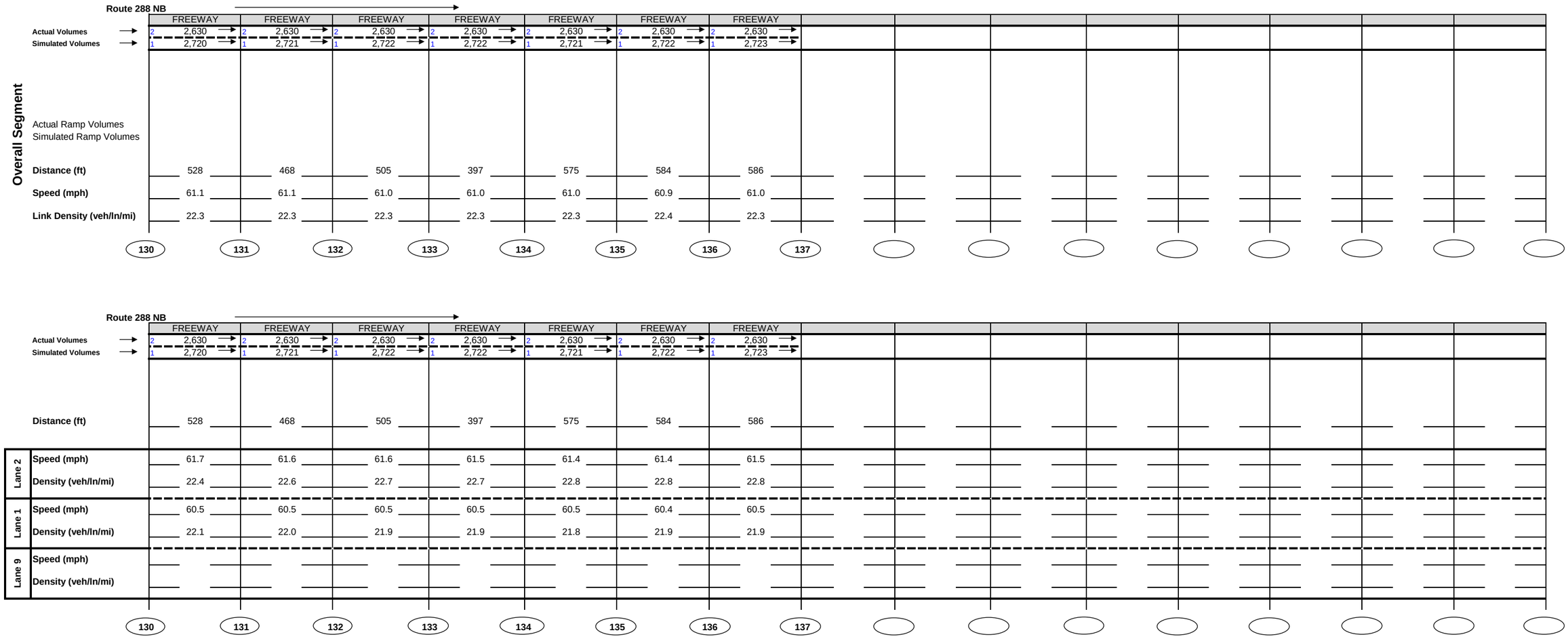
Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

VDOT Virginia Department of Transportation

Figure 3
Route 288 at US 360 Interchange Existing Conditions PM
Route 288 NB
2040 PM 3 Lanes_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

