



1100 Marion St., Suite 300  
Knoxville, Tennessee 37921  
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July 3, 2018

Mr. E. J. (Rusty) Baksa  
Land Development Solutions  
310 Simmons Road Suite K  
Knoxville, TN 37922

**RE: FORT SANDER REGIONAL MEDICAL CENTER, KNOXVILLE, TENNESSEE.**

Dear Mr. Baksa:

The traffic assessment is for the planned expansion of the Fort Sanders Regional Medical Center (FSRMC) for an additional 46 beds. The FSRMC is located west of the Knoxville central business district (CBD), north of Cumberland Avenue. **Figure 1** illustrates where FSRMC is located relative to the local and regional road facilities. Nineteenth Street is a 2-lane local street with two-way traffic flow. To the south, 19<sup>th</sup> Street is discontinuous at Clinch Avenue with its termination southbound at the current FSRMC emergency access, and to the north, 19<sup>th</sup> Street becomes a one-way traffic flow southbound north of Highland Avenue. Laurel Avenue is a 2-lane local street west of 19<sup>th</sup> Street with two-way traffic flow and is a single lane with one-way traffic flow, eastbound from 19<sup>th</sup> Street to 17<sup>th</sup> Street. Highland Avenue is a local 2-lane street with two-way traffic. The intersections of 19<sup>th</sup> Street with Laurel Avenue and Highland Avenue are multi-way STOP controlled. From various studies within the FSRMC vicinity conducted by CDM Smith over the past few years, peak-hour traffic is estimated to be 7:30-8:30AM and PM 4:00-5:00PM; therefore, traffic counts were conducted for these hours for the garage access. **Figure 2** illustrates the current garage access traffic to the adjacent local streets.

This bed expansion is in conjunction with the relocation of the emergency facilities and its access and should be completed within the next few years. This emergency facilities relocation will remove the current upper level parking from the Center for Advanced Medicine (CAM) building and expand the parking garage, north of the CAM building. This displaced parking will redistribute to the relocated emergency hospital access and to the expanded garage. This reassignment distribution is illustrated in **Figure 3**. **Table 1** below presents the CAM trips associated with the upper level parking and reflects the trips counted from the Laurel Avenue garage access and the 19<sup>th</sup> Street CAM upper level access (TMCs enclosed).

**TABLE 1-CAM UPPER LEVEL PARKING TRIPS**

AM PEAK			PM PEAK		
ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
24	12	36	29	37	66



**Figure 4** illustrates the upper level parking trip reassignment. **Figure 5** illustrates the resulting traffic with the upper level parking reassignment. For the access to the garage from Laurel Avenue and the relocated emergency access (previous upper level parking), a few trips may enter to drop off and proceed the parking garage as illustrated in trips crossing Laurel Avenue.

The trip generation for the proposed 46 additional beds is presented in **Table 2**. The trip generation for the proposed added beds used the published trip rates from **Trip Generation, 10<sup>th</sup> Edition**.

**TABLE 2-EXPANSION TRIP GENERATION**

LAND USE	LUC		BEDS	DAILY TRIPS	AM PEAK			PM PEAK		
					ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
Hospital	610	Proposed	455	8,693	606	236	842	236	607	842
Hospital	610	Existing	409	8,127	548	213	761	209	538	747
<b>Hospital</b>	<b>610</b>	<b>Change</b>	<b>46</b>	<b>566</b>	<b>59</b>	<b>23</b>	<b>81</b>	<b>27</b>	<b>69</b>	<b>96</b>

REFERENCE: Trip Generation, 10th Edition, Institute of Transportation Engineers

The trip generation of the increased beds for the FMRMC is calculated as the difference in the proposed 455 and the current 409 beds. The difference is used as the equations are not applicable with this proposed change in number of beds, and the trip rates should be applied to the proposed total number of beds of the hospital. The daily trip generation of 566 trips for the FSRMC added beds is less than the 750 daily trips requiring a Level 1 traffic impact assessment by the Knoxville/Knox County MPC. This review of the 46 additional beds is, therefore limited to the review of the additional generated trips and their impact to the existing FSRMC garage access from 19<sup>th</sup> Street; to and from Laurel Avenue; and to Highland Avenue. This review assumes all these trips enter and exit the garage located in the northeast corner of 19<sup>th</sup> Street and Laurel Avenue, disregarding the other available off-street and on-street parking. **Figures 6-9** illustrate the trip distribution and assignment of the proposed new trips and the resulting projected garage access traffic with the 46 additional beds. The trip distribution assumes the current distribution exhibited by the current access traffic for the AM and PM peak hours. Traffic volumes on 19<sup>th</sup> Street, Laurel Avenue, and Highland Avenue are low with minimal through traffic on Laurel Avenue.

The egress from the garage is limited to Laurel Avenue to the east as the exit is onto the one-way street. With minimal through traffic on Laurel Avenue, the conflict is minimal and thereby will operate with minimal delay. The egress to Highland Avenue has more through traffic but this through traffic is low and conflicts should remain minimal. An analysis of the egress to Laurel Avenue and Highland Avenue during the PM peak hour finds the level of service to be a minimum of a LOS B indicating acceptable access operations with insignificant queues, not



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more than a vehicle during the peak period. The added trips to the current traffic conditions will have a minimal impact on the adjacent streets. In addition, the additional traffic will distribute to numerous other parking alternatives, not just the garage studied, and utilize the numerous local street facilities thereby widely distributing any impact such that it will be negligible.

Should you have any questions, please call me.

Sincerely,  
**CDM Smith Inc.**



John F. Gould, P.E.  
Senior Transportation Engineer

Enclosures:    Figures 1-9  
                     PM Peak Synchro HCM Reports  
                     Peak Hour TMCs

