

Northside Hospital – North Tower Addition Traffic Impact Analysis

*Prepared for:
Northside Hospital*



NORTHSIDE HOSPITAL

*Prepared by:
Michael Baker International*

Michael Baker
INTERNATIONAL

May 31, 2016

TABLE OF CONTENTS

1.0 INTRODUCTION 1
2.0 EXISTING CONDITIONS..... 2
3.0 PROPOSED DEVELOPMENT 4
4.0 TRAFFIC VOLUMES..... 5
 4.1 Existing Traffic Volumes..... 5
 4.2 Historical Growth..... 5
 4.3 Background Traffic Volumes 6
 4.4 Development Traffic Volumes..... 8
 4.5 Build Traffic Volumes 8
5.0 CAPACITY ANALYSIS 11
 5.1 Background Conditions..... 11
 5.2 Build Conditions..... 13
6.0 CONCLUSIONS 14

APPENDIX A : TRAFFIC COUNTS A
APPENDIX B : ITE TRIP GENERATION SHEETS B
APPENDIX C : 2018 BACKGROUND SYNCHRO REPORTS C
APPENDIX D : 2018 BUILD SYNCHRO REPORTS D

LIST OF TABLES

Table 1: Historical Average Daily Traffic	6
Table 2: Trip Generation	8
Table 3: Level of Service Definitions	11
Table 4: 2018 Background LOS Results	12
Table 5: 2018 Build LOS Results	13

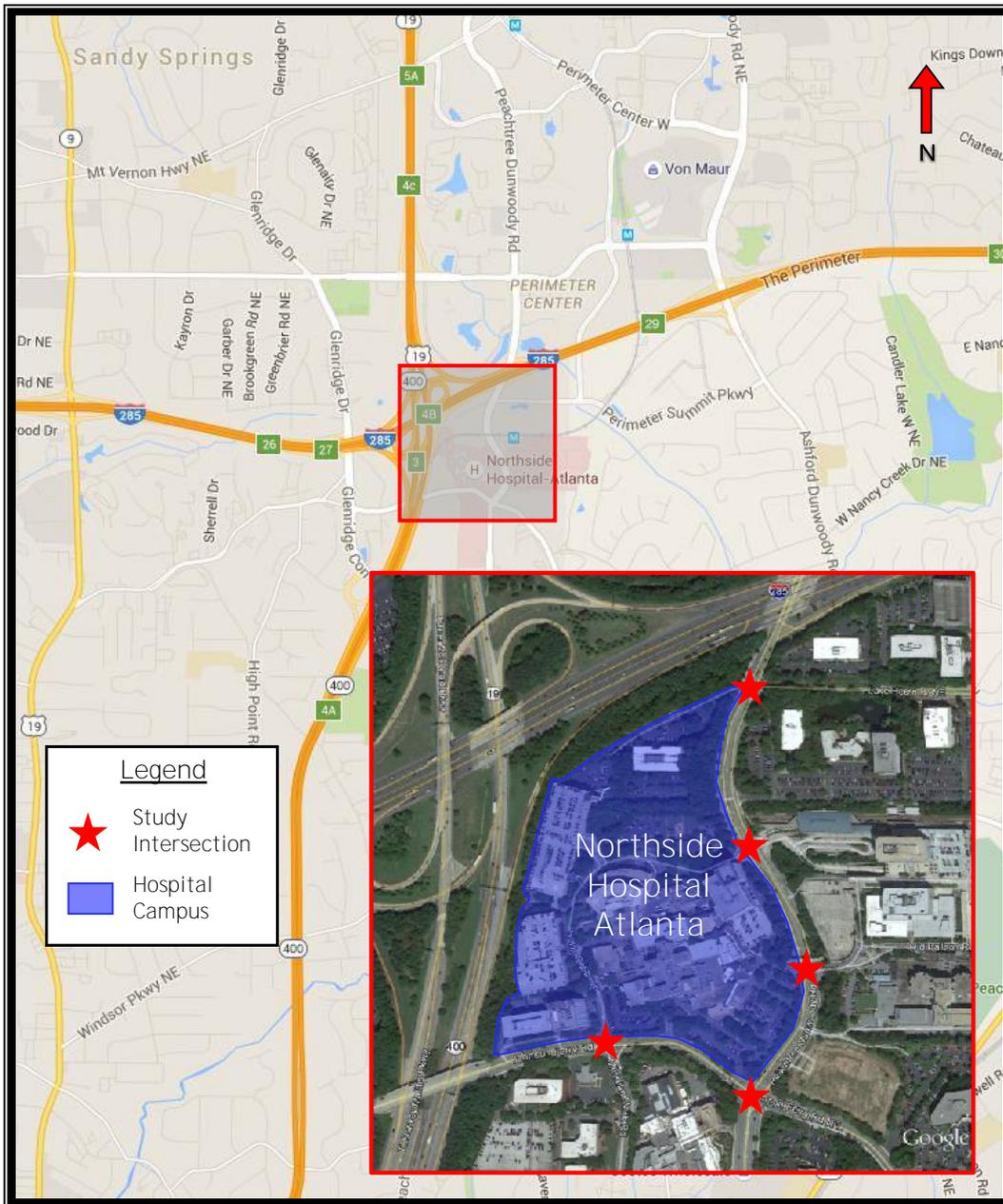
LIST OF FIGURES

Figure 1: Site Location Map.....	1
Figure 2: Existing Conditions.....	3
Figure 3: Proposed Development.....	4
Figure 4: 2018 Background Traffic Volumes.....	7
Figure 5: Trip Generation Traffic Volumes.....	9
Figure 6: 2018 Build Traffic Volumes.....	10

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



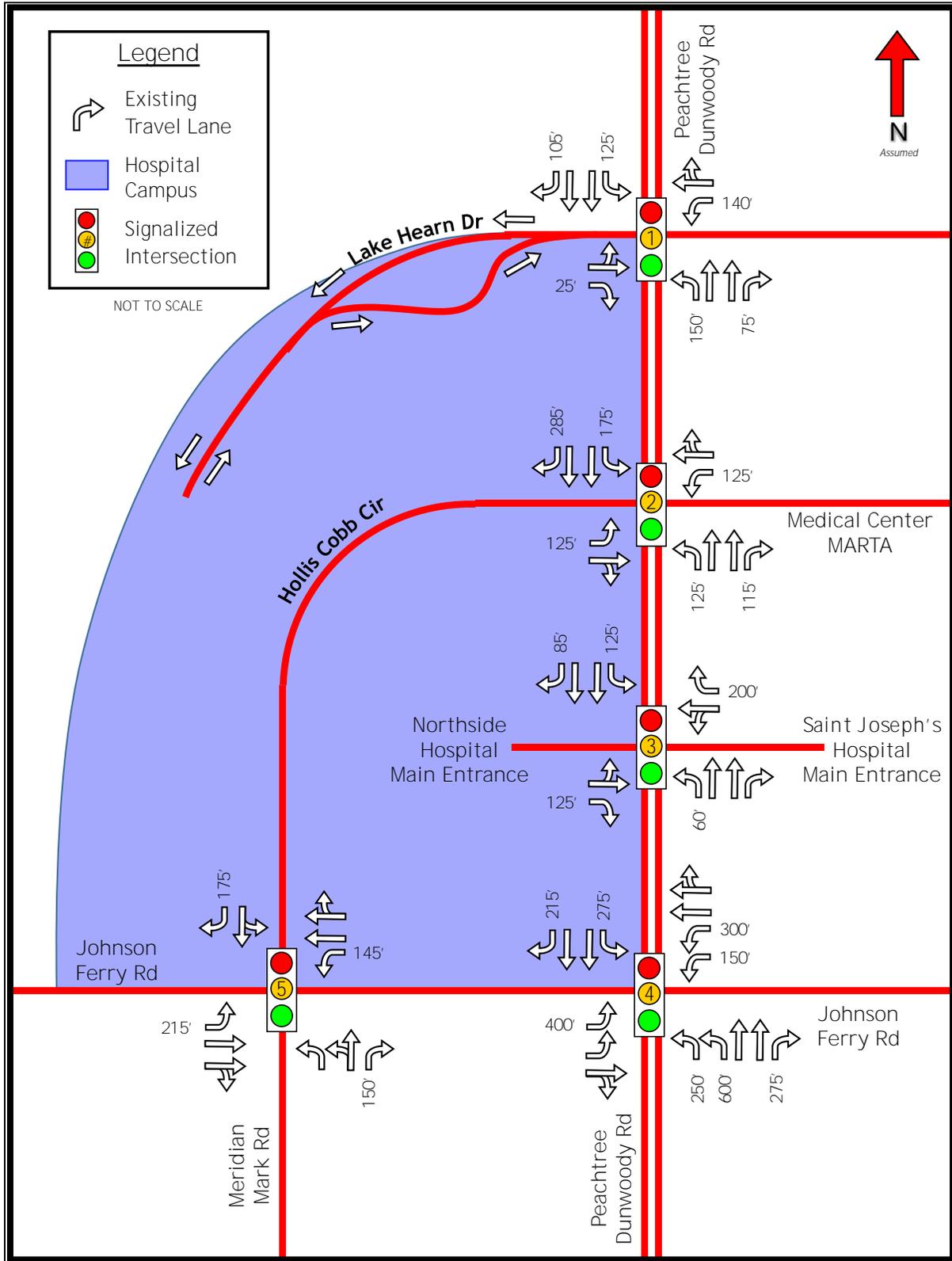
2.0 EXISTING CONDITIONS

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.

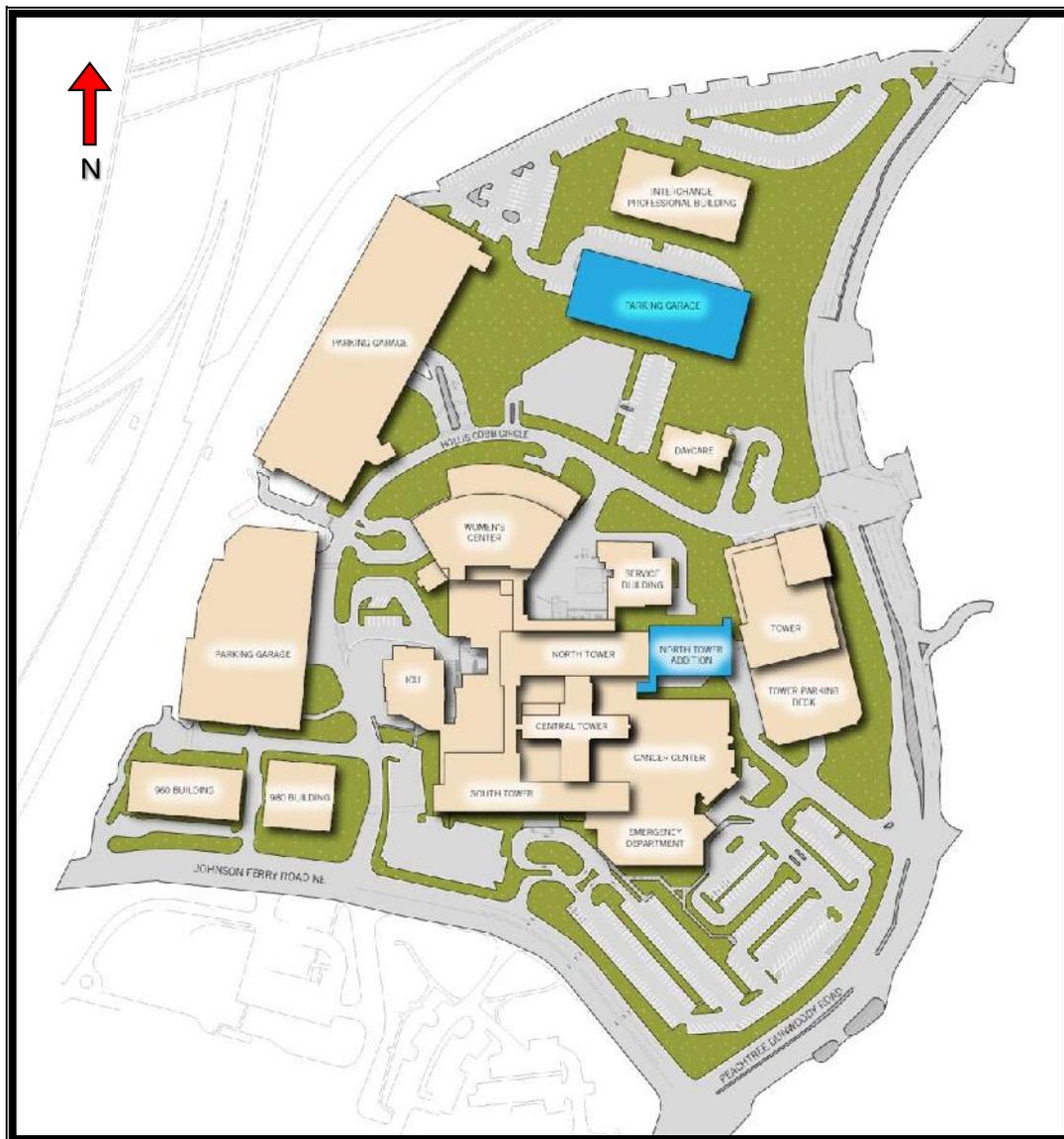
Figure 2: Existing Conditions



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.

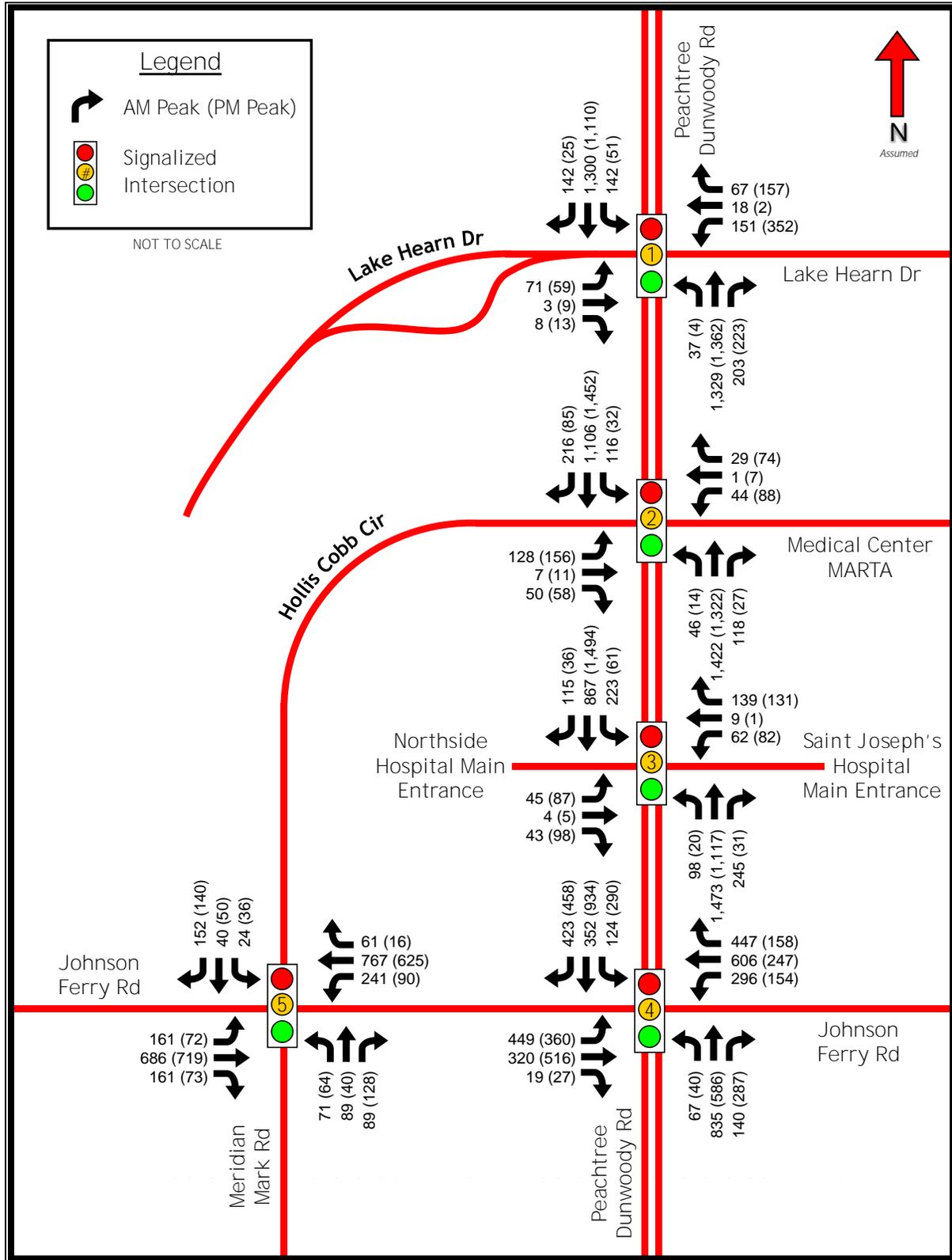
Table 1: Historical Average Daily Traffic

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						
*No field count collected, AADT estimated from previous year					Weighted Average	-2.3%	-0.1%

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

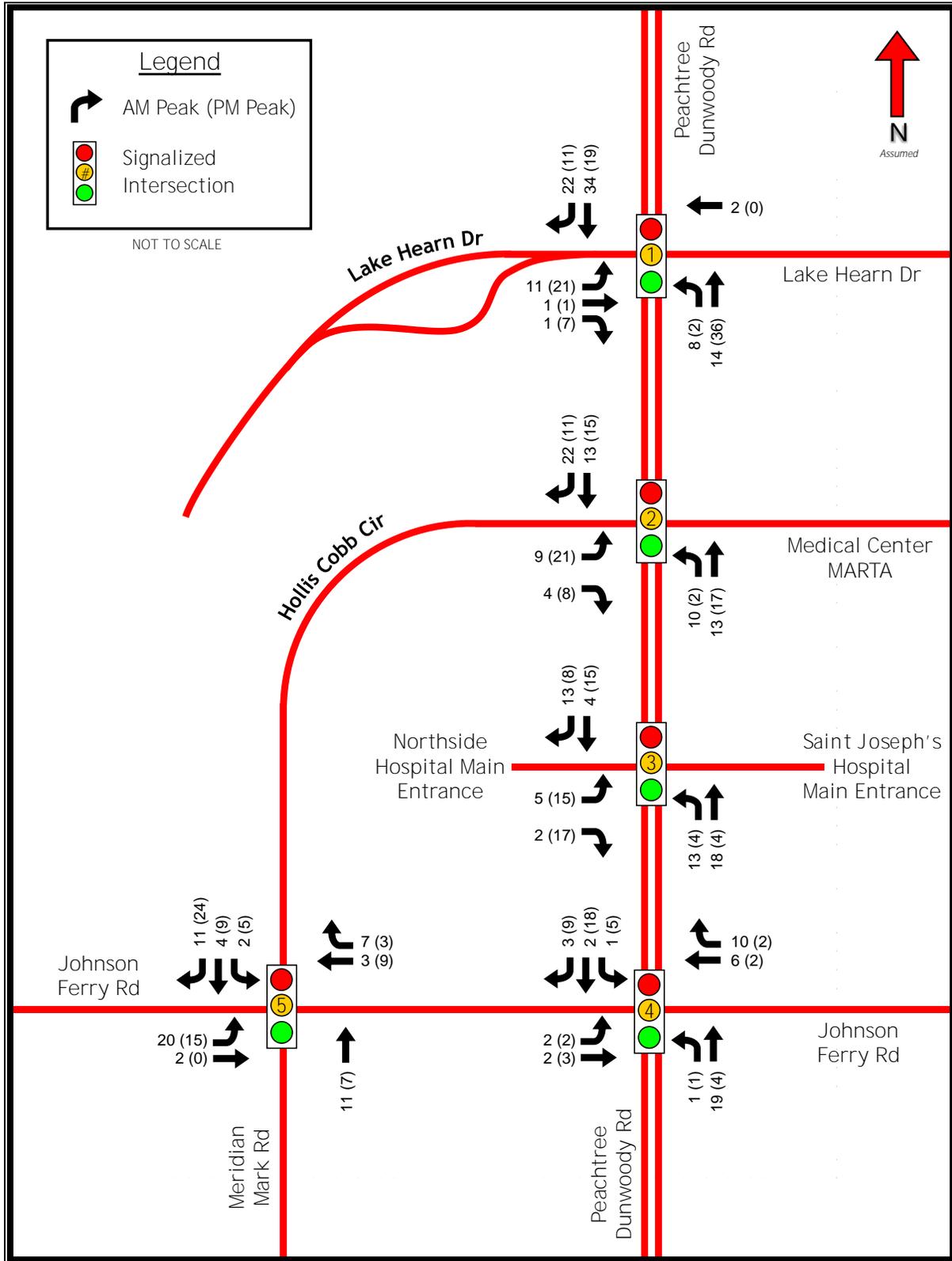
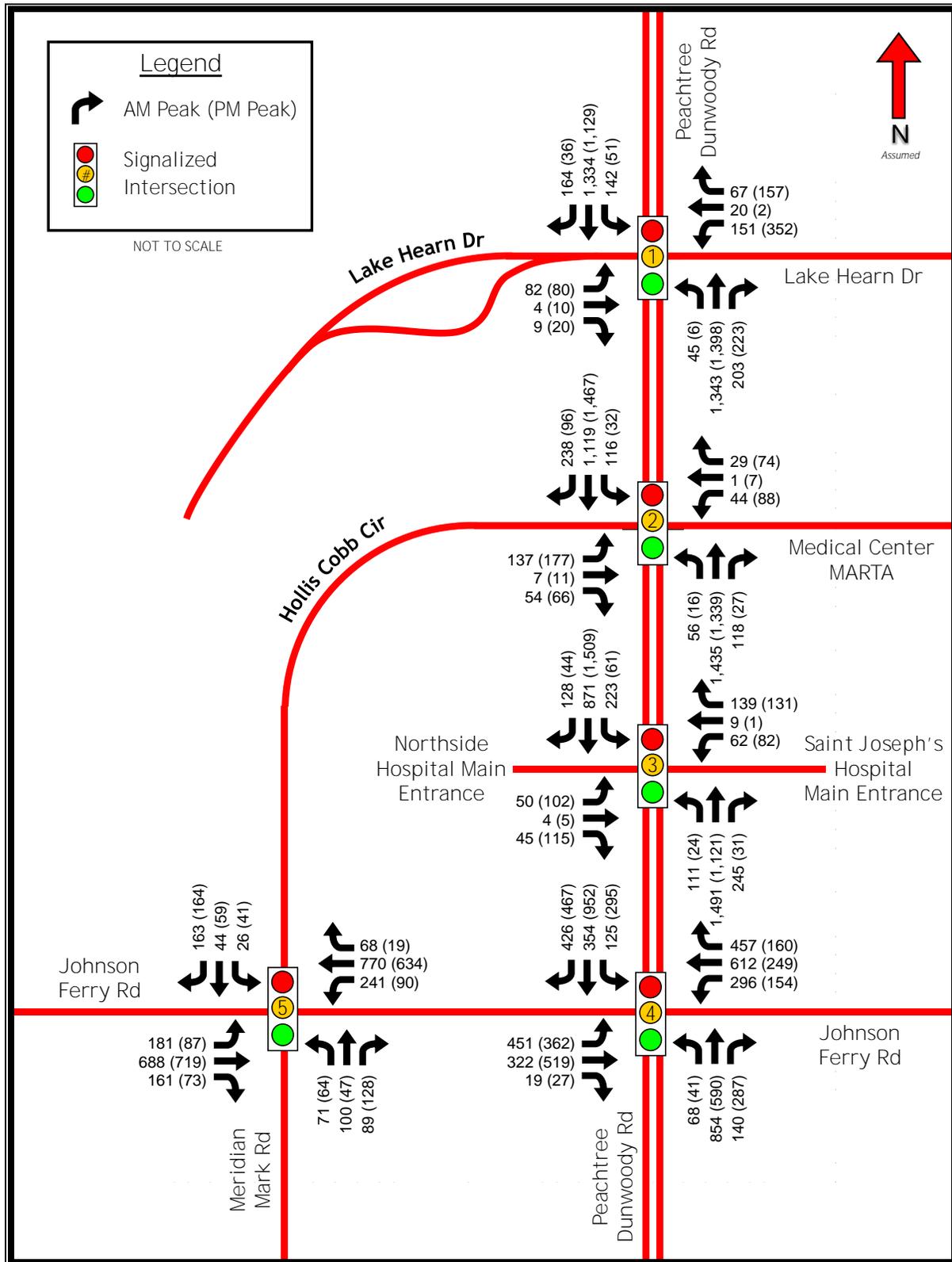


Figure 6: 2018 Build Traffic Volumes



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.

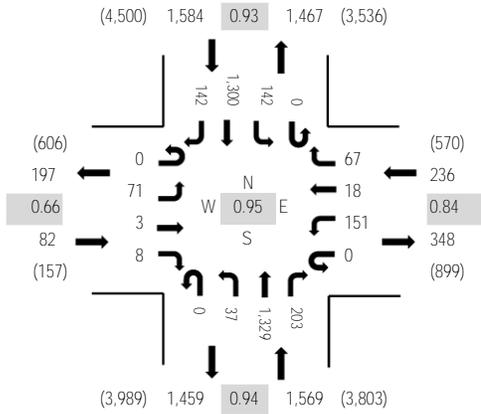
APPENDIX A : TRAFFIC COUNTS



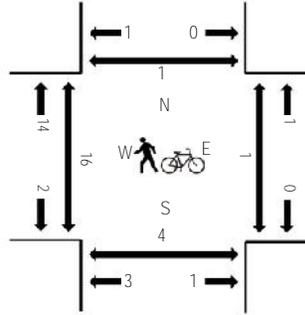
(303) 216-2439
www.alltrafficdata.net

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



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Office Drwy Eastbound			Lake Hearn Dr Westbound			Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrian 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

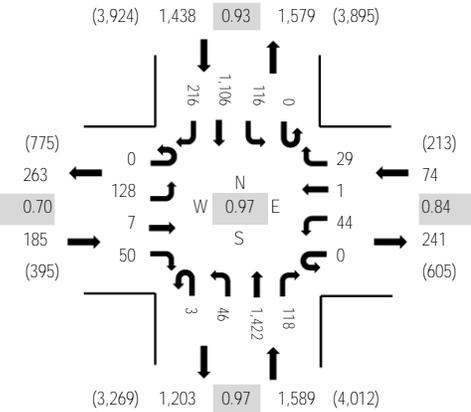
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Lights	0	71	3	8	0	146	18	66	0	37	1,316	197	0	141	1,282	142	3,427
Mediums	0	0	0	0	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



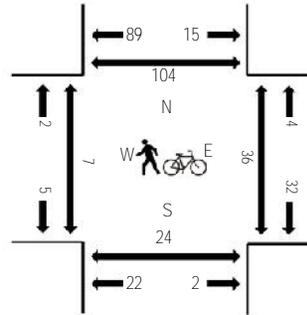
(303) 216-2439
www.alltrafficdata.net

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



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Hollis Cobb Circle Eastbound			Hollis Cobb Circle Westbound				Peachtree Dunwoody Rd Northbound			Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrian 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

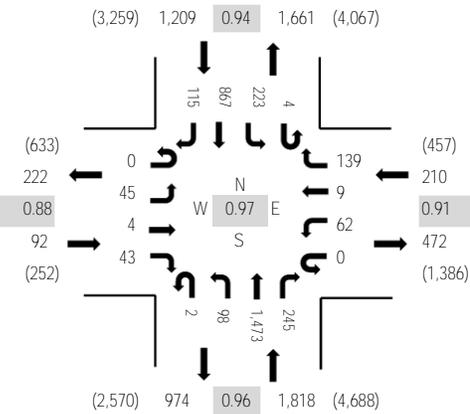
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	3	0	0	0	0	0	0	0	0	0	0	1	1	5
Lights	0	127	7	44	0	35	1	23	3	45	1,412	109	0	111	1,092	212	3,221
Mediums	0	1	0	3	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



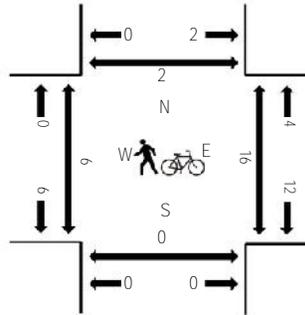
(303) 216-2439
www.alltrafficdata.net

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



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

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	Pedestrian 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	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

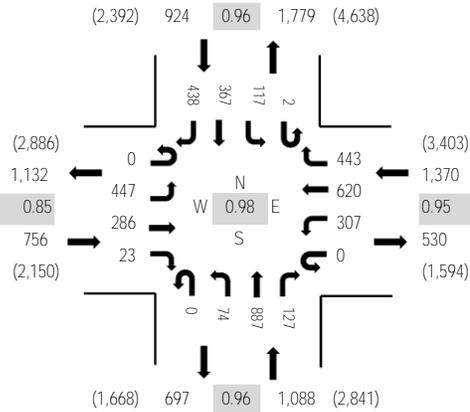
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
Lights	0	44	4	43	0	62	9	139	2	97	1,455	245	4	223	841	113	3,281
Mediums	0	1	0	0	0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



