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ROADWAY NETWORK ANALYSIS

MAIN STREET AND 1ST STREET

ZIONSVILLE, INDIANA

***PREPARED FOR
MAYOR STEHR***



JUNE 2024

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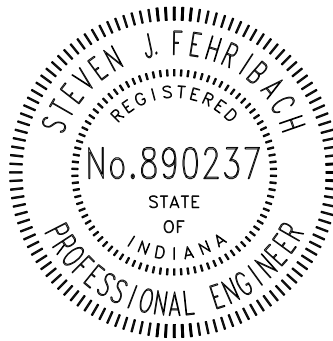
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CERTIFICATION

I certify that this **TRAFFIC IMPACT STUDY** has been prepared by me and under my immediate supervision and that I have experience and training in the field of traffic and transportation engineering.

A&F ENGINEERING Co., LLC



June 4, 2024
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INTRODUCTION

This **ROADWAY NETWORK ANALYSIS**, prepared on behalf of the Town of Zionsville, is to address the proposed changes to the roadway network that includes Main Street, 1st Street, Sycamore Street, Hawthorne Street, Pine Street, and Oak Street in Zionsville, Indiana.

PURPOSE

The purpose of this analysis is to determine what impact the proposed geometric and intersection changes to the downtown Zionsville roadway network will have on traffic operations. This analysis will consider different proposed scenarios. Based on the results of this analysis, recommendations will be formulated to adequately serve vehicles traveling to and through the downtown area alike.

SCOPE OF WORK

The scope of work for this analysis is as follows:

First, obtain year 2024 turning movement traffic volume counts during a typical weekday while school was in session at the following intersections:

- Hawthorne Street & Main Street
- Pine Street & Main Street

Second, estimate the year 2024 traffic volumes at the following intersections using previously completed traffic counts from the Town of Zionsville Road Impact Fee and utilizing a non-compounded growth rate of 1.5% per year.

- Sycamore Street & 1st Street
- Sycamore Street & Main Street
- Oak Street & 1st Street

Third, balance the traffic volumes that enter and exit each intersection with the adjacent intersection traffic volumes.

Fourth, redistribute the 2024 traffic volumes to account for the following changes in the roadway network:

- The realignment of Main Street south of Sycamore Street to the intersection of Sycamore Street & 1st Street.
- Reconstruction of the intersection of Sycamore Street & 1st Street as a single-lane roundabout with an additional westbound right-turn lane and a southbound left-turn lane.

- Removal of automobile traffic on Oak Street between Main Street and 1st Street with the creation of a pedestrian plaza. This pedestrian plaza would remove the eastbound through and northbound right-turn movements at the intersection of Oak Street & 1st Street.
- Restriction of the traffic along 1st Street between Oak Street and Cedar Street to create a one-way northbound traffic pattern. This change would remove all southbound traffic from the intersection of Oak Street & 1st Street.
- Reconstruction of the intersection of Oak Street & 1st Street for each of the following scenarios:
 - o All-Way Stop Condition
 - o Signalized Intersection
 - o Creation of a free-flow intersection with the removal of the eastbound left-turn movement with the construction of a raised curb.

Fifth, prepare a capacity analysis, level of service analysis, and turn lane analysis at the study intersections for each of the following scenarios:

Scenario 1: 2024 Traffic Volumes with Existing Roadway Network Conditions – Based on the balanced 2024 traffic volumes.

Scenario 2: 2024 Traffic Volumes with Proposed Roadway Network Conditions – Based on the redistributed 2024 traffic volumes.

Sixth, prepare conclusions and recommendations for the roadway network that will be needed to accommodate the proposed changes in the intersection geometrics and intersection control types within the study area. These conclusions and recommendations begin on page 12 of this report.

Finally, prepare a **ROADWAY NETWORK ANALYSIS** report documenting all data, analyses, conclusions, and recommendations to provide for the safe and efficient movement of traffic through the study area.

STUDY AREA

The study area for this analysis has been defined to include the following intersections:

- Sycamore Street & 1st Street
- Sycamore Street & Main Street
- Hawthorne Street & Main Street
- Pine Street & Main Street
- Oak Street & 1st Street

Figure 1 is a map of the study area.



FIGURE 1
AREA MAP

**ROADWAY NETWORK
 ANALYSIS
 TOWN OF ZIONSVILLE**

YEAR 2024 TRAFFIC VOLUMES & PEAK HOURS

Turning movement traffic volume counts were collected by A&F Engineering at the intersections of Hawthorne Street & Main Street and Pine Street & Main Street between the hours of 6:00 AM to 9:00 AM and 4:00 PM to 7:00 PM during a typical weekday in April 2024 under good weather conditions while school was in session. Additionally, turning movement traffic volume counts at the remaining study intersections were taken from the Town of Zionsville Road Impact Fee Update. Because these traffic volume counts were conducted before 2024, they were grown to 2024 levels. For this analysis, a non-compounded growth rate of 1.5% per year was assumed. According to the turning traffic volume movement counts, the AM and PM peak hours vary slightly at each study intersection. Hence, the actual peak hours are used at each study intersection to create a “worse-case” traffic volume scenario. The intersection count output summary sheets are included in the **Appendix** and the peak hour volumes are shown on **Figure 2**.

BALANCED YEAR 2024 TRAFFIC VOLUMES

Because the intersection traffic volume counts were conducted within different years and the intersections have different peak hours, the traffic volumes were balanced to ease the traffic redistribution process. In order to create a “worse-case” traffic volume scenario, the higher of the intersection volumes were used to balance the lower the intersection volumes. This means, for example, that the volumes exiting an intersection in the northbound direction will equal the total number of vehicles on the northbound approach of the intersection directly to the north of the first intersection. The Balanced 2024 Traffic Volumes are shown on **Figure 3**.

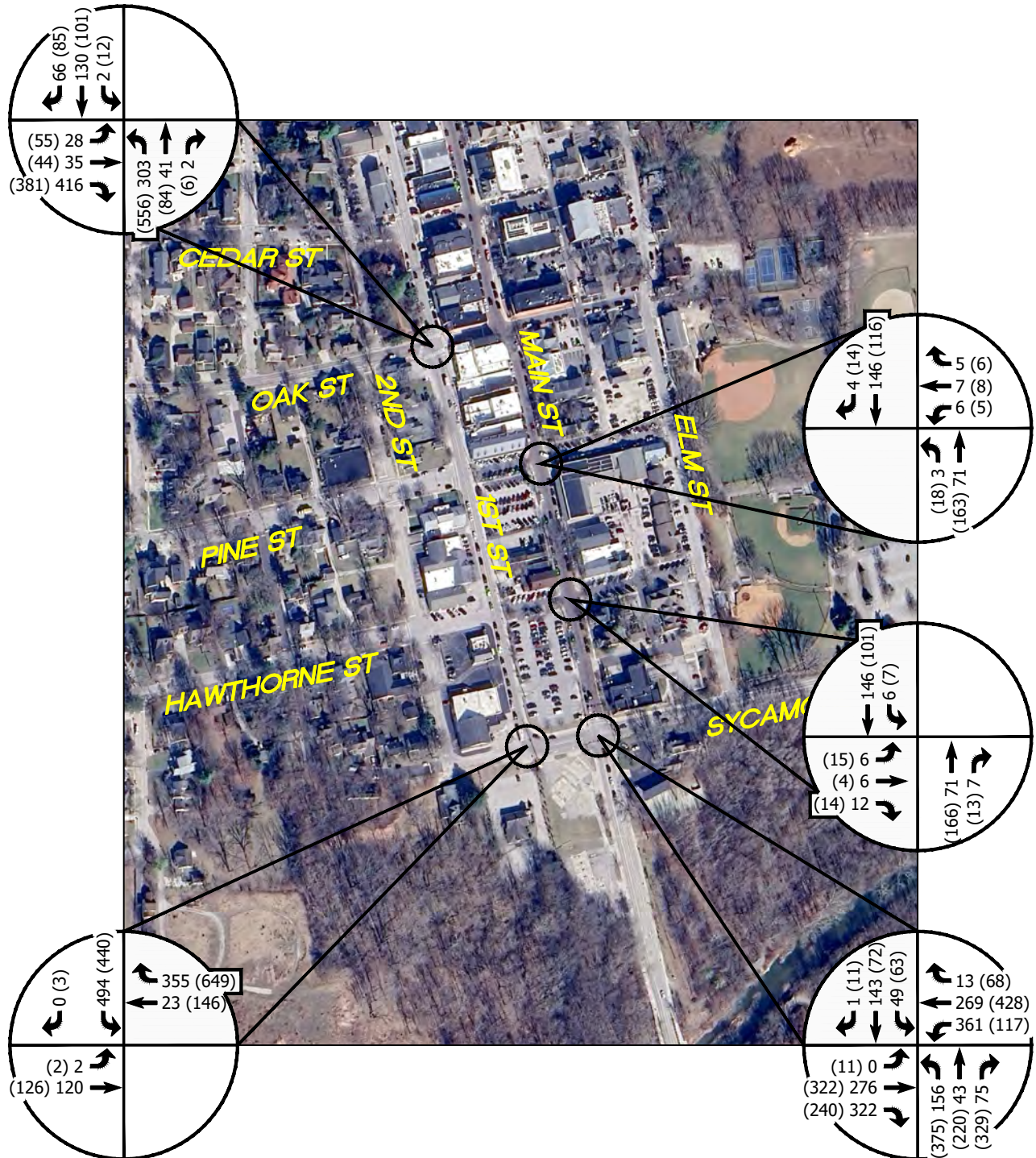
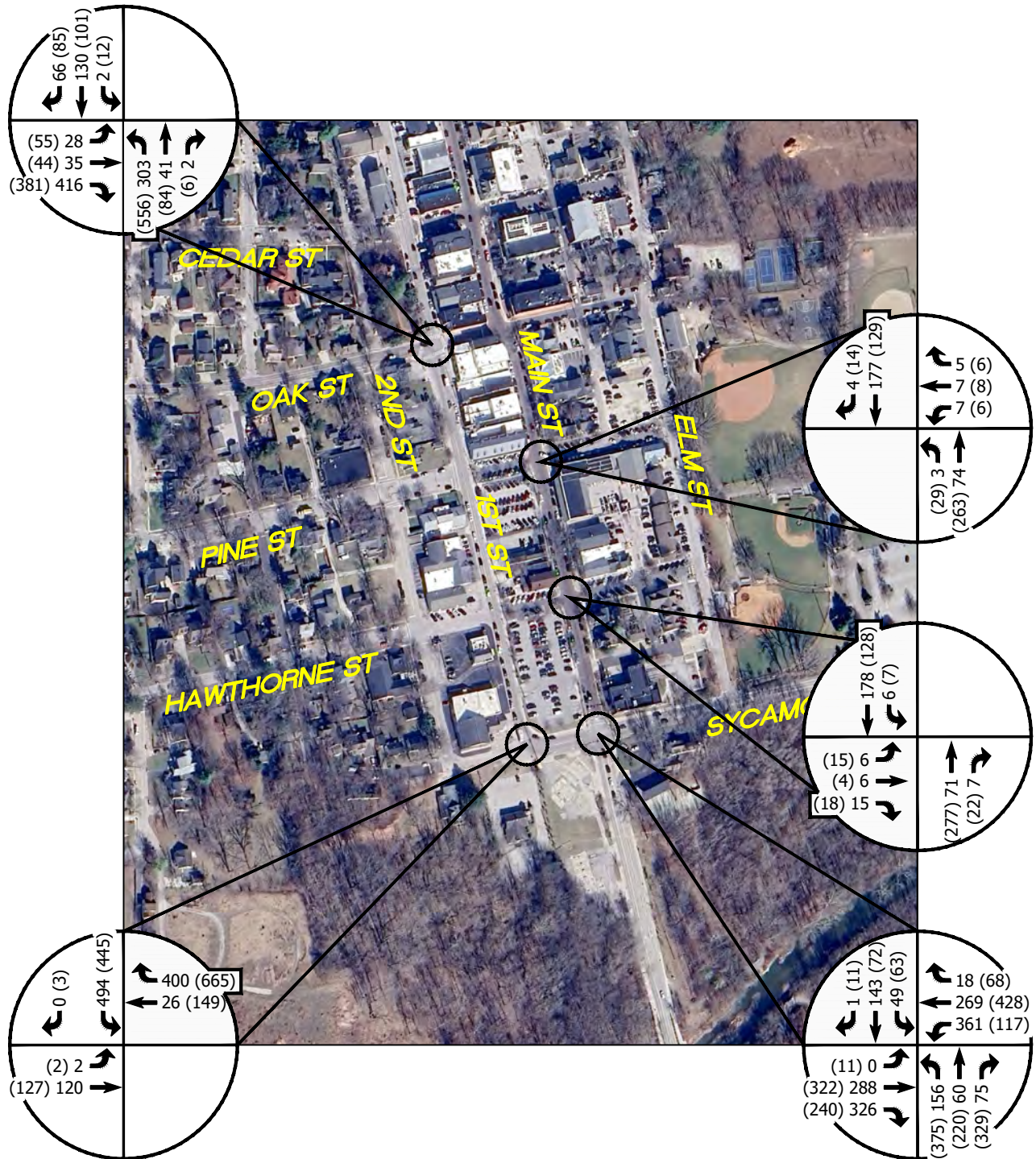


FIGURE 2

2024 TRAFFIC VOLUMES



LEGEND
XX = A.M. PEAK HOUR
(XX) = P.M. PEAK HOUR
* = NEGLIGIBLE

FIGURE 3

2024 BALANCED TRAFFIC VOLUMES

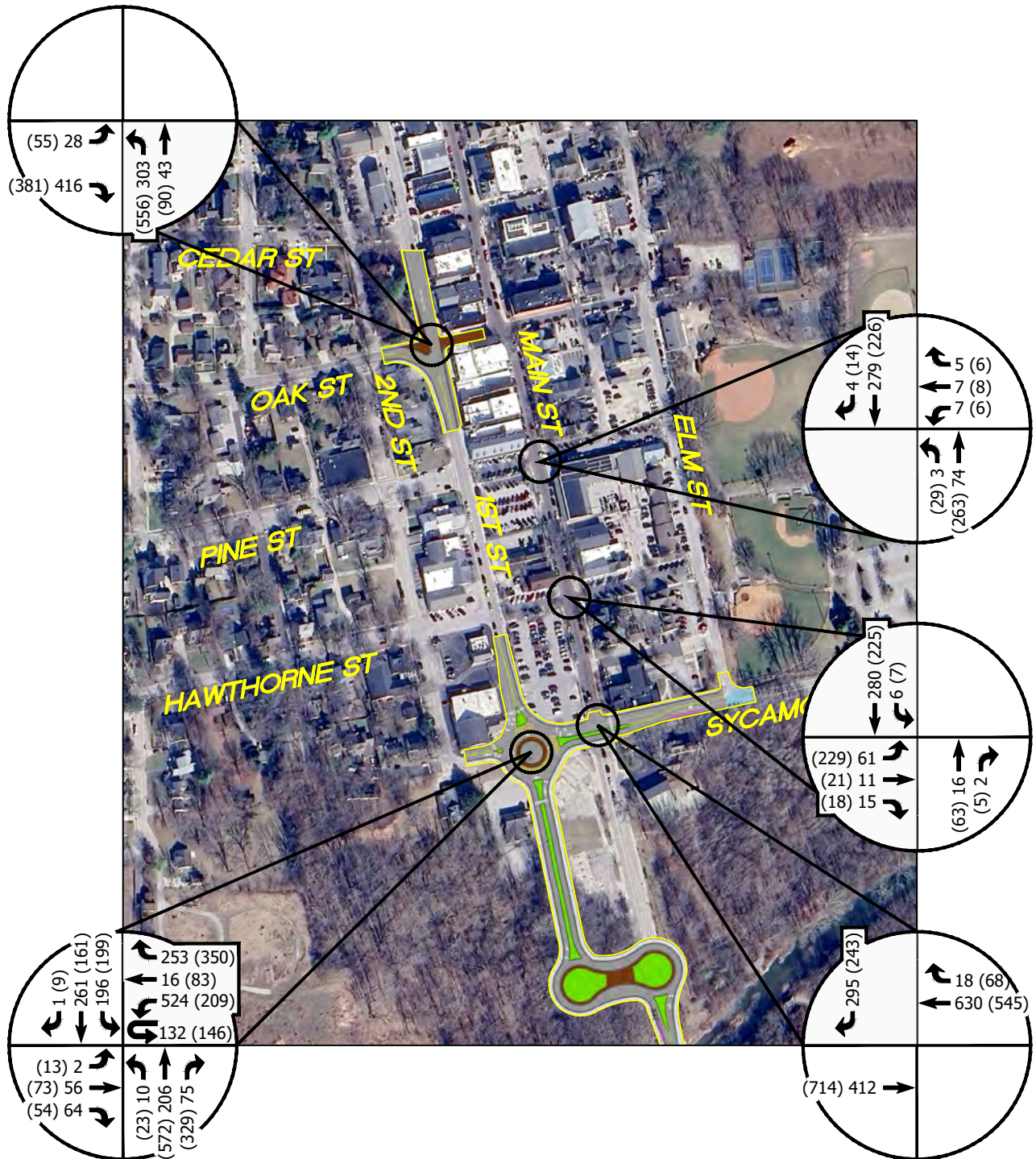
**ROADWAY NETWORK
ANALYSIS
TOWN OF ZIONSVILLE**

YEAR 2024 REDISTRIBUTED TRAFFIC VOLUMES

The following changes are proposed to the roadway network intersection geometrics and control types:

- The realignment of Main Street south of Sycamore Street to the intersection of Sycamore Street & 1st Street.
- Reconstruction of the intersection of Sycamore Street & 1st Street as a single-lane roundabout with an additional westbound right-turn lane and a southbound left-turn lane.
- Removal of automobile traffic on Oak Street between Main Street and 1st Street with the creation of a pedestrian plaza. This pedestrian plaza would remove the eastbound through and northbound right-turn movements at the intersection of Oak Street & 1st Street.
- Restriction of the traffic along 1st Street between Oak Street and Cedar Street to create a one-way northbound traffic pattern. This change would remove all southbound traffic from the intersection of Oak Street & 1st Street.
- Reconstruction of the intersection of Oak Street & 1st Street for each of the following scenarios:
 - All-Way Stop Condition
 - Signalized Intersection
 - Creation of a free-flow intersection with the removal of the eastbound left-turn movement with the construction of a raised curb.

The redistributed 2024 traffic volumes are included in **Figure 4A** and **Figure 4B**. **Figure 4A** includes the eastbound left-turn at the intersection of Oak Street & 1st Street. The capacity analysis considering the all-way stop and signalized conditions considered these traffic volumes. **Figure 4B** considers the reconstruction of the intersection of Oak Street & 1st Street to create a free-flow intersection by removing the eastbound left-turn movement. Capacity analysis was not considered for this scenario as all conflicting movements would be removed from the intersection under this scenario.