Project No. 229617



# VICINITY MAP

## Fort Sanders Regional Medical Center

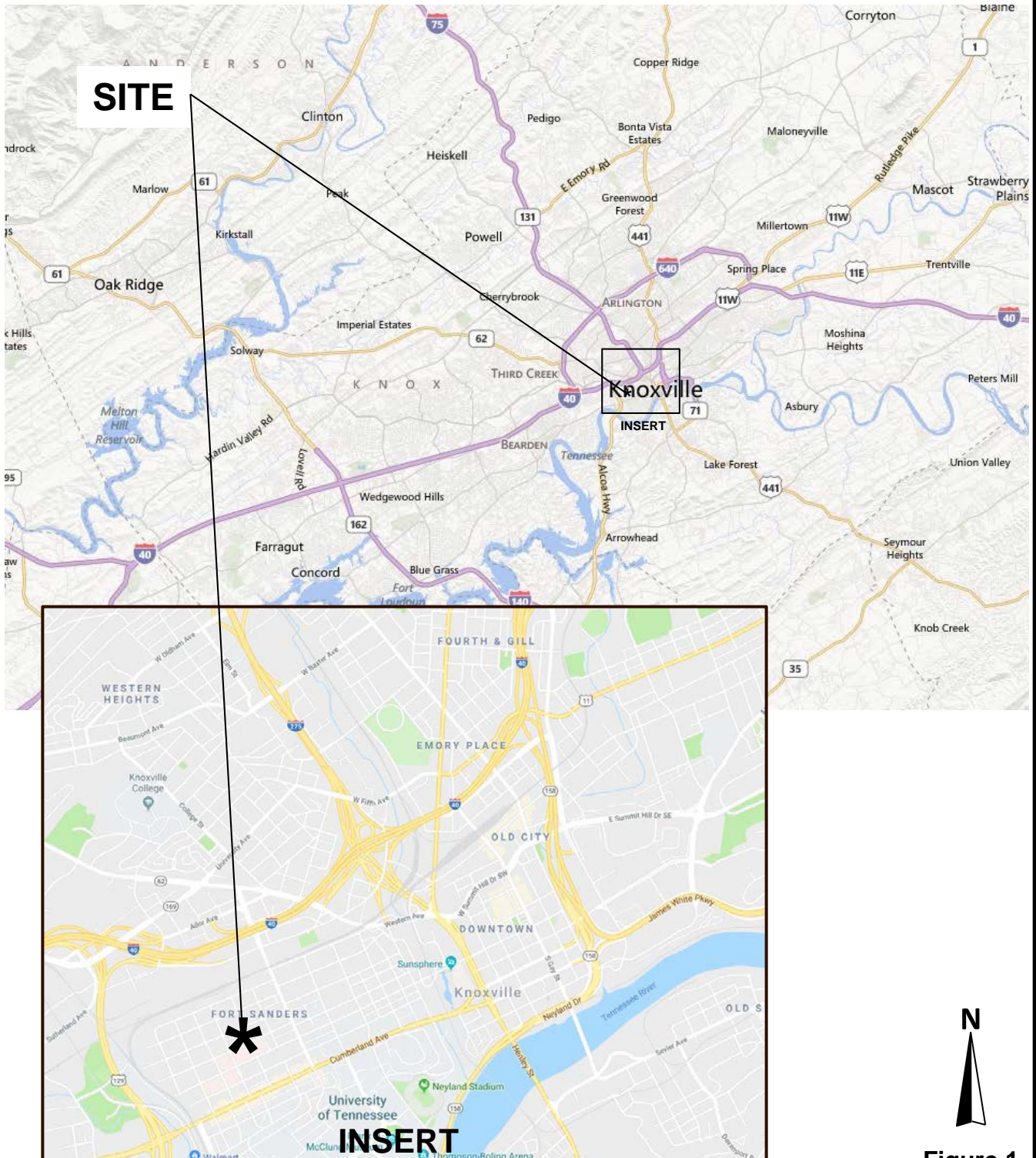
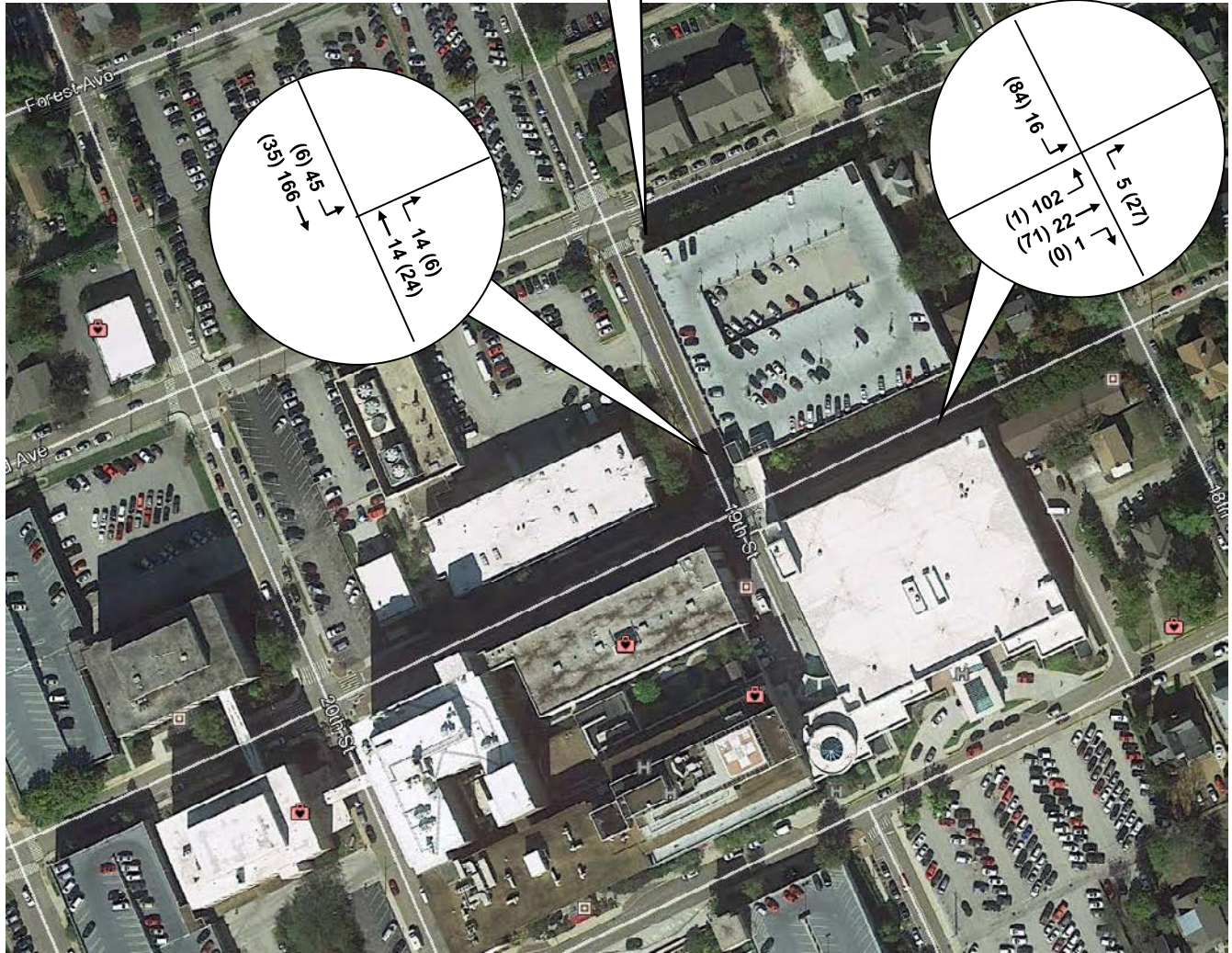