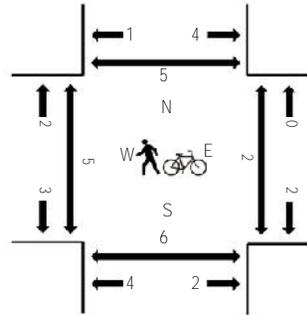
(303) 216-2439
www.alltrafficdata.net

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



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Johnson Ferry Rd Eastbound				Johnson Ferry Rd Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrian 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

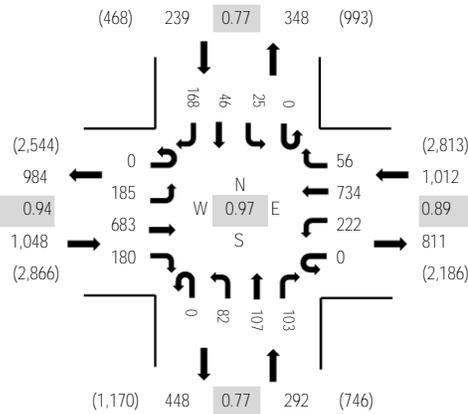
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Lights	0	436	282	21	0	302	616	441	0	71	883	126	2	115	353	424	4,072
Mediums	0	11	4	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



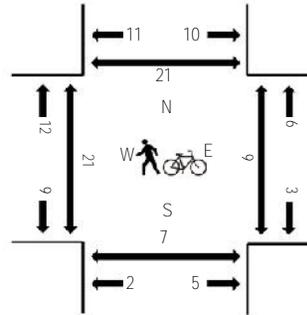
(303) 216-2439
www.alltrafficdata.net

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



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Johnson Ferry Rd Eastbound				Johnson Ferry Rd Westbound				Hollis Cobb Circle Northbound				Hollis Cobb Circle Southbound				Total	Rolling Hour	Pedestrian 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

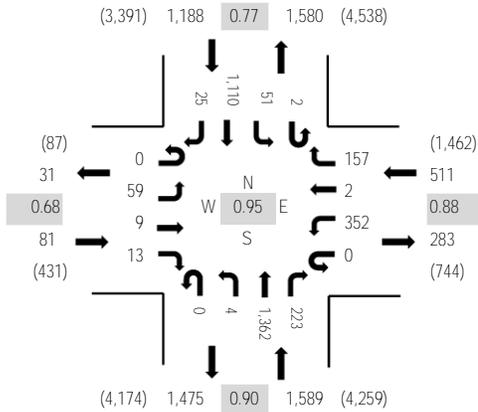
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	4
Lights	0	184	672	178	0	219	727	55	0	82	107	98	0	23	46	165	2,556
Mediums	0	1	11	2	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



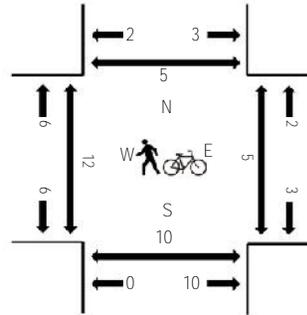
(303) 216-2439
www.alltrafficdata.net

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



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Office Drwy Eastbound			Lake Hearn Dr Westbound			Peachtree Dunwoody Rd Northbound			Peachtree Dunwoody Rd Southbound			Total	Rolling Hour	Pedestrian Crossings							
	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

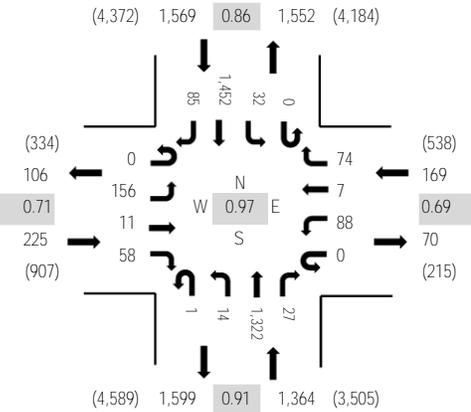
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	59	9	13	0	346	2	157	0	4	1,354	218	2	51	1,097	25	3,337
Mediums	0	0	0	0	0	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



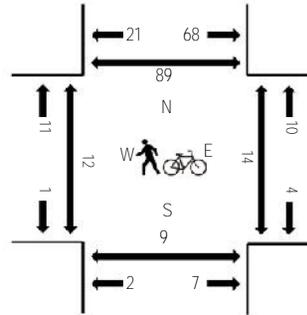
(303) 216-2439
www.alltrafficdata.net

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



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Hollis Cobb Circle Eastbound				Hollis Cobb Circle Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrian 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

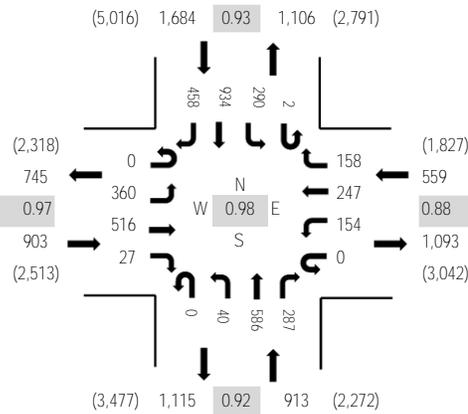
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Lights	0	156	8	58	0	84	6	69	1	14	1,313	25	0	27	1,440	83	3,284
Mediums	0	0	3	0	0	4	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



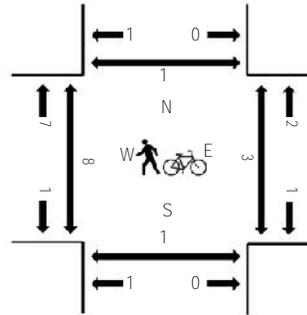
(303) 216-2439
www.alltrafficdata.net

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



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Johnson Ferry Rd Eastbound				Johnson Ferry Rd Westbound				Peachtree Dunwoody Rd Northbound				Peachtree Dunwoody Rd Southbound				Total	Rolling Hour	Pedestrian 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

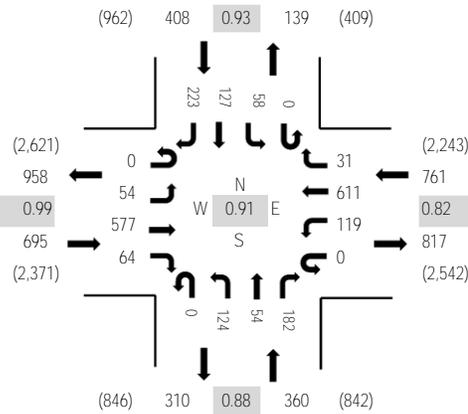
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Lights	0	358	510	26	0	153	246	152	0	40	583	281	2	288	923	452	4,014
Mediums	0	2	6	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



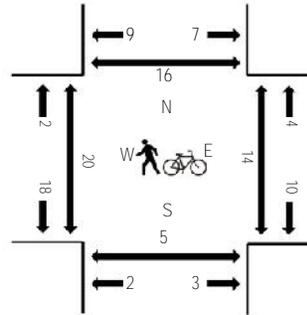
(303) 216-2439
www.alltrafficdata.net

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



Peak Hour - Pedestrians/Bicycles in Crosswalk



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Johnson Ferry Rd Eastbound				Johnson Ferry Rd Westbound				Hollis Cobb Circle Northbound				Hollis Cobb Circle Southbound				Total	Rolling Hour	Pedestrian 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)

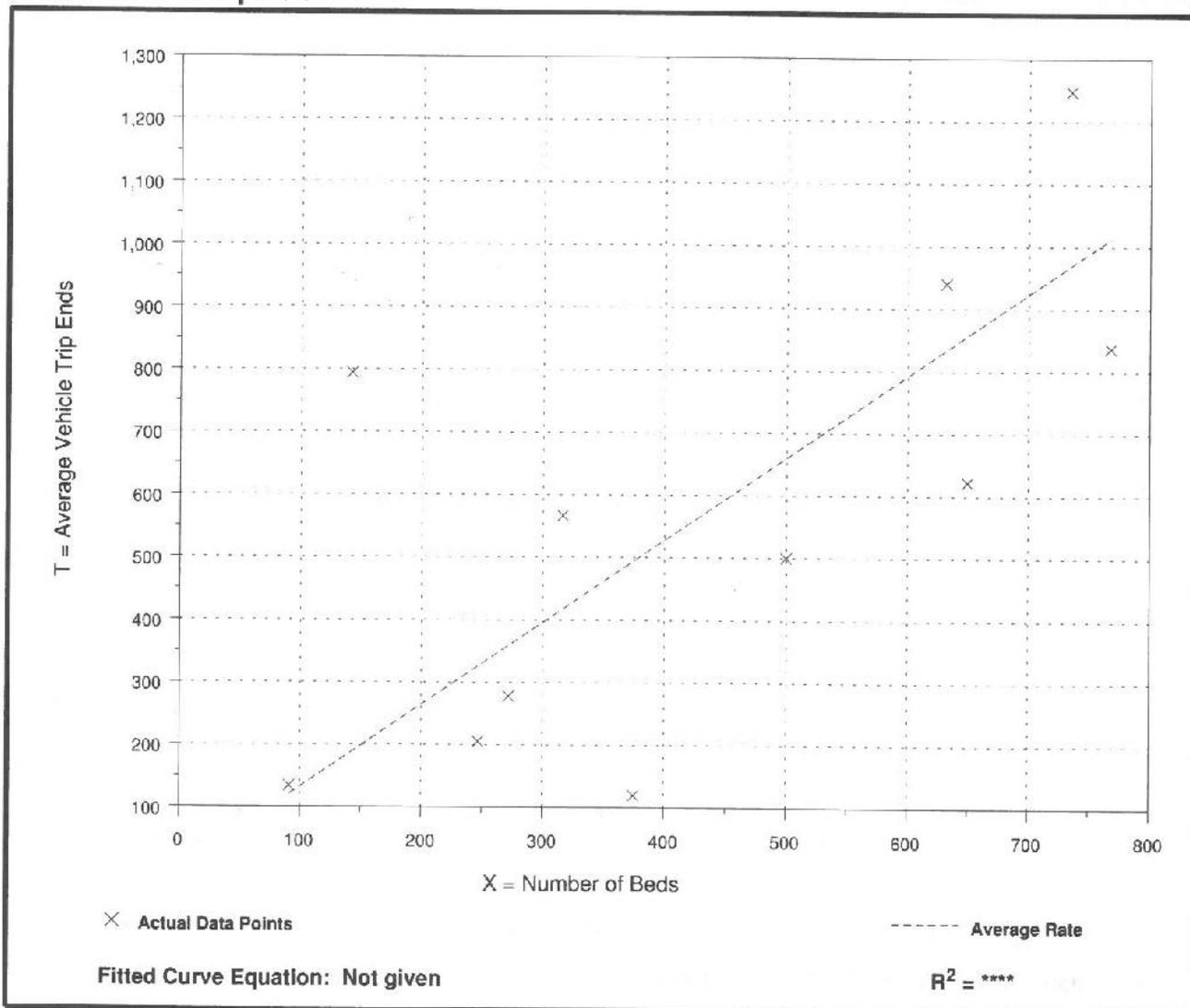
Average Vehicle Trip Ends vs: Beds
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

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



Hospital (610)

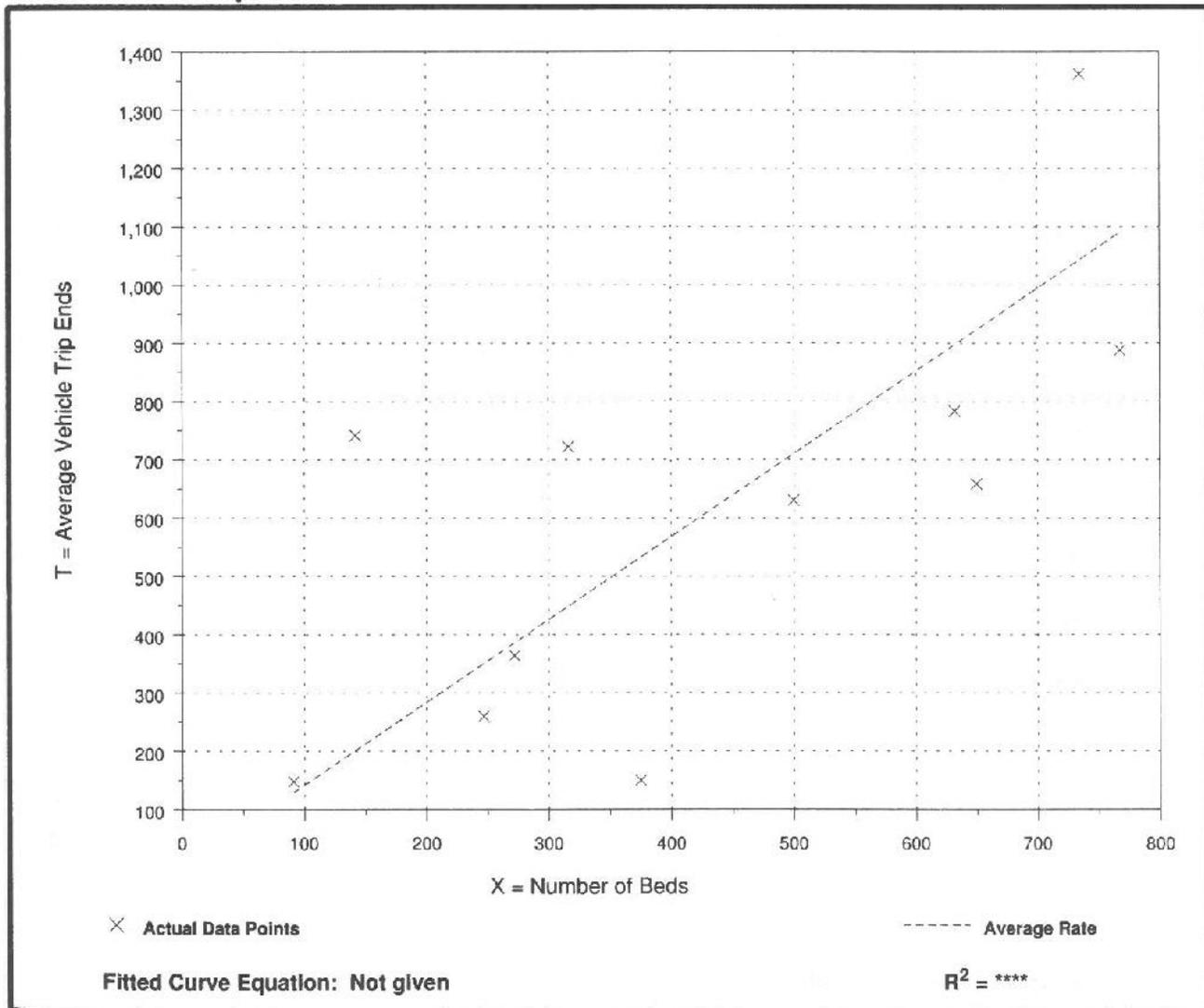
Average Vehicle Trip Ends vs: Beds
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

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



APPENDIX C : 2018 BACKGROUND SYNCHRO REPORTS

HCM Signalized Intersection Capacity Analysis
 1: Peachtree Dunwoody Rd & Lake Hearn

2018 AM Background

5/4/2016

												
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												

HCM Signalized Intersection Capacity Analysis

2: Peachtree Dunwoody Rd & Hollis Cobb Cir/MARTA

2018 AM Background

5/4/2016

												
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
Fr _t	1.00	0.87		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Fl _t 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
Fl _t 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, d ₁	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, d ₂	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												

HCM Signalized Intersection Capacity Analysis

3: Peachtree Dunwoody Rd & Northside/St. Joseph's

2018 AM Background

5/4/2016

													
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	
Fr _t		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fl _t 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	
Fl _t 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, d ₁		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, d ₂		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													

HCM Signalized Intersection Capacity Analysis

4: Peachtree Dunwoody Rd & Johnson Ferry Rd

2018 AM Background

5/4/2016

												
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												

HCM Signalized Intersection Capacity Analysis
5: Meridian Mark Rd/Hollis Cobb Cir & Johnson Ferry Rd

2018 AM Background
5/4/2016

												
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
Flt	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												

HCM Signalized Intersection Capacity Analysis
1: Peachtree Dunwoody Rd & Lake Hearn

2018 PM Background
5/4/2016

												
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
Flt		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												

HCM Signalized Intersection Capacity Analysis

2: Peachtree Dunwoody Rd & Hollis Cobb Cir/MARTA

2018 PM Background

5/4/2016

												
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
Flt	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												

HCM Signalized Intersection Capacity Analysis

3: Peachtree Dunwoody Rd & Northside/St. Joseph's

2018 PM Background

5/4/2016

													
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	
Fr _t		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fl _t 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	
Fl _t 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, d ₁		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, d ₂		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													

HCM Signalized Intersection Capacity Analysis
4: Peachtree Dunwoody Rd & Johnson Ferry Rd

2018 PM Background
5/4/2016

												
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
Flt	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												

HCM Signalized Intersection Capacity Analysis
 5: Meridian Mark Rd/Hollis Cobb Cir & Johnson Ferry Rd

2018 PM Background
 5/4/2016

												
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
Fr _t	1.00	0.99		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Fl _t 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
Fl _t 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, d ₁	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, d ₂	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

HCM Signalized Intersection Capacity Analysis
 1: Peachtree Dunwoody Rd & Lake Hearn

2018 AM Build
 5/4/2016

												
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
Fr _t		1.00	0.85	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Fl _t 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
Fl _t 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, d ₁		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, d ₂		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												

HCM Signalized Intersection Capacity Analysis

2: Peachtree Dunwoody Rd & Hollis Cobb Cir/MARTA

2018 AM Build

5/4/2016

												
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
Flt	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												

HCM Signalized Intersection Capacity Analysis

3: Peachtree Dunwoody Rd & Northside/St. Joseph's

2018 AM Build

5/4/2016

													
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	
Fr _t		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fl _t 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	
Fl _t 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, d ₁		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, d ₂		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													

HCM Signalized Intersection Capacity Analysis

4: Peachtree Dunwoody Rd & Johnson Ferry Rd

2018 AM Build

5/4/2016

												
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
Fr _t	1.00	0.99		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Fl _t 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
Fl _t 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, d ₁	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, d ₂	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												

HCM Signalized Intersection Capacity Analysis
 5: Meridian Mark Rd/Hollis Cobb Cir & Johnson Ferry Rd

2018 AM Build
 5/4/2016

												
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
Flt	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												

HCM Signalized Intersection Capacity Analysis
1: Peachtree Dunwoody Rd & Lake Hearn

2018 PM Build

5/4/2016

												
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
Flt		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												

HCM Signalized Intersection Capacity Analysis

2: Peachtree Dunwoody Rd & Hollis Cobb Cir/MARTA

2018 PM Build

5/4/2016

												
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
Flt	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												

HCM Signalized Intersection Capacity Analysis

3: Peachtree Dunwoody Rd & Northside/St. Joseph's

2018 PM Build

5/4/2016

													
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	
Flt		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													

HCM Signalized Intersection Capacity Analysis

4: Peachtree Dunwoody Rd & Johnson Ferry Rd

2018 PM Build

5/4/2016

												
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												

HCM Signalized Intersection Capacity Analysis
 5: Meridian Mark Rd/Hollis Cobb Cir & Johnson Ferry Rd

2018 PM Build
 5/4/2016

												
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
Fr _t	1.00	0.99		1.00	1.00		1.00	1.00	0.85		1.00	0.85
Fl _t 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
Fl _t 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, d ₁	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, d ₂	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			

Forrest N. Hibbard, PE, LLC

Parking Planning, Programming and Functional Parking Design

Memorandum

To: John Cummings
Director of Facility Services
Northside Hospital

From: Forrest Hibbard
Senior Parking Planner
Forrest N. Hibbard, PE, LLC

Date: July 11, 2016

Subject: Parking Needs Assessment Update
Northside Hospital
Sandy Springs, Georgia

RECEIVED 07/11/2016
PLANNING & ZONING

Northside Hospital Atlanta – Parking Study Update

Northside Hospital's Atlanta (NSH Atlanta) campus consists of properties at 960, 980 and 1000 Johnson Ferry Road and 5780 Peachtree Dunwoody Road in Sandy Springs, Georgia. NSH Atlanta is bounded on the north by I-285, on the east by Peachtree Dunwoody Road, on the south by Johnson Ferry Road and on the west by GA-400.

The following recommendations are provided as a snapshot review of the current parking conditions that exist on the main campus of NSH Atlanta. Strategies to improve the campus parker experience are provided to better justify the immediate need for additional 1,000-space on-site parking supply.

Executive Summary

Northside Hospital – Atlanta Parking Study Update and Recommendations

1. The current parking supply on NSH Atlanta's main campus is 4,665 parking spaces, which is a slight increase over the 4,481 parking spaces which existed when the previous YR 2005 parking study was completed.
2. The Georgia DOT has notified NSH Atlanta that about 110 parking spaces in their Interchange Parking Lot will be lost during the duration of the I-285/GA-400 construction. This impending parking loss will reduce the supply on NSH Atlanta's main campus to 4,555 parking spaces.
3. The Urban Land Institute (ULI) and Institute of Transportation Engineers (ITE) are recognized for establishing recommended parking demand ratios for land uses. They state that calculated parking demands are estimates of the actual number of occupied parking spaces at the design day's peak hour. Effective parking supply cushions of 10% to 15% are clarified as an important design concept, to reduce the need to search for the last unoccupied parking space. The supply cushion percentage will vary based on the land use, customer service desires and other factors.

4. Whether considering hospital or medical office building parking demands, health care planners and administrators recognize the need to apply a higher “effective parking supply cushion”. This approach considers the number of spaces needed to provide a 15% supply cushion for visitor and patient parkers and a 10% supply cushion for physician and employee parkers, based on the 85th percentile peak hour design day. For hospital expansions, which do not include a medical office, an 11.7% supply cushion should be provided. If the expansion included a medical office component, a 13.3% supply cushion should be provided.
5. The current NSH Atlanta main campus parking supply has been functioning under less than ideal conditions, with respect to having an adequate effective parking supply cushion, for some time.
 - a. NSH Atlanta has been compiling twice daily parking counts in parking areas on their main campus for over a year. An overview of the existing parking experience is provided for the first six months in 2016, in the form of tabular summaries.
 - b. The effective parking supply for the 85th percentile peak day is 5.3%, which relates to having only 247 open parking spaces, within a campus-wide 4,665 space parking supply.
6. The future parking demand for the new 62 beds that will be included in the proposed North Tower, which is programmed to be supported by 455 additional NSH FTEs, has been calculated using two different strategies with similar results:
 - a. Using a NSH Atlanta parking demand strategy, identified in the YR 1997 and YR 2005 parking studies, a site-specific “per FTE” ratio has been established for future planning. Using this approach, 455 new NSH FTEs would be expected to generate an additional 282 space parking demand, requiring a 315 space parking supply.
 - b. Using a different parking demand methodology for a replacement hospital in Canton, Georgia, NSH Cherokee is providing their parking supply based on a more general, but nationally recognized, “per bed” ratio. Employing a similar approach, 62 hospital beds would be expected to generate an additional 279 space parking demand, requiring a 312 space parking supply.
7. The proposed Interchange Parking Deck is a 1,271-space, 10-level parking deck located on the NSH Atlanta campus, just south the Interchange Building and north of the MARTA tracks.
 - a. The Interchange Parking Deck footprint is positioned in the Interchange Parking Lot, which will result in the loss of 135 parking spaces in the Interchange Parking Lot.
 - b. The Interchange Parking Deck will be able be accessed from the lowest parking level from the Interchange Parking Lot, and from a regraded and reconfigured Lower 40 Parking Lot, resulting in an additional loss of 18 parking spaces.
 - c. Coupled with the loss of 110 parking spaces due to the Georgia DOT construction, the proposed Interchange Parking Deck will add 1,008 net gain spaces to the parking supply which presently exists at NSH Atlanta.
8. The parking supply on NSH Atlanta’s main campus will be 5,673 parking spaces, when the Interchange Parking Deck is completed, an approximate 1,000 net gain.
 - a. To improve the current parking experience for NSH patients and visitors, a minimum of 250 to 300 NSH and MOB employee parkers, presently parking in other parking areas on the main campus, should be reassigned to the Interchange Parking Deck.
 - b. Another 300 NSH employee parking spaces on the main campus will be reassigned to park in the Interchange Parking Deck, to proactively plan for the parking demands of the 62 beds in the proposed North Tower Addition.

- c. There may be opportunities to reassign other NSH Atlanta employee parkers to the Interchange Parking Deck, who are presently having to park off-site and shuttle to and from the main campus.

Northside Hospital – Parking Occupancy Survey Results – Existing Parking Conditions

The July 2016 parking supply at the main campus of NSH Atlanta totals 4,665 parking spaces.

Patients and visitors have access over 85% of the provided parking in five of the larger designated parking areas, which does not guarantee that they will find a parking space, as NSH employees have privileges to park in four of the same parking areas.

Table 1.1 ** Summary of NSH Atlanta Parking Area Capacity

Parking Area	Parking Spaces	Patient/Visitor	Physician	Reserved
Main Visitor Lot	260	248	12	-
Tower Garage	917	846	52	19
Doctor’s Centre Garage	980	928	-	52
Women’s Center Garage	1,849	1,709	-	140
Interchange Lot	381	365	15	1
Physician’s Lot	91	-	91	-
Labor & Delivery Lot	17	-	10	7
Lower 40 Lot	110	-	-	110
Day Care Lot	22	-	-	22
Outside Doctor’s Centre	30	-	-	30
Outside Women’s Center	8	-	-	8
NSH Atlanta Parking Totals	4,665	4,096	180	389

Of the 4,665 parking spaces on the main campus, 167 (3.6%) are ADA designated spaces, which are distributed throughout campus to best accommodate the parking patron.

The 389 reserved spaces include parking spaces adjacent to short-term drop-off areas, service and delivery vehicles, and “nested by signage” parking areas for NSH employees, vendors and contractors.

The 170 parking spaces in Lower 40 Lot, the Day Care Lot and the two Outside Parking Areas have been observed to have no open parking spaces at either the 10:30 am or 1:30 pm occupancy survey counts, except for shipping and receiving parking spaces. These lots are allocated as 100% reserved with a few physician parking spaces.

On a daily basis, it is estimated that up to 45 parkers are being inventive and finding a place to squeeze in unstriped parking areas. It is assumed that 50% of the “illegal parkers are NSH employees and staff, while 50% are patients and visitors. At this time, these parkers are not being ticketed.

Mindful of parking patron feedback that NSH has been receiving, NSH Atlanta has been conducting ongoing field surveys of the “empty” open parking spaces that are available to patient/visitor parkers and employee/staff parkers for over 18 months.

Monthly field report summaries from the previous six months are attached as supporting information. The NSH Parking Occupancy Survey for the months of January 2016 through June 2016 identify that the NSH’s target strategy of having a daily “effective parking supply” cushion of at least 11.7% on their main campus has rarely been seen during the last year and a half of monitoring parking activity.

On average, the twice daily counts have been taken on 20 days during each month. In none of the survey months has the 85th percentile peak parking demand had a 10% effective supply cushion at either of the twice daily counts, nor when the monthly peak parking demand are averaged for the month. The 85th percentile peak parking activity has been established as the day of the month that NSH Atlanta main campus is the 4th most full, or when the campus has the 4th fewest open parking spaces.

An overview of the campus parking conditions are provided below for the 10:30 am morning counts in Table 1.2, and for the 1:30 pm afternoon counts in Table 1.3.

Table 1.2 ** Morning Parking Occupancy Count Summary – January 2016 to June 2016

(10:30 am) Open Parking Space Count Survey						
Month 2016	100% Peak Occupancy		85% Peak Occupancy		Average Occupancy	
June	253 Spaces	5.5% Open	288 Spaces	6.3% Open	339 Spaces	7.3% Open
May	224 Spaces	4.9% Open	283 Spaces	6.2% Open	350 Spaces	7.5% Open
April	160 Spaces	3.5% Open	293 Spaces	6.4% Open	356 Spaces	7.6% Open
March	187 Spaces	4.1% Open	263 Spaces	5.8% Open	318 Spaces	6.8% Open
February	150 Spaces	3.3% Open	197 Spaces	4.3% Open	282 Spaces	6.1% Open
January	127 Spaces	2.8% Open	161 Spaces	3.5% Open	307 Spaces	6.6% Open

Table 1.3 ** Afternoon Parking Occupancy Count Summary – January 2016 to June 2016

(1:30 pm) Open Parking Space Count Survey						
Month 2016	100% Peak Occupancy		85% Peak Occupancy		Average Occupancy	
June	251 Spaces	5.5% Open	309 Spaces	6.8% Open	389 Spaces	8.3% Open
May	290 Spaces	6.4% Open	347 Spaces	7.6% Open	423 Spaces	9.1% Open
April	227 Spaces	5.0% Open	320 Spaces	7.0% Open	411 Spaces	8.8% Open
March	223 Spaces	4.9% Open	315 Spaces	6.9% Open	412 Spaces	8.8% Open
February	176 Spaces	3.9% Open	221 Spaces	4.8% Open	355 Spaces	7.6% Open
January	145 Spaces	3.2% Open	240 Spaces	5.3% Open	360 Spaces	7.7% Open

As expected, the morning occupancy counts are found to have fewer open spaces, than the afternoon occupancy count, and the survey confirms the urgency that parking relief is needed at NSH Atlanta.