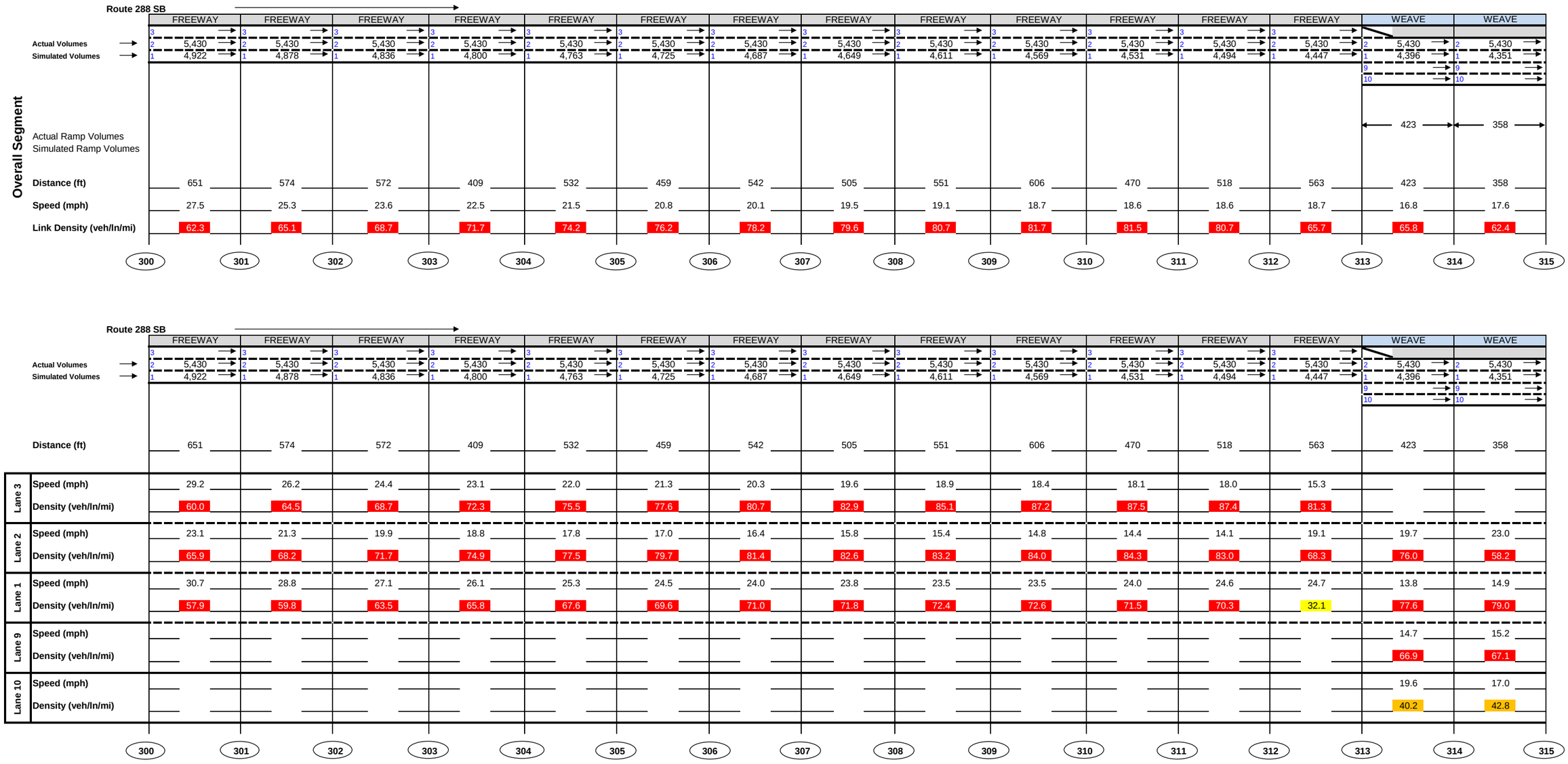
VDOT Virginia Department of Transportation

Figure 4

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 NB

2040 PM 3 Lanes_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)	Weave/Ramp Density (veh/ln/mi)
45 and above	43 and above
35 to 45	35 to 43
26 to 35	28 to 35
18 to 26	20 to 28
11 to 18	10 to 20
0 to 11	0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