Figure 1



2018  
EXISTING GARAGE  
TRAFFIC  
Fort Sanders Regional  
Medical Center



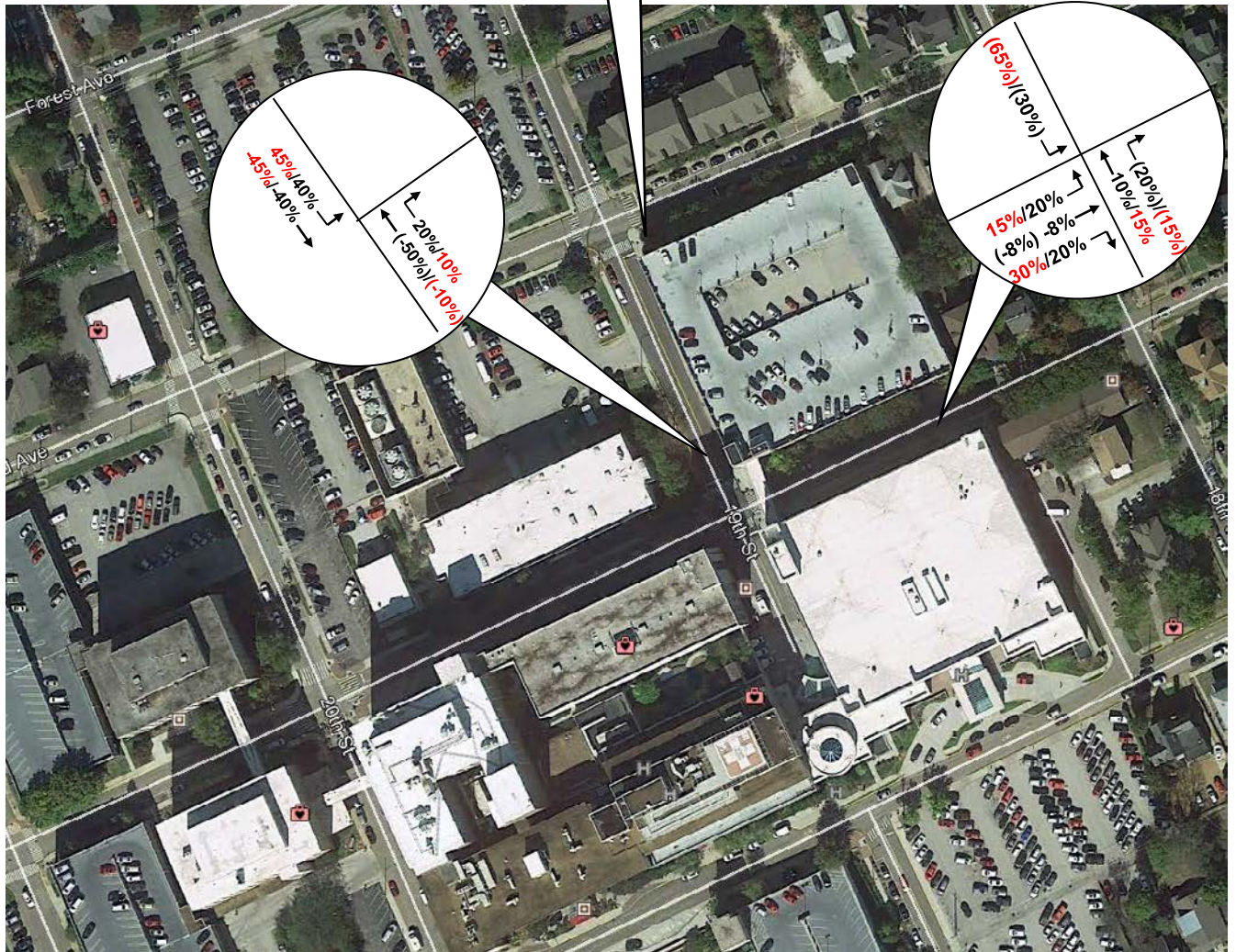
**LEGEND**  
XXX AM PEAK  
(XXX) PM PEAK



