

July 28, 2017

Mr. Ted Zafiris
JZ Inc.
D.B.A. Dunkin' Donuts
1 Kirby Road
Cromwell, CT 06416

**Re: Proposed Dunkin' Donuts
639 Main Street (Route 5)
East Hartford, CT
Our File: 17110**

Dear Mr. Zafiris:

Pursuant to your request our office has completed a study of the potential impact of a proposed 2,660 s.f. Dunkin' Donuts Restaurant with a drive through window proposed for property located at 639 Main Street in East Hartford, Connecticut. This report is written to present our findings. The site location is presented in Figure 1.

The proposed development is depicted on plans prepared by Dutton Associates, LLC. The site plan shows a single 2,660 s.f. building located in the southeast corner of the site. A drive through window is proposed for the east side of the building with the drive through lane extending in a counterclockwise direction around the building. A total of 31 parking spaces are provided on site. Access to the site is proposed by way of a full access driveway to Pitkin Street located approximately 110 feet west of the eastbound stop bar at the intersection of Route 5. There are two driveways proposed to Route 5, a right in/right out driveway located approximately 220 feet south of the Pitkin Street centerline. A second right turn exit-only driveway is proposed along the southerly property line.

The Pitkin Street driveway is shared with the adjacent parcel. That property is occupied by a 9,100 s.f. Pawn Shop. The Pawn Shop provides a total of 14 parking spaces. Access to the parcel includes the shared driveway with Dunkin' Donuts and an exit-only driveway located on the west side of the parcel. There is a one way driveway around the building in the counter clockwise direction.

Existing Conditions

The site proposed for development is located on the southwest corner of the intersection of Route 5 and Pitkin Street in the Town of East Hartford, CT. Route 5 is a State maintained roadway that traverses the Town of East Hartford from Glastonbury in

the south to South Windsor in the north. Within East Hartford the roadway has the name Main Street. Main Street, south of the Charter Oak Bridge, carries the designation of SR 517. Route 5 crosses over the Connecticut River on the Charter Oak Bridge into Hartford. Main Street generally provides two northbound and two southbound travel lanes throughout the town of East Hartford. Additional turn lanes are provided at signalized intersections. South of the I-84 overpass, Main Street is a divided roadway with a raised median separating the northbound and southbound lanes. North of the I-84 overpass the roadway is a four lane un-divided roadway. Land use along Main Street is a mix of multi-family residential and commercial uses. The roadway is posted at 35 miles per hour.

Pitkin Street is a Town maintained roadway that originates at Main Street and extends in a westerly direction past the subject a distance of approximately .85 miles to its terminus at East River Drive. Pitkin Street provides 40 feet of pavement with a single travel lane and painted shoulder in each direction, separated by a painted double yellow centerline. Land use along Pitkin Street is a mix of residential and commercial uses, east of the Route 2 overpass, and a mix of commercial and office uses west of Route 2. The roadway is posted at 30 miles per hour.

The site proposed for development is currently a vacant restaurant. The site is almost completely paved with one driveway to Pitkin Street and two driveways to Route 5. There are a total of approximately 20 paved parking spaces, but since the lot is paved, there is room for an additional 40 vehicles on site. A sidewalk is provided along the entire site frontage.

Background Traffic

In order to determine the impact of new traffic in the area it is necessary to identify the existing traffic on local streets in the vicinity of the site. ConnDOT maintains a database of traffic counts for all state highways. Included within that database is a count station on Route 5, north of Silver Lane. The count, taken in March 2012, indicates an average daily traffic volume of 21,600 vehicles with peak hour volumes of 1,607 vehicles during the a.m. (8:00) peak hour and 1,893 vehicles during the p.m. (4:00) peak hour. That count is presented as Table 1.

ConnDOT also had a count station on Pitkin Street west of Route 5. The count, also conducted during March 2012 indicates an average daily traffic volume of 4,500 vehicles with peak hour volumes of 312 vehicles during the a.m. (8:00) peak hour and 419 vehicles during the p.m. (3:00) peak hour. That count is presented as Table 2.

In order to verify and update the ConnDOT data manual turning movement counts were conducted by our office for the morning, afternoon and Saturday peak hours during February 2017. Copies of the count data are included in the appendix. Figure 2

represents the observed traffic volumes for the peak hours. A 2% per year growth rate was applied to the existing traffic volumes to a design year of 2017. Figure 3 presents the 2017 background traffic volumes. These volumes have been adjusted to reflect the highest observed volumes. We have checked with the Office of the State Traffic Administration and the planning departments in East Hartford to determine if there are any recently approved developments that would generate traffic through the intersection. The two most recent approvals are for the relocation of an office building and the proposed Outlet Shoppes at Rentschler Field. We have determined that these developments will not generate substantial additional traffic through the subject intersection.

Trip Generation

In order to determine the trip generation for the proposed site, the Institute of Transportation Engineers (ITE) *Trip Generation* Report was consulted. *Trip Generation* presents trip generation estimates for many land uses based on counts conducted at existing facilities throughout the country. Included within the ITE database are two land uses that could be applicable to the proposed development. Among them are the following uses; Land Use Code: 937 – Coffee/Donut Shop with Drive Thru Window and Land Use Code: 934 – Fast Food Restaurant. The report presents data based on building size and adjacent street traffic volumes. Trip generation estimates were calculated for the restaurant uses using the several independent variables. Based on the ITE data the site is projected to generate a total of 343 trips, made up of 175 entering and 168 exiting movements, during the morning peak hour; 190 trips, made up of 95 entering and 95 exiting movements, during the afternoon peak hour; and a total of 225 trips, made up of 112 entering and 113 exiting movements, during the Saturday peak hour.

For comparison purposes we have reviewed the trip generation of the existing Silver Lane facility. You have provided to us three months of register transaction data for the Silver Lane store. The data, from October 2, 2016 through December 31, 2016 is presented in the appendix, and summarized in Table C, also provided in the appendix. The data indicates an average morning peak hour customer count of 145 over the three month period, with a peak volume of 187 customers. The morning peak hour typically occurs during the 7:00 a.m. hour. A peak afternoon customer count of 82 customers was observed. A Saturday peak hour volume of 159 customers was also observed.

We have chosen to use the higher of the observed volumes and the calculated volumes for the proposed site. Therefore we are using the Observed volumes from the Silver Lane Store for the morning and Saturday peak hours and the calculated volumes from ITE for the afternoon peak hour. The site generated traffic volumes used in the report are denoted in bold type and summarized in Table 3.

Figure 4 presents a representation of the Directional Distribution of the site generated traffic used in this report. Since the proposed Dunkin' Donuts is a convenience type use, patrons typically arrive and depart the site via a right turn movement. We have adjusted this slightly based on the fact that the restaurant is located at an intersection to reflect the relative volumes on each intersecting roadway. Therefore we have projected a directional distribution with 60% of the site traffic arriving from the north along Main Street, 20% arriving from the south along Main Street, and 20% arriving from the west along Pitkin Street. Departing traffic leaves the site with 60% to the south along Main Street, 20% to the north along Main Street, and 20% to the west along Pitkin Street. In addition, as much as 70% of traffic to this type of facility is generally considered to be Pass-by traffic, or traffic already on the roadway and not newly generated traffic. To be conservative in our analysis we have assumed that 100% of the site generated traffic is new to the roadway network.

Figures 5, 6 and 7 represent the Site Generated Traffic for the morning, afternoon and Saturday peak hours based on this distribution. We have included the site generated traffic for the existing Pawn Shop in this figure as well. By adding the Site Generated Traffic to the background traffic, the Combined Traffic volumes can be represented. These volumes are presented in Figures 8, 9 and 10, and represent the 2018 Combined Traffic volumes.

Capacity Analysis

In order to determine the impact of the site generated traffic on the local roadway network, capacity analyses were conducted for the background and combined traffic volume conditions at the intersection of Main Street with Pitkin Street as well as for the proposed site driveways. The capacity analysis results are summarized in Table 4.

The intersection of Main Street with Pitkin Street is an existing signalized "T" intersection with Main Street oriented in the north/south direction. Pitkin Street approaches from the west. The northbound Main Street approach provides a dedicated left turn lane and two through lanes. The southbound approach provides two through lanes and a dedicated right turn lane that is stop sign controlled. The Pitkin Street approach provides a double left turn lane and a dedicated right turn lane. The signal operates with an advanced northbound phase followed by the north/south movements, followed by the eastbound movements. The eastbound right turn overlaps with the advance northbound phase. The analysis indicates that the intersection operates at an overall LOS A during the morning and Saturday peak hours under the background traffic volume conditions. With the introduction of the site generated traffic the intersection will operate at a LOS B during the morning and afternoon phases and at a LOS A during the Saturday peak hour.

The intersection of Pitkin Street and the Site driveway is an existing un-signalized "T" intersection with Pitkin Street oriented in the east/west direction with the site driveway approaching from the south. The southbound Main Street right turn is located opposite and slightly north of the site driveway. (The right turn movements were considered as part of the signalized intersection). All approaches provide a single lane approach. The site driveway is proposed to operate under stop sign control. An analysis of the combined traffic volume conditions indicates that the Pitkin Street approaches operate at a LOS A during peak hours while the site driveway approach operates at a LOS B during peak hours. An analysis of the background conditions was not conducted.

There are two proposed site driveways to Main Street. The northerly of the two driveways is proposed as a right in/right out only driveway. The southerly driveway is proposed as a right turn exit only driveway. At Both driveways Main Street is oriented in the north/south direction with the site driveways approaching from the west. The southbound Main Street approaches provide two travel lanes. The site driveways will provide a single lane and operate under stop sign control. An analysis of the combined traffic volume conditions indicates that the Main Street approaches will operate at a LOS A during peak hours. The site driveway approaches will operate at either a LOS A or B during peak hours.

Sight Distance

Visual observations were made at each of the proposed site driveway locations. The available sight distances at the proposed Main Street driveways exceeded 700 feet in each direction. The available sight distance from the Pitkin Street drive are in excess of 500 feet looking to the west and to the intersection of Main Street looking to the east. The 700 foot sight distance meets the ConnDOT requirement for an approach speed in excess of 60 miles per hour. The 500 foot sight distance meets the requirements for an approach speed of 45 miles per hour. Main Street is posted at 25 miles per hour. Pitkin Street is posted at 30 mph.

Drive Thru Queuing

A standard queue analysis was conducted for the proposed drive through window to determine the required vehicle stacking distance for this site. The results of that analysis are presented in Table 5. The analysis was conducted based on the observed service rate (138 veh/hr) and the 85% drive thru volume at the Silver Lane facility (115 veh). The analysis indicates the expected queue length would be 5 vehicles with an average waiting time of 130 seconds per vehicle. The probability that the queue would exceed fifteen (15) vehicles is approximately 5%.

The proposed site plan provides approximately 350 feet of storage behind the building, before queued vehicles would extend into the main parking field. The available storage is capable of accommodating fourteen (14) vehicles at an average of 25 feet per

vehicle. There is an additional 100 feet of storage in the parking lot between the right in driveway from Main Street and the drive thru lane. This area is capable of storing an additional four (4) vehicles, for a total of eighteen (18) vehicles.

Conclusion

Based on the available count data, and the analysis presented in this report, it is our professional opinion that the increase in traffic volumes associated with the development of a Dunkin' Donuts restaurant with a drive thru window on the subject parcel will not present a significant change to the operations on local roadways. The signalized intersection of Main Street and Pitkin Street will all operate at acceptable levels of service during peak hours under the combined traffic volume conditions.

The proposed site driveways are properly designed to accommodate the anticipated driveway volumes, are properly located with respect to adjacent driveways and intersecting roadways, and provide the appropriate site distances based on the posted speed limits.

Vehicle storage provided on site is sufficient to accommodate the anticipated queues at the proposed drive through window. There is sufficient storage provided to accommodate eighteen (18) vehicles before the queue would encroach on the State highway. The available storage provided meets the recommendations contained in the ConnDOT Dunkin' Donuts report.

We appreciate the opportunity to provide this analysis to you. We will be available to present our findings to local planning boards upon your request. If you require any additional information regarding this project please do not hesitate to contact our office.

Sincerely,
F. A. Hesketh & Associates, Inc.



Scott F. Hesketh, P.E.
Manager of Transportation Engineering

cc: Mr. James Dutton, Dutton Associates, LLC

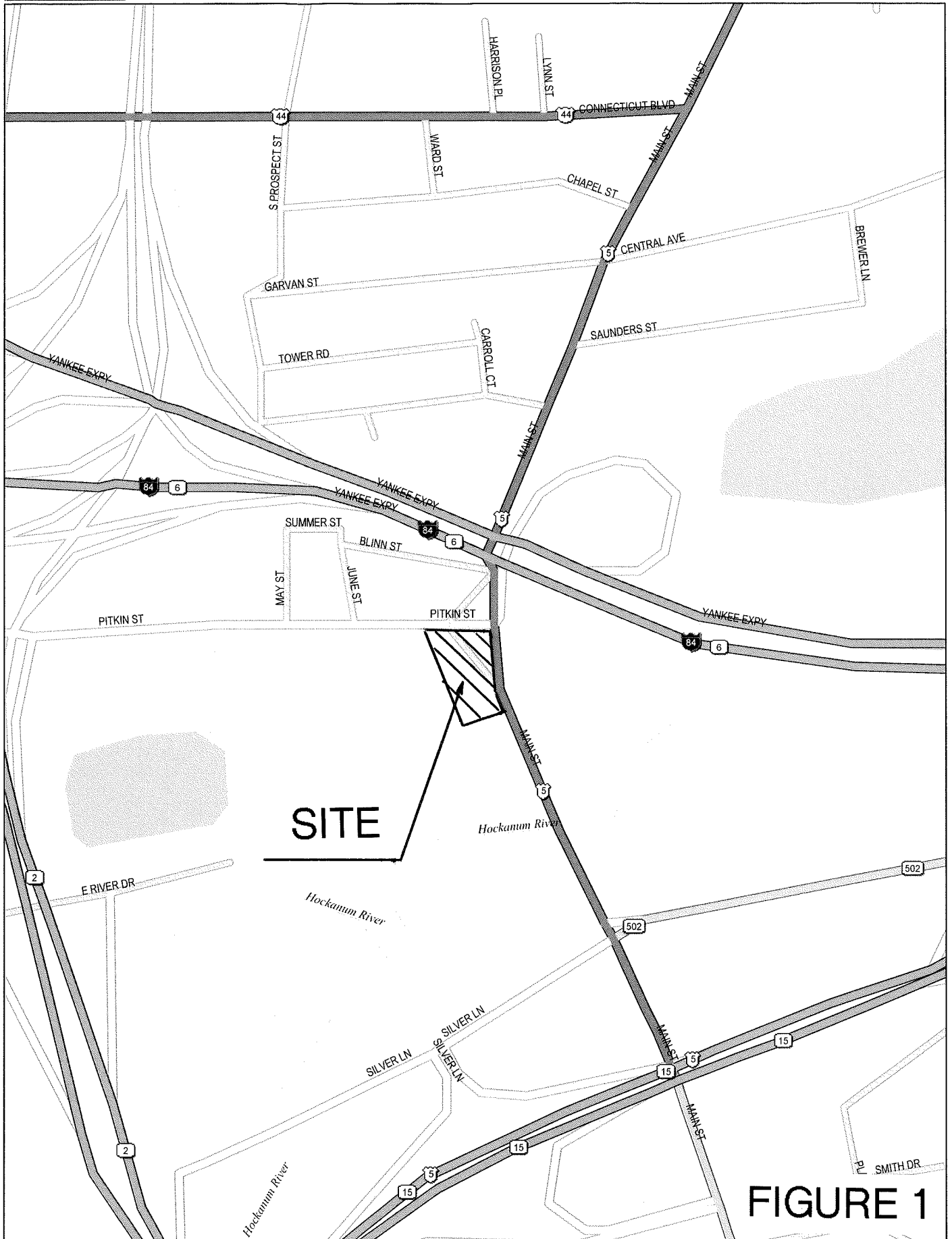


FIGURE 1

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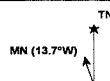


