

# JAMES E. MCDADE CLASSICAL ELEMENTARY SCHOOL PROPOSED ANNEX EXPANSION/RENOVATION

## Traffic Impact Study



Prepared for:



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# DRAFT

**KNIGHT**

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## EXECUTIVE SUMMARY

Knight E/A, Inc. (Knight) was retained by The Public Building Commission of Chicago (PBCC) to prepare a traffic impact study for the proposed annex expansion and renovation of James E. McDade Classical Elementary School. The school is located at 8801 South Indiana Avenue and is generally within the block bounded by 87th Street to the north, Calumet Avenue to the east, 89th Street to the south, and Indiana Avenue to the west. The existing school currently serves students in Kindergarten through sixth grade, has a current enrollment of 195 students, and a total capacity of 240 students.

The proposed annex would primarily contain a gymnasium/multi-purpose room, science lab, and classroom while renovations within the existing building would create a lunchroom/multi-purpose room and kitchen and update classrooms, offices, bathrooms, auxiliary spaces, and library. Overall, the expansion and renovation would allow for the school to offer grades seventh and eighth and serve 105 additional students for a total capacity of 300 students. No changes to the access are proposed, although the parking lot is proposed to be reduced by ten parking spaces to provide a total of 30 spaces.

To understand the traffic operation of the school and the surrounding street network, the following intersections were included in the study area.

- Indiana Avenue with 87<sup>th</sup> Street
- Indiana Avenue with 88<sup>th</sup> Street
- Indiana Avenue with McDade Parking Lot Access Drive
- Indiana Avenue with 89<sup>th</sup> Street
- 87<sup>th</sup> Street with Prairie Avenue
- 89<sup>th</sup> Street with Prairie Avenue
- 88<sup>th</sup> Street with Calumet Avenue

Vehicular, pedestrian, and bicycle traffic counts were conducted via video data collection at these intersections during the morning peak period (7:00 A.M. to 9:00 P.M.), the afternoon school dismissal period (2:00 P.M. to 4:00 P.M.), and the evening peak period (5:00 P.M. to 9:00 P.M.) as requested by the PBCC. In addition, the drop-off/pick-up lay-by lane on Indiana Avenue was also counted and observed. The traffic counts, along with multiple field visits, provided an overall understanding of the morning arrival (drop-off) and afternoon dismissal (pick-up) peak periods, which are described in detail within the report. Overall, the drop-off/pick-up activity occurs curbside and within the lay-by lane on Indiana Avenue, both sides of 88<sup>th</sup> Street, and in the parking lot. From these observations and the traffic counts, Knight determined the number of vehicle trips generated during the morning and afternoon peak periods. These rates were then used to determine the increase in vehicle trips under projected conditions.

The existing and projected traffic conditions were analyzed using the Synchro/SimTraffic 9.0 traffic capacity analysis and simulation software. All existing intersections operate at acceptable levels of service and experience minimal increases in delay under projected conditions. A significant portion of the traffic on these streets is related to the school, and therefore peaks generally only occur within a 20 to 30 minute period surrounding the start or end of the school day. During these times, the intersections continue to operate under capacity, although some additional delay is observed adjacent to the school due to conflicts with drop-off/pick-up traffic and pedestrians. Overall, no capacity improvements are required. However, in order to improve pedestrian safety in the area, the installation of pedestrian countdown timers should be considered for all legs at the intersection of Indiana Avenue with 87<sup>th</sup> Street. Furthermore, the installation of high visibility crosswalk striping should be considered on the south and west legs.

The following recommendations are also provided to improve upon the existing drop-off/pick-up operation as well as mitigate the increase in traffic under projected conditions.