Figure 2



# CAM UPPER LEVEL PARKING REASSIGNMENT Fort Sanders Regional Medical Center



## LEGEND

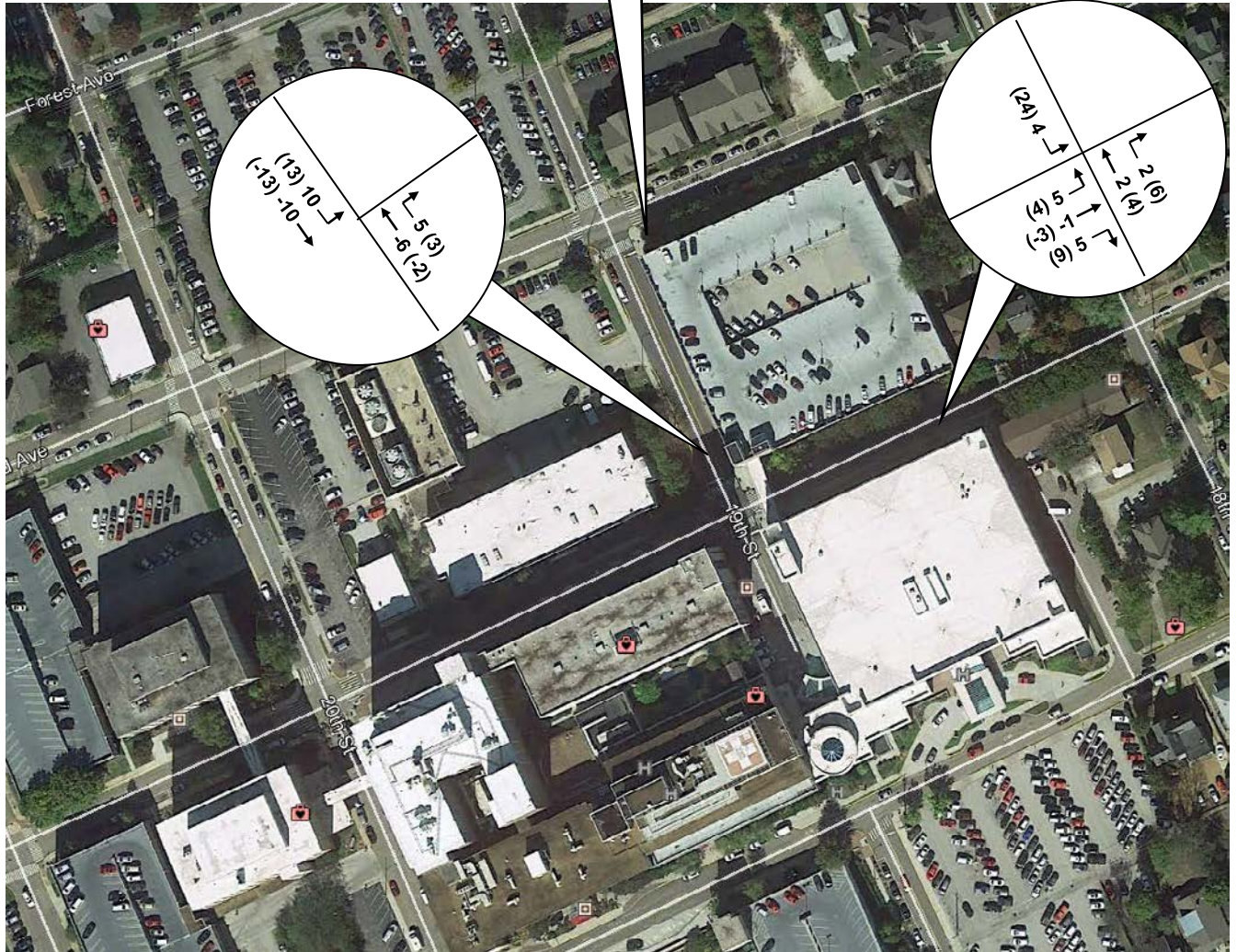
XX%/XX% AM/PM ENTERING TRIPS  
(XX%)/(XX%) AM/PM EXITING TRIPS



Figure 4



# CAM UPPER LEVEL PARKING TRIPS REASSIGNMENT Fort Sanders Regional Medical Center



## LEGEND

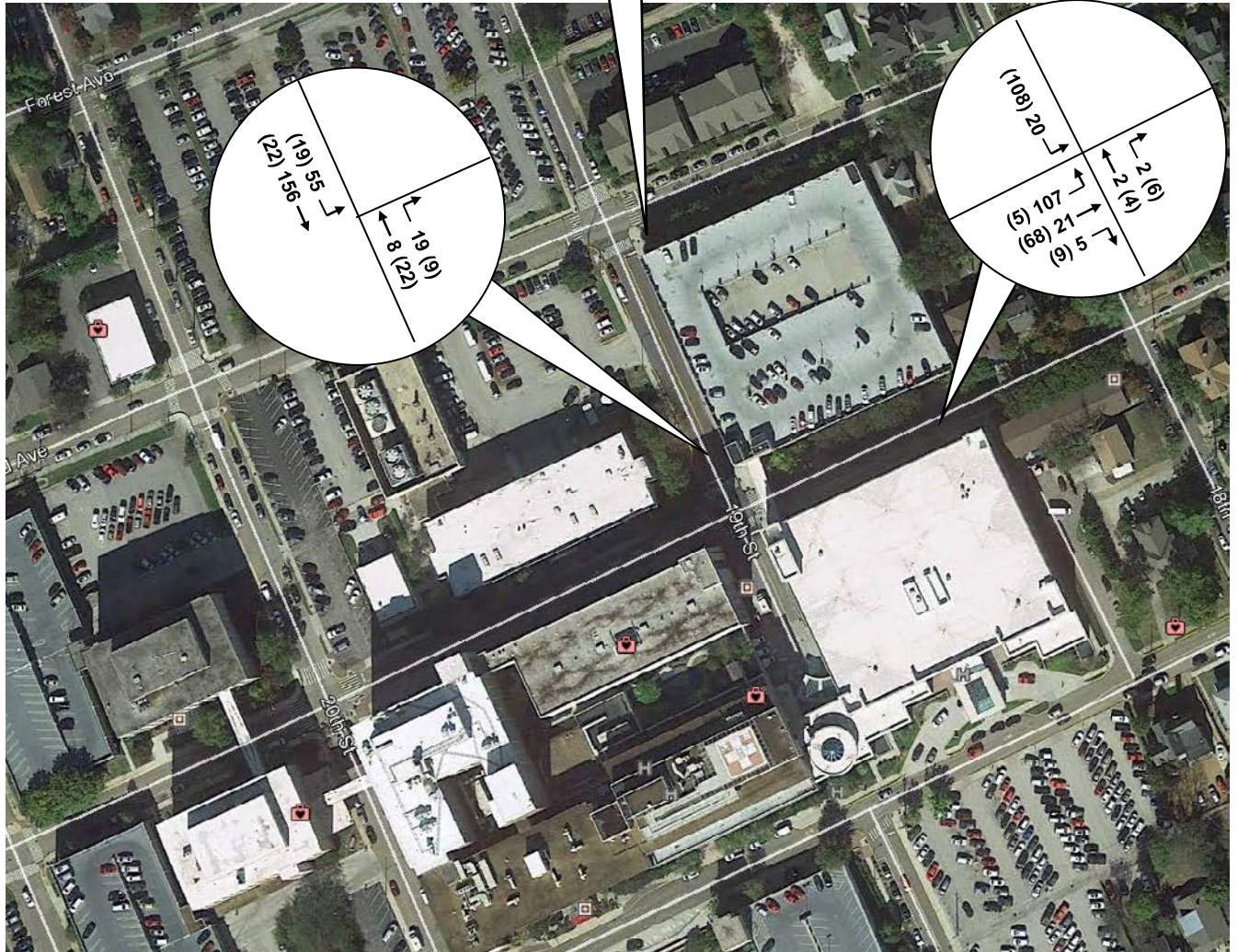
XXX AM PEAK  
(XXX) PM PEAK



Figure 5



# TRAFFIC REASSIGNMENT Fort Sanders Regional Medical Center



## LEGEND

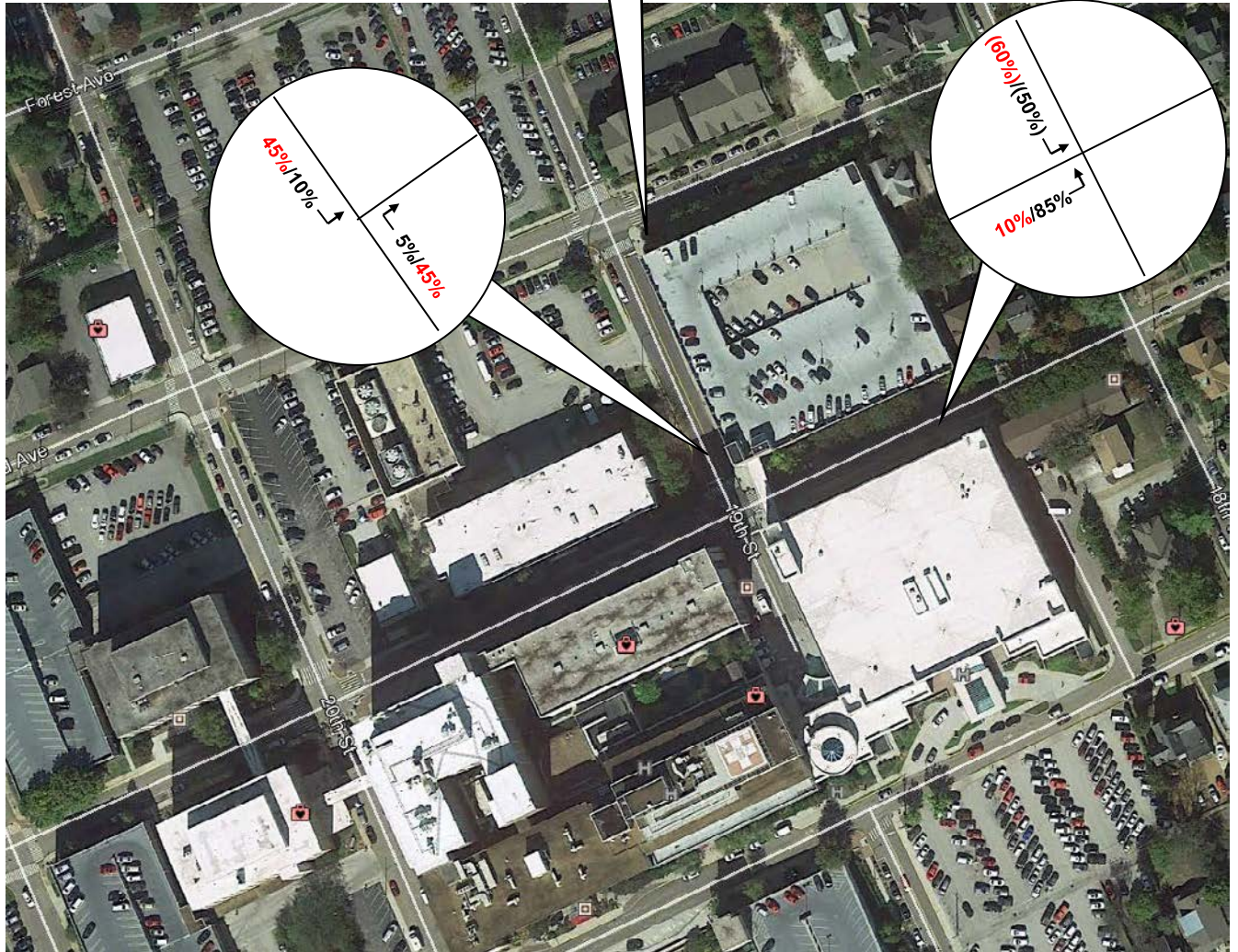
XXX AM PEAK  
(XXX) PM PEAK



Figure 6



# EXPANSION TRIP DISTRIBUTION Fort Sanders Regional Medical Center



## LEGEND

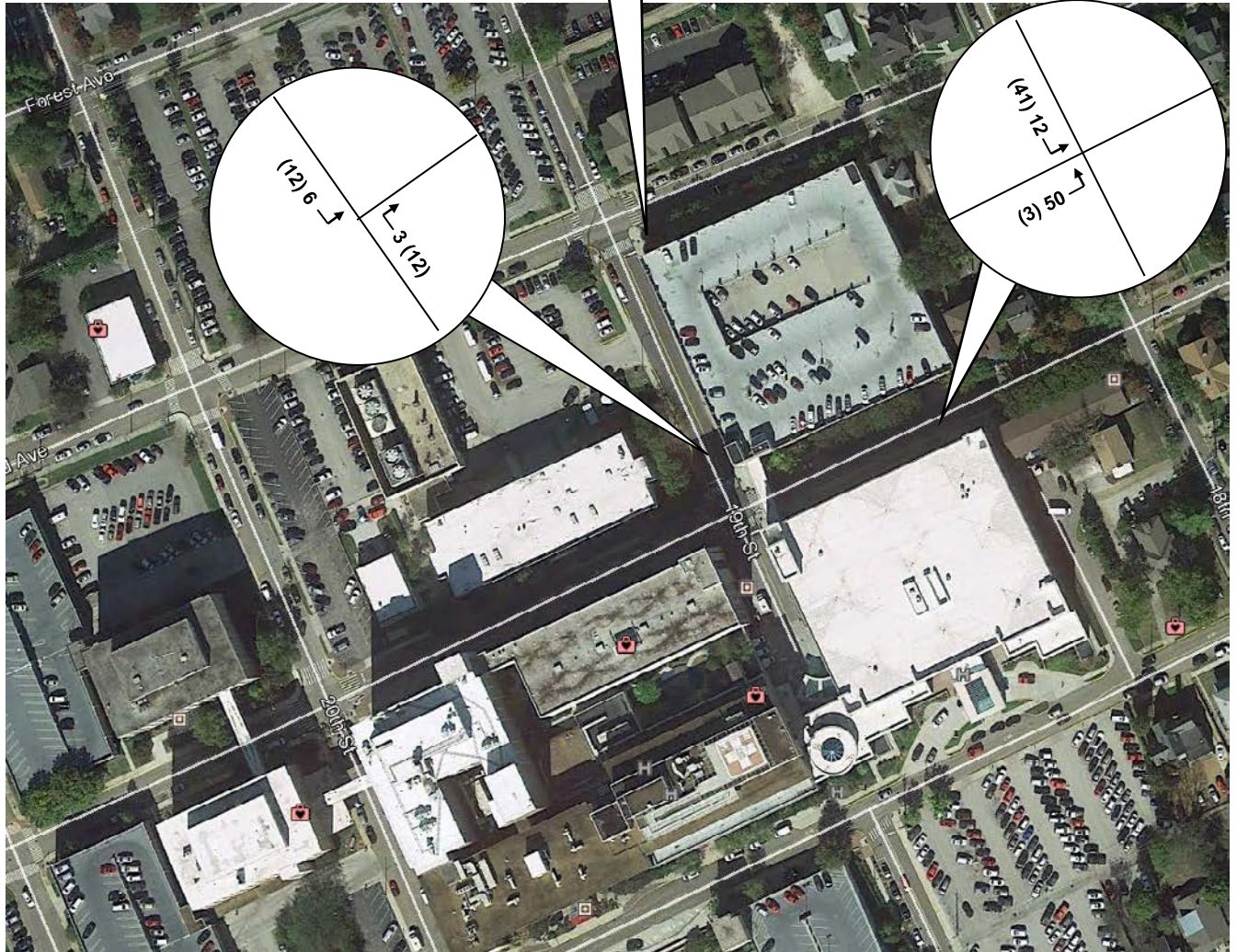
XX%/XX% AM/PM ENTERING TRIPS  
(XX%)/(XX%) AM/PM EXITING TRIPS



Figure 7



# EXPANSION TRIPS Fort Sanders Regional Medical Center



## LEGEND

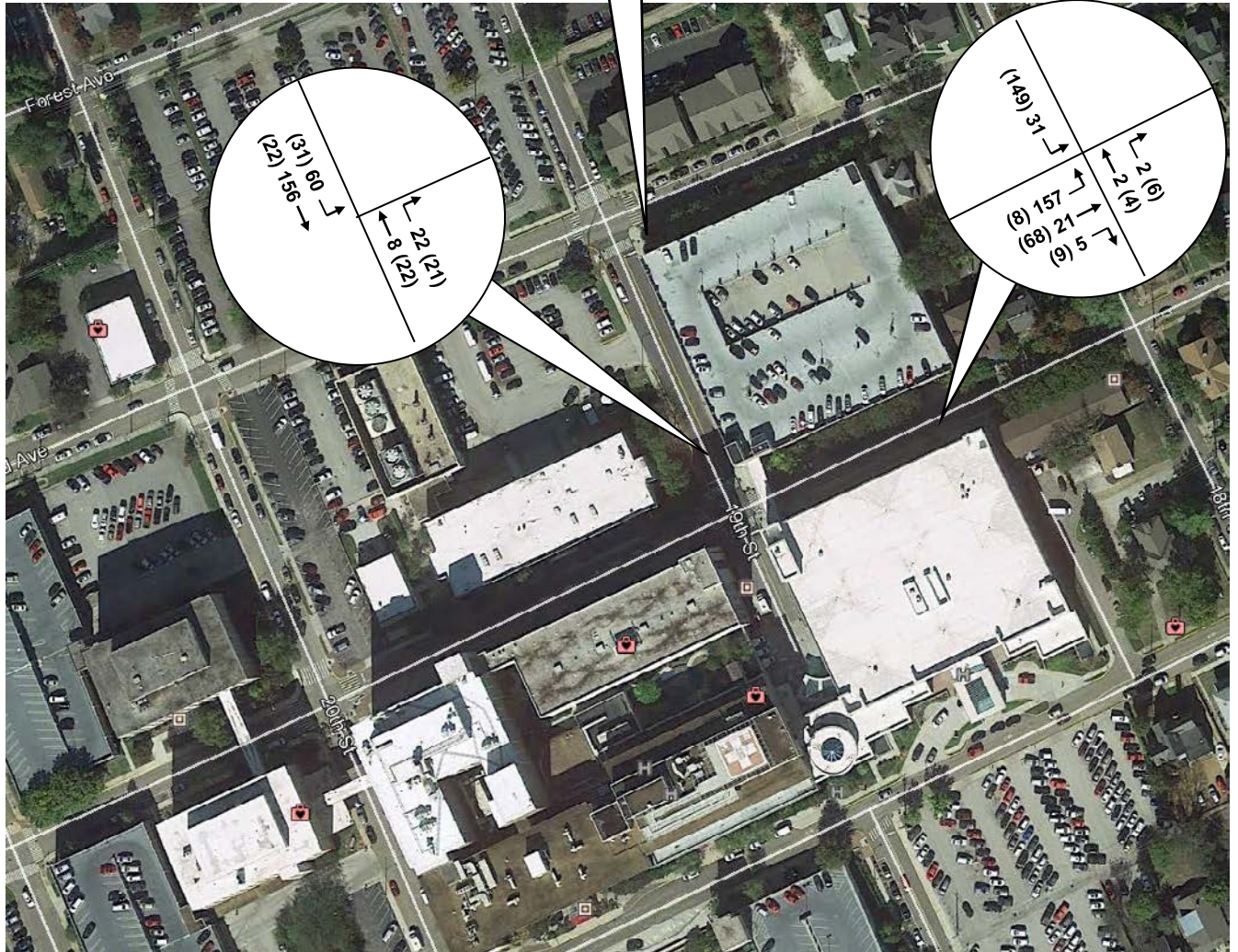
XXX AM PEAK  
(XXX) PM PEAK



Figure 8



# PROJECTED TRAFFIC Fort Sanders Regional Medical Center



## LEGEND

XXX AM PEAK  
(XXX) PM PEAK



Figure 9

HCM 2010 TWSC  
13: Garage/FSRMC Garage & Laurel Avenue

07/03/2018

Intersection

Int Delay, s/veh 7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕							↗	↘		
Traffic Vol, veh/h	8	71	9	0	0	0	0	4	6	149	0	0
Future Vol, veh/h	8	71	9	0	0	0	0	4	6	149	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	0	-	-
Veh in Median Storage, #	-	0	-	-	-	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	92	92	92	92	92	84	70	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	79	10	0	0	0	0	4	7	213	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	0	0	0	-	102	84	104	-	-
Stage 1	-	-	-	-	102	-	0	-	-
Stage 2	-	-	-	-	0	-	104	-	-
Critical Hdwy	4.12	-	-	-	6.52	6.22	7.12	-	-
Critical Hdwy Stg 1	-	-	-	-	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-
Follow-up Hdwy	2.218	-	-	-	4.018	3.318	3.518	-	-