TABLE 1
ConnDOT Traffic Volumes
Route 5 north of Silver Lane
Station No. 042 0018

<u>Time</u>	26-Mar-12 Monday			27-Mar-12 Tuesday		
	<u>NB</u>	<u>SB</u>	<u>Total</u>	<u>NB</u>	<u>SB</u>	<u>Total</u>
12:00				78	75	35
1:00				50	21	17
2:00				31	26	21
3:00				37	28	20
4:00				81	63	144
5:00	203	140	343			
6:00	472	356	828			
7:00	681	587	1268			
8:00	863	744	1607			
9:00	688	514	1202			
10:00	586	581	1167			
11:00	703	646	1349			
12:00	788	797	1585			
1:00	775	709	1484			
2:00	804	792	1596			
3:00	824	933	1757			
4:00	876	1017	1893			
5:00	827	965	1792			
6:00	503	625	1128			
7:00	421	452	873			
8:00	342	351	693			
9:00	223	240	463			
10:00	175	152	327			
11:00	112	99	211			
Totals	10866	10700	21566	277	213	490

2012 ADT = 21,600 for Station No. 042 0018 in East Hartford

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF POLICY AND PLANNING
PLANNING INVENTORY AND DATA

TRAFFIC RECORDER DATA

TOWN OF EAST HARTFORD

ROUTE

DIRECTION B

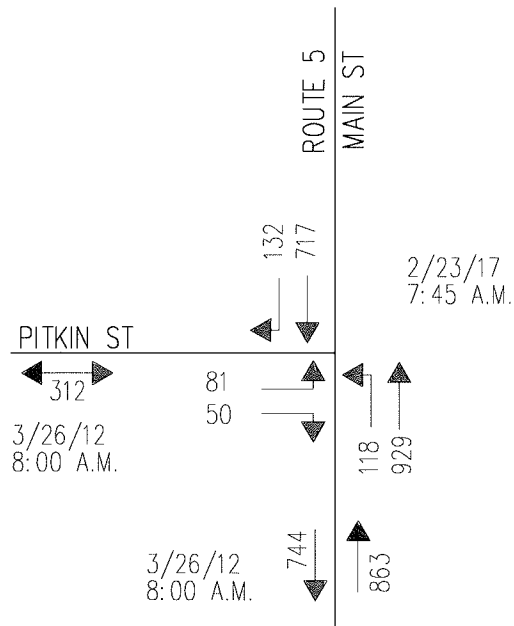
PITKIN STREET - EAST OF JUNE STREET

DAY	SUN	MON	TUE	WED	THU	FRI	SAT
DATE	0	03/26/2012	03/27/2012	0	0	0	0
TYPE							
HOUR							

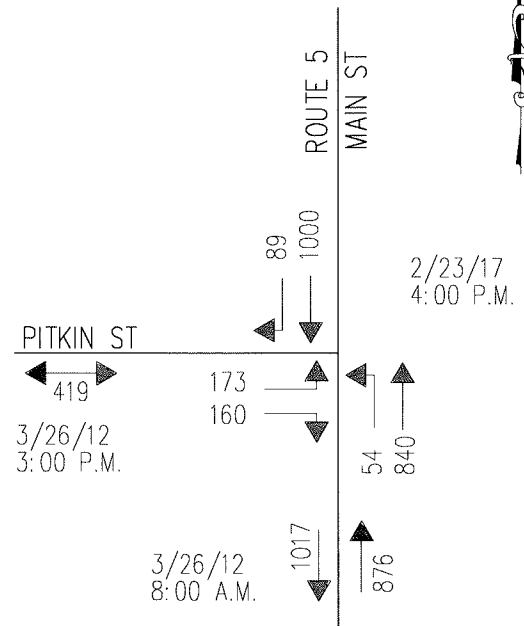
2012 ADT = 4500

ACF = NA

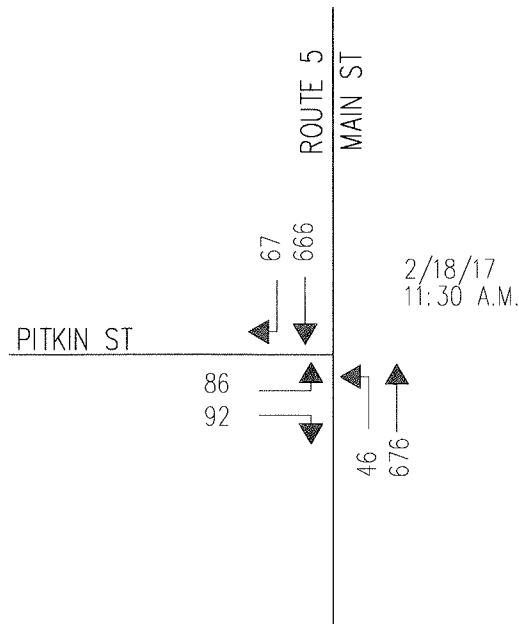
12A	0	0	14	0	0	0	0
01A	0	0	11	0	0	0	0
02A	0	0	6	0	0	0	0
03A	0	0	13	0	0	0	0
04A	0	0	18	0	0	0	0
05A	0	0	58	0	0	0	0
06A	0	112	112	0	0	0	0
07A	0	283	0	0	0	0	0
08A	0	312	0	0	0	0	0
09A	0	244	0	0	0	0	0
10A	0	259	0	0	0	0	0
11A	0	352	0	0	0	0	0
12P	0	430	0	0	0	0	0
01P	0	375	0	0	0	0	0
02P	0	374	0	0	0	0	0
03P	0	419	0	0	0	0	0
04P	0	384	0	0	0	0	0
05P	0	373	0	0	0	0	0
06P	0	184	0	0	0	0	0
07P	0	111	0	0	0	0	0
08P	0	108	0	0	0	0	0
09P	0	64	0	0	0	0	0
10P	0	41	0	0	0	0	0
11P	0	28	0	0	0	0	0
TOT	0	4453	232	0	0	0	0



AM PEAK HOUR



PM PEAK HOUR



SAT PEAK HOUR

FIGURE 2

02/24/17

OBSERVED TRAFFIC VOLUMES
AM, PM, AND SAT PEAK HOURS

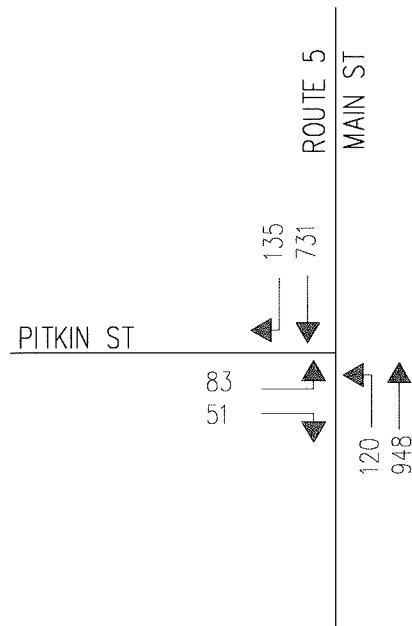
DUNKIN' DONUTS
MAIN STREET AT PITKIN STREET
EAST HARTFORD, CONNECTICUT

F. A. Hesketh & Associates, Inc.
6 CREAMERY BROOK, EAST GRANBY, CT 06026

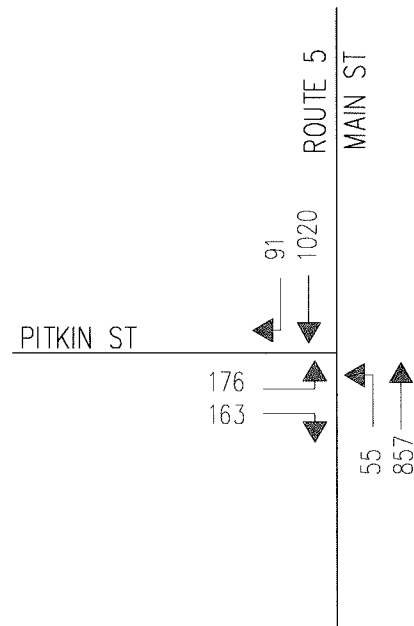


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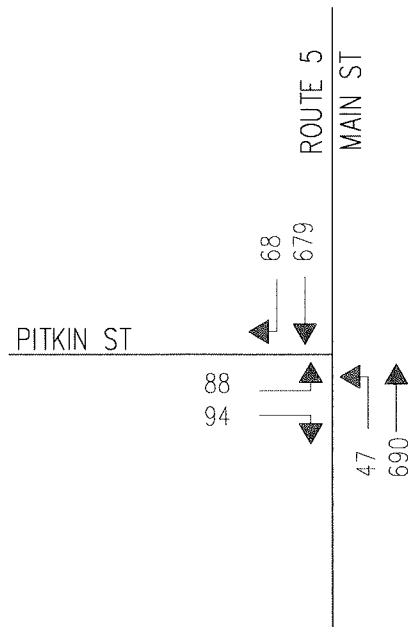
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AM PEAK HOUR



PM PEAK HOUR



SAT PEAK HOUR

OBSERVED TRAFFIC FROM FIGURE 2
INCREASED 2% TO 2017 DESIGN YEAR

FIGURE 3

02/24/17

2017 BACKGROUND TRAFFIC
AM, PM, AND SAT PEAK HOURS

DUNKIN' DONUTS
MAIN STREET AT PITKIN STREET
EAST HARTFORD, CONNECTICUT

F. A. Hesketh & Associates, Inc.
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Table 3
Trip Generation Summary
Proposed Dunkin' Donuts
Route 5 at Pitkin Street - East Hartford, CT

Land Use	Size	ADT	A.M. Peak Hour			P.M. Peak Hour			Saturday Peak Hour		
			Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Coffee / Donut Shop with Drive Thru											
	2,660 s.f.	2177	175	168	343	95	95	190	112	113	225
A.M. Peak Hour	1896 veh	n/a	155	148	303						
P.M. Peak Hour	1360 veh					51	48	99			
Based on Mansfield/Vernon Counts			93	93	186						
Fast Food Restaurant											
	2,660 s.f.	1320	73	70	143	66	60	126	80	77	157
A.M. Peak Hour	1896 veh		123	105	228						
P.M. Peak Hour	1360 veh					42	37	79			
Based on Silver Lane Store			187	187	374	82	82	164	159	159	318

