



1001 G Street NW
Suite 1125
Washington, D.C. 20001



1100 H Street NW
Suite 805
Washington, D.C. 20005

8th Street NE

One-Way Circulation Study
Traffic Operations Evaluation



Table of Contents

1.	Introduction.....	3
2.	Existing Conditions.....	4
2.1.	Roadway Characteristics	4
2.2.	Existing Street Network and Facilities.....	4
2.3.	Transit Routes	5
2.4.	Bicycle Routes	6
2.5.	Commercial Vehicle Routes.....	6
2.6.	Existing Traffic Counts/Peak Hour Determinations	7
2.7.	Capacity Analysis	11
3.	Proposed Reconfiguration of 8 th Street NE.....	13
3.1.	Traffic Redistribution and Rerouting Assumptions.....	15
3.2.	Proposed One-way Capacity Analysis	19
4.	Mitigation.....	21
4.1.	7 th Street NE & Monroe Street NE	21
4.2.	7 th Street & Franklin Street NE.....	23
4.3.	7 th Street & Edgewood Street NE.....	24
5.	Conclusions and Recommendations	25

List of Figures

Figure 1: Study Area and Intersection ID Numbers	3
Figure 2: 2900 Block of Edgewood Street NE (Looking South)	4
Figure 3: 3400 Block of 8 th Street NE (Looking South)	5
Figure 4: 3200 Block of 8 th Street NE (Looking South).....	6
Figure 5: Existing Cross-section of 8th St NE (looking North)	8
Figure 6: 2020 Existing Lane Configuration.....	9
Figure 7: 2020 Existing Turning Movement Counts.....	10
Figure 8: Proposed Reconfiguration of 8 th Street NE (looking North).....	14
Figure 9: DDOT Preferred Proposed Reconfiguration of 8 th St NE (looking North)	14
Figure 10: Future Build Lane Use and Traffic Control.....	16
Figure 11: AM and PM Rerouted Traffic Volumes	17
Figure 12: Final Rerouted TMC.....	18
Figure 13: 7 th Street NE & Monroe Updated Lane Configuration.....	21
Figure 14: 7 th Street NE Southbound Lane Configuration.....	23

List of Tables

Table 1: Turning Movement Count Data.....	7
Table 2: Existing AM/PM LOS and Delay Results	12
Table 3: Existing Queuing Summary	13
Table 4: Future Build LOS and Delay Results.....	19
Table 5: Build Queueing Summary	20
Table 6: Mitigation Traffic Operations Measures of Effectiveness- 7 th Street NE & Monroe Street NE	22
Table 7: Mitigation Queueing Summary- 7 th Street NE & Monroe Street NE.....	22
Table 8: Mitigation Traffic Operations Measures of Effectiveness- 7 th Street NE & Franklin Street NE	24
Table 9: Mitigation Queueing Summary- 7 th Street NE & Franklin Street NE.....	24

Appendices

Appendix A	Traffic Counts
Appendix B	Volume Balancing Adjustments
Appendix C	Synchro Reports

1. Introduction

DDOT requested traffic analysis support services for Edgewood Street NE/8th Street NE between 7th Street NE and Monroe Street NE. The proposed project will convert Edgewood Street NE/8th Street NE between 7th Street NE and Monroe Street NE to one-way eastbound/northbound and provide a two-way cycle track. This study evaluates the circulation impacts at the adjacent intersections with proposed diversions.

The initial traffic analysis, prepared by Cube Root, of the proposed one-way conversion is documented in the attached 8th Street NE One-way Conversion Traffic Operations Evaluation report. Upon DDOT review and implementation of a separated bike lane on Franklin Street NE, supplemental analysis is required.



Figure 1: Study Area and Intersection ID Numbers

2. Existing Conditions

The following sections provide a description of the study area and site conditions.

2.1. Roadway Characteristics

According to DDOT’s 2016 functional classification map, 8th Street NE is classified as a two-lane local street oriented north-south between Monroe Street and Hamlin Street NE. Eighth Street NE is directly accessible from Monroe Street NE, which is a minor arterial. The segment is approximately 2,500 feet in length and 35 feet wide with bike shared lane markings in both directions. Parking is generally unrestricted on both sides of the roadway, except for the west side of the 3200 block, between Kearney Street and Jackson Street NE (which is signed for two-hour parking limit, except for Zone 5 Permit holders). The roadway has a posted speed limit of 25 miles per hour (mph), with a 15-mph reduced school speed zone within the 2900 block. Eighth Street NE has a sidewalk located on the both sides of the street north of Kearny Street NE. However, south of Kearny Street NE, there is only a sidewalk on the west side of 8th Street NE.

2.2. Existing Street Network and Facilities

Edgewood Street NE

The Edgewood Street NE portion of the study corridor is approximately 950 feet long from Hamlin Street NE to beyond the Franklin Street NE overpass. The roadway is approximately 30 feet wide with bi-directional vehicular travel lanes and bi-directional bike lanes adjacent to the curb. Figure 2 shows a photograph of the lane configuration and parking arrangement of the 2900 block of Edgewood Street NE.



Figure 2: 2900 Block of Edgewood Street NE (Looking South)

7th Street NE

7th Street NE is a two-lane north-south collector street between Monroe Street NE and Franklin Street NE. The segment is approximately 2,500 feet in length and 33 feet wide, with two vehicular travel lane (one in each direction). There is curb side parking on both sides of the street, with most blocks signed for two-hour parking limit, except for Zone 5 permit holders. The posted speed limit is 25 mph.

8th Street NE

8th Street NE is a two-lane north-south local street between Monroe Street NE and Hamlin Street NE. The segment is approximately 1,700 feet in length and 33 feet wide, with two vehicular travel lane (one in each direction) and parking located on both sides. Eighth Street NE has various businesses, residential units and commercial buildings within this segment. The posted speed limit is 25 mph.



Figure 3: 3400 Block of 8th Street NE (Looking South)

2.3. Transit Routes

The Washington Metropolitan Area Transit Authority (WMATA) G8 line, services 7th Street between Franklin Street NE and Monroe Street NE. It has four stops on 7th Street NE: 7th Street NE at Franklin Street NE, Hamlin Street NE, Jackson Street NE, and Monroe Street NE. Buses operate on a 15-minute headway during weekday morning peak hours and a 12-

minute headway during the weekday evening peak hours. They also operate on 20 to 30-minute headways on the weekends, depending on the time of day.

2.4. Bicycle Routes

The study segment is an on-street section of the Metropolitan Branch Trail (MBT) and provides north-south connectivity. The MBT, which travels parallel to the Red Line northbound towards Silver Spring, uses a combination of on-road and off-road trails that connects Union Station to the south and Maryland to the north. East-west connectivity is achieved through bicycle lanes on Monroe Street NE and signed routes along Newton Street NE and Randolph Street NE. Figure 4 shows a photograph of the typical segment of 8th Street NE with share lane markings.



Figure 4: 3200 Block of 8th Street NE (Looking South)

2.5. Commercial Vehicle Routes

Commercial vehicles are present in the study area due to the nature of the businesses on 8th Street NE. However, Monroe Street NE and 7th Street NE have a truck restriction. Even with this restriction, smaller commercial vehicles still access 8th Street NE by using the side streets such as Hamlin Street and Irving Street NE, even though there is signage to restrict this movement such as “No Thru Trucks Over 1 ¼ Ton Capacity” and “No Buses”. This is an existing problem in the study area and the community is seeking additional support on how to reroute medium/small sized commercial vehicle to 8th Street NE. Additionally, the Franklin St NE bridge height is 14’-3”, therefore larger vehicles will not be able to access 8th St NE via Edgewood Road NE. Further discussion is required with the adjacent business owner on expected vehicle type.

2.6. Existing Traffic Counts/Peak Hour Determinations

Several sources were used to obtain the data required for this traffic analysis. Peak hour turning movement count data was provided by DDOT through the comprehensive transportation review (CTR) study for the Hanover 8th Street NE planned unit development (PUD). DDOT offered that the 2021 total future traffic volumes with the project would provide the best representation of future traffic volumes when the one-way conversion would be implemented.

The 2021 total future traffic volumes consist of the 2021 background volumes with the addition of the traffic volumes generated by the proposed Project (site-generated trips). Thus, the 2021 total future traffic volumes include traffic generated by: the existing volumes, background developments, the inherent growth on the study area roadways, and site-generated trips of the proposed Project.

Upon review of the CTR study, the existing traffic volumes that form the basis of the total future traffic volumes were collected on Wednesday, October 10, 2018 and Thursday, November 29, 2018 between the hours of 6:30 and 9:30 AM and 4:00 and 7:00 PM. In addition to the CTR counts, Cube Root collected TMCs for the intersection of Edgewood Street NE at 8th Street NE. A summary of actual TMC data collection is included in Table 1. The raw turning movement counts are located in Appendix A.

Table 1: Turning Movement Count Data

Location	Source	Date
7 th Street NE & Monroe Street NE	Hanover 8 th PUD	October 2018
8 th Street NE & Monroe Street NE	Hanover 8 th PUD	October 2018
8 th Street NE & Kearny Street NE	Hanover 8 th PUD	October/ November 2018
8 th Street NE & Hamlin Street NE	Hanover 8 th PUD	October 2018
7 th Street NE & Edgewood Street NE	Cube Root	April 2019
7 th Street NE & Franklin St NE	Hanover 8 th PUD	October/ November 2018

As directed by DDOT staff, the future build scenario for the Hanover 8th Street NE PUD was used as the baseline traffic volume for the analysis. The traffic counts for the Hanover 8th Street NE PUD were collected on Wednesday, October 10, 2018 and Thursday, November 29, 2018 between the hours of 6:30 and 9:30 a.m. and 4:00 and 7:00 p.m.

The future build scenario also balances volumes between intersections to between 5-10%.

Figure 5 shows the existing cross-section of 8th Street NE looking north.

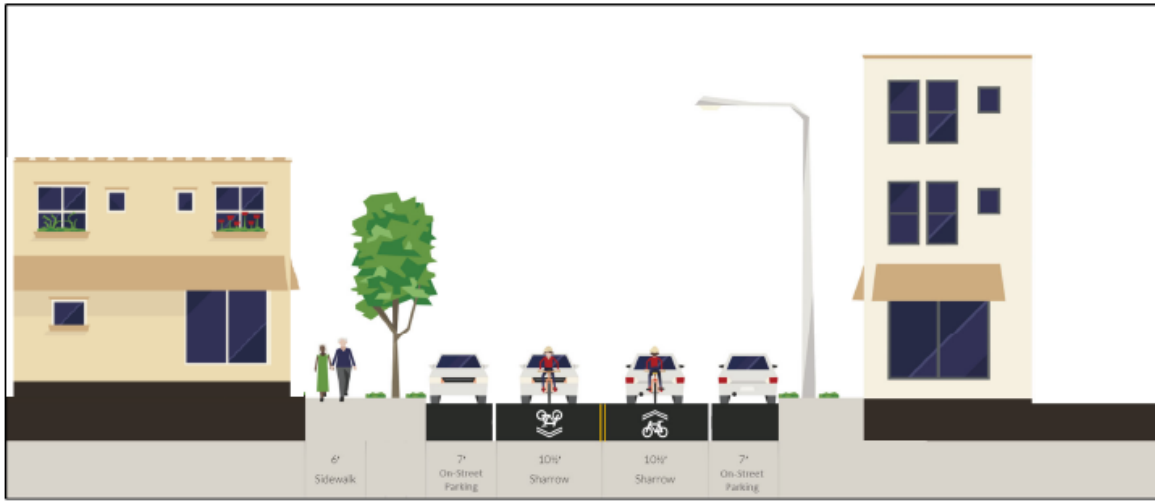


Figure 5: Existing Cross-section of 8th St NE (looking North)

Figure 6 and Figure 7 show the existing (baseline) AM and PM existing lane configuration and balanced turning movement counts.

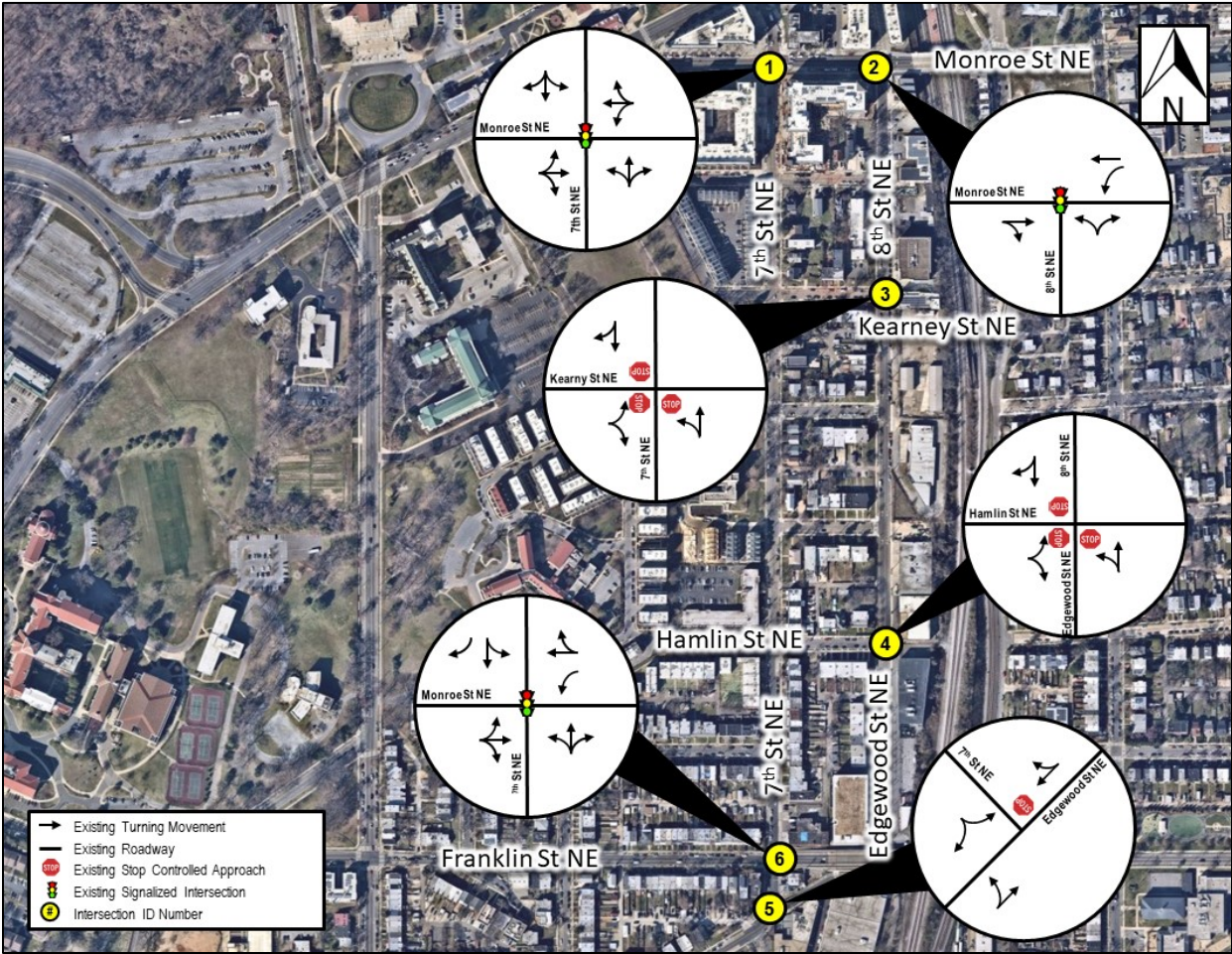


Figure 6: 2020 Existing Lane Configuration

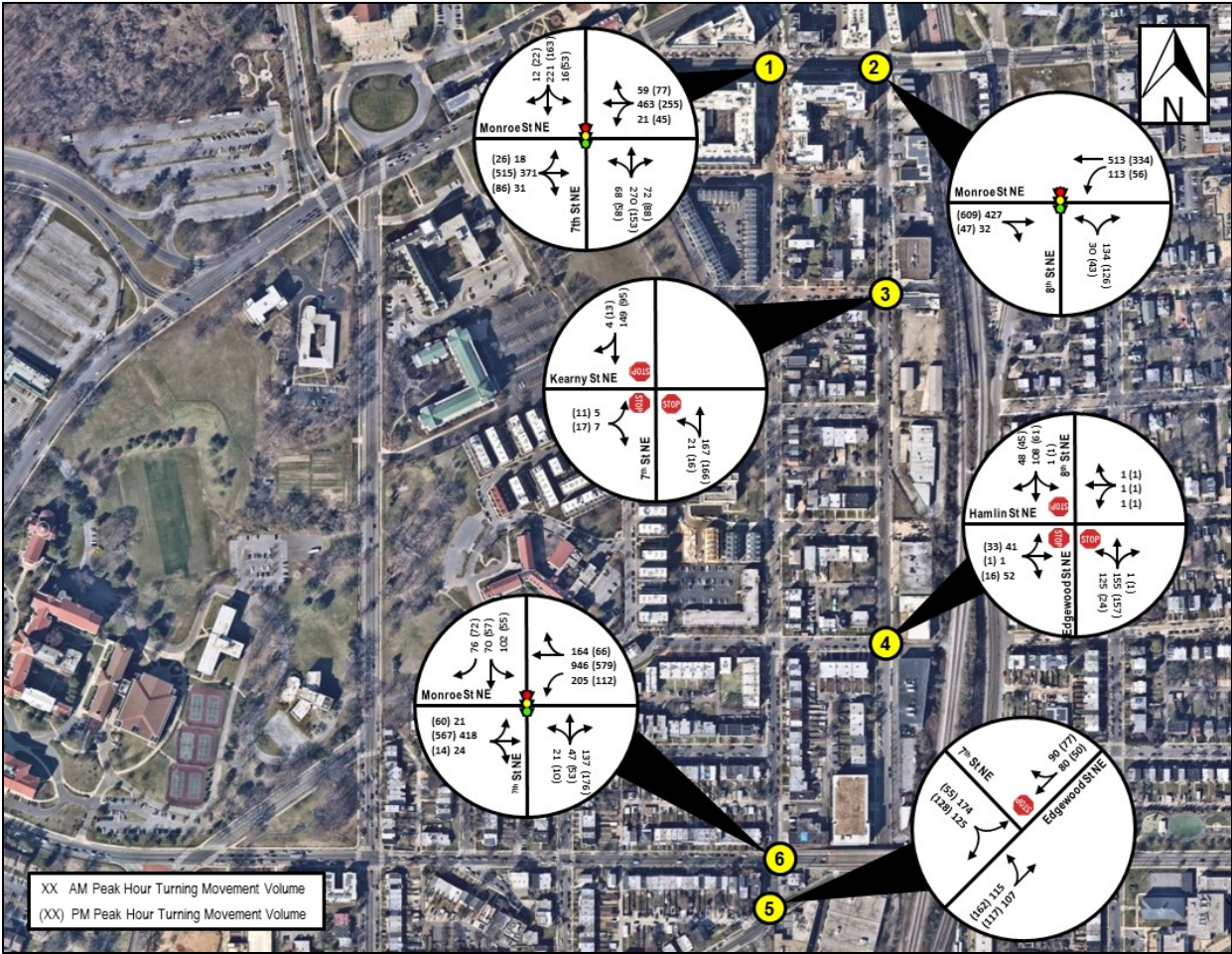


Figure 7: 2020 Existing Turning Movement Counts

2.7. Capacity Analysis

Capacity analysis results are expressed in terms of Level of Service (LOS). LOS is a qualitative measurement of traffic operations. It is translated from a measure of delay to drivers in units of time, seconds per vehicle. The Transportation Research Board’s Highway Capacity Manual (HCM) defines six levels of service for intersections with LOS “A” representing operating conditions with minimal constraints on traffic movements and LOS “F” representing extremely congested operating conditions. LOS “D” is considered the threshold of acceptable operations for an overall intersection. Exhibit 18-4 of the HCM gives the criteria for signal-controlled intersections, while HCM Exhibit 19-1 gives the criteria for unsignalized intersections.

HCM Exhibit 18-4: Level of Service Criteria

Signalized Level of Service	Signal Delay per Vehicle (sec/veh)
A	≤ 10.0
B	> 10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

HCM Exhibit 19-1: Level of Service Criteria

Unsignalized Level of Service	Stopped Delay per Vehicle (sec/veh)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

Synchro 9.1 is the software tool used to evaluate the delay, capacity and corresponding LOS for the study intersections. Traffic operations analysis results for the 2020 existing conditions include delay and LOS information, and are presented in Table 2. The queuing analysis is summarized in Table 3. Appendix B includes the Synchro reports for the 2020 existing conditions.

Table 2 shows the existing conditions results. The signalized study intersections currently operate at acceptable levels of service (LOS D or better), except for the 7th Street NE & Franklin Street NE intersection that operates at LOS E in the AM peak. During the AM peak, the eastbound, westbound and southbound approaches operate at LOS E. The southbound approach is a LOS F with 104.2s of delay per cycle.

The unsignalized intersection of 7th Street NE and Edgewood Street NE operates at LOS D. The primary westbound movement operates with 27.1s of delay. However, the proposed configuration of this intersection is uncontrolled, and will improve operationally as there will be no Edgewood Street SEB approach.

Table 3 shows the queue length summary within the study area. The northbound approach at 7th Street NE & Monroe Street NE has an average queue length, in the AM peak, that exceeds the link storage. This suggests that the queue will extend beyond the upstream intersection in this

configuration. Additionally, the existing queue lengths at the southbound and westbound approaches at the 7th Street NE & Franklin Street NE intersection exceed the available storage.

Table 2: Existing AM/PM LOS and Delay Results

ID #	Intersection	Intersection Control Type	Approach	AM Peak				PM Peak			
				Approach		Overall LOS		Approach		Overall LOS	
				Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	7 th Street NE & Monroe Street NE	Signalized	EB	15.9	B	24.3	C	17.0	B	26.1	C
			WB	15.1	B			14.8	B		
			NB	44.9	D			51.5	D		
			SB	24.2	C			36.0	D		
2	8 th Street NE & Monroe Street NE	Signalized	EB	8.5	A	15.7	B	20.2	C	19.8	B
			WB	16.3	B			11.9	B		
			NB	33.3	C			36.4	D		
3	8 th Street NE & Kearny Street NE	AWSC	EB	7.5	A	8.3	A	7.5	A	8.1	A
			NB	8.4	A			8.3	A		
			SB	8.1	A			7.8	A		
4	8 th Street NE & Hamlin Street NE	TWSC	EB	16.8	C	-	-	11.8	B	-	-
			WB	17.0	C			11.1	B		
5	7 th Street NE & Edgewood Street NE	TWSC	WB	27.1	D	-	-	13.1	B	-	-
6	7 th Street NE & Franklin St NE	Signalized	EB	63.6	E	61.6	E	22.4	C	21.3	C
			WB	55.6	E			9.6	A		
			NB	43.7	D			39.9	D		
			SB	104.2	F			39.8	D		

Table 3: Existing Queuing Summary

Intersection	Approach	Storage or Link Distance (ft)	Movement	Existing Queuing			
				AM Peak		PM Peak	
				Average Queues (ft)	95 th Percentile Queues (ft)	Average Queues (ft)	95 th Percentile Queues (ft)
7 th Street NE & Monroe Street NE	Eastbound	336	LTR	219	381	301	445
	Westbound	273	LTR	264	345	226	350
	Northbound	290	LTR	294	363	186	301
	Southbound	191	LTR	106	162	122	206
8 th Street NE & Monroe Street NE	Eastbound	273	TR	92	205	255	349
	Westbound	100	L	88	164	53	119
		403	T	370	534	197	392
Northbound	660	LR	323	721	110	235	
8 th Street NE & Kearny Street NE	Eastbound	242	LR	10	32	19	44
	Northbound	1030	LT	85	289	46	71
	Southbound	660	TR	41	65	43	72
8 th Street NE & Hamlin Street NE	Eastbound	268	LTR	40	66	28	55
	Westbound	76	LTR	3	18	3	16
	Northbound	601	LTR	45	95	7	30
	Southbound	1030	LTR	5	27	1	8
7 th Street NE & Edgewood Street NE	Westbound	124	LR	88	181	61	114
	Northbound	405	TR	46	145	50	147
	Southbound	96	LT	32	83	13	46
7 th Street NE & Franklin St NE	Eastbound	570	LTR	543	749	338	597
	Westbound	350	L	277	508	46	91
		633	TR	640	754	152	259
	Northbound	96	LTR	94	130	90	128
	Southbound	528	LT	488	674	160	364
50		R	55	107	51	99	

3. Proposed Reconfiguration of 8th Street NE

The proposed one-way conversion of 8th Street NE/ Edgewood Street NE between Monroe Street and 7th Street NE would restrict vehicular travel to one-way northbound and enable DDOT to install a cycle track. This would provide an important bike segment in the Metropolitan Branch Trail (MBT).

Based on the results of the traffic analysis performed, the conversion of 8th Street/ Edgewood Street NE from a bidirectional roadway to a one-way street with northbound travel with a cycle track is feasible; it is recommended that the cycle track be oriented parallel to the west curb. Figure 8 shows the proposed cross-section of 8th Street NE.

This recommendation is based on several factors, including:

- The number of wide commercial driveways on the east side of 8th Street/ Edgewood Street NE. There are approximately sixteen (16) wide commercial driveways located on 8th Street NE between Monroe Street and Hamlin Street NE with another three (3) located on Edgewood Street NE between Hamlin Street and the Franklin Street NE overpass.
- The number of transverse parking areas located on the east side outnumbers the amount of minor street intersections on the west side of 8th Street NE
- The potential for heavy vehicle activity associated with commercial entities such as Sunbelt Rentals, located on the east side of 8th Street NE, to affect operation of the cycle track
- The potential for pick up and drop off activities at the Imagine Hope Community Charter School, located on the east side of 8th Street NE, to impact the cycle track.



Figure 8: Proposed Reconfiguration of 8th Street NE (looking North)

Pending DDOT further review, Figure 9 shows a supplemental cross section of 8th St NE to retain parking while maintaining safe conditions.