Pot Cap-1 Maneuver	-	-	-	0	788	975	876	0	0
Stage 1	-	-	-	0	811	-	-	0	0
Stage 2	-	-	-	0	-	-	902	0	0
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	788	975	866	-	-
Mov Cap-2 Maneuver	-	-	-	-	788	-	866	-	-
Stage 1	-	-	-	-	811	-	-	-	-
Stage 2	-	-	-	-	-	-	891	-	-

Approach	EB	NB	SB
HCM Control Delay, s		8.7	10.5
HCM LOS		A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	975	-	-	-	866
HCM Lane V/C Ratio	0.007	-	-	-	0.246
HCM Control Delay (s)	8.7	-	-	-	10.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	1



HCM 2010 TWSC  
16: FSRMC Garage & Highland Avenue

07/03/2018

Intersection

Int Delay, s/veh 2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	↑
Traffic Vol, veh/h	224	0	0	61	26	63
Future Vol, veh/h	224	0	0	61	26	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	92	59	59	75	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	280	0	0	103	35	68

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	- 280	0 383 280
Stage 1	-	-	- 280 -
Stage 2	-	-	- 103 -
Critical Hdwy	-	- 4.12	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	-	- 2.218	- 3.518 3.318
Pot Cap-1 Maneuver	-	0 1283	- 620 759
Stage 1	-	0	- 767 -
Stage 2	-	0	- 921 -
Platoon blocked, %	-		-
Mov Cap-1 Maneuver	-	- 1283	- 620 759
Mov Cap-2 Maneuver	-	-	- 620 -
Stage 1	-	-	- 767 -
Stage 2	-	-	- 921 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	WBL	WBT
Capacity (veh/h)	706	-	1283	-
HCM Lane V/C Ratio	0.146	-	-	-
HCM Control Delay (s)	11	-	0	-
HCM Lane LOS	B	-	A	-
HCM 95th %tile Q(veh)	0.5	-	0	-

# CDM Smith, Inc.

1100 Marion Street, Ste 300

Knoxville, TN 37921

865-963-4300

File Name : 19th Street Access

Site Code : 00000123

Start Date : 6/1/2018

Page No : 1

## Groups Printed- Unshifted

	19TH STREET Southbound				GARAGE ACCESS Westbound				19TH STREET Northbound				GARAGE ACCESS Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:30 AM	16	60	0	76	0	0	0	0	0	6	6	12	0	0	0	0	88