The monthly occupancy counts also confirmed that January and February parker activity is higher, which has been a recurring theme at hospitals nationally for many years. The 85th percentile parking demands

are higher during the first two months of the year, which at NSH Atlanta resulted in having up to 100 fewer open spaces for later arriving parkers.

For a parking supply of 4,665 to best serve patients and visitors at NSH Atlanta, there should be 487 open parking spaces when the 85th percentile peak parking demand is modeled. Averaging the data compiled over the most recent six months, the 85th percentile number of open parking spaces is 247 spaces (less than 6.0%), and 240 spaces fewer than the “effective supply” goal of 11.7%.

To upgrade the patient and visitor parking experience at NSH Atlanta, It is recommended that a minimum of 250 to 300 NSH Hospital and MOB employees be reassigned to park at the new Interchange Parking Deck.

Hospital and Medical Office Building Parking Resources

Parking demands at hospitals will vary from hospital to hospital, based on the services they provide and where they are located – urban, suburban or rural. National planning publications recommend that hospitals which have stayed in one location for many years are “best practices” candidates to have on-going reviews of their parking needs. This is due to the evolving patient/visitor and hospital staffing trends in the health care industry, which often results in building expansion strategies in a land-locked environment. As a result, health care planners and hospital administrators will proactively review their specific parking needs, based on their continual growth

One exception to predicting hospital parking demand, is when a new hospital is being planned and built. In such cases, hospital building programs are starting from the ground up. Parking demand ratios identified in local zoning ordinances and codes can vary greatly, and are usually identified as minimum guidelines, based on the building program. National health care planning and design firms have found that parking demand can be estimated for new hospitals, based on a parking spaces “per bed” ratio.

For new hospitals, planning for a parking demand ratio of 5.0 spaces per hospital bed has been found to be a good health care planning standard. This ratio assumes that parking spaces be allocated as follows: 1.5 spaces per bed for visitor parking, 3.0 spaces per bed for hospital staff parking and 0.5 spaces for physician parking.

If a medical office building is also being considered in close proximity a new hospital, the 0.5 spaces for the physician at the hospital is not needed, reducing the hospital parking demand ratio to 4.5 spaces per hospital bed. The physician parking space will be then carried in the medical office building’s parking demand calculations.

The Urban Land Institute (ULI) has established a recognized industry standard 85th percentile peak parking demand ratio of 4.5 spaces per 1,000 sq.ft. of gross floor area for stand-alone medical and dental office buildings in The Dimensions of Parking, 5th Edition, 2010, as authored by the Parking Consultants Council of the National Parking Association. For medical office buildings provided within a medical campus, ULI also indicated a reduced parking demand ratio of 4.0 spaces per 1,000 sq. ft. of gross floor area, which was not provided in earlier editions of *The Dimensions of Parking*.

Another industry accepted publication, Shared Parking, 2nd Edition, 2005, provides parking planning methodology and introduces strategies for reducing the number of parking spaces that are needed in a mixed-use development. The Urban Land Institute and the International Council of Shopping Centers (ICSC) identify base parking demand ratios for individual land uses, which reference the recommended parking demand ratios provided the 4th Edition of The Dimensions of Parking, 2000. A parking demand ratio of 4.5 spaces per 1,000 sq. ft. of gross floor area is indicated for a Medical/Dental Office Land Use.

Parking Generation, 3rd Edition, 2004, Institute of Transportation Engineers (ITE) identifies a slightly lower 85th percentile peak parking demand ratio for Medical and Dental Offices (Land Use 720) of 4.3 spaces per 1,000 sq. ft. of gross floor area, based on 18 representative medical office study sites. This publication, however, does not differentiate between parking demand ratios for medical offices within a medical campus and the parking demand ratios when considering a stand-alone medical office.

An article entitled "Parking Requirements for Medical Office Buildings" was presented by authors John Dorsett and Mark Lukasick of Walker Parking Consultants in the August 2007 issue of the ITE Journal. The article summarized the findings of parking studies which were performed at 50 free-standing medical office buildings. The 85th percentile peak-period parking demand was identified to be 4.21 spaces per 1,000 sq. ft. of gross floor area. The report indicated that a medical office building parking supply of 4.5 spaces per 1,000 sq. ft. of gross floor area is likely to have a 10% effective supply cushion.

The Dimensions of Parking, 5th Edition, includes a glossary of commonly used and referenced parking industry terms, providing definitions which may clarify parking demand and parking supply strategies which are presented in this report. The glossary includes the following definitions:

- Generator – a use that creates parking demand, such as a store, office building, hospital or recreational facility.
- Parking Demand – the number of potential customers for a parking facility or system.
- Effective supply – a downward adjustment, usually between 10 and 15 percent, of the actual parking inventory, to reflect the fact that the facility will rarely be functioning at 100 percent of capacity. When a parking facility is designed, it ordinarily incorporates an effective supply cushion, which is the difference between the actual number of spaces and the effective supply.
- Capacity – the number of vehicles that can be accommodated in a parking facility
- Peak Period – period of maximum parking activity; can be determined by the hour, by the day of the week, or by the season.
- Design hour – a percentage (usually 85 percent) of the highest one-hour volume of parking demand experienced in a particular location; used to determine what capacity a facility will be expected to provide.
- Design Day – the level of parking activity that recurs frequently enough to justify providing parking spaces; used to determine what capacity a facility will be expected to provide.

ULI's 85th percentile medical office building peak parking demand ratio, 4.0 spaces (on a hospital campus) to 4.5 spaces (not on a hospital campus) per 1,000 sq. ft., has been validated from parking occupancy studies which have been conducted at Atlanta area medical campuses over the past 20 years.

Citing personal experience, several of these parking studies have been provided for hospitals and medical centers having convenient access to MARTA stations.

Comprehensive parking studies have been completed at Northside Hospital's Atlanta campus in 1994, 1997 and 2005 to compare earlier parking demand assumptions with observed and evolving on-site parking conditions. Follow up snapshot assessments of parking supply have allowed administrators to appropriately plan for future medical campus expansion scenarios, often predicated on adding a new medical office to a land-locked suburban campus. Medical office building parking demands have been found to range between 4.0 to 4.5 spaces per 1,000 sq. ft., within their hospital medical campus.

The parking occupancy data collected on a survey day is analyzed and adjusted up or down, to account for day of the week and seasonal parking demand variables. Hospital surgeries performed on the survey day and medical office building activity levels are then compared with tracked historical data to test the reliability of the parking data collected and observed field conditions.

A parking demand ratio is then calculated for the specific healthcare environment, which can directly relate to the number of hospital beds or number of hospital employees or medical office building size. The parking demand ratio should relate to parking conditions which are expected during the peak hour of the "design day", often referred to as the 85th percentile parking volume. Over the period of one calendar year, the 85th percentile parking demand relates to peak hour parking volumes which occur on the 40th busiest day of the year.

One has to keep in mind that the 85th percentile value represents the number of parking spaces that are occupied at the peak hour. An "effective supply" cushion strategy is used to create parking spaces specifically intended to remain vacant during "peak period" parking activity during the "design hour" of the "design day", the day having the 40th highest daily parking volume during the year.

Forrest Hibbard, PE is a parking planning and design specialist with expertise in functionality and operational flexibility. Mr. Hibbard is skilled in parking programming for phased mixed-use projects and master planning for university, healthcare and corporate campuses. He is experienced in coordinating parking requirements with developers; owners; design consultants; and planning, zoning, and building departments. His technical strengths include sustainable parking design strategies, barrier-free design, parking geometrics, pedestrian and vehicular traffic flows, signage and graphics, and parking control equipment design integration.

Mr. Hibbard is a graduate of the Georgia Institute of Technology and is a licensed professional engineer in Georgia. He is a contributing author of *The Dimensions of Parking, 5th Edition, 2010*, a collaborative effort of the Urban Land Institute (ULI) and the National Parking Association (NPA). As a member of NPA's Parking Consultants Council, Mr. Hibbard has been an on-going committee member contributor to several publications, including *Parking Studies, 2006*, *Parking Garage Maintenance Manual, 2004*, and *Guidelines for Parking Geometrics, 2002*.

Mr. Hibbard has provided on-going parking planning and design expertise for Northside Hospital-Atlanta for 25 years, including leading two campus-wide parking studies and several site specific studies, usually predicated on the addition of a new medical office building. He has provided parking consulting for five

parking decks at their Atlanta campus, with each having future parking expansion opportunity. Parking master planning studies have been performed at the Northside Hospital campuses in Forsyth County (Cumming) and Cherokee County (Canton). He has also provided parking planning and design consulting for Piedmont Hospital, Grady Memorial Hospital, Emory University Hospital Midtown, Children's Healthcare of Atlanta, the V. A. Medical Center and DeKalb Medical Center.

Mr. Hibbard is providing parking planning services for City Springs, a public/private mixed-use project for the City of Sandy Springs, Georgia. The project includes a new government building, performing arts center, retail and restaurants, residential units and landscaped park. A shared parking analysis has been provided to recommend parking operations strategies for weekday, weekend and special event parkers. Parking allocation strategies have been considered for 1,000 parking spaces, for a two-level below grade parking deck and City Springs' on-site and on-street parking supply.

Mr. Hibbard's parking consulting expertise in Atlanta includes phased mixed-use development projects such as Atlantic Station, Terminus and Ponce City Market. He has served as the parking consultant for many mixed use redevelopment projects in Georgia, including the Washington Street Building for Athens-Clarke County Unified Government and at Ellis Square for the City of Savannah.

Mr. Hibbard has been the parking master planner for campus-wide studies at Emory University, Georgia State University, Georgia Tech, Spelman College and Kennesaw State University. He has also been the functional parking designer for over 20 structured parking decks at those higher education campuses.

NSH Parking Occupancy Survey

10% or less of inventory available = LOT FULL	Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside Doctor Centre and Women's Center Decks	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak Month Occupancy Rank / %	10% or less of inventory available = LOT FULL
JUNE 2016 10:30 AM		260	917	1849	381	980	91	17	110	22	38	4665			JUNE 1:30
W 06/01/16		35	102	138	68	23	0	0	0	0	0	366	8.0%		W
Th 06/02/16		0	78	162	71	74	4	0	0	0	0	389	8.5%		Th
F 06/03/16		17	139	72	23	77	3	0	0	0	0	331	7.3%		F
M 06/06/16		15	82	75	30	72	14	0	0	0	0	288	6.3%	4th / 85%	M
Tu 06/07/16		9	87	143	56	1	0	0	0	0	0	296	6.5%		Tu
W 06/08/16		2	40	155	28	50	15	0	0	0	0	290	6.4%		W
Th 06/09/16		2	75	78	32	70	7	0	0	0	0	264	5.8%	2nd / 95%	Th
F 06/10/16		0	75	86	37	83	8	0	0	0	0	289	6.3%		F
M 06/13/16		0	81	350	7	40	11	0	0	0	0	489	10.7%		M
Tu 06/14/16		8	85	135	56	110	7	0	0	0	0	401	8.8%		Tu
W 06/15/16		5	79	117	33	41	1	0	0	0	0	276	6.1%	3rd / 90%	W
Th 06/16/16		0	74	118	40	95	10	0	0	0	0	337	7.4%		Th
F 06/17/16		9	136	80	37	83	1	0	0	0	0	346	7.6%		F
M 06/20/16		4	69	300	12	40	11	0	0	0	0	436	9.6%		M
Tu 06/21/16		0	54	139	72	72	3	0	0	0	0	340	7.5%		Tu
W 06/22/16		2	58	272	72	72	0	0	0	0	0	476	10.4%		W
Th 06/23/16		10	68	71	31	65	8	0	0	0	0	253	5.5%	1st / 100%	Th
F 06/24/16		19	112	74	25	79	5	0	0	0	0	314	6.9%		F
M 06/27/16															M
Tu 06/28/16		22	40	173	11	42	10	0	0	0	0	298	6.5%		Tu
W 06/29/16		0	55	127	74	46	11	0	0	0	0	313	6.9%		W
Th 06/30/16		23	149	63	29	68	1	0	0	0	0	333	7.3%		Th
Jun-16 10:30 AM	Daily Avg. Percentage	9	83	139	40	62	6	0	0	0	0	339	7.3%		Jun-16 1:30 PM
	Jun - 85th Percentile	0	54	72	12	40	0	0	0	0	0	178	3.8%		

NSH Parking Occupancy Survey

10% or less of inventory available = LOT FULL	Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside Doctor Centre and Women's Center Decks	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak Month Occupancy Rank / %	10% or less of inventory available = LOT FULL
MAY 2016 10:30 AM		260	917	1849	381	980	91	17	110	22	38	4665			MAY 1:30
05/02/16	M	42	108	85	35	74	21	0	0	0	0	365	8.0%		05/02/16
05/03/16	Tu	5	89	165	0	39	3	0	0	0	0	301	6.6%		05/03/16
05/04/16	W	12	55	139	0	79	7	0	0	0	0	292	6.4%		05/04/16
05/05/16	Th	8	67	139	31	70	4	0	0	0	0	319	7.0%		05/05/16
05/06/16	F	0	80	156	29	83	7	0	0	0	0	355	7.8%		05/06/16
05/09/16	M	11	93	85	13	74	7	0	0	0	0	283	6.2%	4th / 85%	05/09/16
05/10/16	Tu	5	22	96	35	77	14	0	0	0	0	249	5.5%	2nd / 95%	05/10/16
05/11/16	W	18	54	192	34	56	7	0	0	0	0	361	7.9%		05/11/16
05/12/16	Th														05/12/16
05/13/16	F	11	109	72	34	76	11	0	0	0	0	313	6.9%		05/13/16
05/16/16	M	3	106	275	25	22	3	0	0	0	0	434	9.5%		05/16/16
05/17/16	Tu	5	54	136	52	101	6	0	0	0	0	354	7.8%		05/17/16
05/18/16	W	16	113	152	70	30	4	0	0	0	0	385	8.4%		05/18/16
05/19/16	Th	0	79	112	36	109	2	0	0	0	0	338	7.4%		05/19/16
05/20/16	F	15	139	77	30	79	5	0	0	0	0	345	7.6%		05/20/16
05/23/16	M	0	62	76	32	72	11	0	0	0	0	253	5.5%	3rd / 90%	05/23/16
05/24/16	Tu	1	60	153	72	83	7	0	0	0	0	376	8.2%		05/24/16
05/25/16	W	3	74	24	44	78	1	0	0	0	0	224	4.9%	1st / 100%	05/25/16
05/26/16	Th	23	108	72	36	75	7	0	0	0	0	321	7.0%		05/26/16
05/27/16	F	9	85	178	92	136	8	0	0	0	0	508	11.1%		05/27/16
05/30/16	M														05/30/16
05/31/16	Tu	7	139	358	20	82	12	0	0	0	0	618	13.6%		05/31/16
May-16	Daily Avg. Percentage	10	85	137	36	75	7	0	0	0	0	350			May-16 1:30 PM
		3.7%	9.2%	7.4%	9.4%	7.6%	8.1%	0.0%	0.0%	0.0%	0.0%	7.5%	7.5%		
	May - 85th Percentile	0	54	72	13	39	3	0	0	0	0	181			
		0.0%	5.9%	3.9%	3.4%	4.0%	3.3%	0.0%	0.0%	0.0%	0.0%	3.9%			

NSH Parking Occupancy Survey

10% or less of inventory available = LOT FULL	Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside Doctor Centre and Women's Center Decks	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak Month Occupancy Rank / %	10% or less of inventory available = LOT FULL
APRIL 2016 10:30 AM		260	917	1849	381	980	91	17	110	22	38	4665			APRIL 1:30
04/01/16	F	0	81	216	33	129	2	0	0	0	0	461	10.1%		04/01/16
04/04/16	M	25	140	82	40	89	18	0	0	0	0	394	8.6%		04/04/16
04/05/16	Tu	9	94	249	28	72	4	0	0	0	0	456	10.0%		04/05/16
04/06/16	W	12	136	139	76	99	6	0	0	0	0	468	10.3%		04/06/16
04/07/16	Th	15	87	186	76	82	12	0	0	0	0	458	10.0%		04/07/16
04/08/16	F	32	209	105	48	97	13	0	0	0	0	504	11.1%		04/08/16
04/11/16	M	13	88	88	30	20	9	0	0	0	0	248	5.4%	2nd / 95%	04/25/16
04/12/16	Tu	5	7	158	14	95	4	0	0	0	0	283	6.2%	3rd / 90%	04/12/16
04/13/16	W														04/13/16
04/14/16	Th	8	108	77	37	71	3	0	0	0	0	304	6.7%		04/14/16
04/15/16	F	5	93	75	33	85	2	0	0	0	0	293	6.4%	4th / 85%	04/15/16
04/18/16	M	12	80	86	39	76	11	0	0	0	0	304	6.7%		04/18/16
04/19/16	Tu														04/19/16
04/20/16	W	0	38	62	21	27	12	0	0	0	0	160	3.5%	1st / 100%	04/20/16
04/21/16	Th	13	92	85	33	27	73	0	0	0	0	323	7.1%		04/21/16
04/22/16	F	5	83	90	30	86	4	0	0	0	0	298	6.5%		04/22/16
04/25/16	M	0	81	272	8	20	1	0	0	0	0	382	8.4%		04/25/16
04/26/16	Tu														04/26/16
04/27/16	W														04/27/16
04/28/16	Th	0	84	159	64	46	9	0	0	0	0	362	7.9%		04/28/16
04/29/16	F														04/29/16
Apr-16	Daily Avg. Percentage	10	94	133	38	70	11	0	0	0	0	356	7.6%		Apr-16 1:30 PM
		3.7%	10.2%	7.2%	10.0%	7.1%	12.6%	0.0%	0.0%	0.0%	0.0%	7.6%	7.6%		
	Apr - 85th Percentile	0	80	77	21	27	2	0	0	0	0	207	4.4%		
		0.0%	8.7%	4.2%	5.5%	2.8%	2.2%	0.0%	0.0%	0.0%	0.0%	4.4%			

NSH Parking Occupancy Survey

10% or less of inventory available = LOT FULL	Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside Doctor Centre and Women's Center Decks	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak Month Occupancy Rank / %	10% or less of inventory available = LOT FULL
MARCH 2016		260	917	1849	381	980	91	17	110	22	38	4665			MARCH
10:30 AM															1:30
03/01/16	Tu	0	39	82	14	79	0	0	0	0	0	214	4.7%	3rd / 90%	03/01/16
03/02/16	W	7	33	120	11	35	3	0	0	0	0	209	4.6%	2nd / 95%	03/02/16
03/03/16	Th	6	71	69	36	87	9	0	0	0	0	278	6.1%		03/03/16
03/04/16	F	1	84	84	2	84	8	0	0	0	0	263	5.8%	4th / 85%	03/04/16
03/07/16	M	12	87	88	5	97	0	0	0	0	0	289	6.3%		03/07/16
03/08/16	Tu	23	97	210	5	72	11	0	0	0	0	418	9.2%		03/08/16
03/09/16	W	8	57	91	67	97	4	0	0	0	0	324	7.1%		03/09/16
03/10/16	Th	9	126	69	35	77	4	0	0	0	0	320	7.0%		03/10/16
03/11/16	F	1	112	83	41	85	5	0	0	0	0	327	7.2%		03/11/16
03/14/16	M	15	85	185	10	54	2	0	0	0	0	351	7.7%		03/14/16
03/15/16	Tu														03/15/16
03/16/16	W	0	12	101	8	57	9	0	0	0	0	187	4.1%	1st / 100%	03/16/16
03/17/16	Th	23	165	70	31	77	5	0	0	0	0	371	8.1%		03/17/16
03/18/16	F	3	76	77	10	157	7	0	0	0	0	330	7.2%		03/18/16
03/21/16	M	7	70	264	6	40	5	0	0	0	0	392	8.6%		03/21/16
03/22/16	Tu	7	62	245	10	50	3	0	0	0	0	377	8.3%		03/22/16
03/23/16	W	0	48	213	13	82	2	0	0	0	0	358	7.9%		03/23/16
03/24/16	Th	7	109	149	29	78	11	0	0	0	0	383	8.4%		03/24/16
03/25/16	F														03/25/16
03/28/16	M	0	56	209	5	58	1	0	0	0	0	329	7.2%		03/28/16
03/29/16	Tu	17	87	153	27	67	3	0	0	0	0	354	7.8%		03/29/16
03/30/16	W	2	96	166	55	15	1	0	0	0	0	335	7.3%		03/30/16
03/31/16	Th	0	30	126	33	73	9	0	0	0	0	271	5.9%		03/31/16
Mar-16	Daily Avg. Percentage	7	76	136	22	72	5	0	0	0	0	318	6.8%	6.8%	Mar-16
		2.7%	8.3%	7.4%	5.7%	7.4%	5.3%	0.0%	0.0%	0.0%	0.0%	6.8%			1:30 PM
	Mar - 85th Percentile	0	33	70	5	40	1	0	0	0	0	237	5.1%		

NSH Parking Occupancy Survey

10% or less of inventory available = LOT FULL	Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside Doctor Centre and Women's Center Decks	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak Month Occupancy Rank / %	10% or less of inventory available = LOT FULL
FEBRUARY 2016		260	917	1849	381	980	91	17	110	22	38	4665			FEBRUARY
10:30 AM															1:30
02/01/16	M	3	85	216	59	96	6	0	0	0	0	465	10.2%		02/01/16
02/02/16	Tu	0	69	115	48	75	3	0	0	0	0	310	6.8%		02/02/16
02/03/16	W	20	27	99	8	43	0	0	0	0	0	197	4.3%	4th / 85%	02/03/16
02/04/16	Th	0	77	70	35	75	5	0	0	0	0	262	5.7%		02/04/16
02/05/16	F	5	80	74	25	77	1	0	0	0	0	262	5.7%		02/05/16
02/08/16	M	23	131	212	17	14	14	0	0	0	0	411	9.0%		02/08/16
02/09/16	Tu	0	73	103	3	17	1	0	0	0	0	197	4.3%	3rd / 90%	02/09/16
02/10/16	W	0	47	159	19	2	0	0	0	0	0	227	5.0%		02/10/16
02/11/16	Th	0	78	75	23	72	3	0	0	0	0	251	5.5%		02/11/16
02/12/16	F	2	79	137	38	99	12	0	0	0	0	367	8.1%		02/12/16
02/15/16	M														02/15/16
02/16/16	Tu	3	67	93	15	48	14	0	0	0	0	240	5.3%		02/16/16
02/17/16	W	129	57	128	5	1	1	0	0	0	0	321	7.0%		02/17/16
02/18/16	Th	0	95	73	32	36	1	0	0	0	0	237	5.2%		02/18/16
02/19/16	F	89	57	87	41	86	7	0	0	0	0	367	8.1%		02/19/16
02/22/16	M	12	82	131	50	6	0	0	0	0	0	281	6.2%		02/22/16
02/23/16	Tu	1	35	75	0	32	7	0	0	0	0	150	3.3%	1st / 100%	02/23/16
02/24/16	W	0	52	64	15	37	5	0	0	0	0	173	3.8%	2nd / 95%	02/24/16
02/25/16	Th	0	82	59	64	36	5	0	0	0	0	246	5.4%		02/25/16
02/26/16	F	0	92	163	32	116	0	0	0	0	0	403	8.8%		02/26/16
Feb-16	Daily Avg. Percentage	15	72	112	28	51	4	0	0	0	0	282			Feb-16
		5.8%	7.8%	6.1%	7.3%	5.2%	4.9%	0.0%	0.0%	0.0%	0.0%	6.1%	6.1%		1:30 PM
	Feb - 85th Percentile	0	47	73	5	6	0	0	0	0	0	131			
		0.0%	5.1%	3.9%	1.3%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%			

NSH Parking Occupancy Survey

10% or less of inventory available = LOT FULL	Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside Doctor Centre and Women's Center Decks	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak Month Occupancy Rank / %	10% or less of inventory available = LOT FULL
JANUARY 2016		260	917	1849	381	980	91	17	110	22	38	4665			JANUARY
10:30 AM															1:30
01/04/16	M	4	119	473	13	91	8	0	0	0	0	708	15.5%		01/04/16
01/05/16	Tu	3	113	174	15	19	0	0	0	0	0	324	7.1%		01/05/16
01/06/16	W	3	87	123	52	87	5	0	0	0	0	357	7.8%		01/06/16
01/07/16	Th	7	69	124	21	51	2	0	0	0	0	274	6.0%		01/07/16
01/08/16	F	0	89	84	35	92	7	0	0	0	0	307	6.7%		01/08/16
01/11/16	M	0	143	269	17	24	8	0	0	0	0	461	10.1%		01/11/16
01/12/16	Tu	0	57	51	3	46	4	0	0	0	0	161	3.5%	4th / 85%	01/12/16
01/13/16	W	0	32	92	45	35	0	0	0	0	0	204	4.5%		01/13/16
01/14/16	Th	0	87	72	53	76	4	0	0	0	0	292	6.4%		01/14/16
01/15/16	F														01/15/16
01/18/16	M	0	218	256	36	176	6	0	0	0	0	692	15.2%		01/18/16
01/19/16	Tu	0	58	93	38	41	4	0	0	0	0	234	5.1%		01/19/16
01/20/16	W	1	79	60	15	38	5	0	0	0	0	198	4.3%		01/20/16
01/21/16	Th	0	63	87	2	7	0	0	0	0	0	159	3.5%	3rd / 90%	01/21/16
01/22/16	F	0	80	77	42	84	1	0	0	0	0	284	6.2%		01/22/16
01/25/16	M	0	57	199	22	40	2	0	0	0	0	320	7.0%		01/25/16
01/26/16	Tu	3	79	137	3	57	2	0	0	0	0	281	6.2%		01/26/16
01/27/16	W	0	89	125	43	60	3	0	0	0	0	320	7.0%		01/27/16
01/28/16	Th	0	81	12	8	33	0	0	0	0	0	134	2.9%	2nd / 95%	01/28/16
01/29/16	F	1	70	20	12	23	1	0	0	0	0	127	2.8%	1st / 100%	01/29/16
Jan-16	Daily Avg. Percentage	1	88	133	25	57	3	0	0	0	0	307	6.6%	6.6%	Jan-16
		0.4%	9.6%	7.2%	6.6%	5.8%	3.6%	0.0%	0.0%	0.0%	0.0%	6.6%			1:30 PM
	Jan - 85th Percentile	0	57	51	3	24	0	0	0	0	0	135	2.9%		

NSH Parking Occupancy Survey

Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak
										Doctor Centre and Women's Center Decks			Month Occupancy Rank / %
2016 PM	260	917	1849	381	980	91	17	110	22	38	4665		
06/01/16	0	95	173	118	27	0	0	0	0	0	413	9.1%	
06/02/16	0	86	181	98	96	3	0	0	0	0	464	10.2%	
06/03/16	5	216	79	61	84	2	0	0	0	0	447	9.8%	
06/06/16	0	86	83	56	80	4	0	0	0	0	309	6.8%	4th / 85%
06/07/16	3	138	167	85	5	0	0	0	0	0	398	8.7%	
06/08/16	0	50	120	20	60	1	0	0	0	0	251	5.5%	1st / 100%
06/09/16	0	81	85	57	77	7	0	0	0	0	307	6.7%	3rd / 90%
06/10/16	0	83	97	61	94	9	0	0	0	0	344	7.5%	
06/13/16	2	87	252	68	56	6	0	0	0	0	471	10.3%	
06/14/16	3	136	171	101	131	2	0	0	0	0	544	11.9%	
06/15/16	8	127	125	46	54	3	0	0	0	0	363	8.0%	
06/16/16	0	80	156	38	80	9	0	0	0	0	363	8.0%	
06/17/16	4	179	87	67	89	5	0	0	0	0	431	9.5%	
06/20/16	0	73	314	68	62	9	0	0	0	0	526	11.5%	
06/21/16	0	85	152	81	86	5	0	0	0	0	409	9.0%	
06/22/16	0	74	120	81	86	0	0	0	0	0	361	7.9%	
06/23/16	2	75	77	61	72	8	0	0	0	0	295	6.5%	2nd / 95%
06/24/16	9	149	81	65	86	2	0	0	0	0	392	8.6%	
06/27/16													
06/28/16	0	60	182	19	82	7	0	0	0	0	350	7.7%	
06/29/16	2	68	149	81	53	8	0	0	0	0	361	7.9%	
06/30/16	11	171	79	41	75	3	0	0	0	0	380	8.3%	
Daily Avg. Percentage	2 0.9%	105 11.4%	140 7.5%	65 17.2%	73 7.5%	4 4.9%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	389 8.3%	8.3%	
Jun - 85th Percentile	0 0.0%	68 7.4%	79 4.3%	38 10.0%	53 5.4%	1 1.1%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	239 5.1%		

