Northside Hospital – North Tower Addition
Traffic Impact Analysis

Prepared for:
Northside Hospital

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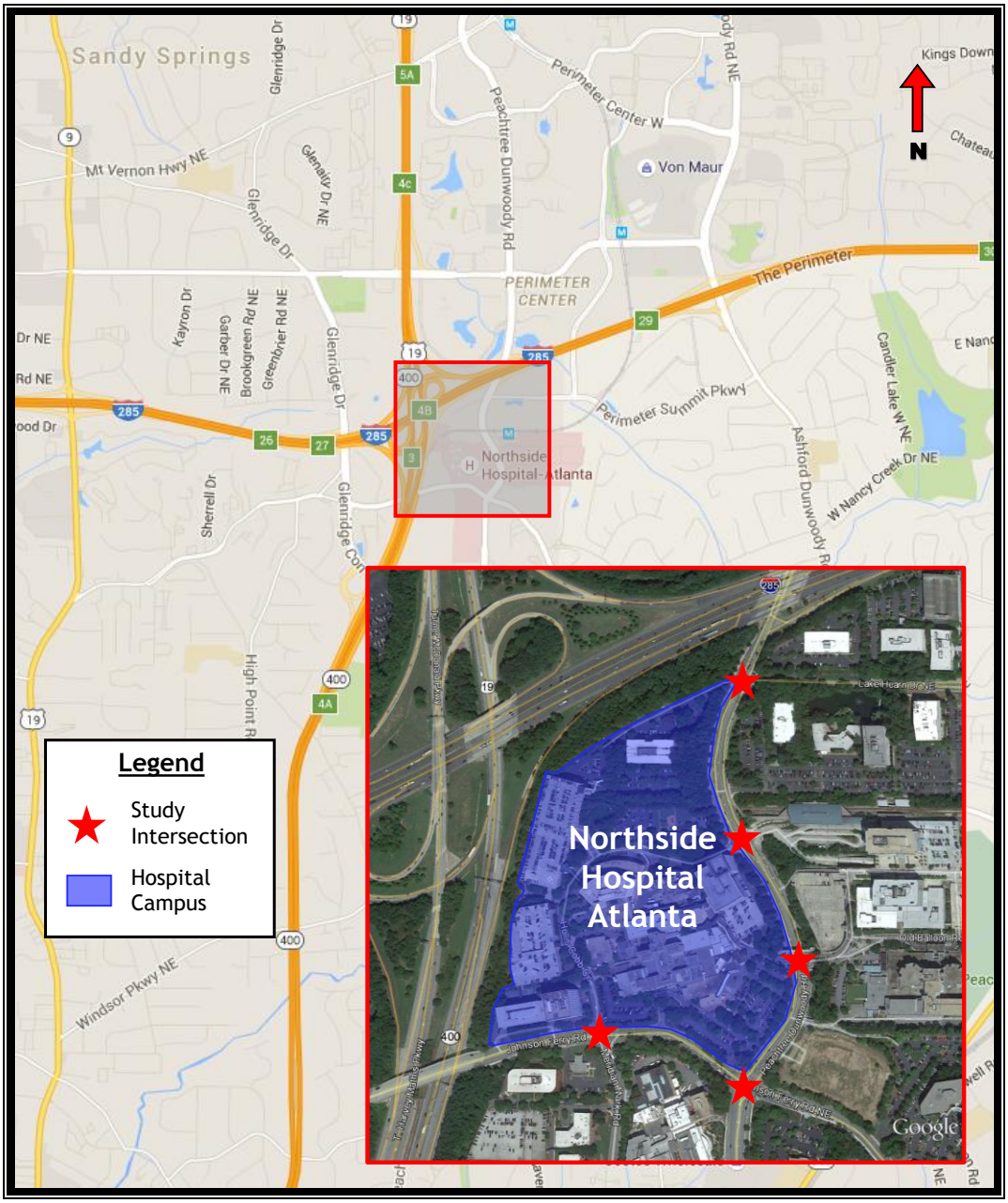
1.0 INTRODUCTION

Northside Hospital is preparing to expand their Atlanta facility with the construction of the North Tower Addition and parking deck on the existing campus. Re-zoning is required to construct this expansion. This study will estimate the volume of traffic produced by this expansion, distribute the traffic to the existing roadway network and, if necessary, will make recommendations for roadway or traffic control improvements to accommodate this added traffic.

Figure 1: Site Location Map



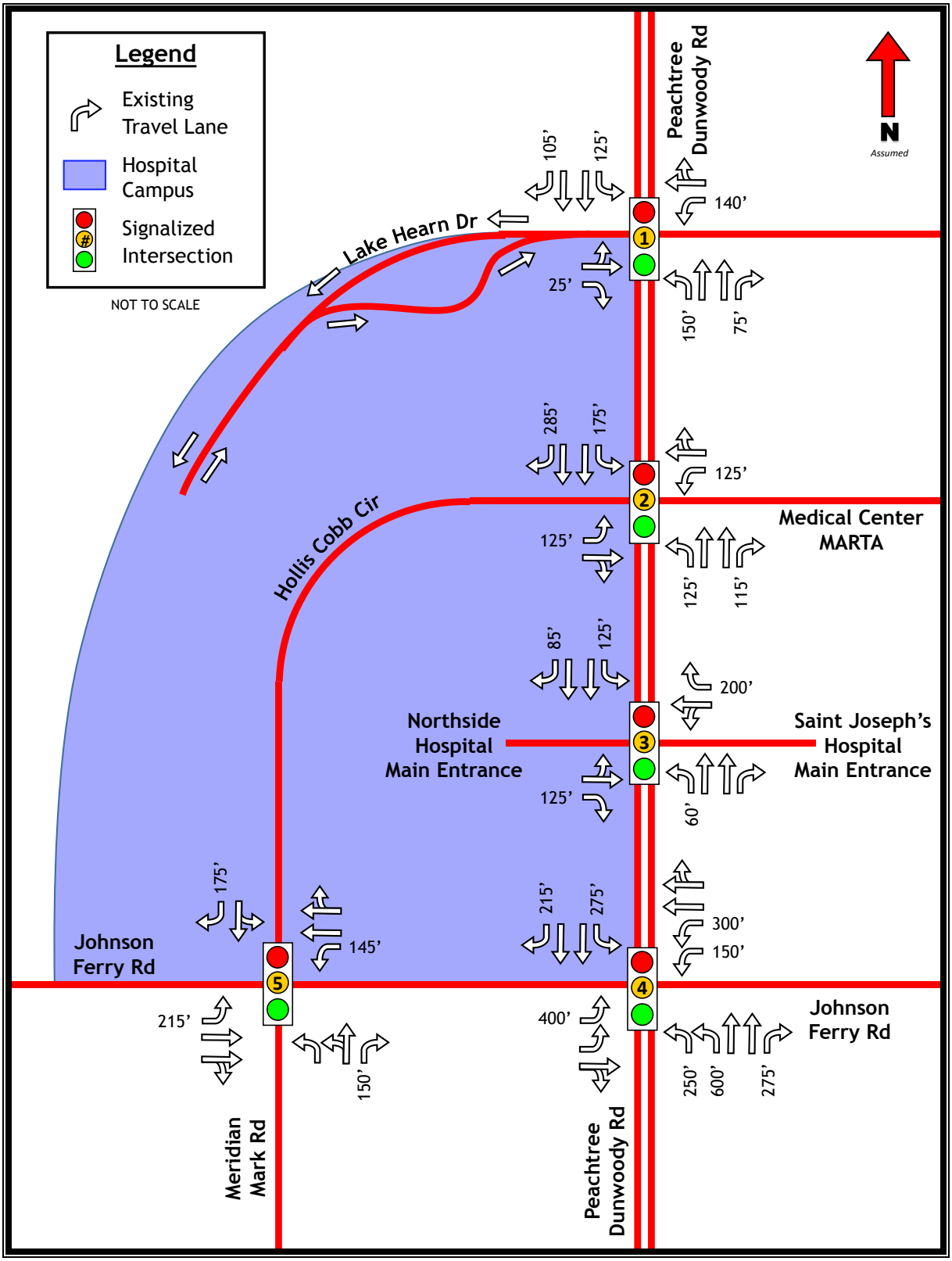
2.0 EXISTING CONDITIONS

The Northside Hospital Atlanta campus is located in the south east corner of the interchange of SR 400 at I-285, bounded on the east by Peachtree Dunwoody Road and on the south by Johnson Ferry Road. Four full-access signalized intersections provide ingress and egress to and from the hospital; Peachtree Dunwoody Road at Lake Hearn Drive, Peachtree Dunwoody Road at Hollis Cobb Circle, Peachtree Dunwoody Road at Northside Hospital Main Entrance/Saint Joseph's Hospital Main Entrance and Johnson Ferry Road at Hollis Cobb Circle/Meridian Mark Road. Peachtree Dunwoody Road and Johnson Ferry Road intersect at a signalized intersection, located to the southeast of the hospital campus.

Peachtree Dunwoody Road is a four-lane divided Minor Arterial with a posted speed limit of 35 mph, which travels north and south through the study area. Johnson Ferry Road is a four-lane undivided Minor Arterial with a posted speed of 35 mph, which travels east and west through the study area. Lake Hearn Drive, east of Peachtree Dunwoody Road, is a two-lane Major Collector with a posted speed limit of 35 mph. South of Johnson Ferry Road, Meridian Mark Road is a three-lane local road with a posted speed limit of 35 mph. Lake Hearn Drive to the west of Peachtree Dunwoody Road, Hollis Cobb Circle and the Northside Hospital Main Entrance/Saint Joseph's Hospital Main Entrance are each two-lane local roads with no posted speed limit.

The existing geometry and traffic control for the study intersections are shown in Figure 2.

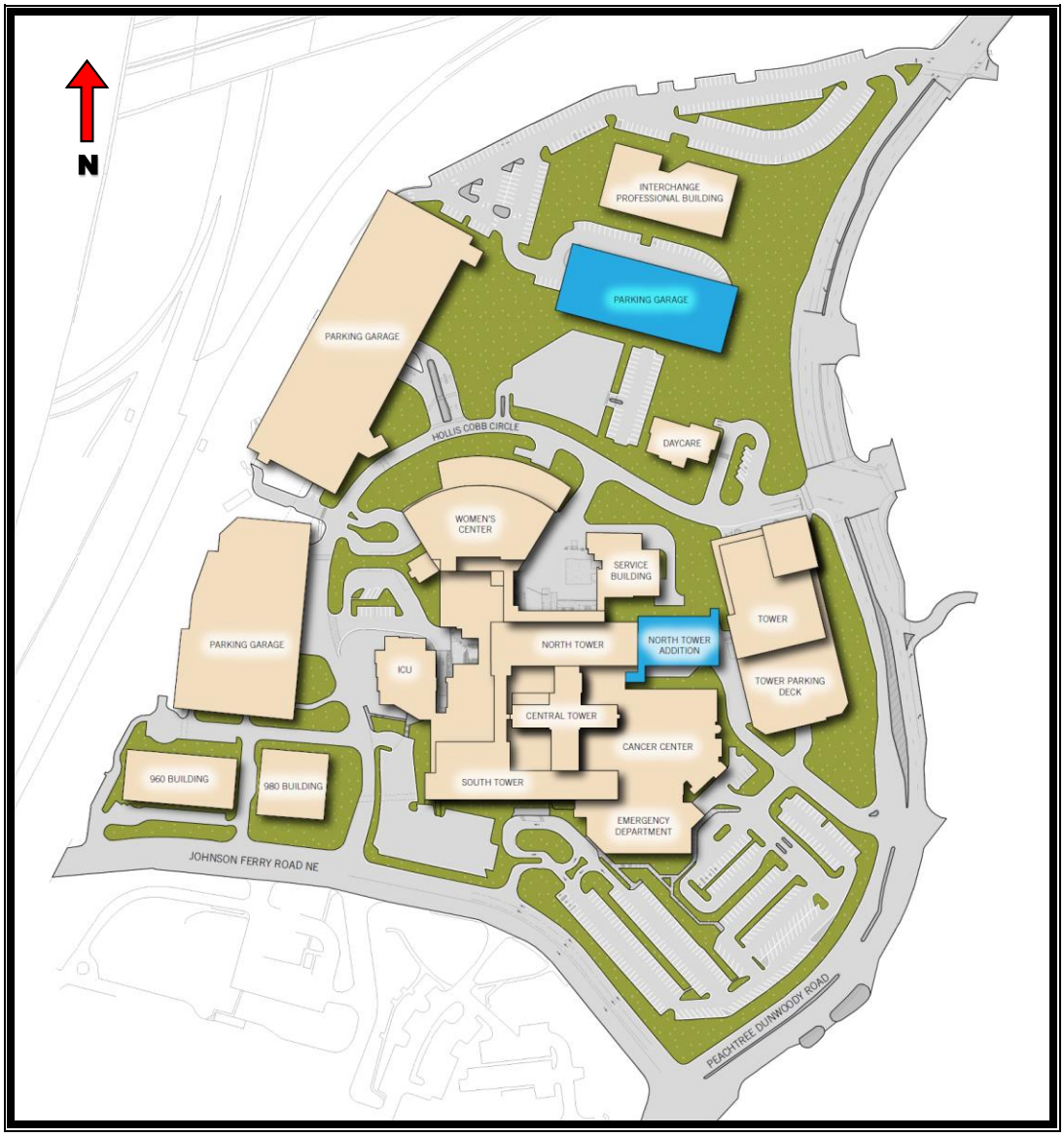
Figure 2: Existing Conditions



3.0 PROPOSED DEVELOPMENT

The North Tower Addition will be constructed on the Northside Hospital Atlanta campus adjacent to the existing North Tower. A new parking deck is also proposed to be added south of the Interchange Professional Building. The North Tower Addition may be constructed in two phases, both of which are planned to be open by December 2017. Phase one improvements will include a net increase of 53 beds with the approximate 65,575 square feet addition. Phase two will include up to 66 beds and approximately 46,500 square feet. The new parking deck will contain 1,271 parking spaces within 406,000 square feet. As the proposed parking deck will be constructed upon an existing parking lot, no new access is planned. A site map showing the location of these proposed additions is presented in Figure 3.

Figure 3: Proposed Development



4.0 TRAFFIC VOLUMES

4.1 Existing Traffic Volumes

Existing turning movement volumes for the morning and afternoon peak periods were collected at each of the study intersections on Wednesday, April 20, 2016. The morning peak hour occurred between 7:30 and 8:30 AM and the afternoon peak hour occurred between 5:15 and 6:15 PM. Due to several high-volume driveways located between the study intersections, the counts along Peachtree Dunwoody Road and Johnson Ferry Road are not balanced. Copies of the raw traffic counts are provided in Appendix A.