BOLD - Bold text denotes volumes used in this report

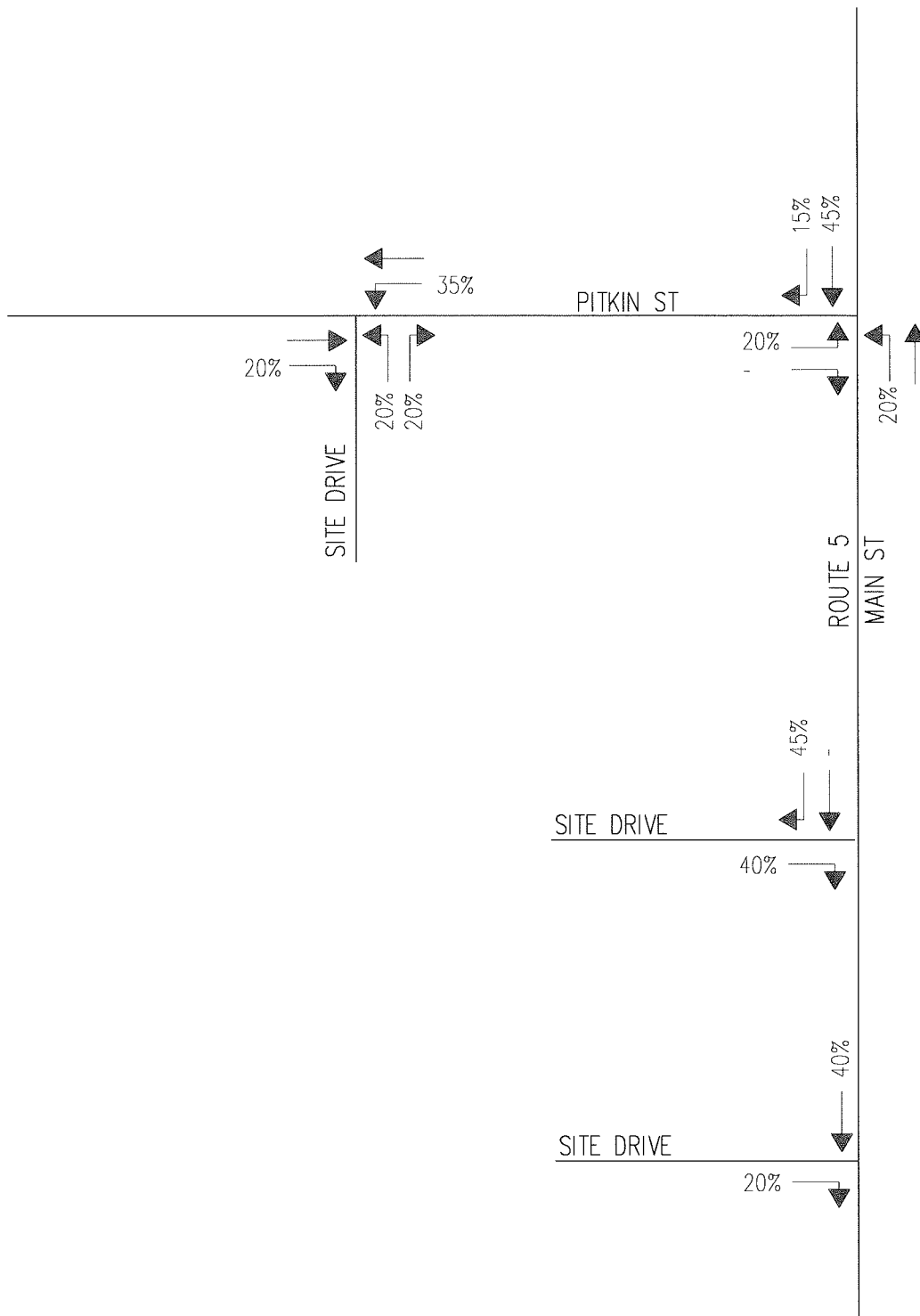


FIGURE 4

02/24/17

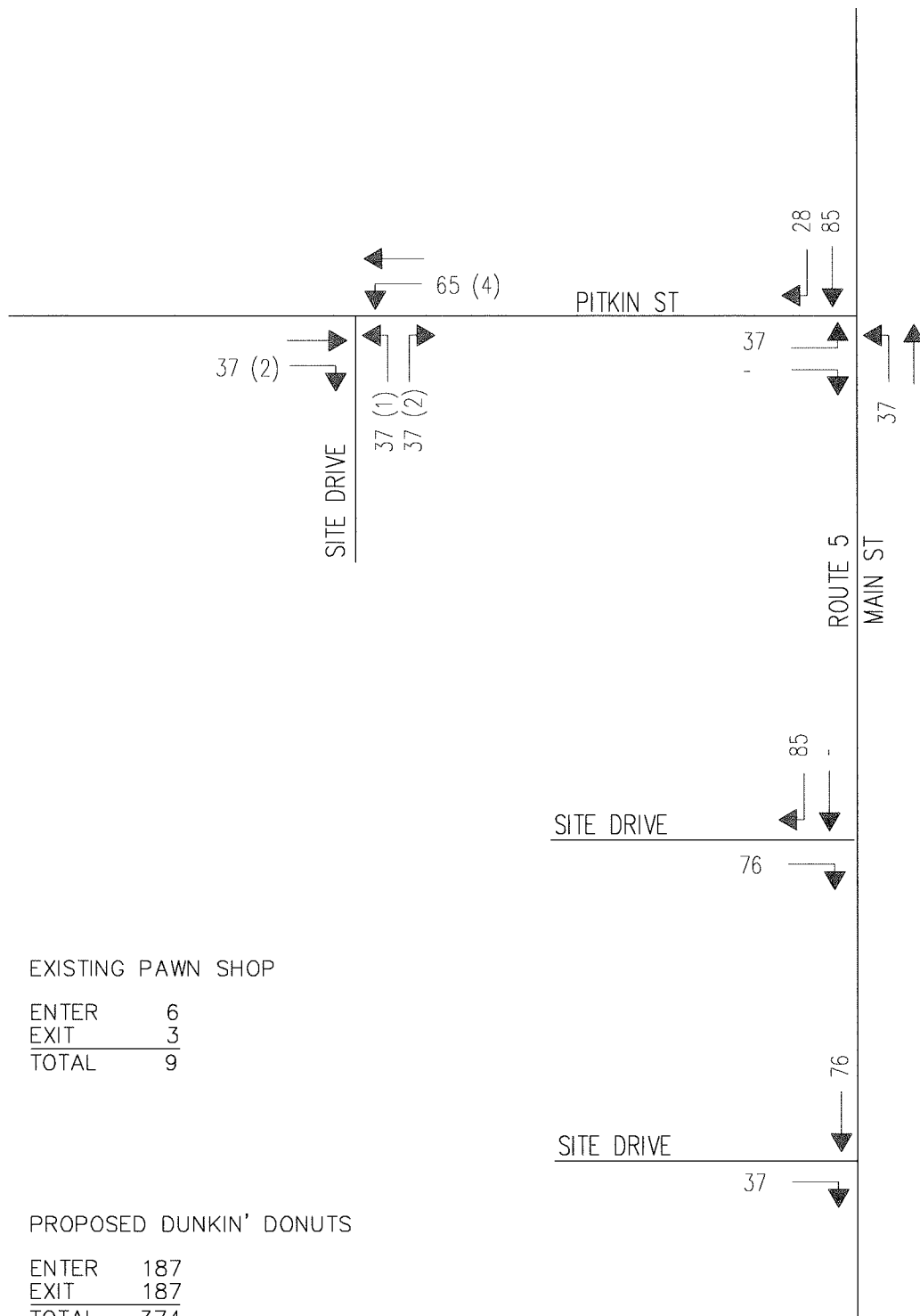
DIRECTIONAL DISTRIBUTION OF
SITE GENERATED TRAFFIC
AM, PM, AND SAT PEAK HOURS
DUNKIN' DONUTS
MAIN STREET AT PITKIN STREET
EAST HARTFORD, CONNECTICUT

F. A. Hesketh & Associates, Inc.
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EXISTING PAWN SHOP

ENTER	6
EXIT	3
TOTAL	9

PROPOSED DUNKIN' DONUTS

ENTER	187
EXIT	187
TOTAL	374

FIGURE 5

02/24/17

SITE GENERATED TRAFFIC AM PEAK HOUR DUNKIN' DONUTS MAIN STREET AT PITKIN STREET EAST HARTFORD, CONNECTICUT	F. A. Hesketh & Associates, Inc. 6 CREAMERY BROOK, EAST GRANBY, CT 06026 FAH TRAFFIC PLANNING ENGINEERING DESIGN
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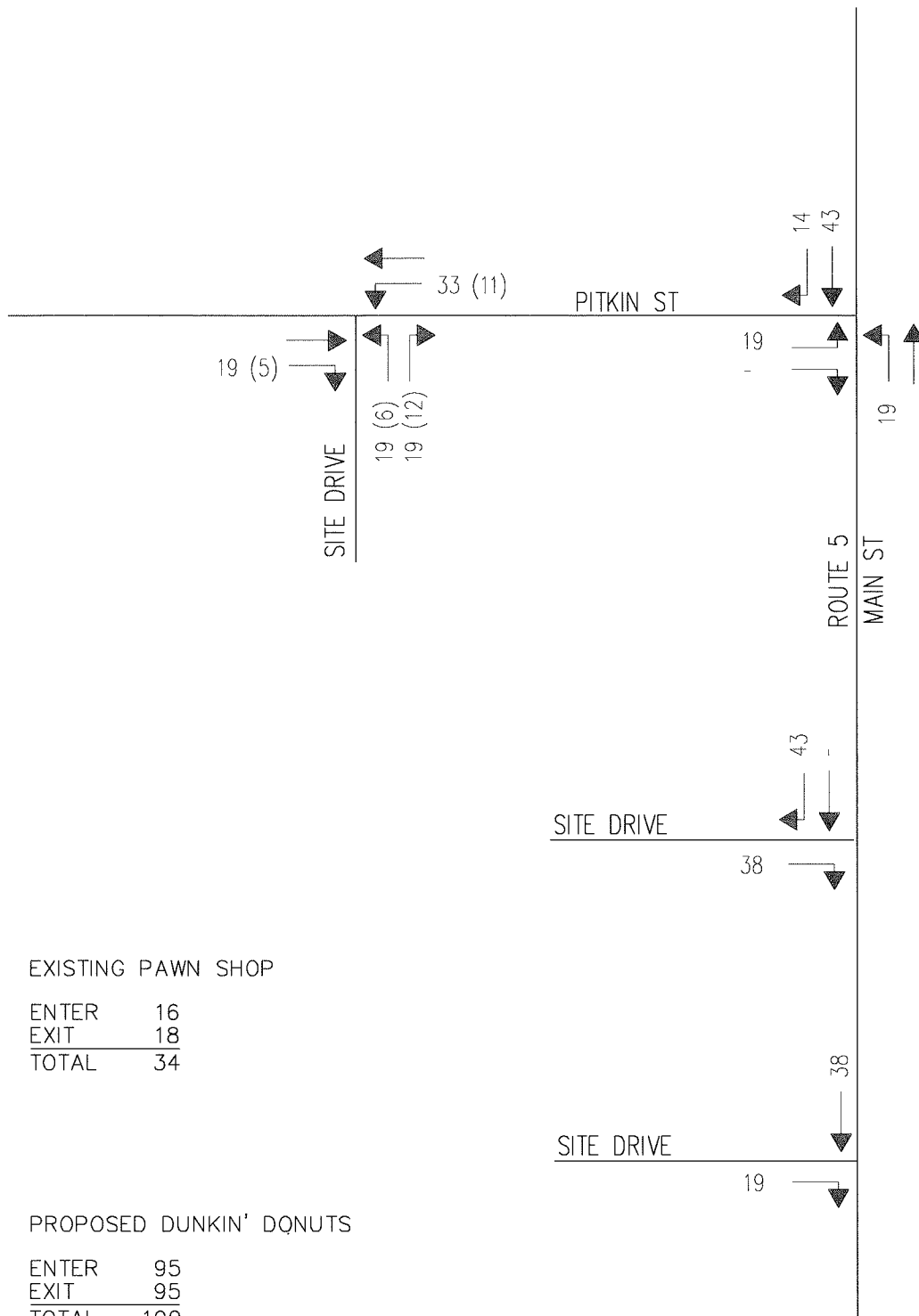
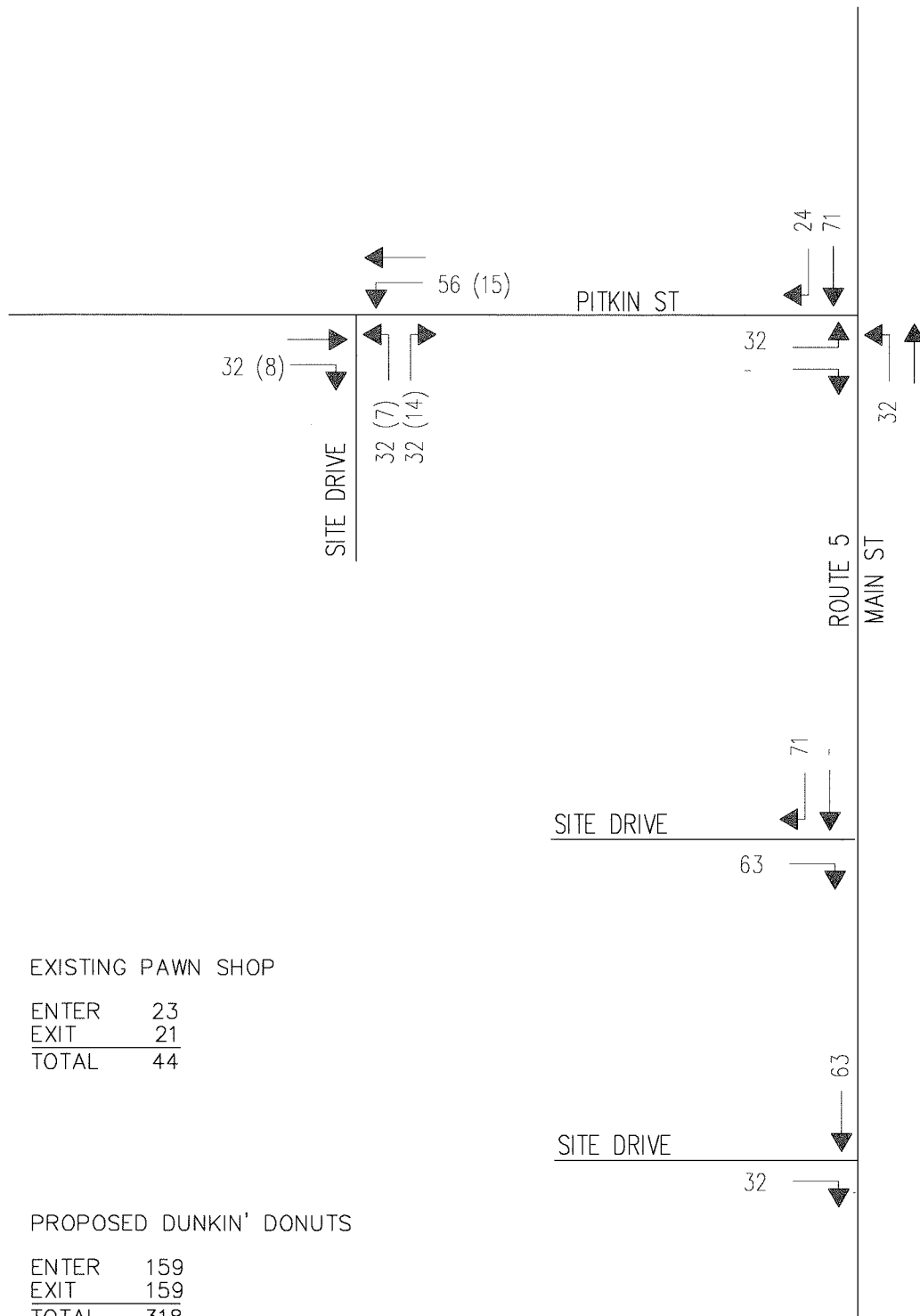


FIGURE 6

02/24/17

SITE GENERATED TRAFFIC P.M. PEAK HOUR DUNKIN' DONUTS MAIN STREET AT PITKIN STREET EAST HARTFORD, CONNECTICUT	F. A. Hesketh & Associates, Inc. 6 CREAMERY BROOK, EAST GRANBY, CT 06026 FAH TRAFFIC PLANNING ENGINEERING DESIGN
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EXISTING PAWN SHOP