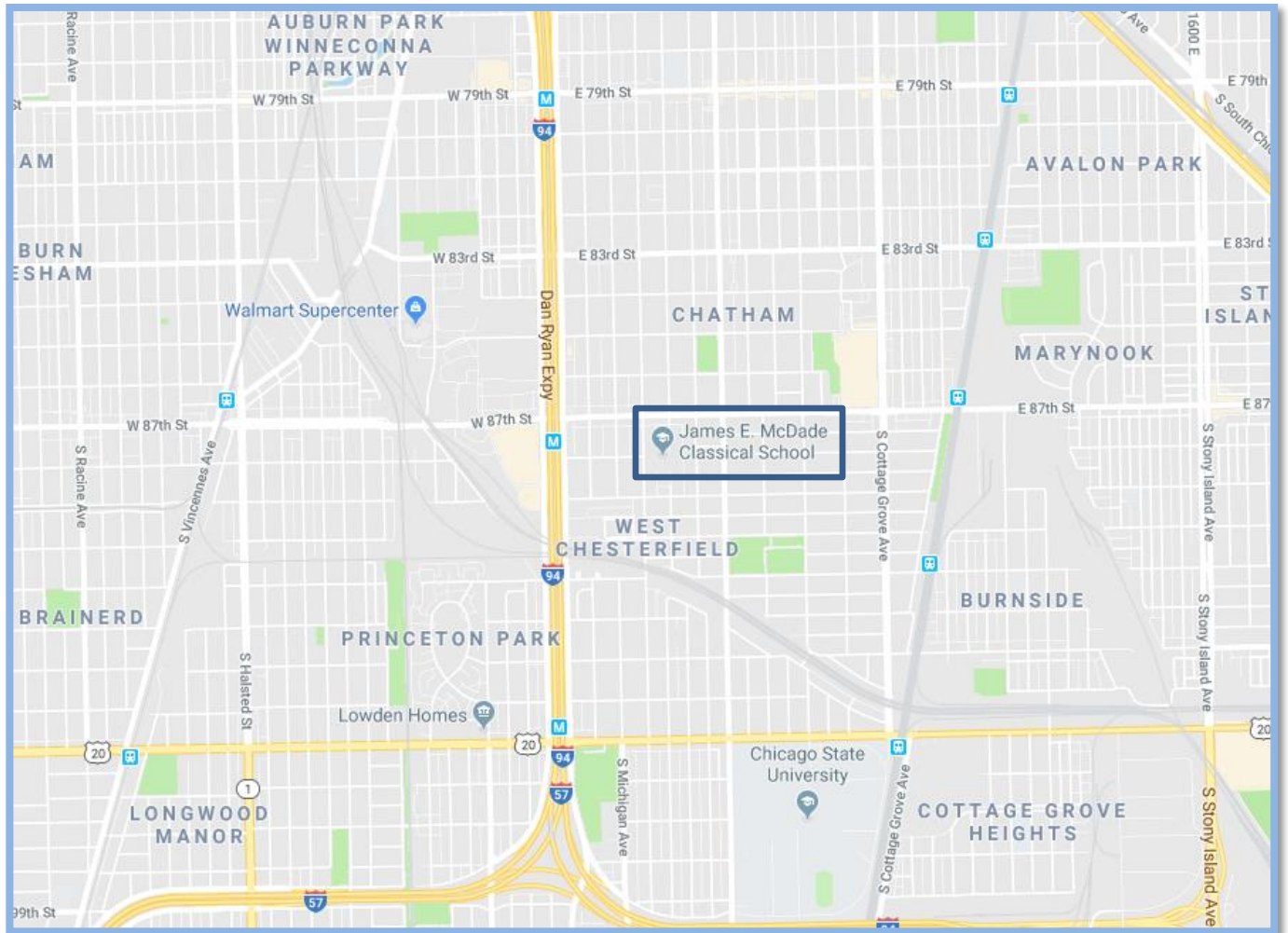
- Continue to encourage parents/guardians to drop-off and pick-up their student on the east side of Indiana Avenue and on both sides of 88<sup>th</sup> Street. They should also be instructed to avoid parking within the lay-by lane for extended periods of time.
- Provide additional parking restrictions on school days (7:00 A.M. to 4:30 P.M.) south of the parking lot access drive. The restriction should be long enough to accommodate any buses unable to park along the school frontage.
- Place the three existing cones within the street on the east side of the intersection of Indiana Avenue with 88<sup>th</sup> Street to more effectively prevent conflicts with buses and drop-off/pick-up activity within the intersection.
- Station a staff member at the lay-by lane during the morning and afternoon peak periods to actively limit the improper use of the lay-by lane and curbside.
- Consideration should be given to allowing private transportation vans to pick up students within the school parking lot or should be instructed to arrive after the buses depart from the lay-by lane.
- Monitor the parking lot in the future to determine if drop-off activity should be restricted during the morning arrival period. Similar to the afternoon dismissal peak period, a staff member should be stationed at the entrance to prevent drop-off traffic from entering.
- Consider extending the existing lay-by lane to the south to maximize the school's adjacent curbside.

# 1 – INTRODUCTION

Knight E/A, Inc. was retained by the Public Building Commission of Chicago (PBCC) to prepare a traffic impact study for the proposed annex expansion/renovation of James E. McDade Classical Elementary School in Chicago, Illinois. The school is located at 8801 South Indiana Avenue and is generally within the block bounded by 87<sup>th</sup> Street to the north, Calumet Avenue to the east, 89<sup>th</sup> Street to the south, and Indiana Avenue to the west. The existing school currently serves students in Kindergarten through sixth grade, has a current enrollment of 195 students, and a total capacity of 240 students. A map of the study location and an aerial photograph of the existing surrounding street network are presented in **Exhibit 1.1** and **Exhibit 1.2**.