4.2 Historical Growth

To determine the anticipated background growth for the study intersections, historical Average Annual Daily Traffic (AADT) volumes for roadways in the project vicinity, were obtained from the Georgia Department of Transportation. As presented in Table 1, the five-year and ten-year growth has been negative on Peachtree Dunwoody Road and positive on Johnson Ferry Road. However, total growth in the area, as shown in the weighted average calculation, has been negative for the five-year and ten-year period.

Table 1: Historical Average Daily Traffic

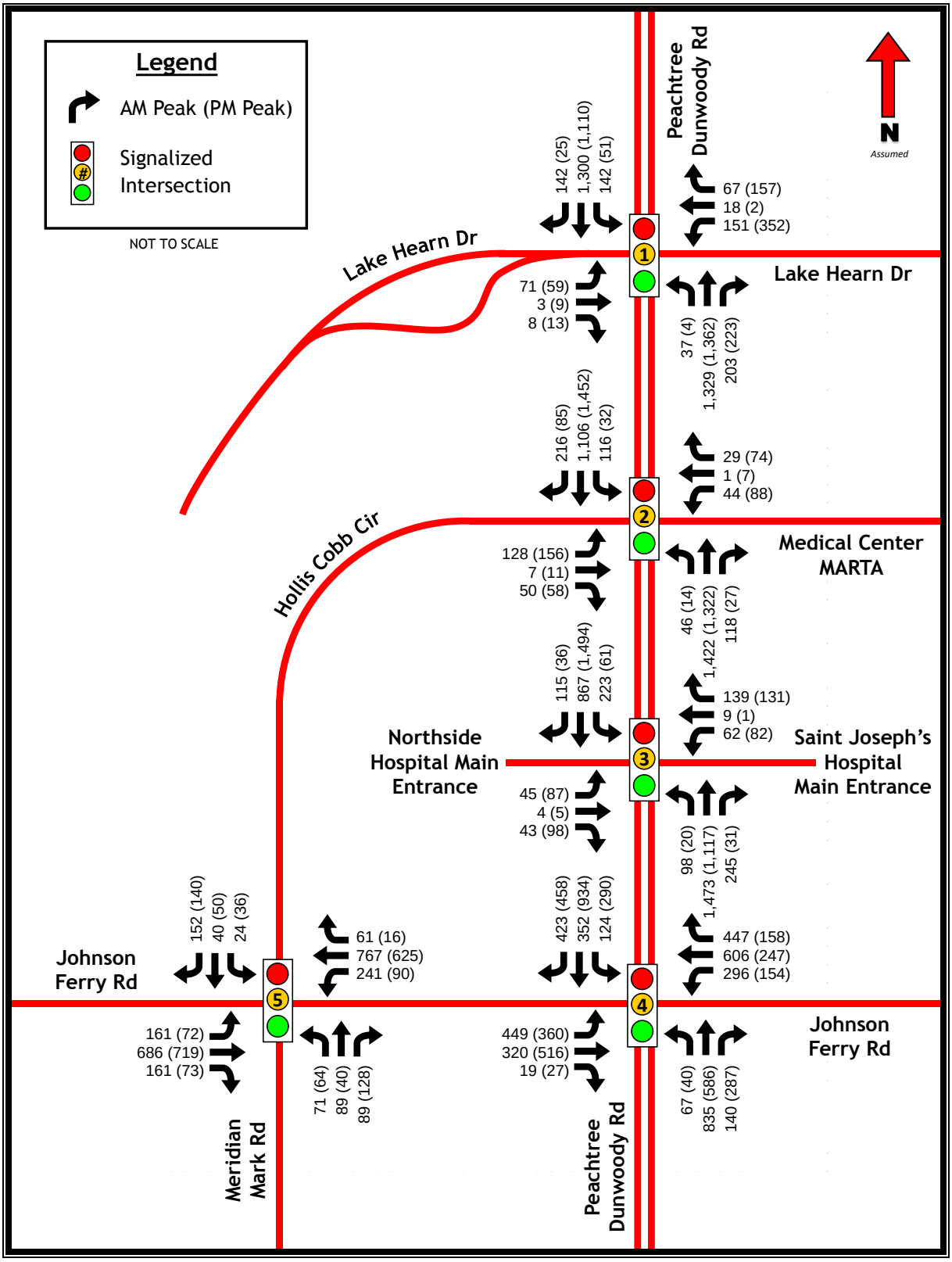
County	Road Name	Station ID	Location	Year	Average Annual Daily Traffic (AADT)	Average Annual Growth Rate	
						10-Year	5-Year
Fulton	Peachtree Dunwoody Road	1215644	Between Glenridge Connector and Johnson Ferry Road	2004*	34,920	-4.8%	-2.4%
				2005*	35,270		
				2006	28,990		
				2007	30,080		
				2008	24,690		
				2009*	24,000		
				2010	19,050		
				2011	21,330		
				2012*	21,210		
				2013*	21,310		
				2014*	21,300		
Fulton	Johnson Ferry Road	1215646	Between Glenridge Connector and Peachtree Dunwoody Road	2004	20,910	0.3%	2.2%
				2005*	21,540		
				2006	14,260		
				2007	19,040		
				2008*	18,930		
				2009	19,300		
				2010*	18,970		
				2011*	18,950		
				2012*	18,840		
				2013	21,520		
				2014*	21,500		
					Weighted Average	-2.3%	-0.1%

*No field count collected, AADT estimated from previous year

4.3 Background Traffic Volumes

For a conservative analysis, a negative growth rate was not applied to the collected peak hour traffic volumes for development of the opening year background volumes. The 2018 Background Traffic for the study area is assumed to be the same as the existing volumes. These morning and afternoon peak hour traffic volumes for the study intersections are shown in Figure 4.

Figure 4: 2018 Background Traffic Volumes



4.4 Development Traffic Volumes

The *Institute of Transportation Engineers (ITE) Trip Generation*, 9th Edition, was consulted to identify number of trip ends typical for the land use, Hospital (610), and to estimate the percentages of entering and exiting trips for each peak hour. Production of trip ends for a Hospital are available based upon three independent variables: Number of Employees, 1,000 Sq. Feet Gross Floor Area, and Number of Beds. The change in number of employees is unknown based upon the North Tower Addition and the existing Sq. Feet Gross Floor Area for Northside Hospital is beyond the upper limit of data used to produce rates for *ITE Trip Generation*. Therefore, trip generation for the North Tower Addition was conducted using Number of Beds.

The applicable AM Peak Hour of Adjacent Street Traffic (AM Peak) and PM Peak Hour of Adjacent Street Traffic (PM Peak) sheets from *ITE Trip Generation* are included in Appendix B. The resulting number of peak hour trips anticipated to be generated following construction of the North Tower Addition are shown in Table 2.

Table 2: Trip Generation

ITE Description	ITE Code	Unit	No. of Units	Peak Hour	Trip Generation			
					Rate	Trips		
						Total	Enter	Exit
Hospital	610	Beds	135	AM Peak of Adjacent Street	1.32	178	128	50
				PM Peak of Adjacent Street	1.42	192	63	128

The generated trips produced by the North Tower Addition were then distributed to the roadway network. As mentioned previously, the new parking deck will be constructed on an existing parking lot, so no new access is planned. Due to the location of the parking deck it will primarily be used by hospital employees. Most hospital employees work non-traditional shift hours, not an 8 AM to 5 PM workday, so they arrive and depart outside of the peak hours of the adjacent roadways. Therefore, a negligible number of existing peak hour trips are expected to be re-routed to the Lake Hearn intersection from other hospital entrances. New peak hour trips generated by the North Tower Addition have been distributed proportionally over the four existing signalized entrances. The distributed traffic for the AM Peak and PM Peak hours are shown in Figure 5.

4.5 Build Traffic Volumes

Total traffic volumes for the study area intersections were produced for the Build condition by combining the 2018 Background traffic volumes and Trip Generation volumes for each peak hour. The resulting 2018 AM Peak Build and 2018 PM Peak Build volumes are shown in Figure 6.

Figure 5: Trip Generation Traffic Volumes

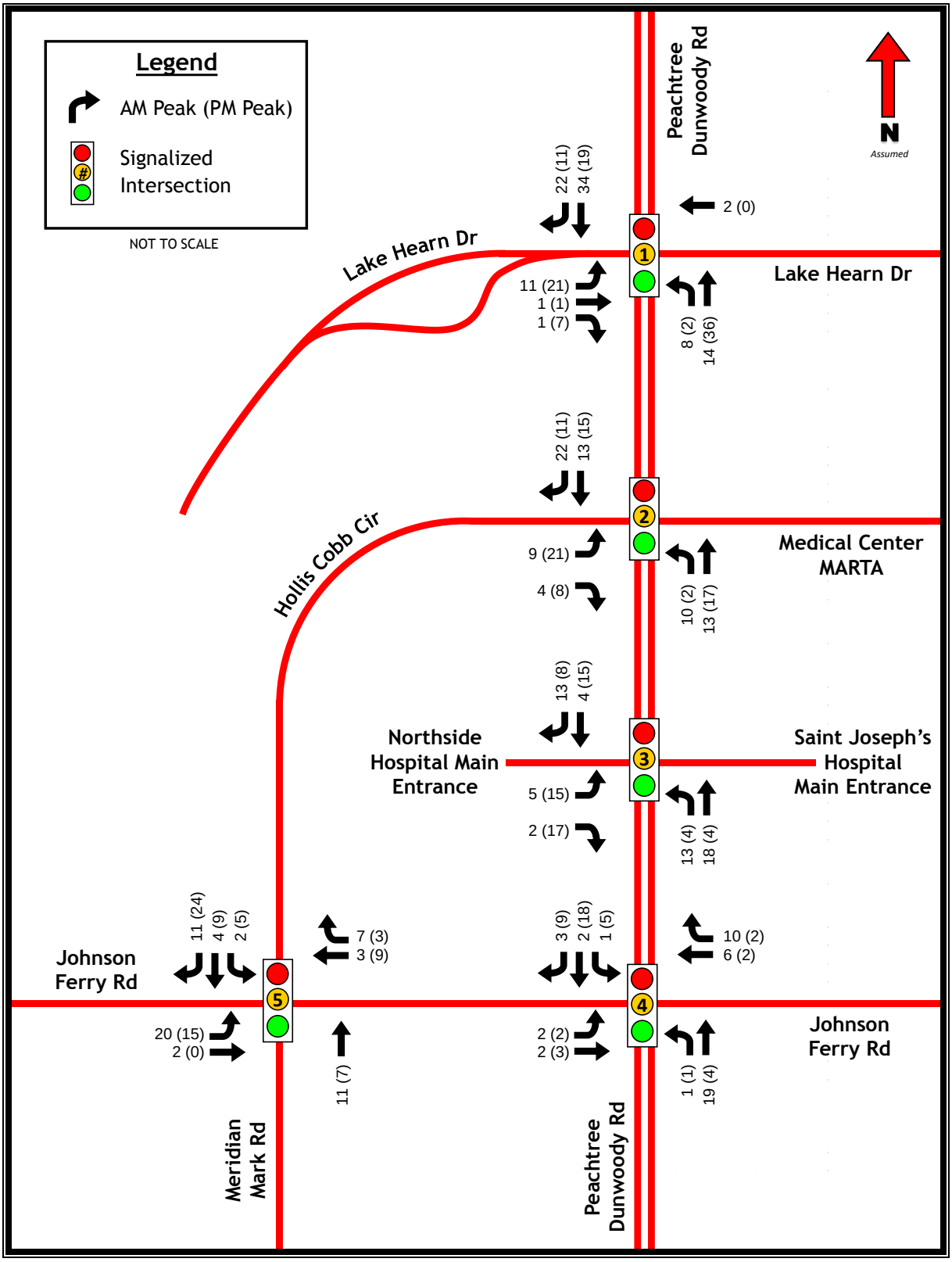
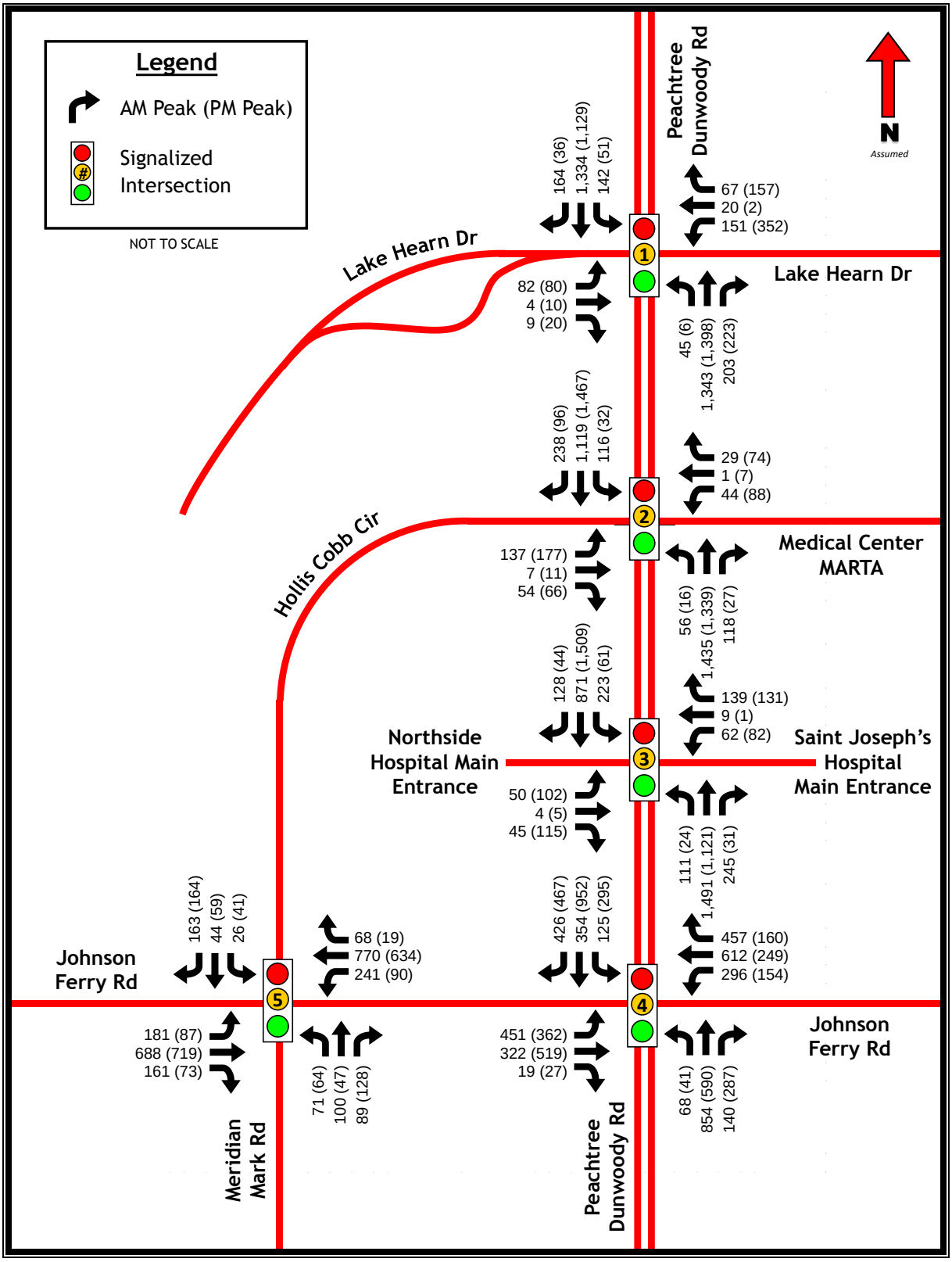


Figure 6: 2018 Build Traffic Volumes



5.0 CAPACITY ANALYSIS

The traffic software *Synchro with SimTraffic* was used to perform capacity analysis for the study area intersections. Using the methods described in the Highway Capacity Manual (HCM), *Synchro* evaluates the performance of an intersection or group of intersections and determines the average delay experienced by each vehicle as a result of traffic control devices, which then provides a Level of Service (LOS). Definitions of LOS for Signalized intersections are shown in Table 3.