ENTER	23
EXIT	21
TOTAL	44

PROPOSED DUNKIN' DONUTS

ENTER	159
EXIT	159
TOTAL	318

FIGURE 7

02/24/17

SITE GENERATED TRAFFIC
SATURDAY PEAK HOUR

DUNKIN' DONUTS
MAIN STREET AT PITKIN STREET
EAST HARTFORD, CONNECTICUT

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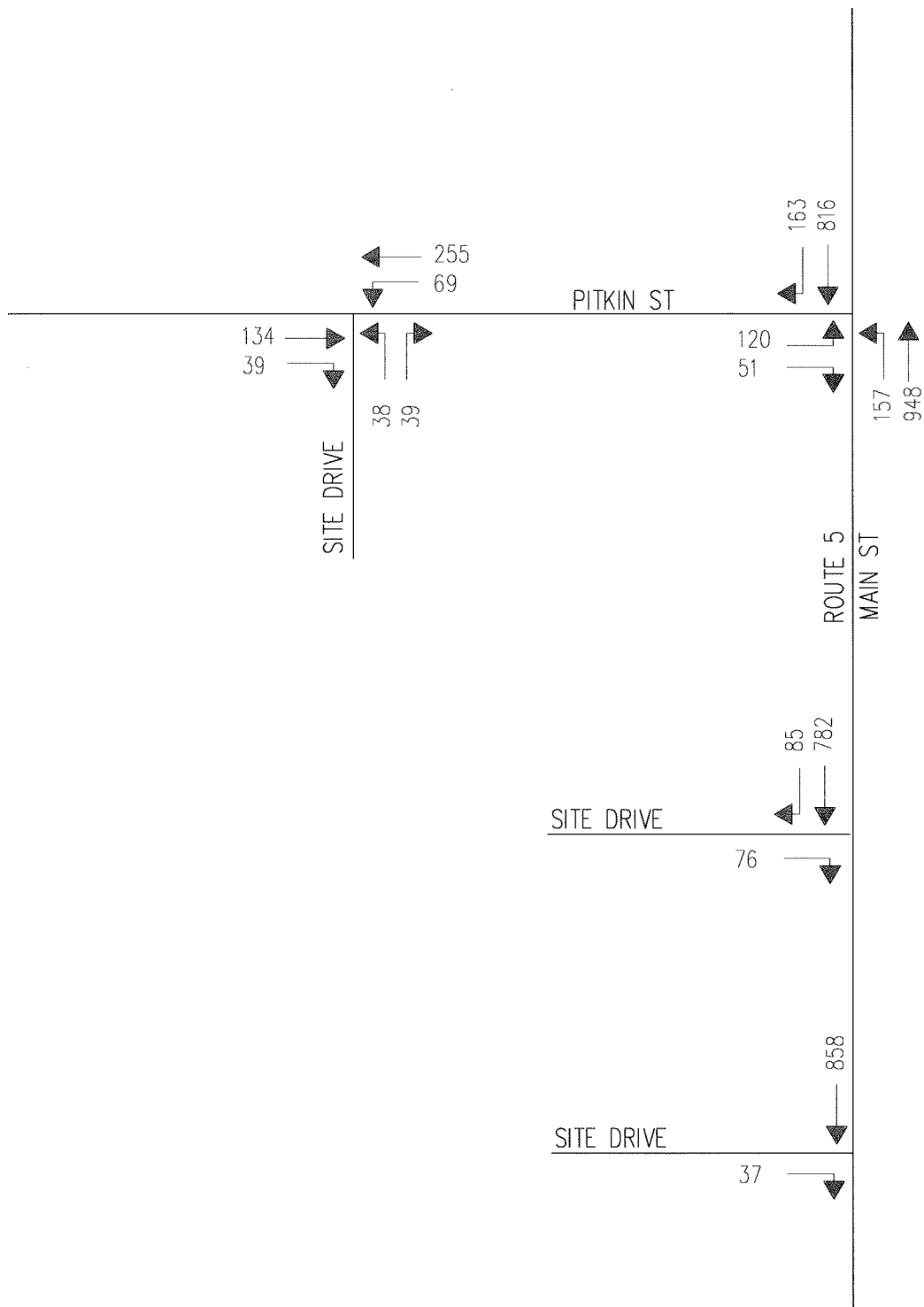


FIGURE 8

02/24/17

2017 COMBINED TRAFFIC AM PEAK HOUR DUNKIN' DONUTS MAIN STREET AT PITKIN STREET EAST HARTFORD, CONNECTICUT	F. A. Hesketh & Associates, Inc. 6 CREAMERY BROOK, EAST GRANBY, CT 06026 FAH TRAFFIC PLANNING ENGINEERING DESIGN
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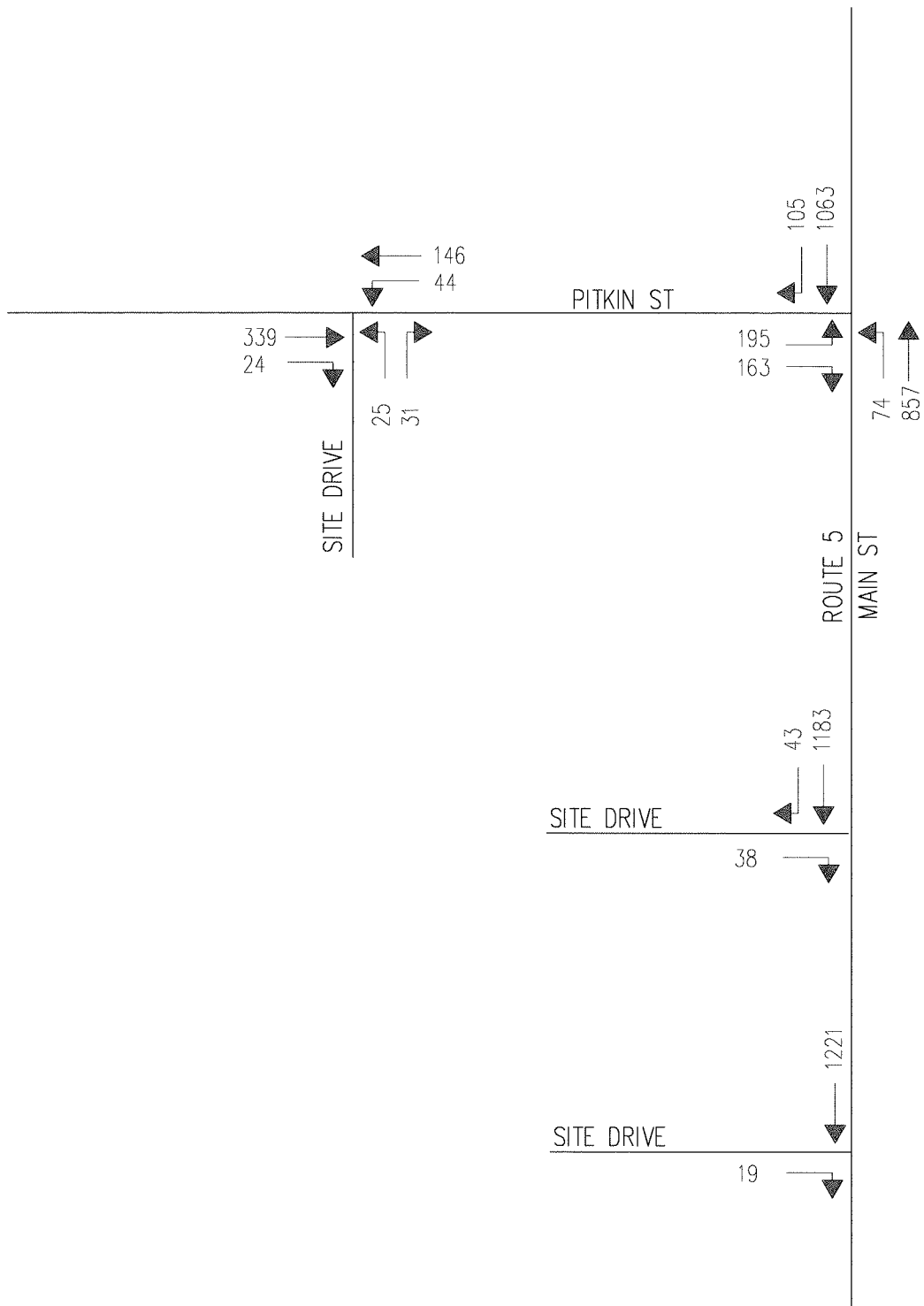


FIGURE 9

02/24/17

2017 COMBINED TRAFFIC P.M. PEAK HOUR DUNKIN' DONUTS MAIN STREET AT PITKIN STREET EAST HARTFORD, CONNECTICUT	F. A. Hesketh & Associates, Inc. 6 CREAMERY BROOK, EAST GRANBY, CT 06026 FAH TRAFFIC PLANNING ENGINEERING DESIGN
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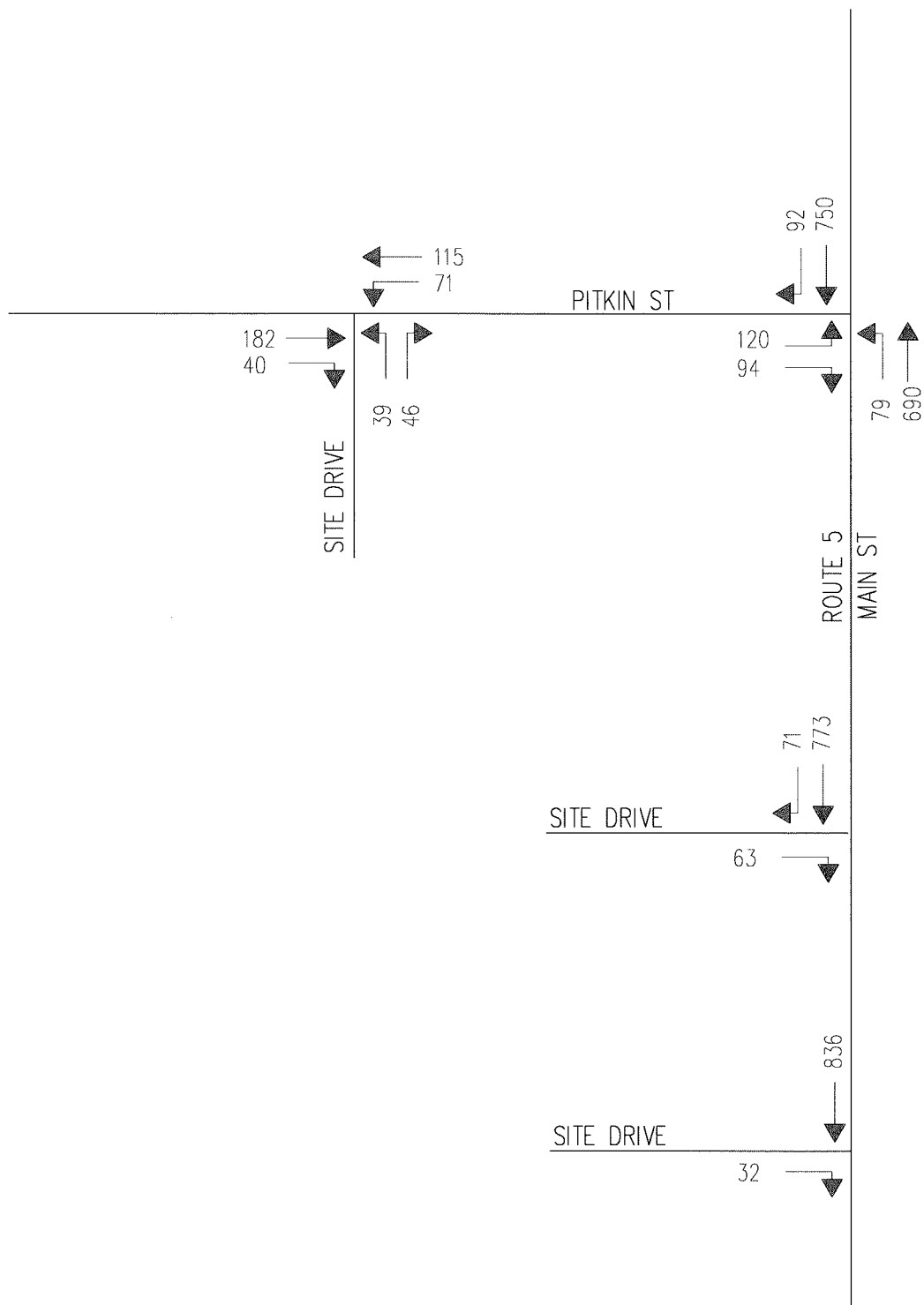


FIGURE 10

02/24/17

2017 COMBINED TRAFFIC
SATURDAY PEAK HOUR

DUNKIN' DONUTS
MAIN STREET AT PITKIN STREET
EAST HARTFORD, CONNECTICUT

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Table 4
Level of Service Summary
Proposed Dunkin' Donuts
Route 5 at Pitkin Street - East Hartford, CT

Time Period	A.M. Peak Hour					P.M. Peak Hour					Saturday Peak Hour						
	Background Traffic		Combined Traffic			Background Traffic		Combined Traffic			Background Traffic		Combined Traffic				
	LOS	delay	v/c	Queue	LOS	delay	v/c	Queue	LOS	delay	v/c	Queue	LOS	delay	v/c	Queue	
Main Street at Pitkin Street																	
NB	Left	D	45.1	0.56	120	D	45.3	0.63	148	D	49.6	0.39	75	D	50.3	0.46	92
	Thru	A	2.9	0.35	101	A	3.6	0.37	110	A	3.8	0.34	111	A	4.0	0.34	115
SB	Thru	A	9.4	0.35	173	B	12.2	0.43	221	B	10.2	0.48	260	B	11.5	0.51	293
	Right	A	2.0	0.14	26	A	2.4	0.18	31	A	2.0	0.09	20	A	2.1	0.11	23
EB	Left	D	40.9	0.31	47	D	41.1	0.39	62	D	46.6	0.51	92	D	46.5	0.54	100
	Right	A	6.9	0.13	25	A	5.9	0.10	23	B	18.9	0.40	102	B	19.1	0.38	102
OVERALL		A	9.2	0.56		B	11.6	0.63		B	11.8	0.51		B	12.9	0.54	
Pitkin Street at Site Driveway																	
NB						B	12.1	0.14	12	B	12.7	0.11	10	B	11.6	0.15	13
	EB					A	0.0	0.11	0	A	0.0	0.23	0	A	0.0	0.14	0
	WB					A	2.0	0.05	4	A	2.2	0.04	3	A	3.3	0.06	5
Route 5 at Northerly Site Driveway																	
SB						A	0.0	0.33	0	A	0.0	0.50	0	A	0.0	0.33	0
	EB					A	9.7	0.10	8	B	10.3	0.06	5	B	10.5	0.09	8
Route 5 at Southerly Site Driveway																	
SB						A	0.0	0.27	0	A	0.0	0.39	0	A	0.0	0.27	0
	EB					B	10.3	0.06	4	B	10.4	0.03	2	B	11.5	0.06	5

TABLE 5
Queue Length Probability
for the Proposed Drive Through Window
A.M. Peak Hour

Service Rate 1

Entering Driveway Volume	171 veh/hr
% Using Drive Through	75 %
Drive Through Volume (q)	115 veh/hr
Average Service Time	26 sec.
Service Rate (Q)	138 veh/hr

P(n) = probability of having n units in the system

$$P(n) = (q/Q)^n (1-(q/Q))$$

$$= 0.8333^n \times 0.1667$$

<u>n</u>	<u>P(n)</u>	<u>Sum of P(n)</u>
0	0.1667	0.1667
1	0.1389	0.3056
2	0.1157	0.4213
3	0.0965	0.5177
4	0.0804	0.5981
5	0.0670	0.6651
6	0.0558	0.7209
7	0.0465	0.7674
8	0.0388	0.8062
9	0.0323	0.8385
10	0.0269	0.8654
11	0.0224	0.8878
12	0.0187	0.9065
13	0.0156	0.9221
14	0.0130	0.9351
15	0.0108	0.9459

Expected Queue Length = 5.0 veh.
Average Waiting Time = 130 sec.