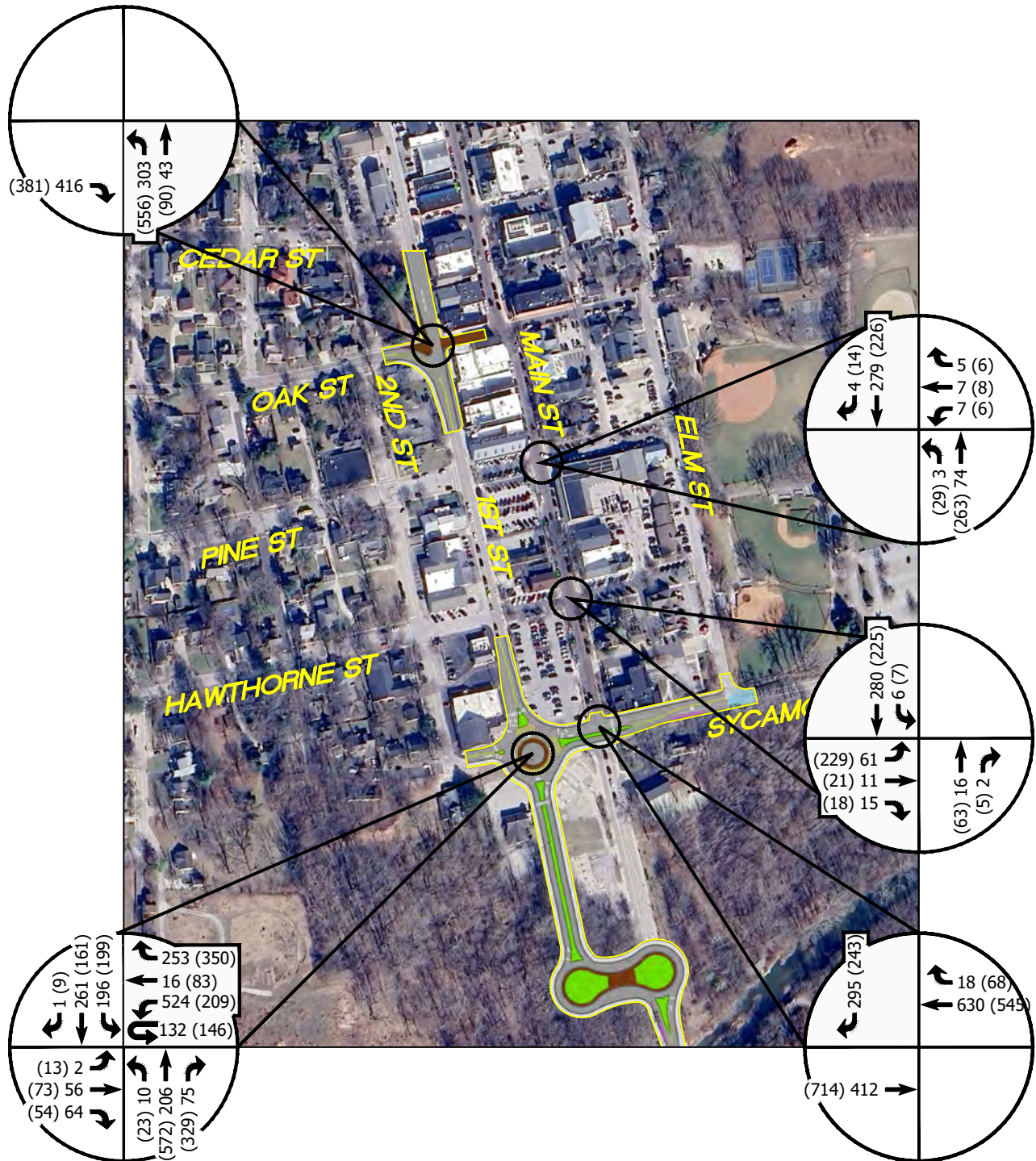


LEGEND
XX = A.M. PEAK HOUR
(XX) = P.M. PEAK HOUR
* = NEGLIGIBLE

**ROADWAY NETWORK
ANALYSIS
TOWN OF ZIONSVILLE**

FIGURE 4A

**2024 REDISTRIBUTED VOLUMES
WITHOUT FREE FLOW INTERSECTION**



LEGEND
XX = A.M. PEAK HOUR
(XX) = P.M. PEAK HOUR
* = NEGLIGIBLE

**ROADWAY NETWORK
ANALYSIS
TOWN OF ZIONSVILLE**

FIGURE 4B

**2024 REDISTRIBUTED VOLUMES
WITH FREE FLOW INTERSECTION**

CAPACITY ANALYSIS

The "efficiency" of an intersection is based on its ability to accommodate the traffic volumes that approach the intersection. It is defined by the Level-of-Service (LOS) of the intersection. The LOS is determined by a series of calculations commonly called a "capacity analysis". Input data into a capacity analysis include traffic volumes, intersection geometry, and number and use of lanes. To determine the LOS at each of the study intersections, a capacity analysis has been made using the recognized computer program *Synchro/SimTraffic*¹. This program allows intersections to be analyzed and optimized using the capacity calculation methods outlined within the *Highway Capacity Manual (HCM 7th Edition)*². Roundabout capacity analyses were conducted using the recognized computer program *SIDRA*³ and the INDOT recommended *SIDRA* parameters. The following list shows the delays related to the levels of service for unsignalized intersections:

<u>Level of Service</u>	<u>Control Delay (seconds/vehicle)</u>	
	<u>UNSIGNALIZED</u>	<u>SIGNALIZED/ROUNDABOUT</u>
A	Less than or equal to 10	Less than or equal to 10
B	Between 10.1 and 15	Between 10.1 and 20
C	Between 15.1 and 25	Between 20.1 and 35
D	Between 25.1 and 35	Between 35.1 and 55
E	Between 35.1 and 50	Between 55.1 and 80
F	greater than 50	greater than 80

CAPACITY ANALYSIS SCENARIOS

To evaluate the effect that the proposed changes to the roadway network will have, a series of traffic volume scenarios were analyzed to determine the adequacy of the existing and proposed roadway networks. An analysis has been made for the peak hours at each of the study intersections for the following traffic volume scenarios:

Scenario 1: Year 2024 Traffic Volumes with Existing Conditions – Based on the year 2024 balanced peak hour traffic volumes and existing roadway network conditions. **Figure 3** is a summary of these traffic volumes.

Scenario 2: Year 2024 Traffic Volumes with Proposed Conditions – Based on the year 2024 redistributed peak hour traffic volumes and existing roadway network conditions. **Figure 4A** is a summary of these traffic volumes.

¹ *Synchro/SimTraffic 12*, Cubic Transportation Systems, 2023.

² *Highway Capacity Manual (HCM), 7th Edition* Transportation Research Board, The National Academies of Sciences, Washington, DC, 2022.

³ *SIDRA INTERSECTION 9.1*, Akcelik and Associates Pty Ltd, 2023

The following tables summarize the level of service results at each study intersection. The Synchro (HCM 7th Edition) intersection reports illustrating the capacity analysis results are included in the **Appendix**.

TABLE 4 – LEVEL OF SERVICE SUMMARY: SYCAMORE ST & 1ST STREET

Approach	AM Peak		PM Peak	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Northbound Approach	---	A	---	C
Southbound Approach	F	A	F	A
Eastbound Approach	A	B	A	A
Westbound Approach	---	A	---	A
Intersection	---	A	---	B

Scenario 1 considers existing intersection conditions with balanced 2024 traffic volumes shown on **Figure 3**.

Scenario 2 considers construction of the northbound approach and reconstruction of the intersection as a single-lane roundabout with an additional southbound left-turn lane and westbound right-turn lane, roundabout analysis using SIDRA and INDOT recommended SIDRA parameters, and year 2024 redistributed traffic volumes shown on **Figure 4A**.

TABLE 5 – LEVEL OF SERVICE SUMMARY: SYCAMORE STREET & MAIN STREET

Approach	AM Peak		PM Peak	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Northbound Approach	C	---	C	---
Southbound Approach	C	D	C	C
Eastbound Approach	C	---	C	---
Westbound Approach	B	---	C	---
Intersection	B	---	C	---

Scenario 1 considers existing intersection conditions with balanced 2024 traffic volumes shown on **Figure 3**.

Scenario 2 considers removal of the northbound approach, restriction of the southbound approach as right-in/right-out access, and year 2024 redistributed traffic volumes shown on **Figure 4A**.

TABLE 6 – LEVEL OF SERVICE SUMMARY: HAWTHORNE STREET & MAIN STREET

Approach	AM Peak		PM Peak	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Southbound Left-Turn	A	A	A	A
Eastbound Approach	A	B	B	C

Scenario 1 considers existing intersection conditions with year 2024 balanced traffic volumes shown on **Figure 3**.

Scenario 2 considers existing intersection conditions with year 2024 redistributed traffic volumes shown on **Figure 4A**.

TABLE 7 – LEVEL OF SERVICE SUMMARY: PINE STREET & MAIN STREET

Approach	AM Peak		PM Peak	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Northbound Left-Turn	A	A	A	A
Westbound Approach	A	B	B	B

Scenario 1 considers existing intersection conditions with year 2024 balanced traffic volumes shown on **Figure 3**.

Scenario 2 considers existing intersection conditions with year 2024 redistributed traffic volumes shown on **Figure 4A**.

TABLE 8 – LEVEL OF SERVICE SUMMARY: OAK STREET & 1ST STREET

Approach	AM Peak			PM Peak		
	Scenario			Scenario		
	1	2A	2B	1	2A	2B
Northbound Approach	C	C	B	F	F	B
Southbound Approach	B	---	---	B	---	---
Eastbound Approach	C	B	B	D	C	C
Intersection	C	B	B	F	E	B

Scenario 1 considers existing intersection conditions with year 2024 balanced traffic volumes shown on **Figure 3**.

Scenario 2 considers the east leg of the intersection being converted to a pedestrian plaza, the north leg being converted to one-way northbound operation, and year 2024 redistributed traffic volumes on **Figure 4A**.

Scenario A considers the existing all-way stop control.

Scenario B considers installation of a traffic signal at the intersection.

It should be noted that no capacity analysis results are shown for the free-flow intersection scenario. These traffic volumes are shown on **Figure 4B**. Under this scenario, there would be no conflicting movements. Therefore, an intersection capacity analysis cannot be completed.

CONCLUSIONS & RECOMMENDATIONS

The conclusions that follow are based on the data and analyses presented in this study and a field review conducted at the site. Based on the analysis and the resulting conclusions of this study, recommendations are formulated to ensure that the roadway system will accommodate future traffic volumes.

MAIN STREET

Based on the 2024 traffic volume counts, it is estimated that there are currently 272 and 445 vehicles on Main Street during the AM and PM peak hours, respectively. Once the proposed changes to the roadway network are completed, and traffic volumes redistribute, it is estimated that there will be 102 and 90 additional vehicles on Main Street during the AM and PM peak hours, respectively.

HAWTHORNE STREET AND PINE STREET

Through the analysis, it was determined that Hawthorne Street and Pine Street currently operate at acceptable levels of service. It was also determined that if the streets remain one-way streets, the network will continue to operate well. However, should it be chosen by the community that the streets should be converted to two-way operations, the network will continue to operate adequately.

SYCAMORE STREET & MAIN STREET

Capacity analyses have shown that the southbound approach of the intersection currently operates below acceptable levels of service during the AM and PM peak hours. Currently, a high number of vehicles are traveling northbound along Main Street, making a left turn onto Sycamore Street, and then making a right turn onto 1st Street. Southbound vehicles are traveling the same route in the opposite direction, causing high delays on the southbound approach of the intersection. It is proposed that Main Street to the south of Sycamore Street be realigned with 1st Street to simplify the path of northbound and southbound traffic through the study area. This realignment would coincide with the construction of a single lane roundabout with an additional southbound left-turn lane and westbound right-turn lane at the intersection. Capacity analyses have shown that when considering these proposed intersection changes and the year 2024 redistributed traffic volumes, the intersection will operate at acceptable levels of service.

SYCAMORE STREET & MAIN STREET

Capacity analyses have shown that the intersection currently operates at acceptable levels of service during the AM and PM peak hours. With the proposed realignment of Main Street to the south of Sycamore Street, this intersection will become a T-intersection with access to Main Street being restricted to right-in/right-out only, and the existing traffic signal control will be removed. Further capacity analyses have shown that all approaches to this intersection will operate at acceptable levels of service with these proposed intersection conditions/geometrics and when considering the additional changes to the roadway network.

HAWTHORNE STREET & MAIN STREET

Capacity analyses have shown that all approaches to the intersection currently operate and will continue to operate at acceptable levels of service during the AM and PM peak hours for all traffic scenarios. Therefore, no improvements are recommended at this location. However, Hawthorne Street could become a two-way road as this will not significantly impact the operation of the intersection.

PINE STREET & MAIN STREET

Capacity analyses have shown that all approaches to the intersection currently operate and will continue to operate at acceptable levels of service during the AM and PM peak hours for all traffic scenarios. Therefore, no improvements are recommended at this location. However, Pine Street could become a two-way road as this will not significantly impact the operation of the intersection.

OAK STREET & 1ST STREET

Capacity analyses have shown that the intersection currently operates at acceptable levels of service during the AM peak hour but below acceptable levels of service during the PM peak hour. It is proposed that the intersection be simplified by removing conflicting movements from the intersection. As proposed, 1st Street between Oak Street and Cedar Street will be converted to one-way northbound operations. This will remove the southbound movements at the intersection. Additionally, the block of Oak Street between 1st Street and Main Street will be converted to a pedestrian plaza. This will remove the eastbound through and northbound right-turn movements. As an all-way stop controlled intersection, when considering the proposed roadway network changes, the intersection will operate below acceptable levels of service during the PM peak hour. However, capacity analyses have shown that with the installation of a traffic signal, the intersection will operate at acceptable levels of service during the AM and PM peak hours.

Furthermore, the intersection could be reconstructed as free-flow with the removal of the eastbound left-turn movement. With the removal of the eastbound left-turn movement, none of the remaining movements (eastbound right-turn, northbound left-turn, and northbound through) would conflict with each other, and the intersection would operate as free-flow with little delay.

TRAFFIC IMPACT STUDY

APPENDIX



***8365 Keystone Crossing Boulevard, Suite 201
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SYCAMORE STREET & 1ST STREET

TRAFFIC VOLUME COUNTS CAPACITY ANALYSIS

SYCAMORE ST & FIRST ST - TMC

Tue Mar 26, 2019

Full Length (6:30 AM-8:30 AM, 3 PM-7 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636974, Location: 39.948141, -86.261567, Site Code: 2-87



Provided by: A&F Engineering
8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2019-03-26 6:30AM	0	0	0	0	0	51	0	0	0	51	0	5	0	0	5	0	0	29	0	29	85
6:45AM	0	0	0	0	0	78	0	0	0	78	0	11	0	0	11	0	0	28	0	28	117
Hourly Total	0	0	0	0	0	129	0	0	0	129	0	16	0	0	16	0	0	57	0	57	202
7:00AM	0	0	0	0	0	74	0	0	0	74	0	16	0	0	16	0	2	58	0	60	150
7:15AM	0	0	0	0	0	113	0	0	0	113	0	19	0	0	19	0	5	56	0	61	193
7:30AM	0	0	0	0	0	116	0	0	0	116	0	24	0	0	24	0	1	66	0	67	207
7:45AM	0	0	0	0	0	123	0	0	0	123	0	29	0	0	29	0	6	81	0	87	239
Hourly Total	0	0	0	0	0	426	0	0	0	426	0	88	0	0	88	0	14	261	0	275	789
8:00AM	0	0	0	0	0	132	0	0	0	132	1	36	0	0	37	0	10	97	0	107	276
8:15AM	0	0	0	0	0	123	0	0	0	123	1	23	0	0	24	0	4	86	0	90	237
8:30AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	255	0	0	0	255	2	59	0	0	61	0	14	183	0	197	513
3:00PM	0	0	0	0	0	96	0	0	0	96	0	5	0	0	5	0	15	131	0	146	247
3:15PM	0	0	0	0	0	104	1	2	0	107	1	11	0	0	12	0	8	130	0	138	257
3:30PM	0	0	0	0	0	99	0	1	0	100	0	14	0	0	14	0	7	131	0	138	252
3:45PM	0	0	0	0	0	112	0	1	0	113	0	14	0	0	14	0	11	123	0	134	261
Hourly Total	0	0	0	0	0	411	1	4	0	416	1	44	0	0	45	0	41	515	0	556	1017
4:00PM	0	0	0	0	0	132	0	0	0	132	2	18	0	0	20	0	8	130	0	138	290
4:15PM	0	0	1	0	1	133	0	2	0	135	0	23	0	0	23	0	10	149	0	159	318
4:30PM	1	0	0	0	1	113	0	2	0	115	1	27	0	0	28	0	17	144	0	161	305
4:45PM	0	0	0	0	0	98	0	0	0	98	0	17	0	0	17	0	37	145	0	182	297
Hourly Total	1	0	1	0	2	476	0	4	0	480	3	85	0	0	88	0	72	568	0	640	1210
5:00PM	0	0	0	0	0	101	0	1	0	102	0	35	0	0	35	0	33	141	0	174	311
5:15PM	0	0	0	0	0	103	0	1	0	104	2	28	0	0	30	0	24	177	0	201	335
5:30PM	0	0	0	0	0	107	0	1	0	108	0	37	0	0	37	0	42	141	0	183	328
5:45PM	0	0	1	0	1	77	0	1	0	78	0	20	0	0	20	0	40	134	0	174	273
Hourly Total	0	0	1	0	1	388	0	4	0	392	2	120	0	0	122	0	139	593	0	732	1247
6:00PM	0	0	0	0	0	19	0	2	0	21	0	65	0	0	65	0	17	135	0	152	238
6:15PM	0	0	0	0	0	72	0	0	0	72	0	23	0	0	23	0	20	145	0	165	260
6:30PM	0	0	0	0	0	105	0	0	0	105	0	16	0	0	16	0	11	115	0	126	247
6:45PM	0	0	0	0	0	117	0	3	0	120	2	19	0	0	21	0	10	120	0	130	271
Hourly Total	0	0	0	0	0	313	0	5	0	318	2	123	0	0	125	0	58	515	0	573	1016
7:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	2	0	3	2398	1	17	0	2416	10	535	0	0	545	0	338	2692	0	3030	5994
% Approach	33.3%	0%	66.7%	0%	-	99.3%	0%	0.7%	0%	-	1.8%	98.2%	0%	0%	-	0%	11.2%	88.8%	0%	-	-
% Total	0%	0%	0%	0%	0.1%	40.0%	0%	0.3%	0%	40.3%	0.2%	8.9%	0%	0%	9.1%	0%	5.6%	44.9%	0%	50.6%	-
Lights and Motorcycles	1	0	2	0	3	2339	1	17	0	2357	10	521	0	0	531	0	334	2637	0	2971	5862
% Lights and Motorcycles	100%	0%	100%	0%	100%	97.5%	100%	100%	0%	97.6%	100%	97.4%	0%	0%	97.4%	0%	98.8%	98.0%	0%	98.1%	97.8%
Heavy	0	0	0	0	0	59	0	0	0	59	0	14	0	0	14	0	4	55	0	59	132
% Heavy	0%	0%	0%	0%	0%	2.5%	0%	0%	0%	2.4%	0%	2.6%	0%	0%	2.6%	0%	1.2%	2.0%	0%	1.9%	2.2%

*L: Left, R: Right, T: Thru, U: U-Turn

SYCAMORE ST & FIRST ST - TMC

Tue Mar 26, 2019

Full Length (6:30 AM-8:30 AM, 3 PM-7 PM)

All Classes (Lights and Motorcycles, Heavy)