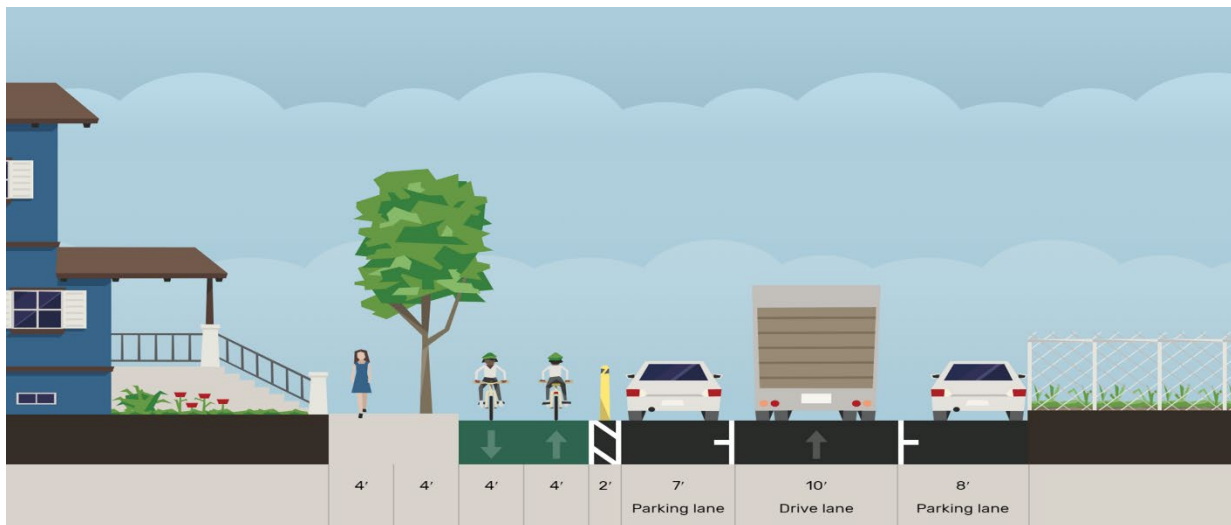


Figure 9: DDOT Preferred Proposed Reconfiguration of 8th St NE (looking North)

3.1. Traffic Redistribution and Rerouting Assumptions

The following section provides an assessment of the impacts of the conversion of 8th Street NE and Edgewood Street NE to one-way northbound. This will facilitate the repurposing of a portion of the right-of-way for the cycle track.

The conversion of 8th Street NE/Edgewood Street NE to one-way northbound operations will result in road users, particularly motor vehicle drivers, choosing alternate routes. However, options are limited because the network is generally constrained by the railroad tracks to the east and limited connecting roadways to the west. It is rational to assume that 7th Street NE would be the only reasonable alternative for southbound vehicular travel in the localized area. The Future Build lane use and traffic control is shown in Figure 9.

A key assumption in this study is that 8th Street NE is an origin/destination. It is assumed that there is no through traffic on 8th Street NE given the local nature of the roadway, so all trips are redistributed within the study area. This represents a conservative approach to the trip distribution analysis, given some traffic travelling through the area may prefer to divert to other southbound routes west of the rail tracks, thus reducing the overall traffic volume load in the study area.

The intersections at 8th Street at Monroe Street NE, 7th Street at Monroe Street NE, and 7th Street at Franklin Street NE are key intersections for destination traffic rerouting. For this analysis, southbound traffic using the intersection of 8th Street at Monroe Street NE, was rerouted to the intersection of 7th Street at Monroe Street NE. This removed eastbound right turn and westbound left turn traffic from the intersection of 8th Street at Monroe Street NE and added this traffic to the eastbound right turn movement and westbound left turn movements, respectively, at 7th Street NE.

The trips that originate within the study area are rerouted northbound on 8th Street NE to Hamlin Street NE and Monroe Street NE. Figure 10 shows the traffic redistribution and rerouting volumes and shows the Future Build peak hour volumes. Figure 11 shows the final rerouted turning movement counts.

While the volume redistribution analysis aids in determining impacts to intersection capacity, the industrial nature of 8th Street NE suggests that commercial vehicles will also be rerouted. Additional restrictions are necessary to prevent commercial vehicles from using residential and local roads such as Kearney St NE, Jackson St NE and Hamlin St NE to reach 8th Street NE. It is recommended that commercial vehicles use Edgewood Street NE to access 8th Street NE.

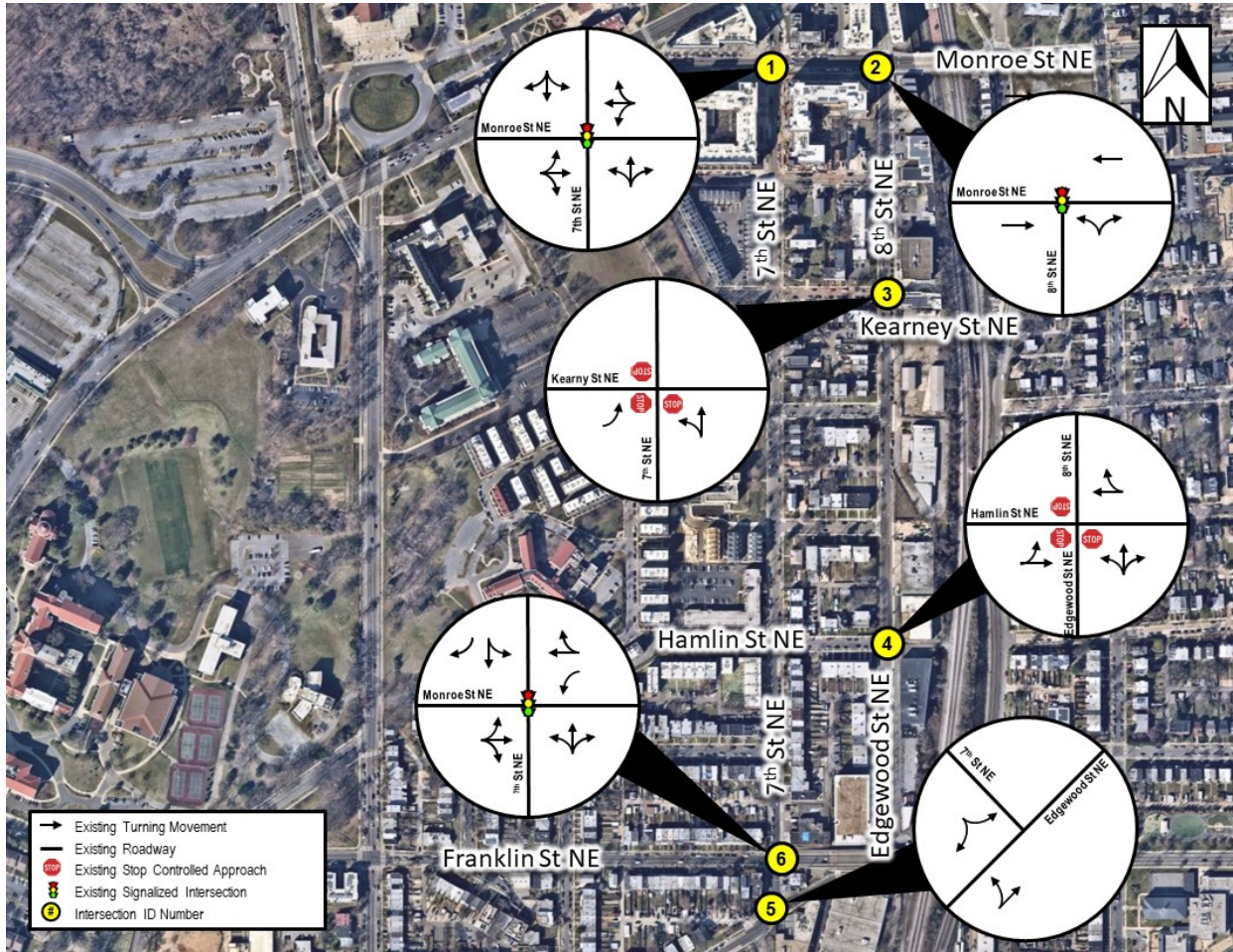


Figure 10: Future Build Lane Use and Traffic Control

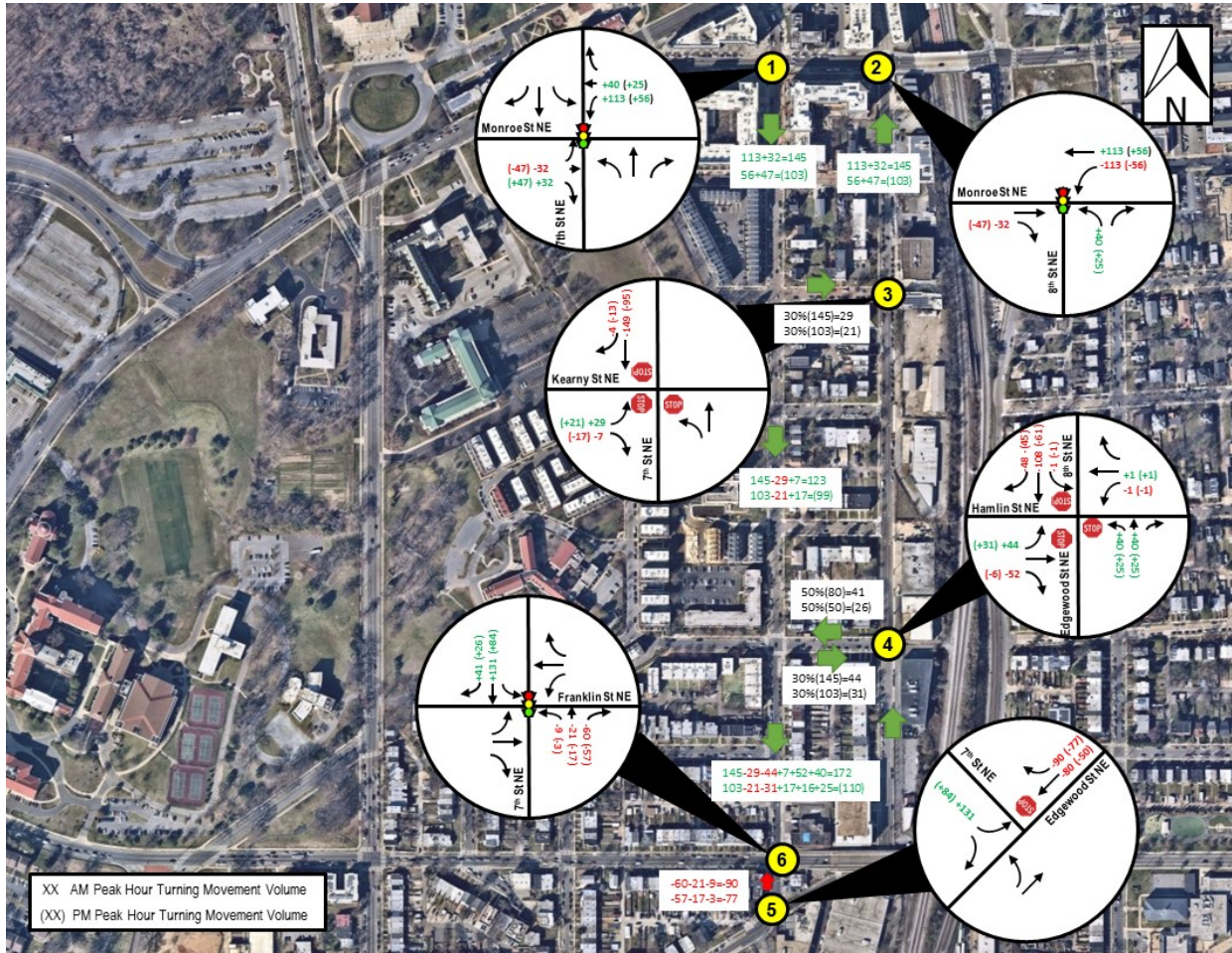


Figure 11: AM and PM Rerouted Traffic Volumes

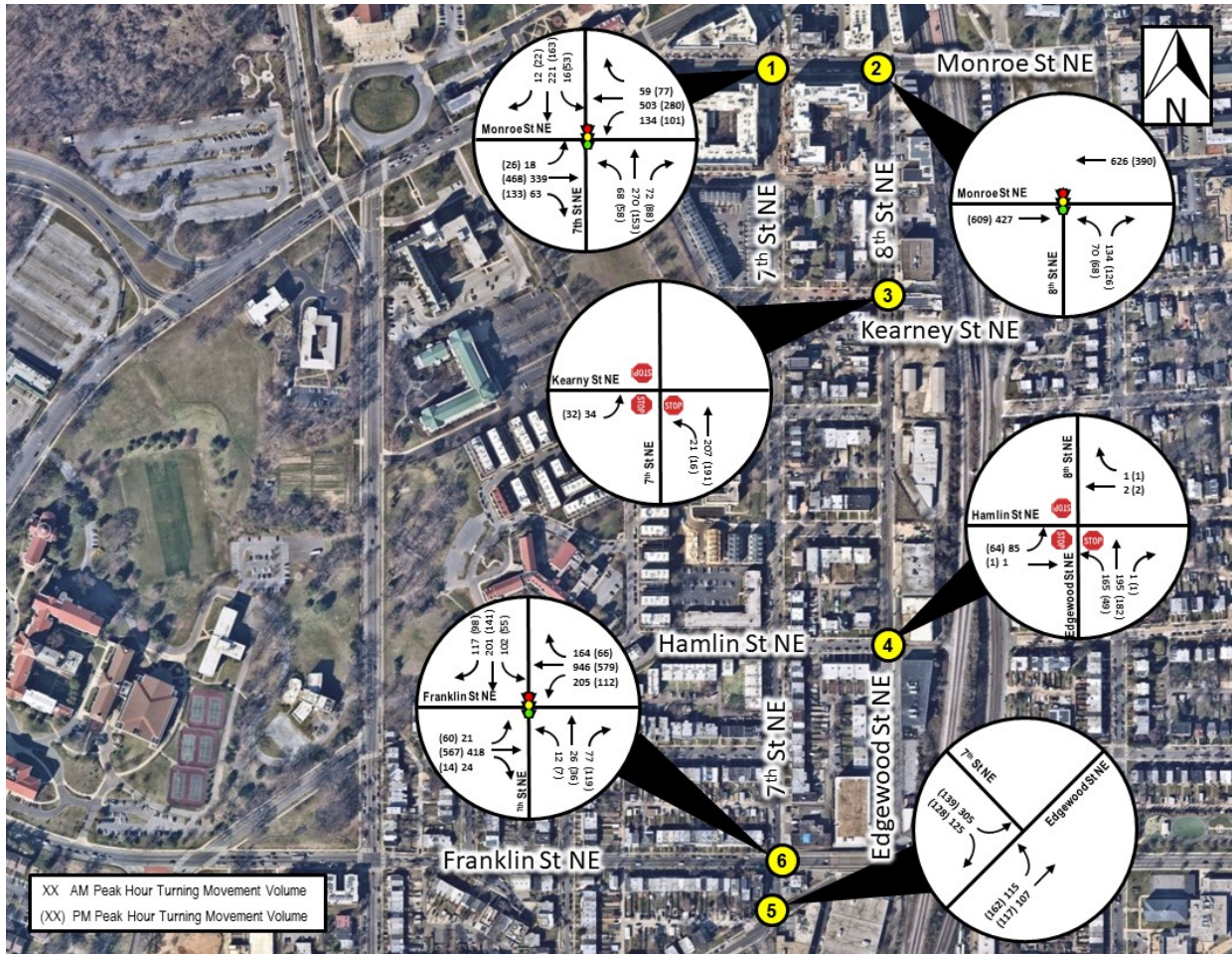


Figure 12: Final Rerouted TMC

3.2. Proposed One-way Capacity Analysis

The proposed one-way northbound operation of 8th Street/ Edgewood Street NE would result in generally acceptable vehicular intersection operations at both the signalized intersections on Monroe Street NE in the AM and PM peak hour with adjustments to green splits to optimize signal operations.

Table 4 shows the LOS and delay for all intersections within the study area. During the AM peak, the intersection at 7th Street NE and Franklin Street NE operates at a LOS E with the eastbound and southbound approaches operating at a LOS F. This intersection requires mitigation given the additional southbound volumes and recommendations are outlined in the following section.

All unsignalized intersections within the study area would operate at LOS A in both the AM and PM peak.

Table 4: Future Build LOS and Delay Results

ID #	Intersection	Intersection Control Type	Approach	AM Peak				PM Peak			
				Approach		Overall LOS		Approach		Overall LOS	
				Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	7 th Street NE & Monroe Street NE	Signalized	EB	13.5	B	34.8	C	15.9	B	29.7	C
			WB	24.7	B			19.7	B		
			NB	78.3	E			66.9	E		
			SB	27.4	C			38.7	D		
2	8 th Street NE & Monroe Street NE	Signalized	EB	9.2	A	19.2	B	17.5	B	20.0	B
			WB	18.6	B			12.8	B		
			NB	42.1	D			41.8	D		
3	8 th Street NE & Kearny Street NE	AWSC	EB	7.9	A	8.5	A	7.8	A	8.3	A
			NB	8.6	A			8.4	A		
4	8 th Street NE & Hamlin Street NE	TWSC	EB	20.2	C	-	-	12.4	B	-	-
			WB	13.7	B			11.1	B		
5	7 th Street NE & Edgewood Street NE	Free	-	-	-	-	-	-	-	-	-
6	7 th Street NE & Franklin St NE	Signalized	EB	98.3	F	78.3	E	22.4	C	21.9	C
			WB	61.0	E			9.6	A		
			NB	33.4	C			33.5	C		
			SB	122.8	F			45.0	D		

Table 5 shows that key intersections would experience some degradation in queueing for the morning peak hour but would improve in the afternoon peak hour with the improvement to signal timings.

The westbound approach queue at 7th Street and Monroe Street NE would increase for the future AM conditions. The westbound approach queues are expected to extend beyond the intersection of 8th Street NE at Monroe Street NE 19% of the AM peak hour. This is primarily due to the increased westbound left turning movement waiting to find gaps in eastbound traffic.

In the PM peak hour, all approaches to the intersection of 7th Street at Monroe Street NE operate under queueing levels at or just above capacity. The westbound approach queues are expected to extend beyond the intersection of 8th Street at Monroe Street NE 5% percent of the PM peak hour.

At 7th Street NE & Franklin Street NE, the existing queue lengths at the southbound and westbound approaches exceed the available storage and mitigation is required.

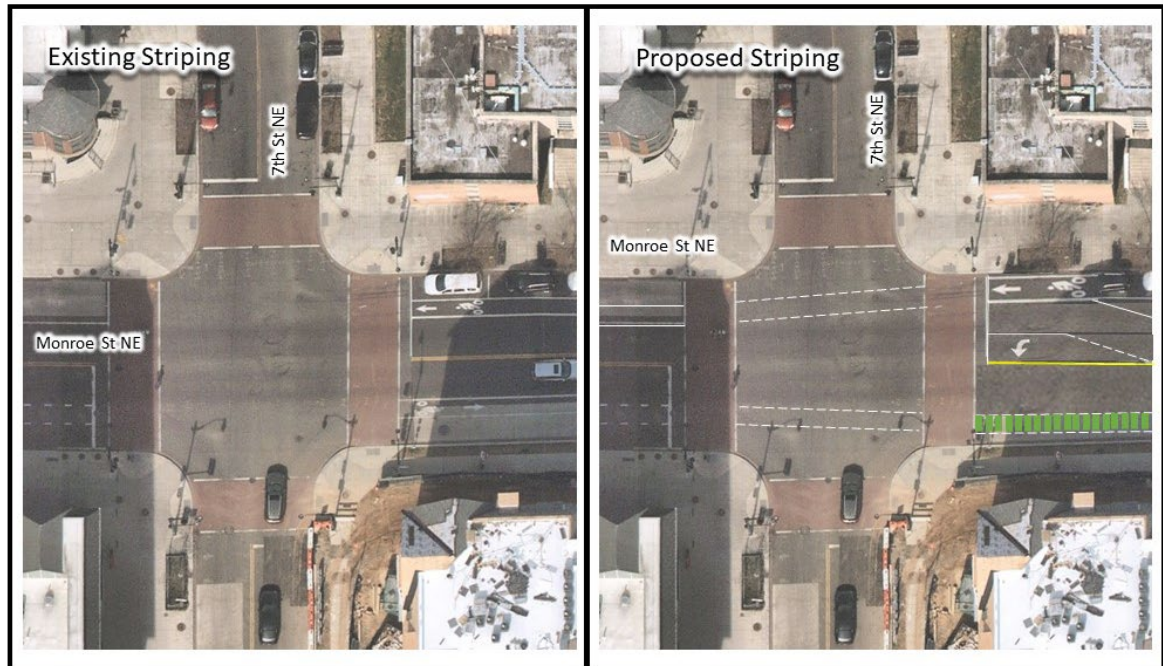
Table 5: Build Queueing Summary

ID #	Intersection	Approach	Movement	Storage or Link Distance (ft)	Future Queueing			
					AM Peak		PM Peak	
					Average Queues (ft)	95 th Percentile Queues (ft)	Average Queues (ft)	95 th Percentile Queues (ft)
1	7 th Street NE & Monroe Street NE	Eastbound	LTR	336	164	301	260	411
		Westbound	LTR	273	291	314	281	342
		Northbound	LTR	290	310	349	218	342
		Southbound	LTR	191	119	175	125	218
2	8 th Street NE & Monroe Street NE	Eastbound	T	286	109	199	233	345
		Westbound	T	403	425	459	323	532
		Northbound	LR	666	117	239	227	494
3	8 th Street NE & Kearny Street NE	Eastbound	L	254	22	50	24	56
		Northbound	LT	1030	43	66	57	129
4	8 th Street NE & Hamlin Street NE	Eastbound	LT	280	38	67	21	49
		Westbound	TR	76	3	17	3	16
		Northbound	LTR	597	31	72	5	27
5	7 th Street NE & Edgewood Street NE	Northbound	TR	405	6	41	16	77
		Southbound	LT	106	52	108	43	101
6	7th Street NE & Franklin St NE	Eastbound	LTR	576	552	732	306	540
		Westbound	L	350	273	379	46	83
			TR	628	654	691	151	272
		Northbound	LTR	106	62	110	80	130
		Southbound	LT	528	549	589	299	530
R	50		60	75	60	102		

4. Mitigation

4.1.7th Street NE & Monroe Street NE

The westbound queue length at 7th Street NE & Monroe St NE is expected to approach the link distance during the AM and PM peaks due to the increase in westbound left turn volume. The AM westbound left turn volume is expected to increase from 21 to 134 vehicles in the peak hour. To mitigate the extended queuing, a westbound left turn lane with 100 feet of storage is recommended as shown in Figure 12. A westbound lane shift is required to accommodate the additional left turn lane. Approximately 4-5 parking spaces along the north side of Monroe Street NE will need to be removed. This condition would result in westbound through traffic shifting through the intersection and would be supported by dashed lane markings to guide through traffic to the receiving lane on the far side of the intersection. Additionally, the far side bus stop on the east side of the intersection will need to be a shared bus bike lane. This intersection striping assumes standard bike lanes however, according to the DDOT's plan to install 20 miles of protected bike lanes by 2022, Monroe St NE will transition to protected bike lanes. Modifications to the intersection are likely when separated bike lanes are installed.



*NTS- turn lane lengths and tapers are not to scale

Figure 13: 7th Street NE & Monroe Updated Lane Configuration

Table 6 and Table 7 show the mitigation condition measures of effectiveness. The westbound queue length still exceeds the storage in the AM peak but is mitigated in the PM peak.

Table 6: Mitigation Traffic Operations Measures of Effectiveness- 7th Street NE & Monroe Street NE

ID #	Intersection	Intersection Control Type	Approach	AM Peak				PM Peak			
				Approach		Overall LOS		Approach		Overall LOS	
				Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
1	7 th Street NE & Monroe Street NE	Signalized	EB	16.0	B	21.5	C	15.8	B	27.4	C
			WB	9.1	A			11.8	B		
			NB	46.0	D			66.9	E		
			SB	24.4	C			38.7	D		

Table 7: Mitigation Queuing Summary- 7th Street NE & Monroe Street NE

Future Queuing								
ID #	Intersection	Approach	Movement	Storage or Link Distance (ft)	AM Peak		PM Peak	
					Average Queues (ft)	95 th Percentile Queues (ft)	Average Queues (ft)	95 th Percentile Queues (ft)
1	7 th Street NE & Monroe Street NE	Eastbound	LTR	336	212	370	286	423
		Westbound	L	100	93	161	82	147
			TR	273	292	301	189	326
		Northbound	LTR	290	306	345	252	353
		Southbound	LTR	191	113	171	120	216

4.2.7th Street & Franklin Street NE

A mitigation condition analysis was completed to evaluate an option to improve the Level of Service at the 7th Street NE & Franklin Street NE intersection. Based on the overall width of 7th Street NE, there is adequate width on the southbound approach to provide a shared southbound through/right lane and an exclusive southbound left-turn lane with up to 120' feet of storage length. Figure 12 shows the existing and proposed lane configuration.

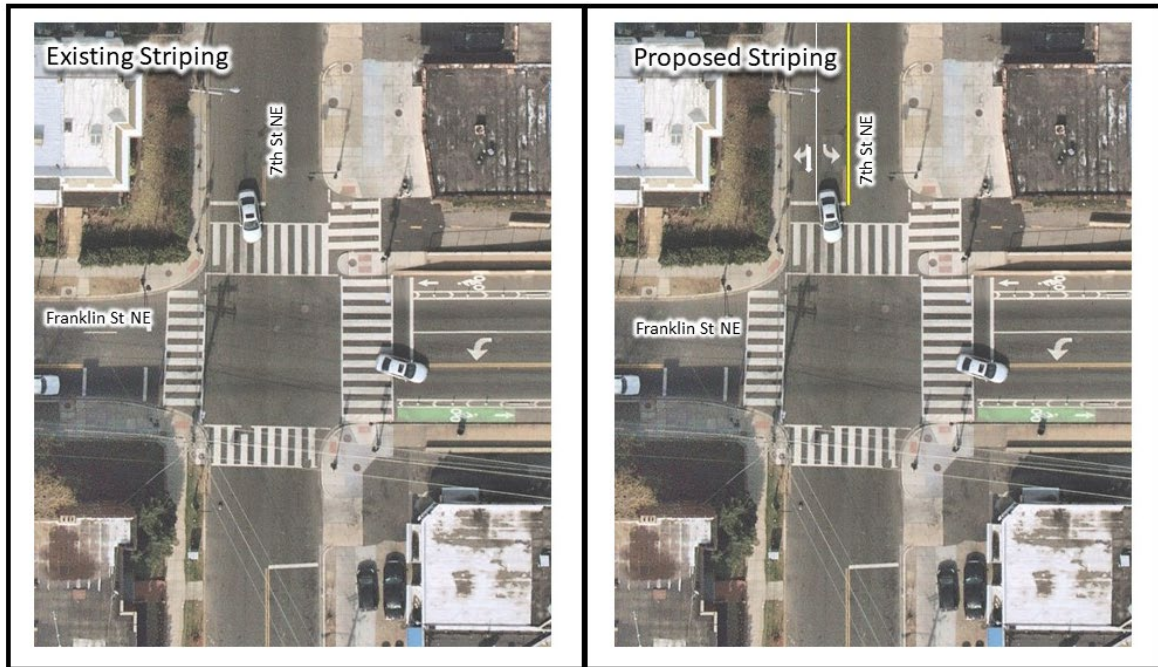


Figure 14: 7th Street NE Southbound Lane Configuration

This improvement concept requires a possible relocation or removal of the near side bus stop on the southbound approach of 7th Street NE (ID 1001926). The G8 route also stops at Hamlin Street NE (1.5 blocks north) and Edgewood Street NE (one block south).

The results of the analyses for the Mitigation condition AM and PM peaks at the 7th Street NE & Franklin Street NE intersection are provided in Table 8 and Table 9. The results indicate an acceptable LOS during both peak hours and an improvement over the existing conditions in the AM peak. The AM peak average queue length is still slightly longer than the link distance but with the rerouted volumes this approach is expected to take most of the increase as shown in the delay.