Table 3: Level of Service Definitions

Level of Service	Control Delay Per Vehicle (sec)
	Signalized Intersection
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

5.1 Background Conditions

Capacity analysis for each of the study intersections was first completed for the 2018 Background conditions. The morning and afternoon peak hour Background traffic volumes were analyzed with the existing geometry, traffic control and signal timing conditions. The resulting LOS for each intersection is shown in Table 4 and the *Synchro* reports are provided in Appendix C.

Table 4: 2018 Background LOS Results

Intersection			2018 Background Level of Service (Delay in sec/veh)	
Number	**Name**	**Approach**	**AM Peak**	**PM Peak**
1	Peachtree Dunwoody Road at Lake Hearn Road	EB	F (87.6)	F (98.2)
		WB	D (48.5)	D (51.1)
		NB	B (13.5)	C (33.6)
		SB	C (21.3)	C (29.8)
		Total	**C (21.2)**	**D (36.5)**
2	Peachtree Dunwoody Road at Hollis Cobb Circle/ Medical Center MARTA	EB	E (68.4)	F (86.7)
		WB	E (57.5)	E (67.2)
		NB	A (9.0)	B (18.4)
		SB	B (11.7)	B (10.0)
		Total	**B (14.6)**	**C (21.6)**
3	Peachtree Dunwoody Road at Northside Hospital/ Saint Joseph's Hospital	EB	E (66.0)	F (104.2)
		WB	E (66.7)	F (97.5)
		NB	B (11.5)	B (10.2)
		SB	B (13.3)	A (3.9)
		Total	**B (17.2)**	**B (18.6)**
4	Peachtree Dunwoody Road at Johnson Ferry Road	EB	E (71.2)	F (134.1)
		WB	F (96.1)	E (68.7)
		NB	E (58.3)	E (56.0)
		SB	F (80.6)	E (56.9)
		Total	**E (78.2)**	**E (75.5)**
5	Johnson Ferry Road at Hollis Cobb Circle/ Meridian Mark Road	EB	C (32.5)	B (13.9)
		WB	B (14.1)	A (8.5)
		NB	E (67.0)	F (82.6)
		SB	F (148.3)	F (108.4)
		Total	**D (37.9)**	**C (30.1)**

As shown above, all the signalized entrances to the hospital are projected to operate at LOS D or better during both the morning and afternoon peak hours in the Background conditions. Peachtree Dunwoody Road at Johnson Ferry Road is expected to operate at LOS E during each peak hour in the Background conditions.

5.2 Build Conditions

To evaluate the impacts of the additional traffic produced by the North Tower Addition the 2018 Build Volumes, as shown in Figure 6, were evaluated with the existing geometry, existing traffic control and existing signal timing conditions. The LOS results for each intersection in the study area for the Build condition are shown in Table 5, and the *Synchro* reports are included in Appendix D.

Table 5: 2018 Build LOS Results

Intersection			2018 Build Level of Service (Delay in sec/veh)	
Number	**Name**	**Approach**	**AM Peak**	**PM Peak**
1	Peachtree Dunwoody Road at Lake Hearn Road	EB	F (87.2)	F (108.2)
		WB	D (47.0)	D (53.0)
		NB	B (15.1)	C (32.4)
		SB	C (23.3)	C (30.1)
		Total	**C (22.9)**	**D (37.0)**
2	Peachtree Dunwoody Road at Hollis Cobb Circle/ Medical Center MARTA	EB	E (71.1)	F (85.2)
		WB	E (56.6)	E (64.5)
		NB	A (9.8)	B (19.3)
		SB	B (12.6)	B (12.5)
		Total	**B (15.7)**	**C (23.3)**
3	Peachtree Dunwoody Road at Northside Hospital/ Saint Joseph's Hospital	EB	E (67.2)	F (94.9)
		WB	E (66.9)	F (86.7)
		NB	B (11.6)	B (10.1)
		SB	B (13.9)	A (4.7)
		Total	**B (17.5)**	**B (18.3)**
4	Peachtree Dunwoody Road at Johnson Ferry Road	EB	E (72.8)	F (112.1)
		WB	F (98.9)	E (65.8)
		NB	E (58.8)	E (60.8)
		SB	E (78.2)	E (69.4)
		Total	**E (79.0)**	**E (76.4)**
5	Johnson Ferry Road at Hollis Cobb Circle/ Meridian Mark Road	EB	C (33.6)	B (14.7)
		WB	B (15.9)	B (13.8)
		NB	E (66.9)	F (82.7)
		SB	F (150.1)	F (113.6)
		Total	**D (40.0)**	**C (34.3)**

In the Build conditions, all intersections in the study area will continue to operate at the same level of service as in the Background conditions, during both the morning and afternoon peak hours.

6.0 CONCLUSIONS

The volume of traffic generated by the North Tower Addition and new parking deck proposed at Northside Hospital Atlanta is projected to be minimal. This minor increase in the overall area traffic does not negatively impact any of the study area intersections along Peachtree Dunwoody Road and Johnson Ferry Road. As all study area intersections are projected to maintain the same LOS as with the background volumes, no geometric or operational improvements are needed to mitigate this development.

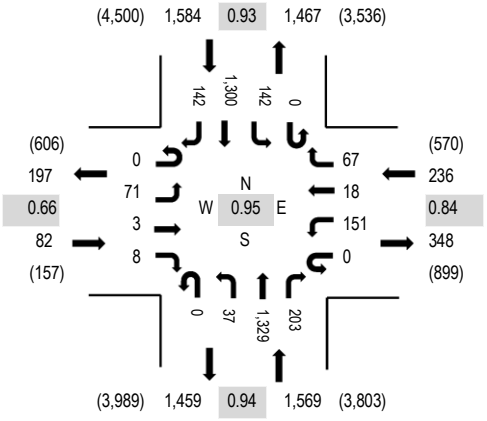
APPENDIX A : TRAFFIC COUNTS

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

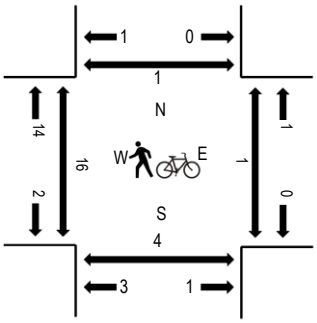
Location: #1 Peachtree Dunwoody Rd & Lake Hearn Dr AM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Office Drwy Eastbound				Lake Hearn Dr Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
6:30:00 AM	0	1	0	1	0	16	2	7	0	6	111	12	0	22	290	67	535	2,362	0	0	0	0
6:45:00 AM	0	2	0	3	0	10	6	12	1	5	125	23	0	26	272	69	554	2,718	0	1	0	1
7:00:00 AM	0	3	0	2	0	14	0	11	1	4	185	21	0	27	288	41	597	3,079	2	0	1	0
7:15:00 AM	0	7	0	1	0	19	3	6	1	8	250	29	0	34	281	37	676	3,348	3	0	1	0
7:30:00 AM	0	28	1	2	0	41	6	13	0	9	337	55	0	30	331	38	891	3,471	3	0	2	0
7:45:00 AM	0	20	1	1	0	30	5	12	0	12	357	49	0	40	345	43	915	3,400	4	0	1	0
8:00:00 AM	0	12	0	3	0	38	2	19	0	9	328	52	0	33	339	31	866	3,345	0	0	0	0
8:15:00 AM	0	11	1	2	0	42	5	23	0	7	307	47	0	39	285	30	799	3,285	7	1	1	1
8:30:00 AM	0	8	0	2	0	31	9	21	1	7	298	54	0	41	322	26	820	3,197	3	0	2	0
8:45:00 AM	0	5	0	3	0	33	3	26	0	12	336	60	1	32	314	35	860		6	2	2	2
9:00:00 AM	0	16	0	6	0	30	1	24	0	10	314	41	0	37	300	27	806		2	0	2	0
9:15:00 AM	0	7	0	8	0	21	1	28	0	8	264	47	1	45	259	22	711		3	2	2	0

Peak Rolling Hour Flow Rates

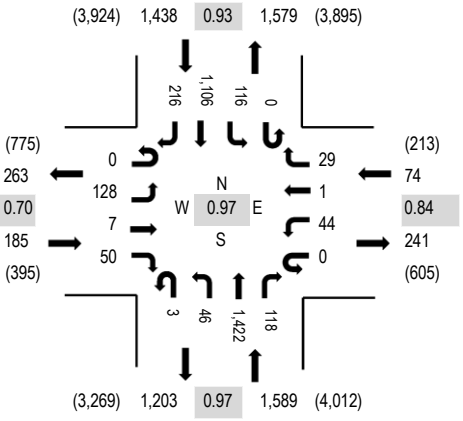
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Lights	0	71	3	8	0	146	18	66	0	37	1,316	197	0	141	1,282	142	3,427
Mediums	0	0	0	0	0	5	0	1	0	0	13	6	0	1	16	0	42
Total	0	71	3	8	0	151	18	67	0	37	1,329	203	0	142	1,300	142	3,471

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

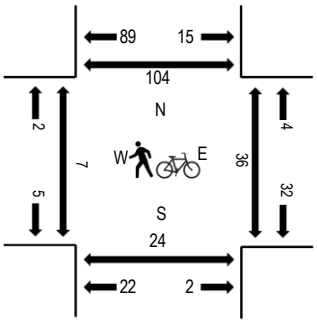
Location: #2 Peachtree Dunwoody Rd & Hollis Cobb Circle AM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Hollis Cobb Circle Eastbound				Hollis Cobb Circle Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
6:30:00 AM	0	12	0	8	0	5	1	2	0	13	113	17	0	14	229	79	493	2,262	0	7	3	26
6:45:00 AM	0	11	1	8	0	7	1	7	1	22	148	23	0	15	200	69	513	2,594	0	12	4	20
7:00:00 AM	0	13	0	4	0	6	0	4	0	19	222	19	0	21	228	44	580	2,928	2	6	2	18
7:15:00 AM	0	20	1	10	0	9	0	6	1	10	295	23	0	25	227	49	676	3,186	2	4	1	23
7:30:00 AM	0	48	2	16	0	9	1	8	0	17	330	30	0	33	281	50	825	3,286	0	16	12	27
7:45:00 AM	0	42	3	11	0	13	0	9	0	9	375	15	0	27	265	78	847	3,238	2	10	11	34
8:00:00 AM	0	21	0	9	0	12	0	7	2	10	354	36	0	32	299	56	838	3,196	2	1	0	3
8:15:00 AM	0	17	2	14	0	10	0	5	1	10	363	37	0	24	261	32	776	3,120	3	9	1	40
8:30:00 AM	0	15	1	10	0	11	2	6	0	13	334	32	0	35	279	39	777	2,996	1	4	0	17
8:45:00 AM	0	17	0	19	0	10	0	12	2	9	372	25	0	22	273	44	805		0	2	2	24
9:00:00 AM	0	18	2	9	0	15	2	13	1	11	344	27	0	21	262	37	762		1	4	2	15
9:15:00 AM	0	24	0	7	0	10	0	10	0	10	297	20	1	20	215	38	652		2	8	0	6

Peak Rolling Hour Flow Rates

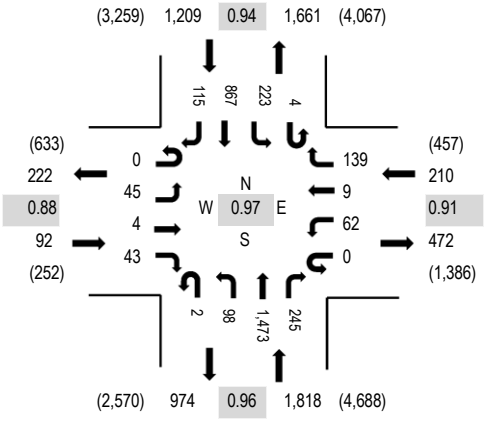
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1	1	5
Lights	0	127	7	44	0	35	1	23	3	45	1,412	109	0	111	1,092	212	3,221
Mediums	0	1	0	3	0	9	0	6	0	1	10	9	0	5	13	3	60
Total	0	128	7	50	0	44	1	29	3	46	1,422	118	0	116	1,106	216	3,286