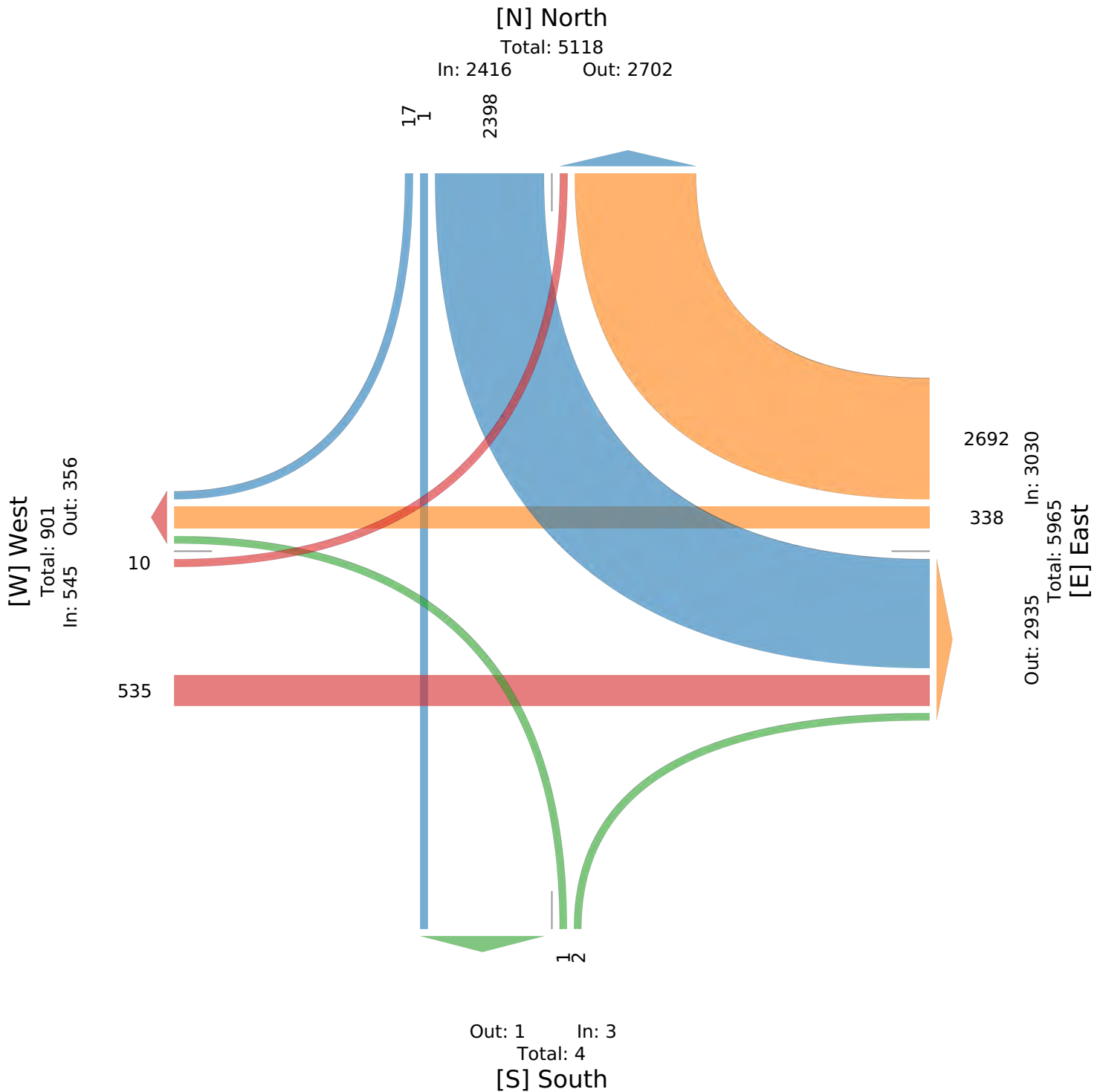
All Movements

ID: 636974, Location: 39.948141, -86.261567, Site Code: 2-87



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SYCAMORE ST & FIRST ST - TMC

Tue Mar 26, 2019

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636974, Location: 39.948141, -86.261567, Site Code: 2-87



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2019-03-26 7:30AM	0	0	0	0	0	116	0	0	0	116	0	24	0	0	24	0	1	66	0	67	207
7:45AM	0	0	0	0	0	123	0	0	0	123	0	29	0	0	29	0	6	81	0	87	239
8:00AM	0	0	0	0	0	132	0	0	0	132	1	36	0	0	37	0	10	97	0	107	276
8:15AM	0	0	0	0	0	123	0	0	0	123	1	23	0	0	24	0	4	86	0	90	237
Total	0	0	0	0	0	494	0	0	0	494	2	112	0	0	114	0	21	330	0	351	959
% Approach	0%	0%	0%	0%	-	100%	0%	0%	0%	-	1.8%	98.2%	0%	0%	-	0%	6.0%	94.0%	0%	-	-
% Total	0%	0%	0%	0%	0%	51.5%	0%	0%	0%	51.5%	0.2%	11.7%	0%	0%	11.9%	0%	2.2%	34.4%	0%	36.6%	-
PHF	-	-	-	-	-	0.936	-	-	-	0.936	0.500	0.778	-	-	0.770	-	0.525	0.851	-	0.820	0.869
Lights and Motorcycles	0	0	0	0	0	474	0	0	0	474	2	111	0	0	113	0	21	316	0	337	924
% Lights and Motorcycles	0%	0%	0%	0%	-	96.0%	0%	0%	0%	96.0%	100%	99.1%	0%	0%	99.1%	0%	100%	95.8%	0%	96.0%	96.4%
Heavy	0	0	0	0	0	20	0	0	0	20	0	1	0	0	1	0	0	14	0	14	35
% Heavy	0%	0%	0%	0%	-	4.0%	0%	0%	0%	4.0%	0%	0.9%	0%	0%	0.9%	0%	0%	4.2%	0%	4.0%	3.6%

* L: Left, R: Right, T: Thru, U: U-Turn

SYCAMORE ST & FIRST ST - TMC

Tue Mar 26, 2019

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636974, Location: 39.948141, -86.261567, Site Code: 2-87



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

[N] North

Total: 826

In: 494

Out: 332

494

[W] West

Total: 135

In: 114 Out: 21

2

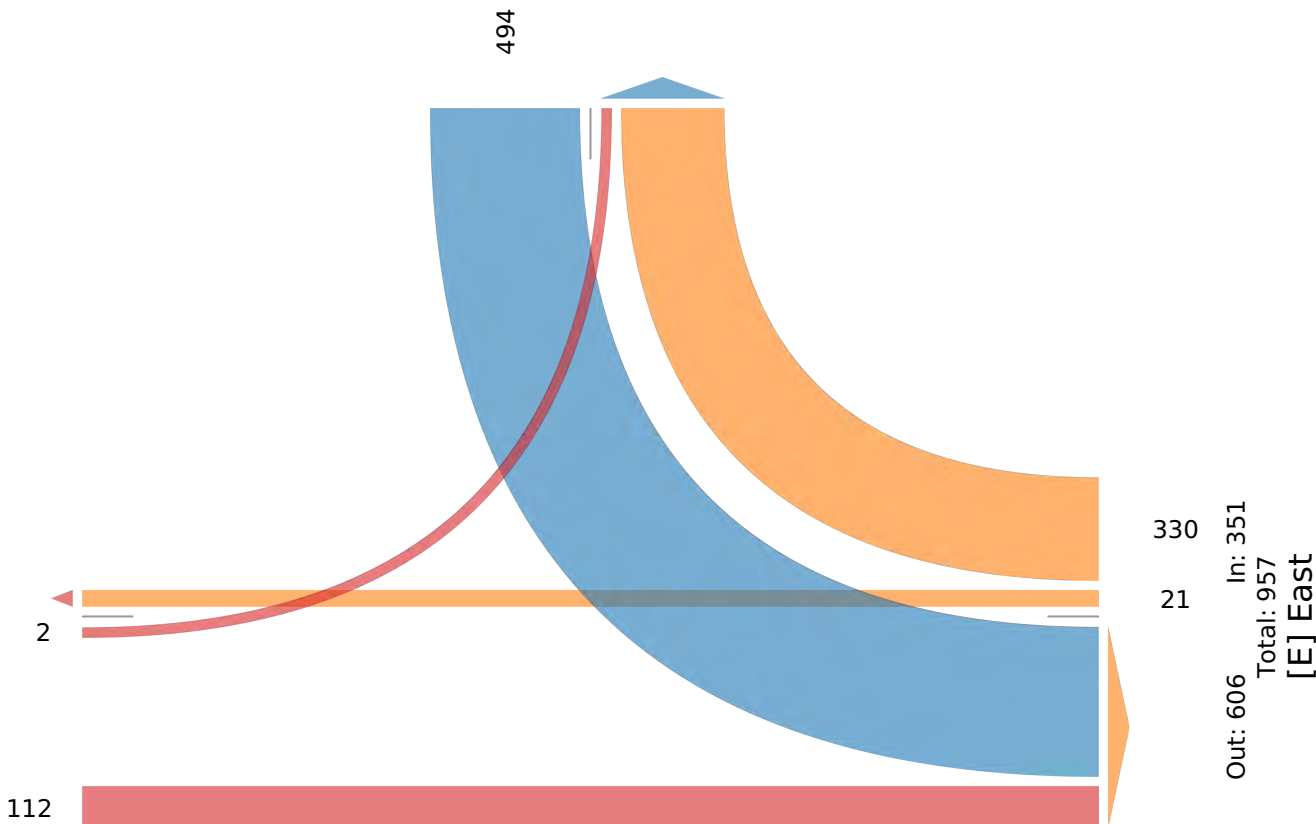
112

330
21

Out: 606 In: 351

Total: 957

[E] East



SYCAMORE ST & FIRST ST - TMC

Tue Mar 26, 2019

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636974, Location: 39.948141, -86.261567, Site Code: 2-87



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2019-03-26 4:45PM	0	0	0	0	0	98	0	0	0	98	0	17	0	0	17	0	37	145	0	182	297
5:00PM	0	0	0	0	0	101	0	1	0	102	0	35	0	0	35	0	33	141	0	174	311
5:15PM	0	0	0	0	0	103	0	1	0	104	2	28	0	0	30	0	24	177	0	201	335
5:30PM	0	0	0	0	0	107	0	1	0	108	0	37	0	0	37	0	42	141	0	183	328
Total	0	0	0	0	0	409	0	3	0	412	2	117	0	0	119	0	136	604	0	740	1271
% Approach	0%	0%	0%	0%	-	99.3%	0%	0.7%	0%	-	1.7%	98.3%	0%	0%	-	0%	18.4%	81.6%	0%	-	-
% Total	0%	0%	0%	0%	0%	32.2%	0%	0.2%	0%	32.4%	0.2%	9.2%	0%	0%	9.4%	0%	10.7%	47.5%	0%	58.2%	-
PHF	-	-	-	-	-	0.956	-	0.750	-	0.954	0.250	0.791	-	-	0.804	-	0.810	0.853	-	0.920	0.949
Lights and Motorcycles	0	0	0	0	0	399	0	3	0	402	2	114	0	0	116	0	135	595	0	730	1248
% Lights and Motorcycles	0%	0%	0%	0%	-	97.6%	0%	100%	0%	97.6%	100%	97.4%	0%	0%	97.5%	0%	99.3%	98.5%	0%	98.6%	98.2%
Heavy	0	0	0	0	0	10	0	0	0	10	0	3	0	0	3	0	1	9	0	10	23
% Heavy	0%	0%	0%	0%	-	2.4%	0%	0%	0%	2.4%	0%	2.6%	0%	0%	2.5%	0%	0.7%	1.5%	0%	1.4%	1.8%

* L: Left, R: Right, T: Thru, U: U-Turn

SYCAMORE ST & FIRST ST - TMC

Tue Mar 26, 2019

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636974, Location: 39.948141, -86.261567, Site Code: 2-87



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

[N] North

Total: 1018

In: 412

Out: 606

3
409

[W] West

Total: 258

In: 119 Out: 139

2

117

604

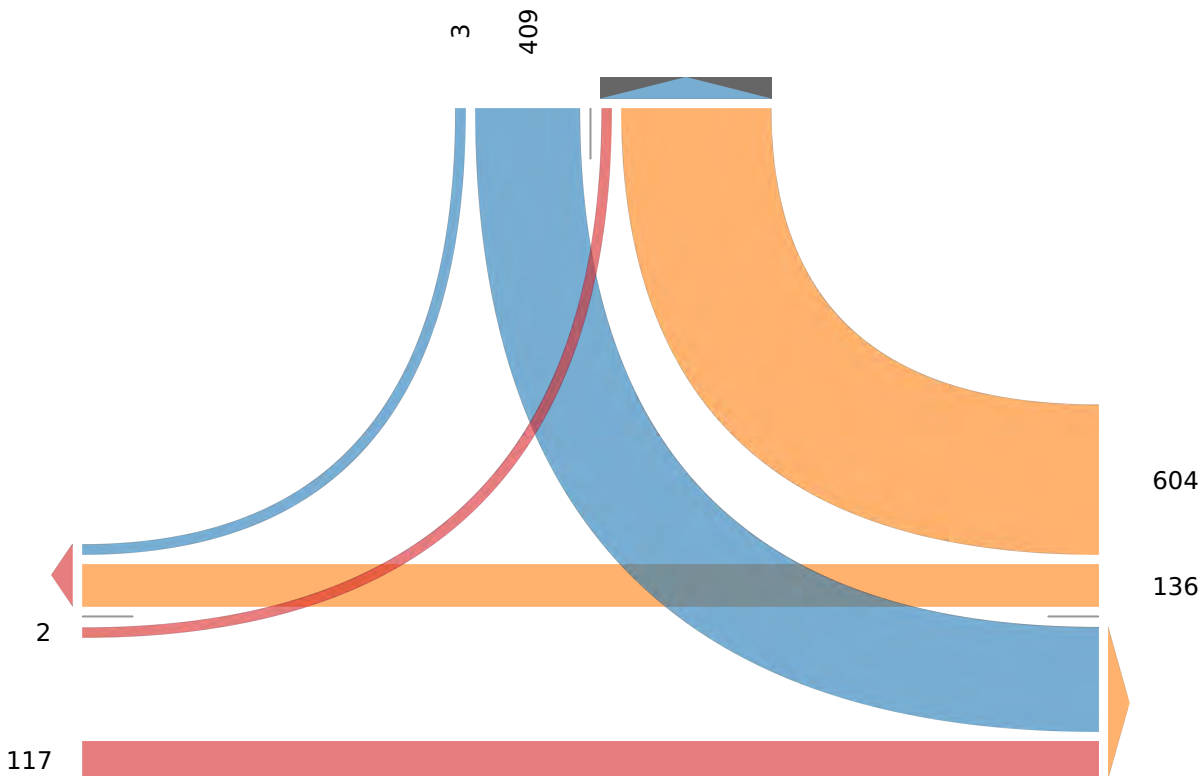
136

In: 740

Total: 1266

[E] East

Out: 526



HCM 7th TWSC
1: Sycamore St & 1st St

2024 AM Peak
Existing Conditions

Intersection						
Int Delay, s/veh	24.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	120	26	400	494	0
Future Vol, veh/h	2	120	26	400	494	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	2	138	30	460	568	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	490	0	-	0	402 260
Stage 1	-	-	-	-	260 -
Stage 2	-	-	-	-	143 -
Critical Hdwy	4.14	-	-	-	6.44 6.24
Critical Hdwy Stg 1	-	-	-	-	5.44 -
Critical Hdwy Stg 2	-	-	-	-	5.44 -
Follow-up Hdwy	2.236	-	-	-	3.536 3.336
Pot Cap-1 Maneuver	1063	-	-	-	600 774
Stage 1	-	-	-	-	779 -
Stage 2	-	-	-	-	880 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1063	-	-	-	599 774
Mov Cap-2 Maneuver	-	-	-	-	599 -
Stage 1	-	-	-	-	777 -
Stage 2	-	-	-	-	880 -

Approach	EB	WB	SB
HCM Control Delay, s/v 0.14		0	51.38
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	30	-	-	-	599
HCM Lane V/C Ratio	0.002	-	-	-	0.948
HCM Control Delay (s/veh)	8.4	0	-	-	51.4
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	12.8

HCM 7th TWSC
1: Sycamore St & 1st St

2024 PM Peak
Existing Conditions

Intersection						
Int Delay, s/veh	31.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	127	149	665	445	3
Future Vol, veh/h	2	127	149	665	445	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	134	157	700	468	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	857	0	0 645 507
Stage 1	-	-	- 507 -
Stage 2	-	-	- 138 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	784	-	- ~ 437 566
Stage 1	-	-	- 605 -
Stage 2	-	-	- 889 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	784	-	- ~ 436 566
Mov Cap-2 Maneuver	-	-	- ~ 436 -
Stage 1	-	-	- 603 -
Stage 2	-	-	- 889 -

Approach	EB	WB	SB
HCM Control Delay, s/v 0.15		0	97.41
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	28	-	-	-	436
HCM Lane V/C Ratio	0.003	-	-	-	1.081
HCM Control Delay (s/veh)	9.6	0	-	-	97.4
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0	-	-	-	15.7

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

MOVEMENT SUMMARY

 **Site: 101 [1st St & Sycamore St (Site Folder: Proposed 2024 AM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

1st St & Sycamore St
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] ft				mph
South: NB 1st St															
3	L2	All MCs	11	4.0	11	4.0	0.363	8.6	LOS A	2.5	64.8	0.71	0.54	0.71	23.5
8	T1	All MCs	237	4.0	237	4.0	0.363	3.8	LOS A	2.5	64.8	0.71	0.54	0.71	23.7
18	R2	All MCs	86	4.0	86	4.0	0.363	4.1	LOS A	2.5	64.8	0.71	0.54	0.71	22.6
Approach			334	4.0	334	4.0	0.363	4.0	LOS A	2.5	64.8	0.71	0.54	0.71	23.5
East: WB Sycamore St															
1u	U	All MCs	152	4.0	152	4.0	0.623	8.2	LOS A	6.2	159.9	0.74	0.62	0.74	4.2
1	L2	All MCs	602	4.0	602	4.0	0.623	6.7	LOS A	6.2	159.9	0.74	0.62	0.74	21.6
6	T1	All MCs	18	4.0	18	4.0	0.623	2.9	LOS A	6.2	159.9	0.74	0.62	0.74	21.8
16	R2	All MCs	291	4.0	291	4.0	0.314	3.2	LOS A	2.1	55.5	0.58	0.49	0.58	23.2
Approach			1063	4.0	1063	4.0	0.623	5.9	LOS A	6.2	159.9	0.69	0.58	0.69	19.5
North: SB 1st St															
7	L2	All MCs	225	4.0	225	4.0	0.417	13.3	LOS B	3.2	82.4	0.93	0.83	1.00	19.6
4	T1	All MCs	300	4.0	300	4.0	0.425	7.0	LOS A	3.6	92.5	0.95	0.75	0.98	23.2
14	R2	All MCs	1	4.0	1	4.0	0.425	7.7	LOS A	3.6	92.5	0.95	0.75	0.98	23.1
Approach			526	4.0	526	4.0	0.425	9.7	LOS A	3.6	92.5	0.94	0.78	0.99	22.0
West: EB Sycamore St															
5	L2	All MCs	2	4.0	2	4.0	0.349	15.2	LOS B	1.9	48.3	0.84	0.86	0.93	22.1
2	T1	All MCs	64	4.0	64	4.0	0.349	10.4	LOS B	1.9	48.3	0.84	0.86	0.93	12.2
12	R2	All MCs	74	4.0	74	4.0	0.349	11.3	LOS B	1.9	48.3	0.84	0.86	0.93	22.2
Approach			140	4.0	140	4.0	0.349	10.9	LOS B	1.9	48.3	0.84	0.86	0.93	17.7
All Vehicles			2064	4.0	2064	4.0	0.623	6.9	LOS A	6.2	159.9	0.77	0.65	0.79	20.9

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [1st St & Sycamore St (Site Folder: Proposed 2024 PM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

1st St & Sycamore St
Site Category: (None)
Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] ft				mph
South: NB 1st St															
3	L2	All MCs	24	2.0	24	2.0	1.005	39.0	LOS F	35.0	889.9	1.00	2.08	2.67	18.0
8	T1	All MCs	602	2.0	602	2.0	1.005	34.2	LOS F	35.0	889.9	1.00	2.08	2.67	18.1
18	R2	All MCs	346	2.0	346	2.0	1.005	34.5	LOS F	35.0	889.9	1.00	2.08	2.67	14.6
Approach			973	2.0	973	2.0	1.005	34.4	LOS C	35.0	889.9	1.00	2.08	2.67	17.1
East: WB Sycamore St															
1u	U	All MCs	154	2.0	154	2.0	0.550	11.7	LOS B	5.7	143.7	0.97	0.81	1.08	4.0
1	L2	All MCs	220	2.0	220	2.0	0.550	10.2	LOS B	5.7	143.7	0.97	0.81	1.08	20.6
6	T1	All MCs	87	2.0	87	2.0	0.550	6.4	LOS A	5.7	143.7	0.97	0.81	1.08	20.9
16	R2	All MCs	368	2.0	368	2.0	0.555	8.5	LOS A	5.3	134.8	0.96	0.86	1.12	21.0
Approach			829	2.0	829	2.0	0.555	9.4	LOS A	5.7	143.7	0.96	0.83	1.10	17.7
North: SB 1st St															
7	L2	All MCs	209	2.0	209	2.0	0.207	7.8	LOS A	1.5	38.6	0.71	0.64	0.71	21.1
4	T1	All MCs	169	2.0	169	2.0	0.215	4.1	LOS A	1.5	37.6	0.72	0.56	0.72	23.6
14	R2	All MCs	9	2.0	9	2.0	0.215	4.8	LOS A	1.5	37.6	0.72	0.56	0.72	23.5
Approach			388	2.0	388	2.0	0.215	6.1	LOS A	1.5	38.6	0.71	0.60	0.71	22.5
West: EB Sycamore St															
5	L2	All MCs	14	2.0	14	2.0	0.223	9.1	LOS A	1.1	26.9	0.66	0.64	0.66	23.4
2	T1	All MCs	77	2.0	77	2.0	0.223	4.3	LOS A	1.1	26.9	0.66	0.64	0.66	13.0
12	R2	All MCs	57	2.0	57	2.0	0.223	5.2	LOS A	1.1	26.9	0.66	0.64	0.66	23.5
Approach			147	2.0	147	2.0	0.223	5.1	LOS A	1.1	26.9	0.66	0.64	0.66	18.1
All Vehicles			2338	2.0	2338	2.0	1.005	19.0	LOS B	35.0	889.9	0.92	1.30	1.66	18.2

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Roundabout LOS Method: Same as Signalised Intersections.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Intersection and Approach LOS values are based on average delay for all movements (v/c not used).