Table 8: Mitigation Traffic Operations Measures of Effectiveness- 7th Street NE & Franklin Street NE

ID #	Intersection	Intersection Control Type	Approach	AM Peak				PM Peak			
				Approach		Overall LOS		Approach		Overall LOS	
				Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
6	7 th Street NE & Franklin St NE	Signalized	EB	27.9	C	52.0	D	21.1	C	21.8	C
			WB	41.6	D			9.0	A		
			NB	44.6	D			34.6	C		
			SB	113.4	F			47.9	D		

Table 9: Mitigation Queueing Summary- 7th Street NE & Franklin Street NE

Future Queueing								
ID #	Intersection	Approach	Movement	Storage or Link Distance (ft)	AM Peak		PM Peak	
					Average Queues (ft)	95 th Percentile Queues (ft)	Average Queues (ft)	95 th Percentile Queues (ft)
6	7 th Street NE & Franklin St NE	Eastbound	LTR	577	493	767	339	594
		Westbound	L	350	268	510	42	82
			TR	628	614	757	132	229
		Northbound	LTR	106	70	120	76	127
		Southbound	L	120	118	197	77	172
			TR	528	552	574	224	445

Appendix B includes the Synchro reports for the mitigation conditions.

4.3.7th Street & Edgewood Street NE

Commercial vehicle routing in the study area is a major concern since most vehicles illegally use side streets between 7th Street NE and 8th Street NE where existing signage already restricts this movement. This study recommends that all commercial vehicles enter 8th Street NE by using Edgewood Street NE.

5. Conclusions and Recommendations

This study provides the results of an evaluation of the weekday AM and PM peak hour intersection capacity and circulation impacts of changing 8th Street NE to one-way northbound. Existing and build condition scenarios were evaluated for the following the study intersections:

1. 7th Street NE & Monroe Street NE
2. 8th Street NE & Monroe Street NE
3. 8th Street NE & Kearny Street NE
4. 8th Street NE & Hamlin Street NE
5. 7th Street NE & Edgewood Street NE
6. 7th Street NE & Franklin St NE

The results indicate that the proposed one-way conversion would result in signalized traffic operations that require mitigation to accommodate the shift in traffic volumes. Since motor vehicle travel would be restricted to northbound only for 8th Street NE, and the traffic shifted is limited to 7th Street NE, the signalized intersections of Monroe Street at 7th Street NE and Franklin Street at 7th Street NE are the key impacted intersections.

7th Street NE & Monroe Street NE

Recommendation: Install pavement markings to provide an exclusive westbound left-turn lane with up to 100 feet of storage length. This measure would require parking removal on the north side of Monroe Street NE.

7th Street NE & Franklin Street NE

Recommendation: Install pavement markings to provide an exclusive southbound left-turn lane with up to 120 feet of storage length. This measure would formalize the existing use of the right side of the southbound approach as a de facto through- right turn lane.

7th Street NE & Edgewood Street NE

Recommendation: Designate as the truck access point to 8th Street NE.

Additionally, based on the challenges with driveways and school pick-up and drop-off areas, it is recommended that the cycle track be oriented parallel to the west side curb.

Appendix A

Traffic Counts

Gorove/Slade Associates - Multimodal Turning Movement Count Report

Project Name : 8th Street NE Residential PUD
 Project # : 2812-001
 Location : Washington DC
 Data Source : Gorove/Slade Associates, Inc.

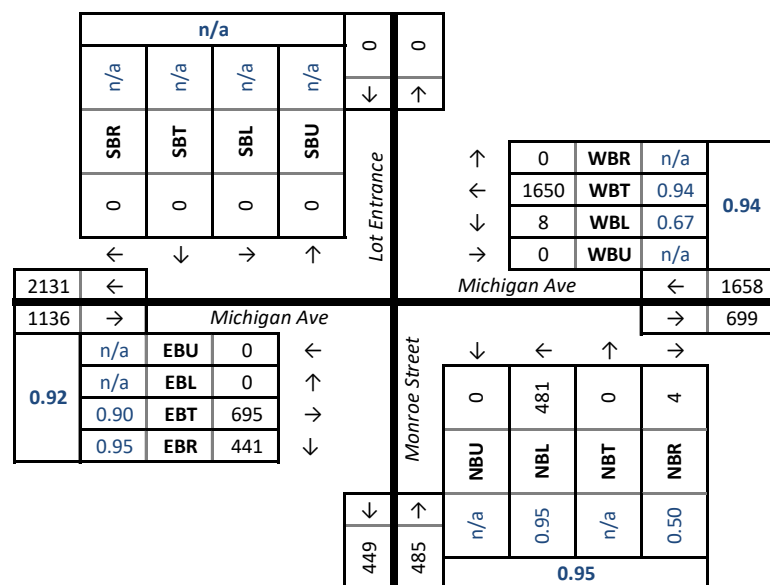
Analysis Period: STUDY_PERIOD
 Date of Counts: Wednesday, October 10, 2018
 Weather: Partly Cloudy

06:30 AM to 09:30 AM

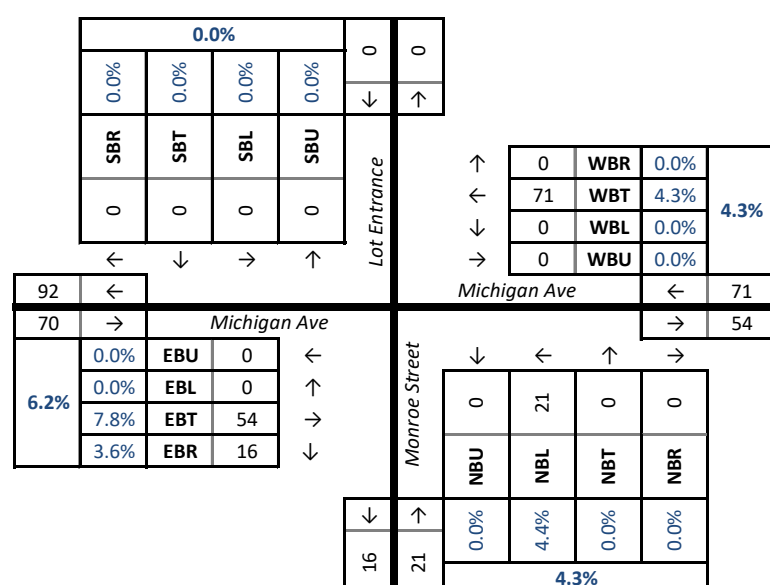
Volumes Displayed as: 1. Intersection Peak (vehicle)
 Intersection Peak Hour (all vehicles): 07:45 AM to 08:45 AM
 System Peak Hour (all vehicles): 07:45 AM to 08:45 AM
 User-Defined Peak Hour: 07:30 AM to 08:30 AM

Intersection:		1. Lot Entrance/Monroe Street & Michigan Ave																							
ALL VEHICLES	Direction:	Southbound					Westbound					Northbound					Eastbound								
	Roadway:	Lot Entrance					Michigan Ave					Monroe Street					Michigan Ave								
	Movement:	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds				
06:30 AM to 06:45 AM		0	0	0	0	1	0	0	289	0	2	0	111	0	1	8	0	0	95	30	0				
06:45 AM to 07:00 AM		0	0	0	0	6	0	0	390	0	5	0	101	0	0	6	0	0	97	48	0				
07:00 AM to 07:15 AM		0	0	0	0	10	0	0	344	0	3	0	120	0	1	7	0	0	119	51	0				
07:15 AM to 07:30 AM		0	0	0	0	3	0	2	396	0	5	0	122	0	3	16	0	0	114	44	0				
07:30 AM to 07:45 AM		0	0	0	0	6	0	1	405	0	10	0	135	0	1	13	0	0	151	75	0				
07:45 AM to 08:00 AM		0	0	0	0	7	0	2	440	0	17	0	116	0	2	24	0	0	170	109	0				
08:00 AM to 08:15 AM		0	0	0	0	3	0	1	390	0	9	0	127	0	1	24	0	0	165	112	0				
08:15 AM to 08:30 AM		0	0	0	0	5	0	3	427	0	14	0	120	0	0	31	0	0	194	116	0				
08:30 AM to 08:45 AM		0	0	0	0	4	0	2	393	0	15	0	118	0	1	28	0	0	166	104	0				
08:45 AM to 09:00 AM		0	0	0	0	9	0	3	385	0	25	0	110	0	3	44	0	0	152	106	0				
09:00 AM to 09:15 AM		0	0	0	0	4	0	1	322	0	21	0	105	0	4	30	0	0	132	93	0				
09:15 AM to 09:30 AM		0	0	0	0	7	0	1	322	0	28	1	93	0	4	28	0	0	116	85	2				
09:30 AM to 09:45 AM																									
09:45 AM to 10:00 AM																									
10:00 AM to 10:15 AM																									
10:15 AM to 10:30 AM																									
10:30 AM to 10:45 AM																									
10:45 AM to 11:00 AM																									
11:00 AM to 11:15 AM																									
11:15 AM to 11:30 AM																									
INT. PEAK HR (ALL VEH)		0					19	1658					55	485					107	1136					0
07:45 AM to 08:45 AM	Overall	U	Left	Thru	Right	SB	U	Left	Thru	Right	WB	U	Left	Thru	Right	NB	U	Left	Thru	Right	EB				
Peak Hour	Factor (PHF)	n/a	n/a	n/a	n/a	n/a	n/a	0.67	0.94	n/a	0.94	n/a	0.95	n/a	0.50	0.95	n/a	n/a	0.90	0.95	0.92				

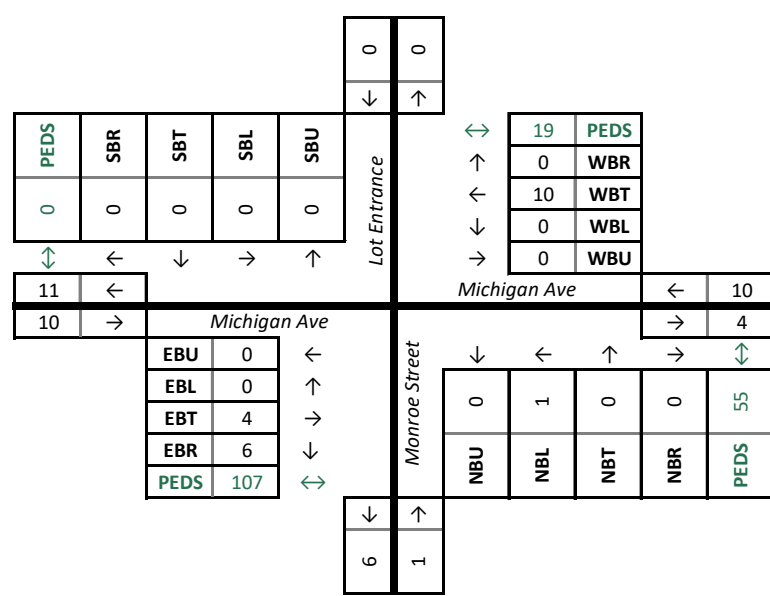
VEHICLE PEAK HOUR VOLS AND PHF: Intersection Peak (vehicle)



HEAVY VEH PEAK HOUR VOLS AND PHV: Intersection Peak (vehicle)



PED AND BIKE PEAK HOUR VOLUMES: Intersection Peak (vehicle)



DATA COLLECTION NOTES :

Gorove/Slade Associates - Multimodal Turning Movement Count Report

Project Name : 8th Street NE Residential PUD
Project # : 2812-001
Location : Washington DC
Data Source : Gorove/Slade Associates, Inc.

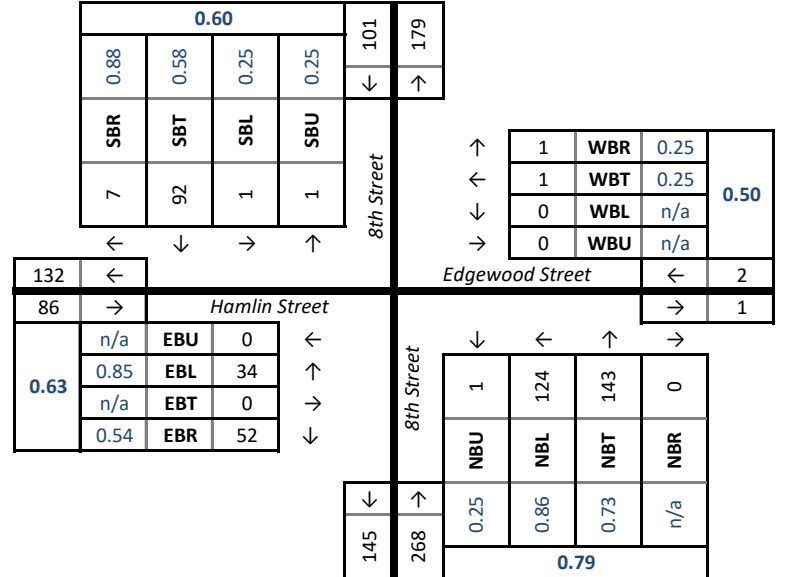
Analysis Period: STUDY_PERIOD
Date of Counts: Wednesday, October 10, 2018
Weather: Partly Cloudy
06:30 AM to 09:30 AM

Volumes Displayed as: 1. Intersection Peak (vehicle)

Intersection Peak Hour (all vehicles):	06:30 AM	to	07:30 AM
System Peak Hour (all vehicles):	07:45 AM	to	08:45 AM
User-Defined Peak Hour:	07:30 AM	to	08:30 AM

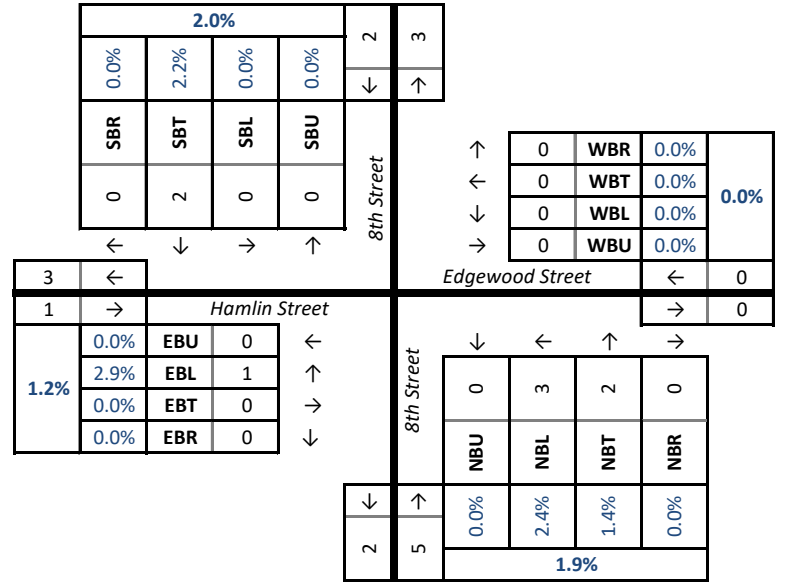
Intersection: 1. 8th Street & Edgewood Street/Hamlin Street																					
ALL VEHICLES	Direction:	Southbound					Westbound					Northbound					Eastbound				
	Roadway:	8th Street					Edgewood Street					8th Street					Hamlin Street				
	Movement:	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds
06:30 AM	to 06:45 AM	0	0	27	2	0	0	0	0	1	5	0	34	41	0	46	0	7	0	13	9
06:45 AM	to 07:00 AM	1	0	40	1	0	0	0	0	0	2	0	36	49	0	73	0	10	0	24	20
07:00 AM	to 07:15 AM	0	1	12	2	0	0	0	1	0	0	1	27	32	0	48	0	9	0	10	10
07:15 AM	to 07:30 AM	0	0	13	2	0	0	0	0	0	0	0	27	21	0	31	0	8	0	5	9
07:30 AM	to 07:45 AM	0	0	9	4	4	0	0	0	0	9	0	6	15	0	15	0	3	1	7	3
07:45 AM	to 08:00 AM	0	0	14	2	0	0	0	0	0	0	0	9	19	0	10	0	2	0	5	4
08:00 AM	to 08:15 AM	0	0	5	3	0	0	0	0	0	0	0	1	7	0	1	0	2	0	0	4
08:15 AM	to 08:30 AM	0	0	9	2	0	0	0	1	0	0	0	0	5	0	0	0	1	0	2	4
08:30 AM	to 08:45 AM	0	0	4	0	0	0	0	0	0	1	0	2	3	0	2	0	0	0	0	2
08:45 AM	to 09:00 AM	0	0	3	1	0	0	0	0	0	0	0	1	5	0	2	0	4	0	2	1
09:00 AM	to 09:15 AM	0	0	5	2	0	0	0	0	0	0	0	2	7	0	0	0	1	0	3	0
09:15 AM	to 09:30 AM	0	0	6	4	0	0	0	0	0	0	0	1	5	0	0	0	1	0	1	1

VEHICLE PEAK HOUR VOLS AND PHF: Intersection Peak (vehicle)



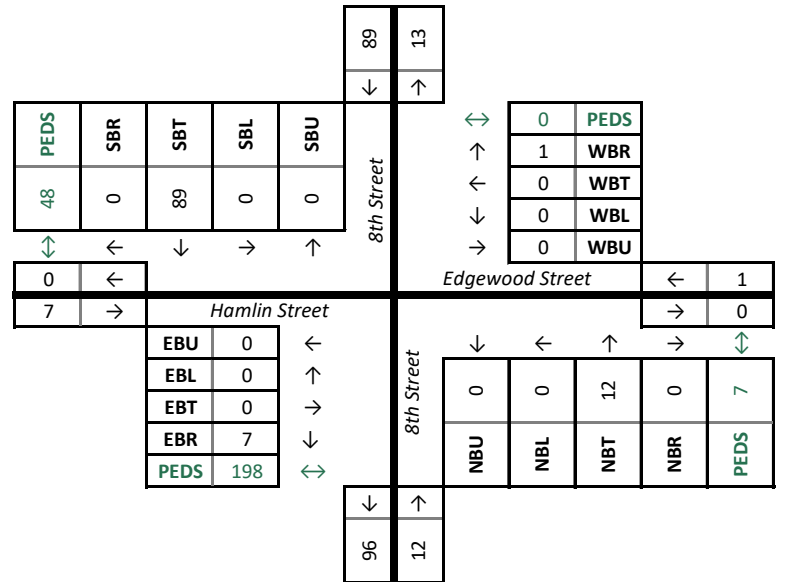
HEAVY VEHICLES (FHWA 4+)	Direction:	Southbound					Westbound					Northbound					Eastbound				
	Roadway:	8th Street					Edgewood Street					8th Street					Hamlin Street				
	Movement:	U	Left	Thru	Right		U	Left	Thru	Right		U	Left	Thru	Right		U	Left	Thru	Right	
06:30 AM	to 06:45 AM	0	0	1	0		0	0	0	0		0	1	0	0		0	1	0	0	
06:45 AM	to 07:00 AM	0	0	1	0		0	0	0	0		0	0	1	0		0	0	0	0	
07:00 AM	to 07:15 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
07:15 AM	to 07:30 AM	0	0	0	0		0	0	0	0		0	2	1	0		0	0	0	0	
07:30 AM	to 07:45 AM	0	0	2	0		0	0	0	0		0	0	0	0		0	0	0	0	
07:45 AM	to 08:00 AM	0	0	0	0		0	0	0	0		0	0	2	0		0	0	0	0	
08:00 AM	to 08:15 AM	0	0	1	0		0	0	0	0		0	0	0	0		0	0	0	0	
08:15 AM	to 08:30 AM	0	0	1	0		0	0	0	0		0	0	0	0		0	0	0	0	
08:30 AM	to 08:45 AM	0	0	1	0		0	0	0	0		0	0	1	0		0	0	0	0	
08:45 AM	to 09:00 AM	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0	
09:00 AM	to 09:15 AM	0	0	0	0		0	0	0	0		0	0	1	0		0	0	0	1	
09:15 AM	to 09:30 AM	0	0	0	1		0	0	0	0		0	0	1	0		0	0	0	0	

HEAVY VEH PEAK HOUR VOLS AND PHV: Intersection Peak (vehicle)



BICYCLES	Direction:	Southbound					Westbound					Northbound					Eastbound				
	Roadway:	8th Street					Edgewood Street					8th Street					Hamlin Street				
	Movement:	U	Left	Thru	Right		U	Left	Thru	Right		U	Left	Thru	Right		U	Left	Thru	Right	
06:30 AM	to 06:45 AM	0	0	16	0		0	0	0	0		0	0	3	0		0	0	0	1	
06:45 AM	to 07:00 AM	0	0	20	0		0	0	0	0		0	0	2	0		0	0	0	0	
07:00 AM	to 07:15 AM	0	0	25	0		0	0	0	1		0	0	1	0		0	0	0	3	
07:15 AM	to 07:30 AM	0	0	28	0		0	0	0	0		0	0	6	0		0	0	0	3	
07:30 AM	to 07:45 AM	0	0	24	0		0	0	0	0		0	0	1	0		0	0	0	0	
07:45 AM	to 08:00 AM	0	0	22	0		0	0	0	0		0	0	2	0		0	1	0	0	
08:00 AM	to 08:15 AM	0	0	26	0		0	0	0	0		0	0	1	0		0	0	0	2	
08:15 AM	to 08:30 AM	0	0	16	0		0	0	0	0		0	0	2	0		0	0	0	0	
08:30 AM	to 08:45 AM	0	0	9	0		0	0	0	0		0	0	3	0		0	0	1	0	
08:45 AM	to 09:00 AM	0	0	11	0		0	0	0	0		0	0	5	0		0	0	0	0	
09:00 AM	to 09:15 AM	0	0	7	0		0	0	0	0		0	0	0	0		0	0	0	1	
09:15 AM	to 09:30 AM	0	0	2	1		0	0	0	0		0	0	1	0		0	0	0	0	

PED AND BIKE PEAK HOUR VOLUMES: Intersection Peak (vehicle)



DATA COLLECTION NOTES :

Gorove/Slade Associates - Multimodal Turning Movement Count Report

Project Name : 8th Street NE Residential PUD
 Project # : 2812-001
 Location : Washington DC
 Data Source : Gorove/Slade Associates, Inc.

Analysis Period: STUDY_PERIOD
 Date of Counts: Wednesday, October 10, 2018
 Weather: Partly Cloudy

06:30 AM to 09:30 AM

Volumes Displayed as: 1. Intersection Peak (vehicle)

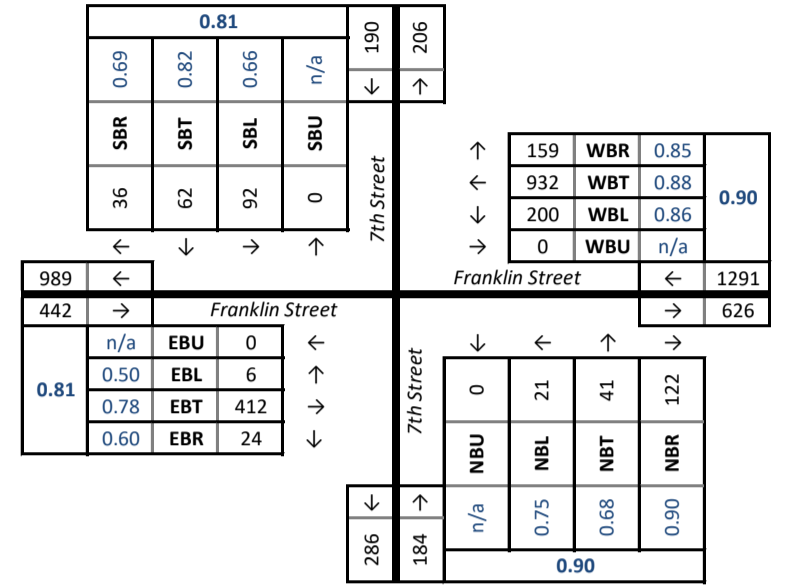
Intersection Peak Hour (all vehicles): 07:45 AM to 08:45 AM

System Peak Hour (all vehicles): 07:45 AM to 08:45 AM

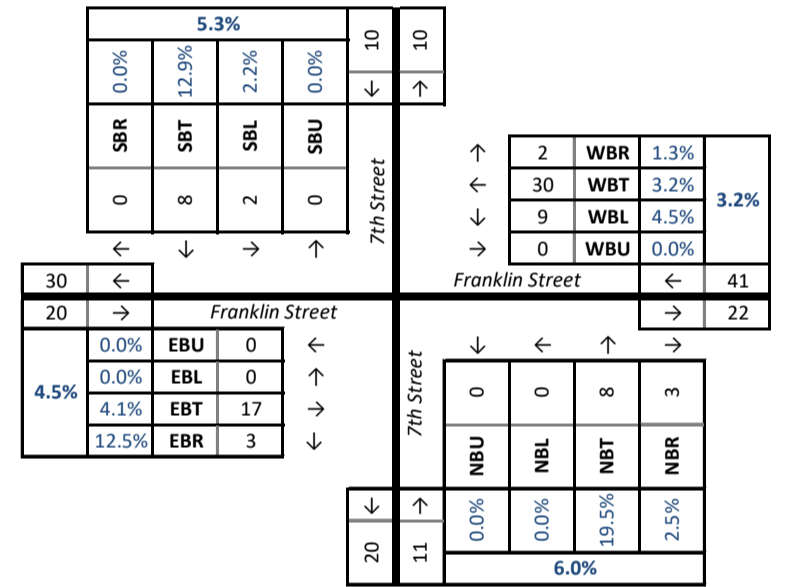
User-Defined Peak Hour: 07:30 AM to 08:30 AM

Intersection:		1. 7th Street & Franklin Street																				
ALL VEHICLES	Direction:	Southbound				Westbound				Northbound				Eastbound								
	Roadway:	7th Street				Franklin Street				7th Street				Franklin Street								
	Movement:	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	
06:30 AM to 06:45 AM		0	8	3	5	1	0	8	181	14	3	0	0	2	6	0	0	1	54	6	0	
06:45 AM to 07:00 AM		0	6	5	10	0	0	15	196	17	6	0	3	5	8	3	0	1	62	8	0	
07:00 AM to 07:15 AM		0	11	7	8	0	0	18	219	18	8	0	4	8	9	1	0	4	55	8	0	
07:15 AM to 07:30 AM		0	10	15	7	1	0	56	216	26	11	0	4	5	12	1	0	3	82	14	8	
07:30 AM to 07:45 AM		0	20	8	19	0	0	52	212	47	27	0	8	7	22	0	0	1	92	10	0	
07:45 AM to 08:00 AM		0	25	18	9	15	0	44	224	47	67	0	7	15	29	0	0	1	102	4	0	
08:00 AM to 08:15 AM		0	35	11	13	7	0	54	266	40	34	0	6	8	34	6	0	2	92	10	4	
08:15 AM to 08:30 AM		0	10	19	6	5	0	58	190	32	13	0	4	9	29	0	0	3	86	6	2	
08:30 AM to 08:45 AM		0	22	14	8	4	0	44	252	40	24	0	4	9	30	1	0	0	132	4	5	
08:45 AM to 09:00 AM		0	12	11	4	2	0	39	226	31	15	0	5	8	28	0	0	3	115	6	0	
09:00 AM to 09:15 AM		0	11	13	2	1	0	22	205	31	8	0	2	6	20	0	0	0	124	5	1	
09:15 AM to 09:30 AM		0	9	11	3	0	0	23	209	19	2	0	4	3	10	0	0	2	102	7	0	
09:30 AM to 09:45 AM																						
09:45 AM to 10:00 AM																						
10:00 AM to 10:15 AM																						
10:15 AM to 10:30 AM																						
10:30 AM to 10:45 AM																						
10:45 AM to 11:00 AM																						
11:00 AM to 11:15 AM																						
11:15 AM to 11:30 AM																						
INT. PEAK HR (ALL VEH)		190				31	1291				138	184				7	442				11	
07:45 AM to 08:45 AM		U	92	62	36		U	200	932	159	138	U	21	41	122	7	U	6	412	24	11	
Peak Hour Factor (PHF)		Overall	n/a	0.66	0.82	0.69	0.81	n/a	0.86	0.88	0.85	0.90	n/a	0.75	0.68	0.90	0.90	n/a	0.50	0.78	0.60	0.81

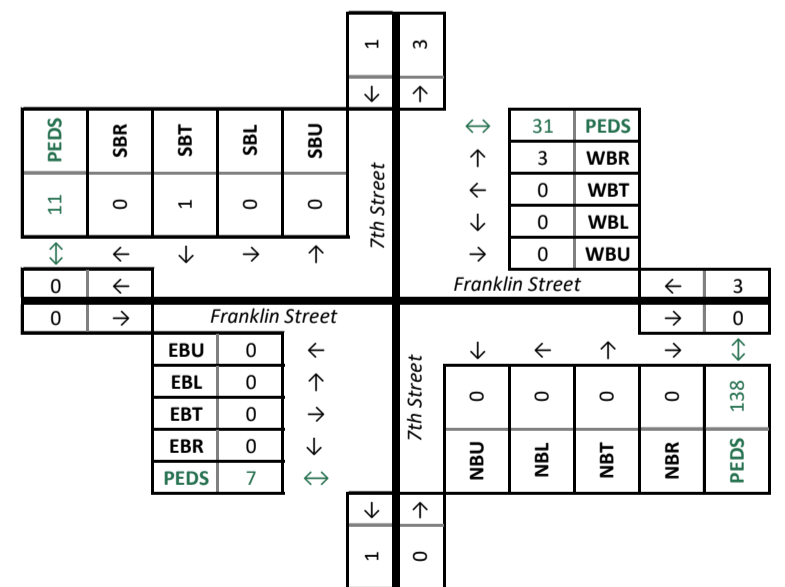
VEHICLE PEAK HOUR VOLS AND PHF: Intersection Peak (vehicle)



HEAVY VEH PEAK HOUR VOLS AND PHV: Intersection Peak (vehicle)



PED AND BIKE PEAK HOUR VOLUMES: Intersection Peak (vehicle)



DATA COLLECTION NOTES:

Gorove/Slade Associates - Multimodal Turning Movement Count Report

Project Name : 8th Street NE Residential PUD
 Project # : 2812-001
 Location : Washington DC
 Data Source : Gorove/Slade Associates, Inc.