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

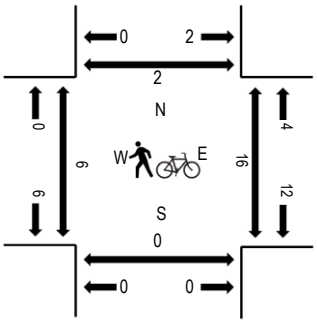
Location: #3 Peachtree Dunwoody Rd & St. Josephs Hospital Ent AM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 08:00 AM - 08:15 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Northside Hospital Ent Eastbound				St. Josephs Hospital Ent Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
6:30:00 AM	0	6	0	3	0	5	0	7	1	26	134	60	0	65	145	25	477	2,245	1	0	0	0
6:45:00 AM	0	5	0	16	0	3	1	6	1	37	183	52	0	62	133	38	537	2,581	2	4	0	0
7:00:00 AM	0	6	1	7	0	9	0	10	0	24	236	58	0	57	144	34	586	2,882	1	4	0	0
7:15:00 AM	0	3	1	14	0	5	2	16	0	32	295	63	1	50	140	23	645	3,155	1	2	0	0
7:30:00 AM	0	13	1	11	0	12	1	45	1	19	343	47	0	63	226	31	813	3,329	1	3	0	0
7:45:00 AM	0	11	1	11	0	14	3	37	0	27	381	66	0	48	206	33	838	3,312	2	6	0	0
8:00:00 AM	0	14	1	11	0	18	2	27	1	25	376	68	1	60	230	25	859	3,298	0	2	0	1
8:15:00 AM	0	7	1	10	0	18	3	30	0	27	373	64	3	52	205	26	819	3,254	3	5	0	1
8:30:00 AM	0	6	1	13	0	12	1	23	0	29	356	65	0	49	221	20	796	3,082	1	2	0	0
8:45:00 AM	0	11	2	11	0	16	3	35	0	18	365	50	1	53	243	16	824		2	2	0	0
9:00:00 AM	0	9	1	14	0	18	0	30	2	22	340	76	4	48	231	20	815		0	3	0	0
9:15:00 AM	0	13	0	17	0	19	3	23	0	24	281	40	1	60	153	13	647		1	3	0	0

Peak Rolling Hour Flow Rates

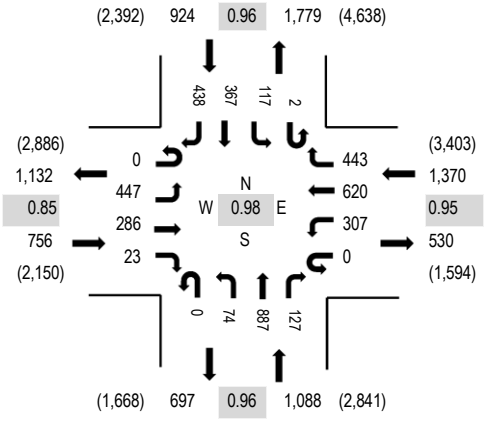
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
Lights	0	44	4	43	0	62	9	139	2	97	1,455	245	4	223	841	113	3,281
Mediums	0	1	0	0	0	0	0	0	0	1	18	0	0	0	22	2	44
Total	0	45	4	43	0	62	9	139	2	98	1,473	245	4	223	867	115	3,329

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

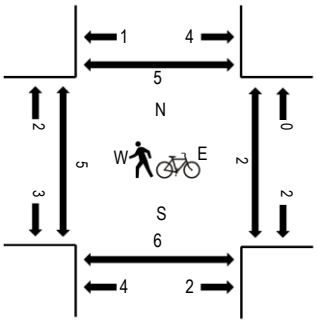
Location: #4 Peachtree Dunwoody Rd & Johnson Ferry Rd AM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 07:45 AM - 08:45 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Johnson Ferry Rd Eastbound				Johnson Ferry Rd Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
6:30:00 AM	0	89	51	6	0	30	61	31	0	11	105	35	0	19	40	70	548	2,778	0	0	0	0
6:45:00 AM	0	98	70	4	0	29	82	46	0	7	130	39	1	11	50	74	641	3,195	0	1	0	0
7:00:00 AM	0	91	55	3	0	40	116	86	0	8	144	28	0	28	56	54	709	3,610	1	0	1	0
7:15:00 AM	0	111	66	7	0	59	142	107	0	15	190	24	0	34	53	72	880	3,955	1	0	1	0
7:30:00 AM	0	105	90	5	0	68	147	110	0	9	187	37	0	36	75	96	965	4,080	1	0	0	1
7:45:00 AM	0	113	78	4	0	78	143	140	0	26	208	48	0	31	84	103	1,056	4,138	1	0	0	1
8:00:00 AM	0	121	92	9	0	79	159	96	0	13	213	31	1	29	96	115	1,054	4,137	1	1	0	1
8:15:00 AM	0	110	60	1	0	71	157	101	0	19	227	24	1	28	97	109	1,005	4,097	1	1	6	1
8:30:00 AM	0	103	56	9	0	79	161	106	0	16	239	24	0	29	90	111	1,023	3,928	2	0	0	2
8:45:00 AM	0	81	86	14	0	59	156	117	0	7	247	43	1	37	103	104	1,055		1	1	1	2
9:00:00 AM	0	92	71	8	0	48	149	110	0	16	237	30	1	39	87	126	1,014		3	0	0	3
9:15:00 AM	0	105	74	12	0	37	125	78	0	14	157	33	2	28	78	93	836		0	3	0	0

Peak Rolling Hour Flow Rates

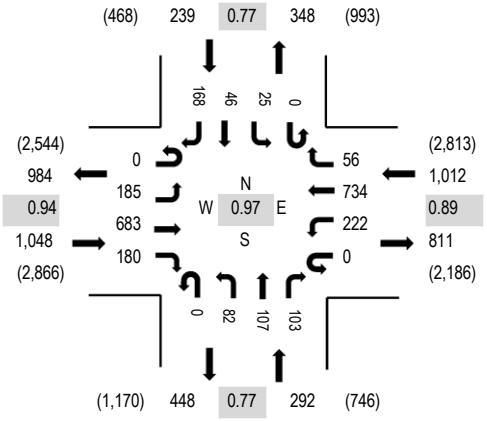
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Lights	0	436	282	21	0	302	616	441	0	71	883	126	2	115	353	424	4,072
Mediums	0	11	4	2	0	5	4	2	0	3	4	1	0	2	13	13	64
Total	0	447	286	23	0	307	620	443	0	74	887	127	2	117	367	438	4,138

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

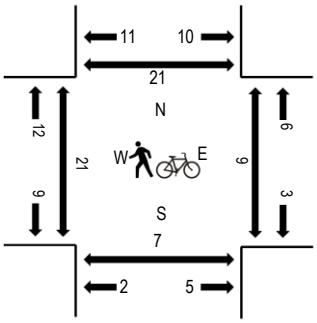
Location: #5 Hollis Cobb Circle & Johnson Ferry Rd AM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Johnson Ferry Rd Eastbound				Johnson Ferry Rd Westbound				Hollis Cobb Circle Northbound				Hollis Cobb Circle Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
6:30:00 AM	0	96	135	39	0	54	61	23	0	10	38	26	0	0	8	3	493	2,129	13	0	0	5
6:45:00 AM	0	86	152	40	0	44	95	14	0	13	39	21	0	2	8	11	525	2,287	6	1	1	5
7:00:00 AM	0	46	140	26	0	42	123	18	0	14	35	23	0	2	10	16	495	2,430	4	1	1	3
7:15:00 AM	0	53	151	45	0	39	160	13	0	28	33	34	0	5	14	41	616	2,591	3	1	0	3
7:30:00 AM	0	40	175	40	0	52	172	14	0	24	28	28	0	7	11	60	651	2,542	6	5	4	4
7:45:00 AM	0	53	174	52	0	79	181	17	0	13	26	16	0	7	13	37	668	2,464	5	2	2	5
8:00:00 AM	0	39	183	43	0	52	221	12	0	17	20	25	0	6	8	30	656	2,361	7	1	1	9
8:15:00 AM	0	29	154	26	0	58	193	18	0	17	15	20	0	4	8	25	567	2,275	2	1	0	2
8:30:00 AM	0	32	140	38	0	48	224	11	0	14	16	9	0	7	11	23	573	2,222	6	4	1	3
8:45:00 AM	0	32	150	35	0	49	225	11	0	16	4	18	0	6	6	13	565		9	1	1	5
9:00:00 AM	0	21	156	39	0	52	208	9	0	21	16	15	0	4	9	20	570		6	2	0	5
9:15:00 AM	0	18	160	28	0	38	174	9	0	20	9	25	0	6	6	21	514		1	0	0	2

Peak Rolling Hour Flow Rates

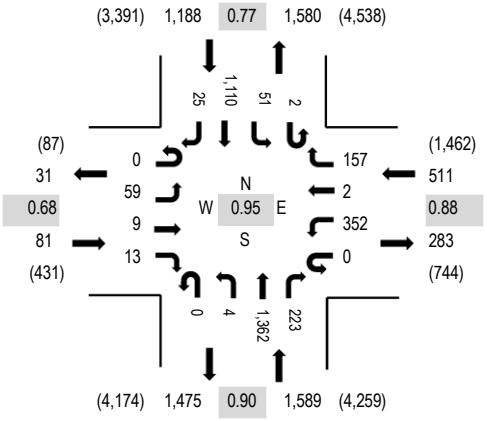
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	4
Lights	0	184	672	178	0	219	727	55	0	82	107	98	0	23	46	165	2,556
Mediums	0	1	11	2	0	3	6	0	0	0	0	5	0	2	0	1	31
Total	0	185	683	180	0	222	734	56	0	82	107	103	0	25	46	168	2,591

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

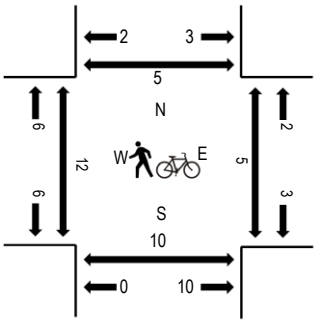
Location: #1 Peachtree Dunwoody Rd & Lake Hearn Dr PM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 05:15 PM - 06:15 PM
Peak 15-Minutes: 05:45 PM - 06:00 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Office Drwy Eastbound				Lake Hearn Dr Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30:00 PM	0	39	4	10	0	49	0	33	0	1	251	15	0	31	248	6	687	2,966	3	0	3	0
3:45:00 PM	0	27	12	13	0	34	2	28	0	3	271	16	0	32	232	2	672	3,073	2	0	2	0
4:00:00 PM	0	26	8	13	0	87	0	50	0	1	311	29	0	33	221	6	785	3,198	3	0	3	0
4:15:00 PM	0	24	4	14	0	88	0	42	0	3	342	38	0	21	243	3	822	3,193	2	0	2	0
4:30:00 PM	0	27	3	29	0	97	1	48	0	1	312	35	0	16	221	4	794	3,211	1	3	1	3
4:45:00 PM	0	31	6	10	0	104	0	33	0	2	339	30	1	12	225	4	797	3,206	4	0	4	0
5:00:00 PM	0	25	5	9	0	87	0	56	0	0	303	33	0	12	249	1	780	3,297	5	1	7	1
5:15:00 PM	0	19	6	5	0	93	1	51	0	2	367	57	1	13	221	4	840	3,369	8	1	6	1
5:30:00 PM	0	21	3	5	0	99	0	41	0	0	314	48	0	13	240	5	789	3,366	1	1	1	1
5:45:00 PM	0	12	0	3	0	88	1	39	0	1	365	73	0	12	288	6	888		3	2	3	2
6:00:00 PM	0	7	0	0	0	72	0	26	0	1	316	45	1	13	361	10	852		0	0	0	0
6:15:00 PM	0	6	5	0	0	69	0	43	1	2	290	41	0	20	346	14	837		2	0	2	0

Peak Rolling Hour Flow Rates

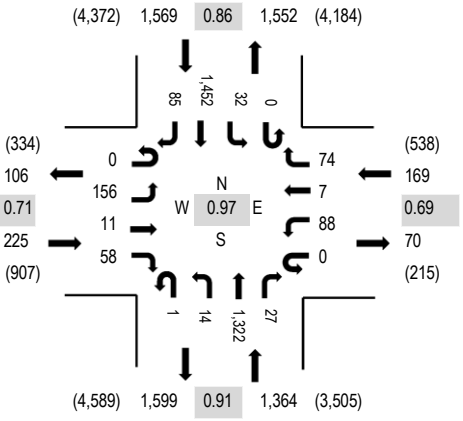
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	59	9	13	0	346	2	157	0	4	1,354	218	2	51	1,097	25	3,337
Mediums	0	0	0	0	0	6	0	0	0	0	8	5	0	0	13	0	32
Total	0	59	9	13	0	352	2	157	0	4	1,362	223	2	51	1,110	25	3,369

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

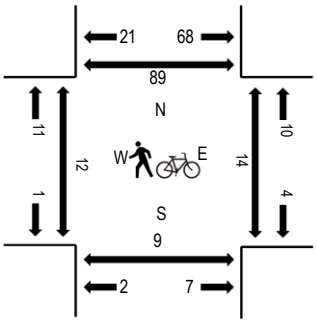
Location: #2 Peachtree Dunwoody Rd & Hollis Cobb Circle PM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 05:15 PM - 06:15 PM
Peak 15-Minutes: 06:00 PM - 06:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Hollis Cobb Circle Eastbound				Hollis Cobb Circle Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30:00 PM	0	49	1	46	0	20	2	20	3	6	192	6	1	8	279	21	654	2,844	3	2	3	27
3:45:00 PM	0	59	5	26	0	15	2	13	0	8	223	4	0	9	248	16	628	2,965	1	7	6	19
4:00:00 PM	0	50	4	22	0	24	2	19	0	5	275	11	0	7	301	21	741	3,145	5	9	4	20
4:15:00 PM	0	67	5	27	0	29	0	26	2	9	291	10	0	7	333	15	821	3,157	1	7	1	24
4:30:00 PM	0	68	3	18	0	33	4	27	0	5	232	10	0	6	349	20	775	3,171	3	10	8	30
4:45:00 PM	0	68	2	30	0	25	2	24	0	1	281	9	0	4	348	14	808	3,202	2	2	2	26
5:00:00 PM	0	66	5	21	0	34	0	16	0	7	238	7	0	6	338	15	753	3,221	3	8	0	32
5:15:00 PM	0	46	3	15	0	30	4	27	0	4	338	6	0	8	335	19	835	3,327	6	4	1	27
5:30:00 PM	0	50	5	24	0	20	3	20	0	6	305	8	0	9	338	18	806	3,307	2	4	2	27
5:45:00 PM	0	29	2	8	0	15	0	13	1	1	364	8	0	6	361	19	827		4	4	3	19
6:00:00 PM	0	31	1	11	0	23	0	14	0	3	315	5	0	9	418	29	859		0	2	3	16
6:15:00 PM	0	23	1	16	0	13	0	19	0	11	285	10	0	5	390	42	815		2	3	0	10

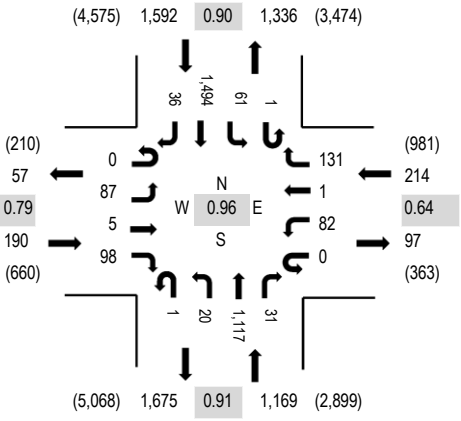
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Lights	0	156	8	58	0	84	6	69	1	14	1,313	25	0	27	1,440	83	3,284
Mediums	0	0	3	0	0	4	1	5	0	0	9	2	0	5	11	2	42
Total	0	156	11	58	0	88	7	74	1	14	1,322	27	0	32	1,452	85	3,327