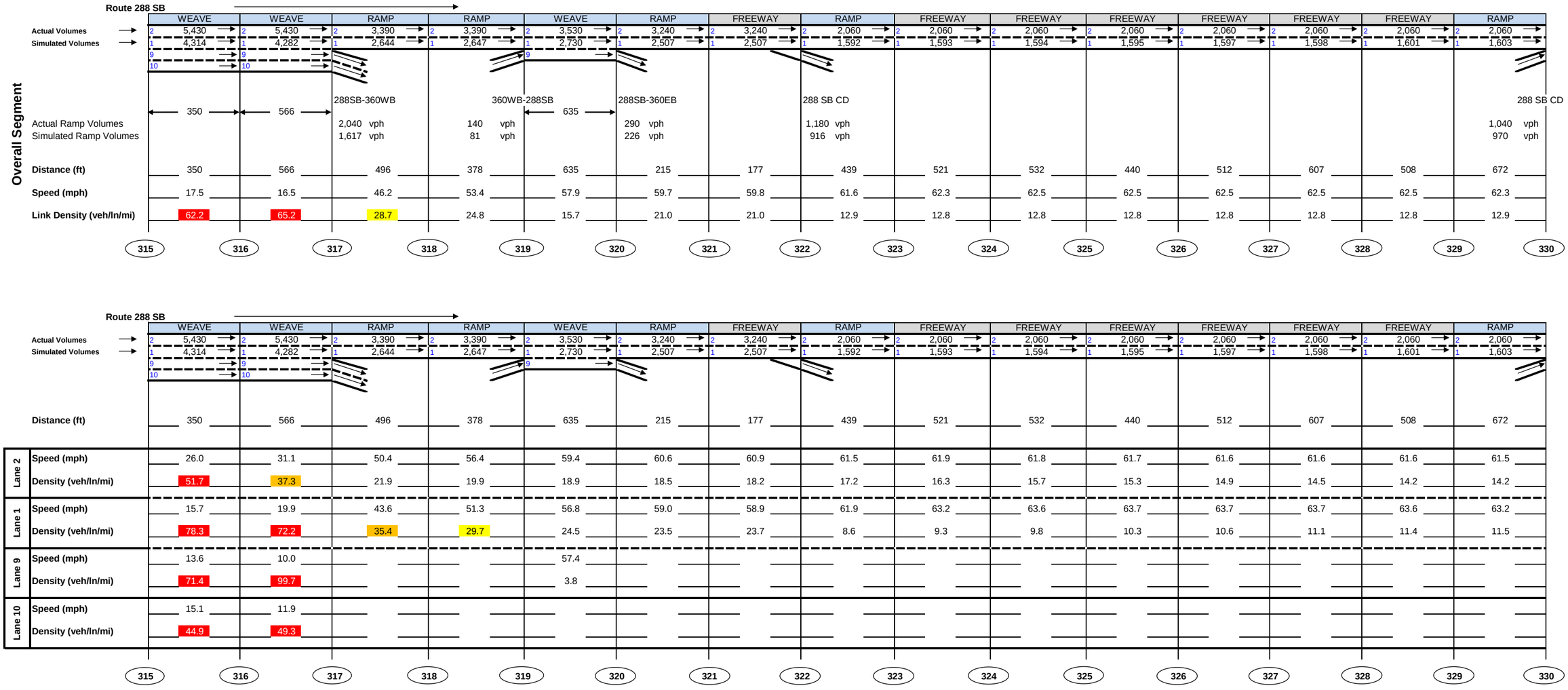
Virginia Department of Transportation

Figure 5

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 PM 3 Lanes_1



NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

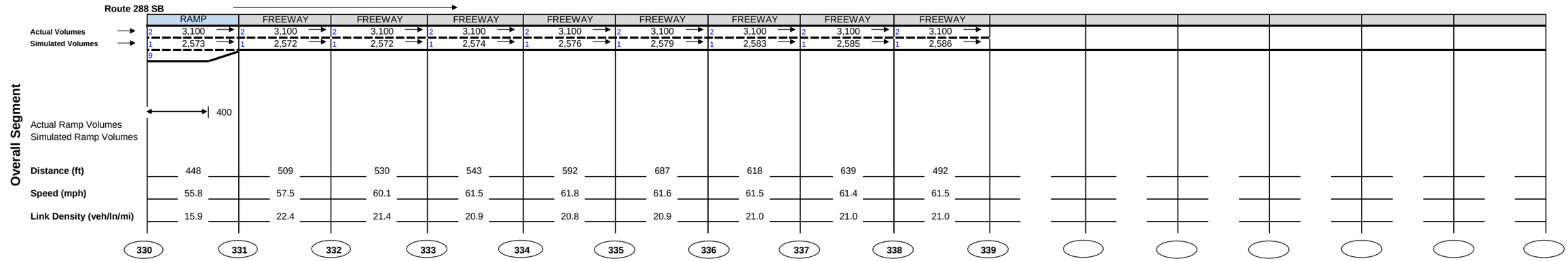
Virginia Department of Transportation