ConnDOT Traffic Counts

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF POLICY AND PLANNING
PLANNING INVENTORY AND DATA

TRAFFIC RECORDER DATA

TOWN OF EAST HARTFORD

ROUTE 5

DIRECTION S

NORTH OF SR 502(SILVER LANE)

DAY	SUN	MON	TUE	WED	THU	FRI	SAT
DATE	0	03/26/2012	03/27/2012	0	0	0	0
TYPE							
HOUR							

2012 ADT = 10700

ACF = NA

12A	0	0	75	0	0	0	0
01A	0	0	21	0	0	0	0
02A	0	0	26	0	0	0	0
03A	0	0	28	0	0	0	0
04A	0	0	63	0	0	0	0
05A	0	140	0	0	0	0	0
06A	0	356	0	0	0	0	0
07A	0	587	0	0	0	0	0
08A	0	744	0	0	0	0	0
09A	0	514	0	0	0	0	0
10A	0	581	0	0	0	0	0
11A	0	646	0	0	0	0	0
12P	0	797	0	0	0	0	0
01P	0	709	0	0	0	0	0
02P	0	792	0	0	0	0	0
03P	0	933	0	0	0	0	0
04P	0	1017	0	0	0	0	0
05P	0	965	0	0	0	0	0
06P	0	625	0	0	0	0	0
07P	0	452	0	0	0	0	0
08P	0	351	0	0	0	0	0
09P	0	240	0	0	0	0	0
10P	0	152	0	0	0	0	0
11P	0	99	0	0	0	0	0
TOT	0	10700	213	0	0	0	0

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF POLICY AND PLANNING
PLANNING INVENTORY AND DATA

TRAFFIC RECORDER DATA

TOWN OF EAST HARTFORD

ROUTE 5

DIRECTION N

NORTH OF SR 502(SILVER LANE)

DAY	SUN	MON	TUE	WED	THU	FRI	SAT
DATE	0	03/26/2012	03/27/2012	0	0	0	0
TYPE							
HOUR							

2012 ADT = 10900

ACF = NA

12A	0	0	78	0	0	0	0
01A	0	0	50	0	0	0	0
02A	0	0	31	0	0	0	0
03A	0	0	37	0	0	0	0
04A	0	0	81	0	0	0	0
05A	0	203	0	0	0	0	0
06A	0	472	0	0	0	0	0
07A	0	681	0	0	0	0	0
08A	0	863	0	0	0	0	0
09A	0	688	0	0	0	0	0
10A	0	586	0	0	0	0	0
11A	0	703	0	0	0	0	0
12P	0	788	0	0	0	0	0
01P	0	775	0	0	0	0	0
02P	0	804	0	0	0	0	0
03P	0	824	0	0	0	0	0
04P	0	876	0	0	0	0	0
05P	0	827	0	0	0	0	0
06P	0	503	0	0	0	0	0
07P	0	421	0	0	0	0	0
08P	0	342	0	0	0	0	0
09P	0	223	0	0	0	0	0
10P	0	175	0	0	0	0	0
11P	0	112	0	0	0	0	0
TOT	0	10866	277	0	0	0	0

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF POLICY AND PLANNING
PLANNING INVENTORY AND DATA

TRAFFIC RECORDER DATA

TOWN OF EAST HARTFORD			ROUTE					DIRECTION B
PITKIN STREET - EAST OF JUNE STREET								
DAY	SUN	MON	TUE	WED	THU	FRI	SAT	
DATE	0	03/26/2012	03/27/2012	0	0	0	0	
TYPE								
HOUR								
	2012 ADT = 4500		ACF = NA					

12A	0	0	14	0	0	0	0	
01A	0	0	11	0	0	0	0	
02A	0	0	6	0	0	0	0	
03A	0	0	13	0	0	0	0	
04A	0	0	18	0	0	0	0	
05A	0	0	58	0	0	0	0	
06A	0	112	112	0	0	0	0	
07A	0	283	0	0	0	0	0	
08A	0	312	0	0	0	0	0	
09A	0	244	0	0	0	0	0	
10A	0	259	0	0	0	0	0	
11A	0	352	0	0	0	0	0	
12P	0	430	0	0	0	0	0	
01P	0	375	0	0	0	0	0	
02P	0	374	0	0	0	0	0	
03P	0	419	0	0	0	0	0	
04P	0	384	0	0	0	0	0	
05P	0	373	0	0	0	0	0	
06P	0	184	0	0	0	0	0	
07P	0	111	0	0	0	0	0	
08P	0	108	0	0	0	0	0	
09P	0	64	0	0	0	0	0	
10P	0	41	0	0	0	0	0	
11P	0	28	0	0	0	0	0	
TOT	0	4453	232	0	0	0	0	

Manual Turning Movement Counts

F.A. Hesketh & Associates, Inc.

6 Creamery Brook

East Granby, CT 06026

Phone: (860) 653-8000

Route 5 at
Pitkin Street
East Hartford, CT
Job No. 17110

File Name : pitkin AM

Site Code : 99999999

Start Date : 2/23/2017

Page No : 1

Groups Printed- Unshifted

Start Time	Route 5 From North			Route 5 From South			Pitkin Street From West			Int. Total
	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	
Factor	1.0	1.0		1.0	1.0		1.0	1.0		
07:00 AM	17	130	147	134	16	150	10	14	24	321
07:15 AM	22	145	167	211	21	232	13	11	24	423
07:30 AM	26	154	180	194	20	214	10	16	26	420
07:45 AM	42	192	234	244	33	277	11	18	29	540
Total	107	621	728	783	90	873	44	59	103	1704
08:00 AM	37	187	224	204	33	237	12	25	37	498
08:15 AM	35	164	199	252	25	277	13	24	37	513
08:30 AM	18	174	192	229	27	256	14	14	28	476
08:45 AM	23	160	183	206	22	228	17	15	32	443
Total	113	685	798	891	107	998	56	78	134	1930
Grand Total	220	1306	1526	1674	197	1871	100	137	237	3634
Apprch %	14.4	85.6		89.5	10.5		42.2	57.8		
Total %	6.1	35.9	42.0	46.1	5.4	51.5	2.8	3.8	6.5	

	Route 5 From North			Route 5 From South			Pitkin Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1										
Intersection	07:45 AM									0.938
Volume	132	717	849	929	118	1047	50	81	131	
Percent	15.5	84.5		88.7	11.3		38.2	61.8		
07:45 Volume	42	192	234	244	33	277	11	18	29	
Peak Factor										0.885
High Int.	07:45 AM			07:45 AM			08:00 AM			
Volume	42	192	234	244	33	277	12	25	37	
Peak Factor	0.907			0.945			0.885			
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1										
By Approach	07:45 AM			07:45 AM			08:00 AM			0.905
Volume	132	717	849	929	118	1047	56	78	134	
Percent	15.5	84.5		88.7	11.3		41.8	58.2		
High Int.	07:45 AM			07:45 AM			08:00 AM			
Volume	42	192	234	244	33	277	12	25	37	
Peak Factor	0.907			0.945			0.905			

F.A. Hesketh & Associates, Inc.

6 Creamery Brook

East Granby, CT 06026

Phone: (860) 653-8000

Route 5 at
Pitkin Street
East Hartford, CT
Job No. 17110

File Name : Pitkin Sat

Site Code : 56565656

Start Date : 2/18/2017

Page No : 1

Groups Printed- Unshifted

	Route 5 From North			Route 5 From South			Pitkin Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Factor	1.0	1.0		1.0	1.0		1.0	1.0		
11:00 AM	11	147	158	151	11	162	26	26	52	372
11:15 AM	11	154	165	163	9	172	21	17	38	375
11:30 AM	20	167	187	168	13	181	21	24	45	413
11:45 AM	18	177	195	161	15	176	26	23	49	420
Total	60	645	705	643	48	691	94	90	184	1580
12:00 PM	14	161	175	178	9	187	21	14	35	397
12:15 PM	15	161	176	169	9	178	24	25	49	403
12:30 PM	17	155	172	162	5	167	28	21	49	388
12:45 PM	11	148	159	160	14	174	27	24	51	384
Total	57	625	682	669	37	706	100	84	184	1572
Grand Total	117	1270	1387	1312	85	1397	194	174	368	3152
Apprch %	8.4	91.6		93.9	6.1		52.7	47.3		
Total %	3.7	40.3	44.0	41.6	2.7	44.3	6.2	5.5	11.7	

	Route 5 From North			Route 5 From South			Pitkin Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour From 11:00 AM to 12:45 PM - Peak 1 of 1										
Intersection	11:30 AM									
Volume	67	666	733	676	46	722	92	86	178	1633
Percent	9.1	90.9		93.6	6.4		51.7	48.3		
11:45 Volume	18	177	195	161	15	176	26	23	49	420
Peak Factor										0.972
High Int.	11:45 AM			12:00 PM			11:45 AM			
Volume	18	177	195	178	9	187	26	23	49	
Peak Factor			0.940			0.965			0.908	
Peak Hour From 11:00 AM to 12:45 PM - Peak 1 of 1										
By Approach	11:30 AM			11:30 AM			11:00 AM			
Volume	67	666	733	676	46	722	94	90	184	
Percent	9.1	90.9		93.6	6.4		51.1	48.9		
High Int.	11:45 AM			12:00 PM			11:00 AM			
Volume	18	177	195	178	9	187	26	26	52	
Peak Factor			0.940			0.965			0.885	

F.A. Hesketh & Associates, Inc.

6 Creamery Brook

East Granby, CT 06026

Phone: (860) 653-8000

Route 5 at
Pitkin Street
East Hartford, CT
Job No. 17110

File Name : Pitkin PM

Site Code : 17110667

Start Date : 2/23/2017

Page No : 1

Groups Printed- Unshifted

	Route 5 From North			Route 5 From South			Pitkin Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Factor	1.0	1.0		1.0	1.0		1.0	1.0		
03:00 PM	28	177	205	211	15	226	18	49	67	498
03:15 PM	24	181	205	219	9	228	24	35	59	492
03:30 PM	15	224	239	236	16	252	39	30	69	560
03:45 PM	17	207	224	228	16	244	26	45	71	539
Total	84	789	873	894	56	950	107	159	266	2089
04:00 PM	21	219	240	195	9	204	27	49	76	520
04:15 PM	21	253	274	205	13	218	34	32	66	558
04:30 PM	25	274	299	217	11	228	50	54	104	631
04:45 PM	22	254	276	223	21	244	49	38	87	607
Total	89	1000	1089	840	54	894	160	173	333	2316
Grand Total	173	1789	1962	1734	110	1844	267	332	599	4405
Apprch %	8.8	91.2		94.0	6.0		44.6	55.4		
Total %	3.9	40.6	44.5	39.4	2.5	41.9	6.1	7.5	13.6	

	Route 5 From North			Route 5 From South			Pitkin Street From West			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour From 03:00 PM to 04:45 PM - Peak 1 of 1										
Intersection	04:00 PM									
Volume	89	1000	1089	840	54	894	160	173	333	2316
Percent	8.2	91.8		94.0	6.0		48.0	52.0		
04:30 Volume	25	274	299	217	11	228	50	54	104	631
Peak Factor										0.918
High Int.	04:30 PM			04:45 PM			04:30 PM			
Volume	25	274	299	223	21	244	50	54	104	
Peak Factor			0.911			0.916			0.800	
Peak Hour From 03:00 PM to 04:45 PM - Peak 1 of 1										
By Approach	04:00 PM			03:00 PM			04:00 PM			
Volume	89	1000	1089	894	56	950	160	173	333	
Percent	8.2	91.8		94.1	5.9		48.0	52.0		
High Int.	04:30 PM			03:30 PM			04:30 PM			
Volume	25	274	299	236	16	252	50	54	104	
Peak Factor			0.911			0.942			0.800	

ITE Trip Generation Worksheets

Detailed Land Use Data
For 2.66 Gross Floor Area 1000 SF of COFFEEDT 1
(937) Coffee/Donut Shop with Drive-Thru

Project: Dunkin Pitkin

Phase: Phase 1

Description:

Open Date: 2/24/2017

Analysis Date: 2/24/2017

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday Average Daily Trips	2177	0	818.58	734.34	869		2	50	50	False		
Weekday AM Peak Hour of Generator	270	0	101.4	18.23	275	45.9	2	49	51	False		
Weekday AM Peak Hour of Adjacent Street Traffic	343	0	100.58	18.23	349.41	49.38	2	51	49	False		
Weekday AM Peak Hour of Adjacent Street Traffic	343	0	128.77					52	48	False		
Weekday PM Peak Hour of Generator	96	0	36.16	2.08	60.5	19.5	2	51	49	False		
Weekday PM Peak Hour of Adjacent Street Traffic	190	0	42.8	2.08	90	18.06	2	50	50	False		
Weekday PM Peak Hour of Adjacent Street Traffic	190	0	71.54					52	48	False		
Saturday Peak Hour of Generator	225	0	84.52	48.33	137.62	33.38	2	50	50	False	$\ln(T) = 0.64 \ln(X) + 4.68$	0.59