Analysis Period: STUDY_PERIOD
 Date of Counts: Wednesday, October 10, 2018
 Weather: Partly Cloudy

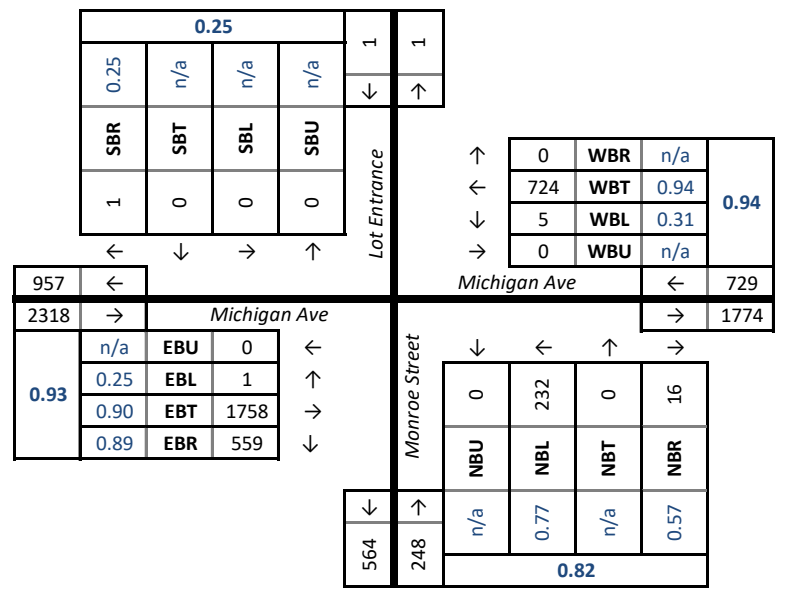
04:00 PM to 07:00 PM

Volumes Displayed as: 1. Intersection Peak (vehicle)

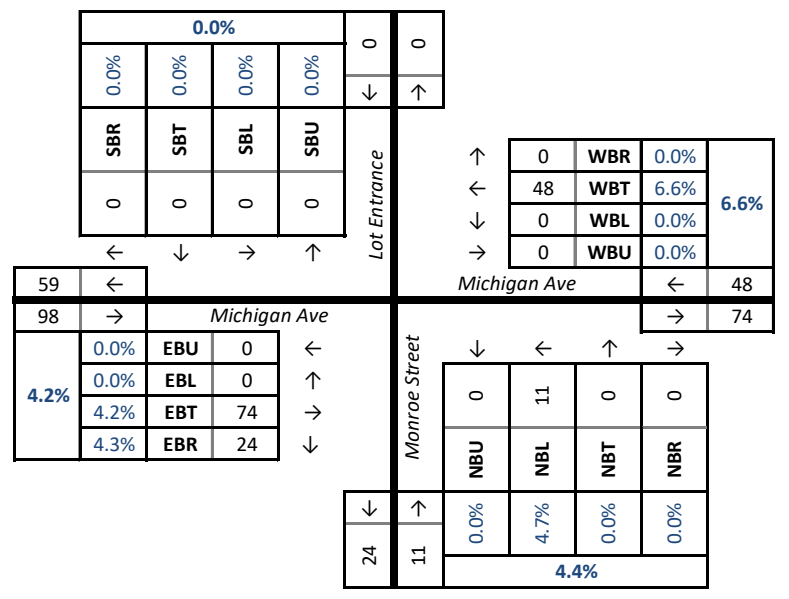
Intersection Peak Hour (all vehicles): 04:30 PM to 05:30 PM
 System Peak Hour (all vehicles): 04:30 PM to 05:30 PM
 User-Defined Peak Hour: 05:00 PM to 06:00 PM

Intersection:		1. Lot Entrance/Monroe Street & Michigan Ave																			
ALL VEHICLES	Direction:	Southbound				Westbound				Northbound				Eastbound							
	Roadway:	Lot Entrance				Michigan Ave				Monroe Street				Michigan Ave							
	Movement:	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds
04:00 PM to 04:15 PM		0	0	1	0	19	0	0	166	0	42	0	61	0	4	28	0	0	422	117	0
04:15 PM to 04:30 PM		0	0	0	0	10	0	2	169	0	18	0	58	0	5	16	0	0	387	147	0
04:30 PM to 04:45 PM		0	0	0	0	26	0	0	190	0	32	0	50	0	5	34	0	0	473	129	0
04:45 PM to 05:00 PM		0	0	0	0	16	0	4	154	0	43	0	56	0	3	43	0	0	486	135	1
05:00 PM to 05:15 PM		0	0	0	1	18	0	0	188	0	52	0	75	0	1	51	0	1	398	138	0
05:15 PM to 05:30 PM		0	0	0	0	13	0	1	192	0	23	0	51	0	7	26	0	0	401	157	0
05:30 PM to 05:45 PM		0	0	0	0	13	0	0	166	0	23	0	87	0	5	29	0	0	315	141	0
05:45 PM to 06:00 PM		0	0	0	0	22	0	2	142	0	39	0	61	0	5	23	0	0	355	128	0
06:00 PM to 06:15 PM		0	0	0	0	29	0	0	157	0	45	1	81	0	1	29	0	0	353	132	0
06:15 PM to 06:30 PM		0	0	0	0	14	0	0	172	0	40	0	59	0	7	39	0	0	331	161	0
06:30 PM to 06:45 PM		0	0	0	1	8	0	1	180	0	34	1	86	0	9	37	0	0	240	124	0
06:45 PM to 07:00 PM		0	0	0	0	9	0	1	153	0	32	0	75	0	7	25	0	0	238	110	0
07:00 PM to 07:15 PM																					
07:15 PM to 07:30 PM																					
07:30 PM to 07:45 PM																					
07:45 PM to 08:00 PM																					
08:00 PM to 08:15 PM																					
08:15 PM to 08:30 PM																					
08:30 PM to 08:45 PM																					
08:45 PM to 09:00 PM																					
INT. PEAK HR (ALL VEH)		1				73	729				150	248				154	2318				1
04:30 PM to 05:30 PM		0	0	0	1	73	0	5	724	0	150	0	232	0	16	154	0	1	1758	559	1
Peak Hour	Overall	U	Left	Thru	Right	SB	U	Left	Thru	Right	WB	U	Left	Thru	Right	NB	U	Left	Thru	Right	EB
Factor (PHF)		n/a	n/a	n/a	n/a	0.25	n/a	0.31	0.94	n/a	0.94	n/a	0.77	n/a	0.57	0.82	n/a	0.25	0.90	0.89	0.93

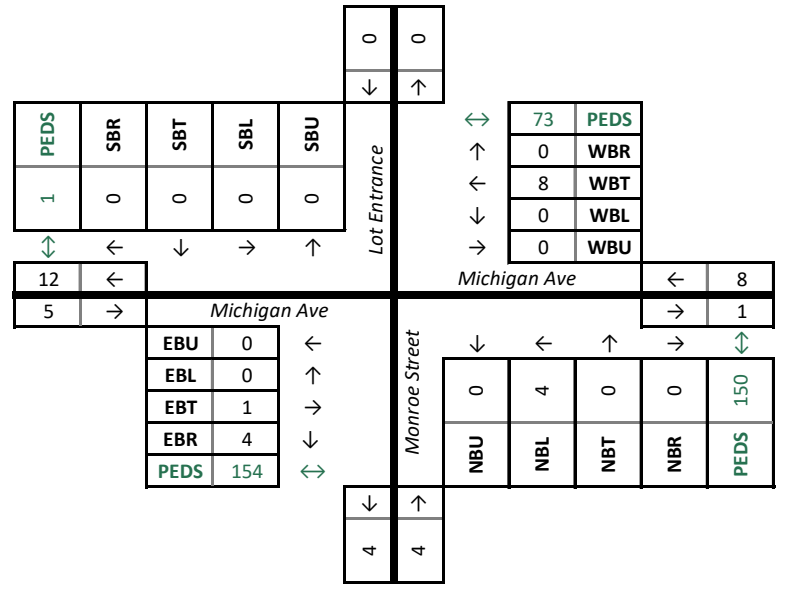
VEHICLE PEAK HOUR VOLS AND PHF: Intersection Peak (vehicle)



HEAVY VEH PEAK HOUR VOLS AND PHV: Intersection Peak (vehicle)



PED AND BIKE PEAK HOUR VOLUMES: Intersection Peak (vehicle)



DATA COLLECTION NOTES :

Gorove/Slade Associates - Multimodal Turning Movement Count Report

Project Name : 8th Street NE Residential PUD
 Project # : 2812-001
 Location : Washington DC
 Data Source : Gorove/Slade Associates, Inc.

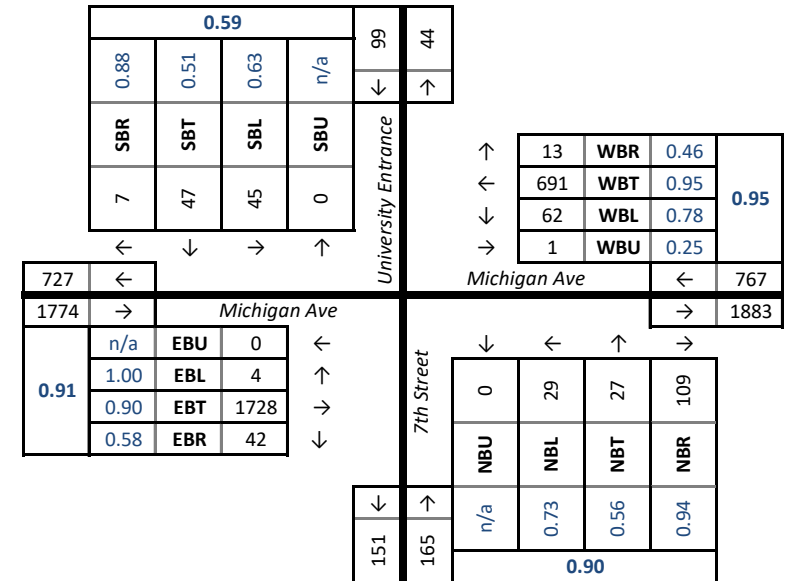
Analysis Period: STUDY_PERIOD
 Date of Counts: Wednesday, October 10, 2018
 Weather: Partly Cloudy

04:00 PM to 07:00 PM

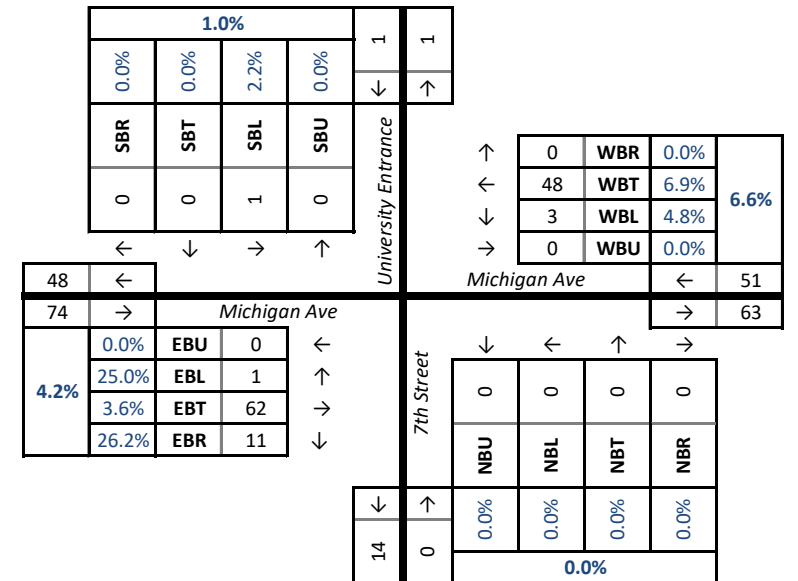
Volumes Displayed as: 1. Intersection Peak (vehicle)
 Intersection Peak Hour (all vehicles): 04:30 PM to 05:30 PM
 System Peak Hour (all vehicles): 04:30 PM to 05:30 PM
 User-Defined Peak Hour: 05:00 PM to 06:00 PM

Intersection:		1. University Entrance/7th Street & Michigan Ave																			
ALL VEHICLES	Direction:	Southbound				Westbound				Northbound				Eastbound							
	Roadway:	University Entrance				Michigan Ave				7th Street				Michigan Ave							
	Movement:	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds	U	Left	Thru	Right	Peds
04:00 PM to 04:15 PM		0	18	10	2	0	0	18	154	3	9	0	10	7	29	2	0	0	407	21	13
04:15 PM to 04:30 PM		0	14	3	1	4	0	17	165	3	20	0	5	3	18	2	0	0	376	15	16
04:30 PM to 04:45 PM		0	9	11	2	4	0	13	177	3	8	0	10	3	24	8	0	1	471	6	29
04:45 PM to 05:00 PM		0	11	7	2	2	0	13	150	7	12	0	6	12	28	12	0	1	479	9	16
05:00 PM to 05:15 PM		0	18	23	1	4	1	16	182	3	7	0	5	5	28	6	0	1	380	18	15
05:15 PM to 05:30 PM		0	7	6	2	3	0	20	182	0	6	0	8	7	29	10	0	1	398	9	18
05:30 PM to 05:45 PM		0	10	4	0	6	0	15	162	2	8	0	6	6	46	4	0	1	312	5	19
05:45 PM to 06:00 PM		0	9	4	0	2	0	13	138	4	2	0	5	6	37	11	0	0	357	5	25
06:00 PM to 06:15 PM		0	9	14	2	6	0	16	148	0	5	0	6	6	30	6	0	0	350	4	16
06:15 PM to 06:30 PM		0	11	7	2	9	0	10	167	3	2	0	3	11	17	16	0	0	329	8	23
06:30 PM to 06:45 PM		0	8	3	3	3	0	12	163	4	9	0	14	6	22	4	0	1	236	11	14
06:45 PM to 07:00 PM		0	10	6	3	5	0	13	142	2	9	0	10	7	23	7	0	0	238	8	13
07:00 PM to 07:15 PM																					
07:15 PM to 07:30 PM																					
07:30 PM to 07:45 PM																					
07:45 PM to 08:00 PM																					
08:00 PM to 08:15 PM																					
08:15 PM to 08:30 PM																					
08:30 PM to 08:45 PM																					
08:45 PM to 09:00 PM																					
INT. PEAK HR (ALL VEH)		99				13	767				33	165				36	1774				78
04:30 PM to 05:30 PM		0	45	47	7	13	1	62	691	13	33	0	29	27	109	36	0	4	1728	42	78
Peak Hour Factor (PHF)	Overall	U	Left	Thru	Right	SB	U	Left	Thru	Right	WB	U	Left	Thru	Right	NB	U	Left	Thru	Right	EB
		n/a	0.63	0.51	0.88	0.59	0.25	0.78	0.95	0.46	0.95	n/a	0.73	0.56	0.94	0.90	n/a	1.00	0.90	0.58	0.91

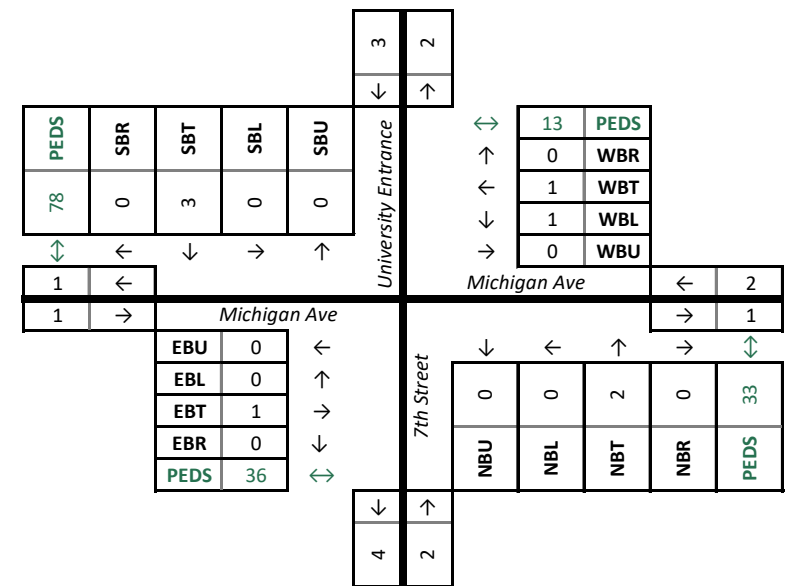
VEHICLE PEAK HOUR VOLS AND PHF: Intersection Peak (vehicle)



HEAVY VEH PEAK HOUR VOLS AND PHV: Intersection Peak (vehicle)



PED AND BIKE PEAK HOUR VOLUMES: Intersection Peak (vehicle)



DATA COLLECTION NOTES :

Edgewood Street and 7th Street, NE

Prepared by



1100 H Street NW, Suite 805
Washington DC 20005

www.cuberootinc.com

Prepared for

Kimley-Horn and The District Department of Transportation

Weekday Traffic Data Collection

Turning Movement Count

April 26, 2019

Introduction

Cube Root provides this report to The District Department of Transportation (DDOT) and Kimley-Horn with Turning Movement Count (TMC) data obtained on April 9, 2019 between the hours of 6:30 AM – 9:30 AM and 3:00 PM – 6:00 PM, at the intersection of Edgewood Street and 7th Street, NE. Figure 1 present a map indicating the location of the study with respect to the surrounding roadway network.

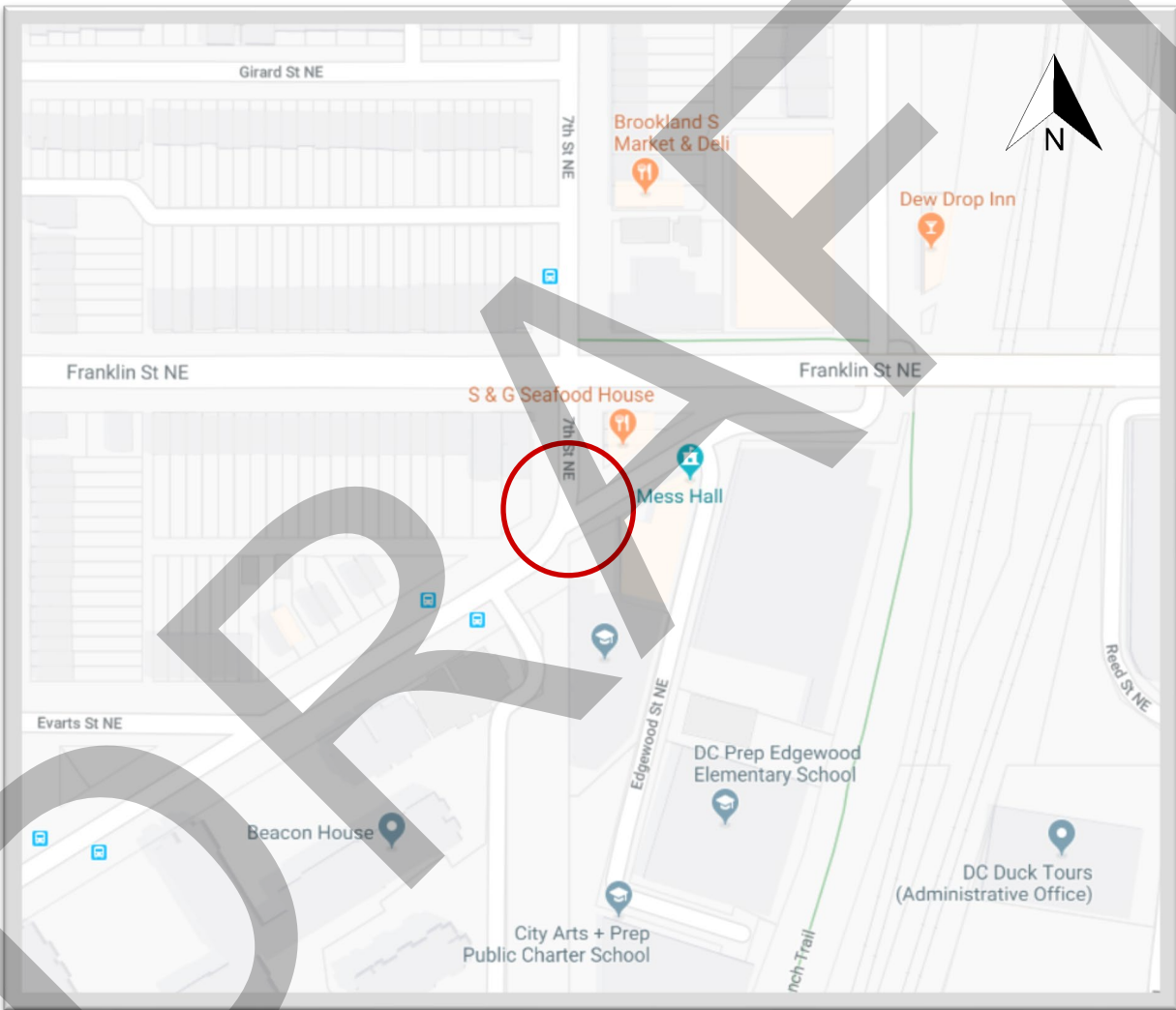


Figure 1: Map of Study Location

CUBE ROOT CORPORATION

1100 H Street, NW
Washington DC, 20005
Suite No. 805
www.cuberootinc.com

7TH STREET AND EDGEWOOD STREET, NE - AM PEAK

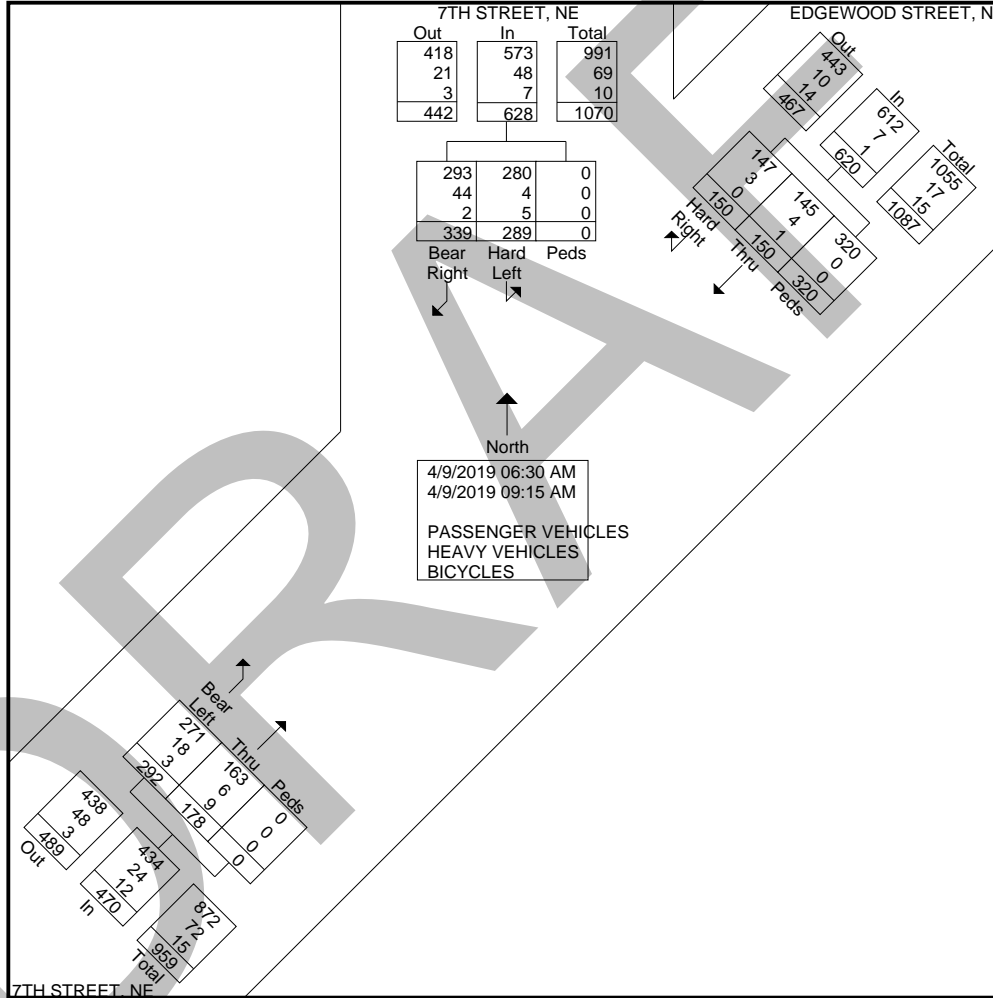
Groups Printed- PASSENGER VEHICLES - HEAVY VEHICLES - BICYCLES