Roundabout Capacity Model: SIDRA HCM.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SYCAMORE STREET & MAIN STREET

TRAFFIC VOLUME COUNTS CAPACITY ANALYSIS

MAIN ST & SYCAMORE ST - TMC

Wed Oct 24, 2018

Full Length (3 PM-7 PM, 6:30 AM-8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 583038, Location: 39.948235, -86.260938



Provided by: A&F Engineering
8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2018-10-24 3:00PM	62	30	15	0	107	14	13	3	0	30	1	42	62	0	105	8	71	9	0	88	330
3:15PM	47	25	9	0	81	3	15	2	0	20	2	58	50	0	110	13	59	10	0	82	293
3:30PM	76	19	32	0	127	15	16	0	0	31	1	52	47	0	100	16	52	7	0	75	333
3:45PM	72	28	28	0	128	12	20	5	0	37	0	68	59	0	127	11	70	8	0	89	381
Hourly Total	257	102	84	0	443	44	64	10	0	118	4	220	218	0	442	48	252	34	0	334	1337
4:00PM	85	25	39	0	149	17	21	6	0	44	0	72	59	0	131	11	73	6	0	90	414
4:15PM	72	27	51	0	150	7	20	3	0	30	1	55	75	0	131	20	65	5	0	90	401
4:30PM	91	39	66	1	197	6	10	5	0	21	1	53	58	0	112	32	80	15	0	127	457
4:45PM	77	43	59	0	179	14	15	1	0	30	3	75	69	0	147	23	102	10	0	135	491
Hourly Total	325	134	215	1	675	44	66	15	0	125	5	255	261	0	521	86	320	36	0	442	1763
5:00PM	86	58	79	0	223	14	20	4	0	38	3	78	38	0	119	28	85	20	0	133	513
5:15PM	94	50	97	0	241	17	15	4	0	36	4	79	61	0	144	28	106	16	0	150	571
5:30PM	87	51	67	0	205	13	16	1	0	30	0	63	52	0	115	28	100	16	0	144	494
5:45PM	100	45	66	0	211	4	17	3	0	24	2	66	55	0	123	17	76	11	0	104	462
Hourly Total	367	204	309	0	880	48	68	12	0	128	9	286	206	0	501	101	367	63	0	531	2040
6:00PM	65	33	62	0	160	7	13	4	0	24	3	83	69	0	155	17	91	14	0	122	461
6:15PM	68	43	37	0	148	14	13	5	0	32	1	59	50	0	110	13	60	17	0	90	380
6:30PM	78	31	18	0	127	12	15	4	0	31	1	62	63	0	126	14	66	11	0	91	375
6:45PM	65	26	24	0	115	11	14	4	0	29	2	52	49	0	103	16	62	13	0	91	338
Hourly Total	276	133	141	0	550	44	55	17	0	116	7	256	231	0	494	60	279	55	0	394	1554
7:00PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
2018-10-25 6:30AM	17	4	2	0	23	2	10	0	0	12	0	28	31	0	59	25	11	0	0	36	130
6:45AM	16	4	4	0	24	2	7	0	0	9	0	39	45	0	84	42	13	2	0	57	174
Hourly Total	33	8	6	0	47	4	17	0	0	21	0	67	76	0	143	67	24	2	0	93	304
7:00AM	22	8	7	0	37	2	15	0	0	17	0	58	52	0	110	30	15	4	0	49	213
7:15AM	32	5	10	0	47	8	23	0	0	31	0	54	58	0	112	43	35	2	0	80	270
7:30AM	32	11	14	0	57	8	33	1	0	42	0	57	65	0	122	81	56	3	0	140	361
7:45AM	36	11	12	0	59	15	39	0	0	54	0	58	82	0	140	101	69	2	0	172	425
Hourly Total	122	35	43	0	200	33	110	1	0	144	0	227	257	0	484	255	175	11	0	441	1269
8:00AM	33	9	16	0	58	15	34	0	0	49	0	75	84	0	159	90	46	4	0	140	406
8:15AM	42	8	27	0	77	7	25	0	0	32	0	63	64	0	127	59	76	3	0	138	374
8:30AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	2
Hourly Total	75	17	43	0	135	22	59	0	0	81	0	138	148	0	286	150	123	7	0	280	782
Total	1455	633	841	1	2930	239	439	55	0	733	25	1450	1397	0	2872	767	1540	208	0	2515	9050
% Approach	49.7%	21.6%	28.7%	0%	-	32.6%	59.9%	7.5%	0%	-	0.9%	50.5%	48.6%	0%	-	30.5%	61.2%	8.3%	0%	-	-
% Total	16.1%	7.0%	9.3%	0%	32.4%	2.6%	4.9%	0.6%	0%	8.1%	0.3%	16.0%	15.4%	0%	31.7%	8.5%	17.0%	2.3%	0%	27.8%	-
Lights and Motorcycles	1426	631	836	1	2894	239	434	55	0	728	25	1424	1362	0	2811	744	1512	208	0	2464	8897
% Lights and Motorcycles	98.0%	99.7%	99.4%	100%	98.8%	100%	98.9%	100%	0%	99.3%	100%	98.2%	97.5%	0%	97.9%	97.0%	98.2%	100%	0%	98.0%	98.3%
Heavy	29	2	5	0	36	0	5	0	0	5	0	26	35	0	61	23	28	0	0	51	153
% Heavy	2.0%	0.3%	0.6%	0%	1.2%	0%	1.1%	0%	0%	0.7%	0%	1.8%	2.5%	0%	2.1%	3.0%	1.8%	0%	0%	2.0%	1.7%

*L: Left, R: Right, T: Thru, U: U-Turn

MAIN ST & SYCAMORE ST - TMC

Wed Oct 24, 2018

Full Length (3 PM-7 PM, 6:30 AM-8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

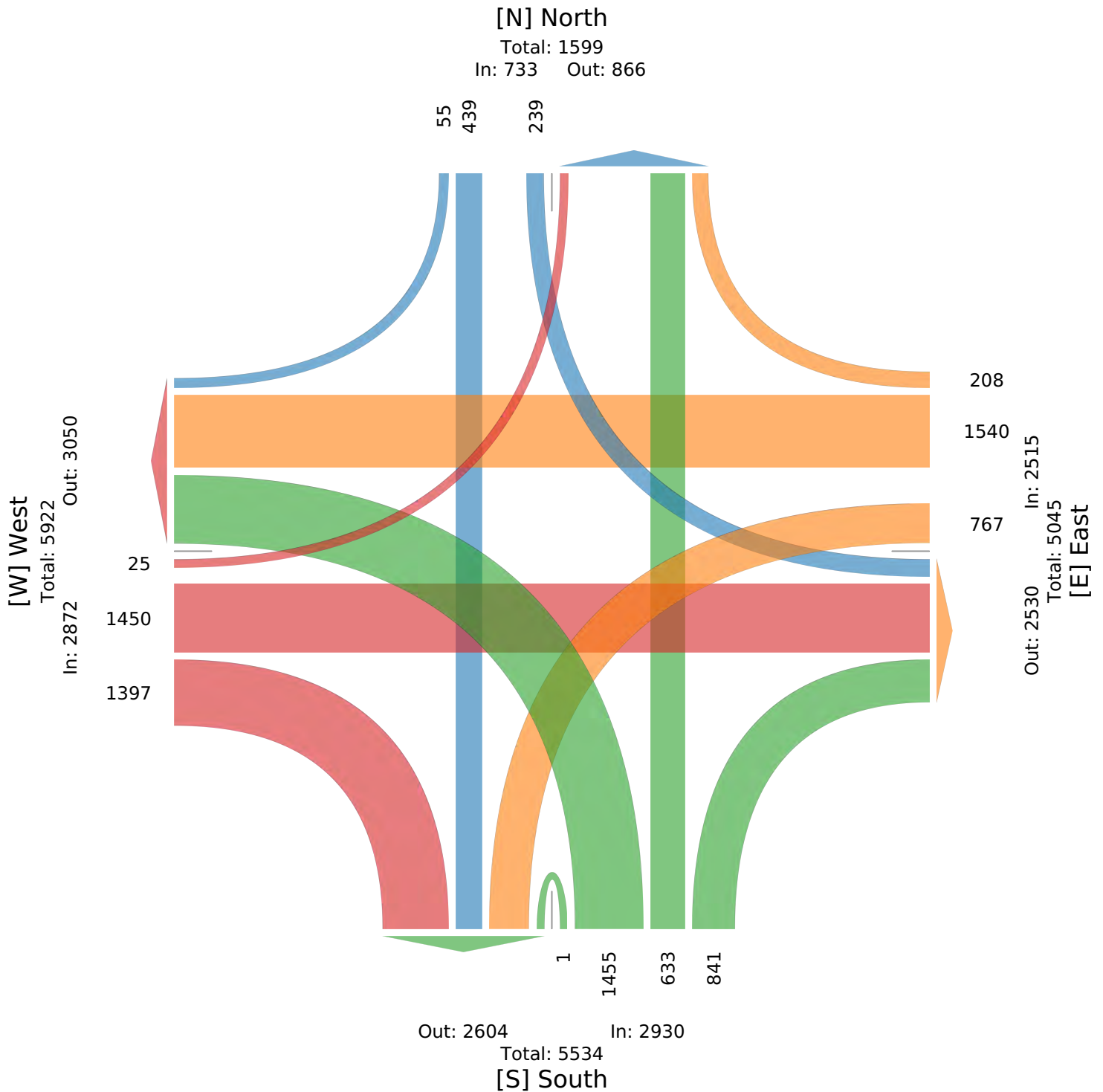
All Movements

ID: 583038, Location: 39.948235, -86.260938



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US



MAIN ST & SYCAMORE ST - TMC

Wed Oct 24, 2018

PM Peak (Oct 24 2018 4:45PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 583038, Location: 39.948235, -86.260938



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2018-10-24 4:45PM	77	43	59	0	179	14	15	1	0	30	3	75	69	0	147	23	102	10	0	135	491
5:00PM	86	58	79	0	223	14	20	4	0	38	3	78	38	0	119	28	85	20	0	133	513
5:15PM	94	50	97	0	241	17	15	4	0	36	4	79	61	0	144	28	106	16	0	150	571
5:30PM	87	51	67	0	205	13	16	1	0	30	0	63	52	0	115	28	100	16	0	144	494
Total	344	202	302	0	848	58	66	10	0	134	10	295	220	0	525	107	393	62	0	562	2069
% Approach	40.6%	23.8%	35.6%	0%	-	43.3%	49.3%	7.5%	0%	-	1.9%	56.2%	41.9%	0%	-	19.0%	69.9%	11.0%	0%	-	-
% Total	16.6%	9.8%	14.6%	0%	41.0%	2.8%	3.2%	0.5%	0%	6.5%	0.5%	14.3%	10.6%	0%	25.4%	5.2%	19.0%	3.0%	0%	27.2%	-
PHF	0.915	0.871	0.778	-	0.880	0.853	0.825	0.625	-	0.882	0.625	0.934	0.797	-	0.893	0.955	0.927	0.775	-	0.937	0.906
Lights and Motorcycles	343	202	302	0	847	58	64	10	0	132	10	291	214	0	515	101	389	62	0	552	2046
% Lights and Motorcycles	99.7%	100%	100%	0%	99.9%	100%	97.0%	100%	0%	98.5%	100%	98.6%	97.3%	0%	98.1%	94.4%	99.0%	100%	0%	98.2%	98.9%
Heavy	1	0	0	0	1	0	2	0	0	2	0	4	6	0	10	6	4	0	0	10	23
% Heavy	0.3%	0%	0%	0%	0.1%	0%	3.0%	0%	0%	1.5%	0%	1.4%	2.7%	0%	1.9%	5.6%	1.0%	0%	0%	1.8%	1.1%

* L: Left, R: Right, T: Thru, U: U-Turn

MAIN ST & SYCAMORE ST - TMC

Wed Oct 24, 2018

PM Peak (Oct 24 2018 4:45PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

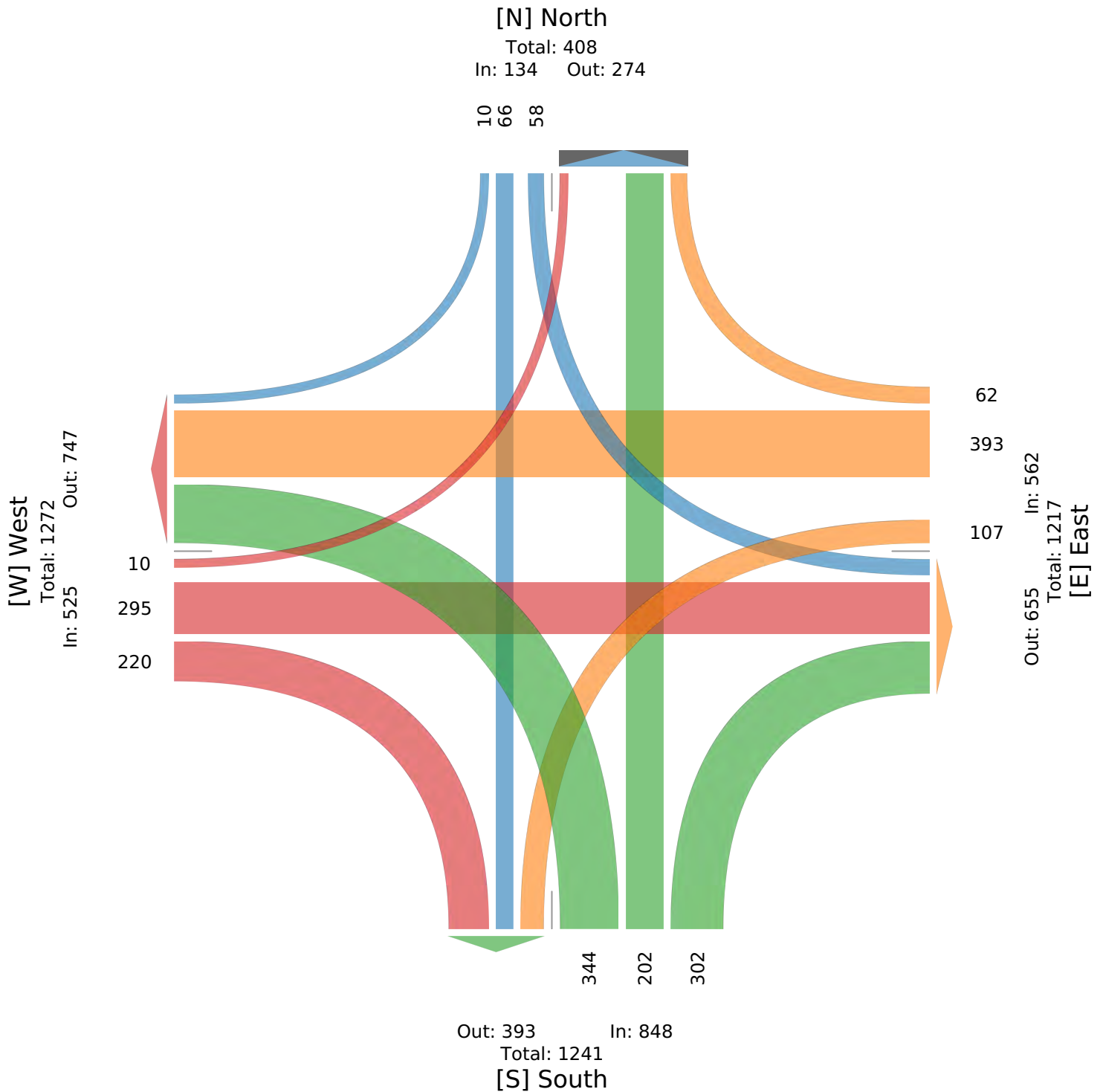
All Movements

ID: 583038, Location: 39.948235, -86.260938



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US



MAIN ST & SYCAMORE ST - TMC

Thu Oct 25, 2018

AM Peak (Oct 25 2018 7:30AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 583038, Location: 39.948235, -86.260938



Provided by: A&F Engineering
8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2018-10-25 7:30AM	32	11	14	0	57	8	33	1	0	42	0	57	65	0	122	81	56	3	0	140	361
7:45AM	36	11	12	0	59	15	39	0	0	54	0	58	82	0	140	101	69	2	0	172	425
8:00AM	33	9	16	0	58	15	34	0	0	49	0	75	84	0	159	90	46	4	0	140	406
8:15AM	42	8	27	0	77	7	25	0	0	32	0	63	64	0	127	59	76	3	0	138	374
Total	143	39	69	0	251	45	131	1	0	177	0	253	295	0	548	331	247	12	0	590	1566
% Approach	57.0%	15.5%	27.5%	0%	-	25.4%	74.0%	0.6%	0%	-	0%	46.2%	53.8%	0%	-	56.1%	41.9%	2.0%	0%	-	-
% Total	9.1%	2.5%	4.4%	0%	16.0%	2.9%	8.4%	0.1%	0%	11.3%	0%	16.2%	18.8%	0%	35.0%	21.1%	15.8%	0.8%	0%	37.7%	-
PHF	0.851	0.886	0.639	-	0.815	0.750	0.840	0.250	-	0.819	-	0.843	0.878	-	0.862	0.819	0.813	0.750	-	0.858	0.921
Lights and Motorcycles	133	39	65	0	237	45	131	1	0	177	0	246	288	0	534	329	239	12	0	580	1528
% Lights and Motorcycles	93.0%	100%	94.2%	0%	94.4%	100%	100%	100%	0%	100%	0%	97.2%	97.6%	0%	97.4%	99.4%	96.8%	100%	0%	98.3%	97.6%
Heavy	10	0	4	0	14	0	0	0	0	0	0	7	7	0	14	2	8	0	0	10	38
% Heavy	7.0%	0%	5.8%	0%	5.6%	0%	0%	0%	0%	0%	0%	2.8%	2.4%	0%	2.6%	0.6%	3.2%	0%	0%	1.7%	2.4%