NSH Parking Occupancy Survey

Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak Month Occupancy Rank / %
										Doctor Centre and Women's Center Decks			
2016 PM	260	917	1849	381	980	91	17	110	22	38	4665		
M	1	108	94	56	82	7	0	0	0	0	348	7.6%	
Tu	9	121	134	48	65	2	0	0	0	0	379	8.3%	
W	2	32	198	48	65	2	0	0	0	0	347	7.6%	4th / 85%
Th	0	75	198	48	91	9	0	0	0	0	421	9.2%	
F	0	95	219	139	89	3	0	0	0	0	545	12.0%	
M	15	173	96	5	86	3	0	0	0	0	378	8.3%	
Tu	0	24	153	56	98	5	0	0	0	0	336	7.4%	
W	3	86	130	80	35	2	0	0	0	0	336	7.4%	3rd / 90%
Th													
F	5	131	79	65	83	2	0	0	0	0	365	8.0%	
M	0	83	217	37	62	0	0	0	0	0	399	8.8%	
Tu	0	67	162	96	112	0	0	0	0	0	437	9.6%	
W	22	165	122	94	82	2	0	0	0	0	487	10.7%	
Th	0	86	139	48	118	5	0	0	0	0	396	8.7%	
F	7	162	85	66	87	1	0	0	0	0	408	8.9%	
M	1	52	89	56	83	9	0	0	0	0	290	6.4%	1st / 100%
Tu	1	73	183	98	112	0	0	0	0	0	467	10.2%	
W	5	114	220	85	80	0	0	0	0	0	504	11.1%	
Th	5	97	85	55	83	2	0	0	0	0	327	7.2%	2nd / 95%
F	0	93	251	115	162	8	0	0	0	0	629	13.8%	
M													
Tu	3	174	320	66	100	5	0	0	0	0	668	14.7%	
Daily Avg. Percentage	4	101	159	68	89	3	0	0	0	0	423		
	1.5%	11.0%	8.6%	17.9%	9.1%	3.7%	0.0%	0.0%	0.0%	0.0%	9.1%	9.1%	
May - 85th Percentile	0	52	85	48	65	0	0	0	0	0	250		
	0.0%	5.7%	4.6%	12.6%	6.6%	0.0%	0.0%	0.0%	0.0%	0.0%	5.4%		

NSH Parking Occupancy Survey

Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak
										Doctor Centre and Women's Center Decks			Month Occupancy Rank / %
2016 PM	260	917	1849	381	980	91	17	110	22	38	4665		
F	0	86	253	65	202	4	0	0	0	0	610	13.4%	
M	1	40	87	56	95	15	0	0	0	0	294	6.4%	
Tu	12	143	229	35	88	6	0	0	0	0	513	11.3%	
W	7	159	176	119	121	4	0	0	0	0	586	12.9%	
Th	0	112	239	119	127	2	0	0	0	0	599	13.1%	
F	28	253	115	60	109	4	0	0	0	0	569	12.5%	
M	0	88	200	2	30	0	0	0	0	0	320	7.0%	4th / 85%
Tu	3	9	166	5	103	3	0	0	0	0	289	6.3%	3rd / 90%
W													
Th	12	201	79	56	82	4	0	0	0	0	434	9.5%	
F	4	156	89	57	97	3	0	0	0	0	406	8.9%	
M	2	25	94	57	83	10	0	0	0	0	271	5.9%	2nd / 95%
Tu													
W	2	58	83	57	17	10	0	0	0	0	227	5.0%	1st / 100%
Th	3	54	92	57	17	87	0	0	0	0	310	6.8%	
F	0	91	97	65	94	1	0	0	0	0	348	7.6%	
M	0	88	200	2	30	0	0	0	0	0	320	7.0%	4th / 85%
Tu													
W													
Th	0	89	215	112	63	2	0	0	0	0	481	10.6%	
F													
Daily Avg. Percentage	5 1.8%	103 11.3%	151 8.2%	58 15.2%	85 8.7%	10 10.6%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	411 8.8%	8.8%	
Apr - 85th Percentile	0 0.0%	40 4.4%	87 4.7%	35 9.2%	30 3.1%	2 2.2%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0.0%	

NSH Parking Occupancy Survey

Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak
										Doctor Centre and Women's Center Decks			Month Occupancy Rank / %
2016 PM	260	917	1849	381	980	91	17	110	22	38	4665		
Tu	1	127	138	53	110	3	0	0	0	0	432	9.5%	
W	8	68	105	50	42	6	0	0	0	0	279	6.1%	2nd / 95%
Th	0	143	163	50	129	6	0	0	0	0	491	10.8%	
F	1	142	92	56	92	4	0	0	0	0	387	8.5%	
M	0	78	232	86	137	3	0	0	0	0	536	11.8%	
Tu	7	61	163	2	100	6	0	0	0	0	339	7.4%	
W	2	96	65	65	123	1	0	0	0	0	352	7.7%	
Th	3	96	79	68	83	5	0	0	0	0	334	7.3%	3rd / 90%
F	0	82	95	63	98	12	0	0	0	0	350	7.7%	
M	0	74	190	45	75	4	0	0	0	0	388	8.5%	
Tu													
W	1	25	127	54	213	5	0	0	0	0	425	9.3%	
Th	7	87	82	51	85	3	0	0	0	0	315	6.9%	4th / 85%
F	0	85	176	118	176	2	0	0	0	0	557	12.2%	
M	0	76	248	39	45	1	0	0	0	0	409	9.0%	
Tu	98	115	145	46	13	12	0	0	0	0	429	9.4%	
W	0	57	268	78	169	0	0	0	0	0	572	12.5%	
Th	12	176	210	110	95	15	0	0	0	0	618	13.6%	
F													
M	0	63	195	20	123	0	0	0	0	0	401	8.8%	
Tu	53	125	192	56	69	0	0	0	0	0	495	10.9%	
W	0	63	179	78	10	0	0	0	0	0	330	7.2%	
Th	0	25	79	65	49	5	0	0	0	0	223	4.9%	1st / 100%
Daily Avg. Percentage	9 3.5%	89 9.7%	153 8.3%	60 15.7%	97 9.9%	4 4.9%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	412 8.8%	8.8%	
Mar - 85th Percentile	0 0.0%	57 6.2%	79 4.3%	39 10.2%	42 4.3%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	217 4.7%		

NSH Parking Occupancy Survey

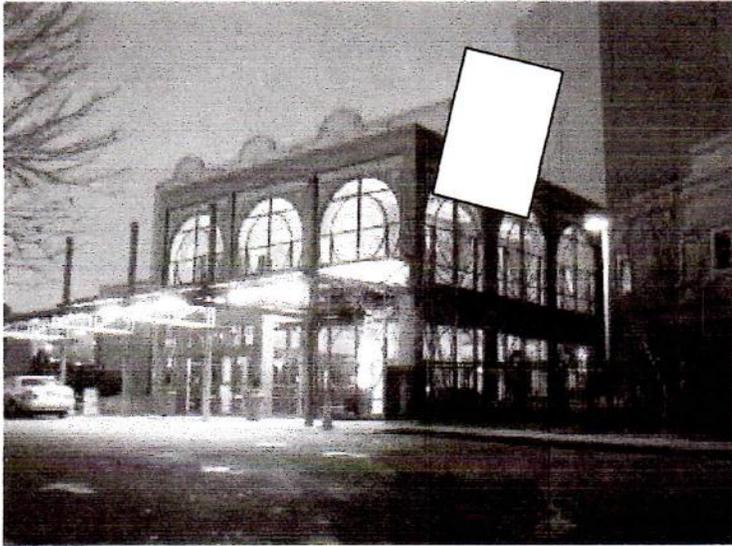
Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak
										Doctor Centre and Women's Center Decks			Month Occupancy Rank / %
2016 PM	260	917	1849	381	980	91	17	110	22	38	4665		
M	0	91	183	63	87	90	0	0	0	0	514	11.3%	
Tu	1	84	138	61	93	7	0	0	0	0	384	8.4%	
W	10	48	89	15	56	3	0	0	0	0	221	4.8%	4th / 85%
Th	0	86	77	60	82	2	0	0	0	0	307	6.7%	
F	0	87	80	57	89	7	0	0	0	0	320	7.0%	
M	0	175	215	31	75	0	0	0	0	0	496	10.9%	
Tu	5	96	91	46	68	0	0	0	0	0	306	6.7%	
W	0	68	167	42	16	3	0	0	0	0	296	6.5%	
Th	2	83	80	51	79	0	0	0	0	0	295	6.5%	
F	1	125	175	75	121	4	0	0	0	0	501	11.0%	
M													
Tu	0	72	125	68	55	8	0	0	0	0	328	7.2%	
W	10	72	20	27	55	1	0	0	0	0	185	4.1%	2nd / 95%
Th	0	50	179	20	105	5	0	0	0	0	359	7.9%	
F	7	121	84	62	97	1	0	0	0	0	372	8.2%	
M	0	68	330	46	42	0	0	0	0	0	486	10.7%	
Tu	0	30	90	1	50	5	0	0	0	0	176	3.9%	1st / 100%
W	0	58	57	36	52	4	0	0	0	0	207	4.5%	3rd / 90%
Th	0	90	109	89	110	5	0	0	0	0	403	8.8%	
F	15	161	198	95	110	9	0	0	0	0	588	12.9%	
Daily Avg. Percentage	3	88	131	50	76	8	0	0	0	0	355		
	1.0%	9.6%	7.1%	13.1%	7.7%	8.9%	0.0%	0.0%	0.0%	0.0%	7.6%	7.6%	
Feb - 85th Percentile	0	50	77	20	50	0	1	0	0	0	198		
	0.0%	5.5%	4.2%	5.2%	5.1%	0.0%	5.9%	0.0%	0.0%	0.0%	4.2%		

NSH Parking Occupancy Survey

Parking Area Inventory	Main Lot	East Parking Deck	Women's Center Decks	Interchange Parking Lot	960/980 Doctor's Building	Physician Parking Lot	Labor and Delivery Lot	Lower 40 Lot	Day Care Lot	Outside	NSH Campus Open Spaces	NSH Campus Open Space Percentage	Observed Peak
										Doctor Centre and Women's Center Decks			Month Occupancy Rank / %
2016 PM	260	917	1849	381	980	91	17	110	22	38	4665		
M	0	71	316	52	125	3	0	0	0	0	567	12.4%	
Tu	1	135	159	73	74	4	0	0	0	0	446	9.8%	
W	0	76	89	46	116	3	0	0	0	0	330	7.2%	
Th	9	76	106	52	92	0	0	0	0	0	335	7.3%	
F	0	97	90	124	99	2	0	0	0	0	412	9.0%	
M	0	167	304	42	36	6	0	0	0	0	555	12.2%	
Tu	2	73	89	17	59	0	0	0	0	0	240	5.3%	4th / 85%
W	0	23	68	42	26	0	0	0	0	0	159	3.5%	2nd / 95%
Th	0	95	84	70	89	2	0	0	0	0	340	7.5%	
F													
M	0	249	274	55	203	19	0	0	0	0	800	17.5%	
Tu	3	64	129	61	88	7	0	0	0	0	352	7.7%	
W	5	113	138	57	71	3	0	0	0	0	387	8.5%	
Th	0	80	96	35	78	1	0	0	0	0	290	6.4%	
F	0	93	84	67	97	0	0	0	0	0	341	7.5%	
M	0	65	189	45	46	0	0	0	0	0	345	7.6%	
Tu	0	56	67	54	71	0	0	0	0	0	248	5.4%	
W	2	79	91	63	115	0	0	0	0	0	350	7.7%	
Th	0	82	58	10	45	0	0	0	0	0	195	4.3%	3rd / 90%
F	0	64	48	8	25	0	0	0	0	0	145	3.2%	1st / 100%
Daily Avg. Percentage	1 0.4%	93 10.1%	130 7.1%	51 13.4%	82 8.4%	3 2.9%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	360 7.7%	7.7%	
Jan - 85th Percentile	0 0.0%	64 7.0%	67 3.6%	17 4.5%	36 3.7%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	184 3.9%		

Northside Hospital Parking Study Update

January 31, 2005



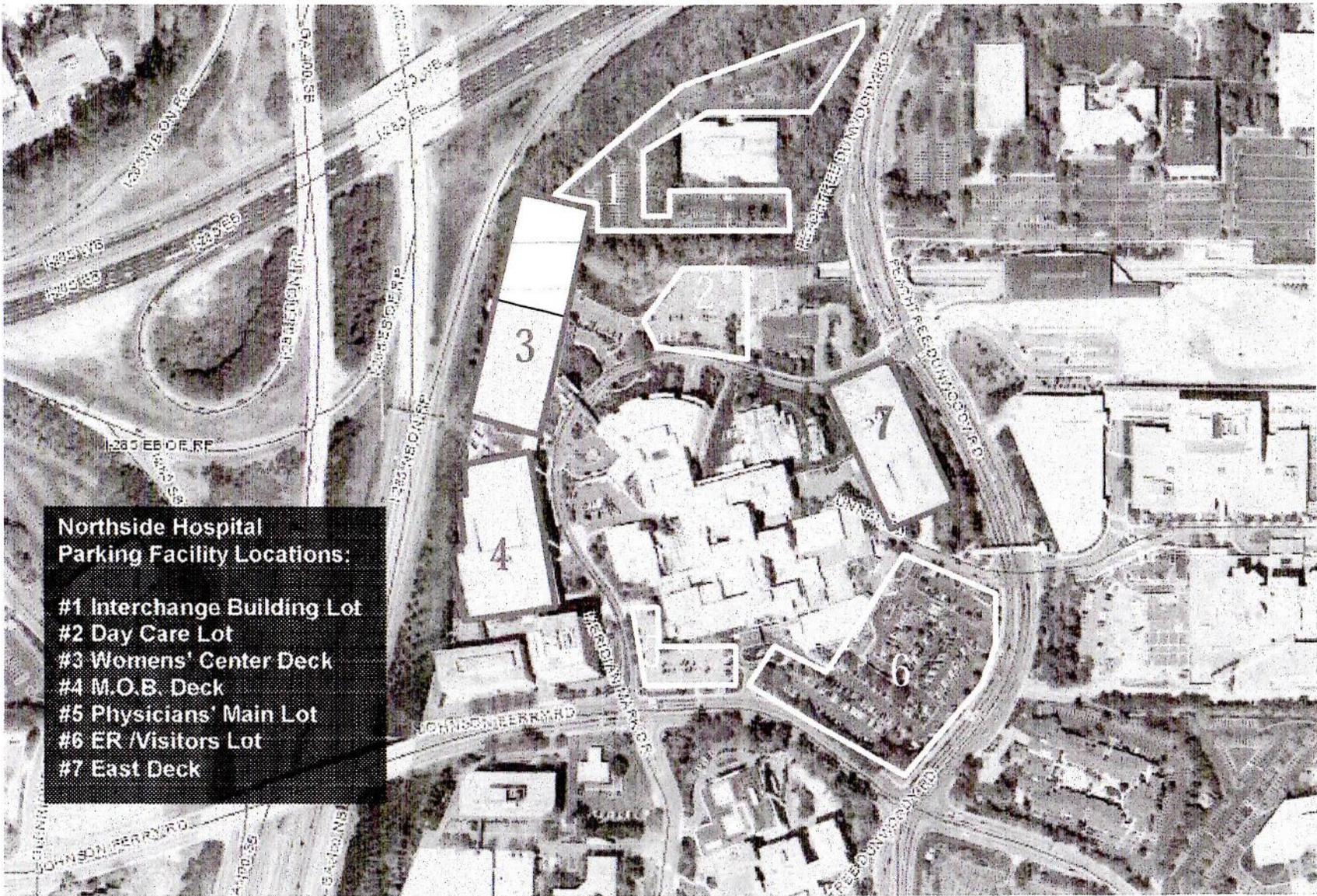
Carl
Parking **Walker**
Planning Engineering Restoration



TABLE OF CONTENTS

	<u>Page</u>
Aerial Photo of Northside Hospital Campus	1
Purpose of Study	3
Background Information Related to Parking.....	4
Current Parking Demand	5
Methodology	6
Survey Results – General	9
Conclusions from Occupancy Survey – User Groups Combined.....	13
Conclusions from Occupancy Survey – Employees	15
Conclusions from Occupancy Survey – Patients & Visitors	16
Conclusions from Occupancy Survey – Physicians' Parking.....	18
Parking Ratios	20
Adjustment Factors	22
Search Margin	22
Seasonal Adjustment	23
Future Parking Projections	26
Womens' Center Expansion	27
Vacant Space in the 960/980 Buildings	27
Future Medical Office Building.....	28
Emergency Room Expansion	28
Future Parking Demand Computation	29
Conclusions Regarding Parking Sufficiency.....	30
Potential Location of New Parking Facility.....	32
E.R. / Visitors Lot	32
Day Care Lot	33
Recommendation	34
Locations of Potential Sites on Aerial Photo	35

APPENDIX



**Northside Hospital
Parking Facility Locations:**

- #1 Interchange Building Lot
- #2 Day Care Lot
- #3 Womens' Center Deck
- #4 M.O.B. Deck
- #5 Physicians' Main Lot
- #6 ER /Visitors Lot
- #7 East Deck



PURPOSE OF STUDY

Carl Walker, Inc. has been engaged to produce an updated parking study that takes into account current parking sufficiency and future parking sufficiency based on current development projects. The most recent changes to campus facilities that affect parking are the expansion of structured parking capacity, closure of the remote employee lot and construction of a Medical Office Building above the East Garage. The study is commissioned to:

- Measure current parking demand for the two major user groups – hospital employees and a combined group consisting of patients and visitors.
- Assess the impact on parking of new facilities or services planned for the campus.
- Evaluate the need for additional parking capacity and the best location for that capacity based on the user-groups being served.

BACKGROUND INFORMATION RELATED TO PARKING

Northside Hospital is presently served by 4,481 parking spaces located in both structured parking facilities and surface lots on the campus. This capacity includes the 991-space garage that is dedicated to the two existing Medical Office Buildings located at 960 and 980 Johnson's Ferry Road. Although this parking facility is physically connected to the original Women's Center Garage by a vehicle bridge, a gate is installed to restrict access and overflow between the two structures when needed.



The expansion of the Women's Center and Employee Deck, which added 1,822 new spaces to the inventory, is a shared-use facility that serves multiple user-groups including patients, visitors and employees. Physicians also have access to this facility and use it when it is more convenient for their specific daily activity. Although internal circulation patterns distinguish the original deck from the expansion, there is no restriction on vehicular access between the two sections of the structure and it essentially acts as a single parking facility with both card access for employees and ticket access for patients and visitors.

The deck expansion also allowed the Hospital to close a remote surface lot that had been used as supplemental parking until the expansion was open. The lot was closed in September, 2004.

Upon completion of the new Medical Office Building (M.O.B.) on top of the East Garage, priority will be given to meeting the obligations for M.O.B. parking in the East Garage. Approximately 600 employees who presently park in the East Garage will be reassigned to the new deck expansion. It is expected that the East Garage will still



serve as an overflow parking location for patients and visitors who cannot find space in the primary Visitor Lot located at the front of the main hospital building. It is also expected that the opening of the new M.O.B. will not only generate parking demand for visitors to that building but may also generate additional vehicle trips to other destinations on the hospital campus for testing and follow-up. The extent to which that might occur is not known.

There is a significant level of flexibility in the functioning of the existing parking facilities located along Hollis Cobb Circle. Each facility is connected to the other there is a direct at-grade connection between the new expansion and the surface lot servicing the Interchange Building. Vehicles can flow freely between the facilities although the route is not easy to find in all cases, and flow between the original Women's Center Deck and the M.O.B. Deck is controlled by an overflow gate. When all parking controls are in place and functioning normally, the overflow gate is necessary to restrict access from the Hospital parking area to the M.O.B. Deck. This is necessary because parking is pre-paid at the M.O.B. Deck. M.O.B. parking customers pay in advance and are allowed to exit at any time through "free-out" gates which raise automatically as a vehicle approaches. If traffic is allowed to overflow from the Hospital parking areas into the M.O.B. Deck, it would allow those customers to exit without charge – since they entered the Hospital decks by taking an entry ticket and have not yet paid a parking fee.

New parking control equipment has been installed to provide access to the new deck expansion and control equipment is being installed for the first time at the entrance to the Interchange Building Lot so that the lot can be included as part of the "paid parking" system. An advantage of this measure is that traffic can flow back and forth as needed between the Interchange Building Lot and the parking structures because both are within the controlled/paid area.

Presently, if the Main Visitor Lot fills to capacity, drivers who have been searching the Visitor Lot for only a short period of time are allowed to exit the lot without charge in order to cross over to the East Garage that provides overflow Patient/Visitor parking.

All employees access hospital parking facilities using gate cards that are issued by the hospital.

CURRENT PARKING DEMAND

METHODOLOGY

The first step in the process is to measure current parking sufficiency by comparing available parking capacity to actual utilization. In addition to measuring overall parking utilization, it was also important to determine how that demand is distributed between the two major user groups - employee parking and patient/visitor parking. Physician parking was not measured apart from employee parking except for utilization of the three areas designated as Physician's Parking. These include the Physicians Lot near the Main hospital entrance, the physicians parking area at the E.R. entrance, and the gated physicians area in the Women's Center Deck. Despite its designation as the Doctor's/Dare Care Lot, vehicles in that location were counted as employees rather than physicians since there was no way to distinguish between the two and the actual numbers were small.

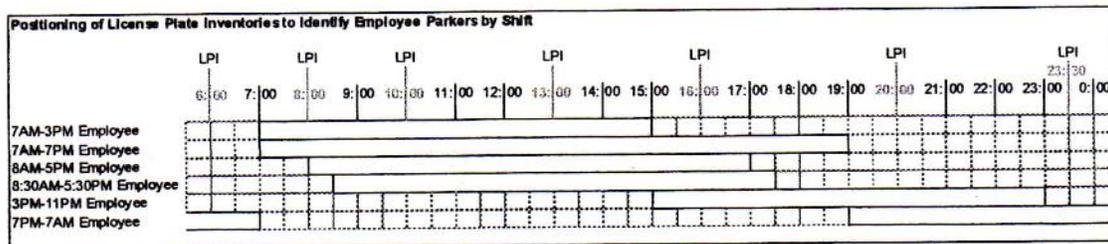
Since, at the time of the survey, much of the parking was open for entry and exit by employees without requiring the use of their gate card, card use information that would allow employees to be identified as a separate group in the garages was not possible. That information, if needed, could be obtained from information provided by the new revenue control system once it is fully functional and all access is fully controlled in both directions. An alternative and more labor-intensive method was used to determine the mix of parkers, as described in the next paragraph.

Measurement of overall parking utilization was accomplished through a method that also provided information that could be used to help identify volume associated with employees apart from volume associated with patients and visitors. Instead of basic car counts, a license plate inventory was taken to track not only the number of vehicles in each parking area but also the approximate arrival times, departure times and length of stay for all vehicles. By matching the arrival and departure times to known hospital staff schedules, reasonable assumptions could be made about assigning each vehicle to one of the two user groups. The method is not perfect but is fairly reliable if the license plate inventories were conducted at the proper times in relation to the staff schedules. For the purposes of describing the process, the term "tour" will be used for a complete cycle of recording license plate numbers in an assigned area. Several "tours" were conducted between the hours of 6 A.M. and midnight on the target date. Two follow-up tours were conducted on the following day to capture peak morning and peak

afternoon loading for comparison to the peak counts found on first day. Each tour took between 90 and 120 minutes depending on the number of vehicles in the area and the number of "new" plates that had to be recorded on that tour. The tours were scheduled as follows:

Time	Rationale – The timing of each tour was designed to capture:
6:00	<ul style="list-style-type: none"> All overnight parkers, including employees, patients and visitors, prior to arrival of 7AM-3PM shift employees.
8:00	<ul style="list-style-type: none"> Recorded departure of overnight 11PM-7AM and 7PM-7AM employees. Recorded arrival of 7AM-3PM employees, 7AM-7PM employees and any patients/visitor arriving in the early morning.
10:00	<ul style="list-style-type: none"> Recorded peak morning activity with both day-shift employees on-site as well as the peak load of patients and morning visitors.
13:00	<ul style="list-style-type: none"> Recorded peak afternoon activity with both day-shift employees on-site as well as the peak load of patients and morning visitors. Last appearance of 7AM-3PM employees
16:00	<ul style="list-style-type: none"> Recorded departure of 7AM-3PM employees. Recorded arrival of 3PM-11PM employees. Last appearance of 7AM-7PM employees.
20:00	<ul style="list-style-type: none"> Recorded departure of 7AM-7PM employees. Recorded arrival of 7PM-7AM employees.
23:30	<ul style="list-style-type: none"> Recorded departure of 3PM-11PM employees Recorded arrival of 11PM-7AM employees

The following graph shows the distribution of the schedules and times when license plate inventories (LPI) were conducted.



The underlying assumption is that vehicles arriving and departing in a pattern that matches one of the employee shift are employees. Although patient and visitor vehicles would be counted as employees if they happened to arrive and depart at times consistent with an employee schedule, these potential "over-counts" are offset to some extent by employees who move their vehicles

SURVEY RESULTS - General

The tables and graphs in this section of the report show the results of the occupancy survey. The results are compiled to show:

- Total number of vehicles utilizing each facility and the combined facilities
- Percentage of available capacity taken by each of the two primary user groups – the Employee group (including physicians) and the Patient/Visitor group.
- Percentage of occupied space taken by each of the two user groups.
- Utilization of physicians parking areas.

Separate subtotals and separate percentages were provided for the campus with and without the Interchange Building parking lot included. This was necessary because the method of computing the split between employee and patient/visitor parking was different that that used for the balance of the campus facilities. The split for the Interchange Building was based on the more definitive information developed during the previous parking study conducted specifically for the Interchange Building.

The table on the following page summarizes the total vehicle counts (both user categories) and percentage occupancy for each parking facility on the Northside Hospital main campus. That table shows virtually the same number of vehicles on campus during both the late morning and early afternoon peaks as shown in the summary below.