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

TRIP GENERATION 2013, TRAFFICWARE, LLC

Detailed Land Use Data
For 1896 AM Peak Hour Traffic on Adjacent Street of COFFEEDT 2
(937) Coffee/Donut Shop with Drive-Thru

Project: Dunkin Pitkin

Phase: Phase 1

Description:

Open Date: 2/24/2017

Analysis Date: 2/24/2017

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday AM Peak Hour of Adjacent Street Traffic	303	0	0.16	0.05	0.29	0.41	1778	51	49	False		

Detailed Land Use Data
For 1983 PM Peak Hour Traffic on Adjacent Street of COFFEEDT 3
(937) Coffee/Donut Shop with Drive-Thru

Project: Dunkin Pitkin

Phase: Phase 1

Description:

Open Date: 2/24/2017

Analysis Date: 2/24/2017

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday PM Peak Hour of Adjacent Street Traffic	99	0	0.05	0.02	0.09	0.24	1903	51	49	False		

Detailed Land Use Data
For 2.66 Gross Floor Area 1000 SF of FASTFOODDT 1
(934) Fast-Food Restaurant with Drive-Thru

Project: Dunkin Pitkin

Phase: Phase 1

Description:

Open Date: 2/24/2017

Analysis Date: 2/24/2017

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday Average Daily Trips	1320	0	496.12	195.98	1132.92	242.52	3	50	50	False		
Weekday AM Peak Hour of Generator	143	0	53.61	12.96	163.33	26.27	4	51	49	False		
Weekday AM Peak Hour of Adjacent Street Traffic	121	59	45.42	1.02	163.33	28.63	4	51	49	False		
Weekday PM Peak Hour of Generator	126	0	47.3	13.33	158.46	25.52	4	52	48	False		
Weekday PM Peak Hour of Adjacent Street Traffic	87	44	32.65	7.96	117.15	19.73	3	52	48	False		
Saturday Average Daily Trips	1921	0	722.03	338.92	1405	295.62	3	50	50	False		
Saturday Peak Hour of Generator	157	0	59	19.21	122.49	22.89	4	51	49	False		
Sunday Average Daily Trips	1444	0	542.72	225.41	950	206.86	3	50	50	False		
Sunday Peak Hour of Generator	193	0	72.74	60	93.33	11.95	2	48	52	False	T = 46.67(X) + 61.00	0.63

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

TRIP GENERATION 2013, TRAFFICWARE, LLC

Detailed Land Use Data

For 1896 AM Peak Hour Traffic on Adjacent Street of FASTFOODDT 2
(934) Fast-Food Restaurant with Drive-Thru

Project: Dunkin Pitkin

Phase: Phase 1

Description:

Open Date: 2/24/2017

Analysis Date: 2/24/2017

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday AM Peak Hour of Adjacent Street Traffic	228	112	0.12	0.05	0.57	0.36	1351	54	46	False		

Detailed Land Use Data

For 1983 PM Peak Hour Traffic on Adjacent Street of FASTFOODDT 3
(934) Fast-Food Restaurant with Drive-Thru

Project: Dunkin Pitkin

Phase: Phase 1

Description:

Open Date: 2/24/2017

Analysis Date: 2/24/2017

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday PM Peak Hour of Adjacent Street Traffic	79	40	0.04	0.02	0.32	0.21	2199	53	47	False		

Detailed Land Use Data
For 9.1 Gross Leasable Area 1000 SF of CENTERSHOPPING 1
(820) Shopping Center

Project: New Project

Phase: Phase 1

Description:

Open Date: 3/9/2017

Analysis Date: 3/9/2017

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Christmas Weekday Peak Hour of Adjacent Street T	34	0	3.76	2.16	10.01	2.3	459	50	50	False	$T = 2.76(X) + 457.28$	0.68
Christmas Saturday Peak Hour of Generator	54	0	5.88	4.33	7.57	2.58	526	51	49	False	$T = 4.90(X) + 515.88$	0.77
Weekday Average Daily Trips	389	0	42.7	12.5	270.89	21.25	331	50	50	False	$\ln(T) = 0.65 \ln(X) + 5.83$	0.79
Weekday AM Peak Hour of Adjacent Street Traffic	9	0	0.96	0.1	9.05	1.31	310	62	38	False	$\ln(T) = 0.61 \ln(X) + 2.24$	0.56
Weekday PM Peak Hour of Adjacent Street Traffic	34	12	3.71	0.68	29.27	2.74	376	48	52	False	$\ln(T) = 0.67 \ln(X) + 3.31$	0.81
Saturday Average Daily Trips	455	0	49.97	16.7	227.5	22.62	450	50	50	False	$\ln(T) = 0.63 \ln(X) + 6.23$	0.82
Saturday Peak Hour of Generator	44	0	4.82	1.46	18.32	3.1	458	52	48	False	$\ln(T) = 0.65 \ln(X) + 3.78$	0.83
Sunday Average Daily Trips	230	0	25.24	4.15	148.15	17.23	439	50	50	False	$T = 15.63(X) + 4214.46$	0.52
Sunday Peak Hour of Generator	28	0	3.12	0.39	12.4	2.78	369	49	51	False		

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

TRIP GENERATION 2013, TRAFFICWARE, LLC

Register Data for Silver Lane Store

Table C
Register Data Summary
Dunkin' Donuts - Silver Lane
October 2, 2016 - December 31, 2016

	Drive Thru	Total
Busiest Hour	140 Vehicles	187 Customers
Average Peak Hour	98 Vehicles	145 Customers
85% Volume	115 Vehicles	171 Customers
Hours with 175 or More	0 Hours	9 Hours
Hours between 150 and 174	0 Hours	84 Hours
Hours between 125 and 149	3 Hours	112 Hours
Hours between 100 and 124	105 Hours	122 Hours
Hours between 75 and 99	154 Hours	222 Hours

	October 23, 2016		October 24, 2016		October 25, 2016		October 26, 2016		October 27, 2016		October 28, 2016		October 29, 2016		Weekday Average	
	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru
12A	0	7	0	4	0	10	0	7	0	10	0	6	0	7	0	7
1A	0	5	0	6	0	2	0	2	0	3	0	3	0	1	0	3
2A	0	7	0	6	0	5	0	3	0	3	0	3	0	8	0	4
3A	0	7	0	3	0	5	0	4	0	7	0	5	0	3	0	5
4A	0	13	0	29	2	23	1	30	1	28	1	33	0	26	1	29
5A	5	21	4	56	20	48	14	57	10	52	20	52	2	34	14	53
6A	11	40	22	105	36	104	48	99	31	105	44	110	3	42	36	105
7A	24	45	52	113	56	107	45	115	51	109	51	110	15	75	51	111
8A	34	72	49	103	45	100	52	95	50	109	61	106	21	80	51	103
9A	42	83	41	68	43	84	67	81	45	75	50	85	31	82	49	79
10A	46	74	35	49	41	49	27	39	46	70	37	57	13	86	37	53
11A	44	64	27	58	19	43	14	44	39	48	22	53	12	57	24	49
12P	23	54	35	64	28	56	26	70	24	60	39	62	6	51	30	62
1P	19	37	18	44	13	55	22	32	22	46	14	37	5	50	18	43
2P	23	33	19	57	25	52	23	54	13	63	19	54	6	40	20	56
3P	10	35	19	48	20	55	25	57	26	52	17	53	6	35	21	53
4P	11	17	14	42	10	36	24	26	18	35	15	33	0	26	16	34
5P	11	27	20	36	14	29	16	47	11	35	13	33	0	37	15	36
6P	14	24	8	26	6	21	9	21	5	20	10	15	3	15	8	21
7P	9	14	7	20	4	15	3	17	3	15	4	21	5	13	4	18
8P	1	10	3	15	6	11	5	13	3	16	4	13	2	10	4	14
9P	0	9	0	8	0	12	2	12	0	15	2	19	1	18	1	13
10P	0	13	0	18	0	19	0	19	0	14	0	17	0	13	0	17
11P	0	13	0	13	0	12	0	16	0	12	0	16	0	20	0	14
12A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tot	327		373		388		423		398		423		131		401	
DT		724		991		953		960		1002		996		829		980

	November 6, 2016 Sunday	November 7, 2016 Monday	November 8, 2016 Tuesday	November 9, 2016 Wednesday	November 10, 2016 Thursday	November 11, 2016 Friday	November 12, 2016 Saturday	Weekday Average
	DT	DT	DT	DT	DT	DT	DT	
12A	0	9	6	0	8	9	11	0
1A	0	5	5	0	3	0	5	0
2A	0	0	4	0	2	0	0	0
3A	0	3	0	0	1	0	10	0
4A	0	14	2	31	2	24	0	1
5A	5	21	40	7	50	11	35	11
6A	9	34	96	42	84	24	97	35
7A	18	39	99	59	95	39	108	54
8A	25	59	87	61	113	46	94	46
9A	22	63	69	50	91	42	82	44
10A	36	59	50	31	80	48	55	32
11A	24	42	49	28	50	20	51	23
12P	24	36	53	22	52	25	52	27
1P	12	46	30	17	38	15	38	20
2P	12	36	40	24	33	18	47	25
3P	7	20	46	16	46	27	37	23
4P	8	20	28	20	36	19	32	17
5P	6	25	4	7	37	14	34	9
6P	7	22	11	3	16	10	16	9
7P	1	19	6	4	21	4	14	6
8P	7	16	2	2	12	6	12	3
9P	1	9	0	2	12	0	10	0
10P	0	12	0	7	15	0	19	0
11P	0	14	0	0	17	0	19	0
12A	0	0	0	0	0	0	0	0
Tot	224	345	836	398	934	945	942	386
DT	625			391	939	368	746	919

	November 13, 2016		November 14, 2016		November 15, 2016		November 16, 2016		November 17, 2016		November 18, 2016		November 19, 2016		Weekday Average	
	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru	Inside	Drive-Thru
12A	0	4	0	7	0	6	0	5	0	8	0	6	0	10	0	6
1A	0	3	0	4	0	1	0	4	0	2	0	3	0	3	0	3
2A	0	6	0	5	0	3	0	3	0	8	0	7	0	5	0	5
3A	0	4	0	6	0	4	0	3	0	4	0	6	0	1	0	5
4A	0	9	0	28	0	24	3	33	1	25	0	41	8	23	1	30
5A	6	20	7	49	8	49	20	52	13	46	15	51	10	29	13	49
6A	7	36	26	99	29	99	39	94	21	85	48	92	22	45	33	94
7A	12	29	29	109	42	99	51	120	66	112	56	119	26	73	49	112
8A	19	57	45	102	49	110	47	97	54	107	60	109	39	74	51	105
9A	21	59	41	72	38	77	62	79	50	81	55	82	46	88	49	78
10A	24	67	22	51	35	65	27	58	33	58	36	51	39	73	31	57
11A	25	53	17	35	16	31	24	36	19	36	24	44	36	61	20	36
12P	24	54	18	55	23	61	27	66	17	57	18	56	18	43	21	59
1P	9	37	16	38	19	41	19	35	22	46	28	38	13	35	21	40
2P	12	39	18	39	21	54	23	46	25	49	12	43	15	35	20	46
3P	14	22	14	50	11	40	9	58	23	54	16	43	21	30	15	49
4P	8	25	8	29	9	47	18	44	8	27	9	28	10	22	10	35
5P	11	17	9	30	13	34	13	33	8	31	6	34	8	20	10	32
6P	7	21	7	21	6	16	9	13	9	14	10	18	10	16	8	16
7P	8	10	7	18	10	12	10	21	8	17	7	22	3	10	8	18
8P	2	9	2	18	5	11	3	9	2	14	7	9	2	13	4	12
9P	0	6	0	12	0	6	0	12	3	9	1	10	5	10	1	10
10P	0	12	0	17	0	15	0	17	0	13	0	15	0	15	0	15
11P	0	18	0	16	0	14	0	15	0	9	0	17	0	18	0	14
12A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tot	209		286		334		404		382		408		331		363	
DT		617		910		919		953		912		944		752		928

	November 27, 2016			November 28, 2016			November 29, 2016			November 30, 2016			December 1, 2016			December 2, 2016			December 3, 2016			Weekday Average		
	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday			Inside		
	Inside	Drive-Thru		Inside	Drive-Thru		Inside	Drive-Thru		Inside	Drive-Thru		Inside	Drive-Thru		Inside	Drive-Thru		Inside	Drive-Thru		Inside	Drive-Thru	
12A	0	10		0	5		0	6		0	5		0	6		0	8		0	10		0		6
1A	0	3		0	6		0	4		0	9		0	4		0	2		0	5		0		5
2A	0	6		0	0		0	2		0	2		0	4		0	1		0	8		0		2
3A	0	2		0	9		0	7		0	4		0	3		0	4		0	4		0		5
4A	1	12		5	20		2	23		1	28		0	34		32	26		4	27		8		26
5A	1	16		12	49		12	36		20	43		7	53		19	44		9	24		14		45
6A	3	30		38	83		18	84		24	99		51	89		36	92		24	47		33		89
7A	12	23		25	101		23	109		44	112		62	101		54	116		36	57		42		108
8A	14	64		36	104		38	120		52	103		51	104		58	105		32	87		47		107
9A	33	55		48	79		36	94		44	76		47	75		52	88		43	92		45		82
10A	29	57		20	60		32	59		19	65		29	68		37	71		45	76		27		65
11A	18	50		27	46		19	50		25	36		22	46		37	42		45	54		26		44
12P	19	43		22	57		18	51		10	58		27	52		28	60		25	51		21		56
1P	15	34		16	34		13	40		26	49		26	46		16	37		18	36		19		41
2P	18	42		22	42		12	57		20	52		21	45		18	58		13	40		19		51
3P	14	29		18	42		10	32		16	47		24	48		14	42		21	34		16		42
4P	12	26		9	40		8	45		10	32		13	33		13	30		8	38		11		36
5P	13	12		20	34		6	18		8	25		11	31		9	41		15	20		11		30
6P	11	17		7	13		3	14		6	14		7	20		10	32		9	19		7		19
7P	9	9		4	11		6	14		7	18		7	23		11	20		4	16		7		17
8P	2	10		4	12		0	7		0	7		9	8		9	8		2	17		4		8
9P	0	11		2	4		0	6		0	11		0	15		0	11		5	24		0		9
10P	0	11		0	6		0	10		0	10		0	16		0	20		0	12		0		12
11P	0	15		0	18		0	13		0	16		0	12		0	12		0	7		0		14
12A	0	0		0	0		0	0		0	0		0	0		0	0		0	0		0		0
Tot	224			335			256			332			414			453			358			358		921
DT		587			875			901			921			936			970			805				