07:45 AM	11	51	0	62	0	0	0	0	0	2	4	6	0	0	0	0	68
Total	27	111	0	138	0	0	0	0	0	8	10	18	0	0	0	0	156
08:00 AM	9	32	0	41	0	0	0	0	0	4	4	8	0	0	0	0	49
08:15 AM	9	23	0	32	0	0	0	0	0	2	0	2	0	0	0	0	34
*** BREAK ***																	
Total	18	55	0	73	0	0	0	0	0	6	4	10	0	0	0	0	83
*** BREAK ***																	
04:00 PM	1	8	0	9	0	0	0	0	0	6	1	7	0	0	0	0	16
04:15 PM	1	10	0	11	0	0	0	0	0	4	0	4	0	0	0	0	15
04:30 PM	2	8	0	10	0	0	0	0	0	9	1	10	0	0	0	0	20
04:45 PM	2	9	0	11	0	0	0	0	0	5	4	9	0	0	0	0	20
Total	6	35	0	41	0	0	0	0	0	24	6	30	0	0	0	0	71
Grand Total	51	201	0	252	0	0	0	0	0	38	20	58	0	0	0	0	310
Apprch %	20.2	79.8	0		0	0	0		0	65.5	34.5		0	0	0		
Total %	16.5	64.8	0	81.3	0	0	0	0	0	12.3	6.5	18.7	0	0	0	0	

	19TH STREET Southbound				GARAGE ACCESS Westbound				19TH STREET Northbound				GARAGE ACCESS Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	<b>16</b>	<b>60</b>	0	<b>76</b>	0	0	0	0	0	<b>6</b>	<b>6</b>	<b>12</b>	0	0	0	0	<b>88</b>
07:45 AM	11	51	0	62	0	0	0	0	0	2	4	6	0	0	0	0	68
08:00 AM	9	32	0	41	0	0	0	0	0	4	4	8	0	0	0	0	49
08:15 AM	9	23	0	32	0	0	0	0	0	2	0	2	0	0	0	0	34
Total Volume	45	166	0	211	0	0	0	0	0	14	14	28	0	0	0	0	239
% App. Total	21.3	78.7	0		0	0	0		0	50	50		0	0	0		
PHF	.703	.692	.000	.694	.000	.000	.000	.000	.000	.583	.583	.583	.000	.000	.000	.000	.679

Peak Hour Analysis From 12:00 PM to 04:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

04:00 PM	1	8	0	9	0	0	0	0	0	6	1	7	0	0	0	0	16
04:15 PM	1	<b>10</b>	0	<b>11</b>	0	0	0	0	0	4	0	4	0	0	0	0	15
04:30 PM	<b>2</b>	8	0	10	0	0	0	0	0	<b>9</b>	<b>1</b>	<b>10</b>	0	0	0	0	<b>20</b>
04:45 PM	2	9	0	11	0	0	0	0	0	5	4	9	0	0	0	0	20
Total Volume	6	35	0	41	0	0	0	0	0	24	6	30	0	0	0	0	71
% App. Total	14.6	85.4	0		0	0	0		0	80	20		0	0	0		
PHF	.750	.875	.000	.932	.000	.000	.000	.000	.000	.667	.375	.750	.000	.000	.000	.000	.888