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

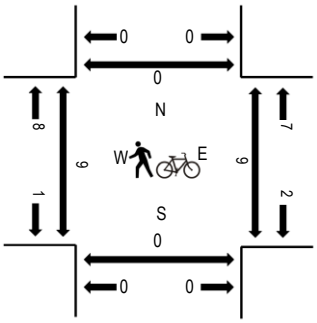
Location: #3 Peachtree Dunwoody Rd & St. Josephs Hospital Ent PM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 05:15 PM - 06:15 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Northside Hospital Ent Eastbound				St. Josephs Hospital Ent Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30:00 PM	0	27	2	51	0	50	0	68	0	7	118	12	0	24	307	15	681	2,916	3	3	0	0
3:45:00 PM	0	24	1	41	0	51	1	54	1	3	169	21	0	16	272	11	665	3,021	4	3	0	0
4:00:00 PM	0	31	4	49	0	65	0	67	1	12	180	19	0	15	314	8	765	3,130	2	7	0	0
4:15:00 PM	0	23	3	39	0	38	0	55	0	7	228	28	0	14	356	14	805	3,081	2	2	0	0
4:30:00 PM	0	30	3	30	0	46	1	45	1	6	199	16	1	10	384	14	786	3,104	4	6	0	0
4:45:00 PM	0	21	1	21	0	42	1	50	2	6	212	12	0	14	380	12	774	3,046	5	0	0	0
5:00:00 PM	0	24	1	26	0	52	0	48	0	7	170	12	0	10	358	8	716	3,071	3	6	0	0
5:15:00 PM	0	30	0	30	0	31	0	52	0	4	267	6	0	13	388	7	828	3,165	6	5	0	0
5:30:00 PM	0	23	4	24	0	20	1	34	1	7	255	8	0	11	329	11	728	3,095	1	2	0	0
5:45:00 PM	0	14	1	25	0	21	0	25	0	5	307	10	1	14	369	7	799		2	2	0	0
6:00:00 PM	0	20	0	19	0	10	0	20	0	4	288	7	0	23	408	11	810		0	0	0	0
6:15:00 PM	0	8	0	10	0	10	0	23	0	7	263	11	0	17	396	13	758		1	1	0	1

Peak Rolling Hour Flow Rates

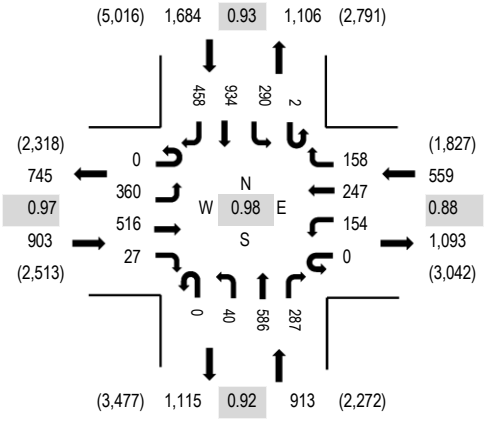
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Lights	0	85	5	95	0	82	1	129	1	18	1,109	31	1	59	1,480	35	3,131
Mediums	0	2	0	3	0	0	0	2	0	2	8	0	0	2	13	1	33
Total	0	87	5	98	0	82	1	131	1	20	1,117	31	1	61	1,494	36	3,165

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

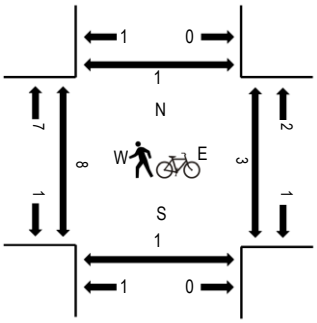
Location: #4 Peachtree Dunwoody Rd & Johnson Ferry Rd PM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 05:15 PM - 06:15 PM
Peak 15-Minutes: 06:00 PM - 06:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Johnson Ferry Rd Eastbound				Johnson Ferry Rd Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30:00 PM	0	56	101	11	0	58	106	25	0	20	55	49	0	80	168	133	862	3,678	2	2	1	0
3:45:00 PM	0	83	108	10	0	67	83	41	0	22	65	59	0	64	201	111	914	3,810	3	0	0	2
4:00:00 PM	0	78	98	20	0	63	56	31	0	34	92	45	0	65	213	119	914	3,838	1	2	1	1
4:15:00 PM	0	107	110	10	0	70	48	40	0	21	94	59	0	87	253	89	988	3,907	1	0	3	0
4:30:00 PM	0	78	120	11	0	81	54	38	0	10	106	41	1	84	261	109	994	3,937	3	0	1	2
4:45:00 PM	1	68	111	7	0	55	58	41	0	16	93	58	2	69	289	74	942	3,926	1	0	0	0
5:00:00 PM	0	73	121	11	0	58	53	21	0	12	113	78	0	90	233	120	983	4,010	2	1	1	2
5:15:00 PM	0	96	132	5	0	38	56	44	0	10	113	69	0	69	265	121	1,018	4,059	4	1	0	0
5:30:00 PM	0	84	132	11	0	51	66	42	0	11	145	76	0	63	205	97	983	4,013	2	1	0	1
5:45:00 PM	0	83	136	4	0	30	63	36	0	9	165	68	2	89	225	116	1,026		2	0	1	0
6:00:00 PM	0	97	116	7	0	35	62	36	0	10	163	74	0	69	239	124	1,032		0	1	0	0
6:15:00 PM	1	97	115	4	0	13	66	42	0	12	145	60	0	77	195	145	972		1	0	0	0

Peak Rolling Hour Flow Rates

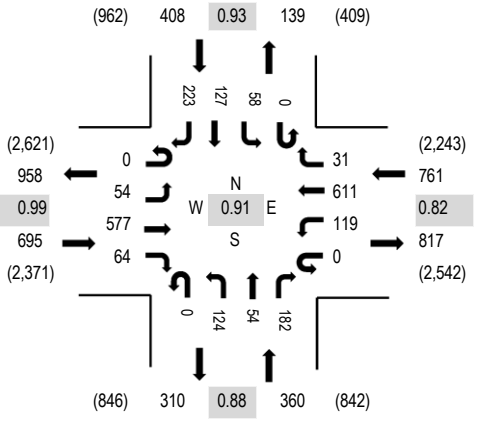
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Lights	0	358	510	26	0	153	246	152	0	40	583	281	2	288	923	452	4,014
Mediums	0	2	6	1	0	1	1	6	0	0	3	6	0	2	10	6	44
Total	0	360	516	27	0	154	247	158	0	40	586	287	2	290	934	458	4,059

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

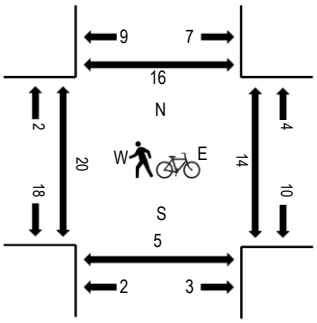
Location: #5 Hollis Cobb Circle & Johnson Ferry Rd PM
Date and Start Time: Wednesday, April 20, 2016
Peak Hour: 03:30 PM - 04:30 PM
Peak 15-Minutes: 03:30 PM - 03:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	Johnson Ferry Rd Eastbound				Johnson Ferry Rd Westbound				Hollis Cobb Circle Northbound				Hollis Cobb Circle Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
3:30:00 PM	0	15	146	14	0	32	191	8	0	46	10	37	0	20	20	70	609	2,224	8	3	1	7
3:45:00 PM	0	12	142	18	0	29	145	5	0	37	14	51	0	9	28	58	548	2,159	4	5	0	2
4:00:00 PM	0	17	142	14	0	40	138	8	0	22	17	44	0	17	35	47	541	2,085	5	3	1	2
4:15:00 PM	0	10	147	18	0	18	137	10	0	19	13	50	0	12	44	48	526	2,112	3	3	3	4
4:30:00 PM	0	16	161	18	0	40	130	4	0	22	13	42	0	17	41	40	544	2,093	1	2	2	2
4:45:00 PM	1	16	133	17	0	21	140	1	0	16	10	24	0	14	37	44	474	2,084	3	0	2	3
5:00:00 PM	0	19	182	13	0	30	164	8	0	24	12	26	0	13	41	36	568	2,093	9	1	3	7
5:15:00 PM	0	18	177	12	0	20	145	5	0	16	15	40	0	10	17	32	507	2,053	10	0	0	8
5:30:00 PM	0	22	204	19	0	23	151	2	0	20	11	24	0	7	12	40	535	2,101	6	5	2	4
5:45:00 PM	0	10	158	20	0	19	166	4	0	14	6	38	0	13	7	28	483		7	1	1	2
6:00:00 PM	0	22	180	22	0	28	163	5	0	14	8	26	0	6	14	40	528		1	0	0	1
6:15:00 PM	0	27	182	27	0	33	174	6	0	12	10	39	0	9	5	31	555		9	2	0	5

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	53	566	63	0	116	604	30	0	120	51	179	0	57	127	223	2,189
Mediums	0	1	11	1	0	3	7	1	0	4	3	3	0	1	0	0	35
Total	0	54	577	64	0	119	611	31	0	124	54	182	0	58	127	223	2,224

APPENDIX B : ITE TRIP GENERATION SHEETS

Hospital
(610)

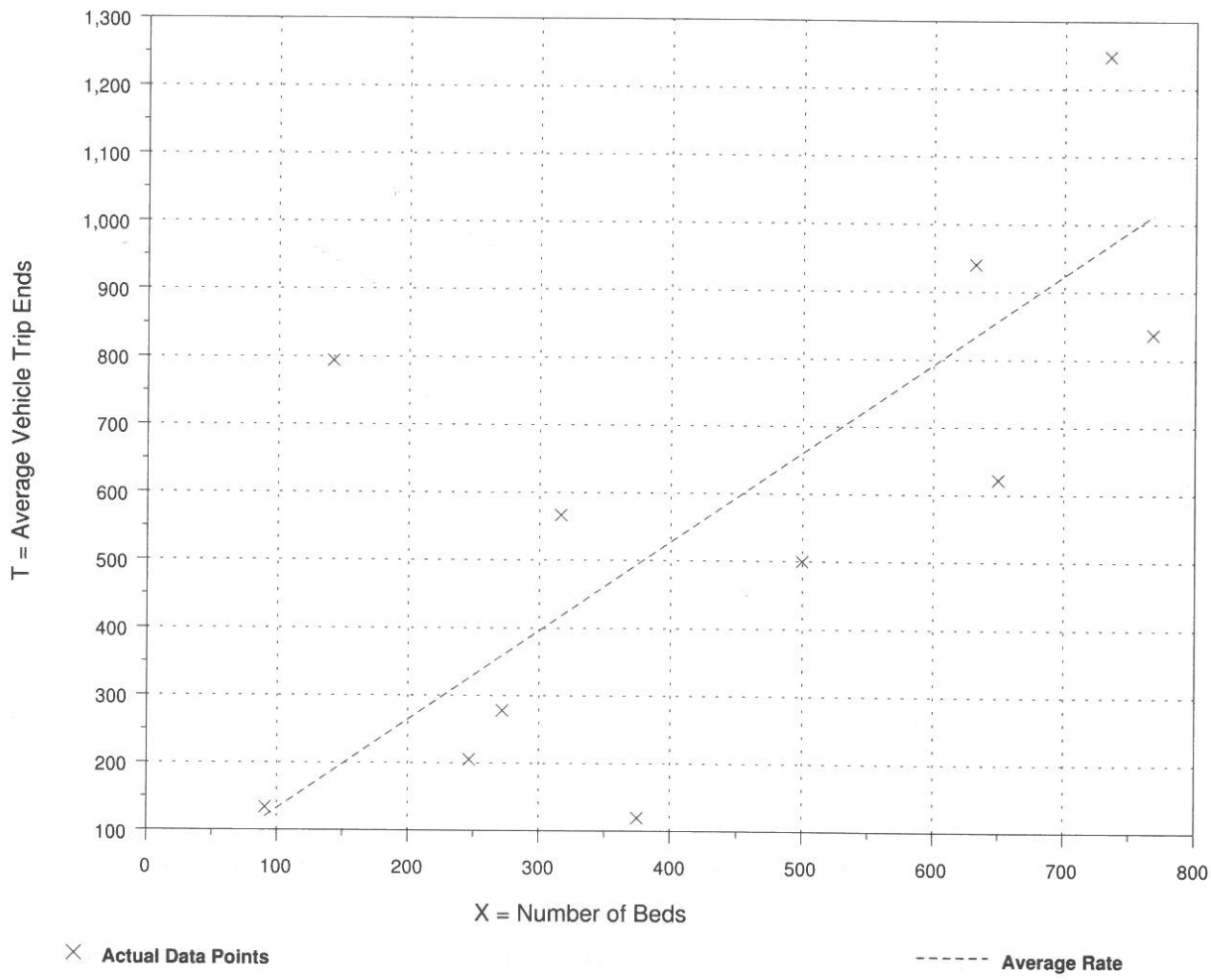
Average Vehicle Trip Ends vs: Beds
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 11
Average Number of Beds: 430
Directional Distribution: 72% entering, 28% exiting

Trip Generation per Bed

Average Rate	Range of Rates	Standard Deviation
1.32	0.32 - 5.59	1.43

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****

Hospital
(610)