TABLE 1	10:00 – 11:30 A.M.	1:00 – 2:30 P.M.
Number of Vehicles	3,160	3,133
% of Capacity Occupied	71%	70%
Number of Available Spaces	1,321	1,348
% of Capacity Available	29%	30%

TABLE 2

TOTAL VEHICLE ACCUMULATION – ALL PARKER CATEGORIES

	6:00	8:00	10:00	13:00	16:00	20:00	23:30
TOTAL ACCUMULATION	to	to	to	to	to	to	to
BY FACILITY	8:00	8:00	11:30	14:30	17:30	21:30	1:00

	Capacity	TOTAL Employees/Patients/Visitors						
		535	889	784	824	257	91	71
960/980 MOB Deck	991 Total	535	889	784	824	257	91	71
Doctor's Lot - Day Care	67 Total	19	44	50	48	33	16	10
East Deck	817 Total	530	680	765	753	437	229	167
Cancer Center	17 Total	8	13	14	13	8	2	0
E.R. Lot - Visitors	258 Total	109	178	240	256	196	199	89
Cardiology	27 Total	22	18	16	16	21	0	0
Women's Ctr Deck and Expansion	1,822 Total	412	644	824	807	603	326	224
Physician's Area W.C. Deck	41 Total	5	26	23	24	19	5	3
Physician's Lot - Main	92 Total	76	95	92	85	55	21	8
E.R. Physicians Lot	14 Total	2	8	10	6	4	2	2

Totals Excluding Interchange Bldg. 4,146 Total 1,718 2,595 2,818 2,832 1,633 891 574
Share of Occupied Parking Spaces

Interchange Building 335 Total 14 202 342 301 109 51 7

TOTAL CAMPUS: 4,481 1,732 2,797 3,160 3,133 1,742 942 581

	Capacity	% FACILITY SPACES OCCUPIED						
		54%	90%	79%	83%	26%	9%	7%
960/980 MOB Deck	991 Total	54%	90%	79%	83%	26%	9%	7%
Doctor's Lot - Day Care	67 Total	28%	66%	75%	72%	49%	24%	15%
East Deck	817 Total	65%	83%	94%	92%	53%	28%	20%
Cancer Center	17 Total	47%	76%	82%	76%	47%	12%	0%
E.R. Lot - Visitors	258 Total	42%	69%	93%	99%	76%	77%	34%
Cardiology	27 Total	81%	67%	59%	59%	78%	0%	0%
Women's Ctr Deck and Expansion	1,822 Total	23%	35%	45%	44%	33%	18%	12%
Physician's Area W.C. Deck	41 Total	12%	63%	56%	59%	46%	12%	7%
Physician's Lot - Main	92 Total	83%	103%	100%	92%	60%	23%	9%
E.R. Physicians Lot	14 Total	14%	57%	71%	43%	29%	14%	14%

Excluding Interchange Building: 4,146 Total 41% 63% 68% 68% 39% 21% 14%

Interchange Building 335 Total 4% 60% 102% 90% 33% 15% 2%

TOTAL CAMPUS: 4,481 39% 62% 71% 70% 39% 21% 13%

AVAILABLE SPACES: 2,749 1,684 1,321 1,348 2,739 3,539 3,900
61% 38% 29% 30% 61% 79% 87%

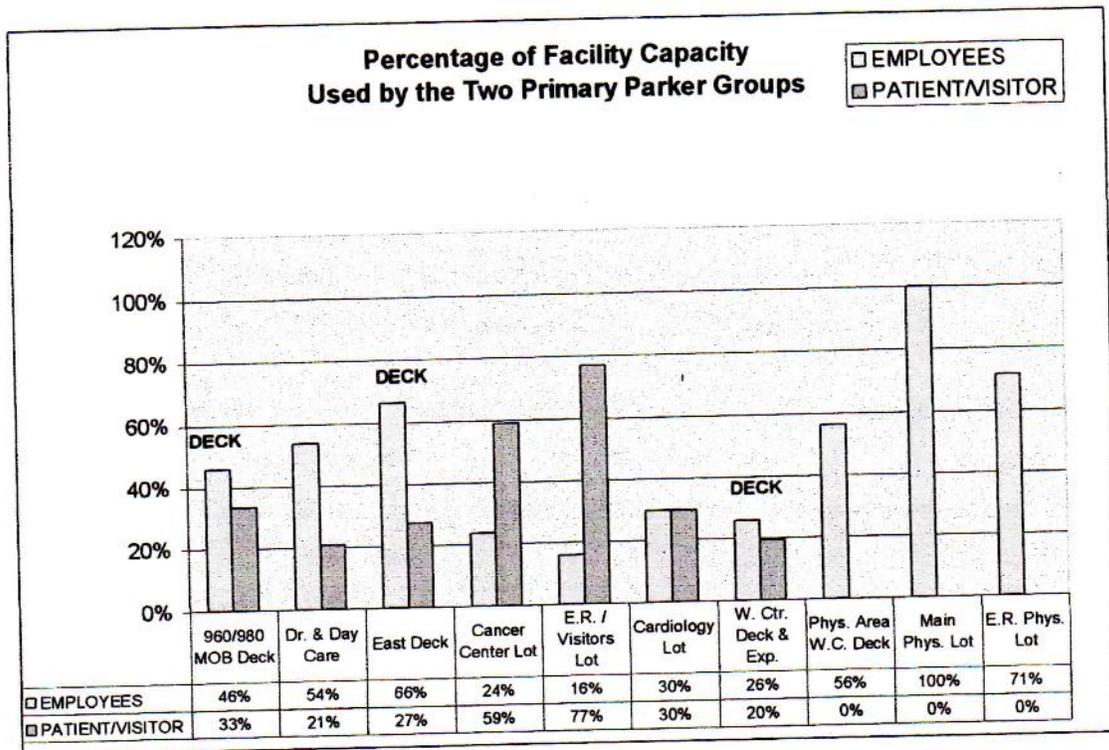
The following table shows the distribution of parking capacity between the two primary user groups. Utilization by each group is shown as a percentage of total facility capacity.

TABLE 3

% of CAPACITY UTILIZED by PARKER GROUP	6:00	8:00	10:00	13:00	16:00	20:00	23:30
	to 8:00	to 10:00	to 11:30	to 14:30	to 17:30	to 21:30	to 1:00
EMPLOYEES							
960/980 MOB Deck	42%	46%	46%	46%	15%	5%	6%
Doctor's Lot - Day Care	27%	54%	54%	54%	33%	16%	13%
East Deck	55%	66%	66%	66%	31%	15%	18%
Cancer Center	41%	24%	24%	24%	18%	6%	0%
E.R. Lot - Visitors	21%	16%	16%	16%	18%	20%	24%
Cardiology	52%	30%	30%	30%	19%	0%	0%
Women's Ctr Deck and Expansion	18%	26%	26%	26%	17%	8%	10%
Physician's Area W.C. Deck	12%	63%	56%	59%	46%	12%	7%
Physician's Lot - Main	83%	103%	100%	92%	60%	23%	9%
E.R. Physicians Lot	14%	57%	71%	43%	29%	14%	14%
Totals Excluding Interchange Bldg.	42%	46%	46%	46%	15%	5%	6%
% of Capacity Occupied	59%	37%	32%	32%	61%	79%	86%
Interchange Building	4%	51%	75%	66%	18%	14%	2%
TOTAL CAMPUS:	31%	41%	43%	42%	21%	10%	11%
PATIENT/VISITOR							
960/980 MOB Deck	12%	44%	33%	37%	11%	4%	1%
Doctor's Lot - Day Care	1%	12%	21%	18%	16%	7%	1%
East Deck	10%	17%	27%	26%	23%	13%	3%
Cancer Center	6%	53%	59%	53%	29%	6%	0%
E.R. Lot - Visitors	21%	53%	77%	83%	58%	57%	11%
Cardiology	30%	37%	30%	30%	59%	0%	0%
Women's Ctr Deck and Expansion	5%	10%	20%	19%	16%	10%	2%
Physician's Area W.C. Deck	0%	0%	0%	0%	0%	0%	0%
Physician's Lot - Main	0%	0%	0%	0%	0%	0%	0%
E.R. Physicians Lot	0%	0%	0%	0%	0%	0%	0%
Excluding Interchange Building:	8%	22%	27%	28%	19%	12%	3%
Interchange Building	0%	9%	27%	24%	15%	1%	0%
TOTAL CAMPUS:	8%	21%	27%	28%	18%	11%	2%

The same information, for the peak hour, is shown in the graph on the next page.

The following graph summarizes the peak hour information from the preceding TABLE, showing the percentage of facility capacity occupied by each of the two primary user groups.



Utilization of capacity was most evenly distributed between the two user groups in the Women's Center Deck where the number of spaces occupied by employees was only 30% higher than by patients and visitors ($26\%/20\% = 1.3$). The M.O.B. Deck ranked next with employees occupying 39% more space than patients and visitors ($46\%/33\% = 1.39$). The most significant difference in distribution was in the East Deck where employees occupied 2.44 spaces for every patient/visitor vehicle ($66\%/27\% = 2.44$). This disparity will certainly be reduced when the New M.O.B. building is opened and hospital employees are relocated to the Women's Center Deck.



RESULTS OF OCCUPANCY SURVEY - User Groups Combined

The following are summary conclusions gained from a review of the occupancy survey results. Additional findings related to space availability and utilization by user group will follow in the next analysis section.

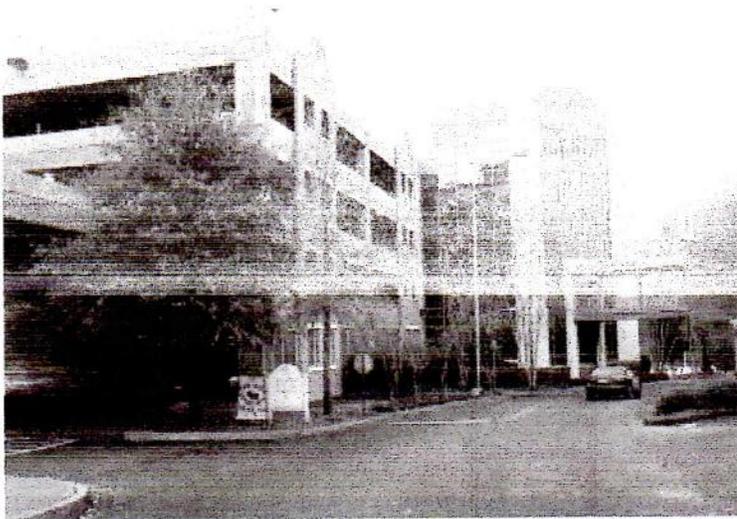
- Of the **4,481 total parking spaces** on campus, **3,160** were filled at the 10AM-11AM peak. This represents **71%** of the total parking capacity at the "apparent" peak. At that time a total of **1,321 spaces** remained available, or **29%** of capacity.
- However, the 1 P.M. – 2:30 P.M. count recorded slightly more available space at 1,348 spaces, but did not include a short-term "spike" during the 3 P.M. shift overlap that is estimated at approximately 150 vehicles. Absent a dramatic departure of patient/visitor vehicles between approximately 2 P.M. and the 3 P.M. shift overlap to offset the arriving evening shift employees, the actual peak likely reached between 3,250 and 3,300 vehicles during the overlap. It is assumed that the additional employee parking demand during the shift change was distributed among the areas used by employees. For clarity in documenting and presenting the survey results the term "peak" will refer, in the balance of this section of the report, to actual counts and will not include the estimated shift overlap vehicles. That additional demand will be included later in the computation of current demand and projecting future needs.
- Peak occupancy levels in the three parking decks were as follows:

EAST DECK at 94%	10:00 A.M.
M.O.B. Deck at 79%	10:00 A.M.
Women's Center Deck at 45%.	10:00 A.M.

- Peak occupancy for both the East Deck and the Women's Center Deck occurred at the same time – during the late morning count. Peak occupancy for the M.O.B. Deck was higher at both the 8 A.M. and 1 P.M. counts.

	889	cars	90%	8:00 A.M.
M.O.B. DECK	784	cars	79%	10:00 A.M.
	824	cars	83%	1:00 P.M.

- The Interchange Building Lot filled to capacity at the morning peak. Although the table shows an overload of that lot during the late morning count (103% occupancy), the capacity at the time of the counts was actually slightly higher than the current capacity that is used in the table.
- The E.R. & Main Visitor Lot reached capacity at 1 P.M., but the 10 A.M. load was slightly lower at 93%. A notable finding is that the evening load in the Main Visitor Lot, at 196 (4 P.M.) and 199 (8 P.M.) is approximately **80% of the daytime peak**, with **space available throughout the evening hours**.
- The Physicians Main Lot did experience overload conditions during the 10 A.M. count (103% occupancy) with some illegal parking observed. At that same time space was available in both the Physicians parking area of the Women's Center Deck and in the E.R. Physician's parking area. (Space availability detailed in tables to follow.)
- The daily pattern in the Cardiology Lot was different from the other parking areas accessible to the public, with clear early morning and late afternoon peaks. This may not be significant because of the small size of the lot – with small changes in use appearing as large percentage changes.



RESULTS OF OCCUPANCY SURVEY - Employees

The following table summarizes the findings related to utilization of parking capacity by employees, including employees of the three M.O.B. buildings within the complex. The second table, "% OCCUPIED SPACES", shows each employee vehicle count as a percentage of the total number of vehicles found during the count. It is the percentage of vehicles present, NOT the percentage of facility capacity. Sufficient employee parking capacity was available, even during the 3 P.M. afternoon shift change that is estimated to be approximately 120 vehicles higher than the 10 A.M. peak count. (3,133 PM count + 150 - 3,160 AM count = 123)

TABLE 4

Utilization by EMPLOYEES	6:00	8:00	10:00	13:00	16:00	20:00	23:30
	to 8:00	to 8:00	to 11:30	to 14:30	to 17:30	to 21:30	to 1:00
	EMPLOYEES						
960/980 MOB Deck	415	454	454	454	145	47	58
Doctor's Lot - Day Care	18	36	36	36	22	11	9
East Deck	449	542	542	542	251	122	146
Cancer Center	7	4	4	4	3	1	0
E.R. Lot - Visitors	55	41	41	41	47	51	61
Cardiology	14	8	8	8	5	0	0
Women's Ctr Deck and Expansion	326	468	468	468	310	151	180
Physician's Area W.C. Deck	5	26	23	24	19	5	3
Physician's Lot - Main	76	95	92	85	55	21	8
E.R. Physicians Lot	2	8	10	6	4	2	2
Totals Excluding Interchange Bldg.	1,367	1,682	1,678	1,668	861	411	467
Share of <u>Occupied</u> Parking Spaces	80%	65%	60%	59%	53%	46%	81%
Interchange Building	14	172	252	221	59	48	7
TOTAL CAMPUS:	1,381	1,854	1,930	1,889	920	459	474
	% of OCCUPIED SPACES						
960/980 MOB Deck	78%	51%	58%	55%	56%	52%	82%
Doctor's Lot - Day Care	95%	82%	72%	75%	67%	69%	90%
East Deck	85%	80%	71%	72%	57%	53%	87%
Cancer Center	88%	31%	29%	31%	38%	50%	NA
E.R. Lot - Visitors	50%	23%	17%	16%	24%	26%	69%
Cardiology	64%	44%	50%	50%	24%	NA	NA
Women's Ctr Deck and Expansion	79%	73%	57%	58%	51%	46%	80%
Physician's Area W.C. Deck	100%	100%	100%	100%	100%	100%	100%
Physician's Lot - Main	100%	100%	100%	100%	100%	100%	100%
E.R. Physicians Lot	100%	100%	100%	100%	100%	100%	100%
Excluding Interchange Building:	80%	65%	60%	59%	53%	46%	81%
Interchange Building	100%	85%	74%	73%	54%	94%	100%
TOTAL CAMPUS:	80%	66%	61%	60%	53%	49%	82%

RESULTS OF OCCUPANCY SURVEY - Patients & Visitors

The following table summarizes the findings related to utilization of parking capacity by patients and visitors, including those of the three M.O.B. buildings within the complex.

TABLE 5

Utilization by PATIENTS/VISITORS	6:00	8:00	10:00	13:00	16:00	20:00	23:30
	to 8:00	to 8:00	to 11:30	to 14:30	to 17:30	to 21:30	to 1:00
	PATIENT/VISITOR						
960/980 MOB Deck	120	435	330	370	112	44	13
Doctor's Lot - Day Care	1	8	14	12	11	5	1
East Deck	81	138	223	211	186	107	21
Cancer Center	1	9	10	9	5	1	0
E.R. Lot - Visitors	54	137	199	215	149	148	28
Cardiology	8	10	8	8	16	0	0
Women's Ctr Deck and Expansion	86	176	356	339	293	175	44
Physician's Area W.C. Deck	0	0	0	0	0	0	0
Physician's Lot - Main	0	0	0	0	0	0	0
E.R. Physicians Lot	0	0	0	0	0	0	0
Totals Excluding Interchange Bldg.	351	913	1,140	1,164	772	480	107
Share of <u>Occupied</u> Parking Spaces	20%	35%	40%	41%	47%	54%	19%
Interchange Building	0	0	0	0	0	0	0
TOTAL CAMPUS:	351	943	1,230	1,244	822	483	107
	% of OCCUPIED SPACES						
960/980 MOB Deck	22%	49%	42%	45%	44%	48%	18%
Doctor's Lot - Day Care	5%	18%	28%	25%	33%	31%	10%
East Deck	15%	20%	29%	28%	43%	47%	13%
Cancer Center	13%	69%	71%	69%	63%	50%	NA
E.R. Lot - Visitors	50%	77%	83%	84%	76%	74%	31%
Cardiology	36%	56%	50%	50%	76%	NA	NA
Women's Ctr Deck and Expansion	21%	27%	43%	42%	49%	54%	20%
Physician's Area W.C. Deck	0%	0%	0%	0%	0%	0%	0%
Physician's Lot - Main	0%	0%	0%	0%	0%	0%	0%
E.R. Physicians Lot	0%	0%	0%	0%	0%	0%	0%
Excluding Interchange Building:	20%	35%	40%	41%	47%	54%	19%
Interchange Building	0%	15%	26%	27%	46%	6%	0%
TOTAL CAMPUS:	20%	34%	39%	40%	47%	51%	18%

Specific Findings Relating to Patient/Visitor Parking

- Although visitors routinely overflow from the E.R. / Visitors Parking Lot into the East Deck, the lot did not approach 100% occupancy until the 1 P.M. survey. Based on comments from the hospital staff and some of our own previous observations, it was initially expected that this lot would be at overflow level by late morning. The lot, in fact, filled to only 93% of its capacity at the 10 A.M. campus occupancy peak, with 18 spaces still available. Since 90%-95% occupancy is considered full occupancy for visitor lots, the lot should still be considered FULL at peak.
- At the 10 A.M. peak, 233 vehicles, identified by their parking patterns as patient/visitor parkers, were found in the East Deck. This is a combination of parkers who parked in that facility as their first choice and overflow parkers from the E.R./Visitor Lot.
- At both the 10 A.M. peak count and the 1 P.M. count, the documented parking patterns indicate that approximately 40 employees were parked in the E.R. / Visitor Parking lot. If all employees are restricted from using that lot, an additional 40 spaces would be available for patient/visitor parking. This would reduce the need to overflow to the East Deck by 40 vehicles. If, in fact, the actual number of overflow parkers from the E.R./Visitor Lot does not exceed 40 vehicles, this change would eliminate the overflow and reduce the inconvenience to the patients and visitors who go first to the open lot to park. It should be noted that there may have been visitors whose pattern of stay in the E.R./Visitor Lot incorrectly identified them as employees. However, employees were, in fact, seen parking in that lot during the survey.



RESULTS OF OCCUPANCY SURVEY - Physicians Parking

Although physician parking was included with employee parking in the overall analysis the following recap does provide some useful information about those areas restricted to use by physicians.

TABLE 6

W.C. = Physicians area within the Women's Center Deck
 Main = Main Physicians Parking Lot near the hospital Main Entrance
 E.R. = Physicians Parking Area at the E.R. entrance

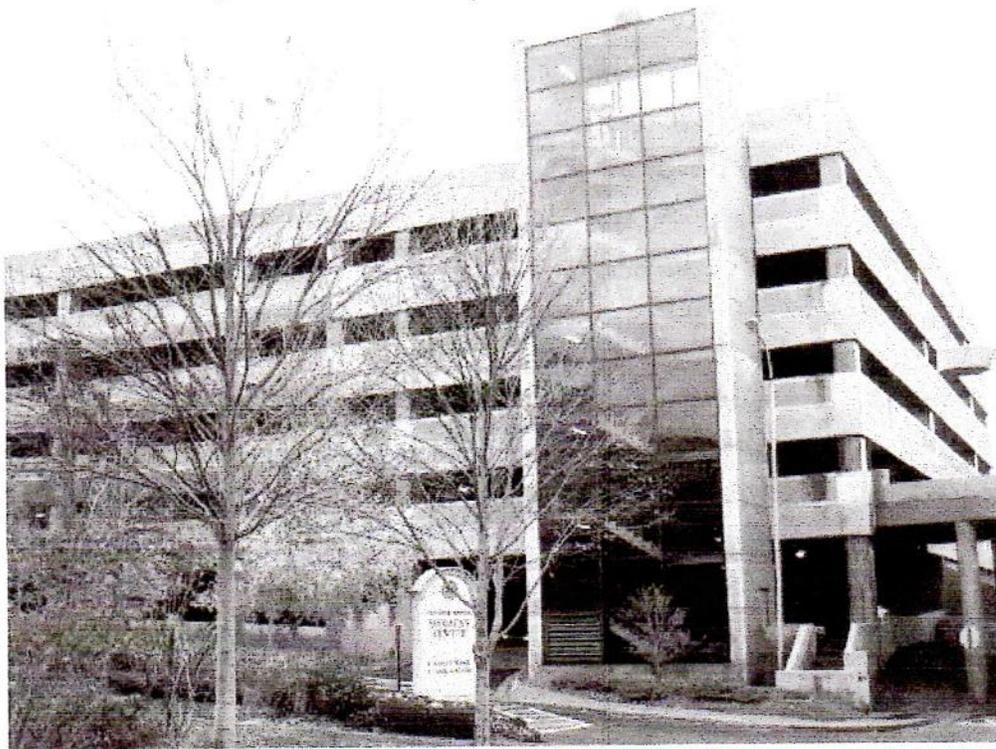
	6:00 to 8:00	8:00 to 10:00	10:00 to 11:30	13:00 to 14:30	16:00 to 17:30	20:00 to 21:30	23:30 to 1:00	Capacity
Physicians Parking Area Occupancy								
W.C	5	26	23	24	19	5	3	41
Main	76	95	92	85	55	21	8	92
E.R.	2	8	10	6	4	2	2	14
Total	83	129	125	115	78	28	13	147
Physicians Parking Area % Utilization								
W.C	12%	63%	56%	59%	46%	12%	7%	
Main	83%	103%	100%	92%	60%	23%	9%	
E.R.	14%	57%	71%	43%	29%	14%	14%	
Total	56%	88%	85%	78%	53%	19%	9%	
Physicians Parking Area Vacant Space								
W.C	36	15	18	17	22	36	38	
Main	16	-3	0	7	37	71	84	
E.R.	12	6	4	8	10	12	12	
Total	64	18	22	32	69	119	134	

Unfortunately, the temporary physicians parking area in the East Deck was included in the "general" counts but, at peak, that area of approximately 55 spaces was more than 80% full which increases the **overall peak parking demand for physicians to approximately 170 vehicles.**

As mentioned in the general conclusions section, space remained available for physicians throughout the day although the Main Physicians Parking Lot filled beyond its capacity at approximately 9 A.M. – 10 A.M. The lowest count of empty spaces in the formal physicians' parking areas was 22 spaces during the 10 AM – 11:30 AM count with an additional 10 open spaces in the East Deck.

Since physicians have unrestricted access to all parking areas, these utilization figures may understate the actual physician parking demand to some degree, particularly for those physicians who park in the M.O.B. Deck, because it is more convenient to their offices in the 960 and 980 Buildings. A more definitive identification of physician parking demand would require an analysis of card access activity.

No vehicles in the Day Care Lot were counted as physician's vehicles and none of the foot traffic during the counts appeared to be physicians using that lot.



PARKING RATIOS

In evaluating current parking conditions and projecting future parking needs associated with growth, it is useful to develop parking demand ratios that relate to measurable factors such as square footage of M.O.B. space or the number of hospital employees.

Historically, the relationship between parking demand and hospital bed counts was used as the primary means of projecting parking needs. With the growth in outpatient services, that measurement has become unreliable. In its place, the relationship between parking demand and the number of Full-Time Equivalent hospital employees (FTEs) has become the most reliable "yardstick" in measuring overall hospital activity and estimating the associated parking demand – for employees, visitors and patients. There is a possibility that three part-time employees who work a combined total of 40 hours a week (1 FTE) will have concurrent schedules and parking demand would be underestimated as a result. But experience has shown that the frequency of that occurrence is minimal and does not change significantly during a typical forecast period. As a result, the ratio of FTEs to parked vehicles remains consistent through that period.

According to the NSH staff, there were 3,714 FTEs assigned to the main campus at the time of the occupancy surveys. With a total of 3,160 vehicles recorded at peak accumulation, this results in a total parking demand ratio of .85 vehicles per FTE. This includes employees, patients and visitors for both the hospital and the medical office buildings. The breakdown between user groups is as follows:

TABLE 7

	Present at 10 A.M. Peak	Ratio vs. FTEs (3,714)
Employee Vehicles	1,930	0.52
Patient/Visitor Vehicles	1,230	0.33
Total	3,160	0.85

(A recent computation at another area hospital with a connected M.O.B. yielded very similar results: 0.527 ratio for employees and 0.29 for patients/visitors.)

Since projections of future parking demand would be based on estimates for the expanded hospital facilities apart from the new M.O.B. building, an additional analysis was performed to determine the ratio that should be used when projecting parking demand from an increase in hospital FTEs - changes that did not include a corresponding increase in M.O.B. space.

Information was obtained from NSH about the current mix of tenants and the building space occupied by those tenants. For the 960 and 980 Buildings, tenants were grouped into three categories NSH, Physicians' practices, and Office/Retail. The estimated parking demand generated by the Physicians' practices and Office/Retail tenants were computed using typical demand ratios. The resulting "Non-NSH" parking demand was deducted from overall campus demand to arrive at a ratio that would apply only to changes in the hospital itself. The results are as follows:

TABLE 8

	NSH	Physicians	Office/Retail
960 Building	7,527 SF	58,158 SF	4,034 SF
980 Building	26,992 SF	123,419 SF	890 SF
Totals:	34,519 SF	181,577 SF	4,924 SF
Parking Demand Ratios:		4	3.0
Non-NSH Vehicles		726	15
Adjustment for difference in timing of peak	88%	639	13
Interchange Building Non-NSH Vehicles		186	135
TOTAL NON-NSH VEHICLES:		825	148
			<hr/> 973
Survey Day Demand - Total Campus:			<hr/> 3,280
Net Demand Generated by NSH:			2,307
FTEs at time of Survey Day:			3,714
Ratio of Parking Demand to NSH FTEs:			0.62 Vehicles per FTE

ADJUSTMENT FACTORS

In order to establish valid demand estimates, two adjustments must be considered:

1. Addition of a "Search Margin" of empty space – to make the facilities functional
2. A "seasonal" adjustment based on where the overall hospital activity level falls within the range of activity levels recorded through the year – to determine how well the car counts on the survey day represent demand at other times during the year.

"Search Margin"

The Northside Hospital staff has accepted the industry accepted principle of a "Search Margin" in past and current planning for its parking requirements. That principle recognizes that a certain amount of empty space is needed in any parking facility in to provide an acceptable level of service to the facility user. The margin is also used to absorb temporary fluctuations in demand that exceed expected occupancy levels.

A Search Margin of 5%-10% of total capacity for employees and 10%-15% for visitors and patient parking areas helps insure that those users do not expend an unacceptable amount of time finding an available parking space. The target margin varies according to the size and configuration of the facility, specific user group, and search aids such as "Space Available" and "Full" signs or variable message signs controlled by a space counts system. Employees can tolerate a search margin as low as 5% if there is an overflow alternative when the primary area becomes full. They become familiar with the facility and know where to find space when the occupancy in a facility is approaching capacity. Visitors and patients must be afforded a higher margin because they are not familiar with the facility and may not be able to find that space when the facility is nearly full. A margin of 10%-15% is more appropriate for that group. If the facility is used by both groups, the higher margin should be applied (10%-15% vs. 5%) because it is the patient or visitor who must be accommodated.

Northside Hospital has established a 10% margin for employee parking and a 15% margin for patient/visitor parking as its target standard of service. When that factor is applied to a raw demand number, the result is defined as the "Effective Demand" and represents the parking capacity that should be provided – including planned empty space.

Seasonal Adjustment

Historical data was provided by NSH to allow a comparison of activity levels on the day of the primary occupancy survey (Tuesday 12/7/04) and activity levels through the balance of the year. Three points of comparison were used to place the survey day within the range of activity that is experienced through the year:

- Overnight bed census
- Number of surgeries
- E.R. visits and admissions

Since E.R. activity during the survey week was typical of averages through the year, the comparison was limited to the other two parameters.

The following are the key factors of comparison in determining if observed car counts on the survey day should be adjusted to better reflect "design day" activity levels for projections and planning. The recorded number of surgeries in the historical data were multiplied by 75% to approximate the number of outpatient surgeries. The balance of those surgeries are assumed to be included in the bed census. In addition to comparing the census and surgery statistics individually, a third test compared the total of these two parameters for each period (census + surgeries). This third comparison is termed a "Combined Activity Factor" for the purposes of this analysis.

TABLE 9	Survey Day	Survey Week Peak	Annual Peak
Overnight Bed Census	368	433	463
% of Survey Day:		118%	126%
Total Surgeries	105	105	118
% of Survey Day:		100%	112%
Combined Activity Factor (Census + Surgeries)	473	534	n/a
% of Survey Day:		113%	n/a

Although the peak census for the year and the peak number of surgeries for the year were available, the daily statistics necessary to identify the peak day for combined census and surgeries on a single day during the year was not available.

The peak daily census for the week (Thursday at 433) was 18% higher than the 368 census on Tuesday, the survey day, but Tuesday was the peak day for surgeries. The highest daily census provided in the historical data was 463, which is 126% of the survey day.

The Combined Activity Factor (census + surgeries), on the peak day of the survey week, at 534, was 113% of the survey day.

December appears to be close to an average month in terms of both the average census and the combined census/surgery figure, with the survey week census running slightly higher than the annual average (103%). The annual average for daily surgeries was significantly lower at only 61% of the level on the survey day. For the combined categories, the annual average was 94% of the survey day.

TABLE 10	Survey Week	Annual Average
Overnight Bed Census	368	380
% of Survey Day:		103%
Surgeries	105	64
% of Survey Day:		61%
Combined Activity Factor (Census and Surgeries)	473	444
% of Survey Day:		94%

Although this information is worth noting, it is not as relevant as the comparisons previously made between the Survey Day and other periods since the vehicle counts for that day are the basis for parking demand calculations – not the entire week. Most relevant is the fact that a significantly higher level of activity took place later during the survey week itself.

Seasonal Adjustment Factor Applied

Since the highest Combined Activity Factor for the survey week was 113% of the survey day itself, an adjustment is appropriate, but an adjustment to this annual peak would not be prudent since that activity level should be a rare occurrence. A general design criteria is to build to the 85 percentile along the scale of daily activity through the year so that the design day capacity is sufficient demand for 85% of the days in the year - while maintaining the desired Search Margin. Hospitals typically select a higher Design Day in order to insure that there is adequate parking for their patients and visitors.

For the purposes of this analysis an adjustment of 10% has been applied to the survey day results to establish raw demand for the Design Day - before application of a Search Margin. This factor is applied before computing the appropriate Search Margin.