Start Time	7TH STREET, NE From North				EDGEWOOD STREET, NE From Northeast				7TH STREET, NE From Southwest				Int. Total
	Bear Right	Hard Left	Peds	App. Total	Hard Right	Thru	Peds	App. Total	Thru	Bear Left	Peds	App. Total	
06:30 AM	12	7	0	19	8	7	3	18	5	7	0	12	49
06:45 AM	11	9	0	20	3	5	13	21	15	12	0	27	68
Total	23	16	0	39	11	12	16	39	20	19	0	39	117
07:00 AM	30	12	0	42	7	8	8	23	18	13	0	31	96
07:15 AM	32	35	0	67	10	17	29	56	16	20	0	36	159
07:30 AM	18	66	0	84	19	24	29	72	34	25	0	59	215
07:45 AM	26	39	0	65	23	15	59	97	23	21	0	44	206
Total	106	152	0	258	59	64	125	248	91	79	0	170	676
08:00 AM	36	42	0	78	19	22	38	79	25	30	0	55	212
08:15 AM	38	27	0	65	29	13	38	80	14	37	0	51	196
08:30 AM	54	21	0	75	9	15	32	56	14	44	0	58	189
08:45 AM	33	12	0	45	12	9	29	50	6	47	0	53	148
Total	161	102	0	263	69	59	137	265	59	158	0	217	745
09:00 AM	25	12	0	37	7	5	21	33	5	21	0	26	96
09:15 AM	24	7	0	31	4	10	21	35	3	15	0	18	84
Grand Total	339	289	0	628	150	150	320	620	178	292	0	470	1718
Apprch %	54	46	0		24.2	24.2	51.6		37.9	62.1	0		
Total %	19.7	16.8	0	36.6	8.7	8.7	18.6	36.1	10.4	17	0	27.4	
PASSENGER VEHICLES	293	280	0	573	147	145	320	612	163	271	0	434	1619
% PASSENGER VEHICLES	86.4	96.9	0	91.2	98	96.7	100	98.7	91.6	92.8	0	92.3	94.2
HEAVY VEHICLES	44	4	0	48	3	4	0	7	6	18	0	24	79
% HEAVY VEHICLES	13	1.4	0	7.6	2	2.7	0	1.1	3.4	6.2	0	5.1	4.6
BICYCLES	2	5	0	7	0	1	0	1	9	3	0	12	20
% BICYCLES	0.6	1.7	0	1.1	0	0.7	0	0.2	5.1	1	0	2.6	1.2

CUBE ROOT CORPORATION

1100 H Street, NW
 Washington DC, 20005
 Suite No. 805
www.cuberootinc.com

7TH STREET AND EDGEWOOD STREET, NE - AM PEAK



CUBE ROOT CORPORATION

1100 H Street, NW
Washington DC, 20005
Suite No. 805
www.cuberootinc.com

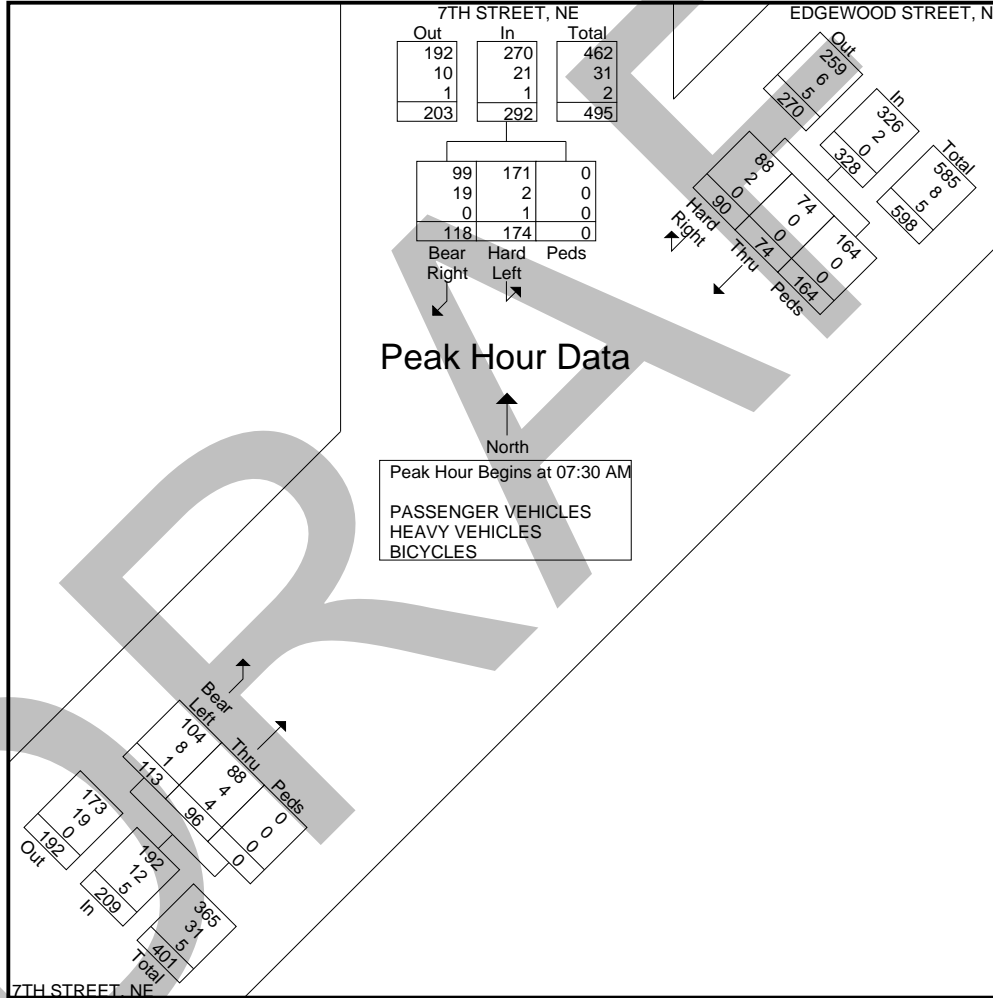
7TH STREET AND EDGEWOOD STREET, NE - AM PEAK

Start Time	7TH STREET, NE From North				EDGEWOOD STREET, NE From Northeast				7TH STREET, NE From Southwest				Int. Total
	Bear Right	Hard Left	Peds	App. Total	Hard Right	Thru	Peds	App. Total	Thru	Bear Left	Peds	App. Total	
Peak Hour Analysis From 06:30 AM to 09:15 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	18	66	0	84	19	24	29	72	34	25	0	59	215
07:45 AM	26	39	0	65	23	15	59	97	23	21	0	44	206
08:00 AM	36	42	0	78	19	22	38	79	25	30	0	55	212
08:15 AM	38	27	0	65	29	13	38	80	14	37	0	51	196
Total Volume	118	174	0	292	90	74	164	328	96	113	0	209	829
% App. Total	40.4	59.6	0		27.4	22.6	50		45.9	54.1	0		
PHF	.776	.659	.000	.869	.776	.771	.695	.845	.706	.764	.000	.886	.964
PASSENGER VEHICLES	99	171	0	270	88	74	164	326	88	104	0	192	788
% PASSENGER VEHICLES	83.9	98.3	0	92.5	97.8	100	100	99.4	91.7	92.0	0	91.9	95.1
HEAVY VEHICLES	19	2	0	21	2	0	0	2	4	8	0	12	35
% HEAVY VEHICLES	16.1	1.1	0	7.2	2.2	0	0	0.6	4.2	7.1	0	5.7	4.2
BICYCLES	0	1	0	1	0	0	0	0	4	1	0	5	6
% BICYCLES	0	0.6	0	0.3	0	0	0	0	4.2	0.9	0	2.4	0.7

CUBE ROOT CORPORATION

1100 H Street, NW
 Washington DC, 20005
 Suite No. 805
www.cuberootinc.com

7TH STREET AND EDGEWOOD STREET, NE - AM PEAK



CUBE ROOT CORPORATION

1100 H Street, NW
 Washington DC, 20005
 Suite No. 805
www.cuberootinc.com

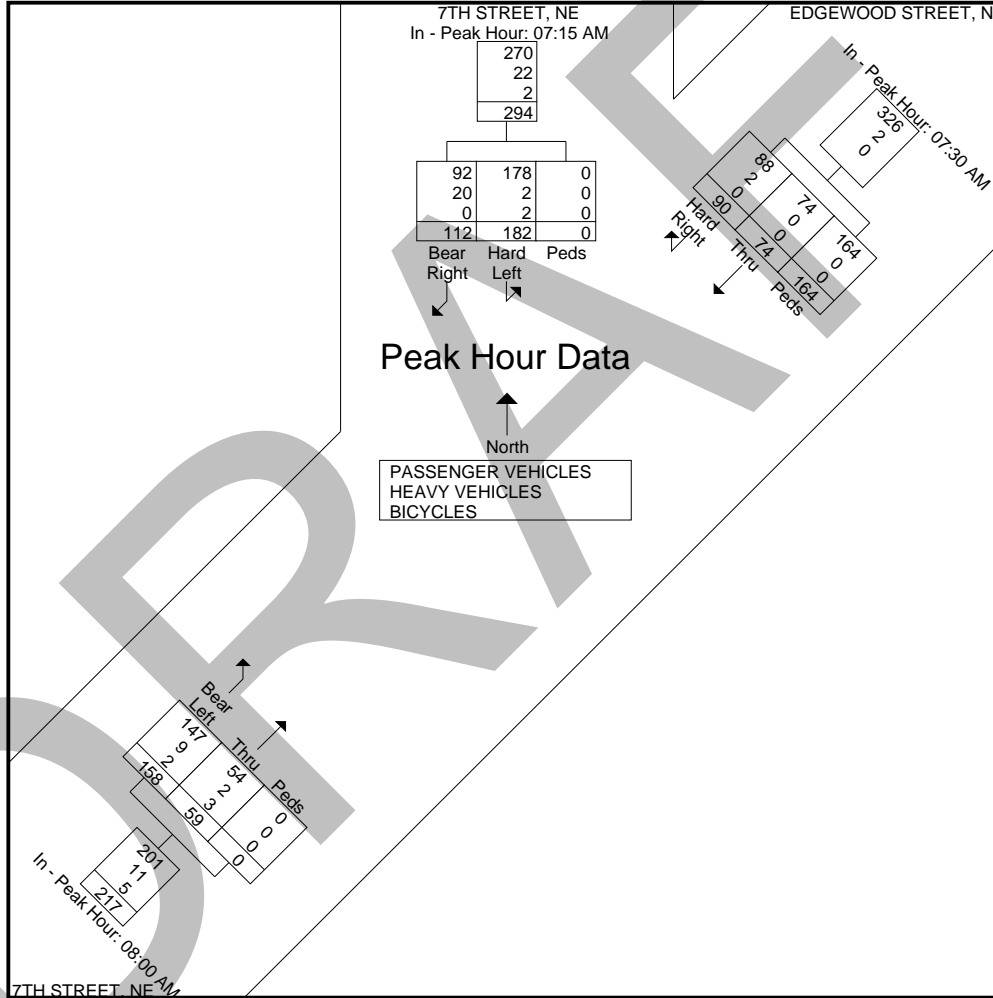
7TH STREET AND EDGEWOOD STREET, NE - AM PEAK

Start Time	7TH STREET, NE From North				EDGEWOOD STREET, NE From Northeast				7TH STREET, NE From Southwest				Int. Total
	Bear Right	Hard Left	Peds	App. Total	Hard Right	Thru	Peds	App. Total	Thru	Bear Left	Peds	App. Total	
Peak Hour Analysis From 06:30 AM to 09:15 AM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	07:15 AM				07:30 AM				08:00 AM				
+0 mins.	32	35	0	67	19	24	29	72	25	30	0	55	
+15 mins.	18	66	0	84	23	15	59	97	14	37	0	51	
+30 mins.	26	39	0	65	19	22	38	79	14	44	0	58	
+45 mins.	36	42	0	78	29	13	38	80	6	47	0	53	
Total Volume	112	182	0	294	90	74	164	328	59	158	0	217	
% App. Total	38.1	61.9	0		27.4	22.6	50		27.2	72.8	0		
PHF	.778	.689	.000	.875	.776	.771	.695	.845	.590	.840	.000	.935	
PASSENGER VEHICLES	92	178	0	270	88	74	164	326	54	147	0	201	
% PASSENGER VEHICLES	82.1	97.8	0	91.8	97.8	100	100	99.4	91.5	93	0	92.6	
HEAVY VEHICLES	20	2	0	22	2	0	0	2	2	9	0	11	
% HEAVY VEHICLES	17.9	1.1	0	7.5	2.2	0	0	0.6	3.4	5.7	0	5.1	
BICYCLES	0	2	0	2	0	0	0	0	3	2	0	5	
% BICYCLES	0	1.1	0	0.7	0	0	0	0	5.1	1.3	0	2.3	

CUBE ROOT CORPORATION

1100 H Street, NW
 Washington DC, 20005
 Suite No. 805
www.cuberootinc.com

7TH STREET AND EDGEWOOD STREET, NE - AM PEAK



CUBE ROOT CORPORATION

1100 H Street, NW
Washington DC, 20005
Suite No. 805
www.cuberootinc.com

7TH STREET AND EDGEWOOD STREET, NE - PM PEAK

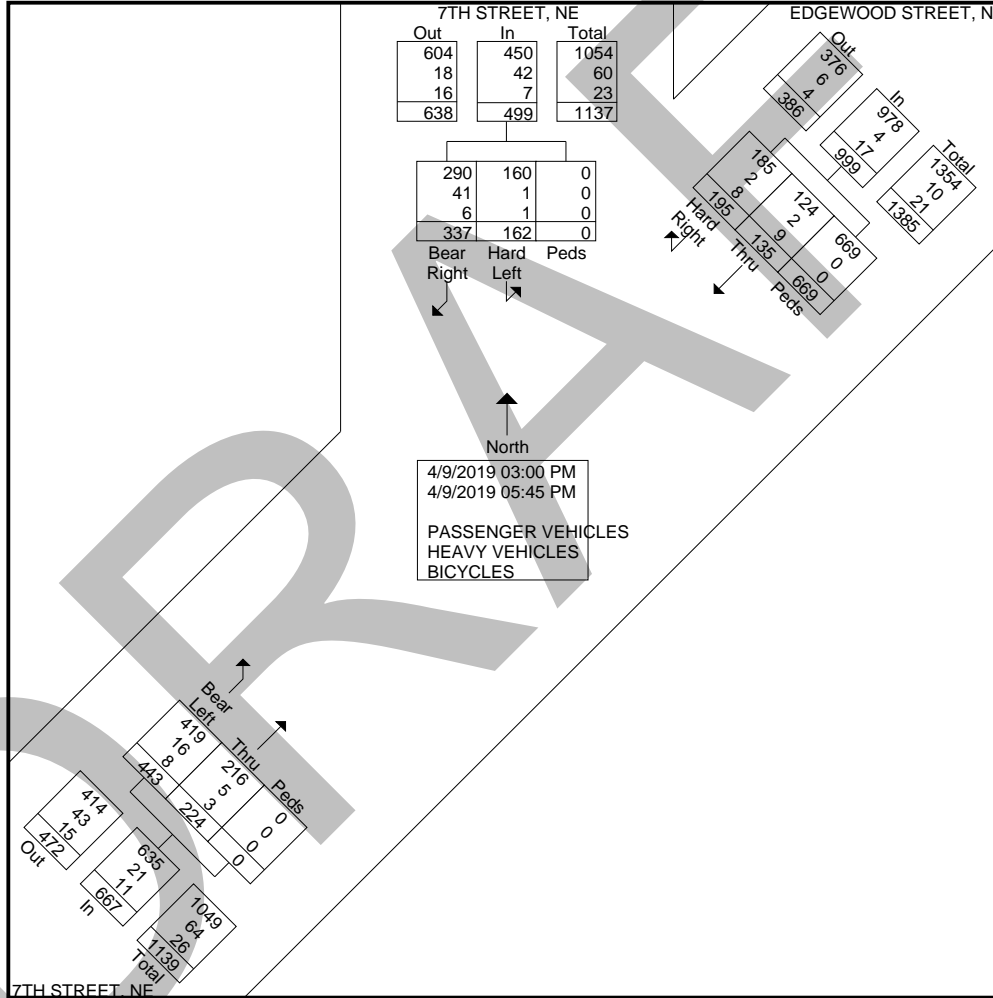
Groups Printed- PASSENGER VEHICLES - HEAVY VEHICLES - BICYCLES

Start Time	7TH STREET, NE From North				EDGEWOOD STREET, NE From Northeast				7TH STREET, NE From Southwest				Int. Total
	Bear Right	Hard Left	Peds	App. Total	Hard Right	Thru	Peds	App. Total	Thru	Bear Left	Peds	App. Total	
03:00 PM	20	21	0	41	10	6	29	45	12	25	0	37	123
03:15 PM	26	14	0	40	12	8	25	45	16	28	0	44	129
03:30 PM	24	15	0	39	14	11	189	214	21	35	0	56	309
03:45 PM	37	16	0	53	13	6	93	112	23	27	0	50	215
Total	107	66	0	173	49	31	336	416	72	115	0	187	776
04:00 PM	39	12	0	51	25	14	62	101	11	32	0	43	195
04:15 PM	28	12	0	40	25	15	38	78	17	42	0	59	177
04:30 PM	26	12	0	38	17	10	63	90	15	43	0	58	186
04:45 PM	22	12	0	34	16	13	32	61	14	32	0	46	141
Total	115	48	0	163	83	52	195	330	57	149	0	206	699
05:00 PM	27	10	0	37	11	6	38	55	15	49	0	64	156
05:15 PM	25	16	0	41	18	16	30	64	22	52	0	74	179
05:30 PM	39	13	0	52	20	8	29	57	22	36	0	58	167
05:45 PM	24	9	0	33	14	22	41	77	36	42	0	78	188
Total	115	48	0	163	63	52	138	253	95	179	0	274	690
Grand Total	337	162	0	499	195	135	669	999	224	443	0	667	2165
Apprch %	67.5	32.5	0		19.5	13.5	67		33.6	66.4	0		
Total %	15.6	7.5	0	23	9	6.2	30.9	46.1	10.3	20.5	0	30.8	
PASSENGER VEHICLES	290	160	0	450	185	124	669	978	216	419	0	635	2063
% PASSENGER VEHICLES	86.1	98.8	0	90.2	94.9	91.9	100	97.9	96.4	94.6	0	95.2	95.3
HEAVY VEHICLES	41	1	0	42	2	2	0	4	5	16	0	21	67
% HEAVY VEHICLES	12.2	0.6	0	8.4	1	1.5	0	0.4	2.2	3.6	0	3.1	3.1
BICYCLES	6	1	0	7	8	9	0	17	3	8	0	11	35
% BICYCLES	1.8	0.6	0	1.4	4.1	6.7	0	1.7	1.3	1.8	0	1.6	1.6

CUBE ROOT CORPORATION

1100 H Street, NW
 Washington DC, 20005
 Suite No. 805
www.cuberootinc.com

7TH STREET AND EDGEWOOD STREET, NE - PM PEAK



CUBE ROOT CORPORATION

1100 H Street, NW
 Washington DC, 20005
 Suite No. 805
www.cuberootinc.com

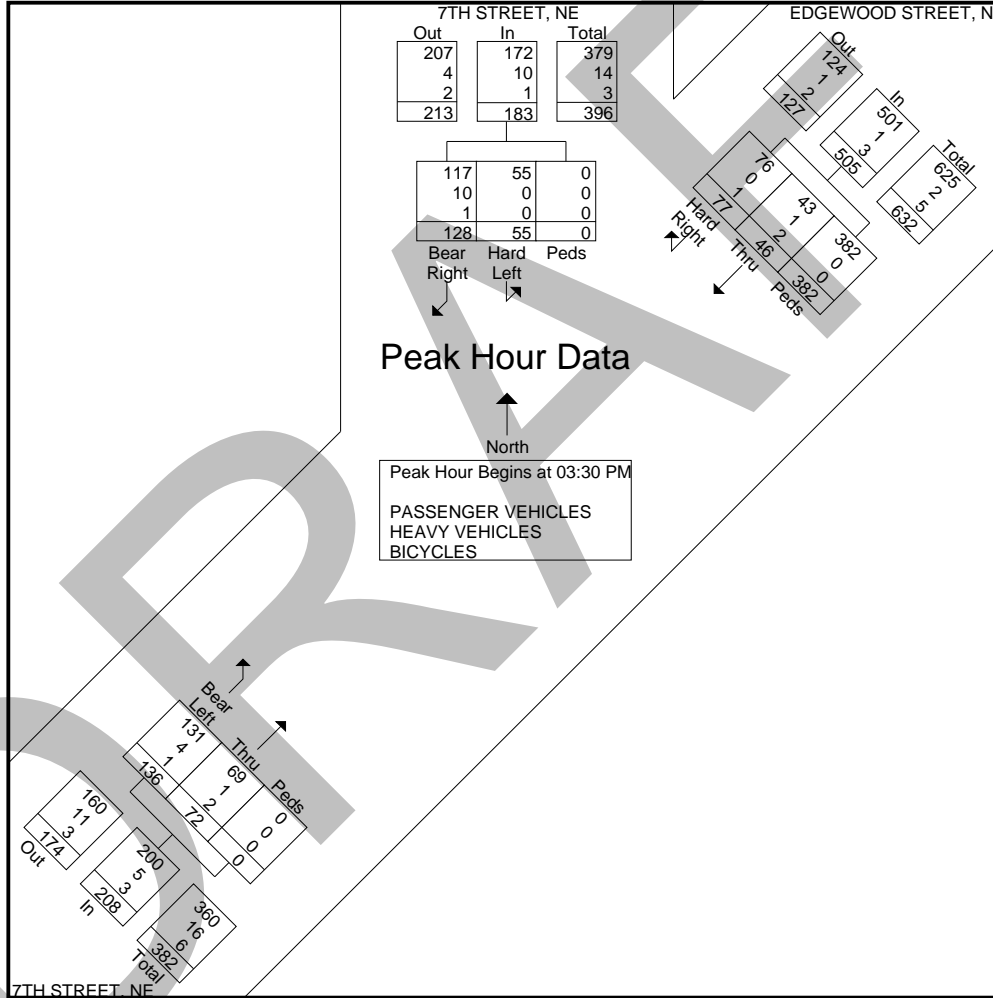
7TH STREET AND EDGEWOOD STREET, NE - PM PEAK

Start Time	7TH STREET, NE From North				EDGEWOOD STREET, NE From Northeast				7TH STREET, NE From Southwest				Int. Total
	Bear Right	Hard Left	Peds	App. Total	Hard Right	Thru	Peds	App. Total	Thru	Bear Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:30 PM													
03:30 PM	24	15	0	39	14	11	189	214	21	35	0	56	309
03:45 PM	37	16	0	53	13	6	93	112	23	27	0	50	215
04:00 PM	39	12	0	51	25	14	62	101	11	32	0	43	195
04:15 PM	28	12	0	40	25	15	38	78	17	42	0	59	177
Total Volume	128	55	0	183	77	46	382	505	72	136	0	208	896
% App. Total	69.9	30.1	0		15.2	9.1	75.6		34.6	65.4	0		
PHF	.821	.859	.000	.863	.770	.767	.505	.590	.783	.810	.000	.881	.725
PASSENGER VEHICLES	117	55	0	172	76	43	382	501	69	131	0	200	873
% PASSENGER VEHICLES	91.4	100	0	94.0	98.7	93.5	100	99.2	95.8	96.3	0	96.2	97.4
HEAVY VEHICLES	10	0	0	10	0	1	0	1	1	4	0	5	16
% HEAVY VEHICLES	7.8	0	0	5.5	0	2.2	0	0.2	1.4	2.9	0	2.4	1.8
BICYCLES	1	0	0	1	1	2	0	3	2	1	0	3	7
% BICYCLES	0.8	0	0	0.5	1.3	4.3	0	0.6	2.8	0.7	0	1.4	0.8

CUBE ROOT CORPORATION

1100 H Street, NW
 Washington DC, 20005
 Suite No. 805
www.cuberootinc.com

7TH STREET AND EDGEWOOD STREET, NE - PM PEAK



CUBE ROOT CORPORATION

1100 H Street, NW
Washington DC, 20005
Suite No. 805
www.cuberootinc.com

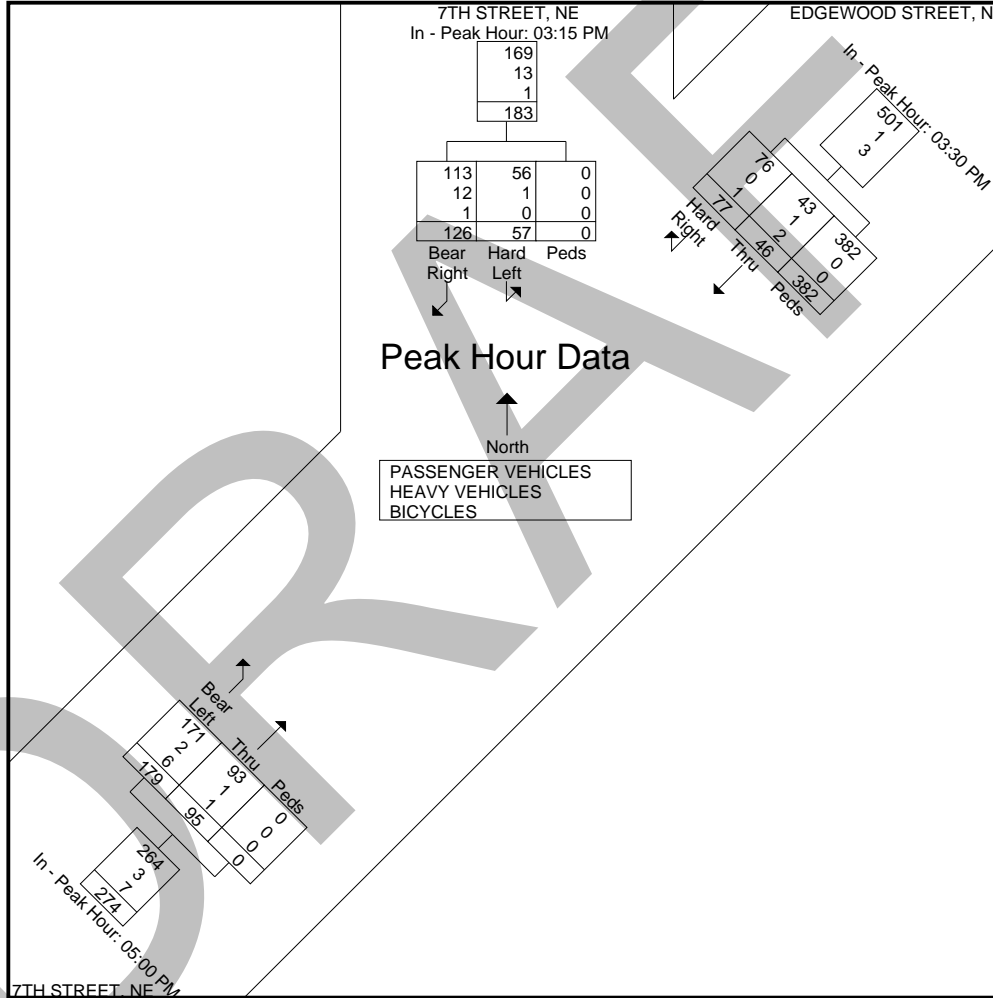
7TH STREET AND EDGEWOOD STREET, NE - PM PEAK

Start Time	7TH STREET, NE From North				EDGEWOOD STREET, NE From Northeast				7TH STREET, NE From Southwest				Int. Total
	Bear Right	Hard Left	Peds	App. Total	Hard Right	Thru	Peds	App. Total	Thru	Bear Left	Peds	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Each Approach Begins at:													
	03:15 PM				03:30 PM				05:00 PM				
+0 mins.	26	14	0	40	14	11	189	214	15	49	0	64	
+15 mins.	24	15	0	39	13	6	93	112	22	52	0	74	
+30 mins.	37	16	0	53	25	14	62	101	22	36	0	58	
+45 mins.	39	12	0	51	25	15	38	78	36	42	0	78	
Total Volume	126	57	0	183	77	46	382	505	95	179	0	274	
% App. Total	68.9	31.1	0		15.2	9.1	75.6		34.7	65.3	0		
PHF	.808	.891	.000	.863	.770	.767	.505	.590	.660	.861	.000	.878	
PASSENGER VEHICLES	113	56	0	169	76	43	382	501	93	171	0	264	
% PASSENGER VEHICLES	89.7	98.2	0	92.3	98.7	93.5	100	99.2	97.9	95.5	0	96.4	
HEAVY VEHICLES	12	1	0	13	0	1	0	1	1	2	0	3	
% HEAVY VEHICLES	9.5	1.8	0	7.1	0	2.2	0	0.2	1.1	1.1	0	1.1	
BICYCLES	1	0	0	1	1	2	0	3	1	6	0	7	
% BICYCLES	0.8	0	0	0.5	1.3	4.3	0	0.6	1.1	3.4	0	2.6	