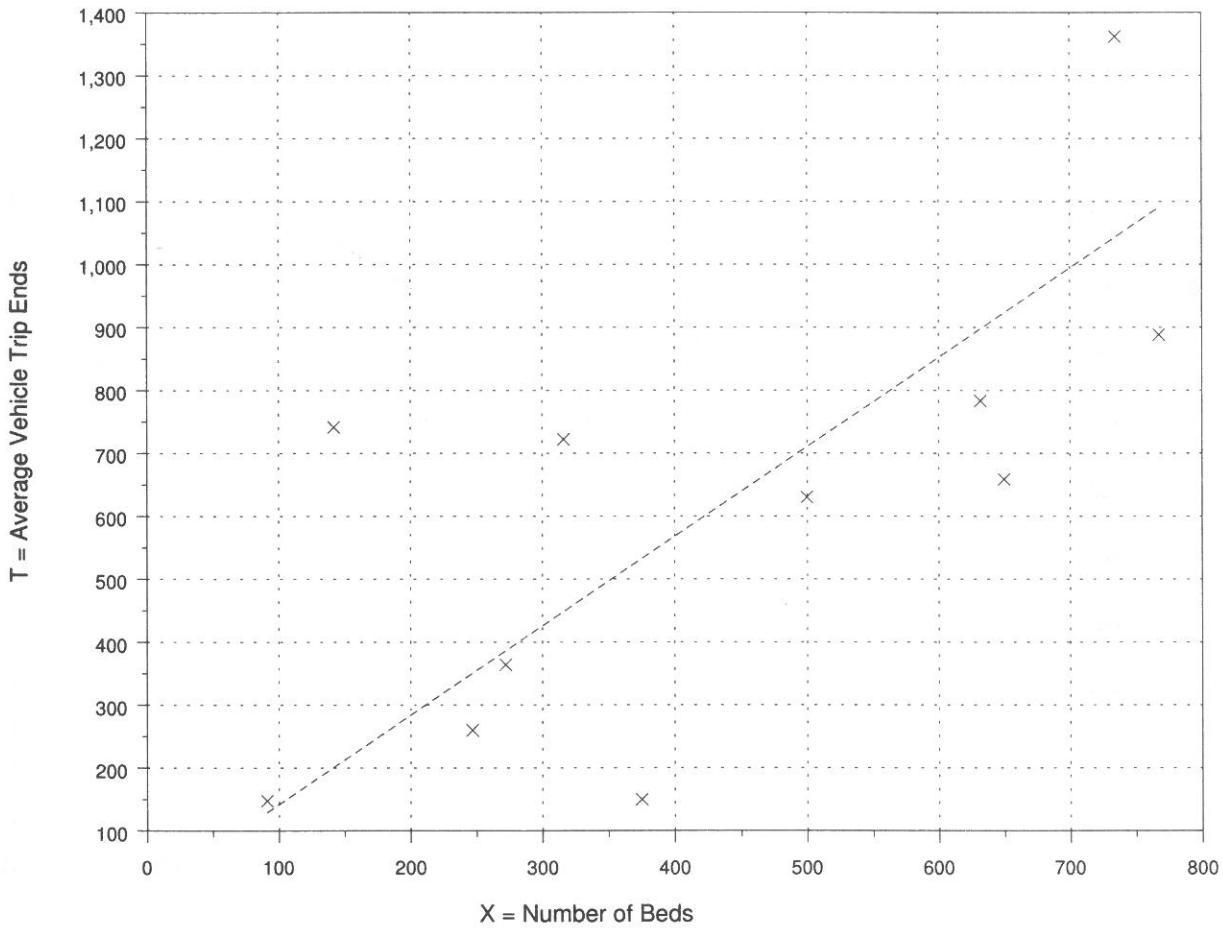
Average Vehicle Trip Ends vs: Beds
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 11
Average Number of Beds: 430
Directional Distribution: 33% entering, 67% exiting