# CDM Smith, Inc.

1100 Marion Street, Ste 300

Knoxville, TN 37921

865-963-4300

File Name : Highland Access

Site Code : 00000000

Start Date : 6/1/2018

Page No : 1

## Groups Printed- Unshifted

	GARAGE ACCESS Southbound				HIGHLAND AVE Westbound				GARAGE ACCESS Northbound				HIGHLAND AVE Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:30 AM	0	0	0	0	0	22	0	22	1	0	3	4	0	20	0	20	46
07:45 AM	0	0	0	0	0	31	0	31	2	0	3	5	0	23	0	23	59
Total	0	0	0	0	0	53	0	53	3	0	6	9	0	43	0	43	105
08:00 AM	0	0	0	0	0	20	0	20	1	0	1	2	0	18	0	18	40
08:15 AM	0	0	0	0	0	14	0	14	1	0	3	4	0	22	0	22	40
*** BREAK ***																	
Total	0	0	0	0	0	34	0	34	2	0	4	6	0	40	0	40	80
*** BREAK ***																	
04:00 PM	0	0	0	0	0	11	0	11	4	0	8	12	0	51	0	51	74
04:15 PM	0	0	0	0	0	8	0	8	1	0	13	14	0	48	0	48	70
04:30 PM	0	0	0	0	0	11	0	11	6	0	12	18	0	71	0	71	100
04:45 PM	0	0	0	0	0	22	0	22	3	0	7	10	0	56	0	56	88
Total	0	0	0	0	0	52	0	52	14	0	40	54	0	226	0	226	332
Grand Total	0	0	0	0	0	139	0	139	19	0	50	69	0	309	0	309	517
Apprch %	0	0	0		0	100	0		27.5	0	72.5		0	100	0		
Total %	0	0	0	0	0	26.9	0	26.9	3.7	0	9.7	13.3	0	59.8	0	59.8	

	GARAGE ACCESS Southbound				HIGHLAND AVE Westbound				GARAGE ACCESS Northbound				HIGHLAND AVE Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	22	0	22	1	0	3	4	0	20	0	20	46
07:45 AM	0	0	0	0	0	31	0	31	2	0	3	5	0	23	0	23	59
08:00 AM	0	0	0	0	0	20	0	20	1	0	1	2	0	18	0	18	40
08:15 AM	0	0	0	0	0	14	0	14	1	0	3	4	0	22	0	22	40
Total Volume	0	0	0	0	0	87	0	87	5	0	10	15	0	83	0	83	185
% App. Total	0	0	0		0	100	0		33.3	0	66.7		0	100	0		
PHF	.000	.000	.000	.000	.000	.702	.000	.702	.625	.000	.833	.750	.000	.902	.000	.902	.784

Peak Hour Analysis From 12:00 PM to 04:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

04:00 PM	0	0	0	0	0	11	0	11	4	0	8	12	0	51	0	51	74
04:15 PM	0	0	0	0	0	8	0	8	1	0	13	14	0	48	0	48	70
04:30 PM	0	0	0	0	0	11	0	11	6	0	12	18	0	71	0	71	100
04:45 PM	0	0	0	0	0	22	0	22	3	0	7	10	0	56	0	56	88
Total Volume	0	0	0	0	0	52	0	52	14	0	40	54	0	226	0	226	332
% App. Total	0	0	0		0	100	0		25.9	0	74.1		0	100	0		
PHF	.000	.000	.000	.000	.000	.591	.000	.591	.583	.000	.769	.750	.000	.796	.000	.796	.830

# CDM Smith, Inc.

1100 Marion Street, Ste 300

Knoxville, TN 37921

865-963-4300

File Name : Laurel Access

Site Code : 00000321

Start Date : 6/1/2018

Page No : 1

## Groups Printed- Unshifted

	GARAGE ACCESS Southbound				LAUREL AVE Westbound				GARAGE ACCESS Northbound				LAUREL AVE Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:30 AM	6	0	0	6	0	0	0	0	0	0	0	0	36	7	0	43	49
07:45 AM	2	0	0	2	0	0	0	0	0	0	4	4	36	6	1	43	49
Total	8	0	0	8	0	0	0	0	0	0	4	4	72	13	1	86	98
08:00 AM	5	0	0	5	0	0	0	0	0	0	1	1	20	4	0	24	30
08:15 AM	3	0	0	3	0	0	0	0	0	0	0	0	10	5	0	15	18
*** BREAK ***																	
Total	8	0	0	8	0	0	0	0	0	0	1	1	30	9	0	39	48
*** BREAK ***																	
04:00 PM	10	0	0	10	0	0	0	0	0	0	6	6	1	16	0	17	33
04:15 PM	20	0	0	20	0	0	0	0	0	0	8	8	0	20	0	20	48
04:30 PM	24	0	0	24	0	0	0	0	0	0	8	8	0	20	0	20	52
04:45 PM	30	0	0	30	0	0	0	0	0	0	5	5	0	15	0	15	50
Total	84	0	0	84	0	0	0	0	0	0	27	27	1	71	0	72	183
Grand Total	100	0	0	100	0	0	0	0	0	0	32	32	103	93	1	197	329
Apprch %	100	0	0		0	0	0		0	0	100		52.3	47.2	0.5		
Total %	30.4	0	0	30.4	0	0	0	0	0	0	9.7	9.7	31.3	28.3	0.3	59.9	

	GARAGE ACCESS Southbound				LAUREL AVE Westbound				GARAGE ACCESS Northbound				LAUREL AVE Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	6	0	0	6	0	0	0	0	0	0	0	0	36	7	0	43	49
07:45 AM	2	0	0	2	0	0	0	0	0	0	4	4	36	6	1	43	49
08:00 AM	5	0	0	5	0	0	0	0	0	0	1	1	20	4	0	24	30
08:15 AM	3	0	0	3	0	0	0	0	0	0	0	0	10	5	0	15	18
Total Volume	16	0	0	16	0	0	0	0	0	0	5	5	102	22	1	125	146
% App. Total	100	0	0		0	0	0		0	0	100		81.6	17.6	0.8		
PHF	.667	.000	.000	.667	.000	.000	.000	.000	.000	.000	.313	.313	.708	.786	.250	.727	.745

Peak Hour Analysis From 12:00 PM to 04:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

04:00 PM	10	0	0	10	0	0	0	0	0	0	6	6	1	16	0	17	33
04:15 PM	20	0	0	20	0	0	0	0	0	0	8	8	0	20	0	20	48
04:30 PM	24	0	0	24	0	0	0	0	0	0	8	8	0	20	0	20	52
04:45 PM	30	0	0	30	0	0	0	0	0	0	5	5	0	15	0	15	50
Total Volume	84	0	0	84	0	0	0	0	0	0	27	27	1	71	0	72	183
% App. Total	100	0	0		0	0	0		0	0	100		1.4	98.6	0		
PHF	.700	.000	.000	.700	.000	.000	.000	.000	.000	.000	.844	.844	.250	.888	.000	.900	.880



**CDM Smith, Inc.**  
1100 Marion Street, Suite 300  
Knoxville, TN 37921

File Name : 19th Laurel  
Site Code : 00001234  
Start Date : 7/2/2018  
Page No : 1