	December 4, 2016			December 5, 2016			December 6, 2016			December 7, 2016			December 8, 2016			December 9, 2016			December 10, 2016			Weekday Average		
	Inside	Drive-Thru	Sunday	Inside	Drive-Thru	Monday	Inside	Drive-Thru	Tuesday	Inside	Drive-Thru	Wednesday	Inside	Drive-Thru	Thursday	Inside	Drive-Thru	Friday	Inside	Drive-Thru	Saturday	Inside	Drive-Thru	Average
12A	0	4		0	8		0	4		0	7		0	5		0	6		0	9		0	6	
1A	0	2		0	3		0	3		0	2		0	4		0	1		0	6		0	3	
2A	0	8		0	3		0	5		0	2		0	4		0	6		0	3		0	4	
3A	0	0		0	9		0	5		0	6		0	7		0	9		0	7		0	7	
4A	0	9		3	22		1	26		0	28		5	27		5	33		4	31		3	27	
5A	0	15		4	53		18	38		12	51		13	44		11	47		12	34		12	47	
6A	7	37		22	79		35	102		23	93		28	87		38	97		14	45		29	92	
7A	20	36		42	112		39	100		39	120		54	106		62	113		18	74		47	110	
8A	26	55		42	105		47	101		49	105		66	92		55	109		45	78		52	102	
9A	26	68		44	81		38	81		42	82		33	99		49	89		51	79		41	86	
10A	47	36		36	55		24	56		20	67		42	63		30	73		40	62		30	63	
11A	22	52		20	42		29	34		18	45		21	49		17	42		28	52		21	42	
12P	20	45		20	69		29	59		28	65		29	71		30	72		27	58		27	67	
1P	18	48		23	48		14	49		26	44		15	53		25	49		20	37		21	49	
2P	13	29		22	63		21	48		21	52		24	51		26	54		12	37		23	54	
3P	10	21		19	45		16	60		23	52		20	50		21	50		19	38		20	51	
4P	7	27		9	36		12	37		15	34		11	28		6	27		21	25		11	32	
5P	10	20		7	35		10	32		17	35		9	23		6	21		6	35		10	29	
6P	5	11		5	21		11	20		9	21		11	14		13	13		5	21		10	18	
7P	14	10		6	20		6	17		13	16		6	22		10	15		7	16		8	18	
8P	2	10		1	12		8	10		4	15		7	9		5	15		2	12		5	12	
9P	0	9		8	8		6	10		2	12		0	6		0	14		3	19		3	10	
10P	0	13		0	15		0	13		0	19		0	23		0	13		0	12		0	17	
11P	0	16		0	18		0	13		0	21		0	18		0	16		0	17		0	17	
12A	0	0		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
Tot	247			333			364			361			394			409			334			372		
DT		581			962			923			994			955			984			807			964	

December 25, 2016			December 26, 2016			December 27, 2016			December 28, 2016			December 29, 2016			December 30, 2016			December 31, 2016			Weekday Average		
Sunday		Drive-Thru	Monday		Drive-Thru	Tuesday		Drive-Thru	Wednesday		Drive-Thru	Thursday		Drive-Thru	Friday		Drive-Thru	Saturday		Drive-Thru	Inside	Drive-Thru	Average
Inside	0		Inside	0		Inside	0		Inside	0		Inside	0		Inside	0		Inside	0				
0	5		8			1			7			5			3			13					
0	2		2			6			3			7			7			6					
0	0		6			1			2			3			4			3					
0	3		4			5			7			5			5			4					
2	3		8			5			26			26			34			17					
6	9		26			48			45			44			49			21					
14	30		34			67			85			83			62			32					
28	36		45			92			94			84			96			57					
23	62		53			88			102			90			84			57					
26	63		68			73			66			81			77			63					
37	69		68			77			64			74			66			73					
43	62		59			45			45			42			64			62					
45	41		68			40			57			54			57			59					
35	39		36			37			39			37			48			41					
37	51		42			48			21			47			50			30					
9	27		40			36			53			37			34			30					
20	25		22			30			37			18			29			33					
10	24		22			26			22			15			21			20					
5	15		22			19			17			10			20			19					
10	16		8			17			16			20			14			18					
4	29		6			7			12			10			17			16					
3	16		17			14			6			8			10			16					
0	16		17			18			16			5			17			19					
0	15		22			13			17			12			12			10					
0	0		0			0			0			0			0			0					
357	658		703			829			887			826			880			719					

12A
1A
2A
3A
4A
5A
6A
7A
8A
9A
10A
11A
12P
1P
2P
3P
4P
5P
6P
7P
8P
9P
10P
11P
12A
Tot
DT

SYNCHRO Capacity Analysis Worksheets

Lanes, Volumes, Timings

3: Route 5 &

2017 Background Traffic

AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	83	51	120	948	731	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175	125	250			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3433	1583	1770	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		55				147
Link Speed (mph)	30			30	30	
Link Distance (ft)	440			520	435	
Travel Time (s)	10.0			11.8	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	55	130	1030	795	147
Shared Lane Traffic (%)						
Lane Group Flow (vph)	90	55	130	1030	795	147
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	6

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	8.0	8.0	22.0	22.0	22.0
Total Split (s)	23.0	21.0	21.0	67.0	46.0	46.0
Total Split (%)	25.6%	23.3%	23.3%	74.4%	51.1%	51.1%
Maximum Green (s)	18.0	17.0	17.0	61.0	40.0	40.0
Yellow Time (s)	3.0	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)	5.0			5.0	5.0	5.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	7.7	22.4	11.9	74.6	57.6	57.6
Actuated g/C Ratio	0.09	0.25	0.13	0.83	0.64	0.64
v/c Ratio	0.31	0.13	0.56	0.35	0.35	0.14
Control Delay	40.9	6.9	45.1	2.9	9.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	6.9	45.1	2.9	9.4	2.0
LOS	D	A	D	A	A	A
Approach Delay	28.0			7.7	8.2	
Approach LOS	C			A	A	
90th %ile Green (s)	9.7	16.4	16.4	69.3	48.9	48.9
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	8.5	13.7	13.7	70.5	52.8	52.8
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	7.7	11.9	11.9	71.3	55.4	55.4
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	6.9	10.0	10.0	72.1	58.1	58.1
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	0.0	7.3	7.3	84.0	72.7	72.7
10th %ile Term Code	Skip	Gap	Gap	Coord	Coord	Coord
Stops (vph)	75	10	109	216	332	11
Fuel Used(gal)	1	0	2	6	6	1
CO Emissions (g/hr)	97	21	153	392	399	40
NOx Emissions (g/hr)	19	4	30	76	78	8
VOC Emissions (g/hr)	23	5	35	91	92	9
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	25	0	70	67	107	0
Queue Length 95th (ft)	47	25	120	101	173	26
Internal Link Dist (ft)	360			440	355	
Turn Bay Length (ft)	175	125	250			
Base Capacity (vph)	687	523	334	2935	2264	1066
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0

Lanes, Volumes, Timings
3: Route 5 &

2017 Background Traffic
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.11	0.39	0.35	0.35	0.14

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 9.2
 Intersection Capacity Utilization 42.7%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: Route 5 &

 ø2	 ø4
67 s	23 s
 ø5	 ø6
21 s	46 s

Lanes, Volumes, Timings

3: Route 5 &

2017 Combined Traffic

AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	120	51	157	948	816	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175	125	250			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3433	1583	1770	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		55				177
Link Speed (mph)	30			30	30	
Link Distance (ft)	440			520	435	
Travel Time (s)	10.0			11.8	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	55	171	1030	887	177
Shared Lane Traffic (%)						
Lane Group Flow (vph)	130	55	171	1030	887	177
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	6

Lanes, Volumes, Timings
3: Route 5 &

2017 Combined Traffic
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	8.0	8.0	22.0	22.0	22.0
Total Split (s)	23.0	21.0	21.0	67.0	46.0	46.0
Total Split (%)	25.6%	23.3%	23.3%	74.4%	51.1%	51.1%
Maximum Green (s)	18.0	17.0	17.0	61.0	40.0	40.0
Yellow Time (s)	3.0	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)	5.0			5.0	5.0	5.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	8.8	27.6	13.9	70.2	52.4	52.4
Actuated g/C Ratio	0.10	0.31	0.15	0.78	0.58	0.58
v/c Ratio	0.39	0.10	0.63	0.37	0.43	0.18
Control Delay	41.1	5.9	45.3	3.6	12.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	5.9	45.3	3.6	12.2	2.4
LOS	D	A	D	A	B	A
Approach Delay	30.6			9.6	10.6	
Approach LOS	C			A	B	
90th %ile Green (s)	11.1	19.0	19.0	67.9	44.9	44.9
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	9.7	16.0	16.0	69.3	49.3	49.3
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	8.8	13.9	13.9	70.2	52.3	52.3
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	7.8	11.8	11.8	71.2	55.4	55.4
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	6.4	8.7	8.7	72.6	59.9	59.9
10th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
Stops (vph)	108	9	142	260	442	14
Fuel Used(gal)	2	0	3	6	7	1
CO Emissions (g/hr)	141	20	201	418	506	50
NOx Emissions (g/hr)	27	4	39	81	99	10
VOC Emissions (g/hr)	33	5	46	97	117	11
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	36	0	92	73	137	0
Queue Length 95th (ft)	62	23	148	110	221	31
Internal Link Dist (ft)	360			440	355	
Turn Bay Length (ft)	175	125	250			
Base Capacity (vph)	687	584	342	2762	2059	995
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0

Lanes, Volumes, Timings
3: Route 5 &

2017 Combined Traffic
AM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.09	0.50	0.37	0.43	0.18

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 11.6
 Intersection Capacity Utilization 47.2%
 Analysis Period (min) 15

Intersection LOS: B
 ICU Level of Service A

Splits and Phases: 3: Route 5 &

 ø2	 ø4
67 s	23 s
 ø5	 ø6
21 s	46 s

HCM Unsignalized Intersection Capacity Analysis 5: Pitkin Street & Site Drive

2017 Combined Traffic
AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↰	↰	
Volume (veh/h)	134	39	69	255	38	39
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	146	42	75	277	41	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				440		
pX, platoon unblocked						
vC, conflicting volume			188		594	167
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			188		594	167
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		91	95
cM capacity (veh/h)			1386		442	877
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	188	352	84			
Volume Left	0	75	41			
Volume Right	42	0	42			
cSH	1700	1386	591			
Volume to Capacity	0.11	0.05	0.14			
Queue Length 95th (ft)	0	4	12			
Control Delay (s)	0.0	2.0	12.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.0	12.1			
Approach LOS			B			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			41.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2017 Combined Traffic

7: Site Drive & *NORTHERLY SITE DRIVE*

AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	76	0	1105	782	85
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	83	0	1201	850	92
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					520	
pX, platoon unblocked	0.86	0.86	0.86			
vC, conflicting volume	1497	471	942			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1256	67	613			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	90	100			
cM capacity (veh/h)	141	848	829			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	83	601	601	567	376	
Volume Left	0	0	0	0	0	
Volume Right	83	0	0	0	92	
cSH	848	1700	1700	1700	1700	
Volume to Capacity	0.10	0.35	0.35	0.33	0.22	
Queue Length 95th (ft)	8	0	0	0	0	
Control Delay (s)	9.7	0.0	0.0	0.0	0.0	
Lane LOS	A					
Approach Delay (s)	9.7	0.0		0.0		
Approach LOS	A					

Intersection Summary

Average Delay	0.4		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

9: Site Drive & SOUTHERLY SITE DRIVE

2017 Combined Traffic

AM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	37	0	1105	858	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	40	0	1201	933	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					940	
pX, platoon unblocked	0.91	0.91	0.91			
vC, conflicting volume	1533	466	933			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1387	214	726			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	100			
cM capacity (veh/h)	122	720	793			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	40	601	601	466	466	
Volume Left	0	0	0	0	0	
Volume Right	40	0	0	0	0	
cSH	720	1700	1700	1700	1700	
Volume to Capacity	0.06	0.35	0.35	0.27	0.27	
Queue Length 95th (ft)	4	0	0	0	0	
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	10.3	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			33.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Route 5 & PITKIN ST

2017 Background Traffic
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	 			 	 	
Volume (vph)	176	163	55	857	1020	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175	125	250			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3433	1583	1770	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		78				99
Link Speed (mph)	30			30	30	
Link Distance (ft)	440			520	435	
Travel Time (s)	10.0			11.8	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	191	177	60	932	1109	99
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	177	60	932	1109	99
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	6

Lanes, Volumes, Timings
3: Route 5 &

2017 Background Traffic
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	8.0	8.0	22.0	22.0	22.0
Total Split (s)	22.0	16.0	16.0	78.0	62.0	62.0
Total Split (%)	22.0%	16.0%	16.0%	78.0%	62.0%	62.0%
Maximum Green (s)	17.0	12.0	12.0	72.0	56.0	56.0
Yellow Time (s)	3.0	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)	5.0			5.0	5.0	5.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	10.9	24.6	8.7	78.1	65.4	65.4
Actuated g/C Ratio	0.11	0.25	0.09	0.78	0.65	0.65
v/c Ratio	0.51	0.40	0.39	0.34	0.48	0.09
Control Delay	46.6	18.9	49.6	3.8	10.2	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	18.9	49.6	3.8	10.2	2.0
LOS	D	B	D	A	B	A
Approach Delay	33.3			6.6	9.5	
Approach LOS	C			A	A	
90th %ile Green (s)	13.9	12.0	12.0	75.1	59.1	59.1
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	12.1	10.1	10.1	76.9	62.8	62.8
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	10.9	8.7	8.7	78.1	65.4	65.4
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	9.6	7.4	7.4	79.4	68.0	68.0
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	7.9	5.5	5.5	81.1	71.6	71.6
10th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
Stops (vph)	161	73	50	230	493	7
Fuel Used(gal)	3	2	1	5	8	0
CO Emissions (g/hr)	221	111	74	378	581	27
NOx Emissions (g/hr)	43	22	14	74	113	5
VOC Emissions (g/hr)	51	26	17	88	135	6
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	60	51	37	73	168	0
Queue Length 95th (ft)	92	102	75	111	260	20
Internal Link Dist (ft)	360			440	355	
Turn Bay Length (ft)	175	125	250			
Base Capacity (vph)	584	498	212	2765	2314	1069
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0