Trip Generation per Bed

Average Rate	Range of Rates	Standard Deviation
1.42	0.40 - 5.22	1.44

Data Plot and Equation



× **Actual Data Points**

------ **Average Rate**

Fitted Curve Equation: Not given

R^2 = ****

APPENDIX C : 2018 BACKGROUND SYNCHRO REPORTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	3	8	151	18	67	37	1329	203	142	1300	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.5	6.7		5.6	6.0	6.0	5.6	6.0	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1777	1583	1770	1643		1770	3539	1583	1770	3539	1583
Flt Permitted		0.67	1.00	0.47	1.00		0.12	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)		1243	1583	878	1643		222	3539	1583	177	3539	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)	77	3	9	164	20	73	40	1445	221	154	1413	154
RTOR Reduction (vph)	0	0	8	0	56	0	0	0	48	0	0	61
Lane Group Flow (vph)	0	80	1	164	37	0	40	1445	173	154	1413	93
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		13.1	13.1	35.3	35.3		92.8	87.0	87.0	100.0	90.6	90.6
Effective Green, g (s)		13.1	13.1	35.3	35.3		92.8	87.0	87.0	100.0	90.6	90.6
Actuated g/C Ratio		0.09	0.09	0.24	0.24		0.62	0.58	0.58	0.67	0.60	0.60
Clearance Time (s)		6.7	6.7	6.5	6.7		5.6	6.0	6.0	5.6	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		108	138	299	386		197	2052	918	217	2137	956
v/s Ratio Prot				c0.06	0.02		0.01	0.41		c0.04	c0.40	
v/s Ratio Perm		c0.06	0.00	0.07			0.12		0.11	c0.43		0.06
v/c Ratio		0.74	0.01	0.55	0.10		0.20	0.70	0.19	0.71	0.66	0.10
Uniform Delay, d1		66.8	62.5	48.5	44.9		15.1	22.4	14.9	20.7	19.6	12.5
Progression Factor		1.00	1.00	1.00	1.00		0.46	0.61	0.24	1.00	1.00	1.00
Incremental Delay, d2		23.6	0.0	2.1	0.1		0.4	1.6	0.3	10.2	1.6	0.2
Delay (s)		90.4	62.5	50.6	45.0		7.4	15.1	3.8	30.9	21.2	12.7
Level of Service		F	E	D	D		A	B	A	C	C	B
Approach Delay (s)		87.6			48.5			13.5			21.3	
Approach LOS		F			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	7	50	44	1	29	46	1422	118	116	1106	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.3	7.3		7.3	7.3		6.7	6.4	6.4	6.7	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.87		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1619		1770	1592		1770	3539	1583	1770	3539	1583
Flt Permitted	0.74	1.00		0.72	1.00		0.20	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1370	1619		1335	1592		381	3539	1583	177	3539	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)	139	8	54	48	1	32	50	1546	128	126	1202	235
RTOR Reduction (vph)	0	47	0	0	28	0	0	0	28	0	0	73
Lane Group Flow (vph)	139	15	0	48	5	0	50	1546	100	126	1202	162
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	20.7	20.7		20.7	20.7		102.3	96.8	96.8	115.5	103.4	103.4
Effective Green, g (s)	20.7	20.7		20.7	20.7		102.3	96.8	96.8	115.5	103.4	103.4
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.68	0.65	0.65	0.77	0.69	0.69
Clearance Time (s)	7.3	7.3		7.3	7.3		6.7	6.4	6.4	6.7	6.4	6.4
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)	189	223		184	219		310	2283	1021	264	2439	1091
v/s Ratio Prot		0.01			0.00		0.01	c0.44		c0.04	c0.34	
v/s Ratio Perm	c0.10			0.04			0.10		0.06	0.33		0.10
v/c Ratio	0.74	0.07		0.26	0.02		0.16	0.68	0.10	0.48	0.49	0.15
Uniform Delay, d1	62.0	56.3		57.8	55.9		8.4	16.8	10.1	15.2	11.0	8.1
Progression Factor	0.94	1.11		1.00	1.00		0.54	0.50	0.19	3.22	0.76	0.66
Incremental Delay, d2	12.9	0.1		0.8	0.0		0.2	1.3	0.2	1.0	0.6	0.2
Delay (s)	71.1	62.3		58.6	56.0		4.7	9.7	2.0	50.1	8.9	5.6
Level of Service	E	E		E	E		A	A	A	D	A	A
Approach Delay (s)		68.4			57.5			9.0			11.7	
Approach LOS		E			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	4	43	62	9	139	98	1473	245	223	867	115
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	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1780	1583		1785	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.58	1.00		0.71	1.00	0.30	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)		1090	1583		1322	1583	566	3539	1583	192	3539	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)	49	4	47	67	10	151	107	1601	266	242	942	125
RTOR Reduction (vph)	0	0	43	0	0	137	0	0	76	0	0	14
Lane Group Flow (vph)	0	53	4	0	77	14	107	1601	190	242	942	111
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)		14.0	14.0		14.0	14.0	114.0	106.9	106.9	128.0	116.9	116.9
Effective Green, g (s)		14.0	14.0		14.0	14.0	114.0	106.9	106.9	128.0	116.9	116.9
Actuated g/C Ratio		0.09	0.09		0.09	0.09	0.76	0.71	0.71	0.85	0.78	0.78
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)		101	147		123	147	487	2522	1128	343	2758	1233
v/s Ratio Prot							0.01	0.45		c0.08	0.27	
v/s Ratio Perm		0.05	0.00		c0.06	0.01	0.16		0.12	c0.52		0.07
v/c Ratio		0.52	0.03		0.63	0.10	0.22	0.63	0.17	0.71	0.34	0.09
Uniform Delay, d1		64.8	61.8		65.5	62.2	4.6	11.3	7.0	25.7	5.0	3.9
Progression Factor		1.00	1.00		1.00	1.00	0.96	1.05	1.25	1.71	0.97	1.08
Incremental Delay, d2		4.8	0.1		9.6	0.3	0.1	0.6	0.1	5.9	0.3	0.1
Delay (s)		69.7	61.9		75.0	62.5	4.5	12.4	8.9	49.7	5.1	4.4
Level of Service		E	E		E	E	A	B	A	D	A	A
Approach Delay (s)		66.0			66.7			11.5			13.3	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
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)	449	320	19	296	606	447	67	835	140	124	352	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	7.1		7.0	7.1		7.0	5.7	5.7	6.3	5.7	5.7
Lane Util. Factor	0.97	1.00		0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1847		3433	3314		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1847		3433	3314		3433	3539	1583	1770	3539	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)	488	348	21	322	659	486	73	908	152	135	383	460
RTOR Reduction (vph)	0	2	0	0	88	0	0	0	107	0	0	290
Lane Group Flow (vph)	488	367	0	322	1057	0	73	908	45	135	383	170
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	23.0	35.2		31.5	44.0		8.2	44.0	44.0	13.2	48.3	48.3
Effective Green, g (s)	23.0	35.2		31.5	44.0		8.2	44.0	44.0	13.2	48.3	48.3
Actuated g/C Ratio	0.15	0.23		0.21	0.29		0.05	0.29	0.29	0.09	0.32	0.32
Clearance Time (s)	6.7	7.1		7.0	7.1		7.0	5.7	5.7	6.3	5.7	5.7
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)	526	433		720	972		187	1038	464	155	1139	509
v/s Ratio Prot	0.14	c0.20		0.09	c0.32		0.02	c0.26		c0.08	0.11	
v/s Ratio Perm									0.03			0.11
v/c Ratio	0.93	0.85		0.45	1.09		0.39	0.87	0.10	0.87	0.34	0.33
Uniform Delay, d1	62.7	54.9		51.7	53.0		68.5	50.4	38.5	67.6	38.7	38.6
Progression Factor	0.86	1.01		1.00	1.00		1.00	1.00	1.00	1.03	1.06	2.68
Incremental Delay, d2	19.7	12.2		0.4	55.5		1.3	10.2	0.4	36.5	0.8	1.7
Delay (s)	73.9	67.5		52.1	108.5		69.8	60.6	39.0	106.2	41.9	105.3
Level of Service	E	E		D	F		E	E	D	F	D	F
Approach Delay (s)		71.2			96.1			58.3			80.6	
Approach LOS		E			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	78.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.8
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	161	686	161	241	767	61	71	89	89	24	40	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	5.7		7.0	5.7		7.0	7.0	7.0		7.1	7.1
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00		1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.98	1.00
Satd. Flow (prot)	1770	3438		1770	3500		1681	1763	1583		1828	1583
Flt Permitted	0.30	1.00		0.17	1.00		0.95	1.00	1.00		0.98	1.00
Satd. Flow (perm)	564	3438		311	3500		1681	1763	1583		1828	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)	175	746	175	262	834	66	77	97	97	26	43	165
RTOR Reduction (vph)	0	11	0	0	3	0	0	0	88	0	0	152
Lane Group Flow (vph)	175	910	0	262	897	0	69	105	9	0	69	13
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2					3			4
Actuated Green, G (s)	81.9	64.3		104.5	80.6		14.3	14.3	14.3		11.4	11.4
Effective Green, g (s)	81.9	64.3		104.5	80.6		14.3	14.3	14.3		11.4	11.4
Actuated g/C Ratio	0.55	0.43		0.70	0.54		0.10	0.10	0.10		0.08	0.08
Clearance Time (s)	6.3	5.7		7.0	5.7		7.0	7.0	7.0		7.1	7.1
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)	449	1473		539	1880		160	168	150		138	120
v/s Ratio Prot	0.05	c0.26		c0.11	c0.26		0.04	c0.06			c0.04	
v/s Ratio Perm	0.17			0.23					0.01			0.01
v/c Ratio	0.39	0.62		0.49	0.48		0.43	0.62	0.06		0.50	0.10
Uniform Delay, d1	17.2	33.3		14.7	21.6		64.0	65.3	61.7		66.6	64.5
Progression Factor	1.00	1.00		1.34	0.55		1.00	1.00	1.00		1.13	2.75
Incremental Delay, d2	0.6	2.0		0.4	0.4		1.9	7.1	0.2		2.8	0.4
Delay (s)	17.8	35.2		20.1	12.3		65.9	72.3	61.9		77.9	177.8
Level of Service	B	D		C	B		E	E	E		E	F
Approach Delay (s)		32.5			14.1			67.0			148.3	
Approach LOS		C			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.8
Intersection Capacity Utilization	64.8%	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)	59	9	13	352	2	157	4	1362	223	51	1110	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.5	6.7		5.6	6.0	6.0	5.6	6.0	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1786	1583	1770	1587		1770	3539	1583	1770	3539	1583
Flt Permitted		0.64	1.00	0.49	1.00		0.15	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)		1192	1583	909	1587		278	3539	1583	108	3539	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)	64	10	14	383	2	171	4	1480	242	55	1207	27
RTOR Reduction (vph)	0	0	13	0	80	0	0	0	47	0	0	12
Lane Group Flow (vph)	0	74	1	383	93	0	4	1480	195	55	1207	15
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		15.5	15.5	62.3	62.3		94.1	92.7	92.7	104.7	98.0	98.0
Effective Green, g (s)		15.5	15.5	62.3	62.3		94.1	92.7	92.7	104.7	98.0	98.0
Actuated g/C Ratio		0.09	0.09	0.35	0.35		0.52	0.52	0.52	0.58	0.54	0.54
Clearance Time (s)		6.7	6.7	6.5	6.7		5.6	6.0	6.0	5.6	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	0.1	0.1	3.0	3.0	3.0
Lane Grp Cap (vph)		102	136	507	549		156	1822	815	124	1926	861
v/s Ratio Prot				c0.17	0.06		0.00	c0.42		c0.02	c0.34	
v/s Ratio Perm		0.06	0.00	c0.09			0.01		0.12	0.24		0.01
v/c Ratio		0.73	0.01	0.76	0.17		0.03	0.81	0.24	0.44	0.63	0.02
Uniform Delay, d1		80.2	75.2	49.3	40.9		23.7	36.4	24.2	30.7	28.4	18.9
Progression Factor		1.00	1.00	1.00	1.00		0.78	0.91	0.62	1.00	1.00	1.00
Incremental Delay, d2		22.4	0.0	6.3	0.1		0.1	3.5	0.6	2.5	1.6	0.0
Delay (s)		102.6	75.3	55.6	41.0		18.5	36.6	15.6	33.3	29.9	18.9
Level of Service		F	E	E	D		B	D	B	C	C	B
Approach Delay (s)		98.2			51.1			33.6			29.8	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	84.7%	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)	156	11	58	88	7	74	14	1322	27	32	1452	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.3	7.3		7.3	7.3		6.7	6.4	6.4	6.7	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.87		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1628		1770	1609		1770	3539	1583	1770	3539	1583
Flt Permitted	0.69	1.00		0.71	1.00		0.11	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1283	1628		1319	1609		209	3539	1583	249	3539	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)	170	12	63	96	8	80	15	1437	29	35	1578	92
RTOR Reduction (vph)	0	53	0	0	67	0	0	0	9	0	0	20
Lane Group Flow (vph)	170	22	0	96	21	0	15	1437	20	35	1578	72
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	29.0	29.0		29.0	29.0		129.0	125.2	125.2	132.2	126.8	126.8
Effective Green, g (s)	29.0	29.0		29.0	29.0		129.0	125.2	125.2	132.2	126.8	126.8
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.72	0.70	0.70	0.73	0.70	0.70
Clearance Time (s)	7.3	7.3		7.3	7.3		6.7	6.4	6.4	6.7	6.4	6.4
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)	206	262		212	259		182	2461	1101	228	2493	1115
v/s Ratio Prot		0.01			0.01		0.00	0.41		c0.00	c0.45	
v/s Ratio Perm	c0.13			0.07			0.06		0.01	0.11		0.05
v/c Ratio	0.83	0.08		0.45	0.08		0.08	0.58	0.02	0.15	0.63	0.06
Uniform Delay, d1	73.0	64.2		68.3	64.2		11.4	14.0	8.4	10.2	14.2	8.2
Progression Factor	0.99	1.06		1.00	1.00		0.68	1.27	1.00	0.79	0.66	0.62
Incremental Delay, d2	22.7	0.1		1.5	0.1		0.2	0.9	0.0	0.3	1.0	0.1
Delay (s)	94.8	68.4		69.9	64.3		8.0	18.8	8.5	8.3	10.4	5.2
Level of Service	F	E		E	E		A	B	A	A	B	A
Approach Delay (s)		86.7			67.2			18.4			10.0	
Approach LOS		F			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	87	5	98	82	1	131	20	1117	31	61	1494	36
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	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		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	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1778	1583		1775	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.53	1.00		0.48	1.00	0.13	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)		978	1583		896	1583	233	3539	1583	370	3539	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)	95	5	107	89	1	142	22	1214	34	66	1624	39
RTOR Reduction (vph)	0	0	95	0	0	126	0	0	7	0	0	6
Lane Group Flow (vph)	0	100	12	0	90	16	22	1214	28	66	1624	33
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)		20.2	20.2		20.2	20.2	144.8	141.0	141.0	150.8	144.0	144.0
Effective Green, g (s)		20.2	20.2		20.2	20.2	144.8	141.0	141.0	150.8	144.0	144.0
Actuated g/C Ratio		0.11	0.11		0.11	0.11	0.80	0.78	0.78	0.84	0.80	0.80
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)		109	177		100	177	219	2772	1240	362	2831	1266
v/s Ratio Prot							0.00	0.34		c0.01	c0.46	
v/s Ratio Perm		c0.10	0.01		0.10	0.01	0.08		0.02	0.15		0.02
v/c Ratio		0.92	0.07		0.90	0.09	0.10	0.44	0.02	0.18	0.57	0.03
Uniform Delay, d1		79.1	71.5		78.9	71.7	5.5	6.4	4.3	3.8	6.7	3.7
Progression Factor		1.00	1.00		1.00	1.00	1.09	1.56	1.20	0.69	0.50	0.37
Incremental Delay, d2		60.0	0.2		58.9	0.2	0.2	0.4	0.0	0.2	0.7	0.0
Delay (s)		139.1	71.6		137.8	71.9	6.1	10.4	5.2	2.9	4.0	1.4
Level of Service		F	E		F	E	A	B	A	A	A	A
Approach Delay (s)		104.2			97.5			10.2			3.9	
Approach LOS		F			F			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	360	516	27	154	247	158	40	586	287	290	934	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	7.1		7.0	7.1		7.0	5.7	5.7	6.3	5.7	5.7
Lane Util. Factor	0.97	1.00		0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1849		3433	3332		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1849		3433	3332		3433	3539	1583	1770	3539	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)	391	561	29	167	268	172	43	637	312	315	1015	498
RTOR Reduction (vph)	0	1	0	0	59	0	0	0	216	0	0	188
Lane Group Flow (vph)	391	589	0	167	381	0	43	637	96	315	1015	310
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	24.0	48.8		14.2	39.3		7.8	52.8	52.8	38.1	82.4	82.4
Effective Green, g (s)	24.0	48.8		14.2	39.3		7.8	52.8	52.8	38.1	82.4	82.4
Actuated g/C Ratio	0.13	0.27		0.08	0.22		0.04	0.29	0.29	0.21	0.46	0.46
Clearance Time (s)	6.7	7.1		7.0	7.1		7.0	5.7	5.7	6.3	5.7	5.7
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)	457	501		270	727		148	1038	464	374	1620	724
v/s Ratio Prot	0.11	c0.32		c0.05	0.11		0.01	c0.18		c0.18	c0.29	
v/s Ratio Perm									0.06			0.20
v/c Ratio	0.86	1.18		0.62	0.52		0.29	0.61	0.21	0.84	0.63	0.43
Uniform Delay, d1	76.3	65.6		80.3	62.1		83.4	54.8	47.9	68.1	37.1	32.9
Progression Factor	1.12	0.91		1.00	1.00		1.00	1.00	1.00	1.08	1.18	1.80
Incremental Delay, d2	13.8	97.7		4.2	0.7		1.1	2.7	1.0	13.7	1.6	1.6
Delay (s)	99.4	157.1		84.5	62.8		84.5	57.5	48.9	87.4	45.5	60.8
Level of Service	F	F		F	E		F	E	D	F	D	E
Approach Delay (s)		134.1			68.7			56.0			56.9	
Approach LOS		F			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	75.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.8
Intersection Capacity Utilization	87.2%	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)	72	719	73	90	625	16	64	40	128	36	50	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	5.7		7.0	5.7		7.0	7.0	7.0		7.1	7.1
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.99	1.00		0.98	1.00
Satd. Flow (prot)	1770	3491		1770	3526		1681	1747	1583		1824	1583
Flt Permitted	0.36	1.00		0.28	1.00		0.95	0.99	1.00		0.98	1.00
Satd. Flow (perm)	670	3491		530	3526		1681	1747	1583		1824	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)	78	782	79	98	679	17	70	43	139	39	54	152
RTOR Reduction (vph)	0	2	0	0	1	0	0	0	130	0	0	140
Lane Group Flow (vph)	78	859	0	98	695	0	55	58	9	0	93	12
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2					3			4
Actuated Green, G (s)	126.5	118.6		128.4	119.9		11.4	11.4	11.4		14.7	14.7
Effective Green, g (s)	126.5	118.6		128.4	119.9		11.4	11.4	11.4		14.7	14.7
Actuated g/C Ratio	0.70	0.66		0.71	0.67		0.06	0.06	0.06		0.08	0.08
Clearance Time (s)	6.3	5.7		7.0	5.7		7.0	7.0	7.0		7.1	7.1
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)	519	2300		436	2348		106	110	100		148	129
v/s Ratio Prot	0.01	c0.25		c0.01	0.20		0.03	c0.03			c0.05	
v/s Ratio Perm	0.10			0.15					0.01			0.01
v/c Ratio	0.15	0.37		0.22	0.30		0.52	0.53	0.09		0.63	0.10
Uniform Delay, d1	8.5	13.9		8.7	12.5		81.6	81.7	79.4		80.0	76.5
Progression Factor	1.00	1.00		0.84	0.66		1.00	1.00	1.00		1.07	1.53
Incremental Delay, d2	0.1	0.5		0.2	0.3		4.2	4.5	0.4		8.1	0.3
Delay (s)	8.7	14.4		7.5	8.6		85.9	86.2	79.8		93.8	117.3
Level of Service	A	B		A	A		F	F	E		F	F
Approach Delay (s)		13.9			8.5			82.6			108.4	
Approach LOS		B			A			F			F	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.8
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D : 2018 BUILD SYNCHRO REPORTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	82	4	9	151	20	67	45	1343	203	142	1334	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.5	6.7		5.6	6.0	6.0	5.6	6.0	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.95	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1778	1583	1770	1648		1770	3539	1583	1770	3539	1583
Flt Permitted		0.67	1.00	0.46	1.00		0.11	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)		1242	1583	861	1648		198	3539	1583	165	3539	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)	89	4	10	164	22	73	49	1460	221	154	1450	178
RTOR Reduction (vph)	0	0	9	0	55	0	0	0	49	0	0	64
Lane Group Flow (vph)	0	93	1	164	40	0	49	1460	172	154	1450	114
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		14.8	14.8	37.0	37.0		91.4	85.5	85.5	98.0	88.8	88.8
Effective Green, g (s)		14.8	14.8	37.0	37.0		91.4	85.5	85.5	98.0	88.8	88.8
Actuated g/C Ratio		0.10	0.10	0.25	0.25		0.61	0.57	0.57	0.65	0.59	0.59
Clearance Time (s)		6.7	6.7	6.5	6.7		5.6	6.0	6.0	5.6	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		122	156	307	406		182	2017	902	206	2095	937
v/s Ratio Prot				c0.06	0.02		0.01	0.41		c0.05	c0.41	
v/s Ratio Perm		c0.07	0.00	0.08			0.15		0.11	c0.44		0.07
v/c Ratio		0.76	0.01	0.53	0.10		0.27	0.72	0.19	0.75	0.69	0.12
Uniform Delay, d1		65.9	61.0	47.1	43.6		16.7	23.6	15.6	22.5	21.2	13.5
Progression Factor		1.00	1.00	1.00	1.00		0.48	0.64	0.29	1.00	1.00	1.00
Incremental Delay, d2		24.1	0.0	1.8	0.1		0.6	1.7	0.3	13.8	1.9	0.3
Delay (s)		90.0	61.0	48.9	43.7		8.6	16.9	4.9	36.3	23.1	13.7
Level of Service		F	E	D	D		A	B	A	D	C	B
Approach Delay (s)		87.2			47.0			15.1			23.3	
Approach LOS		F			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	75.3%	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)	137	7	54	44	1	29	56	1435	118	116	1119	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.3	7.3		7.3	7.3		6.7	6.4	6.4	6.7	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.87		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		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1617		1770	1592		1770	3539	1583	1770	3539	1583
Flt Permitted	0.74	1.00		0.71	1.00		0.20	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1370	1617		1329	1592		369	3539	1583	168	3539	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)	149	8	59	48	1	32	61	1560	128	126	1216	259
RTOR Reduction (vph)	0	50	0	0	27	0	0	0	29	0	0	83
Lane Group Flow (vph)	149	17	0	48	6	0	61	1560	99	126	1216	176
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	21.7	21.7		21.7	21.7		101.4	95.6	95.6	114.4	102.1	102.1
Effective Green, g (s)	21.7	21.7		21.7	21.7		101.4	95.6	95.6	114.4	102.1	102.1
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.68	0.64	0.64	0.76	0.68	0.68
Clearance Time (s)	7.3	7.3		7.3	7.3		6.7	6.4	6.4	6.7	6.4	6.4
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)	198	233		192	230		303	2255	1008	259	2408	1077
v/s Ratio Prot		0.01			0.00		0.01	c0.44		c0.04	c0.34	
v/s Ratio Perm	c0.11			0.04			0.13		0.06	0.33		0.11
v/c Ratio	0.75	0.07		0.25	0.02		0.20	0.69	0.10	0.49	0.50	0.16
Uniform Delay, d1	61.6	55.4		56.9	55.1		8.9	17.6	10.5	16.5	11.7	8.6
Progression Factor	0.96	1.22		1.00	1.00		0.55	0.52	0.18	3.01	0.78	0.86
Incremental Delay, d2	13.6	0.1		0.7	0.0		0.3	1.4	0.2	1.1	0.6	0.2
Delay (s)	72.6	67.5		57.6	55.1		5.1	10.6	2.0	50.6	9.7	7.7
Level of Service	E	E		E	E		A	B	A	D	A	A
Approach Delay (s)		71.1			56.6			9.8			12.6	
Approach LOS		E			E			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	77.4%	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)	50	4	45	62	9	139	111	1491	245	223	871	128
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	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1780	1583		1785	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.59	1.00		0.69	1.00	0.30	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)		1091	1583		1279	1583	563	3539	1583	185	3539	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	4	49	67	10	151	121	1621	266	242	947	139
RTOR Reduction (vph)	0	0	44	0	0	137	0	0	76	0	0	15
Lane Group Flow (vph)	0	58	5	0	77	14	121	1621	190	242	947	124
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)		14.2	14.2		14.2	14.2	114.0	106.7	106.7	127.8	116.5	116.5
Effective Green, g (s)		14.2	14.2		14.2	14.2	114.0	106.7	106.7	127.8	116.5	116.5
Actuated g/C Ratio		0.09	0.09		0.09	0.09	0.76	0.71	0.71	0.85	0.78	0.78
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)		103	149		121	149	486	2517	1126	338	2748	1229
v/s Ratio Prot							0.01	0.46		c0.08	0.27	
v/s Ratio Perm		0.05	0.00		c0.06	0.01	0.18		0.12	c0.53		0.08
v/c Ratio		0.56	0.03		0.64	0.10	0.25	0.64	0.17	0.72	0.34	0.10
Uniform Delay, d1		64.9	61.7		65.4	62.0	4.6	11.5	7.1	27.4	5.1	4.1
Progression Factor		1.00	1.00		1.00	1.00	0.94	1.04	1.19	1.63	1.06	1.20
Incremental Delay, d2		6.9	0.1		10.5	0.3	0.1	0.5	0.1	6.4	0.3	0.1
Delay (s)		71.8	61.7		75.9	62.3	4.5	12.6	8.6	51.0	5.7	5.0
Level of Service		E	E		E	E	A	B	A	D	A	A
Approach Delay (s)		67.2			66.9			11.6			13.9	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	451	322	19	296	612	457	68	854	140	125	354	426
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	7.1		7.0	7.1		7.0	5.7	5.7	6.3	5.7	5.7
Lane Util. Factor	0.97	1.00		0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1847		3433	3312		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1847		3433	3312		3433	3539	1583	1770	3539	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)	490	350	21	322	665	497	74	928	152	136	385	463
RTOR Reduction (vph)	0	2	0	0	89	0	0	0	107	0	0	280
Lane Group Flow (vph)	490	369	0	322	1073	0	74	928	45	136	385	183
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	22.5	35.4		31.1	44.3		8.2	44.5	44.5	12.9	48.5	48.5
Effective Green, g (s)	22.5	35.4		31.1	44.3		8.2	44.5	44.5	12.9	48.5	48.5
Actuated g/C Ratio	0.15	0.24		0.21	0.30		0.05	0.30	0.30	0.09	0.32	0.32
Clearance Time (s)	6.7	7.1		7.0	7.1		7.0	5.7	5.7	6.3	5.7	5.7
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)	514	435		711	978		187	1049	469	152	1144	511
v/s Ratio Prot	0.14	c0.20		0.09	c0.32		0.02	c0.26		c0.08	0.11	
v/s Ratio Perm									0.03			0.12
v/c Ratio	0.95	0.85		0.45	1.10		0.40	0.88	0.10	0.89	0.34	0.36
Uniform Delay, d1	63.2	54.8		52.0	52.9		68.5	50.3	38.2	67.9	38.5	38.8
Progression Factor	0.84	0.99		1.00	1.00		1.00	1.00	1.00	1.06	1.10	2.45
Incremental Delay, d2	24.7	12.0		0.5	58.9		1.4	10.9	0.4	42.0	0.8	1.9
Delay (s)	77.8	66.1		52.5	111.8		69.9	61.2	38.6	114.0	43.2	96.9
Level of Service	E	E		D	F		E	E	D	F	D	F
Approach Delay (s)		72.8			98.9			58.8			78.2	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	79.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.8
Intersection Capacity Utilization	96.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	181	688	161	241	770	68	71	100	89	26	44	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	5.7		7.0	5.7		7.0	7.0	7.0		7.1	7.1
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00		1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.98	1.00
Satd. Flow (prot)	1770	3439		1770	3496		1681	1764	1583		1829	1583
Flt Permitted	0.27	1.00		0.16	1.00		0.95	1.00	1.00		0.98	1.00
Satd. Flow (perm)	504	3439		297	3496		1681	1764	1583		1829	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)	197	748	175	262	837	74	77	109	97	28	48	177
RTOR Reduction (vph)	0	12	0	0	3	0	0	0	87	0	0	163
Lane Group Flow (vph)	197	911	0	262	908	0	69	117	10	0	76	14
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2					3			4
Actuated Green, G (s)	83.8	62.4		103.0	75.3		15.3	15.3	15.3		11.9	11.9
Effective Green, g (s)	83.8	62.4		103.0	75.3		15.3	15.3	15.3		11.9	11.9
Actuated g/C Ratio	0.56	0.42		0.69	0.50		0.10	0.10	0.10		0.08	0.08
Clearance Time (s)	6.3	5.7		7.0	5.7		7.0	7.0	7.0		7.1	7.1
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)	462	1430		533	1754		171	179	161		145	125
v/s Ratio Prot	0.06	c0.27		c0.11	c0.26		0.04	c0.07			c0.04	
v/s Ratio Perm	0.18			0.23					0.01			0.01
v/c Ratio	0.43	0.64		0.49	0.52		0.40	0.65	0.06		0.52	0.11
Uniform Delay, d1	16.8	34.8		15.6	25.1		63.1	64.8	60.9		66.3	64.1
Progression Factor	1.00	1.00		1.16	0.58		1.00	1.00	1.00		1.13	2.82
Incremental Delay, d2	0.6	2.2		0.4	0.5		1.6	8.3	0.2		3.4	0.4
Delay (s)	17.4	37.0		18.4	15.2		64.6	73.1	61.0		78.3	181.0
Level of Service	B	D		B	B		E	E	E		E	F
Approach Delay (s)		33.6			15.9			66.9			150.1	
Approach LOS		C			B			E			F	