Groups Printed- Unshifted

	19th Street Southbound				Laurel Ave Westbound				19th Street Northbound				Laurel Ave Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
*** BREAK ***																	
07:30 AM	0	3	0	3	0	0	0	0	0	3	0	3	3	0	0	3	9
07:45 AM	0	5	0	5	0	0	0	0	1	2	0	3	2	0	0	2	10
Total	0	8	0	8	0	0	0	0	1	5	0	6	5	0	0	5	19
08:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	1	0	0	1	3
08:15 AM	0	2	0	2	0	0	0	0	0	1	0	1	5	0	0	5	8
*** BREAK ***																	
Total	0	4	0	4	0	0	0	0	0	1	0	1	6	0	0	6	11
*** BREAK ***																	
04:00 PM	0	6	0	6	0	0	0	0	0	0	2	2	2	0	0	2	10
04:15 PM	0	8	0	8	0	0	0	0	1	2	1	4	3	0	0	3	15
04:30 PM	0	2	0	2	0	0	0	0	0	0	2	2	4	0	0	4	8
04:45 PM	0	3	0	3	0	0	0	0	2	0	0	2	1	0	0	1	6
Total	0	19	0	19	0	0	0	0	3	2	5	10	10	0	0	10	39
Grand Total	0	31	0	31	0	0	0	0	4	8	5	17	21	0	0	21	69
Apprch %	0	100	0		0	0	0		23.5	47.1	29.4		100	0	0		
Total %	0	44.9	0	44.9	0	0	0	0	5.8	11.6	7.2	24.6	30.4	0	0	30.4	

	19th Street Southbound				Laurel Ave Westbound				19th Street Northbound				Laurel Ave Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	3	0	3	0	0	0	0	0	3	0	3	3	0	0	3	9
07:45 AM	0	5	0	5	0	0	0	0	1	2	0	3	2	0	0	2	10
08:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	1	0	0	1	3
08:15 AM	0	2	0	2	0	0	0	0	0	1	0	1	5	0	0	5	8
Total Volume	0	12	0	12	0	0	0	0	1	6	0	7	11	0	0	11	30
% App. Total	0	100	0		0	0	0		14.3	85.7	0		100	0	0		
PHF	.000	.600	.000	.600	.000	.000	.000	.000	.250	.500	.000	.583	.550	.000	.000	.550	.750

Peak Hour Analysis From 12:00 PM to 04:45 PM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 04:00 PM

04:00 PM	0	6	0	6	0	0	0	0	0	0	2	2	2	0	0	2	10
04:15 PM	0	8	0	8	0	0	0	0	1	2	1	4	3	0	0	3	15
04:30 PM	0	2	0	2	0	0	0	0	0	0	2	2	4	0	0	4	8
04:45 PM	0	3	0	3	0	0	0	0	2	0	0	2	1	0	0	1	6
Total Volume	0	19	0	19	0	0	0	0	3	2	5	10	10	0	0	10	39
% App. Total	0	100	0		0	0	0		30	20	50		100	0	0		
PHF	.000	.594	.000	.594	.000	.000	.000	.000	.375	.250	.625	.625	.625	.000	.000	.625	.650



1100 Marion St., Suite 300  
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July 3, 2018

Ms. Tarren Barrett  
Knox County MPC  
400 Main Street  
Knoxville, TN 37902

**SUBJECT: FORT SANDERS REGIONAL MEDICAL CENTER TRAFFIC IMPACT  
LETTER REVIEW (7-A-18-UR)  
CDM SMITH RESPONSES**

Dear Ms. Barnett:

The comments received June 28, 2018 for the above referenced letter are address as follows:

1. Grammatical errors
  - a. Add comma after "traffic flow" (page 1, 3rd sentence from the bottom of the first paragraph)
  - b. Remove "are" before " a multi-way STOP" (page 1, last sentence at the end of the first paragraph) and add "is". Make "intersections" singular because the sentence is talking about 1 intersection.
  - c. Add "trips" after "566" (page 2, 3rd sentence first paragraph)
  - d. Modify "the exit is to the on-way street" to "the exit is on the one-way street" (page 2, 1st sentence last paragraph)

**Addressed**

2. The traffic counts (mentioned on page 2 and typically 2-hrs long) are discussed as the peak hours within the AM & PM. Were the counts only completed within a 1-hr span in the AM & PM?

**Peak-hour TMCs were conducted for the garage accesses based on the peak hours identified from numerous studies conducted by CDM Smith in the FSRMC vicinity over the past few years. Letter is revised with this statement.**

3. The study identifies the large parking garage as the only garage with vehicle entry and exit. Although the majority of the parking will be in the large parking garage, will there not be parking still in the CAM building? This was noticed in page 2, 2nd paragraph
  - a. Related to this, there are 3 garage access points from the north side of the building to the CAM parking garage. Since none of these access points were discussed, please include them within the analysis and discussion of the letter.

**Letter expanded to include the reassignment of CAM trips to the garage accesses.**





4. There was no discussion concerning the details of what Fort Sanders Hospital is ultimately wanting to do on the premises (ie. swapping parking spaces, beds, etc., where they are going, and what is happening with the empty space(s), if any). Please provide more detailed discussion as originally discussed with the applicant.

Added additional description of the current plan as it relates to the traffic projections and reassignments.

5. In Figure 2, the NB PM direction for the Laurel Ave garage exits should be 27, instead of 227, as per the traffic count sheet.

Addressed

6. In Figure 3, there is parking on the south-side garage off of Laurel Ave that will still remain, so why is there no distribution to or from this garage area? Is the assumption that only parking will be in the expanded parking garage? Also, where is the thru distribution of 5%/35% at the intersection of Highland Ave & garage access going toward? It seems as though it would head toward the 19th St & garage access, but doesn't replicate to the 10%/45% that is currently there. Please explain.

The letter report now reflects a reassignment of CAM upper level parking trips. The 5%/35% reflects the distribution from the east at the Highland Avenue access; the 10%/45% distribution reflects trips from the east, west and north at the 19<sup>th</sup> Street access.

7. In Figure 5, if parking in the CAM building is being reduced and no distribution is shown in Figure 4, then why is the same traffic count predicted for the right-only exit/northbound garage access to Laurel Ave? Please explain.

Letter expanded to include the reassignment of CAM trips to the garage accesses.

8. When is the projected p
9. roject supposed to be finished, or when is the assumed final design year? This needs to be discussed in the detailed synopsis of the project (mentioned in #4 above).

The expansion should be completed within the next few years. The letter is revised to further clarify our understanding of the FSRMC plan as it relates to the traffic analysis of the garage access. As identified in the analyses, the traffic impact is negligible.



Ms. Tarrren Barrett  
Knox County MPC  
July 3, 2018  
Page 3

10. The queuing for the expanded parking garage needs to be evaluated. Sufficient queuing needs to be provided on site. It may be necessary to look into the option of quick cycle gates to help cut down on queue length/time.

Analyses of the STOP controlled access indicates not more than 1 vehicle queue from the garage access during the peak period. The projected traffic to and from the Laurel Avenue garage access would be approximately 2.5 vehicles per minute arriving at the gate, which should not result in any adverse queues as typical service rates for a gate operation can be a design of 150 to 320vph. Exiting queues due to the gate operation will be within the garage and would not impact the public streets.

Please contact me if additional information or clarification is needed.

Sincerely,  
**CDM SMITH INC.**



John F. Gould, P.E.  
Senior Transportation Engineer

pc: Rusty Baksa, Land Development Solutions

Project No. 229617