Lanes, Volumes, Timings
3: Route 5 &

2017 Background Traffic
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.36	0.28	0.34	0.48	0.09

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 98 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.51
 Intersection Signal Delay: 11.8
 Intersection Capacity Utilization 49.0%
 Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service A

Splits and Phases: 3: Route 5 &

 ø2	 ø4
78 s	22 s
 ø5	 ø6
16 s	62 s

Lanes, Volumes, Timings
3: Route 5 & PITKIN ST

2017 Combined Traffic
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	195	163	74	857	1063	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175	125	250			0
Storage Lanes	1	1	1			1
Taper Length (ft)	25	25	25			25
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3433	1583	1770	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		70				114
Link Speed (mph)	30			30	30	
Link Distance (ft)	440			520	435	
Travel Time (s)	10.0			11.8	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	212	177	80	932	1155	114
Shared Lane Traffic (%)						
Lane Group Flow (vph)	212	177	80	932	1155	114
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	6

Lanes, Volumes, Timings

3: Route 5 &

2017 Combined Traffic

PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	8.0	8.0	22.0	22.0	22.0
Total Split (s)	22.0	16.0	16.0	78.0	62.0	62.0
Total Split (%)	22.0%	16.0%	16.0%	78.0%	62.0%	62.0%
Maximum Green (s)	17.0	12.0	12.0	72.0	56.0	56.0
Yellow Time (s)	3.0	3.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0	4.0	6.0	6.0	6.0
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)	5.0			5.0	5.0	5.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	11.5	26.3	9.8	77.5	63.7	63.7
Actuated g/C Ratio	0.12	0.26	0.10	0.78	0.64	0.64
v/c Ratio	0.54	0.38	0.46	0.34	0.51	0.11
Control Delay	46.5	19.1	50.3	4.0	11.5	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	19.1	50.3	4.0	11.5	2.1
LOS	D	B	D	A	B	A
Approach Delay	34.0			7.7	10.7	
Approach LOS	C			A	B	
90th %ile Green (s)	14.6	13.6	13.6	74.4	56.8	56.8
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	12.8	11.4	11.4	76.2	60.8	60.8
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	11.5	9.8	9.8	77.5	63.7	63.7
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	10.2	8.3	8.3	78.8	66.5	66.5
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	8.3	6.1	6.1	80.7	70.6	70.6
10th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
Stops (vph)	178	76	68	237	552	9
Fuel Used(gal)	4	2	1	5	9	0
CO Emissions (g/hr)	245	113	100	383	640	32
NOx Emissions (g/hr)	48	22	19	75	125	6
VOC Emissions (g/hr)	57	26	23	89	148	7
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	67	54	49	76	190	0
Queue Length 95th (ft)	100	102	92	115	293	23
Internal Link Dist (ft)	360			440	355	
Turn Bay Length (ft)	175	125	250			
Base Capacity (vph)	584	506	218	2744	2254	1049
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0

Lanes, Volumes, Timings
3: Route 5 &

2017 Combined Traffic
PM Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.35	0.37	0.34	0.51	0.11

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 98 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.54
 Intersection Signal Delay: 12.9
 Intersection Capacity Utilization 51.5%
 Analysis Period (min) 15

Intersection LOS: B
ICU Level of Service A

Splits and Phases: 3: Route 5 &

 ø2	 ø4
78 s	22 s
 ø5	 ø6
18 s	62 s

HCM Unsignalized Intersection Capacity Analysis

5: Pitkin Street & Site Drive

2017 Combined Traffic
PM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Volume (veh/h)	339	24	44	146	25	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	368	26	48	159	27	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				440		
pX, platoon unblocked						
vC, conflicting volume			395		636	382
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			395		636	382
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		94	95
cM capacity (veh/h)			1164		424	666
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	395	207	61			
Volume Left	0	48	27			
Volume Right	26	0	34			
cSH	1700	1164	531			
Volume to Capacity	0.23	0.04	0.11			
Queue Length 95th (ft)	0	3	10			
Control Delay (s)	0.0	2.2	12.7			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.2	12.7			
Approach LOS			B			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			42.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Site Drive &

2017 Combined Traffic

PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	38	0	931	1183	43
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	41	0	1012	1286	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					520	
pX, platoon unblocked	0.82	0.82	0.82			
vC, conflicting volume	1815	666	1333			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1549	141	958			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	100			
cM capacity (veh/h)	85	719	583			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	41	506	506	857	475	
Volume Left	0	0	0	0	0	
Volume Right	41	0	0	0	47	
cSH	719	1700	1700	1700	1700	
Volume to Capacity	0.06	0.30	0.30	0.50	0.28	
Queue Length 95th (ft)	5	0	0	0	0	
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	10.3	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		44.1%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

9: Site Drive &

2017 Combined Traffic

PM Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	19	0	931	1221	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	21	0	1012	1327	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					940	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	1833	664	1327			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1595	187	986			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	81	684	578			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	21	506	506	664	664	
Volume Left	0	0	0	0	0	
Volume Right	21	0	0	0	0	
cSH	684	1700	1700	1700	1700	
Volume to Capacity	0.03	0.30	0.30	0.39	0.39	
Queue Length 95th (ft)	2	0	0	0	0	
Control Delay (s)	10.4	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	10.4	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			43.8%		ICU Level of Service	A
Analysis Period (min)			15			

Lanes, Volumes, Timings
3: Route 5 & PITKIN ST

2017 Background Traffic
Sat Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	88	94	47	690	679	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	250			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25	25	25			25
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3433	1583	1770	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		102				74
Link Speed (mph)	30			30	30	
Link Distance (ft)	440			520	435	
Travel Time (s)	10.0			11.8	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	96	102	51	750	738	74
Shared Lane Traffic (%)						
Lane Group Flow (vph)	96	102	51	750	738	74
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	6

Lanes, Volumes, Timings
3: Route 5 &

2017 Background Traffic
Sat Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	8.0	20.0	20.0	20.0
Total Split (s)	22.0	14.0	14.0	58.0	44.0	44.0
Total Split (%)	27.5%	17.5%	17.5%	72.5%	55.0%	55.0%
Maximum Green (s)	18.0	10.0	10.0	54.0	40.0	40.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)	5.0			5.0	5.0	5.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	7.6	17.4	7.8	67.1	57.3	57.3
Actuated g/C Ratio	0.10	0.22	0.10	0.84	0.72	0.72
v/c Ratio	0.29	0.24	0.30	0.25	0.29	0.06
Control Delay	35.6	6.5	37.3	2.1	6.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.6	6.5	37.3	2.1	6.2	1.9
LOS	D	A	D	A	A	A
Approach Delay	20.6			4.3	5.8	
Approach LOS	C			A	A	
90th %ile Green (s)	9.5	10.3	10.3	62.5	48.2	48.2
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	8.4	8.8	8.8	63.6	50.8	50.8
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	7.6	7.7	7.7	64.4	52.7	52.7
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	6.8	6.6	6.6	65.2	54.6	54.6
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	0.0	0.0	0.0	76.0	76.0	76.0
10th %ile Term Code	Skip	Skip	Skip	Coord	Coord	Coord
Stops (vph)	78	17	44	130	248	7
Fuel Used(gal)	1	1	1	4	5	0
CO Emissions (g/hr)	96	38	55	266	317	21
NOx Emissions (g/hr)	19	7	11	52	62	4
VOC Emissions (g/hr)	22	9	13	62	73	5
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	23	0	24	33	72	0
Queue Length 95th (ft)	44	33	55	54	120	15
Internal Link Dist (ft)	360			440	355	
Turn Bay Length (ft)			250			
Base Capacity (vph)	772	467	222	2970	2533	1154
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0

Lanes, Volumes, Timings
3: Route 5 &

2017 Background Traffic
Sat Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.22	0.23	0.25	0.29	0.06

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.30
 Intersection Signal Delay: 6.8
 Intersection Capacity Utilization 35.4%
 Analysis Period (min) 15

Intersection LOS: A
ICU Level of Service A

Splits and Phases: 3: Route 5 &

 Ø2	 Ø4
58 s	22 s
 Ø5	 Ø6
14 s	44 s

Lanes, Volumes, Timings
3: Route 5 &

2017 Combined Traffic
Sat Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	120	94	79	690	750	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	250			0
Storage Lanes	2	1	1			1
Taper Length (ft)	25	25	25			25
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	3433	1583	1770	3539	3539	1583
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	3433	1583	1770	3539	3539	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		102				100
Link Speed (mph)	30			30	30	
Link Distance (ft)	440			520	435	
Travel Time (s)	10.0			11.8	9.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	102	86	750	815	100
Shared Lane Traffic (%)						
Lane Group Flow (vph)	130	102	86	750	815	100
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type		pm+ov	Prot			Perm
Protected Phases	4	5	5	2	6	
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	6

Lanes, Volumes, Timings
3: Route 5 &

2017 Combined Traffic
Sat Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	8.0	20.0	20.0	20.0
Total Split (s)	22.0	14.0	14.0	58.0	44.0	44.0
Total Split (%)	27.5%	17.5%	17.5%	72.5%	55.0%	55.0%
Maximum Green (s)	18.0	10.0	10.0	54.0	40.0	40.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag		Lead	Lead		Lag	Lag
Lead-Lag Optimize?		Yes	Yes		Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	C-Max	C-Max	C-Max
Walk Time (s)	5.0			5.0	5.0	5.0
Flash Dont Walk (s)	11.0			11.0	11.0	11.0
Pedestrian Calls (#/hr)	0			0	0	0
Act Effct Green (s)	8.4	19.5	9.2	66.4	55.2	55.2
Actuated g/C Ratio	0.10	0.24	0.12	0.83	0.69	0.69
v/c Ratio	0.36	0.22	0.42	0.26	0.33	0.09
Control Delay	35.7	5.7	38.5	2.3	7.6	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	5.7	38.5	2.3	7.6	2.0
LOS	D	A	D	A	A	A
Approach Delay	22.5			6.0	7.0	
Approach LOS	C			A	A	
90th %ile Green (s)	10.6	12.6	12.6	61.4	44.8	44.8
90th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
70th %ile Green (s)	9.3	10.6	10.6	62.7	48.1	48.1
70th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
50th %ile Green (s)	8.4	9.2	9.2	63.6	50.4	50.4
50th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
30th %ile Green (s)	7.5	7.8	7.8	64.5	52.7	52.7
30th %ile Term Code	Gap	Gap	Gap	Coord	Coord	Coord
10th %ile Green (s)	0.0	0.0	0.0	76.0	76.0	76.0
10th %ile Term Code	Skip	Skip	Skip	Coord	Coord	Coord
Stops (vph)	107	16	70	139	310	9
Fuel Used(gal)	2	1	1	4	5	0
CO Emissions (g/hr)	131	36	93	272	379	28
NOx Emissions (g/hr)	26	7	18	53	74	5
VOC Emissions (g/hr)	30	8	21	63	88	6
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	31	0	41	36	91	0
Queue Length 95th (ft)	56	31	80	59	152	19
Internal Link Dist (ft)	360			440	355	
Turn Bay Length (ft)			250			
Base Capacity (vph)	772	491	235	2939	2442	1123
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0

Lanes, Volumes, Timings
3: Route 5 &

2017 Combined Traffic
Sat Peak Hour

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.21	0.37	0.26	0.33	0.09

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.42
 Intersection Signal Delay: 8.4
 Intersection Capacity Utilization 38.5%
 Analysis Period (min) 15

Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 3: Route 5 &

 ø2	 ø4
58 s	22 s
 ø5	 ø6
14 s	44 s

HCM Unsignalized Intersection Capacity Analysis

5: Pitkin Street & Site Drive

2017 Combined Traffic
Sat Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Volume (veh/h)	182	40	71	115	39	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	198	43	77	125	42	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)				440		
pX, platoon unblocked						
vC, conflicting volume			241		499	220
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			241		499	220
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		92	94
cM capacity (veh/h)			1325		500	820
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	241	202	92			
Volume Left	0	77	42			
Volume Right	43	0	50			
cSH	1700	1325	634			
Volume to Capacity	0.14	0.06	0.15			
Queue Length 95th (ft)	0	5	13			
Control Delay (s)	0.0	3.3	11.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	3.3	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			37.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

7: Site Drive & *NORTHERLY SITE DRIVE / RT 5*

2017 Combined Traffic

Sat Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	63	0	769	773	71
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	68	0	836	840	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					520	
pX, platoon unblocked	0.91	0.91	0.91			
vC, conflicting volume	1297	459	917			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1130	210	714			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	91	100			
cM capacity (veh/h)	180	724	804			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	68	418	418	560	357	
Volume Left	0	0	0	0	0	
Volume Right	68	0	0	0	77	
cSH	724	1700	1700	1700	1700	
Volume to Capacity	0.09	0.25	0.25	0.33	0.21	
Queue Length 95th (ft)	8	0	0	0	0	
Control Delay (s)	10.5	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	10.5	0.0		0.0		
Approach LOS	B					

Intersection Summary

Average Delay		0.4			
Intersection Capacity Utilization		34.2%	ICU Level of Service	A	
Analysis Period (min)		15			

HCM Unsignalized Intersection Capacity Analysis

9: Site Drive & *SOUTHERLY SIDE DRIVE / RT 5*

2017 Combined Traffic

Sat Peak Hour

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	32	0	769	836	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	35	0	836	909	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)					940	
pX, platoon unblocked	0.98	0.98	0.98			
vC, conflicting volume	1327	454	909			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1292	402	866			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	100			
cM capacity (veh/h)	152	586	758			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	35	418	418	454	454	
Volume Left	0	0	0	0	0	
Volume Right	35	0	0	0	0	
cSH	586	1700	1700	1700	1700	
Volume to Capacity	0.06	0.25	0.25	0.27	0.27	
Queue Length 95th (ft)	5	0	0	0	0	
Control Delay (s)	11.5	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	11.5	0.0		0.0		
Approach LOS	B					

Intersection Summary

Average Delay	0.2				
Intersection Capacity Utilization	33.1%	ICU Level of Service	A		
Analysis Period (min)	15				