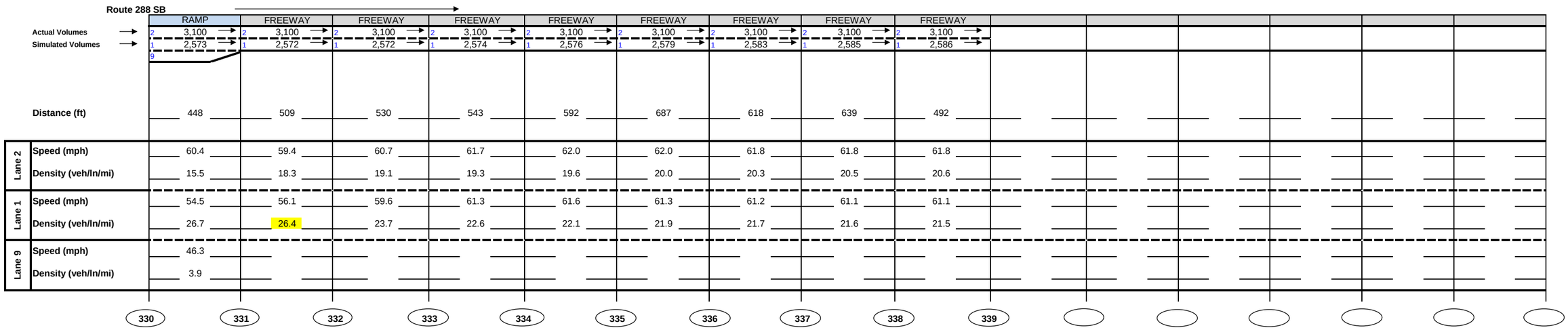
Figure 6

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 PM 3 Lanes_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

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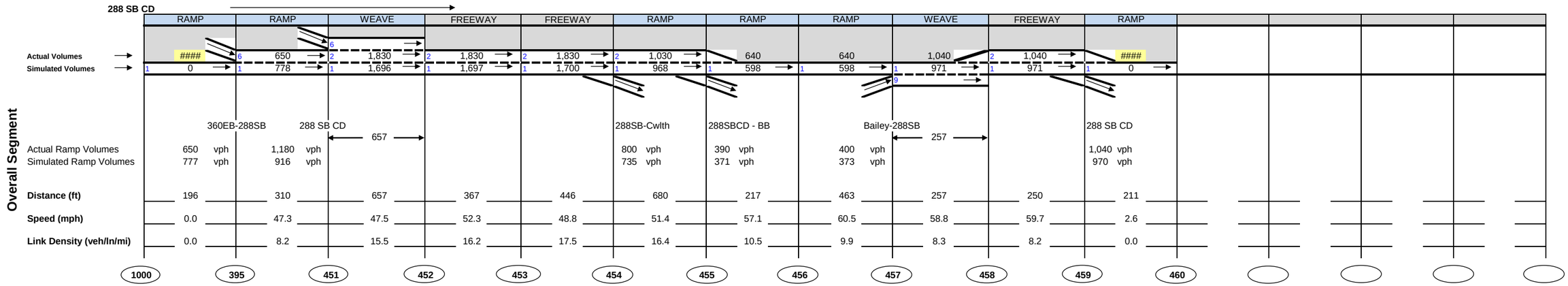
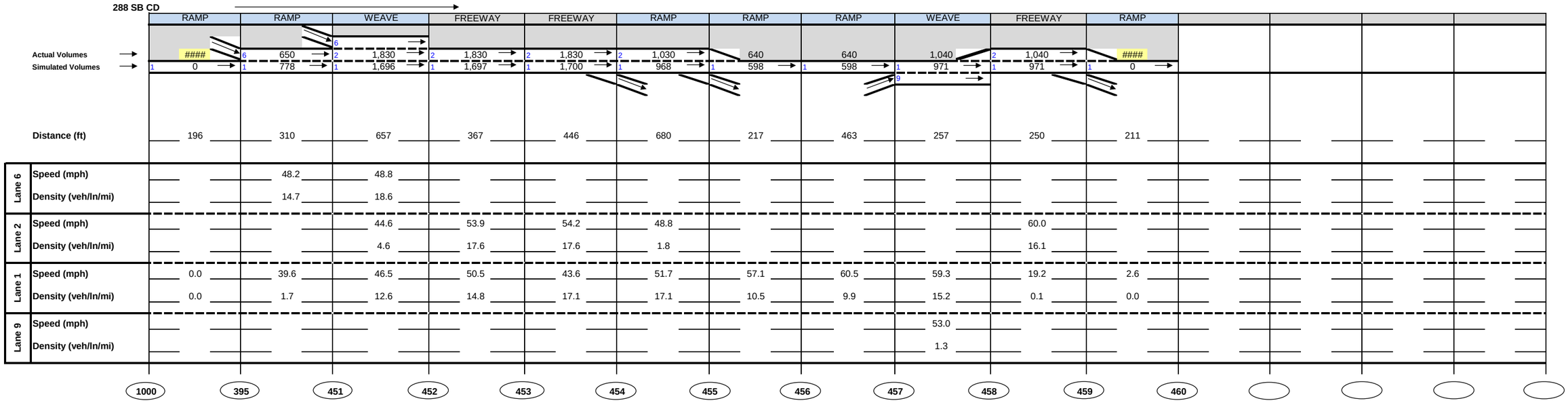
Figure 7