* L: Left, R: Right, T: Thru, U: U-Turn

MAIN ST & SYCAMORE ST - TMC

Thu Oct 25, 2018

AM Peak (Oct 25 2018 7:30AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 583038, Location: 39.948235, -86.260938



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

[N] North

Total: 228

In: 177 Out: 51

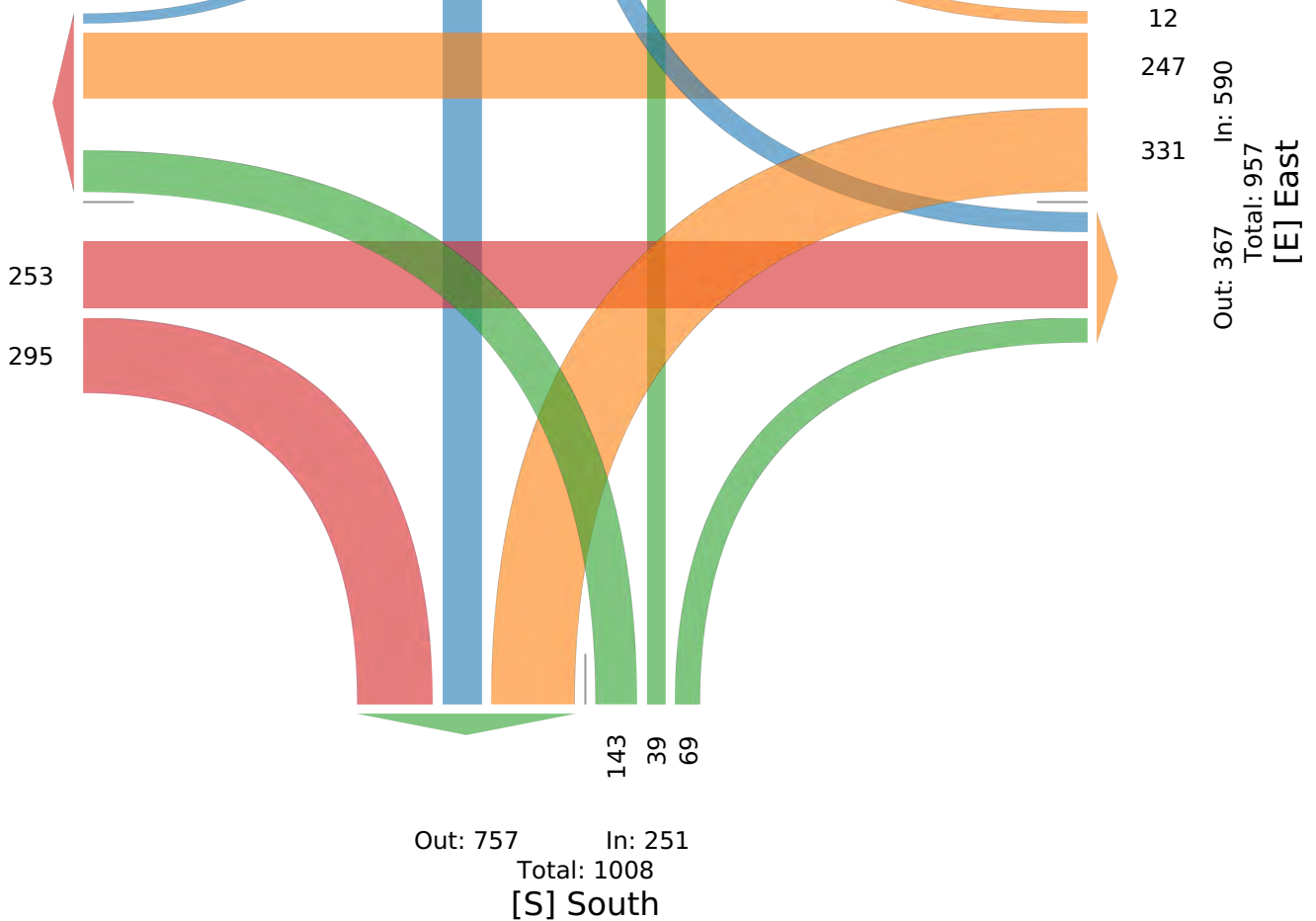
1
131

45

[W] West

Total: 939

In: 548 Out: 391



HCM 7th Signalized Intersection Summary

2: Main St & Sycamore St

2024 AM Peak
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	288	326	361	269	18	156	60	75	49	143	1
Future Volume (veh/h)	0	288	326	361	269	18	156	60	75	49	143	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	313	354	392	292	20	170	65	82	53	155	1
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
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	472	563	530	874	60	423	164	207	405	336	2
Arrive On Green	0.00	0.25	0.25	0.19	0.50	0.50	0.10	0.22	0.22	0.07	0.18	0.18
Sat Flow, veh/h	0	1870	1585	1781	1730	119	1781	752	948	1781	1856	12
Grp Volume(v), veh/h	0	313	354	392	0	312	170	0	147	53	0	156
Grp Sat Flow(s),veh/h/ln	0	1870	1585	1781	0	1849	1781	0	1700	1781	0	1868
Q Serve(g_s), s	0.0	10.0	12.3	9.8	0.0	6.7	5.0	0.0	4.9	1.5	0.0	4.9
Cycle Q Clear(g_c), s	0.0	10.0	12.3	9.8	0.0	6.7	5.0	0.0	4.9	1.5	0.0	4.9
Prop In Lane	0.00		1.00	1.00		0.06	1.00		0.56	1.00		0.01
Lane Grp Cap(c), veh/h	0	472	563	530	0	934	423	0	371	405	0	338
V/C Ratio(X)	0.00	0.66	0.63	0.74	0.00	0.33	0.40	0.00	0.40	0.13	0.00	0.46
Avail Cap(c_a), veh/h	0	705	761	778	0	1423	562	0	462	475	0	366
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	22.2	17.7	13.7	0.0	9.8	18.7	0.0	22.2	19.4	0.0	24.3
Incr Delay (d2), s/veh	0.0	1.6	1.2	2.1	0.0	0.2	0.6	0.0	0.7	0.1	0.0	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.3	4.3	3.7	0.0	2.4	2.0	0.0	1.9	0.6	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	23.9	18.9	15.8	0.0	10.0	19.3	0.0	22.9	19.6	0.0	25.3
LnGrp LOS		C	B	B		A	B		C	B		C
Approach Vol, veh/h	667			704			317			209		
Approach Delay, s/veh	21.2			13.2			21.0			23.8		
Approach LOS	C			B			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	16.7	21.7	10.8	17.0		38.5	8.4	19.5				
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0		5.0	4.0	5.0				
Max Green Setting (Gmax), s	22.0	25.0	12.0	13.0		51.0	7.0	18.0				
Max Q Clear Time (g_c+I1), s	11.8	14.3	7.0	6.9		8.7	3.5	6.9				
Green Ext Time (p_c), s	0.9	2.4	0.2	0.3		2.1	0.0	0.5				
Intersection Summary												
HCM 7th Control Delay, s/veh	18.5											
HCM 7th LOS	B											

HCM 7th Signalized Intersection Summary

2: Main St & Sycamore St

2024 PM Peak
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	322	240	117	428	68	375	220	329	63	72	11
Future Volume (veh/h)	11	322	240	117	428	68	375	220	329	63	72	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	12	354	264	129	470	75	412	242	362	69	79	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	52	435	678	282	588	94	726	262	392	251	425	65
Arrive On Green	0.24	0.24	0.24	0.08	0.37	0.37	0.19	0.38	0.38	0.07	0.27	0.27
Sat Flow, veh/h	23	1834	1598	1795	1586	253	1795	682	1020	1795	1599	243
Grp Volume(v), veh/h	366	0	264	129	0	545	412	0	604	69	0	91
Grp Sat Flow(s),veh/h/ln	1858	0	1598	1795	0	1840	1795	0	1702	1795	0	1841
Q Serve(g_s), s	3.3	0.0	9.0	4.0	0.0	21.0	12.3	0.0	26.9	2.1	0.0	3.0
Cycle Q Clear(g_c), s	14.7	0.0	9.0	4.0	0.0	21.0	12.3	0.0	26.9	2.1	0.0	3.0
Prop In Lane	0.03		1.00	1.00		0.14	1.00		0.60	1.00		0.13
Lane Grp Cap(c), veh/h	488	0	678	282	0	682	726	0	653	251	0	490
V/C Ratio(X)	0.75	0.00	0.39	0.46	0.00	0.80	0.57	0.00	0.92	0.27	0.00	0.19
Avail Cap(c_a), veh/h	628	0	802	291	0	834	797	0	707	286	0	510
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.7	0.0	15.8	20.4	0.0	22.3	14.3	0.0	23.4	20.4	0.0	22.5
Incr Delay (d2), s/veh	3.7	0.0	0.4	1.2	0.0	4.6	0.8	0.0	17.2	0.6	0.0	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	0.0	3.2	1.7	0.0	9.4	4.7	0.0	13.2	0.9	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.4	0.0	16.1	21.6	0.0	26.9	15.1	0.0	40.6	21.0	0.0	22.7
LnGrp LOS	C		B	C		C	B		D	C		C
Approach Vol, veh/h	630			674			1016			160		
Approach Delay, s/veh	25.6			25.9			30.2			21.9		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s	10.6	23.8	18.8	26.1		34.4	9.5	35.5				
Change Period (Y+Rc), s	4.0	5.0	4.0	5.0		5.0	4.0	5.0				
Max Green Setting (Gmax), s	7.0	25.0	18.0	22.0		36.0	7.0	33.0				
Max Q Clear Time (g_c+I1), s	6.0	16.7	14.3	5.0		23.0	4.1	28.9				
Green Ext Time (p_c), s	0.0	2.1	0.5	0.3		3.0	0.0	1.6				
Intersection Summary												
HCM 7th Control Delay, s/veh				27.3								
HCM 7th LOS				C								

HCM 7th TWSC
2: Sycamore St & Main St

2024 AM Peak
Proposed Conditions

Intersection						
Int Delay, s/veh	6.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	412	630	18	0	295
Future Vol, veh/h	0	412	630	18	0	295
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	448	685	20	0	321
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	695
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	442
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	442
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s/v	0	0		31.76		
HCM LOS	D					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	442		
HCM Lane V/C Ratio	-	-	-	0.725		
HCM Control Delay (s/veh)	-	-	-	31.8		
HCM Lane LOS	-	-	-	D		
HCM 95th %tile Q(veh)	-	-	-	5.7		

HCM 7th TWSC
2: Sycamore St & Main St

2024 PM Peak
Proposed Conditions

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	714	545	68	0	243
Future Vol, veh/h	0	714	545	68	0	243
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	785	599	75	0	267
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	636
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.309
Pot Cap-1 Maneuver	0	-	-	-	0	479
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	479
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s/v	0	0		21.54		
HCM LOS	C					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	479		
HCM Lane V/C Ratio	-	-	-	0.557		
HCM Control Delay (s/veh)	-	-	-	21.5		
HCM Lane LOS	-	-	-	C		
HCM 95th %tile Q(veh)	-	-	-	3.3		

HAWTHORNE STREET & MAIN STREET

TRAFFIC VOLUME COUNTS CAPACITY ANALYSIS

MAIN ST & HAWTHORNE ST - TMC

Tue Mar 19, 2024

Full Length (6 AM-9 AM, 4 PM-7 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1167071, Location: 39.949076, -86.261179



Provided by: A&F Engineering
8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2024-03-19 6:00AM	0	4	0	0	4	1	7	0	0	8	0	0	0	0	0	0	0	0	0	0	12
6:15AM	0	2	0	0	2	0	11	0	0	11	0	0	0	0	0	0	0	0	0	0	13
6:30AM	0	7	0	0	7	0	11	0	0	11	0	0	0	0	0	0	0	0	0	0	18
6:45AM	0	3	0	0	3	0	13	0	0	13	0	0	0	0	0	0	0	0	0	0	16
Hourly Total	0	16	0	0	16	1	42	0	0	43	0	0	0	0	0	0	0	0	0	0	59
7:00AM	0	9	0	0	9	0	10	0	0	10	0	1	0	0	1	0	0	0	0	0	20
7:15AM	0	10	1	0	11	1	16	0	0	17	0	0	0	0	0	0	0	0	0	0	28
7:30AM	0	18	1	0	19	0	17	0	0	17	1	0	0	0	1	0	0	0	0	0	37
7:45AM	0	17	2	0	19	0	33	0	0	33	1	0	0	0	1	0	0	0	0	0	53
Hourly Total	0	54	4	0	58	1	76	0	0	77	2	1	0	0	3	0	0	0	0	0	138
8:00AM	0	14	0	0	14	3	46	0	0	49	3	1	2	0	6	0	0	0	0	0	69
8:15AM	0	18	1	0	19	1	29	0	0	30	0	3	6	0	9	0	0	0	0	0	58
8:30AM	0	22	1	0	23	0	42	0	0	42	1	1	2	0	4	0	0	0	0	0	69
8:45AM	0	17	5	0	22	2	29	0	0	31	2	1	2	0	5	0	0	0	0	0	58
Hourly Total	0	71	7	0	78	6	146	0	0	152	6	6	12	0	24	0	0	0	0	0	254
9:00AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00PM	0	42	1	0	43	1	45	0	0	46	2	2	6	0	10	0	0	0	0	0	99
4:15PM	0	43	1	0	44	2	35	0	0	37	3	2	1	0	6	0	0	0	0	0	87
4:30PM	0	36	1	0	37	0	21	0	0	21	6	3	2	0	11	0	0	0	0	0	69
4:45PM	0	25	0	0	25	1	21	0	0	22	0	1	0	0	1	0	0	0	0	0	48
Hourly Total	0	146	3	0	149	4	122	0	0	126	11	8	9	0	28	0	0	0	0	0	303
5:00PM	0	35	4	0	39	1	27	0	0	28	4	2	4	0	10	0	0	0	0	0	77
5:15PM	0	36	2	0	38	2	27	0	0	29	3	1	4	0	8	0	0	0	0	0	75
5:30PM	0	53	2	0	55	1	30	0	0	31	4	0	4	0	8	0	0	0	0	0	94
5:45PM	0	42	5	0	47	2	17	0	1	20	4	1	2	0	7	0	0	0	0	0	74
Hourly Total	0	166	13	0	179	6	101	0	1	108	15	4	14	0	33	0	0	0	0	0	320
6:00PM	0	34	5	0	39	4	19	0	0	23	6	5	3	0	14	0	0	0	0	0	76
6:15PM	0	28	1	0	29	0	13	0	0	13	3	2	1	0	6	0	0	0	0	0	48
6:30PM	0	32	2	0	34	2	22	0	0	24	1	1	4	0	6	0	0	0	0	0	64
6:45PM	0	26	0	0	26	1	20	0	0	21	2	4	1	0	7	0	0	0	0	0	54
Hourly Total	0	120	8	0	128	7	74	0	0	81	12	12	9	0	33	0	0	0	0	0	242
7:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	573	35	0	608	25	561	0	1	587	46	31	44	0	121	0	0	0	0	0	1316
% Approach	0%	94.2%	5.8%	0%	-	4.3%	95.6%	0%	0.2%	-	38.0%	25.6%	36.4%	0%	-	0%	0%	0%	0%	-	-
% Total	0%	43.5%	2.7%	0%	46.2%	1.9%	42.6%	0%	0.1%	44.6%	3.5%	2.4%	3.3%	0%	9.2%	0%	0%	0%	0%	0%	-
Lights and Motorcycles	0	569	34	0	603	25	554	0	1	580	45	31	43	0	119	0	0	0	0	0	1302
% Lights and Motorcycles	0%	99.3%	97.1%	0%	99.2%	100%	98.8%	0%	100%	98.8%	97.8%	100%	97.7%	0%	98.3%	0%	0%	0%	0%	-	98.9%
Heavy	0	4	1	0	5	0	7	0	0	7	1	0	1	0	2	0	0	0	0	0	14
% Heavy	0%	0.7%	2.9%	0%	0.8%	0%	1.2%	0%	0%	1.2%	2.2%	0%	2.3%	0%	1.7%	0%	0%	0%	0%	-	1.1%

*L: Left, R: Right, T: Thru, U: U-Turn

MAIN ST & HAWTHORNE ST - TMC

Tue Mar 19, 2024

Full Length (6 AM-9 AM, 4 PM-7 PM)

All Classes (Lights and Motorcycles, Heavy)

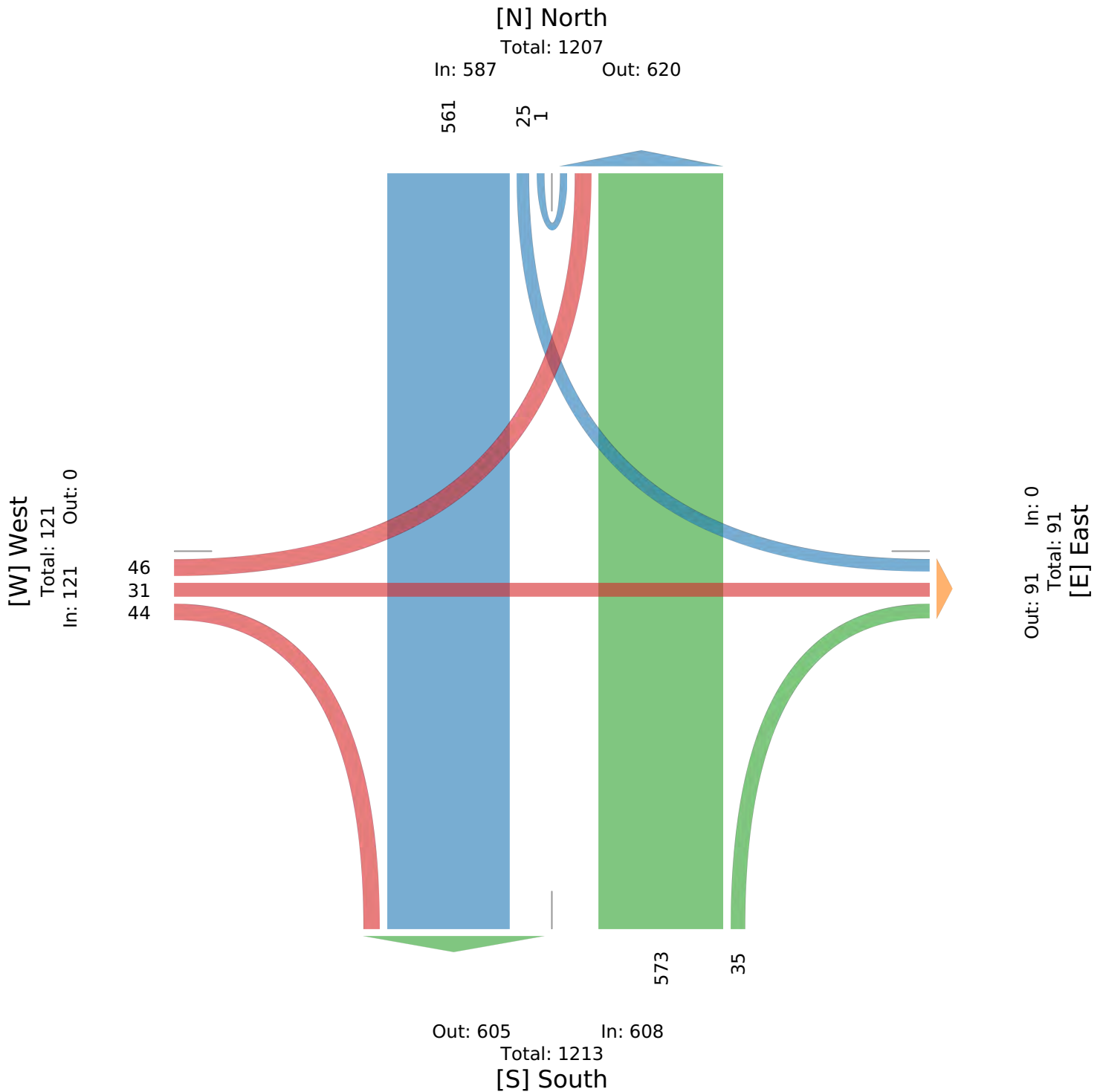
All Movements

ID: 1167071, Location: 39.949076, -86.261179



Provided by: A&F Engineering

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MAIN ST & HAWTHORNE ST - TMC