CUBE ROOT CORPORATION

1100 H Street, NW
 Washington DC, 20005
 Suite No. 805
www.cuberootinc.com

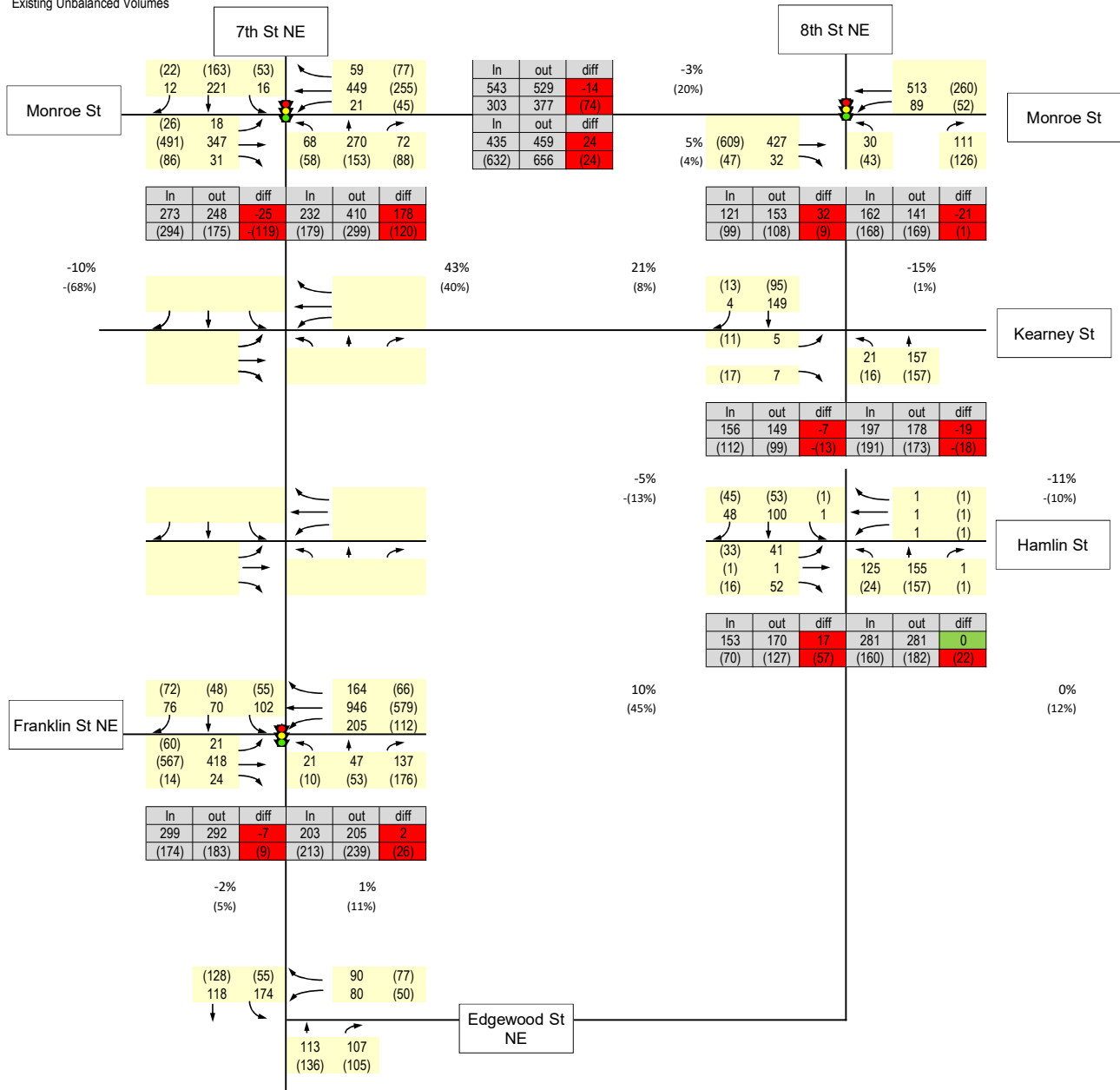
7TH STREET AND EDGEWOOD STREET, NE - PM PEAK



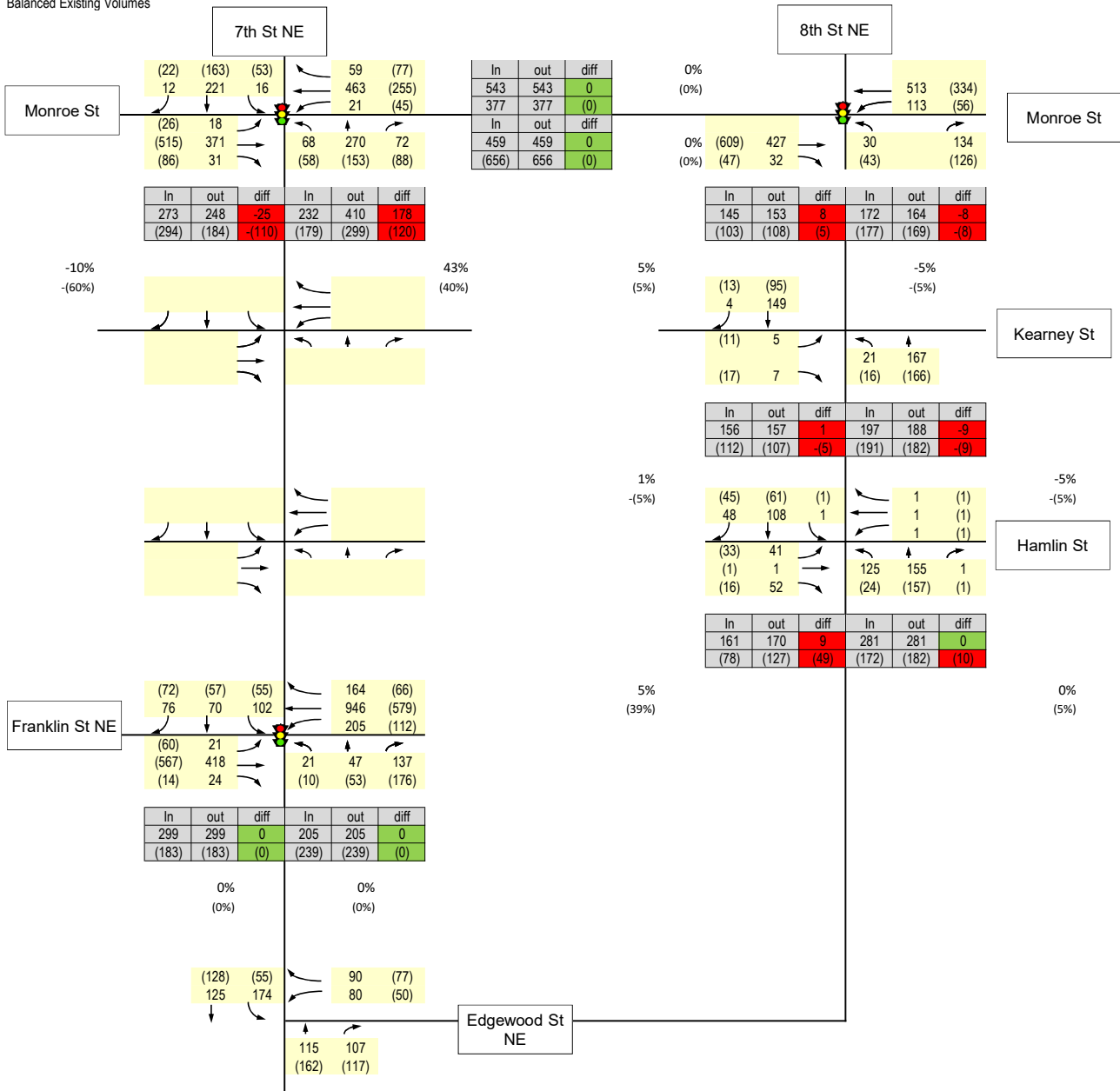
Appendix B

Volume Balancing Adjustments

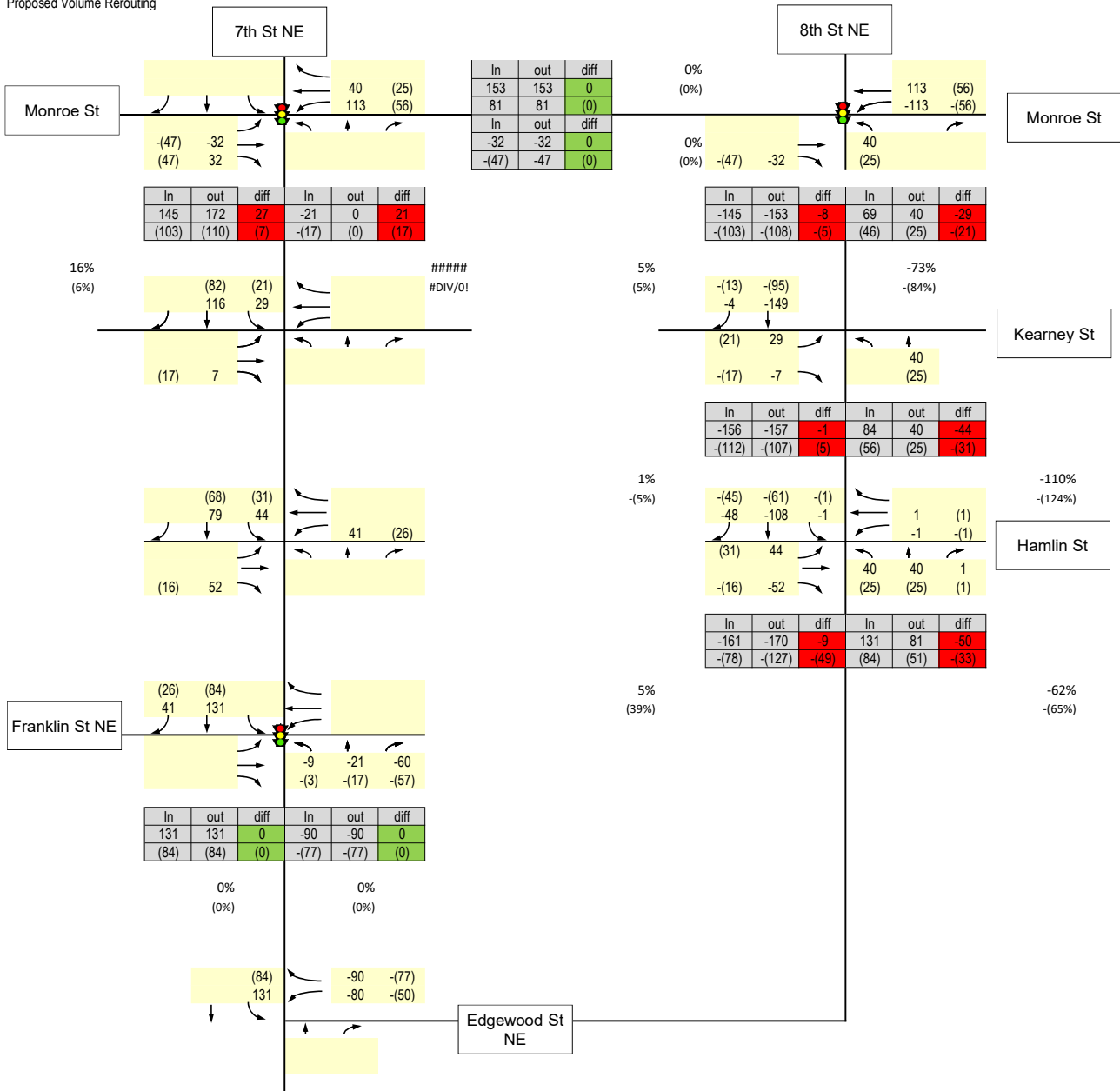
Existing Unbalanced Volumes



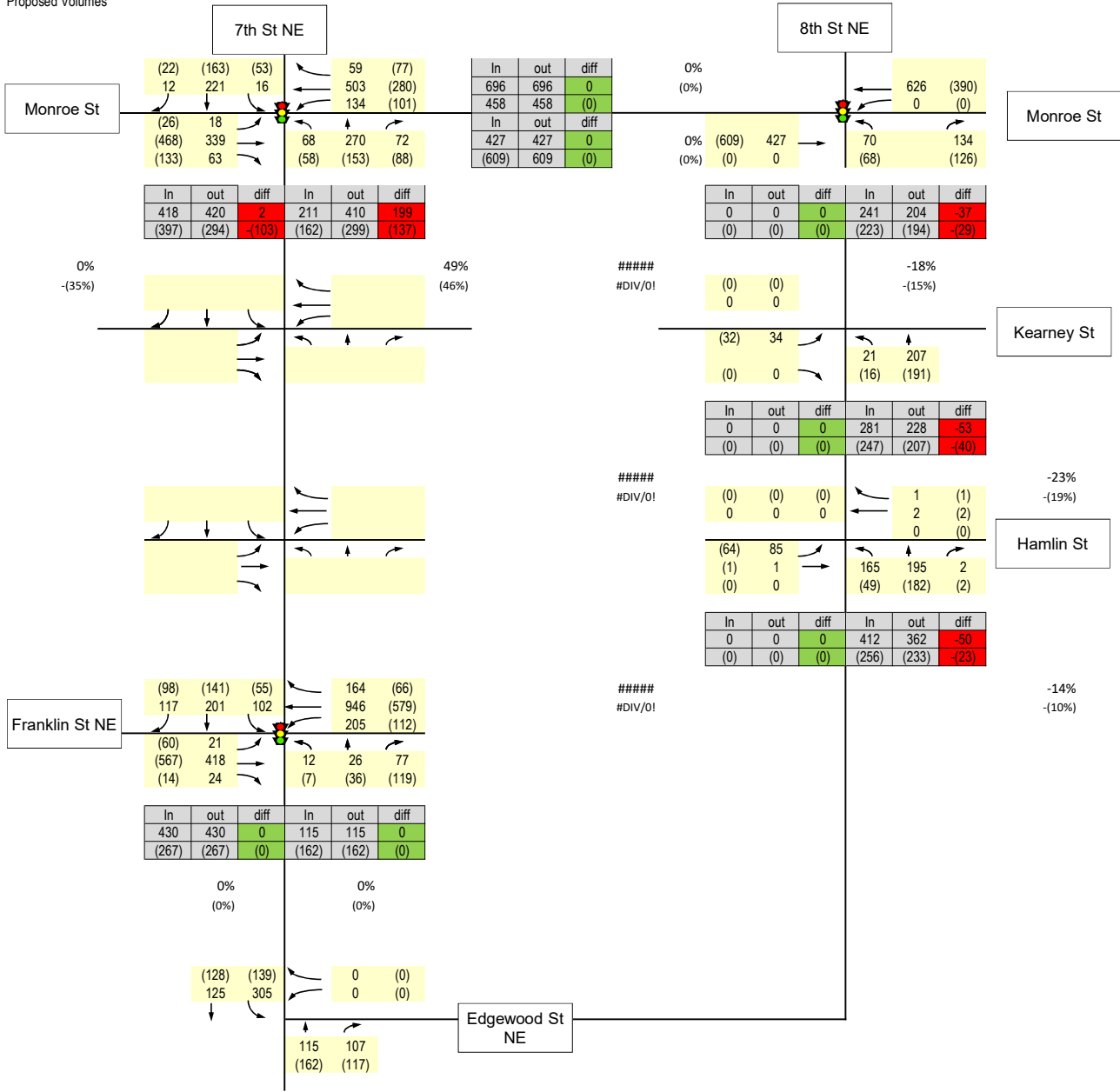
Balanced Existing Volumes



Proposed Volume Rerouting



Proposed Volumes



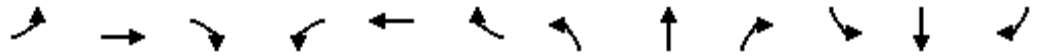
Appendix C

Existing, Build, Mitigation, Synchro and SimTraffic Reports

HCM Signalized Intersection Capacity Analysis

1: 7th St & Monroe St

Existing - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	18	371	31	21	463	59	68	270	72	16	221	12
Future Volume (vph)	18	371	31	21	463	59	68	270	72	16	221	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.99			0.99			0.96			0.99	
Flpb, ped/bikes		1.00			1.00			0.98			1.00	
Frt		0.99			0.99			0.98			0.99	
Flt Protected		1.00			1.00			0.99			1.00	
Satd. Flow (prot)		1574			1539			1478			1623	
Flt Permitted		0.97			0.98			0.89			0.96	
Satd. Flow (perm)		1531			1505			1325			1566	
Peak-hour factor, PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	19	399	33	22	482	61	72	287	77	17	240	13
RTOR Reduction (vph)	0	3	0	0	4	0	0	9	0	0	2	0
Lane Group Flow (vph)	0	448	0	0	561	0	0	427	0	0	268	0
Confl. Peds. (#/hr)	27		44	44		27	105		83	83		105
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	6%	6%	7%	10%	8%	4%	2%	5%	7%	2%	2%	10%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		54.1			54.1			34.9			34.9	
Effective Green, g (s)		56.1			56.1			36.9			36.9	
Actuated g/C Ratio		0.56			0.56			0.37			0.37	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		1.0			1.0			1.0			1.0	
Lane Grp Cap (vph)		858			844			488			577	
v/s Ratio Prot												
v/s Ratio Perm		0.29			0.37			0.32			0.17	
v/c Ratio		0.52			0.66			0.88			0.46	
Uniform Delay, d1		13.6			15.4			29.4			24.0	
Progression Factor		1.00			0.76			1.00			1.00	
Incremental Delay, d2		2.3			3.4			15.5			0.2	
Delay (s)		15.9			15.1			44.9			24.2	
Level of Service		B			B			D			C	
Approach Delay (s)		15.9			15.1			44.9			24.2	
Approach LOS		B			B			D			C	

Intersection Summary

HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2: 8th St & Monroe St

Existing - AM Peak



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	
Traffic Volume (vph)	427	32	113	513	30	134
Future Volume (vph)	427	32	113	513	30	134
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	3.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	0.98		1.00	1.00	0.98	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.89	
Flt Protected	1.00		0.95	1.00	0.99	
Satd. Flow (prot)	1578		1593	1644	1448	
Flt Permitted	1.00		0.38	1.00	0.99	
Satd. Flow (perm)	1578		629	1644	1448	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	464	35	123	558	33	146
RTOR Reduction (vph)	3	0	0	0	114	0
Lane Group Flow (vph)	496	0	123	558	65	0
Confl. Peds. (#/hr)		72	72		87	
Confl. Bikes (#/hr)		4				3
Heavy Vehicles (%)	5%	2%	2%	4%	2%	2%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Actuated Green, G (s)	55.0		55.0	55.0	20.0	
Effective Green, g (s)	57.0		57.0	57.0	22.0	
Actuated g/C Ratio	0.57		0.57	0.57	0.22	
Clearance Time (s)	6.0		6.0	6.0	5.0	
Lane Grp Cap (vph)	899		358	937	318	
v/s Ratio Prot	0.31			c0.34	c0.04	
v/s Ratio Perm			0.20			
v/c Ratio	0.55		0.34	0.60	0.20	
Uniform Delay, d1	13.5		11.5	14.0	31.9	
Progression Factor	0.47		1.00	1.00	1.00	
Incremental Delay, d2	2.1		2.6	2.8	1.5	
Delay (s)	8.5		14.1	16.8	33.3	
Level of Service	A		B	B	C	
Approach Delay (s)	8.5			16.3	33.3	
Approach LOS	A			B	C	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

4: Edgewood St/8th St & Hamlin St/Driveway

Existing - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	41	1	52	1	1	1	125	155	1	1	108	48
Future Volume (Veh/h)	41	1	52	1	1	1	125	155	1	1	108	48
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	1	57	1	1	1	136	168	1	1	117	52
Pedestrians		48			7			198				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		5			1			19				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	635	641	389	848	666	176	217			176		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	635	641	389	848	666	176	217			176		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	89	99	100	100	89			100		
cM capacity (veh/h)	327	333	510	177	322	862	1291			1391		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	103	3	305	170								
Volume Left	45	1	136	1								
Volume Right	57	1	1	52								
cSH	408	303	1291	1391								
Volume to Capacity	0.25	0.01	0.11	0.00								
Queue Length 95th (ft)	25	1	9	0								
Control Delay (s)	16.8	17.0	4.1	0.1								
Lane LOS	C	C	A	A								
Approach Delay (s)	16.8	17.0	4.1	0.1								
Approach LOS	C	C										
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			53.0%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

5: Edgewood St/7th St

Existing - AM Peak



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	90	115	107	174	125
Future Volume (Veh/h)	80	90	115	107	174	125
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.77	0.78	0.59	0.84	0.69	0.78
Hourly flow rate (vph)	104	115	195	127	252	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume						
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol						
tC, single (s)						
tC, 2 stage (s)						
tF (s)						
p0 queue free %						
cM capacity (veh/h)						
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	219	322	412			
Volume Left	104	0	252			
Volume Right	115	127	0			
cSH	376	1700	1244			
Volume to Capacity	0.58	0.19	0.20			
Queue Length 95th (ft)	89	0	19			
Control Delay (s)	27.1	0.0	6.0			
Lane LOS	D		A			
Approach Delay (s)	27.1	0.0	6.0			
Approach LOS	D					
Intersection Summary						
Average Delay			8.8			
Intersection Capacity Utilization			53.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: 7th St & Franklin St

Existing - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↖	↗
Traffic Volume (vph)	21	418	24	205	946	164	21	47	137	102	70	76
Future Volume (vph)	21	418	24	205	946	164	21	47	137	102	70	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0			4.0			4.0	4.0
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	1.00
Frbp, ped/bikes		1.00		1.00	0.98			0.79			1.00	0.97
Flpb, ped/bikes		1.00		1.00	1.00			1.00			0.88	1.00
Frt		0.99		1.00	0.98			0.91			1.00	0.85
Flt Protected		1.00		0.95	1.00			0.99			0.97	1.00
Satd. Flow (prot)		1622		1547	1596			1169			1384	1379
Flt Permitted		0.66		0.35	1.00			0.95			0.52	1.00
Satd. Flow (perm)		1067		570	1596			1121			743	1379
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	454	26	223	1028	178	23	51	149	111	76	83
RTOR Reduction (vph)	0	2	0	0	6	0	0	72	0	0	0	59
Lane Group Flow (vph)	0	501	0	223	1200	0	0	151	0	0	187	24
Confl. Peds. (#/hr)	31		7	7		31	11		138	138		11
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	2%	4%	10%	5%	3%	2%	2%	10%	3%	2%	10%	2%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6		5	2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		45.5		68.0	68.0			21.0			21.0	21.0
Effective Green, g (s)		47.5		70.0	70.0			23.0			23.0	23.0
Actuated g/C Ratio		0.48		0.70	0.70			0.23			0.23	0.23
Clearance Time (s)		5.0		5.0	5.0			6.0			6.0	6.0
Lane Grp Cap (vph)		506		589	1117			257			170	317
v/s Ratio Prot				0.07	c0.75							
v/s Ratio Perm		0.47		0.19				0.13			c0.25	0.02
v/c Ratio		0.99		0.38	1.07			0.59			1.10	0.08
Uniform Delay, d1		26.0		7.6	15.0			34.3			38.5	30.2
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		37.6		1.8	49.2			9.4			98.3	0.5
Delay (s)		63.6		9.4	64.2			43.7			136.8	30.7
Level of Service		E		A	E			D			F	C
Approach Delay (s)		63.6			55.6			43.7			104.2	
Approach LOS		E			E			D			F	

Intersection Summary

HCM 2000 Control Delay	61.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	138.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: 7th St & Monroe St

Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	26	515	86	45	255	77	58	153	88	53	163	22
Future Volume (vph)	26	515	86	45	255	77	58	153	88	53	163	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.96			0.90			0.92			0.95	
Flpb, ped/bikes		0.99			1.00			0.95			0.98	
Frt		0.98			0.97			0.96			0.99	
Flt Protected		1.00			0.99			0.99			0.99	
Satd. Flow (prot)		1529			1423			1372			1511	
Flt Permitted		0.97			0.87			0.86			0.80	
Satd. Flow (perm)		1491			1249			1185			1223	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	560	93	49	277	84	63	166	96	58	177	24
RTOR Reduction (vph)	0	3	0	0	5	0	0	17	0	0	4	0
Lane Group Flow (vph)	0	678	0	0	405	0	0	308	0	0	255	0
Confl. Peds. (#/hr)	105		69	69		105	219		82	82		219
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	2%	5%	2%	5%	5%	2%	2%	2%	8%	2%	2%	9%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		73.3			73.3			35.7			35.7	
Effective Green, g (s)		75.3			75.3			37.7			37.7	
Actuated g/C Ratio		0.63			0.63			0.31			0.31	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		1.0			1.0			1.0			1.0	
Lane Grp Cap (vph)		935			783			372			384	
v/s Ratio Prot												
v/s Ratio Perm		c0.45			0.32			c0.26			0.21	
v/c Ratio		0.72			0.52			0.83			0.66	
Uniform Delay, d1		15.3			12.3			38.1			35.7	
Progression Factor		0.97			1.00			1.00			0.93	
Incremental Delay, d2		2.3			2.4			13.4			2.9	
Delay (s)		17.0			14.8			51.5			36.0	
Level of Service		B			B			D			D	
Approach Delay (s)		17.0			14.8			51.5			36.0	
Approach LOS		B			B			D			D	