As proposed, the school is to be expanded/renovated to increase the capacity to 300 students and serve the seventh and eighth grades. Improvements to the existing school will include renovations to the existing facility as well as a one-story annex located to the northeast of the existing building. The annex will primarily contain a gymnasium/multi-purpose room, science lab, and classroom. No changes to the existing parking lot access drive will result from the expansion, although a new trash enclosure will be constructed within the parking lot resulting in the loss of ten spaces (projected total of 30 spaces).

The purpose of this study was to determine the projected impacts on traffic operations and identify any necessary improvements/modifications to the street network, traffic control, or school operation. As a part of this study, the existing street network surrounding the school was observed, counted, and analyzed to determine the operation at the study intersections during the weekday hourly peaks in the morning, during the school dismissal period, and in the evening. New trips generated based on the projected capacity following the expansion/renovation and background traffic conditions were determined and assigned to the street network to evaluate future traffic conditions. This report presents and documents the data collection, summarizes the evaluation of traffic conditions on the surrounding street network, details the potential impact of the projected school traffic on the adjacent street network, and identifies recommendations to mitigate operational issues.



**Exhibit 1.1: Site Location Map**





**Exhibit 1.2: Aerial View of Poe Classical Elementary School**

## 2 – EXISTING CONDITIONS

The study area and adjacent streets were evaluated through field data collection and traffic counts. Information regarding the characteristics and operation of the school are based on observations, contact with school officials, and publicized data. A detailed summary of the findings are as follows.

### 2.1 Study Area

The study area is located within the West Chesterfield neighborhood of Chicago and is defined by 87<sup>th</sup> Street to the north, Calumet Avenue to the east, 89<sup>th</sup> Street to the south, and Indiana Avenue to the west. The area is primarily occupied by residential land uses although some commercial/industrial uses are located to the east and west along 87<sup>th</sup> Street. It should be noted that the Dan Ryan (I-94) Expressway is located approximately one-quarter mile west of Indiana Avenue. Furthermore, the Jane A. Neil Elementary School is located in the northwest corner of the intersection of 86<sup>th</sup> Street with Indiana Avenue.

### 2.2 Existing Street Characteristics

A description of the existing street system within the study area follows and is illustrated in **Exhibit 2.1**. This information was primarily collected from online databases or obtained during a field investigation. It should be noted that all streets are under the jurisdiction of the Chicago Department of Transportation (CDOT) unless otherwise noted.

*Indiana Avenue* is a north-south street generally providing one lane in each direction with parking on both sides of the street. Indiana Avenue has a signalized intersection with 87<sup>th</sup> Street and is under stop sign control at its intersections with 88<sup>th</sup> Street and 89<sup>th</sup> Street. A speed hump and lay-by lane are provided near the school and parking is generally permitted on both sides of the street (restricted to Residential Permit #1049 north of 88<sup>th</sup> Street). Parking is restricted on school day from 7:30 A.M. to 4:00 P.M. along the school frontage.

*87<sup>th</sup> Street* is an east-west arterial street providing two lanes in each direction. Parking is provided on both sides, except when peak period restrictions are in effect. During the weekday morning peak (7:00 A.M. to 9:00 A.M.), parking is prohibited on the north side of 87<sup>th</sup> Street and prohibited on the south side during the evening peak (4:00 P.M. to 6:00 P.M.). 87<sup>th</sup> Street has a signalized intersection with Indiana Avenue. All other intersections between State Street to the west and Martin Luther King Drive to the east are under all-way stop sign control. 87<sup>th</sup> Street is under the jurisdiction of the Cook County Department of Transportation and Highways (CCDOTH) and carries an Average Annual Daily Traffic (AADT) volume of 28,300 vehicles per day according to the Illinois Department of Transportation (IDOT).

*89<sup>th</sup> Street* is an east-west street providing one lane in each direction with parking on both sides of the street. All intersections in the area are under all-way stop sign control.

*Calumet Avenue* is a north-south street restricted to one-way southbound travel only. It is under all-way stop sign control at all intersections in the vicinity of the site. Parking is generally provided on both sides of the street.

*Prairie Street* is a north-south street divided by the McDade campus. The north segment terminates in a cul-de-sac while the south segment terminates into a dead end. South of 89<sup>th</sup> Street, Prairie Street is restricted to one-way northbound travel only. Parking is provided on both sides of the street and all intersections are under stop sign control.



88<sup>th</sup> Street is an east-west street divided by the McDade campus. The west segment is restricted to one-way westbound travel only and extends west from its 'T'-intersection with Indiana Avenue. The east segment extends to the east from the north-south alley (immediately east of the campus) and is restricted to one-way eastbound travel (except the segment between alley and Calumet Avenue). Parking is generally provided on both sides of the street.