Tue Mar 19, 2024

AM Peak (8 AM - 9 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1167071, Location: 39.949076, -86.261179



Provided by: A&F Engineering
8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2024-03-19 8:00AM	0	14	0	0	14	3	46	0	0	49	3	1	2	0	6	0	0	0	0	0	69
8:15AM	0	18	1	0	19	1	29	0	0	30	0	3	6	0	9	0	0	0	0	0	58
8:30AM	0	22	1	0	23	0	42	0	0	42	1	1	2	0	4	0	0	0	0	0	69
8:45AM	0	17	5	0	22	2	29	0	0	31	2	1	2	0	5	0	0	0	0	0	58
Total	0	71	7	0	78	6	146	0	0	152	6	6	12	0	24	0	0	0	0	0	254
% Approach	0%	91.0%	9.0%	0%	-	3.9%	96.1%	0%	0%	-	25.0%	25.0%	50.0%	0%	-	0%	0%	0%	0%	-	-
% Total	0%	28.0%	2.8%	0%	30.7%	2.4%	57.5%	0%	0%	59.8%	2.4%	2.4%	4.7%	0%	9.4%	0%	0%	0%	0%	0%	-
PHF	-	0.807	0.350	-	0.848	0.500	0.793	-	-	0.776	0.500	0.500	0.500	-	0.667	-	-	-	-	-	0.920
Lights and Motorcycles	0	70	7	0	77	6	144	0	0	150	6	6	11	0	23	0	0	0	0	0	250
% Lights and Motorcycles	0%	98.6%	100%	0%	98.7%	100%	98.6%	0%	0%	98.7%	100%	100%	91.7%	0%	95.8%	0%	0%	0%	0%	-	98.4%
Heavy	0	1	0	0	1	0	2	0	0	2	0	0	1	0	1	0	0	0	0	0	4
% Heavy	0%	1.4%	0%	0%	1.3%	0%	1.4%	0%	0%	1.3%	0%	0%	8.3%	0%	4.2%	0%	0%	0%	0%	-	1.6%

* L: Left, R: Right, T: Thru, U: U-Turn

MAIN ST & HAWTHORNE ST - TMC

Tue Mar 19, 2024

AM Peak (8 AM - 9 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1167071, Location: 39.949076, -86.261179



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

[N] North

Total: 229

In: 152

Out: 77

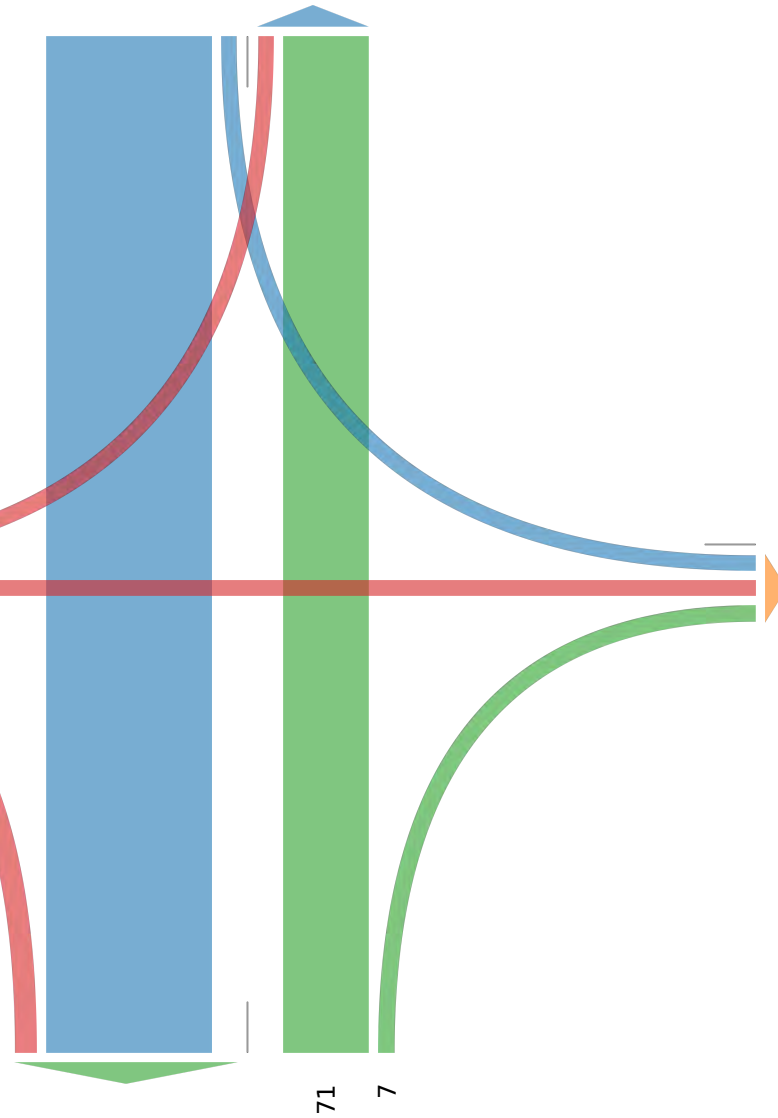
146

6

[W] West
Total: 24
In: 24 Out: 0

6
6
12

Out: 19 In: 0
Total: 19
[E] East



71
7

Out: 158

In: 78

Total: 236

[S] South

MAIN ST & HAWTHORNE ST - TMC

Tue Mar 19, 2024

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1167071, Location: 39.949076, -86.261179



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2024-03-19 5:00PM	0	35	4	0	39	1	27	0	0	28	4	2	4	0	10	0	0	0	0	0	77
5:15PM	0	36	2	0	38	2	27	0	0	29	3	1	4	0	8	0	0	0	0	0	75
5:30PM	0	53	2	0	55	1	30	0	0	31	4	0	4	0	8	0	0	0	0	0	94
5:45PM	0	42	5	0	47	2	17	0	1	20	4	1	2	0	7	0	0	0	0	0	74
Total	0	166	13	0	179	6	101	0	1	108	15	4	14	0	33	0	0	0	0	0	320
% Approach	0%	92.7%	7.3%	0%	-	5.6%	93.5%	0%	0.9%	-	45.5%	12.1%	42.4%	0%	-	0%	0%	0%	0%	-	-
% Total	0%	51.9%	4.1%	0%	55.9%	1.9%	31.6%	0%	0.3%	33.8%	4.7%	1.3%	4.4%	0%	10.3%	0%	0%	0%	0%	0%	-
PHF	-	0.783	0.650	-	0.814	0.750	0.842	-	0.250	0.871	0.938	0.500	0.875	-	0.825	-	-	-	-	-	0.851
Lights and Motorcycles	0	166	13	0	179	6	101	0	1	108	15	4	14	0	33	0	0	0	0	0	320
% Lights and Motorcycles	0%	100%	100%	0%	100%	100%	100%	0%	100%	100%	100%	100%	100%	0%	100%	0%	0%	0%	0%	-	100%
Heavy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%

* L: Left, R: Right, T: Thru, U: U-Turn

MAIN ST & HAWTHORNE ST - TMC

Tue Mar 19, 2024

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1167071, Location: 39.949076, -86.261179



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

[N] North

Total: 290

In: 108

Out: 182

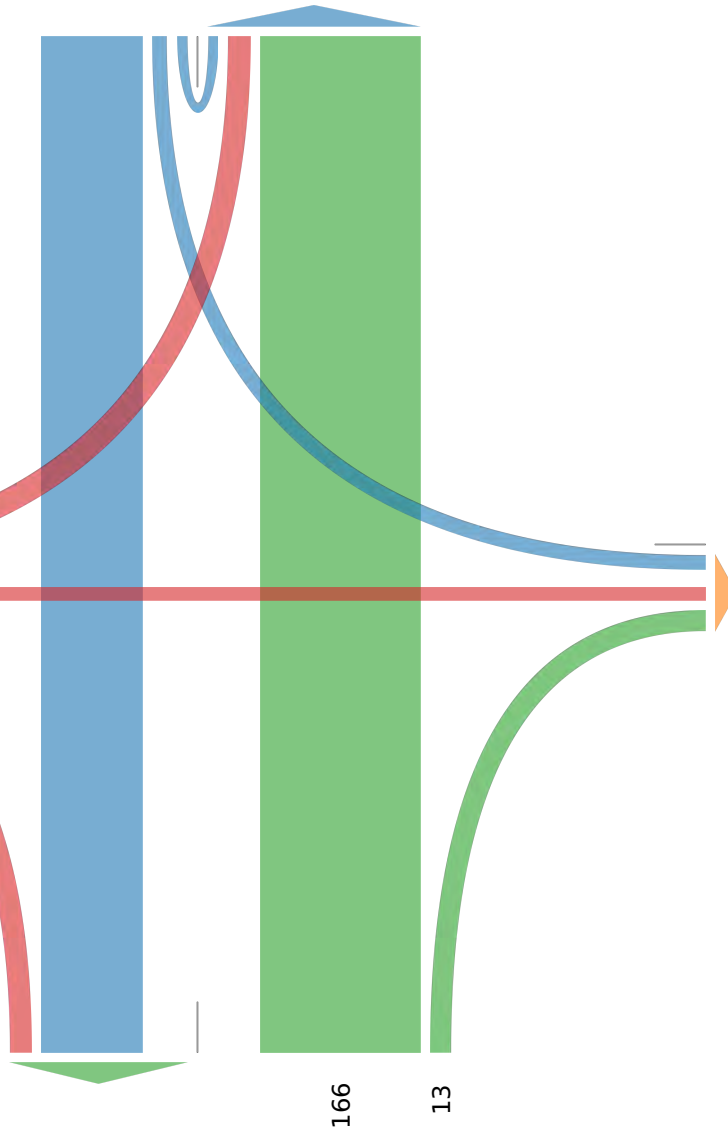
101

6
1

[W] West
Total: 33
In: 33 Out: 0

15
4
14

Out: 23 In: 0
Total: 23
[E] East



Out: 115

In: 179

Total: 294

[S] South

HCM 7th TWSC
4: Main St & Hawthorne St

2024 AM Peak
Existing Conditions

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	6	6	15	0	0	0	0	71	7	6	178	0
Future Vol, veh/h	6	6	15	0	0	0	0	71	7	6	178	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	7	16	0	0	0	0	77	8	7	193	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	284	291	193	-	0	0	85	0	0
Stage 1	207	207	-	-	-	-	-	-	-
Stage 2	77	85	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	706	619	848	0	-	-	1512	-	0
Stage 1	828	731	-	0	-	-	-	-	0
Stage 2	946	825	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	703	0	848	-	-	-	1512	-	-
Mov Cap-2 Maneuver	703	0	-	-	-	-	-	-	-
Stage 1	828	0	-	-	-	-	-	-	-
Stage 2	941	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	9.67	0	0.24
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	801	59	-
HCM Lane V/C Ratio	-	-	0.037	0.004	-
HCM Control Delay (s/veh)	-	-	9.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

HCM 7th TWSC
4: Main St & Hawthorne St

2024 PM Peak
Existing Conditions

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	15	4	18	0	0	0	0	277	22	7	128	0
Future Vol, veh/h	15	4	18	0	0	0	0	277	22	7	128	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	18	5	21	0	0	0	0	326	26	8	151	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	493	519	151	-	0	0	352	0	0
Stage 1	167	167	-	-	-	-	-	-	-
Stage 2	326	352	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	539	464	901	0	-	-	1218	-	0
Stage 1	867	764	-	0	-	-	-	-	0
Stage 2	736	635	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	535	0	901	-	-	-	1218	-	-
Mov Cap-2 Maneuver	535	0	-	-	-	-	-	-	-
Stage 1	867	0	-	-	-	-	-	-	-
Stage 2	731	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v10.59		0	0.41
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	687	93	-
HCM Lane V/C Ratio	-	-	0.063	0.007	-
HCM Control Delay (s/veh)	-	-	10.6	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

HCM 7th TWSC
4: Main St & Hawthorne St

2024 AM Peak
Proposed Conditions

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	61	11	15	0	0	0	0	16	2	6	280	0
Future Vol, veh/h	61	11	15	0	0	0	0	16	2	6	280	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	66	12	16	0	0	0	0	17	2	7	304	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	335	337	304	-	0	0	20	0	0
Stage 1	317	317	-	-	-	-	-	-	-
Stage 2	17	20	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22	-	-	-	4.12	-	-
Critical Hdwy Stg 1	5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	-	-	-	2.218	-	-
Pot Cap-1 Maneuver	660	584	735	0	-	-	1597	-	0
Stage 1	738	654	-	0	-	-	-	-	0
Stage 2	1005	879	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	657	0	735	-	-	-	1597	-	-
Mov Cap-2 Maneuver	657	0	-	-	-	-	-	-	-
Stage 1	738	0	-	-	-	-	-	-	-
Stage 2	1000	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v11.24		0	0.15
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	671	38	-
HCM Lane V/C Ratio	-	-	0.141	0.004	-
HCM Control Delay (s/veh)	-	-	11.2	7.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Intersection												
Int Delay, s/veh	7.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	229	21	18	0	0	0	0	63	5	7	225	0
Future Vol, veh/h	229	21	18	0	0	0	0	63	5	7	225	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	269	25	21	0	0	0	0	74	6	8	265	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	355	361	265	-	0	0	80	0	0
Stage 1	281	281	-	-	-	-	-	-	-
Stage 2	74	80	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	647	569	779	0	-	-	1531	-	0
Stage 1	771	682	-	0	-	-	-	-	0
Stage 2	954	832	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	643	0	779	-	-	-	1531	-	-
Mov Cap-2 Maneuver	643	0	-	-	-	-	-	-	-
Stage 1	771	0	-	-	-	-	-	-	-
Stage 2	948	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v15.61		0	0.22
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	651	54	-
HCM Lane V/C Ratio	-	-	0.484	0.005	-
HCM Control Delay (s/veh)	-	-	15.6	7.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2.7	0	-

PINE STREET & MAIN STREET

TRAFFIC VOLUME COUNTS CAPACITY ANALYSIS

MAIN ST & PINE ST - TMC

Tue Mar 19, 2024

Full Length (6 AM-9 AM, 4 PM-7 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1167070, Location: 39.949944, -86.261409



Provided by: A&F Engineering
8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2024-03-19 6:00AM	0	5	0	0	5	0	8	0	0	8	0	0	0	0	0	1	1	0	0	2	15
6:15AM	0	2	0	0	2	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	12
6:30AM	0	5	0	0	5	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	15
6:45AM	0	3	0	0	3	0	15	0	0	15	0	0	0	0	0	1	0	0	0	1	19
Hourly Total	0	15	0	0	15	0	43	0	0	43	0	0	0	0	0	2	1	0	0	3	61
7:00AM	1	9	0	0	10	0	11	1	0	12	0	0	0	0	0	0	0	1	0	1	23
7:15AM	0	10	0	0	10	0	15	0	0	15	0	0	0	0	0	0	0	0	0	0	25
7:30AM	1	16	0	0	17	0	16	2	0	18	0	0	0	0	0	0	2	0	0	2	37
7:45AM	1	21	0	0	22	0	32	2	0	34	0	0	0	0	0	0	1	0	0	1	57
Hourly Total	3	56	0	0	59	0	74	5	0	79	0	0	0	0	0	0	3	1	0	4	142
8:00AM	1	14	0	0	15	0	49	0	0	49	0	0	0	0	0	1	1	2	0	4	68
8:15AM	0	17	0	0	17	0	28	1	0	29	0	0	0	0	0	1	2	2	0	5	51
8:30AM	1	19	0	0	20	0	37	1	0	38	0	0	0	0	0	4	3	1	0	8	66
8:45AM	0	12	0	0	12	0	32	2	0	34	0	0	0	0	0	3	1	3	0	7	53
Hourly Total	2	62	0	0	64	0	146	4	0	150	0	0	0	0	0	9	7	8	0	24	238
9:00AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00PM	9	40	0	0	49	0	36	2	0	38	0	0	0	0	0	3	1	3	0	7	94
4:15PM	2	41	0	0	43	0	27	6	0	33	0	0	0	0	0	5	2	3	0	10	86
4:30PM	9	41	0	0	50	0	19	6	0	25	0	0	0	0	0	3	3	2	0	8	83
4:45PM	6	21	0	0	27	0	20	6	0	26	0	0	0	0	0	2	3	2	0	7	60
Hourly Total	26	143	0	0	169	0	102	20	0	122	0	0	0	0	0	13	9	10	0	32	323
5:00PM	5	28	0	0	33	0	28	2	2	32	0	0	0	0	0	1	1	3	0	5	70
5:15PM	6	39	0	0	45	0	32	4	1	37	0	0	0	0	0	1	3	2	0	6	88
5:30PM	4	49	0	0	53	0	26	3	0	29	0	0	0	0	0	1	1	1	0	3	85
5:45PM	3	47	0	0	50	0	27	5	0	32	0	0	0	0	0	2	3	0	0	5	87
Hourly Total	18	163	0	0	181	0	113	14	3	130	0	0	0	0	0	5	8	6	0	19	330
6:00PM	2	41	0	0	43	0	14	5	0	19	0	0	0	0	0	0	4	1	0	5	67
6:15PM	5	20	0	0	25	0	17	4	0	21	0	0	0	0	0	2	2	1	0	5	51
6:30PM	2	32	0	0	34	0	19	5	0	24	0	0	0	0	0	3	1	1	0	5	63
6:45PM	4	31	0	0	35	0	16	3	0	19	0	0	0	0	0	3	2	1	0	6	60
Hourly Total	13	124	0	0	137	0	66	17	0	83	0	0	0	0	0	8	9	4	0	21	241
7:00PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	62	563	0	0	625	0	544	60	3	607	0	0	0	0	0	37	37	29	0	103	1335
% Approach	9.9%	90.1%	0%	0%	-	0%	89.6%	9.9%	0.5%	-	0%	0%	0%	0%	-	35.9%	35.9%	28.2%	0%	-	-
% Total	4.6%	42.2%	0%	0%	46.8%	0%	40.7%	4.5%	0.2%	45.5%	0%	0%	0%	0%	0%	2.8%	2.8%	2.2%	0%	7.7%	-
Lights and Motorcycles	62	559	0	0	621	0	540	60	3	603	0	0	0	0	0	35	36	29	0	100	1324
% Lights and Motorcycles	100%	99.3%	0%	0%	99.4%	0%	99.3%	100%	100%	99.3%	0%	0%	0%	0%	-	94.6%	97.3%	100%	0%	97.1%	99.2%
Heavy	0	4	0	0	4	0	4	0	0	4	0	0	0	0	0	2	1	0	0	3	11
% Heavy	0%	0.7%	0%	0%	0.6%	0%	0.7%	0%	0%	0.7%	0%	0%	0%	0%	-	5.4%	2.7%	0%	0%	2.9%	0.8%

*L: Left, R: Right, T: Thru, U: U-Turn

MAIN ST & PINE ST - TMC

Tue Mar 19, 2024

Full Length (6 AM-9 AM, 4 PM-7 PM)

All Classes (Lights and Motorcycles, Heavy)