Intersection Summary			
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	26.8
Intersection Capacity Utilization	65.2%	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)	80	10	20	352	2	157	6	1398	223	51	1129	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.7	6.7	6.5	6.7		5.6	6.0	6.0	5.6	6.0	6.0
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1784	1583	1770	1587		1770	3539	1583	1770	3539	1583
Flt Permitted		0.63	1.00	0.44	1.00		0.14	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)		1180	1583	813	1587		266	3539	1583	94	3539	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	11	22	383	2	171	7	1520	242	55	1227	39
RTOR Reduction (vph)	0	0	20	0	78	0	0	0	47	0	0	18
Lane Group Flow (vph)	0	98	2	383	95	0	7	1520	195	55	1227	21
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)		18.1	18.1	62.3	62.3		94.2	92.8	92.8	104.6	98.0	98.0
Effective Green, g (s)		18.1	18.1	62.3	62.3		94.2	92.8	92.8	104.6	98.0	98.0
Actuated g/C Ratio		0.10	0.10	0.35	0.35		0.52	0.52	0.52	0.58	0.54	0.54
Clearance Time (s)		6.7	6.7	6.5	6.7		5.6	6.0	6.0	5.6	6.0	6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	0.1	0.1	3.0	3.0	3.0
Lane Grp Cap (vph)		118	159	481	549		150	1824	816	116	1926	861
v/s Ratio Prot				c0.17	0.06		0.00	c0.43		c0.02	c0.35	
v/s Ratio Perm		0.08	0.00	c0.11			0.02		0.12	0.26		0.01
v/c Ratio		0.83	0.01	0.80	0.17		0.05	0.83	0.24	0.47	0.64	0.02
Uniform Delay, d1		79.4	72.9	49.4	40.9		23.9	37.0	24.1	32.3	28.6	18.9
Progression Factor		1.00	1.00	1.00	1.00		0.63	0.85	0.54	1.00	1.00	1.00
Incremental Delay, d2		36.7	0.0	8.9	0.2		0.1	3.9	0.6	3.0	1.6	0.1
Delay (s)		116.2	72.9	58.3	41.1		15.1	35.5	13.6	35.3	30.2	19.0
Level of Service		F	E	E	D		B	D	B	D	C	B
Approach Delay (s)		108.2			53.0			32.4			30.1	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	84.7%	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)	177	11	66	88	7	74	16	1339	27	32	1467	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.3	7.3		7.3	7.3		6.7	6.4	6.4	6.7	6.4	6.4
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.87		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1623		1770	1609		1770	3539	1583	1770	3539	1583
Flt Permitted	0.69	1.00		0.70	1.00		0.10	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1291	1623		1308	1609		195	3539	1583	234	3539	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)	192	12	72	96	8	80	17	1455	29	35	1595	104
RTOR Reduction (vph)	0	59	0	0	66	0	0	0	9	0	0	22
Lane Group Flow (vph)	192	25	0	96	22	0	17	1455	20	35	1595	82
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	32.0	32.0		32.0	32.0		125.9	122.1	122.1	129.3	123.8	123.8
Effective Green, g (s)	32.0	32.0		32.0	32.0		125.9	122.1	122.1	129.3	123.8	123.8
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.70	0.68	0.68	0.72	0.69	0.69
Clearance Time (s)	7.3	7.3		7.3	7.3		6.7	6.4	6.4	6.7	6.4	6.4
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)	229	288		232	286		169	2400	1073	215	2434	1088
v/s Ratio Prot		0.02			0.01		0.00	0.41		c0.00	c0.45	
v/s Ratio Perm	c0.15			0.07			0.07		0.01	0.11		0.05
v/c Ratio	0.84	0.09		0.41	0.08		0.10	0.61	0.02	0.16	0.66	0.07
Uniform Delay, d1	71.5	61.8		65.7	61.7		13.2	15.8	9.4	11.8	16.0	9.3
Progression Factor	0.99	1.09		1.00	1.00		0.71	1.17	1.00	0.81	0.74	0.61
Incremental Delay, d2	22.6	0.1		1.2	0.1		0.2	1.1	0.0	0.3	1.1	0.1
Delay (s)	93.1	67.3		66.9	61.8		9.6	19.6	9.5	9.8	13.0	5.8
Level of Service	F	E		E	E		A	B	A	A	B	A
Approach Delay (s)		85.2			64.5			19.3			12.5	
Approach LOS		F			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	102	5	115	82	1	131	24	1121	31	61	1509	44
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	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		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	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1778	1583		1775	1583	1770	3539	1583	1770	3539	1583
Flt Permitted		0.55	1.00		0.46	1.00	0.12	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)		1020	1583		850	1583	221	3539	1583	361	3539	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)	111	5	125	89	1	142	26	1218	34	66	1640	48
RTOR Reduction (vph)	0	0	109	0	0	124	0	0	7	0	0	7
Lane Group Flow (vph)	0	116	16	0	90	18	26	1218	27	66	1640	42
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)		23.2	23.2		23.2	23.2	141.7	137.9	137.9	147.9	141.0	141.0
Effective Green, g (s)		23.2	23.2		23.2	23.2	141.7	137.9	137.9	147.9	141.0	141.0
Actuated g/C Ratio		0.13	0.13		0.13	0.13	0.79	0.77	0.77	0.82	0.78	0.78
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)		131	204		109	204	206	2711	1212	350	2772	1240
v/s Ratio Prot							0.00	0.34		c0.01	c0.46	
v/s Ratio Perm		c0.11	0.01		0.11	0.01	0.10		0.02	0.15		0.03
v/c Ratio		0.89	0.08		0.83	0.09	0.13	0.45	0.02	0.19	0.59	0.03
Uniform Delay, d1		77.1	69.0		76.4	69.1	6.7	7.5	5.0	4.6	7.9	4.3
Progression Factor		1.00	1.00		1.00	1.00	0.93	1.32	0.83	0.72	0.51	0.44
Incremental Delay, d2		45.6	0.2		37.6	0.2	0.2	0.4	0.0	0.2	0.7	0.0
Delay (s)		122.7	69.2		114.1	69.3	6.4	10.4	4.2	3.5	4.8	1.9
Level of Service		F	E		F	E	A	B	A	A	A	A
Approach Delay (s)		94.9			86.7			10.1			4.7	
Approach LOS		F			F			B			A	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	362	519	27	154	249	160	41	590	287	295	952	467
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.7	7.1		7.0	7.1		7.0	5.7	5.7	6.3	5.7	5.7
Lane Util. Factor	0.97	1.00		0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	1849		3433	3332		3433	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	1849		3433	3332		3433	3539	1583	1770	3539	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)	393	564	29	167	271	174	45	641	312	321	1035	508
RTOR Reduction (vph)	0	1	0	0	58	0	0	0	221	0	0	196
Lane Group Flow (vph)	393	592	0	167	387	0	45	641	91	321	1035	312
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	23.8	53.1		14.2	43.8		7.9	47.9	47.9	38.7	78.0	78.0
Effective Green, g (s)	23.8	53.1		14.2	43.8		7.9	47.9	47.9	38.7	78.0	78.0
Actuated g/C Ratio	0.13	0.30		0.08	0.24		0.04	0.27	0.27	0.22	0.43	0.43
Clearance Time (s)	6.7	7.1		7.0	7.1		7.0	5.7	5.7	6.3	5.7	5.7
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)	453	545		270	810		150	941	421	380	1533	685
v/s Ratio Prot	0.11	c0.32		c0.05	0.12		0.01	c0.18		c0.18	c0.29	
v/s Ratio Perm									0.06			0.20
v/c Ratio	0.87	1.09		0.62	0.48		0.30	0.68	0.22	0.84	0.68	0.46
Uniform Delay, d1	76.6	63.5		80.3	58.3		83.4	59.2	51.4	67.8	40.9	36.0
Progression Factor	1.12	0.89		1.00	1.00		1.00	1.00	1.00	1.20	1.34	2.15
Incremental Delay, d2	15.1	63.1		4.2	0.4		1.1	4.0	1.2	13.6	2.0	1.8
Delay (s)	101.0	119.5		84.5	58.7		84.5	63.2	52.6	95.1	56.6	79.3
Level of Service	F	F		F	E		F	E	D	F	E	E
Approach Delay (s)		112.1			65.8			60.8			69.4	
Approach LOS		F			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	76.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.8
Intersection Capacity Utilization	87.7%	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)	87	719	73	90	634	19	64	47	128	41	59	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.3	5.7		7.0	5.7		7.0	7.0	7.0		7.1	7.1
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.99	1.00		0.98	1.00
Satd. Flow (prot)	1770	3491		1770	3524		1681	1754	1583		1825	1583
Flt Permitted	0.35	1.00		0.28	1.00		0.95	0.99	1.00		0.98	1.00
Satd. Flow (perm)	651	3491		527	3524		1681	1754	1583		1825	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)	95	782	79	98	689	21	70	51	139	45	64	178
RTOR Reduction (vph)	0	2	0	0	1	0	0	0	130	0	0	162
Lane Group Flow (vph)	95	859	0	98	709	0	59	62	9	0	109	16
Turn Type	pm+pt	NA		pm+pt	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		3	3		4	4	
Permitted Phases	6			2					3			4
Actuated Green, G (s)	125.1	116.6		126.0	117.4		11.8	11.8	11.8		16.2	16.2
Effective Green, g (s)	125.1	116.6		126.0	117.4		11.8	11.8	11.8		16.2	16.2
Actuated g/C Ratio	0.69	0.65		0.70	0.65		0.07	0.07	0.07		0.09	0.09
Clearance Time (s)	6.3	5.7		7.0	5.7		7.0	7.0	7.0		7.1	7.1
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)	505	2261		428	2298		110	114	103		164	142
v/s Ratio Prot	0.01	c0.25		c0.01	0.20		0.04	c0.04			c0.06	
v/s Ratio Perm	0.12			0.15					0.01			0.01
v/c Ratio	0.19	0.38		0.23	0.31		0.54	0.54	0.09		0.66	0.11
Uniform Delay, d1	9.2	14.8		9.5	13.6		81.5	81.5	79.0		79.3	75.3
Progression Factor	1.00	1.00		1.23	1.01		1.00	1.00	1.00		1.07	1.66
Incremental Delay, d2	0.2	0.5		0.2	0.3		5.0	5.2	0.4		9.7	0.4
Delay (s)	9.3	15.3		11.9	14.1		86.4	86.7	79.4		94.7	125.2
Level of Service	A	B		B	B		F	F	E		F	F
Approach Delay (s)		14.7			13.8			82.7			113.6	
Approach LOS		B			B			F			F	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	180.0	Sum of lost time (s)	26.8
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			