The rationale for applying a seasonal adjustment smaller than computed differences between the survey day and other days is that there is already some excess capacity built into the projections through application of the Search Margin. This surplus can be used to meet the additional demand on unusually high activity days.

As a result of these adjustments, the CURRENT "Effective Parking Demand" and overall parking sufficiency is computed as follows:

TABLE 11

		Employee	Patient/ Visitor	TOTAL Demand	
Current Capacity					4,481
Current Base Demand (including 150 space shift overlap)		2,039	1,244	3,283	
Seasonal Adjustment base on Activity Level	10%	204	124	328	
Adjusted Demand		2,243	1,368	3,611	
Application of "Search Margins"					
Employee parking areas	@ 10%	224		224	
Patient/Visitor parking areas	@ 15%		205	205	
CURRENT EFFECTIVE PARKING DEMAND (Required Capacity)		2,467	1,574	4,041	4,041
Current Surplus					440

FUTURE PARKING PROJECTIONS

Meetings were held with NSH staff to discuss future growth plans that include, primarily, completion of the new Medical Office Building currently under construction and the expansion of the Womens' Center facilities.

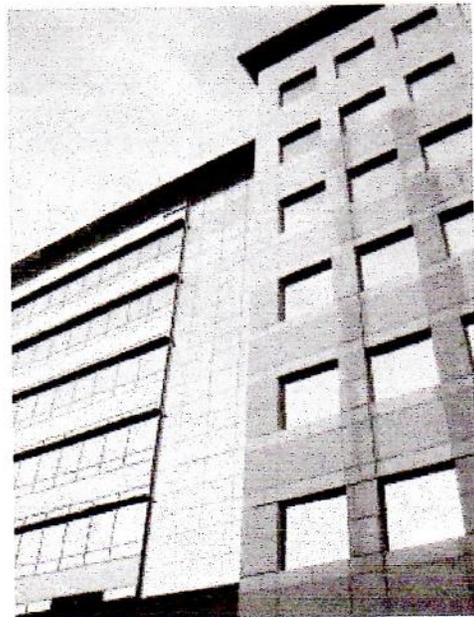
During these discussions a number of other changes in the location and configuration of hospital services areas were discussed. The purpose of these discussions was to identify any changes that were likely to change parking demand in ways that might not be reflected in the application of FTE growth factors. Some of those changes are included in the discussion notes found in the APPENDIX of this report. The conclusion drawn from those discussions was that no changes outside of the new M.O.B. and the planned Womens' Center expansion would have a significant impact on parking demand. In most cases, those changes involved relocation of services within the main campus, in which case the parking demand was already captured in the basic analysis.

The following is a condensed conclusion about the impact of the pending campus changes on parking demand when the full build-out is complete in YR 2011.

New Medical Office Building

At 150,000 SF, the new Medical Office Building under construction on top of the East Parking Deck is expected to generate a peak parking demand of 600-700 spaces based on a demand ratio of 4.0-4.5 spaces per 1,000 square foot. That ratio is considered appropriate within the industry and consistent with the results of numerous parking studies.

Parking for tenants and patients of the new M.O.B. will be provided by NSH in the East Deck on a market demand basis. Tenant employees will be able to purchase monthly parking and patients will pay hourly parking rates as is currently the case throughout the NSH campus.

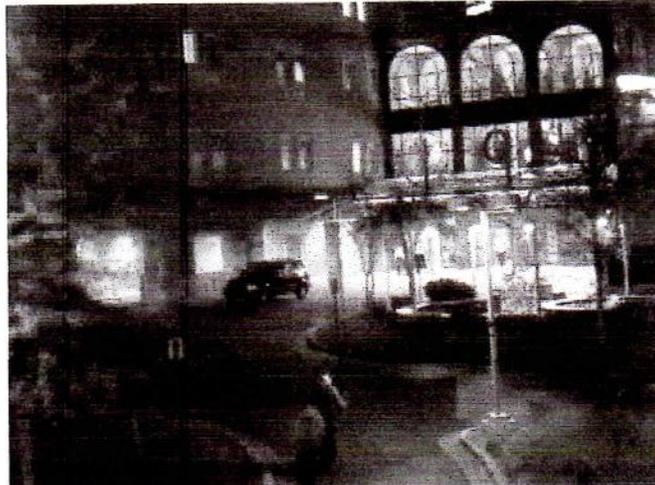


When the new M.O.B. opens, approximately 600 NSH employees currently parking in the East Garage will be reassigned to the Womens' Center Deck and Expansion to provide the necessary space. Based on the survey results, this will free up approximately 550 spaces in the East Deck, leaving 600 spaces for M.O.B. employees/patients, and the remaining 217 spaces for visitor overflow from the Main Visitor Lot.

Operationally, it will be important to nest M.O.B. tenant employees and any NSH employees still assigned to the East Deck into the upper areas of the East Deck if that facility is to continue to effectively serve as a general overflow location for Visitor parking.

Womens' Center Expansion

The planned expansion of the Womens' Center will add 130 beds in the new structure but, as existing rooms are vacated by the move, some of that existing space will be converted to single occupancy rooms. The result is that the expansion will result in a net increase of 93 beds.



With FTEs as the primary basis for projecting parking needs, the NSH staff provided a projection for the number of additional employee FTEs that will be added as the result of the Womens' Center expansion and any other known changes. According to their information the present 3,714 FTEs will increase by 365 by the end of the expansion project for a total of 4,079 FTEs in YR 2011. This represents an increase of just under 10%.

Vacant Space in the 960/980 Buildings

At the time of the occupancy surveys 12,000 SF of the existing M.O.B. office space was vacant. At a parking demand ratio of 4.0/1,000 SF this would represent another potential 48 vehicles if that space is leased. This must be considered in projecting future campus parking demand.

Future Medical Office Building

During discussions about potential future additions, Northside Hospital staff indicated that consideration was being given to a future Medical Office Building that may be constructed on top of or integrated with a new parking structure. The size of that prospective building has not been determined but direction from the staff was to assume that the future M.O.B. may be similar in size to the one currently under construction. That building is 150,000 Square Feet.

Using the same 4.0-4.5 /1,000 SF parking ratio range that has been established for the existing and new M.O.B., the parking demand projected for this future building is estimated at 600-700 spaces. Assuming a 4.0 ratio, with a 600 vehicle base demand, and a 15% Search Margin the capacity requirement be **705 spaces**.

Emergency Room Expansion

The possible expansion of the existing Emergency Room facilities was not included in the projection of future additional parking demand. Although there may be some increase in demand associated with that possible expansion, much of the expansion appears to be re-working of internal facilities without an increase in the number of E.R. beds. As a result, parking demand associated with E.R. activities should remain relatively constant.

Loss of existing parking capacity in the E.R. / Visitor Parking Lot to make room for any horizontal expansion would have to be factored into future parking sufficiency estimates but have not been included in this study because it has not been determined whether that expansion would be added horizontally (taking existing parking) or vertically (on top of the existing structure and not taking out existing parking).

FUTURE PARKING DEMAND COMPUTATION

The TABLE that follows shows the summary computation of projected parking demand for the forecast year 2011. The computation is based on the results of the occupancy survey, computed parking demands, growth factors for the campus, and the targeted service level reflected in the applied "Search Margin." The projection indicates that an **additional 485 parking spaces** will be needed at the end of the forecast period, or at the point when the Women's Center Expansion is on line and the areas vacated in the existing hospital facilities by the move are back in service. With the addition of a future 150,000 SF Medical Office Building, generating the need for an additional 705 parking spaces, that total campus requirement would increase to **1,190 spaces**.

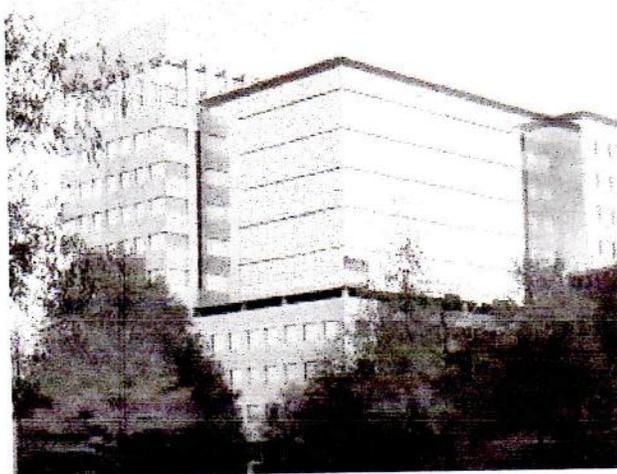
TABLE 12

		Employee	Patient/ Visitor	TOTAL Demand	
Current Capacity					4,481
Current Base Demand (including 150 space shift overlap)		2,039	1,244	3,283	
Seasonal Adjustment base on Activity Level	10%	204	124	328	
Adjusted Demand		2,243	1,368	3,611	
Application of "Search Margins"					
Employee parking areas	@ 10%	224		224	
Patient/Visitor parking areas	@ 15%		205	205	
CURRENT EFFECTIVE PARKING DEMAND (Required Capacity)		2,467	1,574	4,041	4,041
Current Surplus					440
Changes in Demand through YR 2011					
Additional Demand from New M.O.B.				600	
Additional Demand from Expansions at ratio of (representing demand from additional 365 FTEs)	0.62 / FTE			226	
New Raw Demand				826	
Blended "Search Margin" for Increase in Raw Demand	@ 12.0%			99	
Additional Capacity Required (New "Effective Demand")					925
PROJECTED EFFECTIVE PARKING DEMAND YR 2011 CAPACITY REQUIREMENT					4,966
YR 2011 - Projected Surplus (+) / Deficit (-)					-485
Additional Demand from future 150,000 SF M.O.B.				600	
Search Margin (600 / .85)	@ 15%			105	
Additional Capacity Required for Future M.O.B.				705	-705
YR 2011 - Additional Parking Capacity Required With Future M.O.B.					-1,190

Note: If the more conservative 15% seasonal adjustment is applied the deficit in YR 2011 becomes **385 spaces** and the additional capacity needed with a future 150,000 SF M.O.B. would be **1,374 spaces**.

CONCLUSIONS REGARDING FUTURE CAPACITY REQUIREMENTS

- Current "Effective Parking Demand" is **4,041 spaces** against a current capacity of **4,481 spaces**, resulting in a **current surplus of 440 spaces**. The actual number of empty spaces is 869, which includes 429 spaces that are the Search Margin and an additional 440 space surplus.
- When the New M.O.B. is in operation and fully occupied, the estimated new demand for 600 parking spaces to serve the M.O.B. will reduce the total number of empty spaces from 869 to 269. At this point the overall campus Search Margin will have been reduced to 269 spaces or 6% of capacity. This margin is below normal design standards and below the NSH service level target of 10% for employees and 15% for patients and visitors.
- Not included in these computations are approximately 100 spaces on the top level of the East Deck, some or all of which may be returned to service after construction of the New M.O.B. building is complete. However, since the NSH staff has assumed that the parking demand generated by the New M.O.B. may be as high as 700 spaces rather than the 600 used in these projections, that space may be consumed by the higher demand. The 4.5 spaces/1,000 SF used to arrive at the higher 700 space demand is not unreasonable.
- Based on the information provided by the Northside Hospital staff and the results of the physical parking occupancy and duration surveys, projections of known changes in the present campus will result in a parking deficit of ~~440~~ spaces in the Year 2011.



This assumes that the existing M.O.B. space used as NSH staff space or for activities other than physicians' practices, will remain relatively unchanged. Should that space, particularly the

sizeable amount in the Interchange Building, be converted to normal medical office use, the parking demand will be higher than shown in the report projections. Conversion of the 56,000 square feet of space in the Interchange Building currently occupied by NSH functions would increase parking demand by approximately 73 spaces based on a demand differential of 1.3 spaces/1,000 SF. (4.5 for Physician's offices, 3.2 for NSH office space)

It also assumes that full control of all parking facilities will allow effective management of existing parking resources through the careful allocation and assignment of hospital staff to specific parking areas. At some point, this could include separation of employee and visitor parking areas in the Womens' Center Deck so that close, convenient space can be controlled and reserved for visitors. If this is not done, at some point visitors will be forced to find the last available space on the most remote upper deck areas of that facility.

The East Deck can continue to function as an overflow reservoir for the Main Visitor Lot, but that cannot be fully accomplished until all construction is complete and physical parking controls are in place.

With the exception of the equipment recently installed in conjunction with the Womens' Center Deck expansion, the existing parking equipment is old, outdated and in poor physical condition. It should be replaced with new equipment that is compatible with the equipment just installed in the new deck. Considerable thought and planning should be committed to the selection and integration of that equipment in order to provide the real controls necessary to effectively management the system. That is the only way that the hospital will be able to maintain a reasonable level of service to employees, patients and visitors through the full forecast period.



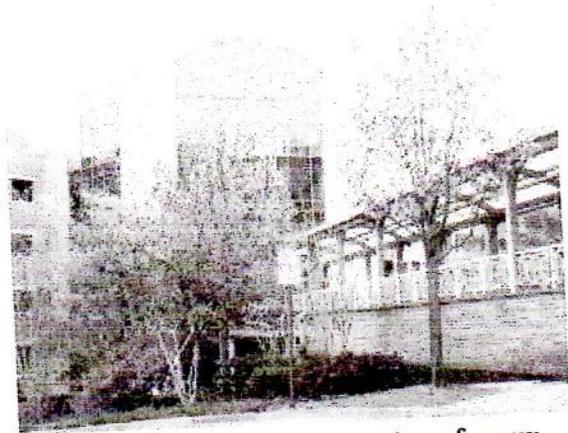
POTENTIAL LOCATION OF NEW PARKING FACILITY

The options for placing additional parking capacity on the campus have become rather limited with the additional construction that has taken place over the past several years. At this point, there are only two potential locations that appear to be feasible for the addition of any significant amount of structured parking and opportunities for additional surface parking are essentially exhausted.

E.R. / Visitors Lot

The first potential location is the E.R./Visitors Lot. The size of that location would allow footprint that would yield good space efficiency and allow ramp slope to be kept to a minimum. There are four primary drawbacks to that location.

- Providing good access from either Peachtree-Dunwoody Road or Johnson's Ferry Road would be a challenge because of the sensitivity of those major thoroughfares to any obstructions of the lanes by slowing traffic or additional turning maneuvers.
- The cost per space to provide structured parking on that site would automatically be higher than other locations because of the number of existing parking spaces that would be lost in providing a footprint for the structure.
- That corner would seem to be the likely location of a future marquis Medical Office Building or an expansion of the hospital structure and possible creation of a new main entrance. There have also been discussions about the possible expansion of the E.R. facilities which could impact space availability.
- Planned expansion, other than the new M.O.B. presently under construction, will take place along Hollis Cobb Circle, primarily related to the Womens' Center. Location of additional parking capacity on the E.R. / Visitor Lot would put that capacity on the opposite side of the complex from its need.



The prospect of a future fourth Medical Office Building at that corner actually offers an advantage in the phasing of overall development, including parking. There may be sufficient space to develop a structure that would satisfy both the needs of the existing and planned facilities and part of the parking needs of a fourth M.O.B. The design of the fourth M.O.B. would have to include the remaining parking capacity to serve its needs. This approach reduces the amount of parking that is built in the initial phase, avoiding an excessive over-build in anticipation of the future M.O.B. need. Only part of the future M.O.B. parking requirement is built early.

Day Care Lot

The second potential site is in the general area of the existing Day Care Center Lot located between the Day Care Center and the Womens' Center Deck although there are several obstacles that must be overcome in using that site. Factors in favor of this location include:

- Close proximity to the planned expansion of the Womens' Center that will be the source of additional parking demand.
- Less of an access problem related to the traffic volumes on Peachtree-Dunwoody Road and Johnson's Ferry Road.
- No loss of sites with exposure to the primary streets – Peachtree-Dunwoody Road and Johnson's Ferry Road.
- Less visual obstruction of the view to the hospital main entrance from Peachtree-Dunwoody Road than a facility located on the E.R / Visitors Lot.
- Potential connection to the Womens' Center via pedestrian bridge across Hollis Cobb.
- More latitude in reallocating parking space between the new parking structure and the Womens' Center Deck without significant differences in convenience between the two.
- Possible positioning to provide a portion of parking capacity required for a future M.O.B. near the corner of Peachtree-Dunwoody Road and Hollis Cobb Circle, with the remaining parking capacity added as part of the M.O.B. construction when it occurs.

- Proximity to the Interchange Building that may allow some of the parking capacity of a new structure to be used for NSH employees working in the Interchange Building and could position additional parking capacity to support future development on the Interchange Building site.
- Potential for a shorter pedestrian route through the new facility for NSH and tenant employees/physicians movement between the Interchange Building and the main hospital building. This would require a vertical transition (elevator) from the Interchange Building elevation to the new parking structure.

There are, however, significant drawbacks that must be considered with this location.

- The path of the underground MARTA line poses significant limitations on the specific siting of the structure. The distance between Hollis Cobb Circle and the MARTA easement may limit the number of parking bays that could be positioned within the site.
- The location of the existing Day Care Center, if it remains in its present location, limits the footprint to the east. It may be possible, however, to incorporate the Day Care Center structure within a new parking facility with ample outdoor areas and external pick-up/drop-off capacity.

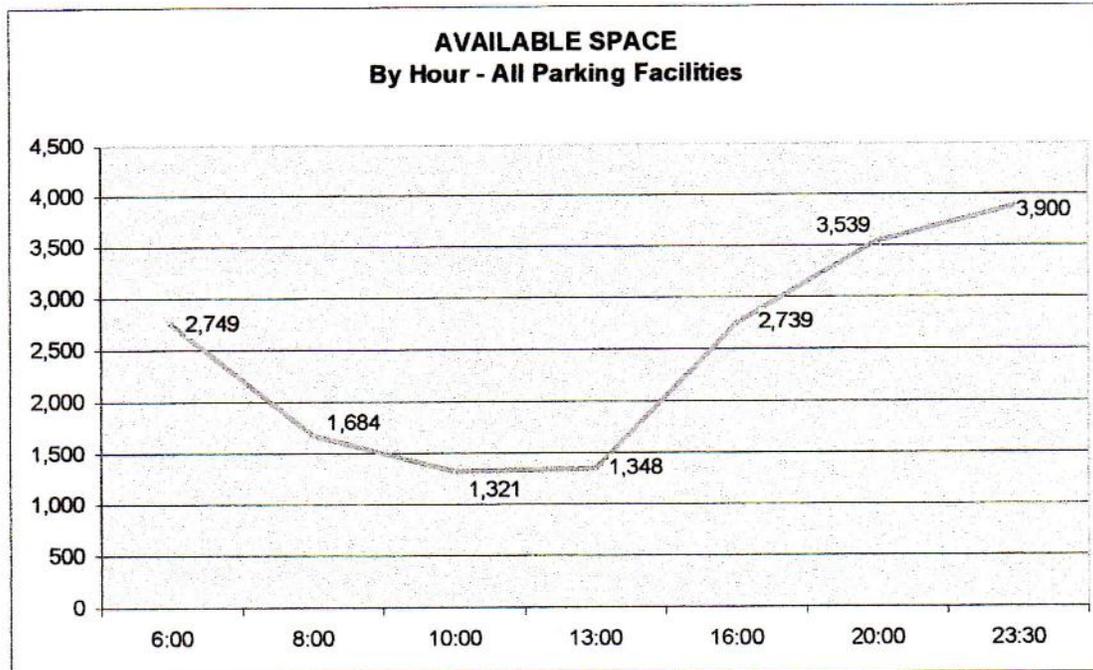
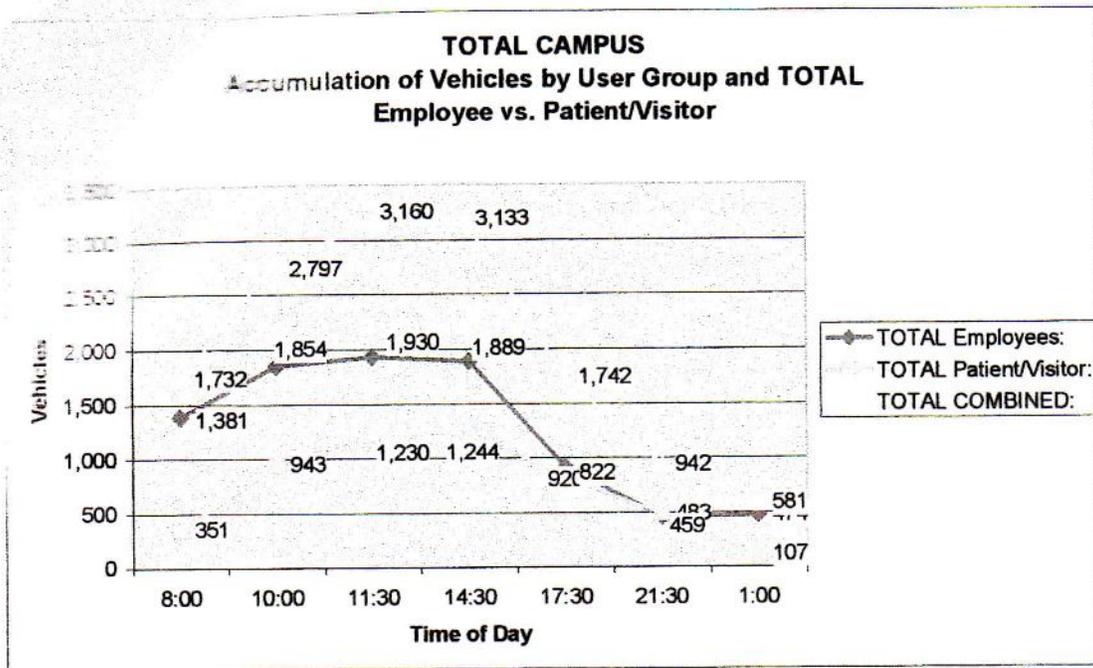
RECOMMENDATION

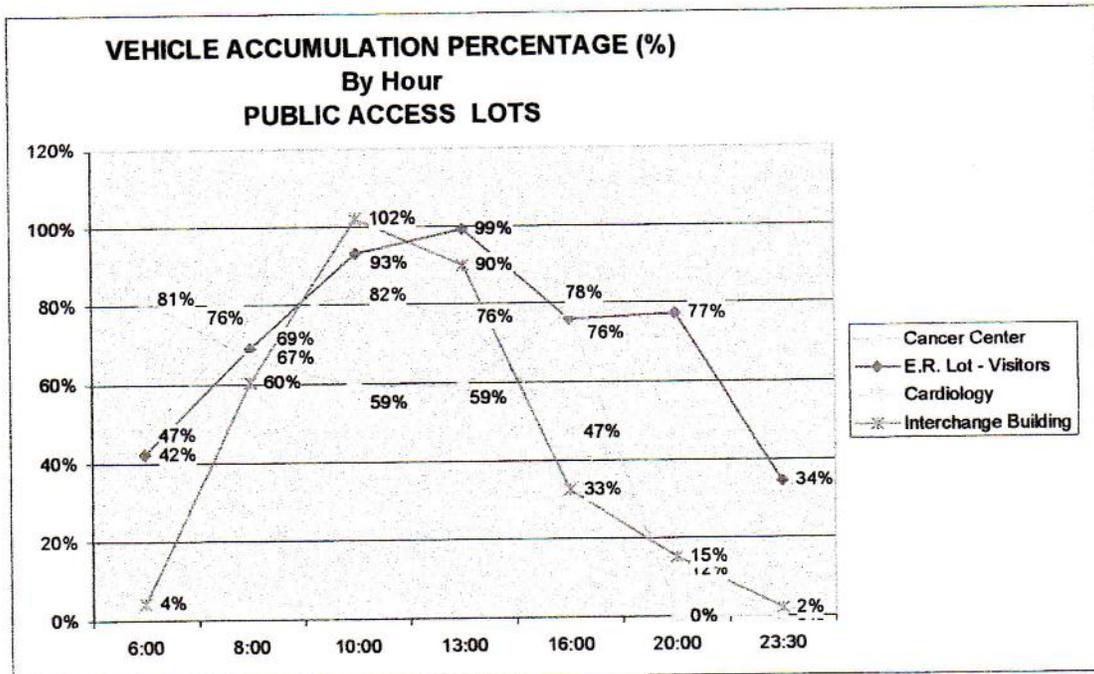
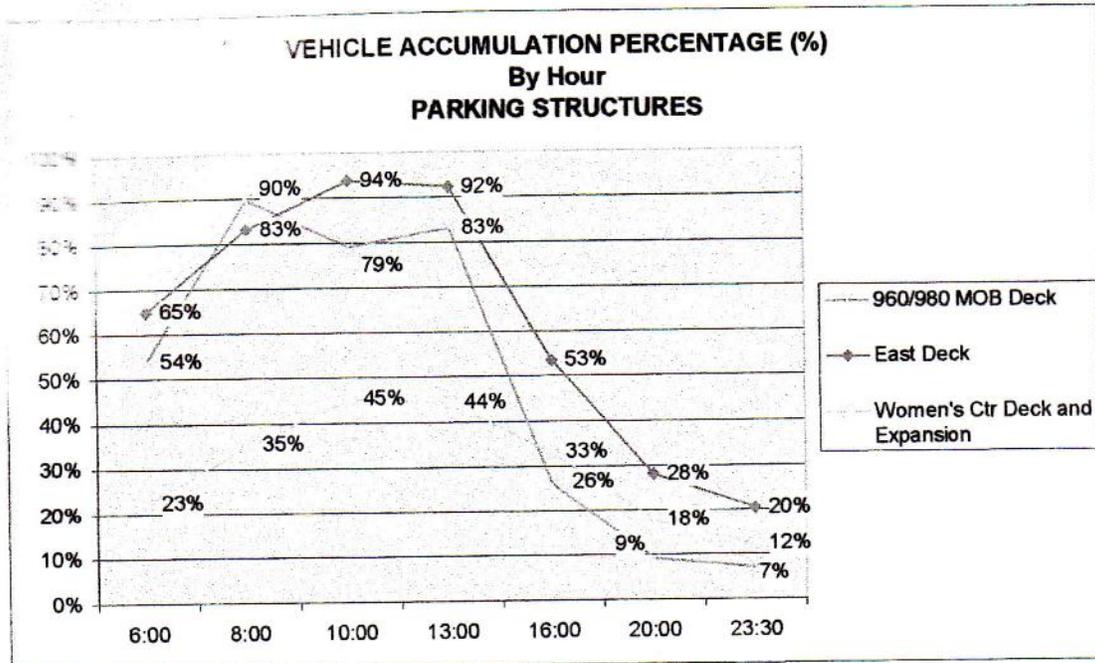
It is the recommendation of the study team that the Day Care Lot be given first consideration in examining potential locations for an additional parking structure.