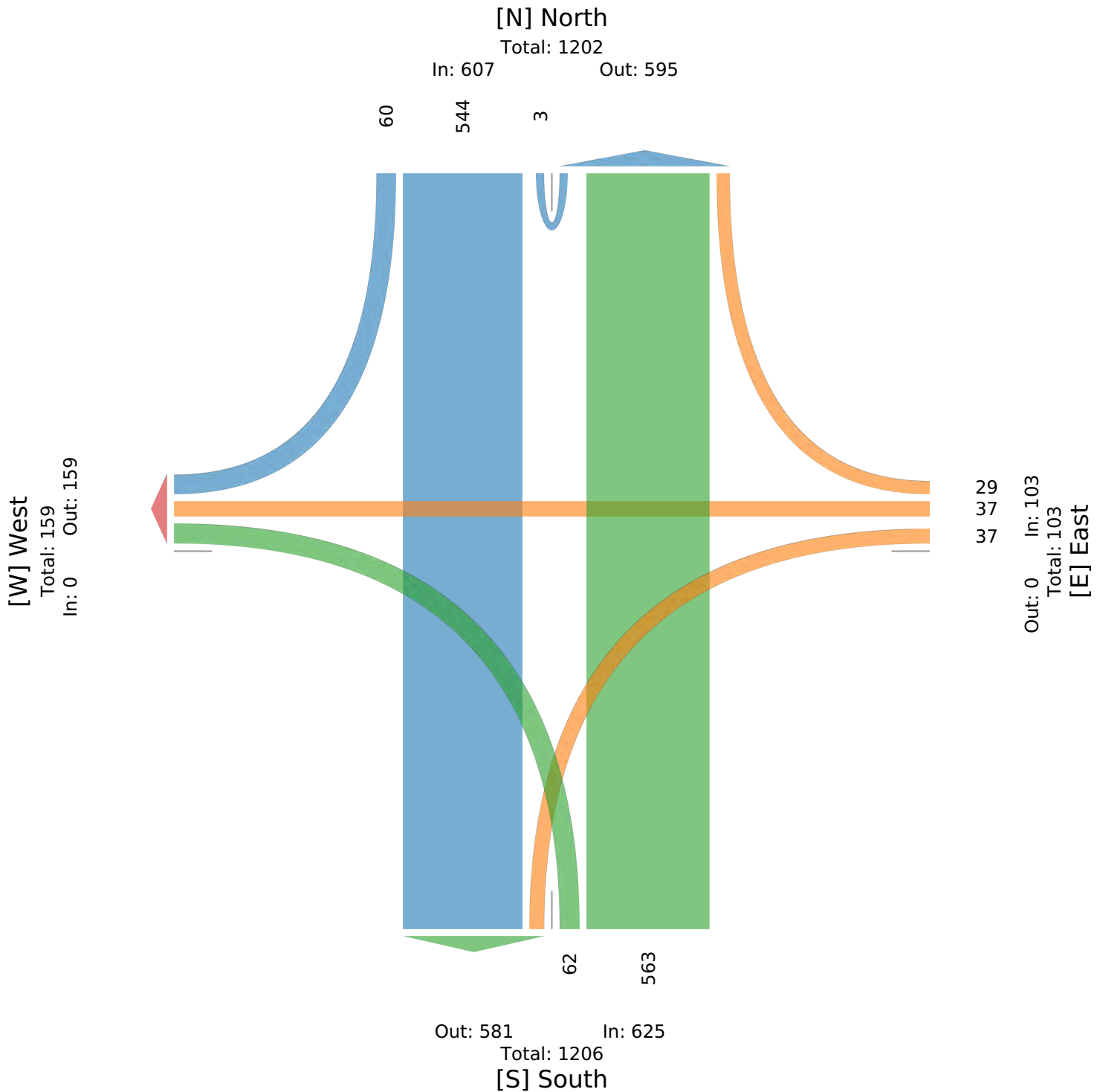
All Movements

ID: 1167070, Location: 39.949944, -86.261409



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MAIN ST & PINE ST - TMC

Tue Mar 19, 2024

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1167070, Location: 39.949944, -86.261409



Provided by: A&F Engineering
8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2024-03-19 7:45AM	1	21	0	0	22	0	32	2	0	34	0	0	0	0	0	0	1	0	0	1	57
8:00AM	1	14	0	0	15	0	49	0	0	49	0	0	0	0	0	1	1	2	0	4	68
8:15AM	0	17	0	0	17	0	28	1	0	29	0	0	0	0	0	1	2	2	0	5	51
8:30AM	1	19	0	0	20	0	37	1	0	38	0	0	0	0	0	4	3	1	0	8	66
Total	3	71	0	0	74	0	146	4	0	150	0	0	0	0	0	6	7	5	0	18	242
% Approach	4.1%	95.9%	0%	0%	-	0%	97.3%	2.7%	0%	-	0%	0%	0%	0%	-	33.3%	38.9%	27.8%	0%	-	-
% Total	1.2%	29.3%	0%	0%	30.6%	0%	60.3%	1.7%	0%	62.0%	0%	0%	0%	0%	0%	2.5%	2.9%	2.1%	0%	7.4%	-
PHF	0.750	0.845	-	-	0.841	-	0.745	0.500	-	0.765	-	-	-	-	-	0.375	0.583	0.625	-	0.563	0.890
Lights and Motorcycles	3	71	0	0	74	0	145	4	0	149	0	0	0	0	0	5	7	5	0	17	240
% Lights and Motorcycles	100%	100%	0%	0%	100%	0%	99.3%	100%	0%	99.3%	0%	0%	0%	0%	-	83.3%	100%	100%	0%	94.4%	99.2%
Heavy	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	2
% Heavy	0%	0%	0%	0%	0%	0%	0.7%	0%	0%	0.7%	0%	0%	0%	0%	-	16.7%	0%	0%	0%	5.6%	0.8%

* L: Left, R: Right, T: Thru, U: U-Turn

MAIN ST & PINE ST - TMC

Tue Mar 19, 2024

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1167070, Location: 39.949944, -86.261409



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

[N] North

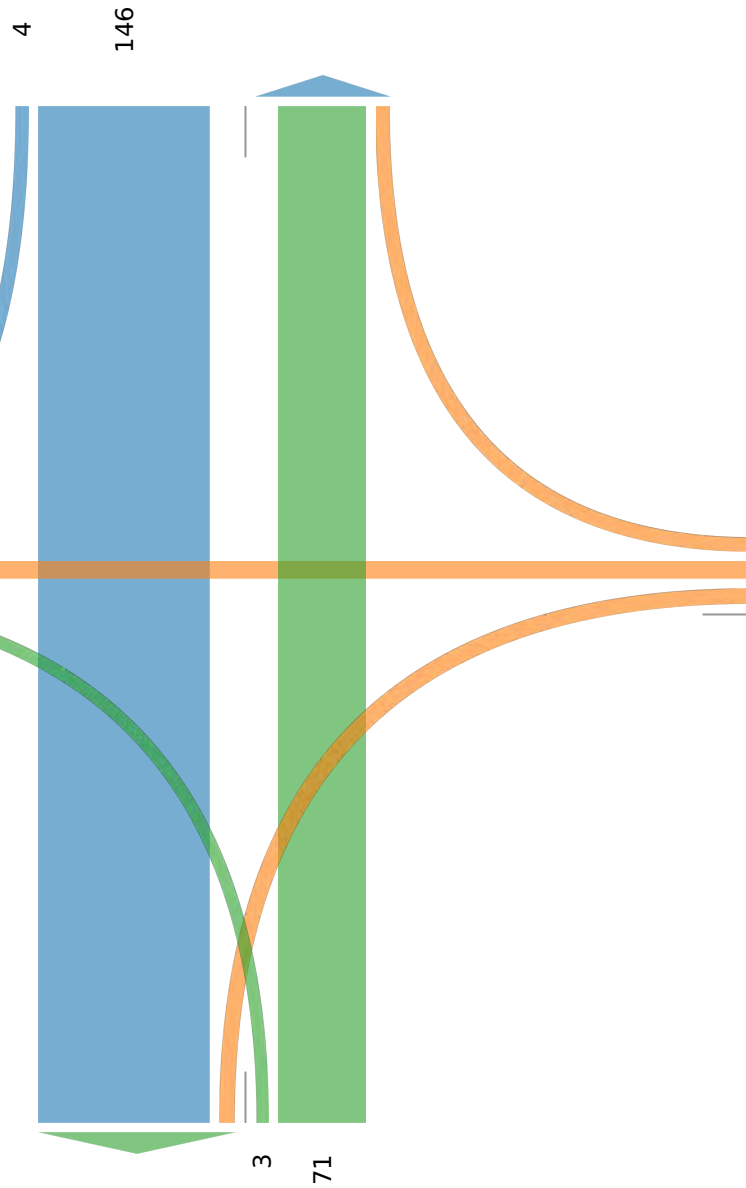
Total: 226

In: 150

Out: 76

[W] West
Total: 14
In: 0 Out: 14

Out: 0 In: 18
Total: 18
[E] East



Out: 152

In: 74

Total: 226

[S] South

MAIN ST & PINE ST - TMC

Tue Mar 19, 2024

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 1167070, Location: 39.949944, -86.261409



Provided by: A&F Engineering
8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2024-03-19 5:00PM	5	28	0	0	33	0	28	2	2	32	0	0	0	0	0	1	1	3	0	5	70
5:15PM	6	39	0	0	45	0	32	4	1	37	0	0	0	0	0	1	3	2	0	6	88
5:30PM	4	49	0	0	53	0	26	3	0	29	0	0	0	0	0	1	1	1	0	3	85
5:45PM	3	47	0	0	50	0	27	5	0	32	0	0	0	0	0	2	3	0	0	5	87
Total	18	163	0	0	181	0	113	14	3	130	0	0	0	0	0	5	8	6	0	19	330
% Approach	9.9%	90.1%	0%	0%	-	0%	86.9%	10.8%	2.3%	-	0%	0%	0%	0%	-	26.3%	42.1%	31.6%	0%	-	-
% Total	5.5%	49.4%	0%	0%	54.8%	0%	34.2%	4.2%	0.9%	39.4%	0%	0%	0%	0%	0%	1.5%	2.4%	1.8%	0%	5.8%	-
PHF	0.750	0.832	-	-	0.854	-	0.883	0.700	0.375	0.878	-	-	-	-	-	0.625	0.667	0.500	-	0.792	0.938
Lights and Motorcycles	18	163	0	0	181	0	113	14	3	130	0	0	0	0	0	5	8	6	0	19	330
% Lights and Motorcycles	100%	100%	0%	0%	100%	0%	100%	100%	100%	100%	0%	0%	0%	0%	-	100%	100%	100%	0%	100%	100%
Heavy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%

* L: Left, R: Right, T: Thru, U: U-Turn

MAIN ST & PINE ST - TMC

Tue Mar 19, 2024

PM Peak (5 PM - 6 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

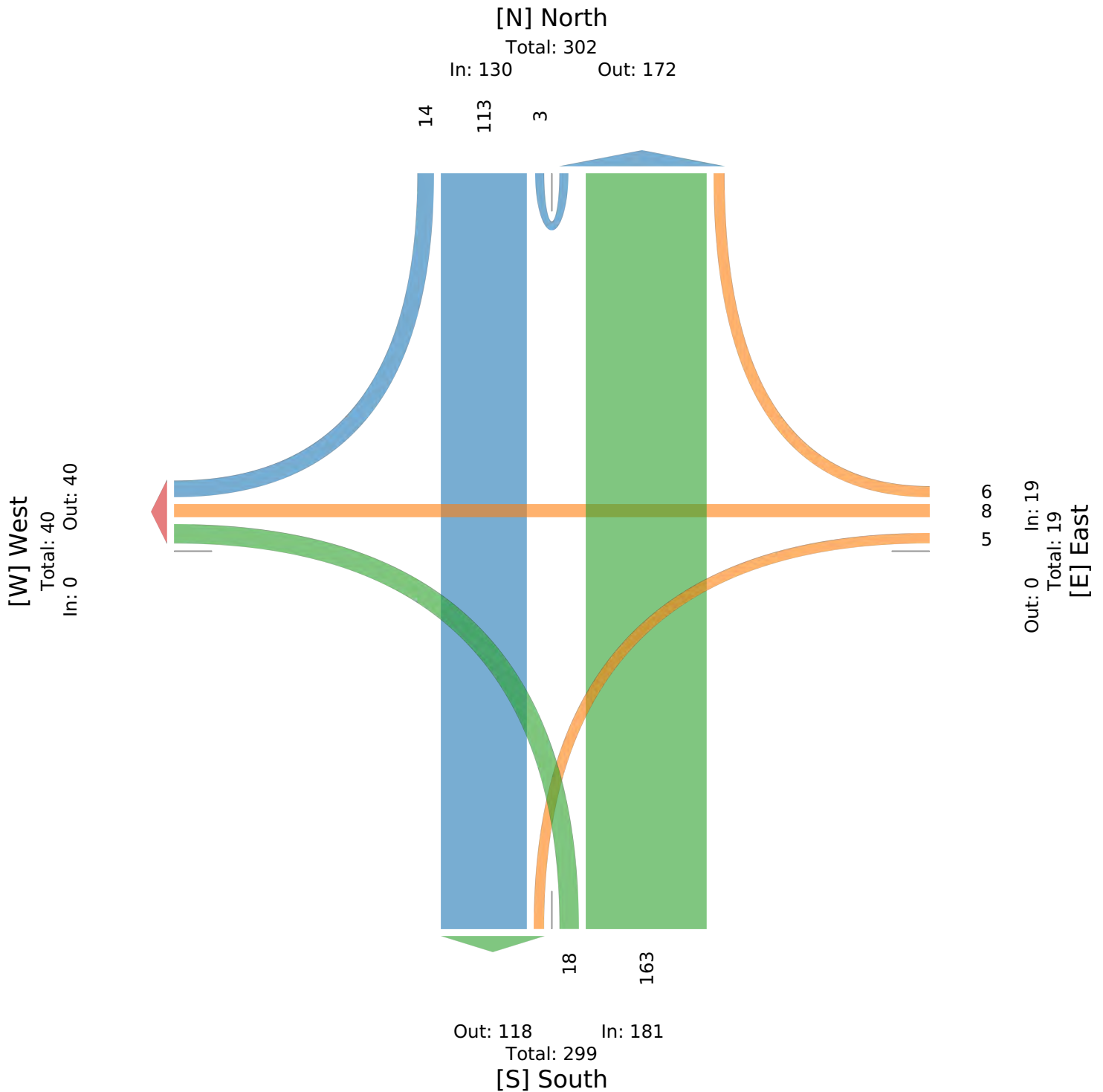
All Movements

ID: 1167070, Location: 39.949944, -86.261409



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US



Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	7	7	5	3	74	0	0	177	4
Future Vol, veh/h	0	0	0	7	7	5	3	74	0	0	177	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	0	8	8	6	3	83	0	0	199	4

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	289	293	83	203	0	-
Stage 1	90	90	-	-	-	-
Stage 2	199	203	-	-	-	-
Critical Hdwy	6.41	6.51	6.21	4.11	-	-
Critical Hdwy Stg 1	5.41	5.51	-	-	-	-
Critical Hdwy Stg 2	5.41	5.51	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	2.209	-	-
Pot Cap-1 Maneuver	704	619	979	1374	-	0
Stage 1	936	822	-	-	0	0
Stage 2	837	735	-	-	0	0
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	702	0	979	1374	-	-
Mov Cap-2 Maneuver	702	0	-	-	-	-
Stage 1	934	0	-	-	-	-
Stage 2	837	0	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	9.65	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	70	-	796	-
HCM Lane V/C Ratio	0.002	-	0.027	-
HCM Control Delay (s/veh)	7.6	0	9.6	-
HCM Lane LOS	A	A	A	-
HCM 95th %tile Q(veh)	0	-	0.1	-

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	6	8	6	29	263	0	0	129	14
Future Vol, veh/h	0	0	0	6	8	6	29	263	0	0	129	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	6	9	6	31	280	0	0	137	15

Major/Minor	Minor1		Major1		Major2					
Conflicting Flow All	479	494	280	152	0	-	-	-	-	0
Stage 1	341	341	-	-	-	-	-	-	-	-
Stage 2	137	152	-	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	-	-	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	-	-	-	-
Pot Cap-1 Maneuver	549	480	764	1441	-	0	0	-	-	-
Stage 1	724	642	-	-	-	0	0	-	-	-
Stage 2	894	775	-	-	-	0	0	-	-	-
Platoon blocked, %					-			-	-	-
Mov Cap-1 Maneuver	535	0	764	1441	-	-	-	-	-	-
Mov Cap-2 Maneuver	535	0	-	-	-	-	-	-	-	-
Stage 1	706	0	-	-	-	-	-	-	-	-
Stage 2	894	0	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	10.92	0.75	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	179	-	630	-
HCM Lane V/C Ratio	0.021	-	0.034	-
HCM Control Delay (s/veh)	7.6	0	10.9	-
HCM Lane LOS	A	A	B	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	7	7	5	3	74	0	0	279	4
Future Vol, veh/h	0	0	0	7	7	5	3	74	0	0	279	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	0	8	8	6	3	83	0	0	313	4

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	403	408	83	318	0	-
Stage 1	90	90	-	-	-	-
Stage 2	313	318	-	-	-	-
Critical Hdwy	6.41	6.51	6.21	4.11	-	-
Critical Hdwy Stg 1	5.41	5.51	-	-	-	-
Critical Hdwy Stg 2	5.41	5.51	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	2.209	-	-
Pot Cap-1 Maneuver	605	534	979	1248	-	0
Stage 1	936	822	-	-	-	0
Stage 2	743	655	-	-	-	0
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	603	0	979	1248	-	-
Mov Cap-2 Maneuver	603	0	-	-	-	-
Stage 1	933	0	-	-	-	-
Stage 2	743	0	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	10.17	0.31	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	70	-	718	-
HCM Lane V/C Ratio	0.003	-	0.03	-
HCM Control Delay (s/veh)	7.9	0	10.2	-
HCM Lane LOS	A	A	B	-
HCM 95th %tile Q(veh)	0	-	0.1	-

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↔			↔			↔	
Traffic Vol, veh/h	0	0	0	6	8	6	29	263	0	0	226	14
Future Vol, veh/h	0	0	0	6	8	6	29	263	0	0	226	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	6	9	6	31	280	0	0	240	15

Major/Minor	Minor1		Major1		Major2					
Conflicting Flow All	582	597	280	255	0	-	-	-	-	0
Stage 1	341	341	-	-	-	-	-	-	-	-
Stage 2	240	255	-	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	-	-	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	-	-	-	-
Pot Cap-1 Maneuver	479	419	764	1321	-	0	0	-	-	-
Stage 1	724	642	-	-	-	0	0	-	-	-
Stage 2	804	700	-	-	-	0	0	-	-	-
Platoon blocked, %					-			-	-	-
Mov Cap-1 Maneuver	465	0	764	1321	-	-	-	-	-	-
Mov Cap-2 Maneuver	465	0	-	-	-	-	-	-	-	-
Stage 1	704	0	-	-	-	-	-	-	-	-
Stage 2	804	0	-	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	11.46	0.77	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBTWBLn1	SBT	SBR
Capacity (veh/h)	179	-	578	-
HCM Lane V/C Ratio	0.023	-	0.037	-
HCM Control Delay (s/veh)	7.8	0	11.5	-
HCM Lane LOS	A	A	B	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-

OAK STREET & FIRST STREET

TRAFFIC VOLUME COUNTS CAPACITY ANALYSIS

OAK ST & FIRST ST - TMC

Tue Mar 26, 2019

Full Length (6:30 AM-8:30 AM, 3 PM-7 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636975, Location: 39.950649, -86.262301, Site Code: 2-86