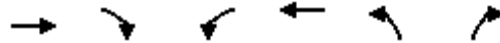
Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2: 8th St & Monroe St

Existing - PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→		↙	↘	↙	↘
Traffic Volume (vph)	609	47	56	334	43	126
Future Volume (vph)	609	47	56	334	43	126
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	3.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frbp, ped/bikes	0.97		1.00	1.00	0.96	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.99		1.00	1.00	0.90	
Flt Protected	1.00		0.95	1.00	0.99	
Satd. Flow (prot)	1575		1593	1644	1418	
Flt Permitted	1.00		0.26	1.00	0.99	
Satd. Flow (perm)	1575		429	1644	1418	
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.92	0.92
Adj. Flow (vph)	641	49	61	363	47	137
RTOR Reduction (vph)	3	0	0	0	105	0
Lane Group Flow (vph)	687	0	61	363	79	0
Confl. Peds. (#/hr)		76	76		84	1
Confl. Bikes (#/hr)		1				14
Heavy Vehicles (%)	5%	2%	2%	4%	4%	3%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Actuated Green, G (s)	57.0		57.0	57.0	18.0	
Effective Green, g (s)	59.0		59.0	59.0	20.0	
Actuated g/C Ratio	0.59		0.59	0.59	0.20	
Clearance Time (s)	6.0		6.0	6.0	5.0	
Lane Grp Cap (vph)			253	969	283	
v/s Ratio Prot	c0.44			0.22	c0.06	
v/s Ratio Perm			0.14			
v/c Ratio	0.74		0.24	0.37	0.28	
Uniform Delay, d1	14.9		9.8	10.8	33.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	5.3		2.2	1.1	2.5	
Delay (s)	20.2		12.0	11.9	36.4	
Level of Service	C		B	B	D	
Approach Delay (s)	20.2			11.9	36.4	
Approach LOS	C			B	D	

Intersection Summary

HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

4: Edgewood St/8th St & Hamlin St/Driveway

Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	33	1	16	1	1	1	24	157	1	1	61	45
Future Volume (Veh/h)	33	1	16	1	1	1	24	157	1	1	61	45
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	1	17	1	1	1	26	171	1	1	66	49
Pedestrians		51			2			30			5	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		5			0			3			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	374	370	172	366	394	178	166			174		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	374	370	172	366	394	178	166			174		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	98	100	100	100	98			100		
cM capacity (veh/h)	522	521	797	530	505	859	1343			1400		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	54	3	198	116								
Volume Left	36	1	26	1								
Volume Right	17	1	1	49								
cSH	585	596	1343	1400								
Volume to Capacity	0.09	0.01	0.02	0.00								
Queue Length 95th (ft)	8	0	1	0								
Control Delay (s)	11.8	11.1	1.2	0.1								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.8	11.1	1.2	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			35.0%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

5: Edgewood St/7th St

Existing - PM Peak Hour



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	77	162	117	55	128
Future Volume (Veh/h)	50	77	162	117	55	128
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.77	0.77	0.86	0.66	0.86	0.82
Hourly flow rate (vph)	65	100	188	177	64	156
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked	0.99					174
vC, conflicting volume	560	276			365	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	552	276			365	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	87			95	
cM capacity (veh/h)	464	767			1205	
Direction, Lane #						
	WB 1	NB 1	SB 1			
Volume Total	165	365	220			
Volume Left	65	0	64			
Volume Right	100	177	0			
cSH	610	1700	1205			
Volume to Capacity	0.27	0.21	0.05			
Queue Length 95th (ft)	27	0	4			
Control Delay (s)	13.1	0.0	2.7			
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	2.7			
Approach LOS	B					
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			46.6%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: 7th St & Franklin St

Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	↕
Traffic Volume (vph)	60	567	14	112	579	66	10	53	176	55	57	72
Future Volume (vph)	60	567	14	112	579	66	10	53	176	55	57	72
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0			4.0			4.0	4.0
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	1.00
Frbp, ped/bikes		1.00		1.00	0.99			0.90			1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00			1.00			0.97	1.00
Frt		1.00		1.00	0.98			0.90			1.00	0.85
Flt Protected		1.00		0.95	1.00			1.00			0.98	1.00
Satd. Flow (prot)		1634		1593	1641			1332			1519	1392
Flt Permitted		0.89		0.33	1.00			0.99			0.58	1.00
Satd. Flow (perm)		1465		557	1641			1317			908	1392
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	65	616	15	118	609	69	11	57	189	60	62	78
RTOR Reduction (vph)	0	1	0	0	4	0	0	100	0	0	0	60
Lane Group Flow (vph)	0	695	0	118	674	0	0	157	0	0	122	18
Confl. Peds. (#/hr)	12		8	8		12	6		54	54		6
Confl. Bikes (#/hr)			1			2			1			
Heavy Vehicles (%)	8%	3%	10%	2%	2%	2%	2%	10%	2%	2%	10%	2%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6		5	2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		58.0		68.0	68.0			21.0			21.0	21.0
Effective Green, g (s)		60.0		70.0	70.0			23.0			23.0	23.0
Actuated g/C Ratio		0.60		0.70	0.70			0.23			0.23	0.23
Clearance Time (s)		5.0		5.0	5.0			6.0			6.0	6.0
Lane Grp Cap (vph)		879		462	1148			302			208	320
v/s Ratio Prot				0.02	c0.41							
v/s Ratio Perm		c0.47		0.16				0.12			c0.13	0.01
v/c Ratio		0.79		0.26	0.59			0.52			0.59	0.06
Uniform Delay, d1		15.2		6.7	7.6			33.7			34.3	30.0
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		7.2		1.3	2.2			6.3			11.6	0.3
Delay (s)		22.4		8.1	9.8			39.9			45.8	30.4
Level of Service		C		A	A			D			D	C
Approach Delay (s)		22.4			9.6			39.9			39.8	
Approach LOS		C			A			D			D	

Intersection Summary

HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	119.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: 7th St & Monroe St

Future - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	18	339	63	134	503	59	68	270	72	16	221	12
Future Volume (vph)	18	339	63	134	503	59	68	270	72	16	221	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frbp, ped/bikes		0.98			0.99			0.96			0.99	
Flpb, ped/bikes		1.00			0.99			0.98			1.00	
Frt		0.98			0.99			0.98			0.99	
Flt Protected		1.00			0.99			0.99			1.00	
Satd. Flow (prot)		1536			1518			1479			1623	
Flt Permitted		0.96			0.82			0.87			0.96	
Satd. Flow (perm)		1483			1263			1291			1570	
Peak-hour factor, PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	19	365	68	140	524	61	72	287	77	17	240	13
RTOR Reduction (vph)	0	6	0	0	3	0	0	8	0	0	2	0
Lane Group Flow (vph)	0	446	0	0	722	0	0	428	0	0	268	0
Confl. Peds. (#/hr)	27		44	44		27	105		83	83		105
Confl. Bikes (#/hr)												2
Heavy Vehicles (%)	6%	6%	7%	10%	8%	4%	2%	5%	7%	2%	2%	10%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)		58.0			58.0			31.0			31.0	
Effective Green, g (s)		60.0			60.0			33.0			33.0	
Actuated g/C Ratio		0.60			0.60			0.33			0.33	
Clearance Time (s)		5.0			5.0			6.0			6.0	
Vehicle Extension (s)		1.0			1.0			1.0			1.0	
Lane Grp Cap (vph)		889			757			426			518	
v/s Ratio Prot												
v/s Ratio Perm		0.30			c0.57			c0.33			0.17	
v/c Ratio		0.50			0.95			1.00			0.52	
Uniform Delay, d1		11.4			18.7			33.5			27.1	
Progression Factor		1.00			0.34			1.00			1.00	
Incremental Delay, d2		2.0			18.4			44.8			0.4	
Delay (s)		13.5			24.7			78.3			27.4	
Level of Service		B			C			E			C	
Approach Delay (s)		13.5			24.7			78.3			27.4	
Approach LOS		B			C			E			C	

Intersection Summary

HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	121.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

2: 8th St & Monroe St

Future - AM Peak



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Volume (vph)	427	0	0	626	70	134
Future Volume (vph)	427	0	0	626	70	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	0.98	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1629			1644	1477	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1629			1644	1477	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	464	0	0	680	76	146
RTOR Reduction (vph)	0	0	0	0	69	0
Lane Group Flow (vph)	464	0	0	680	153	0
Confl. Peds. (#/hr)		72	72		87	
Confl. Bikes (#/hr)		4				3
Heavy Vehicles (%)	5%	0%	0%	4%	2%	2%
Turn Type	NA			NA	Prot	
Protected Phases	2			6	4	
Permitted Phases						
Actuated Green, G (s)	57.0			57.0	18.0	
Effective Green, g (s)	59.0			59.0	20.0	
Actuated g/C Ratio	0.59			0.59	0.20	
Clearance Time (s)	6.0			6.0	5.0	
Lane Grp Cap (vph)	961			969	295	
v/s Ratio Prot	0.28			c0.41	c0.10	
v/s Ratio Perm						
v/c Ratio	0.48			0.70	0.52	
Uniform Delay, d1	11.8			14.3	35.7	
Progression Factor	0.66			1.00	1.00	
Incremental Delay, d2	1.4			4.2	6.4	
Delay (s)	9.2			18.6	42.1	
Level of Service	A			B	D	
Approach Delay (s)	9.2			18.6	42.1	
Approach LOS	A			B	D	

Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

4: Edgewood St/8th St & Hamlin St/Driveway

Future - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗			↕				
Traffic Volume (veh/h)	85	1	0	0	2	1	165	195	2	0	0	0
Future Volume (Veh/h)	85	1	0	0	2	1	165	195	2	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	1	0	0	2	1	179	212	2	0	0	0
Pedestrians		48			7			198				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		5			1			19				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	621	627	246	776	626	220	48			221		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	621	627	246	776	626	220	48			221		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	72	100	100	100	99	100	88			100		
cM capacity (veh/h)	330	334	618	222	334	814	1488			1351		
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	93	3	393									
Volume Left	92	0	179									
Volume Right	0	1	2									
cSH	330	416	1488									
Volume to Capacity	0.28	0.01	0.12									
Queue Length 95th (ft)	28	1	10									
Control Delay (s)	20.2	13.7	4.1									
Lane LOS	C	B	A									
Approach Delay (s)	20.2	13.7	4.1									
Approach LOS	C	B										
Intersection Summary												
Average Delay			7.2									
Intersection Capacity Utilization			48.4%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

5: Edgewood St/7th St

Future - AM Peak



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (veh/h)	0	0	115	107	304	125
Future Volume (Veh/h)	0	0	115	107	304	125
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.77	0.78	0.59	0.84	0.69	0.78
Hourly flow rate (vph)	0	0	195	127	441	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						174
pX, platoon unblocked	0.81					
vC, conflicting volume	1300	258			322	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1255	258			322	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			64	
cM capacity (veh/h)	100	785			1232	
Direction, Lane #	NB 1	SB 1				
Volume Total	322	601				
Volume Left	0	441				
Volume Right	127	0				
cSH	1700	1232				
Volume to Capacity	0.19	0.36				
Queue Length 95th (ft)	0	41				
Control Delay (s)	0.0	8.0				
Lane LOS		A				
Approach Delay (s)	0.0	8.0				
Approach LOS						
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization			46.7%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: 7th St & Franklin St

Future - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↖	↗
Traffic Volume (vph)	21	418	24	205	946	164	12	26	77	102	201	117
Future Volume (vph)	21	418	24	205	946	164	12	26	77	102	201	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0			4.0			4.0	4.0
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	1.00
Frbp, ped/bikes		1.00		1.00	0.98			0.80			1.00	0.97
Flpb, ped/bikes		1.00		1.00	1.00			1.00			0.90	1.00
Frt		0.99		1.00	0.98			0.91			1.00	0.85
Flt Protected		1.00		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)		1622		1547	1596			1180			1409	1379
Flt Permitted		0.60		0.34	1.00			0.83			0.80	1.00
Satd. Flow (perm)		981		560	1596			988			1142	1379
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	454	26	223	1028	178	13	28	84	111	218	127
RTOR Reduction (vph)	0	2	0	0	6	0	0	64	0	0	0	58
Lane Group Flow (vph)	0	501	0	223	1200	0	0	61	0	0	329	69
Confl. Peds. (#/hr)	31		7	7		31	11		138	138		11
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	2%	4%	10%	5%	3%	2%	2%	10%	3%	2%	10%	2%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6		5	2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		44.5		67.0	67.0			22.0			22.0	22.0
Effective Green, g (s)		46.5		69.0	69.0			24.0			24.0	24.0
Actuated g/C Ratio		0.46		0.69	0.69			0.24			0.24	0.24
Clearance Time (s)		5.0		5.0	5.0			6.0			6.0	6.0
Lane Grp Cap (vph)		456		578	1101			237			274	330
v/s Ratio Prot				0.08	c0.75							
v/s Ratio Perm		0.51		0.19				0.06			c0.29	0.05
v/c Ratio		1.10		0.39	1.09			0.26			1.20	0.21
Uniform Delay, d1		26.8		8.0	15.5			30.8			38.0	30.4
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		71.5		1.9	55.0			2.6			119.9	1.4
Delay (s)		98.3		9.9	70.5			33.4			157.9	31.9
Level of Service		F		A	E			C			F	C
Approach Delay (s)		98.3			61.0			33.4			122.8	
Approach LOS		F			E			C			F	

Intersection Summary

















HCM 2000 Control Delay	78.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	128.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: 7th St & Monroe St

Future - PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	26	468	133	101	280	77	58	153	88	53	163	22	
Future Volume (vph)	26	468	133	101	280	77	58	153	88	53	163	22	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		3.0			3.0			4.0			4.0		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		0.94			0.92			0.92			0.95		
Flpb, ped/bikes		0.99			0.99			0.95			0.98		
Frt		0.97			0.98			0.96			0.99		
Flt Protected		1.00			0.99			0.99			0.99		
Satd. Flow (prot)		1483			1432			1374			1512		
Flt Permitted		0.97			0.74			0.84			0.78		
Satd. Flow (perm)		1440			1078			1169			1196		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	28	509	145	110	304	84	63	166	96	58	177	24	
RTOR Reduction (vph)	0	7	0	0	5	0	0	13	0	0	4	0	
Lane Group Flow (vph)	0	675	0	0	493	0	0	312	0	0	255	0	
Confl. Peds. (#/hr)	105		69	69		105	219		82	82		219	
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	2%	5%	2%	5%	5%	2%	2%	2%	8%	2%	2%	9%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		2			6			4			8		
Permitted Phases	2			6			4			8			
Actuated Green, G (s)		75.7			75.7			33.3			33.3		
Effective Green, g (s)		77.7			77.7			35.3			35.3		
Actuated g/C Ratio		0.65			0.65			0.29			0.29		
Clearance Time (s)		5.0			5.0			6.0			6.0		
Vehicle Extension (s)		1.0			1.0			1.0			1.0		
Lane Grp Cap (vph)		932			698			343			351		
v/s Ratio Prot													
v/s Ratio Perm		c0.47			0.46			c0.27			0.21		
v/c Ratio		0.72			0.71			0.91			0.73		
Uniform Delay, d1		14.0			13.7			40.8			38.0		
Progression Factor		0.97			1.00			1.00			0.87		
Incremental Delay, d2		2.3			5.9			26.1			5.4		
Delay (s)		15.9			19.7			66.9			38.7		
Level of Service		B			B			E			D		
Approach Delay (s)		15.9			19.7			66.9			38.7		
Approach LOS		B			B			E			D		
Intersection Summary													
HCM 2000 Control Delay			29.7									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.78										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	7.0
Intersection Capacity Utilization			103.1%									ICU Level of Service	G
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: 8th St & Monroe St

Future - PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	609	0	0	390	68	126
Future Volume (vph)	609	0	0	390	68	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frbp, ped/bikes	1.00			1.00	0.97	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1629			1644	1437	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1629			1644	1437	
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.92	0.92
Adj. Flow (vph)	641	0	0	424	74	137
RTOR Reduction (vph)	0	0	0	0	66	0
Lane Group Flow (vph)	641	0	0	424	145	0
Confl. Peds. (#/hr)		76	76		84	1
Confl. Bikes (#/hr)		1				14
Heavy Vehicles (%)	5%	0%	0%	4%	4%	3%
Turn Type	NA			NA	Prot	
Protected Phases	2			6	4	
Permitted Phases						
Actuated Green, G (s)	57.0			57.0	18.0	
Effective Green, g (s)	59.0			59.0	20.0	
Actuated g/C Ratio	0.59			0.59	0.20	
Clearance Time (s)	6.0			6.0	5.0	
Lane Grp Cap (vph)	961			969	287	
v/s Ratio Prot	c0.39			0.26	c0.10	
v/s Ratio Perm						
v/c Ratio	0.67			0.44	0.50	
Uniform Delay, d1	13.9			11.3	35.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	3.7			1.4	6.2	
Delay (s)	17.5			12.8	41.8	
Level of Service	B			B	D	
Approach Delay (s)	17.5			12.8	41.8	
Approach LOS	B			B	D	

Intersection Summary

HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

4: Edgewood St/8th St & Hamlin St/Driveway

Future - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗			↕				
Traffic Volume (veh/h)	33	1	0	0	2	1	49	182	1	0	0	0
Future Volume (Veh/h)	33	1	0	0	2	1	49	182	1	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	1	0	0	2	1	53	198	1	0	0	0
Pedestrians		51			2			30			5	
Lane Width (ft)		12.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		5			0			3			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	362	358	81	337	358	206	51			201		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	362	358	81	337	358	206	51			201		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	100	100	100	100	96			100		
cM capacity (veh/h)	526	520	910	562	521	833	1480			1380		
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	37	3	252									
Volume Left	36	0	53									
Volume Right	0	1	1									
cSH	526	595	1480									
Volume to Capacity	0.07	0.01	0.04									
Queue Length 95th (ft)	6	0	3									
Control Delay (s)	12.4	11.1	1.8									
Lane LOS	B	B	A									
Approach Delay (s)	12.4	11.1	1.8									
Approach LOS	B	B										
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization			38.7%	ICU Level of Service						A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

5: Edgewood St/7th St

Future - PM Peak Hour

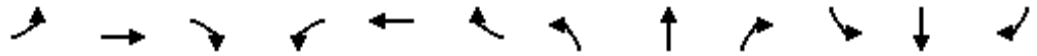


Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (veh/h)	0	0	162	117	139	128
Future Volume (Veh/h)	0	0	162	117	139	128
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.77	0.77	0.86	0.66	0.86	0.82
Hourly flow rate (vph)	0	0	188	177	162	156
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						174
pX, platoon unblocked	0.91					
vC, conflicting volume	756	276			365	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	680	276			365	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			86	
cM capacity (veh/h)	329	767			1188	
Direction, Lane #	NB 1	SB 1				
Volume Total	365	318				
Volume Left	0	162				
Volume Right	177	0				
cSH	1700	1188				
Volume to Capacity	0.21	0.14				
Queue Length 95th (ft)	0	12				
Control Delay (s)	0.0	5.0				
Lane LOS		A				
Approach Delay (s)	0.0	5.0				
Approach LOS						
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			40.1%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: 7th St & Franklin St

Future - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗			↕			↖	↗
Traffic Volume (vph)	60	567	14	112	579	66	7	36	119	55	141	98
Future Volume (vph)	60	567	14	112	579	66	7	36	119	55	141	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0		3.0	3.0			4.0			4.0	4.0
Lane Util. Factor		1.00		1.00	1.00			1.00			1.00	1.00
Frbp, ped/bikes		1.00		1.00	0.99			0.90			1.00	0.98
Flpb, ped/bikes		1.00		1.00	1.00			1.00			0.97	1.00
Frt		1.00		1.00	0.98			0.90			1.00	0.85
Flt Protected		1.00		0.95	1.00			1.00			0.99	1.00
Satd. Flow (prot)		1634		1593	1641			1333			1522	1392
Flt Permitted		0.89		0.33	1.00			0.98			0.81	1.00
Satd. Flow (perm)		1465		557	1641			1314			1250	1392
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	65	616	15	118	609	69	8	39	128	60	153	107
RTOR Reduction (vph)	0	1	0	0	4	0	0	98	0	0	0	59
Lane Group Flow (vph)	0	695	0	118	674	0	0	77	0	0	213	48
Confl. Peds. (#/hr)	12		8	8		12	6		54	54		6
Confl. Bikes (#/hr)			1			2			1			
Heavy Vehicles (%)	8%	3%	10%	2%	2%	2%	2%	10%	2%	2%	10%	2%
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	Perm
Protected Phases		6		5	2			8			4	
Permitted Phases	6			2			8			4		4
Actuated Green, G (s)		58.0		68.0	68.0			21.0			21.0	21.0
Effective Green, g (s)		60.0		70.0	70.0			23.0			23.0	23.0
Actuated g/C Ratio		0.60		0.70	0.70			0.23			0.23	0.23
Clearance Time (s)		5.0		5.0	5.0			6.0			6.0	6.0
Lane Grp Cap (vph)		879		462	1148			302			287	320
v/s Ratio Prot				0.02	c0.41							
v/s Ratio Perm		c0.47		0.16				0.06			c0.17	0.03
v/c Ratio		0.79		0.26	0.59			0.26			0.74	0.15
Uniform Delay, d1		15.2		6.7	7.6			31.5			35.7	30.7
Progression Factor		1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2		7.2		1.3	2.2			2.0			15.9	1.0
Delay (s)		22.4		8.1	9.8			33.5			51.6	31.7
Level of Service		C		A	A			C			D	C
Approach Delay (s)		22.4			9.6			33.5			45.0	
Approach LOS		C			A			C			D	

Intersection Summary

















HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	116.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

1: 7th St & Monroe St

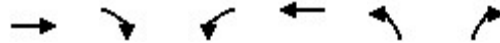
Future - AM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	18	339	63	134	503	59	68	270	72	16	221	12	
Future Volume (vph)	18	339	63	134	503	59	68	270	72	16	221	12	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		3.0			3.0			4.0			4.0		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		0.98			0.99			0.96			0.99		
Flpb, ped/bikes		1.00			0.99			0.98			1.00		
Frt		0.98			0.99			0.98			0.99		
Flt Protected		1.00			0.99			0.99			1.00		
Satd. Flow (prot)		1536			1518			1479			1623		
Flt Permitted		0.96			0.82			0.87			0.96		
Satd. Flow (perm)		1483			1263			1291			1570		
Peak-hour factor, PHF	0.93	0.93	0.93	0.96	0.96	0.96	0.94	0.94	0.94	0.92	0.92	0.92	
Adj. Flow (vph)	19	365	68	140	524	61	72	287	77	17	240	13	
RTOR Reduction (vph)	0	6	0	0	3	0	0	8	0	0	2	0	
Lane Group Flow (vph)	0	446	0	0	722	0	0	428	0	0	268	0	
Confl. Peds. (#/hr)	27		44	44		27	105		83	83		105	
Confl. Bikes (#/hr)												2	
Heavy Vehicles (%)	6%	6%	7%	10%	8%	4%	2%	5%	7%	2%	2%	10%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		2			6			4			8		
Permitted Phases	2			6			4			8			
Actuated Green, G (s)		58.0			58.0			31.0			31.0		
Effective Green, g (s)		60.0			60.0			33.0			33.0		
Actuated g/C Ratio		0.60			0.60			0.33			0.33		
Clearance Time (s)		5.0			5.0			6.0			6.0		
Vehicle Extension (s)		1.0			1.0			1.0			1.0		
Lane Grp Cap (vph)		889			757			426			518		
v/s Ratio Prot													
v/s Ratio Perm		0.30			c0.57			c0.33			0.17		
v/c Ratio		0.50			0.95			1.00			0.52		
Uniform Delay, d1		11.4			18.7			33.5			27.1		
Progression Factor		1.00			0.34			1.00			1.00		
Incremental Delay, d2		2.0			18.4			44.8			0.4		
Delay (s)		13.5			24.7			78.3			27.4		
Level of Service		B			C			E			C		
Approach Delay (s)		13.5			24.7			78.3			27.4		
Approach LOS		B			C			E			C		
Intersection Summary													
HCM 2000 Control Delay			34.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.97										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	7.0
Intersection Capacity Utilization			121.7%									ICU Level of Service	H
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

2: 8th St & Monroe St

Future - AM Peak



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	427	0	0	626	70	134
Future Volume (vph)	427	0	0	626	70	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.98	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1629			1644	1477	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1629			1644	1477	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	464	0	0	680	76	146
RTOR Reduction (vph)	0	0	0	0	69	0
Lane Group Flow (vph)	464	0	0	680	153	0
Confl. Peds. (#/hr)		72	72		87	
Confl. Bikes (#/hr)		4				3
Heavy Vehicles (%)	5%	0%	0%	4%	2%	2%
Turn Type	NA			NA	Prot	
Protected Phases	2			6	4	
Permitted Phases						
Actuated Green, G (s)	57.0			57.0	18.0	
Effective Green, g (s)	59.0			59.0	20.0	
Actuated g/C Ratio	0.59			0.59	0.20	
Clearance Time (s)	6.0			6.0	5.0	
Lane Grp Cap (vph)	961			969	295	
v/s Ratio Prot	0.28			c0.41	c0.10	
v/s Ratio Perm						
v/c Ratio	0.48			0.70	0.52	
Uniform Delay, d1	11.8			14.3	35.7	
Progression Factor	0.66			1.00	1.00	
Incremental Delay, d2	1.4			4.2	6.4	
Delay (s)	9.2			18.6	42.1	
Level of Service	A			B	D	
Approach Delay (s)	9.2			18.6	42.1	
Approach LOS	A			B	D	

Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

3: 8th St & Kearny St

Future - AM Peak



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖			↖		
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	34	0	21	207	0	0
Future Volume (vph)	34	0	21	207	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	0	23	225	0	0

Direction, Lane #	EB 1	NB 1
Volume Total (vph)	37	248
Volume Left (vph)	37	23
Volume Right (vph)	0	0
Hadj (s)	0.23	0.05
Departure Headway (s)	4.7	4.0
Degree Utilization, x	0.05	0.28
Capacity (veh/h)	721	875
Control Delay (s)	7.9	8.6
Approach Delay (s)	7.9	8.6
Approach LOS	A	A

Intersection Summary	
Delay	8.5
Level of Service	A
Intersection Capacity Utilization	33.4%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis