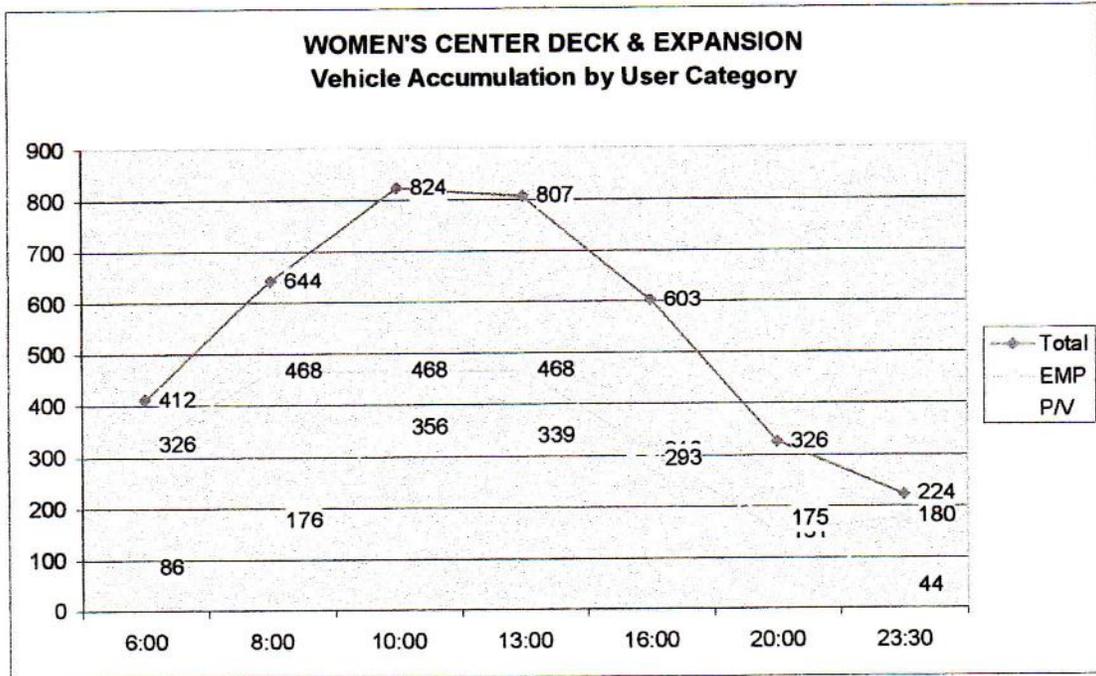
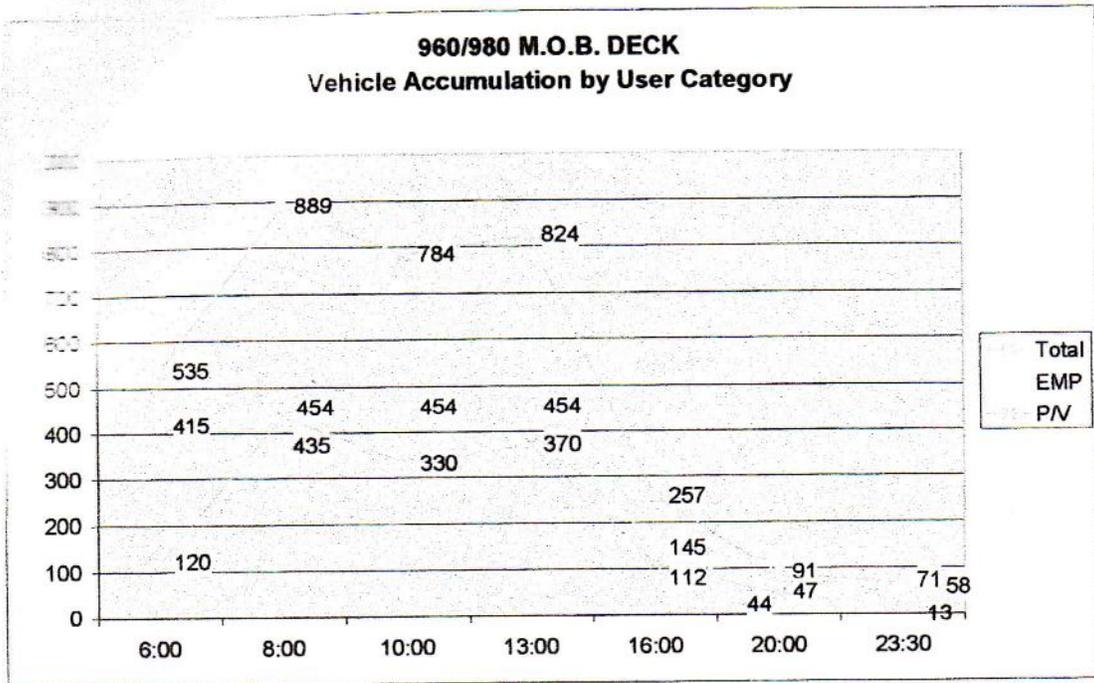
APPENDIX

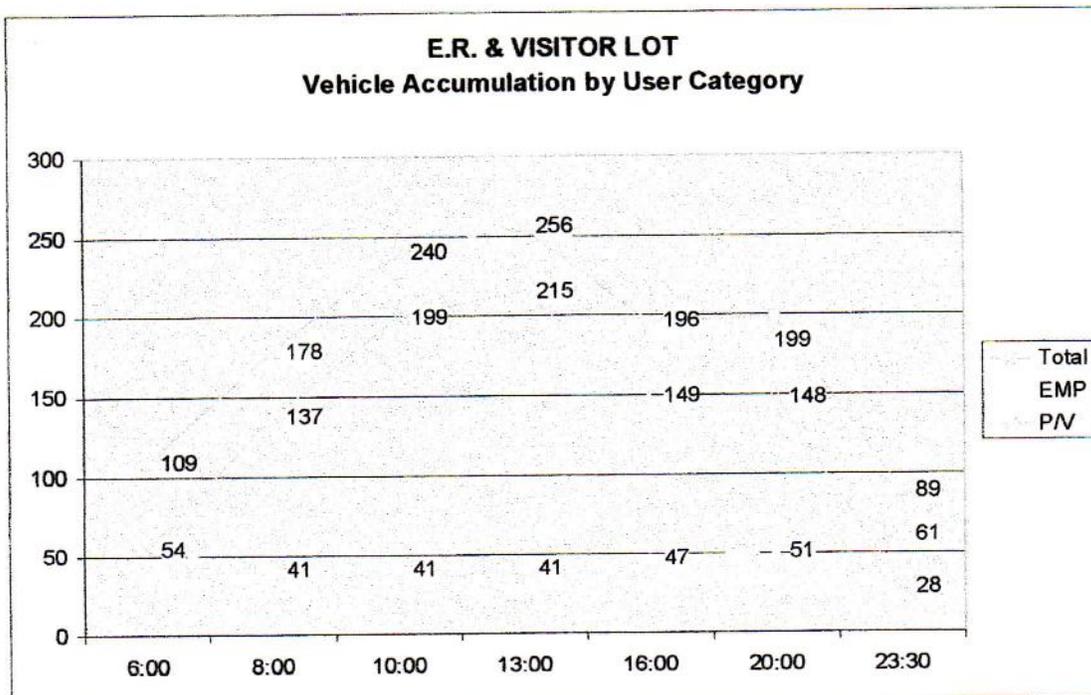
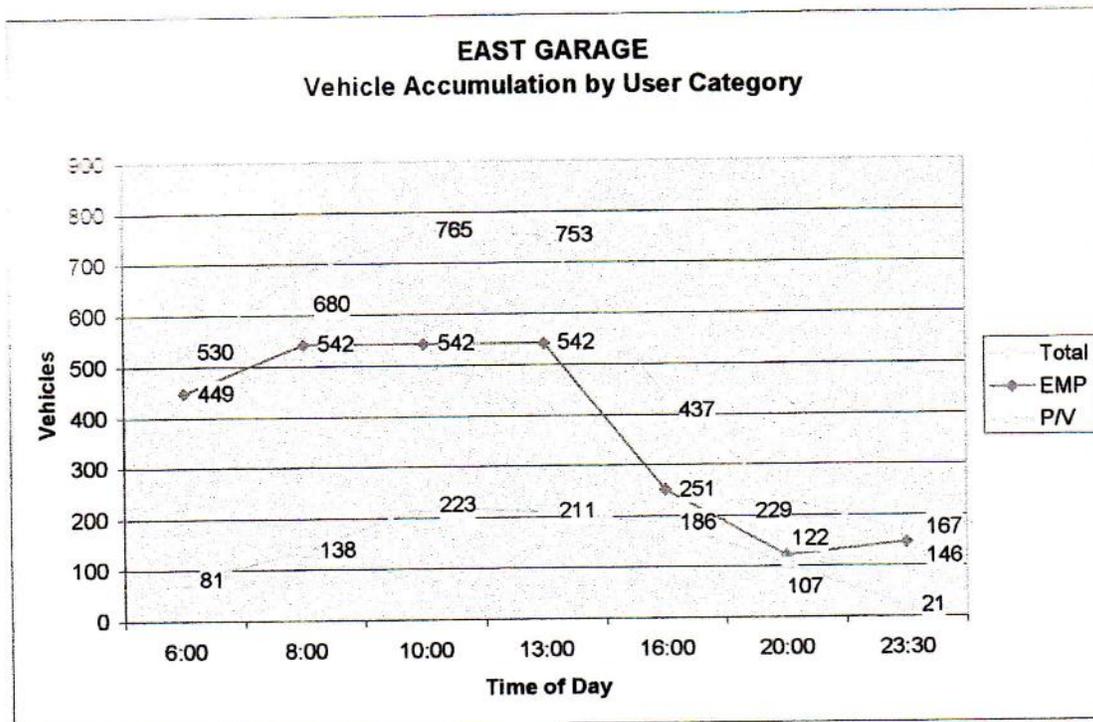
Additional Graphs of Occupancy Survey Results

Summary Notes from meetings with NSH Staff

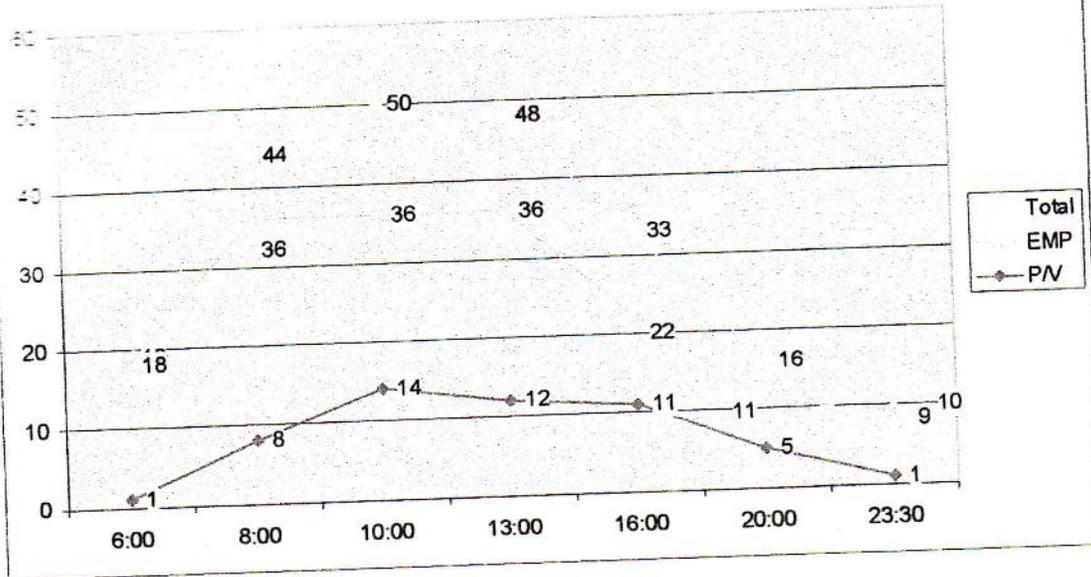




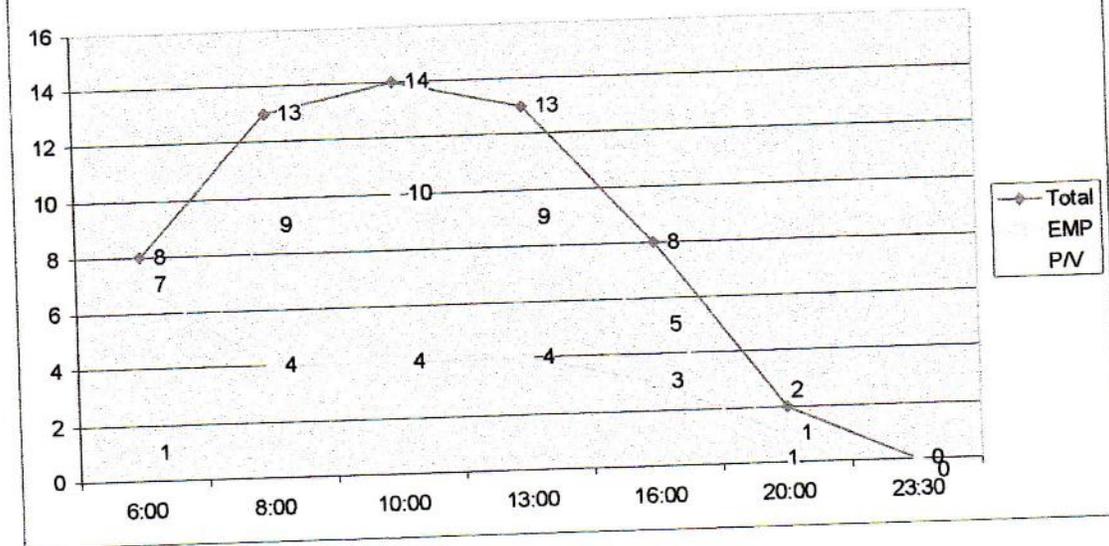


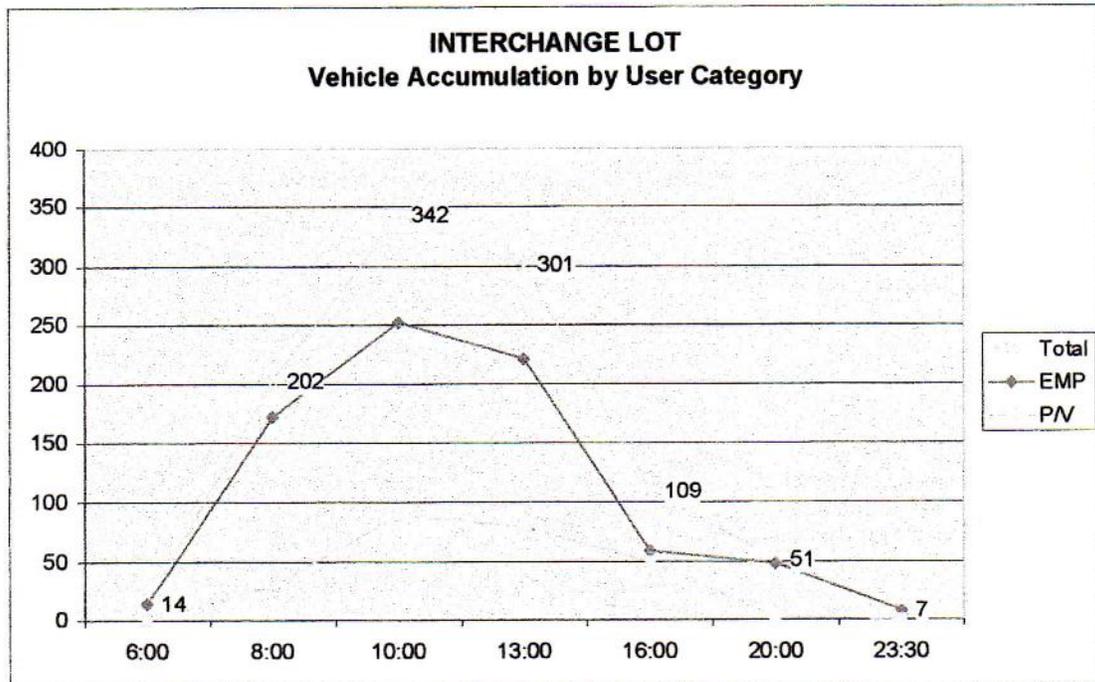
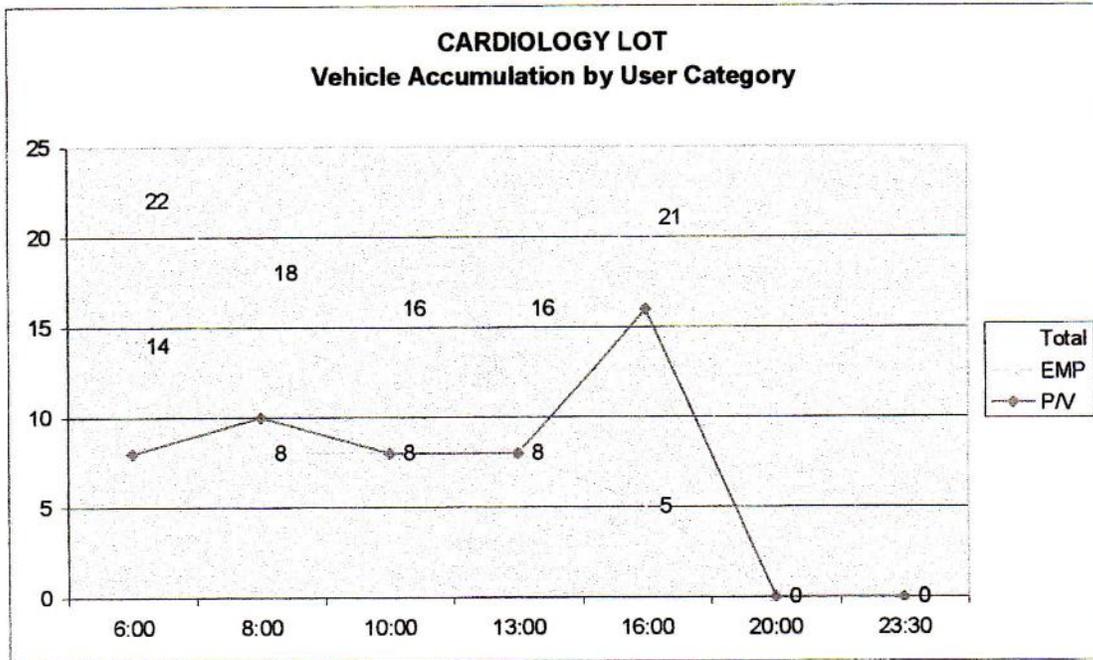


DOCTOR'S / DAY CARE LOT
 Vehicle Accumulation by User Category



CANCER CENTER
 Vehicle Accumulation by User Category





Summary of Information provided through discussions with Northside Hospital Staff

<p>Women's Center Expansion</p>	<ul style="list-style-type: none"> • Plan to add 4 floors above the interior portion of the existing structure and expand the lower floors horizontally toward the roadway approximately 50' into the 100' existing green area. • Adding 130 beds to net 93 additional beds because some existing "shared" rooms will be converted to single patient rooms. 	<ul style="list-style-type: none"> • How many new employees will that expansion represent? <ul style="list-style-type: none"> ○ The current hospital staff is expected to increase by 365 FTEs or approximately 10% by YR2011 when the expansion project is complete. The current staff is 3,714 FTEs. The increase in staff due to expansion of the Women's Center is included in this projection. ○ New employees at the W.C. are expected to work primarily 12 hour shifts 7AM-7PM, 7PM-7AM ○ No reason not to assume increase in parking demand that is in direct proportion to current hospital-wide ratio per SA.
<p>Space vacated by Women's Center Expansion</p>	<ul style="list-style-type: none"> • Space in main building vacated by women's services to the WC expansion will be renovated. • Approximate Timetable: WC on line in 2 to 2.5 years with renovations of vacated main building space completed taking place over another 2 years. 	
<p>Hospital Activity Characteristics</p>	<ul style="list-style-type: none"> • High volume of surgery – one of the highest in S.E. U.S. 	
<p>General Expansion Plans</p>	<ul style="list-style-type: none"> • May expand at other campuses – Alpharetta and Forsyth. • Meridian Mark – ambulatory care center at Meridian and Johnson's Ferry. 	

Interchange Bldg.	<ul style="list-style-type: none"> • Purchase of Interchange Building - at least 2 years ago. 	
Pain Clinic	<ul style="list-style-type: none"> • 75-80 visits per day • 45-60 minute avg. stay • Per SA, the exchange of services between Pain Clinic at Meridian Mark and the main campus facilities would not likely change the parking ratio on the main campus. It would simply exchange employees and visitors. 	<ul style="list-style-type: none"> • Neutral impact on parking demand on the main campus because the services relocating to Meridian Mark in exchange for relocation of the Pain Clinic to the main hospital generate similar employee and visitor/patient numbers?
Interchange Bldg.	<ul style="list-style-type: none"> • Installing equipment to control use of the lot and allow collection of parking fees for people using it. 	
Remote Lot	<ul style="list-style-type: none"> • The remote lot was closed once the deck expansion opened and was closed at the time of the field surveys. • 100 Interchange Bldg. Employees went into the newly completed deck expansion. • The 100 Interchange Bldg. Employees represented nearly all, if not all, of the demand satisfied at the remote lot. Additional demand was on Mondays - new employee orientation. 	<p>(Remote lot is not a factor in the study because it was closed before any of the field work was done. Those employees were already in their new parking areas - principally the new deck expansion.)</p>

<p>OBGYN group practice moves</p>	<ul style="list-style-type: none"> • 960 Bldg. = 76,000 SF • 980 Bldg. = 128,000 SF • 15,000 SF of space vacated in the 960/980 MOB when OBGYN group practices moved to the Interchange Bldg. • 7,500 SF vacated in the 960 bldg. was taken by the hospital. 6,000 SF taken by hospital = approx. 10 employees. • The 7,500 SF space vacated in the 980 bldg. is being revamped and will be filled with other physicians practices when completed. • These moves took place before the occupancy counts, so there was 7,500 SF of vacant space still in the 980 Bldg. • Per SA, there was no noticeable increase in parking demand. 	<ul style="list-style-type: none"> • How much vacant space was there in the 960 Bldg. at the time of the counts? <ul style="list-style-type: none"> ○ 12,000 SF per Tom H. • What is the reasonable expectation for "full" occupancy on an ongoing basis? 95%?
<p>New M.O.B.</p>	<ul style="list-style-type: none"> • Sold air rights to Lee Richmond for development of the new M.O.B. on top of the East Garage • Expected need of 600-700 spaces to meet the needs of the M.O.B. tenants. • New M.O.B. is not guaranteed any specific number of spaces. NH will simply sell space in the East Garage as requested by tenants and provide paid parking to patients/visitors. • Parking revenue from M.O.B. tenants and visitors will go to NH. 	<ul style="list-style-type: none"> • What is the size of the new M.O.B.? <ul style="list-style-type: none"> ○ 150,000 SF

	<ul style="list-style-type: none"> • Cancer Center functions relocating to the new M.O.B. • 365 patients in DEC, which is a low month. Represents 18-20 patients per day. • However, radiation patients parking in the East Deck and that probably will not change. • Chemotherapy infusions will be relocated from the 980 Bldg. to the new M.O.B. along with associated parking demand. 	
<p>Parking Location changes</p>	<ul style="list-style-type: none"> • 600 employees move from East Garage to new deck expansion. • 100 employees already moved from closed shuttle lot to new deck expansion. • Additional 75 management staff asked to relocate from the Women's Tower deck to the expansion deck. 	<ul style="list-style-type: none"> • Original notes referred to another 75 parkers but not clear. Who are they and what is the change? <ul style="list-style-type: none"> ○ Management staff asked to be relocated from the Women's Tower Deck to the Women's Center Deck Expansion.
<p>Women's Center expansion</p>	<ul style="list-style-type: none"> • WC expansion could affect parking demand not only as a result of increased activity at the WC itself but return visits to NH for testing could increase parking demand. 	<ul style="list-style-type: none"> • After discussions with Steve Aslinger (2nd meeting), it does not appear likely that the additional visits will represent a significant number.
<p>Projected Growth</p>	<ul style="list-style-type: none"> • 7% - 9% growth projections have proven lower than the actual growth rate. 	
<p>Current Statistics</p>	<ul style="list-style-type: none"> • 445 beds licensed now • Wanting to increase number of licensed beds in order to reach an average overnight census of 410-450 patients. • Current average census: 311 OCT-DEC adults only. Average additional 98 babies in special care. These are counted in some patient numbers, but not others. Confirm with SA before using data. 	<ul style="list-style-type: none"> • What are the average census numbers by month (for seasonal trend analysis)?

Current Statistics	<ul style="list-style-type: none"> • 50-75 babies delivered per day 	
Front Lot	<ul style="list-style-type: none"> • Open to being decked to increase parking capacity at the front. 	
ER Expansion	<ul style="list-style-type: none"> • Possible future expansion of the ER facilities per Billy Carr 	
Physicians Lot	<ul style="list-style-type: none"> • Always fills during the morning peak • Physicians badges to allow access to any of the parking facilities. 	
Control of Employee Parking	<ul style="list-style-type: none"> • John controls NH employees. • Tom Huffine controls tenant access to the 960/980 M.O.B. 	
Car Counts	<ul style="list-style-type: none"> • Security has been conducting periodic car counts. 	
Construction Worker Parking	<ul style="list-style-type: none"> • Estimated 15-20 construction vehicles in the East Garage daily for tool and equipment access. 	
Interchange Bldg.	<ul style="list-style-type: none"> • Converted after purchase and conversion increased parking demand – increased density. 	
Existing Garages	<ul style="list-style-type: none"> • Some concern about visitors getting lost in the existing garages. 	
Existing Garages	<ul style="list-style-type: none"> • All along Hollis Cobb are interconnected in some way. • Free flow is possible between garages 2 and 3, but it costs some space. 	

From: Michaëlle Arkin
Sent: Wednesday, September 07, 2016 5:22 PM
To: George McCallum
Cc: COSS Planning and Zoning;
Marusha.carpenter@northside.com; Carol M. Kratochvil
Subject: Re: Parking Deck Zoning approval for Northside Hospital

RE:Re: Application Numbers RZ16-0095 & U16-0024

As current President for the 300 member Auxiliary at Northside Hospital-Atlanta, I implore the Planning Commission of Sandy Springs to consider and approve our request to expand, grow and improve our service to the community.

Forty-five years ago when our hospital was built, we never envisioned the need for space that we are faced with today.

We deliver more babies than any other hospital in the nation. Our need for cancer care, bariatric services, and general surgeries has grown as our demographic ages. We need more beds and we need more parking. Numerous times I have observed visitors enter our hospital, not just concerned and anxious about visiting family members, but angry and frustrated with the shortage and difficulty of parking spaces,

We have done everything within our power to provide quality care to our patients and visitors. We have strategically reorganized our staff parking options to provide availability to our customers.

Additional beds and a parking deck has been researched and planned with much forethought for the effect on traffic patterns, bearing in mind the benefits to our community.

Please help us help our community. Please approve our request for expansion.

Thank you for your time and consideration.

Michaëlle Arkin

On Wed, Sep 7, 2016 at 4:09 PM, George McCallum

▪ wrote:

Re: Application Numbers RZ16-0095 & U16-0024

To whom it may concern:

I have been a volunteer at Northside Hospital for 5 years working with our patient transport service. I usually work on Monday and Thursday afternoons and our primary duty is taking discharged patients from their rooms to the pick up areas either at the main admission's or the Women's Center exits. As the last people to see the patients before they get into their cars to go home, we feel that we can make an average experience just a little better or to reinforce a really

good experience in the hospital. We do this by engaging the patient and family members who usually accompany them by answering any questions that they may have, engaging in small talk, giving directions, and wishing them well as they get into their cars. One of the biggest issues that family members and patients complain about is the difficulty in finding a parking space at the hospital that is close to one of the exits. As a volunteer, I park in the Women's Center deck on an upper level floor as far away from the hospital as possible so that the closer spaces can be left for visitors and patients. I know others do this also. Although it helps, it isn't enough and additional parking spaces around the hospital would go a long way towards alleviating the problem.

Without this approval, the problem will only get worse as it is my understanding that the State of Georgia has recommended that Northside Hospital expand its bed capacity, with 53 additional beds already planned with another 32 beds in the future. Everyone at Northside Hospital, from the doctors, nurses, techs, food service, environmental, and maintenance employees, as well as the volunteers – all want the patient and visitor experience to be the highest possible quality. That experience is not just the medical care that people receive, but it includes everything from the time people arrive at the hospital until the time they go home. That experience includes parking. I urge the Planning Commission to approve the above referenced applications and help Northside Hospital continue to aid patients, families, other visitors, employees, and volunteers with the additional parking spaces that are so urgently needed. Thank you for your consideration.

George McCallum

Johns Creek, GA

--

Michaëlle Arkin

From: ED DONNELLY
Sent: Tuesday, September 06, 2016 7:06 AM
To: COSS Planning and Zoning
Cc: Marusha.carpenter@northside.com
Subject: Application Numbers RZ16-0095 & U16-0024.

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Purple Category

- It is imperative that approvals and permits be given *now* to allow the Northside tower to be built, as the State of Georgia has already determined that Northside Hospital has a need for 53 more beds and has projected a need for at least 32 additional beds in the future.
- Parking on campus is already over capacity, and the 1,270 spaces in the new parking deck are critical to allow access to the hospital for patients and their families.
- A temporary lot on Meridian Mark Drive for employees will greatly improve patient access to the hospital on the main campus, which is needed immediately.

Edwin H. Donnelly, MD

From: Chuck Ellet
Sent: Thursday, September 08, 2016 10:01 AM
To: COSS Planning and Zoning
Cc: Marusha.Carpenter@northside.com
Subject: Application # RZ16-0095 & U16-0024

I'm sure it will not be news to you when I tell you that parking at Northside Hospital is at a premium. What you may not know is that the Northside Cancer Center is in desperate need to expand. the number of patient beds.

The State of Georgia has already determined Northside needs 53 more cancer patient beds now and 32 more beds in the future. To quantify the parking problem, parking is already over capacity and 1270 additional parking spaces in a new parking deck are critical for patient and family access.

A temporary lot on Meridian Mark Drive for employees will greatly improve patient and family access to the hospital. Northside has already initiated numerous traffic reduction initiatives to improve traffic flow and will continue to work vigorously toward this goal.

I urge you to approve Northside's applications to significantly improve patient and family access to Northside's Cancer Center.

Chuck Ellet

From: Carol M. Kratochvil <Carol.Kratochvil@northside.com>
Sent: Thursday, September 08, 2016 7:59 AM
To: COSS Planning and Zoning
Subject: Application Numbers RZ16-0095 & U16-0024

Re: Application Numbers RZ16-0095 & U16-0024

I have been associated with Northside Hospital for 14 years. I began as a volunteer and for the last six years I have been an employee. I am proud of Northside; we provide outstanding care in women's services, oncology, cardiology and to the community in general. We recently completed planning for a new 7 story, 53 bed medical tower with the possibility to expand in the future. The State of Georgia has already determined that Northside Hospital has this need now and has projected a need for at least 32 more beds in the future; therefore it is imperative that Northside receive permits to begin building this tower.

With growth parking is a major consideration. After extensive research Northside has proposed two very viable plans to address the parking issue to allow access to the hospital for patients and their families and our employees. We have proposed a 1,270 space parking deck and a temporary lot on Meridian Mark Drive for employees.