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2019-03-26 6:30AM	23	6	0	0	29	0	8	7	0	15	4	3	45	0	52	0	0	0	0	0	96
6:45AM	25	1	0	0	26	0	16	5	0	21	3	4	64	0	71	0	0	0	0	0	118
Hourly Total	48	7	0	0	55	0	24	12	0	36	7	7	109	0	123	0	0	0	0	0	214
7:00AM	48	5	0	0	53	0	18	10	0	28	5	2	58	0	65	0	0	0	0	0	146
7:15AM	42	13	0	0	55	0	19	13	0	32	6	3	90	0	99	0	0	0	0	0	186
7:30AM	53	8	0	0	61	0	23	17	0	40	4	6	94	0	104	0	0	0	0	0	205
7:45AM	74	5	0	0	79	1	27	9	0	37	8	12	97	0	117	0	0	0	0	0	233
Hourly Total	217	31	0	0	248	1	87	49	0	137	23	23	339	0	385	0	0	0	0	0	770
8:00AM	84	12	1	0	97	1	39	18	0	58	9	6	94	0	109	0	0	0	0	0	264
8:15AM	71	13	1	0	85	0	32	17	0	49	5	9	102	0	116	0	0	0	0	0	250
8:30AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	155	25	2	0	182	1	71	35	0	107	14	15	196	0	225	0	0	0	0	0	514
3:00PM	113	14	1	0	128	0	15	7	0	22	13	12	84	0	109	0	0	0	0	0	259
3:15PM	116	18	2	0	136	1	15	10	0	26	11	11	86	0	108	0	0	0	0	0	270
3:30PM	102	18	0	0	120	1	26	12	0	39	24	4	76	0	104	0	0	0	0	0	263
3:45PM	108	16	0	0	124	0	45	22	0	67	16	13	81	0	110	0	0	0	0	0	301
Hourly Total	439	66	3	0	508	2	101	51	0	154	64	40	327	0	431	0	0	0	0	0	1093
4:00PM	103	10	4	0	117	1	37	14	0	52	15	8	104	0	127	0	0	0	0	0	296
4:15PM	122	20	2	0	144	0	27	17	0	44	10	10	100	0	120	0	0	0	0	0	308
4:30PM	128	18	1	0	147	3	28	18	0	49	23	12	92	0	127	0	0	0	0	0	323
4:45PM	117	19	4	0	140	4	20	22	0	46	14	9	66	0	89	0	0	0	0	0	275
Hourly Total	470	67	11	0	548	8	112	71	0	191	62	39	362	0	463	0	0	0	0	0	1202
5:00PM	129	22	1	0	152	0	27	21	0	48	10	12	88	0	110	0	0	0	0	0	310
5:15PM	143	19	0	0	162	4	19	18	0	41	7	8	108	0	123	0	0	0	0	0	326
5:30PM	112	19	3	0	134	3	21	28	0	52	20	16	83	0	119	0	0	0	0	0	305
5:45PM	105	12	2	0	119	6	14	23	0	43	15	29	64	0	108	0	0	0	0	0	270
Hourly Total	489	72	6	0	567	13	81	90	0	184	52	65	343	0	460	0	0	0	0	0	1211
6:00PM	90	19	1	0	110	7	0	10	0	17	16	46	0	0	62	0	0	0	0	0	189
6:15PM	116	22	1	0	139	2	17	15	0	34	6	23	56	0	85	1	0	0	0	1	259
6:30PM	93	18	0	0	111	1	20	15	0	36	17	14	85	0	116	0	0	0	0	0	263
6:45PM	98	23	2	0	123	0	24	12	0	36	11	14	99	0	124	0	0	0	0	0	283
Hourly Total	397	82	4	0	483	10	61	52	0	123	50	97	240	0	387	1	0	0	0	1	994
Total	2215	350	26	0	2591	35	537	360	0	932	272	286	1916	0	2474	1	0	0	0	1	5998
% Approach	85.5%	13.5%	1.0%	0%	-	3.8%	57.6%	38.6%	0%	-	11.0%	11.6%	77.4%	0%	-	100%	0%	0%	0%	-	-
% Total	36.9%	5.8%	0.4%	0%	43.2%	0.6%	9.0%	6.0%	0%	15.5%	4.5%	4.8%	31.9%	0%	41.2%	0%	0%	0%	0%	0%	-
Lights and Motorcycles	2170	343	25	0	2538	35	524	356	0	915	269	284	1871	0	2424	1	0	0	0	1	5878
% Lights and Motorcycles	98.0%	98.0%	96.2%	0%	98.0%	100%	97.6%	98.9%	0%	98.2%	98.9%	99.3%	97.7%	0%	98.0%	100%	0%	0%	0%	100%	98.0%
Heavy	45	7	1	0	53	0	13	4	0	17	3	2	45	0	50	0	0	0	0	0	120
% Heavy	2.0%	2.0%	3.8%	0%	2.0%	0%	2.4%	1.1%	0%	1.8%	1.1%	0.7%	2.3%	0%	2.0%	0%	0%	0%	0%	0%	2.0%

* L: Left, R: Right, T: Thru, U: U-Turn

OAK ST & FIRST ST - TMC

Tue Mar 26, 2019

Full Length (6:30 AM-8:30 AM, 3 PM-7 PM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636975, Location: 39.950649, -86.262301, Site Code: 2-86



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

[N] North

Total: 1554

In: 932 Out: 622

360 537 35

[W] West
Total: 5049
In: 2474 Out: 2575

272
286
1916

Out: 347 In: 1
Total: 348
[E] East

Out: 2454 In: 2591
Total: 5045
[S] South

2215
350
26

OAK ST & FIRST ST - TMC

Tue Mar 26, 2019

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636975, Location: 39.950649, -86.262301, Site Code: 2-86



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2019-03-26 7:30AM	53	8	0	0	61	0	23	17	0	40	4	6	94	0	104	0	0	0	0	0	205
7:45AM	74	5	0	0	79	1	27	9	0	37	8	12	97	0	117	0	0	0	0	0	233
8:00AM	84	12	1	0	97	1	39	18	0	58	9	6	94	0	109	0	0	0	0	0	264
8:15AM	71	13	1	0	85	0	32	17	0	49	5	9	102	0	116	0	0	0	0	0	250
Total	282	38	2	0	322	2	121	61	0	184	26	33	387	0	446	0	0	0	0	0	952
% Approach	87.6%	11.8%	0.6%	0%	-	1.1%	65.8%	33.2%	0%	-	5.8%	7.4%	86.8%	0%	-	0%	0%	0%	0%	-	-
% Total	29.6%	4.0%	0.2%	0%	33.8%	0.2%	12.7%	6.4%	0%	19.3%	2.7%	3.5%	40.7%	0%	46.8%	0%	0%	0%	0%	0%	-
PHF	0.839	0.731	0.500	-	0.830	0.500	0.776	0.847	-	0.793	0.722	0.688	0.949	-	0.953	-	-	-	-	-	0.902
Lights and Motorcycles	269	37	1	0	307	2	118	61	0	181	25	33	373	0	431	0	0	0	0	0	919
% Lights and Motorcycles	95.4%	97.4%	50.0%	0%	95.3%	100%	97.5%	100%	0%	98.4%	96.2%	100%	96.4%	0%	96.6%	0%	0%	0%	0%	-	96.5%
Heavy	13	1	1	0	15	0	3	0	0	3	1	0	14	0	15	0	0	0	0	0	33
% Heavy	4.6%	2.6%	50.0%	0%	4.7%	0%	2.5%	0%	0%	1.6%	3.8%	0%	3.6%	0%	3.4%	0%	0%	0%	0%	-	3.5%

* L: Left, R: Right, T: Thru, U: U-Turn

OAK ST & FIRST ST - TMC

Tue Mar 26, 2019

AM Peak (7:30 AM - 8:30 AM)

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636975, Location: 39.950649, -86.262301, Site Code: 2-86



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

[N] North

Total: 248

In: 184 Out: 64

61 121 2

[W] West

Total: 789

Out: 343

In: 446

26 33 387

Out: 37 In: 0

Total: 37

[E] East

Out: 508

In: 322

Total: 830

[S] South

282 38 2

OAK ST & FIRST ST - TMC

Tue Mar 26, 2019

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636975, Location: 39.950649, -86.262301, Site Code: 2-86



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

Leg Direction	South Northbound					North Southbound					West Eastbound					East Westbound					
Time	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	L	T	R	U	App	Int
2019-03-26 4:30PM	128	18	1	0	147	3	28	18	0	49	23	12	92	0	127	0	0	0	0	0	323
4:45PM	117	19	4	0	140	4	20	22	0	46	14	9	66	0	89	0	0	0	0	0	275
5:00PM	129	22	1	0	152	0	27	21	0	48	10	12	88	0	110	0	0	0	0	0	310
5:15PM	143	19	0	0	162	4	19	18	0	41	7	8	108	0	123	0	0	0	0	0	326
Total	517	78	6	0	601	11	94	79	0	184	54	41	354	0	449	0	0	0	0	0	1234
% Approach	86.0%	13.0%	1.0%	0%	-	6.0%	51.1%	42.9%	0%	-	12.0%	9.1%	78.8%	0%	-	0%	0%	0%	0%	-	-
% Total	41.9%	6.3%	0.5%	0%	48.7%	0.9%	7.6%	6.4%	0%	14.9%	4.4%	3.3%	28.7%	0%	36.4%	0%	0%	0%	0%	0%	-
PHF	0.904	0.886	0.375	-	0.927	0.688	0.839	0.898	-	0.939	0.587	0.854	0.819	-	0.884	-	-	-	-	-	0.946
Lights and Motorcycles	509	78	6	0	593	11	91	77	0	179	53	41	351	0	445	0	0	0	0	0	1217
% Lights and Motorcycles	98.5%	100%	100%	0%	98.7%	100%	96.8%	97.5%	0%	97.3%	98.1%	100%	99.2%	0%	99.1%	0%	0%	0%	0%	-	98.6%
Heavy	8	0	0	0	8	0	3	2	0	5	1	0	3	0	4	0	0	0	0	0	17
% Heavy	1.5%	0%	0%	0%	1.3%	0%	3.2%	2.5%	0%	2.7%	1.9%	0%	0.8%	0%	0.9%	0%	0%	0%	0%	-	1.4%

* L: Left, R: Right, T: Thru, U: U-Turn

OAK ST & FIRST ST - TMC

Tue Mar 26, 2019

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy)

All Movements

ID: 636975, Location: 39.950649, -86.262301, Site Code: 2-86



Provided by: A&F Engineering

8365 Keystone Crossing, Suite 201, Indianapolis, IN, 46240, US

[N] North

Total: 316

In: 184 Out: 132

79 94 11

[W] West
Total: 1045
In: 449 Out: 596

54
41
354

Out: 58 In: 0
Total: 58
[E] East

Out: 448 In: 601
Total: 1049
[S] South

517
78
6

Intersection	
Intersection Delay, s/veh	19.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	28	35	416	0	0	0	303	41	2	2	130	66
Future Vol, veh/h	28	35	416	0	0	0	303	41	2	2	130	66
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	31	39	462	0	0	0	337	46	2	2	144	73
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	23.4	19.3	12.4
HCM LOS	C	C	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	88%	6%	1%
Vol Thru, %	12%	7%	66%
Vol Right, %	1%	87%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	346	479	198
LT Vol	303	28	2
Through Vol	41	35	130
RT Vol	2	416	66
Lane Flow Rate	384	532	220
Geometry Grp	1	1	1
Degree of Util (X)	0.642	0.768	0.363
Departure Headway (Hd)	6.014	5.192	5.948
Convergence, Y/N	Yes	Yes	Yes
Cap	600	692	601
Service Time	4.08	3.255	4.027
HCM Lane V/C Ratio	0.64	0.769	0.366
HCM Control Delay, s/veh	19.3	23.4	12.4
HCM Lane LOS	C	C	B
HCM 95th-tile Q	4.6	7.3	1.7

Intersection	
Intersection Delay, s/veh	65.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Traffic Vol, veh/h	55	44	381	0	0	0	556	84	6	12	101	85
Future Vol, veh/h	55	44	381	0	0	0	556	84	6	12	101	85
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	58	46	401	0	0	0	585	88	6	13	106	89
Number of Lanes	0	1	0	0	0	0	0	1	0	0	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	29.7	108.8	13.4
HCM LOS	D	F	B

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	86%	11%	6%
Vol Thru, %	13%	9%	51%
Vol Right, %	1%	79%	43%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	646	480	198
LT Vol	556	55	12
Through Vol	84	44	101
RT Vol	6	381	85
Lane Flow Rate	680	505	208
Geometry Grp	1	1	1
Degree of Util (X)	1.151	0.806	0.367
Departure Headway (Hd)	6.095	6.129	6.609
Convergence, Y/N	Yes	Yes	Yes
Cap	598	596	548
Service Time	4.109	4.129	4.609
HCM Lane V/C Ratio	1.137	0.847	0.38
HCM Control Delay, s/veh	108.8	29.7	13.4
HCM Lane LOS	F	D	B
HCM 95th-tile Q	22.5	8	1.7

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	0	416	0	0	0	303	43	0	0	0	0
Future Vol, veh/h	28	0	416	0	0	0	303	43	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	31	0	462	0	0	0	337	48	0	0	0	0
Number of Lanes	0	1	0	0	0	0	0	1	0	0	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay, s/veh	14.4	15.2
HCM LOS	B	C

Lane	NBLn1	EBLn1
Vol Left, %	88%	6%
Vol Thru, %	12%	0%
Vol Right, %	0%	94%
Sign Control	Stop	Stop
Traffic Vol by Lane	346	444
LT Vol	303	28
Through Vol	43	0
RT Vol	0	416
Lane Flow Rate	384	493
Geometry Grp	1	1
Degree of Util (X)	0.571	0.612
Departure Headway (Hd)	5.349	4.465
Convergence, Y/N	Yes	Yes
Cap	680	799
Service Time	3.349	2.536
HCM Lane V/C Ratio	0.565	0.617
HCM Control Delay, s/veh	15.2	14.4
HCM Lane LOS	C	B
HCM 95th-tile Q	3.6	4.3

Intersection												
Intersection Delay, s/veh	45.5											
Intersection LOS	E											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	0	381	0	0	0	556	90	0	0	0	0
Future Vol, veh/h	55	0	381	0	0	0	556	90	0	0	0	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	58	0	401	0	0	0	585	95	0	0	0	0
Number of Lanes	0	1	0	0	0	0	0	1	0	0	0	0

Approach	EB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		EB
Conflicting Lanes Left	0	1
Conflicting Approach Right	NB	
Conflicting Lanes Right	1	0
HCM Control Delay, s/veh	19.3	63.1
HCM LOS	C	F

Lane	NBLn1	EBLn1
Vol Left, %	86%	13%
Vol Thru, %	14%	0%
Vol Right, %	0%	87%
Sign Control	Stop	Stop
Traffic Vol by Lane	646	436
LT Vol	556	55
Through Vol	90	0
RT Vol	0	381
Lane Flow Rate	680	459
Geometry Grp	1	1
Degree of Util (X)	1.02	0.683
Departure Headway (Hd)	5.4	5.355
Convergence, Y/N	Yes	Yes
Cap	673	670
Service Time	3.434	3.414
HCM Lane V/C Ratio	1.01	0.685
HCM Control Delay, s/veh	63.1	19.3
HCM Lane LOS	F	C
HCM 95th-tile Q	16.8	5.4

HCM 7th Signalized Intersection Summary

7: 1st St & Oak St

2024 AM Peak
Proposed Conditions - Signal

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	0	416	0	0	0	303	43	0	0	0	0
Future Volume (veh/h)	28	0	416	0	0	0	303	43	0	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1841	1841	1841				1841	1841	1841			
Adj Flow Rate, veh/h	31	0	462				337	48	0			
Peak Hour Factor	0.90	0.90	0.90				0.90	0.90	0.90			
Percent Heavy Veh, %	4	4	4				4	4	4			
Cap, veh/h	41	0	617				485	69	0			
Arrive On Green	0.42	0.00	0.42				0.31	0.31	0.00			
Sat Flow, veh/h	99	0	1472				1544	220	0			
Grp Volume(v), veh/h	493	0	0				385	0	0			
Grp Sat Flow(s),veh/h/ln	1571	0	0				1764	0	0			
Q Serve(g_s), s	10.0	0.0	0.0				7.2	0.0	0.0			
Cycle Q Clear(g_c), s	10.0	0.0	0.0				7.2	0.0	0.0			
Prop In Lane	0.06		0.94				0.88		0.00			
Lane Grp Cap(c), veh/h	658	0	0				554	0	0			
V/C Ratio(X)	0.75	0.00	0.00				0.69	0.00	0.00			
Avail Cap(c_a), veh/h	1634	0	0				1928	0	0			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	0.00	0.00				1.00	0.00	0.00			
Uniform Delay (d), s/veh	9.2	0.0	0.0				11.3	0.0	0.0			
Incr Delay (d2), s/veh	1.7	0.0	0.0				1.6	0.0	0.0			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.0				2.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	11.0	0.0	0.0				12.9	0.0	0.0			
LnGrp LOS	B						B					
Approach Vol, veh/h	493						385					
Approach Delay, s/veh	11.0						12.9					
Approach LOS	B						B					
Timer - Assigned Phs	2			4								
Phs Duration (G+Y+Rc), s	16.8			20.7								
Change Period (Y+Rc), s	5.0			5.0								
Max Green Setting (Gmax), s	41.0			39.0								
Max Q Clear Time (g_c+l1), s	9.2			12.0								
Green Ext Time (p_c), s	2.6			3.8								
Intersection Summary												
HCM 7th Control Delay, s/veh				11.8								
HCM 7th LOS				B								

HCM 7th Signalized Intersection Summary

7: 1st St & Oak St

2024 PM Peak
Proposed Conditions - Signal

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	0	381	0	0	0	556	90	0	0	0	0
Future Volume (veh/h)	55	0	381	0	0	0	556	90	0	0	0	0
Initial Q (Qb), veh	0	0	0				0	0	0			
Lane Width Adj.	1.00	1.00	1.00				1.00	1.00	1.00			
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00			
Work Zone On Approach		No						No				
Adj Sat Flow, veh/h/ln	1885	1885	1885				1885	1885	1885			
Adj Flow Rate, veh/h	58	0	401				585	95	0			
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95			
Percent Heavy Veh, %	1	1	1				1	1	1			
Cap, veh/h	70	0	486				726	118	0			
Arrive On Green	0.34	0.00	0.34				0.47	0.47	0.00			
Sat Flow, veh/h	205	0	1415				1555	253	0			
Grp Volume(v), veh/h	459	0	0				680	0	0			
Grp Sat Flow(s),veh/h/ln	1620	0	0				1807	0	0			
Q Serve(g_s), s	13.7	0.0	0.0				16.9	0.0	0.0			
Cycle Q Clear(g_c), s	13.7	0.0	0.0				16.9	0.0	0.0			
Prop In Lane	0.13		0.87				0.86		0.00			
Lane Grp Cap(c), veh/h	556	0	0				844	0	0			
V/C Ratio(X)	0.83	0.00	0.00				0.81	0.00	0.00			
Avail Cap(c_a), veh/h	831	0	0				1819	0	0			
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00			
Upstream Filter(I)	1.00	0.00	0.00				1.00	0.00	0.00			
Uniform Delay (d), s/veh	15.8	0.0	0.0				12.0	0.0	0.0			
Incr Delay (d2), s/veh	4.3	0.0	0.0				1.9	0.0	0.0			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0				0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.0	0.0	0.0				5.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.2	0.0	0.0				13.9	0.0	0.0			
LnGrp LOS	C						B					
Approach Vol, veh/h	459						680					
Approach Delay, s/veh	20.2						13.9					
Approach LOS	C						B					
Timer - Assigned Phs	2			4								
Phs Duration (G+Y+Rc), s	29.6			23.1								
Change Period (Y+Rc), s	5.0			5.0								
Max Green Setting (Gmax), s	53.0			27.0								
Max Q Clear Time (g_c+l1), s	18.9			15.7								
Green Ext Time (p_c), s	5.7			2.4								
Intersection Summary												
HCM 7th Control Delay, s/veh	16.4											
HCM 7th LOS	B											