Route 288 at US 360 Interchange Existing Conditions PM

Route 288 SB

2040 PM 3 Lanes_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

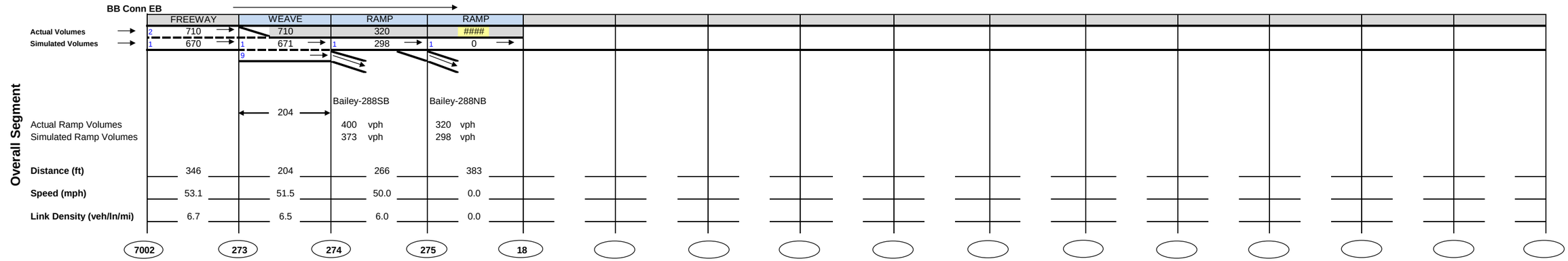
VDOT Virginia Department of Transportation

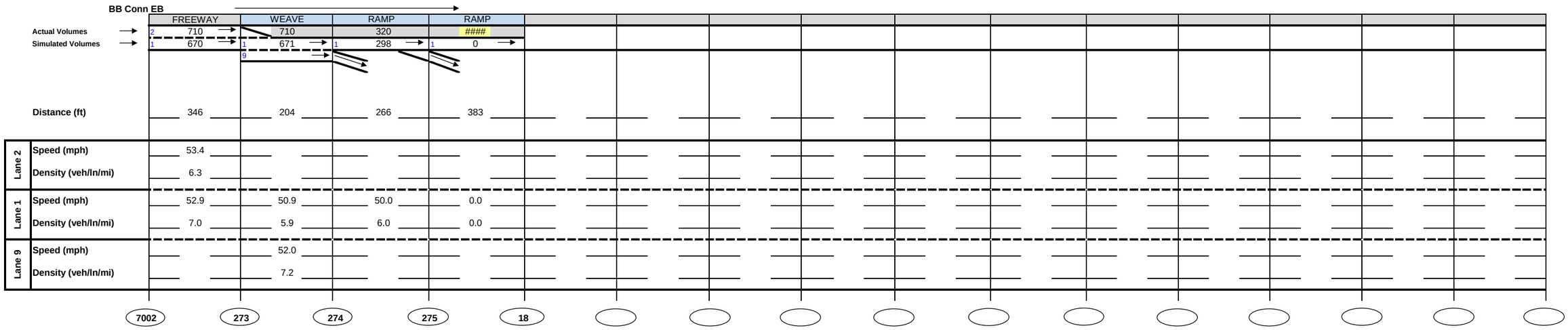
Figure 8

Route 288 at US 360 Interchange Existing Conditions PM

288 SB CD

2040 PM 3 Lanes_1





NOTE: numbers in chart are provided for illustrative purposes only

LEGEND

100 Node Number

Auxiliary Lane Length

Freeway Density (veh/ln/mi)
45 and above
35 to 45
26 to 35
18 to 26
11 to 18
0 to 11

Weave/Ramp Density (veh/ln/mi)
43 and above
35 to 43
28 to 35
20 to 28
10 to 20
0 to 10

NOTE: This output was created using a beta version of the VDOT Traffic Analysis Tool Guidebook CORSIM Freeway Output Template Processing Tool (Beta Version 1.0), which is still undergoing final testing before its official release. This tool is provided for evaluation purposes only.

Virginia Department of Transportation

Figure 9

Route 288 at US 360 Interchange Existing Conditions PM

BB Conn EB

2040 PM 3 Lanes_1