Northside has been collaborating with the other hospitals to reduce congestion in the area. Here are just a few of Northside's efforts:

- Eight hour shifts have been extended to twelve hours (7 am to 7 pm) wherever possible to reduce the number of drivers during rush hour.
- Many employees have moved to off-site parking with a shuttle service provided by Northside.
- Employees have been offered incentives to use MARTA rather than driving their personal vehicles.
- On-site meetings have been limited.
- Northside has provided a Sandy Springs police officer in the afternoon at the Hollis Cobb/Peachtree Dunwoody intersection to improve traffic flow.

If Sandy Springs wants to continue to grow and thrive and to bring in high-end corporations to our community it must be willing to allow growth for one of the highest rated hospitals in the nation. People care about the quality of health care providers and Northside Hospital has an outstanding reputation. Please allow Northside Hospital to increase its partnership with Sandy Springs by allowing us to grow with this amazing city.

Sincerely,

Carol Kratochvil

Carol Kratochvil | Manager, Volunteer Services | Northside Hospital-Atlanta | 404.303.3731 | carol.kratochvil@northside.com



From: William Lavelly
Sent: Tuesday, September 06, 2016 9:59 PM
To: COSS Planning and Zoning
Cc: Marusha.carpenter@northside.com
Subject: Northside Hospital Zoning Request

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Purple Category

To whom it may concern,

Several months ago, Northside completed its planning for a new, seven story, 53 bed medical-surgical tower, which will be located on campus adjacent to the Cancer Center. This tower will enable us to add beds as demand increases in addition to the 53 beds currently planned.

To accommodate this growth, a 1,270 space parking deck has been designed for the area between the Interchange Building and the Child Care Center along Peachtree Dunwoody Road. Temporary parking has been designed and is ready to be constructed at the end of Meridian Mark Drive, which will ease traffic and parking congestion during construction. Together, these projects will eliminate the current bed shortage as well as reduce traffic and parking congestion in the area and on campus.

I am proud of the care my physician colleagues and Northside deliver each day, and this growth will bring that care to so many more people. These projects represent the strategic nature of Northside's forward momentum to extend world class care. Construction is ready to begin, pending approval from the City of Sandy Springs. On September 15th, the Sandy Springs Planning Commission will review Northside's requests for zoning approval. The Commission's recommendation will be taken to the Sandy Springs City Council meeting on October 18th.

To that point, there are 3 items to review and approve:

1. It is imperative that approvals and permits be given *now* to allow the Northside tower to be built, as the State of Georgia has already determined that Northside Hospital has a need for 53 more beds and has projected a need for at least 32 additional beds in the future.

From: Jeffery Lewis
Sent: Friday, September 02, 2016 6:12 PM
To: COSS Planning and Zoning
Subject: RZ16-0095 & U16-0024.

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Purple Category

I was asked by medical staff services to write a letter in support of Northside hospital expansion and construction of a new parking deck on peachtree dunwoody. The letter recommends I mention a number of ways that Northside hospital has partnered with the community to reduce traffic and to help the community.

I would rather point out that the current congestion is horrific. Northside hospital along with St Joseph's hospital and Children's hospital have not significantly altered area congestion. Commuting in this area sorely diminishes quality of life for Sandy Springs residents. The addition of more parking places will only encourage more traffic, more congestion, more pollution, more lost productivity spent sitting in traffic.

According to the American Hospital Directory, Northside had over 5 billion dollars in patient care revenue recently with over 220 million in annual profit. Does Sandy Springs reap any tax revenue from this? Are Sandy Spring resources being used to generate this excess revenue for the "non-profit"?

Is Northside a good neighbor? If you like McDonalds, then you can visit one in the lobby. Why would a hospital have a fast food restaurant in their lobby - must be leasing and getting extra revenue while MCDonald's serves hamburgers to the cardiac patients who generate further revenue for the hospital.

The AJC has featured articles about how Northside has aggressively purchased medical practices, imaging centers and endoscopy centers around Sandy Springs and metro Atlanta. Once acquired, the price of imaging studies, endoscopy, pathology skyrockets to hospital rates - sometimes 10 fold the cost prior to acquisition. This is not how a nonprofit would treat their neighbors if they were truly concerned about our health. Northside hospital is first and foremost a business generating profit and revenue. As such, they should be obligated to contribute to improvements in Sandy Springs including major projects to relieve congestion, efforts to help control medical costs and not rip off our senior citizens and Sandy Spring residents trying to seek affordable quality care.

I would hope that the mayor would look at this zoning request as an opportunity to leverage Northside to be a better neighbor and use some of that net-non-profit annual revenue to lower costs, lower congestion, and improve public health.

Get them to put solar panels on top of the parking deck to generate clean electricity. Get them to make greenspace somewhere in the concrete jungle of pill hill. Convince them to do a real shuttle service in combination iwth St Josephs, and Children's to the Marta. Ask them to support affordable daycare centers for their employees. Use this opportunity to seek quality of life improvements for Sandy Springs workers, commuters and residents.

Jeffery Lewis

Sandy Springs resident, taxpayer, commuter and Sandy Springs business owner

From: GARY LOTNER
Sent: Friday, September 02, 2016 5:24 PM
To: COSS Planning and Zoning
Subject: RZ16-0095, U16-0024

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Purple Category

Dear Sirs,

As a alongside physician at Northside Hospital, as well as a 40 year resident of Sandy Springs, I urge you to issue the rapid approval of the above programs, in support of a new parking deck that is urgently needed at the Hospital. Even prior to the approved hospital addition, with new beds, the parking situation is seriously inadequate. Delaying approval of a new parking deck will not only be intolerable but will increase traffic and flow in an already crowded area.

Gary Z Lotner MD,
Atlanta Allergy and Asthma, PC

From: belinda marcus <bn>
Sent: Wednesday, September 07, 2016 6:13 AM
To: COSS Planning and Zoning
Subject: Application Numbers RZ16-0095 & U16-0024

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Purple Category

To Whom It May Concern:

It is imperative that approvals and permits be given *now* to allow the Northside tower to be built, as the State of Georgia has already determined that Northside Hospital has a need for 53 more beds and has projected a need for at least 32 additional beds in the future.

Parking on campus is already over capacity, and the 1,270 spaces in the new parking deck are critical to allow access to the hospital for patients and their families.

A temporary lot on Meridian Mark Drive for employees will greatly improve patient access to the hospital on the main campus, which is needed immediately.

Northside has already initiated numerous traffic reduction initiatives and will continue to work vigorously on this goal. These initiatives include the following:

- Extended as many 8 hour shifts as possible to 12 hours shifts from 7 am to 7 pm. This will reduce the number of drivers during rush hour.
- Moved employees to off-site parking and provided time off (PTO) incentives for those who choose this option.
- Provided shuttle service for off site parkers. We currently have four buses running.
- Added incentives including subsidized MARTA cards and prizes ([Ipad](#), [Apple Watch](#), and [gift cards](#)) for MARTA riders.
- Incentives are provided for those who do not bring a car at all to the campus to encourage car and van pools.

- Provided a Sandy Springs police officer in the afternoon at the Hollis Cobb/ Peachtree Dunwoody Road intersection to allow traffic to flow as freely as possible.
- Limited on site meetings for any group larger than 25 and allowed them to be hosted off site at local hotels.
- Increased the work from home options where possible.
- Moved several large non-clinical departments to off site locations.
- Funded a traffic study, which is currently underway, through Georgia Department of Transportation and PCID to evaluate options for improvements.

Northside will continue to be a good citizen and will partner with the City of Sandy Springs in meeting the needs of the community.

We ask your support in promoting Northside's request to grow, flourish and care for our patients.

Thank you,

Belinda Marcus, MD

From: George McCallum
Sent: Wednesday, September 07, 2016 4:09 PM
To: COSS Planning and Zoning
Cc: Marusha.carpenter@northside.com; 'Carol M. Kratochvil';
'Michaelle Arkin'
Subject: Parking Deck Zoning approval for Northside Hospital

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Purple Category

Re: Application Numbers RZ16-0095 & U16-0024

To whom it may concern:

I have been a volunteer at Northside Hospital for 5 years working with our patient transport service. I usually work on Monday and Thursday afternoons and our primary duty is taking discharged patients from their rooms to the pick up areas either at the main admission's or the Women's Center exits. As the last people to see the patients before they get into their cars to go home, we feel that we can make an average experience just a little better or to reinforce a really good experience in the hospital. We do this by engaging the patient and family members who usually accompany them by answering any questions that they may have, engaging in small talk, giving directions, and wishing them well as they get into their cars. One of the biggest issues that family members and patients complain about is the difficulty in finding a parking space at the hospital that is close to one of the exits. As a volunteer, I park in the Women's Center deck on an upper level floor as far away from the hospital as possible so that the closer spaces can be left for visitors and patients. I know others do this also. Although it helps, it isn't enough and additional parking spaces around the hospital would go a long way towards alleviating the problem.

Without this approval, the problem will only get worse as it is my understanding that the State of Georgia has recommended that Northside Hospital expand its bed capacity, with 53 additional beds already planned with another 32 beds in the future. Everyone at Northside Hospital, from the doctors, nurses, techs, food service, environmental, and maintenance employees, as well as the volunteers – all want the patient and visitor experience to be the highest possible quality. That experience is not just the medical care that people receive, but it includes everything from the time people arrive at the hospital until the time they go home. That experience includes parking. I urge the Planning Commission to approve the above referenced applications and help Northside Hospital continue to aid patients, families, other visitors, employees, and volunteers with the additional parking spaces that are so urgently needed. Thank you for your consideration.

George McCallum
Johns Creek, GA

From: Judy Risner
Sent: Thursday, September 08, 2016 3:34 PM
To: COSS Planning and Zoning
Cc: Marusha.carpenter@northside.com
Subject: Northside Hospital zoning approval and permits

To whom it may concern:

Re: Application numbers RZ16-0095 & U16-0024

My husband and I strongly support and urge you to approve Northside Hospital's request to build the Northside tower. The state of Georgia has already determined that Northside needs 53 more beds and a projected need for 32 more beds in the future. I also urge you to approve their need to have additional parking spaces in a new parking deck which will be critical for access to the hospital for patients and their families. Northside has already initiated numerous traffic reduction initiatives and will continue to work on this goal. Northside Hospital is a good citizen and needs the support of the city of Sandy Springs to flourish and grow in order to meet its patient needs.

Sincerely,

Judy and Ray Risner

From: Dr. Stephen Wells <Stephen.Wells@Northside.com>
Sent: Tuesday, September 06, 2016 11:27 AM
To: COSS Planning and Zoning
Cc: Marusha Carpenter
Subject: Application Numbers RZ16-0095 and U16-0024

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Purple Category

To Whom It May Concern:

I am writing to express my utmost support for the approval of the planned improvements at Northside Hospital. Northside Hospital provides first quality care to the patients of our community. The high quality of care is reflected in the number of patients who choose to have their medical care at Northside. The hospital has been running at or near capacity for some time. The State of Georgia has recognized that the demand for services requires more bed capacity. The need for additional beds for patient care is acute. I would strongly encourage you to approve the request for zoning approval which will allow immediate and future increases in bed capacity.

Concurrent with the need for hospital beds is the need for additional parking for patients and their families. Northside has proposed a new parking deck along with temporary employee parking during construction. These are critically needed as on-campus parking is already over capacity. I would strongly encourage the request for zoning approval for these projects as well.

Northside has worked hard to be a good community citizen and has undertaken a number of endeavors to reduce traffic in the area, including moving non-clinical departments off-site, enhancing work from home options, providing off-site employee parking and creating incentives for employees who do not bring a car to campus.

Thank you for your attention to this matter. The zoning changes requested are critical to allow Northside to continue to provide the best health care options for our community.

Sincerely,
Stephen Wells, MD

CONFIDENTIALITY NOTICE: This electronic mail transmission has been sent by Northside Hospital. It may contain information that is confidential, privileged, proprietary, or otherwise legally exempt from disclosure. If you are not the intended recipient, you are hereby notified that you are not authorized to read, print, retain, copy or disseminate this message, any part of it, or any attachments. If you have received this message in error, please delete this message and any attachments from your system without reading the content and notify the sender immediately of the inadvertent transmission. There is no intent on the part of the sender to waive any privilege.

From: Seth A. Yellin
Sent: Friday, September 02, 2016 3:54 PM
To: COSS Planning and Zoning
Cc: marusha.carpenter@northside.com
Subject: Zoning Approval for Northside Hospital

Follow Up Flag: Follow up
Flag Status: Completed

Sandy Springs Government,

As a Northside Hospital physician I am writing in support of Application Numbers RZ16-0095 & U16-0024. It is imperative that approvals and permits be given now to allow the Northside tower to be built, as the State of Georgia has already determined that Northside Hospital has a need for 53 more beds and has projected a need for at least 32 additional beds in the future. Parking on campus is already over capacity, and the 1,270 spaces in the new parking deck are critical to allow access to the hospital for patients and their families. A temporary lot on Meridian Mark Drive for employees will greatly improve patient access to the hospital on the main campus, which is needed immediately.

Thank you,

Seth A. Yellin, MD, FACS
Founder & Director, Marietta Facial Plastic Surgery, Laser & Aesthetics Center
Fellow, American Academy of Facial Plastic & Reconstructive Surgery
Diplomate, *American Board of Facial Plastic & Reconstructive Surgery*
Fellow, American Academy of Otolaryngology-Head & Neck Surgery
Diplomate, American Board of Otolaryngology

***Marietta Facial Plastic Surgery,
Laser & Aesthetics Center***

111 Marble Mill Road, NW
Marietta, GA 30060
770.425.7575 (office)
770.425.7568 (fax)
404-290-0101 (cell)
www.mariettafacialplastics.com

This e-mail message (including any attachments) is for the sole use of the intended recipient(s) and may contain confidential

and privileged information. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution or copying of this message (including any attachments) is strictly prohibited.

If you have received this message in error, please contact the sender by reply e-mail message and destroy all copies of the original message (including attachments).

Sottile, Ginger

From: Linda Altman <lindaaltman02@gmail.com>
Sent: Tuesday, September 13, 2016 3:02 PM
To: COSS Planning and Zoning
Subject: Application# RZ16-0095 AND U16-0024

As a Sandy Springs resident for the past 40 years ,we have seen Northside Hospital grow into the standard bearer of excellence that it is today. Once again the hospital needs to grow to continue to serve the needs of our city. It is obvious considering the construction of new buildings in Sandy Springs and the traffic congestion that already exists around the hospital, that additional parking for Northside is critical.

For all the wonderful things said about Atlanta, traffic is not one of them. Sandy Springs can and must do better. We must support this premier institution that almost all Sandy Springs residents will at sometime need.

Mercier-Baggett, Catherine

From: CharlestonA@GTLAW.com on behalf of AltmanA@GTLAW.com
Sent: Tuesday, September 13, 2016 4:25 PM
To: COSS Planning and Zoning
Cc: marusha.carpenter@northside.com; ssommers@scrudderbass.com
Subject: Northside Hospital - Application Numbers RZ16-0095 & U16-0024

Hello –

I am and have been a resident of Sandy Springs for 42 years (since 1972). My wife and I greatly rely on Northside Hospital as the site for various medical care that we receive over the years, including in hospital stay.

I support Northside's request for zoning approval and immediate permitting for a new, seven story, 53 bed medical surgical tower to be located adjacent to the Northside Cancer Center on Peachtree Dunwoody Road. In addition, I support the approval for Northside Hospital to build a 1,270 space parking deck to be situated between the Interchange Building and the Child Care Center along Peachtree Dunwoody Road. I believe this expansion is vitally important to our community and benefits all of us.

Sincerely,

Allen Altman

If you are not an intended recipient of confidential and privileged information in this email, please delete it, notify us immediately at postmaster@gtlaw.com, and do not use or disseminate such information.

Mercier-Baggett, Catherine

From: AltmanA@GTLAW.com
Sent: Wednesday, September 14, 2016 5:29 PM
To: COSS Planning and Zoning
Cc: Marusha.carpenter@northside.com; ssommers@scruddebass.com;
@gmail.com
Subject: FW: Application# RZ16-0095 AND U16-0024

Please see the below email from my wife, Linda Altman –a long-time Sandy Springs resident. Allen Altman

From: Linda Altman [mailto:lindaaltman02@gmail.com]
Sent: Wednesday, September 14, 2016 5:22 PM
To: Altman, Allen (Shld-Atl-CP-TX-T&E)
Subject: Fwd: Application# RZ16-0095 AND U16-0024

Perhaps someone can forward this. Thanks.

----- Forwarded message -----

From: Linda Altman >
Date: Tue, Sep 13, 2016 at 3:01 PM
Subject: Application# RZ16-0095 AND U16-0024
To: pz@sandyspringsga.gov

As a Sandy Springs resident for the past 40 years ,we have seen Northside Hospital grow into the standard bearer of excellence that it is today. Once again the hospital needs to grow to continue to serve the needs of our city. It is obvious considering the construction of new buildings in Sandy Springs and the traffic congestion that already exists around the hospital, that additional parking for Northside is critical. For all the wonderful things said about Atlanta, traffic is not one of them. Sandy Springs can and must do better. We must support this premier institution that almost all Sandy Springs residents will at sometime need.

If you are not an intended recipient of confidential and privileged information in this email, please delete it, notify us immediately at postmaster@gtlaw.com, and do not use or disseminate such information.

To: Sandy Springs Planning Committee

From: Wayne L Ambroze M.D. and Deborah Ambroze

Dated: September 10, 2016

Re: Application #'s: RZ19-0095

U16-0024

On September 15th, the Planning Committee is slated to review Northside Hospital's request for zoning approval to build a 53 bed medical surgical tower and a 1270 space parking deck. It is of the utmost importance that these approvals and permits be given as soon as possible. This project will expand Northside's capacity to provide world class care to our community and accommodates the parallel growth of Sandy Springs. The parking deck as well as the temporary lot on Meridian Mark are necessary to service this growth. The state of Georgia has already determined that our community has a need for these 53 beds as well as 32 additional beds in the near future.

With growth there are growing pains and traffic congestion is one of them. Northside has put in place numerous initiatives to try to help reduce traffic problems, including shift changes to off peak times, shuttles to offsite parking, and incentives for employees to use MARTA, among others, Northside has also funded a traffic study through the Georgia DOT and PCID to evaluate other options for traffic improvement in this area that includes 3 hospitals.

I ask that the Committee move expeditiously forward in granting this request. As Sandy Springs prospers and grows it requires the concomitant expansion of this leading health care facility to meet its community needs.

Sincerely,

Wayne L. Ambroze M.D. and Deborah Ambroze

Residents of Sandy Springs

Mercier-Baggett, Catherine

From: Vicki Atkinson
Sent: Tuesday, September 13, 2016 4:58 PM
To: COSS Planning and Zoning
Cc: marusha.carpenter@northside.com
Subject: Zoning approval

> I am a volunteer at Northside Hospital (NSH) and the most challenging part of my work is finding a parking place. And more importantly, this is true for our patients as well. The parking situation gets worse every year.

>

> My email is to request that you approve the zoning permits to begin construction of a parking facility. Application numbers RZ16-0095 & U16-0024. It is crucial that permits be given NOW. It is a win win for The community as a whole and the hospital.

>

> Thank you for your attention to this critical need for our patients and staff at Northside Hospital.

>

> Best regards,

> Vicki Atkinson

> Northside Hospital Auxiliary

>

>

>

> Sent from my iPhone

Mercier-Baggett, Catherine

From: Colleen Austin M.D. <caustin@atlantacancercare.com>
Sent: Wednesday, September 14, 2016 8:43 AM
To: COSS Planning and Zoning
Cc: Marusha.carpenter@northside.com
Subject: FW: Letter to Sandy Springs re RZ16-0095 and U16-0024

I am writing in support of the Northside Hospital plan to build additional parking in preparation for the much needed bed expansion at the hospital. I am a physician at the hospital and a Sandy Springs resident. I am well aware of the traffic issues we face in the city although as with most of us at the hospital my schedule allows me to avoid the worst of rush hour. Where we do face gridlock is in the admissions department and the ER where because of the bed shortage, patients are often waiting hours for a room. We desperately need the bed expansion and a necessary component of that is additional parking for staff, patients and families. Northside has become a destination hospital for the metro area and actually for the Southeast, one of the many businesses that puts Sandy Springs on the map. The hospital administration has made every effort to do its part to minimize its contribution to the traffic problem but the solution cannot be at the expense of patient care. I am not a traffic engineer but it is apparent to those of us who live here that a large part of the problem is that we serve as a thoroughfare for traffic from adjacent communities. Don't penalize the medical facilities for a this problem by restricting necessary expansion...these are beds you or your family members may someday need.

Mercier-Baggett, Catherine

From: Wayne Chiu ·
Sent: Wednesday, September 14, 2016 4:20 PM
To: COSS Planning and Zoning
Subject: Northside Hospital application number RZ16-0095 and U16-0024

14 September 2016

Sandy Springs Planning Commission

City of Sandy Springs Georgia

Regarding application number RZ16-0095 and U16-0024

To Whom It May Concern:

I write to you concerning the hopeful expansion of inpatient medical beds at the Northside Atlanta campus. I serve as the medical director of the Internal Medicine hospitalist program here and have done so now for the last 21 years.

I arrived here in 1995 having left the U.S. Army Medical Corps after 7 years of active duty service. When I first arrived here, I took on this newly conceptualized style of inpatient practice not realizing that this would become the standard of care nationwide with physicians based in the hospital 24 hours/day caring only for hospitalized patients at Northside.

Over the past 21 years, I have watched the Northside Hospital Atlanta system continue to grow. I started with 4 physicians in 1995 and today have 22 full-time and 16 part-time physicians in our practice to support this continuing growth.

Most striking has been the rapid growth in the last several years with a 50% increase in emergency department admissions over the last 3 years to our service. To accommodate this increasing patient load, the hospital has removed all nonessential nonclinical activities off-site to maximize the number of available inpatient beds. Despite this however, we are now running into the situation we are we are unable to find inpatient beds for all our patients on a daily basis. We occasionally now encounter a situation where patients have to overnight in our emergency department - not an ideal care scenario by any means.

Unknown to many, but well known to our EMS services, the Northside Hospital system makes every effort to not go on any form of EMS diversion. As a result not only are we experiencing growth because of our own patient and physician group expansions but we are also pulling new patients from other hospitals when they are diverted from those emergency departments. We also find ourselves as the safety net for patients from nearby rehabilitative care facilities in our area when their residents get ill and cannot return to their home facility due to distance or nonavailability of service. We make every effort to take these patients in and not infrequently these same patients often become permanent patients in the Northside hospital system. Thusly we are becoming victims of our success. This is adding continued pressure on our inpatient beds as well as on the parking spaces available for our patients, their families as well as the staff needed to care for these additional patients.

I want to make a plea for your support in the endeavor to improve and increase both our clinical space and parking services. I not uncommonly run into patients and their family members, highly stressed when they come in already worried about a sick family member and having struggled sometimes for extended periods to find parking.

The Northside Hospital organization prides itself on the Lifetime of Care concept. We want to always be available to our patients. We never want to turn any of our patients away. Forcing them to go to other hospitals when their entire care team is based here is scary at best - and to a sick patient and their families, terrifying probably states it better.

Help us to continue to help our patients and Sandy Springs by letting us expand the clinical beds and associated parking as soon as possible.

Wayne P Chiu, MD

-wpc

Mercier-Baggett, Catherine

From: Kathleen Meucci
Sent: Wednesday, September 14, 2016 2:24 PM
To: COSS Planning and Zoning
Subject: Fw: Support For Application Numbers RZ16-0095 & U16-0024

Dear Sir,

I am an Volunteer Auxilian at Northside Hospital who lives in the Fairfax Townhomes along Glenridge Drive. I live live amidst the Perimeter Center traffic and the construction of both the new Senior Living home AND the new Mercedes Benz Headquarters! As you must know, I am already dealing with an over abundance of traffic issues by just living in my community; and, as I think forward to the completion of these two projects alone, I find myself wondering how the community will handle the health & welfare of the many new lives that will soon be living in my neighborhood, much less continuing to manage the present population!

It has come to my attention that Northside Hospital has received a certificate of need to add 53 new beds to the present hospital load, which should help. I hope that you will share my support of this project & vote to promote the Northside request for growth AND support additional parking which is WAY OVERDUE! There have been days when I come to the Hospital ready to provide my volunteer assistance totally exhausted from fighting the traffic, and then trying to find a parking place!!! The frustration is already overwhelming before I even put on my "smile"; and, to think of the additional population increase without appropriate parking for Healthcare is totally over the top!

A community MUST take care of it's citizens! Please support those of us who live in Sandy Springs! Please help us by promoting Northside Hospital's request to grow and for providing additional parking!

Thank you
Kathleen Meucci

Sandy Springs, Ga 30328

Mercier-Baggett, Catherine

From: Michael Scott
Sent: Thursday, September 15, 2016 4:14 PM
To: COSS Planning and Zoning
Subject: Northside Hospital Parking

Dear Sir:

My pregnant wife and I moved to Sandy Springs in July of 1991. Over the past 25 years I have lived and practiced OB/GYN in Sandy Springs with Northside Hospital as the location for my work.

Since 1991, Northside Hospital and Sandy Springs have undergone phenomenal growth as you know all too well. The present Northside proposal for the Surgical Tower expansion and the Parking deck construction are both necessary for NSH to meet the needs of our population locally and throughout greater Atlanta.

The Parking deck is greatly needed as currently my patients, many of whom are pregnant, cannot find a parking space and are forced to park far away from my office. NSH is in dire need of additional parking for patients and employees.

Thank you for your consideration.

Respectfully your,

--

Michael C. Scott MD

Sottile, Ginger

From: Thomas West
Sent: Tuesday, September 13, 2016 6:23 AM
To: COSS Planning and Zoning
Cc: Marusha Carpenter
Subject: RZ16-0095 & U16-0024 - request for support

September 13, 2016

Dear Sir or Madam,

As a life long resident of Sandy Springs, I ask that you look with favor to support Northside Hospital's Applications **RZ16-0095 & U16-0024**. Northside Hospital opened in 1970 and was built in response to the severe bed shortage at the "in-town" hospitals which catered mostly to a different geographic group of citizens. The wisdom of Northside's continued growth is self evident to those familiar with the breadth of services and the geographic diversity of patients served. We have patients from down the street to oversea countries. We need more beds now, please. More and more elective cases are being performed as outpatients but sick non-elective patients need in-house care and we are beyond capacity. Parking for staff and families is a daily impediment. NSH has done much to assuage this by discouraging the number of cars associated with staffing but there is a limit and ill patients and their families are not prone to mass transit or structured arrival times. We need the temporary lot on MM to defuse the immediate on campus lot. Generally stated, providing care to our community should not be impeded by factors that we can mollify. The hospital has done much and will continue to do so. Please support the hospital's efforts to provide convenient and comfortable access to care.

With warmest respect,

Thomas B. West, M.D.
Laura P. West, M.D.

Sottile, Ginger

From:
Sent: Tuesday, September 13, 2016 6:46 AM
To: COSS Planning and Zoning
Subject: Application RZ16-0095 & U16-0024

Please approve these 2 projects for expanding Northside hospital beds and parking. Rebecca Westermann

Sent from my iPhone

Sottile, Ginger

From: David Westerman <David.Westerman@northside.com>
Sent: Tuesday, September 13, 2016 10:26 PM
To: COSS Planning and Zoning
Cc: Marusha Carpenter
Subject: Application Numbers RZ16-0095 & U16-0024

Sir,

As a staff member at both Northside and St Joseph's Hospitals for over 32 years, and as a Sandy Springs resident, I earnestly ask that the Sandy Springs City Council give favorable consideration to the above applications.

Northside Hospital, as I am sure the Council is aware, is a nationally recognized institution enhancing Sandy Spring's reputation and dedicated to providing its citizens as well as those from far and wide the highest of medical care. Growth accompanies excellence and as such there is an urgent need for expansion. It is therefore vital that approvals and permits be given to allow the Northside tower to be built, as the State of Georgia has already determined that Northside Hospital has a need for 53 more beds and has projected a need for at least 32 additional beds in the future.

- Parking on campus is already over capacity, and the 1,270 spaces in the new parking deck are critical to allow access to the hospital for patients and their families.

- A temporary lot on Meridian Mark Drive for employees will greatly improve patient access to the hospital and is urgently needed.

Growth does bring more traffic and Northside has made several initiatives to ease the potential congestion during construction.

These projects are vital to the health of our community and indeed to the State of Georgia.

Sincerely yours,

David Westerman MD

CONFIDENTIALITY NOTICE: This electronic mail transmission has been sent by Northside Hospital. It may contain information that is confidential, privileged, proprietary, or otherwise legally exempt from disclosure. If you are not the intended recipient, you are hereby notified that you are not authorized to read, print, retain, copy or disseminate this message, any part of it, or any attachments. If you have received this message in error, please delete this message and any attachments from your system without reading the content and notify the sender immediately of the inadvertent transmission. There is no intent on the part of the sender to waive any privilege.