4: Edgewood St/8th St & Hamlin St/Driveway

Future - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗			↕				
Traffic Volume (veh/h)	85	1	0	0	2	1	165	195	2	0	0	0
Future Volume (Veh/h)	85	1	0	0	2	1	165	195	2	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	1	0	0	2	1	179	212	2	0	0	0
Pedestrians		48			7			198				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		5			1			19				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	621	627	246	776	626	220	48			221		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	621	627	246	776	626	220	48			221		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	72	100	100	100	99	100	88			100		
cM capacity (veh/h)	330	334	618	222	334	814	1488			1351		
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	93	3	393									
Volume Left	92	0	179									
Volume Right	0	1	2									
cSH	330	416	1488									
Volume to Capacity	0.28	0.01	0.12									
Queue Length 95th (ft)	28	1	10									
Control Delay (s)	20.2	13.7	4.1									
Lane LOS	C	B	A									
Approach Delay (s)	20.2	13.7	4.1									
Approach LOS	C	B										
Intersection Summary												
Average Delay			7.2									
Intersection Capacity Utilization			48.4%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

5: Edgewood St/7th St

Future - AM Peak





















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↶			↷
Traffic Volume (veh/h)	0	0	115	107	304	125
Future Volume (Veh/h)	0	0	115	107	304	125
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.77	0.78	0.59	0.84	0.69	0.78
Hourly flow rate (vph)	0	0	195	127	441	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						174
pX, platoon unblocked	0.81					
vC, conflicting volume	1300	258			322	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1253	258			322	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			64	
cM capacity (veh/h)	100	785			1232	
Direction, Lane #	NB 1	SB 1				
Volume Total	322	601				
Volume Left	0	441				
Volume Right	127	0				
cSH	1700	1232				
Volume to Capacity	0.19	0.36				
Queue Length 95th (ft)	0	41				
Control Delay (s)	0.0	8.0				
Lane LOS			A			
Approach Delay (s)	0.0	8.0				
Approach LOS						
Intersection Summary						
Average Delay			5.2			
Intersection Capacity Utilization			46.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: 7th St & Franklin St

















Future - AM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	21	418	24	205	946	164	12	26	77	102	201	117	
Future Volume (vph)	21	418	24	205	946	164	12	26	77	102	201	117	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		3.0		3.0	3.0			4.0		6.0	4.0		
Lane Util. Factor		1.00		1.00	1.00			1.00		1.00	1.00		
Frbp, ped/bikes		1.00		1.00	0.98			0.76		1.00	0.99		
Flpb, ped/bikes		1.00		1.00	1.00			1.00		0.71	1.00		
Frt		0.99		1.00	0.98			0.91		1.00	0.94		
Flt Protected		1.00		0.95	1.00			0.99		0.95	1.00		
Satd. Flow (prot)		1622		1547	1596			1124		1125	1491		
Flt Permitted		0.80		0.37	1.00			0.60		0.57	1.00		
Satd. Flow (perm)		1306		597	1596			678		678	1491		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	23	454	26	223	1028	178	13	28	84	111	218	127	
RTOR Reduction (vph)	0	2	0	0	6	0	0	67	0	0	21	0	
Lane Group Flow (vph)	0	501	0	223	1200	0	0	58	0	111	324	0	
Confl. Peds. (#/hr)	31		7	7		31	11		138	138		11	
Confl. Bikes (#/hr)						3							
Heavy Vehicles (%)	2%	4%	10%	5%	3%	2%	2%	10%	3%	2%	10%	2%	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases		6		5	2			8			4		
Permitted Phases	6			2			8			4			
Actuated Green, G (s)		48.5		71.0	71.0			18.0		18.0	18.0		
Effective Green, g (s)		50.5		73.0	73.0			20.0		18.0	20.0		
Actuated g/C Ratio		0.50		0.73	0.73			0.20		0.18	0.20		
Clearance Time (s)		5.0		5.0	5.0			6.0		6.0	6.0		
Lane Grp Cap (vph)		659		621	1165			135		122	298		
v/s Ratio Prot				0.07	c0.75						c0.22		
v/s Ratio Perm		0.38		0.19				0.09		0.16			
v/c Ratio		0.76		0.36	1.03			0.43		0.91	1.09		
Uniform Delay, d1		19.9		6.3	13.5			35.0		40.2	40.0		
Progression Factor		1.00		1.00	1.00			1.00		1.00	1.00		
Incremental Delay, d2		8.1		1.6	34.3			9.6		60.0	77.6		
Delay (s)		27.9		7.9	47.8			44.6		100.2	117.6		
Level of Service		C		A	D			D		F	F		
Approach Delay (s)		27.9			41.6			44.6			113.4		
Approach LOS		C			D			D			F		
Intersection Summary													
HCM 2000 Control Delay			52.0									HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio			1.08										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	10.0
Intersection Capacity Utilization			127.9%									ICU Level of Service	H
Analysis Period (min)			15										
c Critical Lane Group													

HCM Signalized Intersection Capacity Analysis

1: 7th St & Monroe St

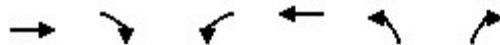
Future - PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	26	468	133	101	280	77	58	153	88	53	163	22	
Future Volume (vph)	26	468	133	101	280	77	58	153	88	53	163	22	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		3.0			3.0			4.0			4.0		
Lane Util. Factor		1.00			1.00			1.00			1.00		
Frbp, ped/bikes		0.94			0.92			0.92			0.95		
Flpb, ped/bikes		0.99			0.99			0.95			0.98		
Frt		0.97			0.98			0.96			0.99		
Flt Protected		1.00			0.99			0.99			0.99		
Satd. Flow (prot)		1483			1432			1374			1512		
Flt Permitted		0.97			0.74			0.84			0.78		
Satd. Flow (perm)		1440			1078			1169			1196		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	28	509	145	110	304	84	63	166	96	58	177	24	
RTOR Reduction (vph)	0	7	0	0	5	0	0	13	0	0	4	0	
Lane Group Flow (vph)	0	675	0	0	493	0	0	312	0	0	255	0	
Confl. Peds. (#/hr)	105		69	69		105	219		82	82		219	
Confl. Bikes (#/hr)									1				
Heavy Vehicles (%)	2%	5%	2%	5%	5%	2%	2%	2%	8%	2%	2%	9%	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA		
Protected Phases		2			6			4			8		
Permitted Phases	2			6			4			8			
Actuated Green, G (s)		75.7			75.7			33.3			33.3		
Effective Green, g (s)		77.7			77.7			35.3			35.3		
Actuated g/C Ratio		0.65			0.65			0.29			0.29		
Clearance Time (s)		5.0			5.0			6.0			6.0		
Vehicle Extension (s)		1.0			1.0			1.0			1.0		
Lane Grp Cap (vph)		932			698			343			351		
v/s Ratio Prot													
v/s Ratio Perm		c0.47			0.46			c0.27			0.21		
v/c Ratio		0.72			0.71			0.91			0.73		
Uniform Delay, d1		14.0			13.7			40.8			38.0		
Progression Factor		0.97			1.00			1.00			0.87		
Incremental Delay, d2		2.3			5.9			26.1			5.4		
Delay (s)		15.9			19.7			66.9			38.7		
Level of Service		B			B			E			D		
Approach Delay (s)		15.9			19.7			66.9			38.7		
Approach LOS		B			B			E			D		
Intersection Summary													
HCM 2000 Control Delay			29.7									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.78										
Actuated Cycle Length (s)			120.0									Sum of lost time (s)	7.0
Intersection Capacity Utilization			103.1%									ICU Level of Service	G
Analysis Period (min)			15										
c	Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: 8th St & Monroe St

Future - PM Peak Hour



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Traffic Volume (vph)	609	0	0	390	68	126
Future Volume (vph)	609	0	0	390	68	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	3.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.97	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.91	
Flt Protected	1.00			1.00	0.98	
Satd. Flow (prot)	1629			1644	1437	
Flt Permitted	1.00			1.00	0.98	
Satd. Flow (perm)	1629			1644	1437	
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.92	0.92
Adj. Flow (vph)	641	0	0	424	74	137
RTOR Reduction (vph)	0	0	0	0	66	0
Lane Group Flow (vph)	641	0	0	424	145	0
Confl. Peds. (#/hr)		76	76		84	1
Confl. Bikes (#/hr)		1				14
Heavy Vehicles (%)	5%	0%	0%	4%	4%	3%
Turn Type	NA			NA	Prot	
Protected Phases	2			6	4	
Permitted Phases						
Actuated Green, G (s)	57.0			57.0	18.0	
Effective Green, g (s)	59.0			59.0	20.0	
Actuated g/C Ratio	0.59			0.59	0.20	
Clearance Time (s)	6.0			6.0	5.0	
Lane Grp Cap (vph)	961			969	287	
v/s Ratio Prot	c0.39			0.26	c0.10	
v/s Ratio Perm						
v/c Ratio	0.67			0.44	0.50	
Uniform Delay, d1	13.9			11.3	35.6	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	3.7			1.4	6.2	
Delay (s)	17.5			12.8	41.8	
Level of Service	B			B	D	
Approach Delay (s)	17.5			12.8	41.8	
Approach LOS	B			B	D	

Intersection Summary

HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

3: 8th St & Kearny St

Future - PM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↗			↖		
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	32	0	16	191	0	0
Future Volume (vph)	32	0	16	191	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	0	17	208	0	0

















Direction, Lane #	EB 1	NB 1
Volume Total (vph)	35	225
Volume Left (vph)	35	17
Volume Right (vph)	0	0
Hadj (s)	0.23	0.05
Departure Headway (s)	4.6	4.0
Degree Utilization, x	0.04	0.25
Capacity (veh/h)	741	876
Control Delay (s)	7.8	8.4
Approach Delay (s)	7.8	8.4
Approach LOS	A	A

Intersection Summary			
Delay		8.3	
Level of Service		A	
Intersection Capacity Utilization	37.3%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

4: Edgewood St/8th St & Hamlin St/Driveway

Future - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	1	0	0	2	1	49	182	1	0	0	0
Future Volume (Veh/h)	33	1	0	0	2	1	49	182	1	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	1	0	0	2	1	53	198	1	0	0	0
Pedestrians		51			2			30			5	
Lane Width (ft)		12.0			12.0			12.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		5			0			3			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	362	358	81	337	358	206	51			201		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	362	358	81	337	358	206	51			201		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	100	100	100	100	96			100		
cM capacity (veh/h)	526	520	910	562	521	833	1480			1380		
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	37	3	252									
Volume Left	36	0	53									
Volume Right	0	1	1									
cSH	526	595	1480									
Volume to Capacity	0.07	0.01	0.04									
Queue Length 95th (ft)	6	0	3									
Control Delay (s)	12.4	11.1	1.8									
Lane LOS	B	B	A									
Approach Delay (s)	12.4	11.1	1.8									
Approach LOS	B	B										
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization			38.7%			ICU Level of Service				A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 5: Edgewood St/7th St

Future - PM Peak Hour





















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↔			↔
Traffic Volume (veh/h)	0	0	162	117	139	128
Future Volume (Veh/h)	0	0	162	117	139	128
Sign Control	Stop		Free		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.77	0.77	0.86	0.66	0.86	0.82
Hourly flow rate (vph)	0	0	188	177	162	156
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		None	
Median storage (veh)						
Upstream signal (ft)						174
pX, platoon unblocked	0.99					
vC, conflicting volume	756	276			365	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	750	276			365	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			86	
cM capacity (veh/h)	327	767			1188	
Direction, Lane #						
	NB 1	SB 1				
Volume Total	365	318				
Volume Left	0	162				
Volume Right	177	0				
cSH	1700	1188				
Volume to Capacity	0.21	0.14				
Queue Length 95th (ft)	0	12				
Control Delay (s)	0.0	5.0				
Lane LOS			A			
Approach Delay (s)	0.0	5.0				
Approach LOS						
Intersection Summary						
Average Delay			2.3			
Intersection Capacity Utilization			40.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

6: 7th St & Franklin St

Future - PM Peak Hour

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	60	567	14	112	579	66	7	36	119	55	141	98	
Future Volume (vph)	60	567	14	112	579	66	7	36	119	55	141	98	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		3.0		3.0	3.0			4.0		6.0	4.0		
Lane Util. Factor		1.00		1.00	1.00			1.00		1.00	1.00		
Frbp, ped/bikes		1.00		1.00	0.99			0.90		1.00	0.99		
Flpb, ped/bikes		1.00		1.00	1.00			1.00		0.90	1.00		
Frt		1.00		1.00	0.98			0.90		1.00	0.94		
Flt Protected		1.00		0.95	1.00			1.00		0.95	1.00		
Satd. Flow (prot)		1634		1593	1641			1328		1439	1489		
Flt Permitted		0.89		0.34	1.00			0.98		0.47	1.00		
Satd. Flow (perm)		1465		563	1641			1306		718	1489		
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.93	0.93	0.93	0.92	0.92	0.92	
Adj. Flow (vph)	65	616	15	118	609	69	8	39	128	60	153	107	
RTOR Reduction (vph)	0	1	0	0	4	0	0	98	0	0	25	0	
Lane Group Flow (vph)	0	695	0	118	674	0	0	77	0	60	235	0	
Confl. Peds. (#/hr)	12		8	8		12	6		54	54		6	
Confl. Bikes (#/hr)			1			2			1				
Heavy Vehicles (%)	8%	3%	10%	2%	2%	2%	2%	10%	2%	2%	10%	2%	
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA		
Protected Phases		6		5	2			8				4	
Permitted Phases	6			2			8			4			
Actuated Green, G (s)		59.0		69.0	69.0			20.0		20.0	20.0		
Effective Green, g (s)		61.0		71.0	71.0			22.0		20.0	22.0		
Actuated g/C Ratio		0.61		0.71	0.71			0.22		0.20	0.22		
Clearance Time (s)		5.0		5.0	5.0			6.0		6.0	6.0		
Lane Grp Cap (vph)		893		471	1165			287		143	327		
v/s Ratio Prot				0.02	c0.41							c0.16	
v/s Ratio Perm		c0.47		0.16				0.06		0.08			
v/c Ratio		0.78		0.25	0.58			0.27		0.42	0.72		
Uniform Delay, d1		14.5		6.3	7.1			32.3		34.9	36.1		
Progression Factor		1.00		1.00	1.00			1.00		1.00	1.00		
Incremental Delay, d2		6.6		1.3	2.1			2.3		8.8	12.8		
Delay (s)		21.1		7.6	9.2			34.6		43.7	48.9		
Level of Service		C		A	A			C		D	D		
Approach Delay (s)		21.1			9.0			34.6			47.9		
Approach LOS		C			A			C			D		
Intersection Summary													
HCM 2000 Control Delay			21.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.75										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	10.0
Intersection Capacity Utilization			117.0%									ICU Level of Service	H
Analysis Period (min)			15										
c Critical Lane Group													

Queuing and Blocking Report
Existing - AM Peak

05/27/2020

Intersection: 1: 7th St & Monroe St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	366	293	344	177
Average Queue (ft)	219	264	294	106
95th Queue (ft)	381	345	363	162
Link Distance (ft)	336	273	290	191
Upstream Blk Time (%)	11	35	57	0
Queuing Penalty (veh)	49	191	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: 8th St & Monroe St

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LR
Maximum Queue (ft)	271	125	449	645
Average Queue (ft)	92	88	370	323
95th Queue (ft)	205	164	534	721
Link Distance (ft)	273		403	660
Upstream Blk Time (%)	0		48	15
Queuing Penalty (veh)	1		0	25
Storage Bay Dist (ft)		100		
Storage Blk Time (%)		5	59	
Queuing Penalty (veh)		23	66	

Intersection: 3: 8th St & Kearny St

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	30	329	75
Average Queue (ft)	10	85	41
95th Queue (ft)	32	289	65
Link Distance (ft)	242	1030	660
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
Existing - AM Peak

05/27/2020

Intersection: 4: Edgewood St/8th St & Hamlin St/Driveway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	77	30	120	48
Average Queue (ft)	40	3	45	5
95th Queue (ft)	66	18	95	27
Link Distance (ft)	268	76	601	1030
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Edgewood St/7th St

Movement	WB	B24	B25	B13	NB	SB
Directions Served	LR	T	T	T	TR	LT
Maximum Queue (ft)	196	78	16	5	208	104
Average Queue (ft)	88	11	1	0	46	32
95th Queue (ft)	181	70	14	5	145	83
Link Distance (ft)	124	120	13	601	405	96
Upstream Blk Time (%)	16	3	0			0
Queuing Penalty (veh)	25	4	1			1
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: 7th St & Franklin St

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	L	TR	LTR	LT	R
Maximum Queue (ft)	623	375	682	122	578	75
Average Queue (ft)	543	277	640	94	488	55
95th Queue (ft)	749	508	754	130	674	107
Link Distance (ft)	570		633	96	528	
Upstream Blk Time (%)	71		32	30	63	
Queuing Penalty (veh)	0		0	61	0	
Storage Bay Dist (ft)		350				50
Storage Blk Time (%)		0	28		90	5
Queuing Penalty (veh)		0	58		69	9

Zone Summary

Zone wide Queuing Penalty: 585

Queuing and Blocking Report
Existing - PM Peak Hour

05/27/2020

Intersection: 1: 7th St & Monroe St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	378	295	315	217
Average Queue (ft)	301	226	186	122
95th Queue (ft)	445	350	301	206
Link Distance (ft)	349	277	283	203
Upstream Blk Time (%)	15	15	4	2
Queuing Penalty (veh)	89	58	0	4
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: 8th St & Monroe St

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LR
Maximum Queue (ft)	297	125	409	300
Average Queue (ft)	255	53	197	110
95th Queue (ft)	349	119	392	235
Link Distance (ft)	277		403	660
Upstream Blk Time (%)	10		7	
Queuing Penalty (veh)	63		0	
Storage Bay Dist (ft)		100		
Storage Blk Time (%)		1	31	
Queuing Penalty (veh)		4	17	

Intersection: 3: 8th St & Kearny St

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	39	83	82
Average Queue (ft)	19	46	43
95th Queue (ft)	44	71	72
Link Distance (ft)	242	1030	660
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
Existing - PM Peak Hour

05/27/2020

Intersection: 4: Edgewood St/8th St & Hamlin St/Driveway

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	64	29	49	14
Average Queue (ft)	28	3	7	1
95th Queue (ft)	55	16	30	8
Link Distance (ft)	268	76	600	1030
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: Edgewood St/7th St

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	134	182	74
Average Queue (ft)	61	50	13
95th Queue (ft)	114	147	46
Link Distance (ft)	141	177	95
Upstream Blk Time (%)	1	1	0
Queuing Penalty (veh)	1	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: 7th St & Franklin St

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	L	TR	LTR	LT	R
Maximum Queue (ft)	594	126	299	120	411	75
Average Queue (ft)	338	46	152	90	160	51
95th Queue (ft)	597	91	259	128	364	99
Link Distance (ft)	570		587	95	528	
Upstream Blk Time (%)	8			26	1	
Queuing Penalty (veh)	0			62	0	
Storage Bay Dist (ft)		350				50
Storage Blk Time (%)			0		62	2
Queuing Penalty (veh)			0		45	2

Zone Summary

Zone wide Queuing Penalty: 346

Queuing and Blocking Report

Future - AM Peak

05/28/2020

Intersection: 1: 7th St & Monroe St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	341	306	347	189
Average Queue (ft)	164	291	310	119
95th Queue (ft)	301	314	349	175
Link Distance (ft)	336	286	290	192
Upstream Blk Time (%)	2	20	85	1
Queuing Penalty (veh)	10	140	0	1
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: 8th St & Monroe St

Movement	EB	WB	NB
Directions Served	T	T	LR
Maximum Queue (ft)	257	463	337
Average Queue (ft)	105	427	122
95th Queue (ft)	201	469	262
Link Distance (ft)	286	403	666
Upstream Blk Time (%)	0	86	
Queuing Penalty (veh)	1	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: 8th St & Kearny St

Movement	EB	NB
Directions Served	L	LT
Maximum Queue (ft)	56	78
Average Queue (ft)	22	43
95th Queue (ft)	50	66
Link Distance (ft)	254	1030
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
 Future - AM Peak

05/28/2020

Intersection: 4: Edgewood St/8th St & Hamlin St/Driveway

Movement	EB	WB	NB
Directions Served	LT	TR	LTR
Maximum Queue (ft)	86	30	88
Average Queue (ft)	38	3	31
95th Queue (ft)	67	17	72
Link Distance (ft)	280	76	597
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Edgewood St/7th St

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	76	113
Average Queue (ft)	6	52
95th Queue (ft)	41	108
Link Distance (ft)	405	106
Upstream Blk Time (%)		1
Queuing Penalty (veh)		4
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: 7th St & Franklin St

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	L	TR	LTR	LT	R
Maximum Queue (ft)	621	375	687	118	586	75
Average Queue (ft)	552	273	654	62	549	60
95th Queue (ft)	732	509	691	110	611	104
Link Distance (ft)	570		633	106	528	
Upstream Blk Time (%)	72		36	3	92	
Queuing Penalty (veh)	0		0	3	0	
Storage Bay Dist (ft)		350				50
Storage Blk Time (%)		0	31		84	5
Queuing Penalty (veh)		0	64		98	17

Zone Summary

Zone wide Queuing Penalty: 338

Queuing and Blocking Report
Future - PM Peak Hour

05/28/2020

Intersection: 1: 7th St & Monroe St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	377	306	320	218
Average Queue (ft)	260	281	218	125
95th Queue (ft)	411	342	342	218
Link Distance (ft)	349	288	283	204
Upstream Blk Time (%)	6	33	14	3
Queuing Penalty (veh)	34	149	0	6
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: 8th St & Monroe St

Movement	EB	WB	NB
Directions Served	T	T	LR
Maximum Queue (ft)	307	454	457
Average Queue (ft)	233	323	227
95th Queue (ft)	345	532	494
Link Distance (ft)	288	403	666
Upstream Blk Time (%)	5	41	2
Queuing Penalty (veh)	32	0	4
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: 8th St & Kearny St

Movement	EB	NB
Directions Served	L	LT
Maximum Queue (ft)	67	125
Average Queue (ft)	24	57
95th Queue (ft)	56	129
Link Distance (ft)	254	1030
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
 Future - PM Peak Hour

05/28/2020

Intersection: 4: Edgewood St/8th St & Hamlin St/Driveway

Movement	EB	WB	NB
Directions Served	LT	TR	LTR
Maximum Queue (ft)	55	27	48
Average Queue (ft)	21	3	5
95th Queue (ft)	49	16	27
Link Distance (ft)	280	76	603
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Edgewood St/7th St

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	114	112
Average Queue (ft)	16	43
95th Queue (ft)	77	101
Link Distance (ft)	177	106
Upstream Blk Time (%)	0	1
Queuing Penalty (veh)	0	2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: 7th St & Franklin St

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	L	TR	LTR	LT	R
Maximum Queue (ft)	586	104	326	122	530	75
Average Queue (ft)	306	46	151	80	299	60
95th Queue (ft)	540	83	272	130	570	102
Link Distance (ft)	570		587	106	528	
Upstream Blk Time (%)	4			8	10	
Queuing Penalty (veh)	0			12	0	
Storage Bay Dist (ft)		350				50
Storage Blk Time (%)			0		71	4
Queuing Penalty (veh)			0		70	8

Zone Summary

Zone wide Queuing Penalty: 317

Queuing and Blocking Report

Mitigation- AM Peak

07/06/2020

Intersection: 1: 7th St & Monroe St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	362	309	342	193
Average Queue (ft)	159	294	312	121
95th Queue (ft)	307	304	331	179
Link Distance (ft)	336	286	290	192
Upstream Blk Time (%)	2	19	91	0
Queuing Penalty (veh)	10	134	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: 8th St & Monroe St

Movement	EB	WB	NB
Directions Served	T	T	LR
Maximum Queue (ft)	246	460	332
Average Queue (ft)	109	425	117
95th Queue (ft)	199	459	239
Link Distance (ft)	286	403	666
Upstream Blk Time (%)		84	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: 8th St & Kearny St

Movement	EB	NB
Directions Served	L	LT
Maximum Queue (ft)	52	66
Average Queue (ft)	19	42
95th Queue (ft)	46	63
Link Distance (ft)	254	1030
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Mitigation - AM Peak

07/06/2020

Intersection: 4: Edgewood St/8th St & Hamlin St/Driveway

Movement	EB	WB	NB
Directions Served	LT	TR	LTR
Maximum Queue (ft)	72	30	87
Average Queue (ft)	37	3	34
95th Queue (ft)	60	19	78
Link Distance (ft)	280	76	597
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Edgewood St/7th St

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	136	115
Average Queue (ft)	13	53
95th Queue (ft)	74	109
Link Distance (ft)	405	106
Upstream Blk Time (%)		1
Queuing Penalty (veh)		2
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: 7th St & Franklin St

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	L	TR	LTR	L	TR
Maximum Queue (ft)	610	375	674	119	145	585
Average Queue (ft)	493	268	614	70	118	552
95th Queue (ft)	767	510	757	120	197	574
Link Distance (ft)	577		628	106		528
Upstream Blk Time (%)	43		25	5		93
Queuing Penalty (veh)	0		0	6		0
Storage Bay Dist (ft)		350			120	
Storage Blk Time (%)		0	24		3	90
Queuing Penalty (veh)		0	49		8	91

Queuing and Blocking Report
Mitigation - PM Peak Hour

07/06/2020

Intersection: 1: 7th St & Monroe St

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	375	305	324	224
Average Queue (ft)	268	274	225	121
95th Queue (ft)	418	355	351	208
Link Distance (ft)	349	288	283	204
Upstream Blk Time (%)	7	32	23	2
Queuing Penalty (veh)	42	145	0	4
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: 8th St & Monroe St

Movement	EB	WB	NB
Directions Served	T	T	LR
Maximum Queue (ft)	311	447	440
Average Queue (ft)	232	299	202
95th Queue (ft)	363	524	431
Link Distance (ft)	288	403	666
Upstream Blk Time (%)	6	29	0
Queuing Penalty (veh)	34	0	1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: 8th St & Kearny St

Movement	EB	NB
Directions Served	L	LT
Maximum Queue (ft)	54	89
Average Queue (ft)	22	49
95th Queue (ft)	48	77
Link Distance (ft)	254	1030
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
Mitigation - PM Peak Hour

07/06/2020

Intersection: 4: Edgewood St/8th St & Hamlin St/Driveway

Movement	EB	WB	NB
Directions Served	LT	TR	LTR
Maximum Queue (ft)	65	30	42
Average Queue (ft)	23	3	5
95th Queue (ft)	52	18	26
Link Distance (ft)	280	76	603
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: Edgewood St/7th St

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	110	103
Average Queue (ft)	14	38
95th Queue (ft)	76	88
Link Distance (ft)	177	106
Upstream Blk Time (%)	1	0
Queuing Penalty (veh)	0	1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: 7th St & Franklin St

Movement	EB	WB	WB	NB	SB	SB
Directions Served	LTR	L	TR	LTR	L	TR
Maximum Queue (ft)	604	109	274	120	145	486
Average Queue (ft)	339	42	132	76	77	224
95th Queue (ft)	594	82	229	127	172	445
Link Distance (ft)	577		583	106		528
Upstream Blk Time (%)	6			7		3
Queuing Penalty (veh)	0			11		0
Storage Bay Dist (ft)		350			120	
Storage Blk Time (%)					1	43
Queuing Penalty (veh)					2	23

Zone Summary

Zone wide Queuing Penalty: 261