In addition to the street network, access to the school parking lot is provided along Indiana Avenue immediately south of the school building. The existing parking lot provides approximately 40 parking spaces. It should be noted that all intersections provide crosswalk striping for each leg of the intersection. However, the intersections along Calumet Avenue provide standard crosswalk striping while the others provide high-visibility striping per CDOT's current standards. Furthermore, the signalized intersection of 87<sup>th</sup> Street with Indiana Avenue does not provide pedestrian signal countdown timers.

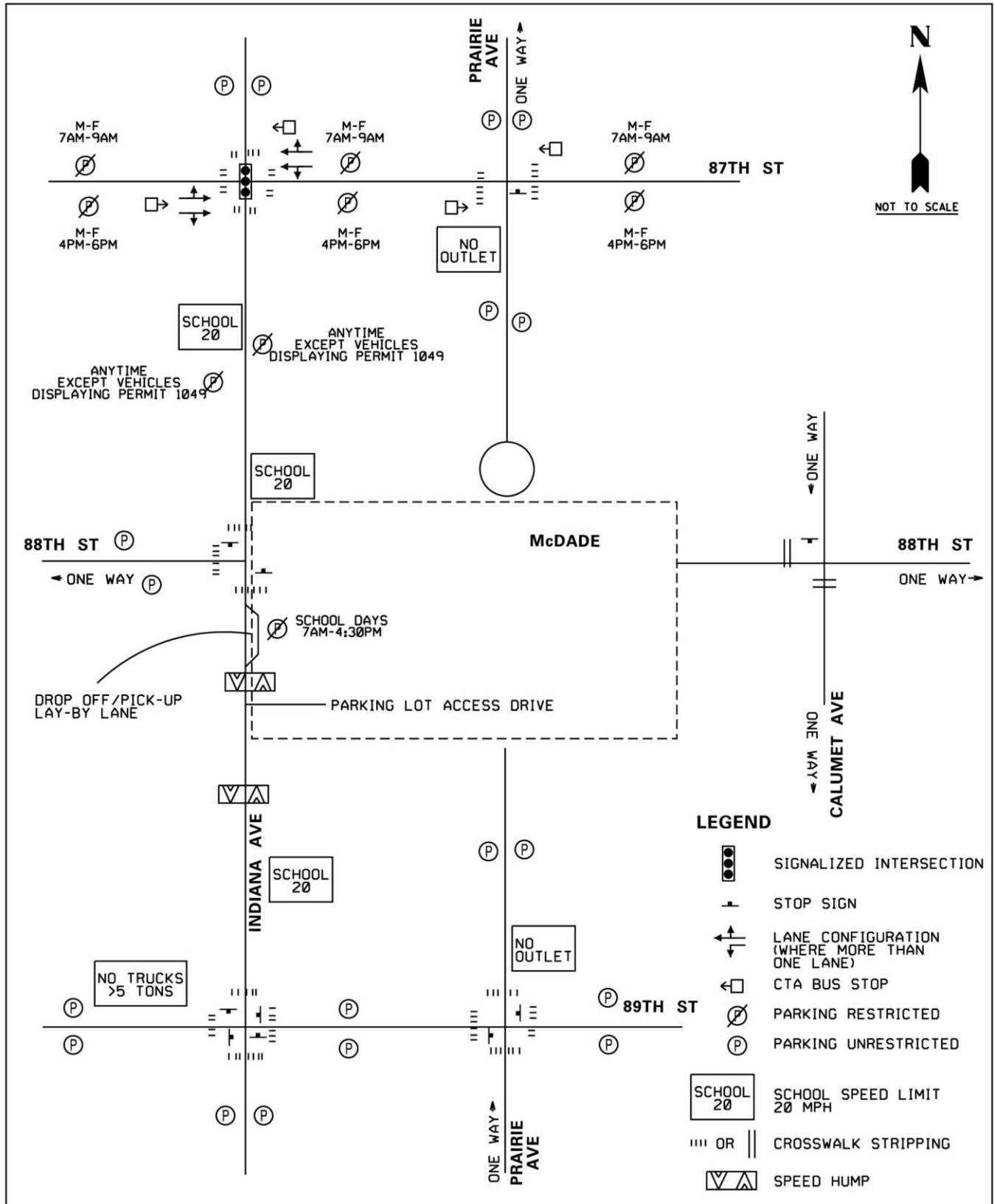
### 2.3 Traffic Count Data

In order to determine existing conditions in the area, traffic counts were conducted at the following study area intersections to capture vehicle, pedestrian, and bicycle data using Miovision Scout Data Collection Units.

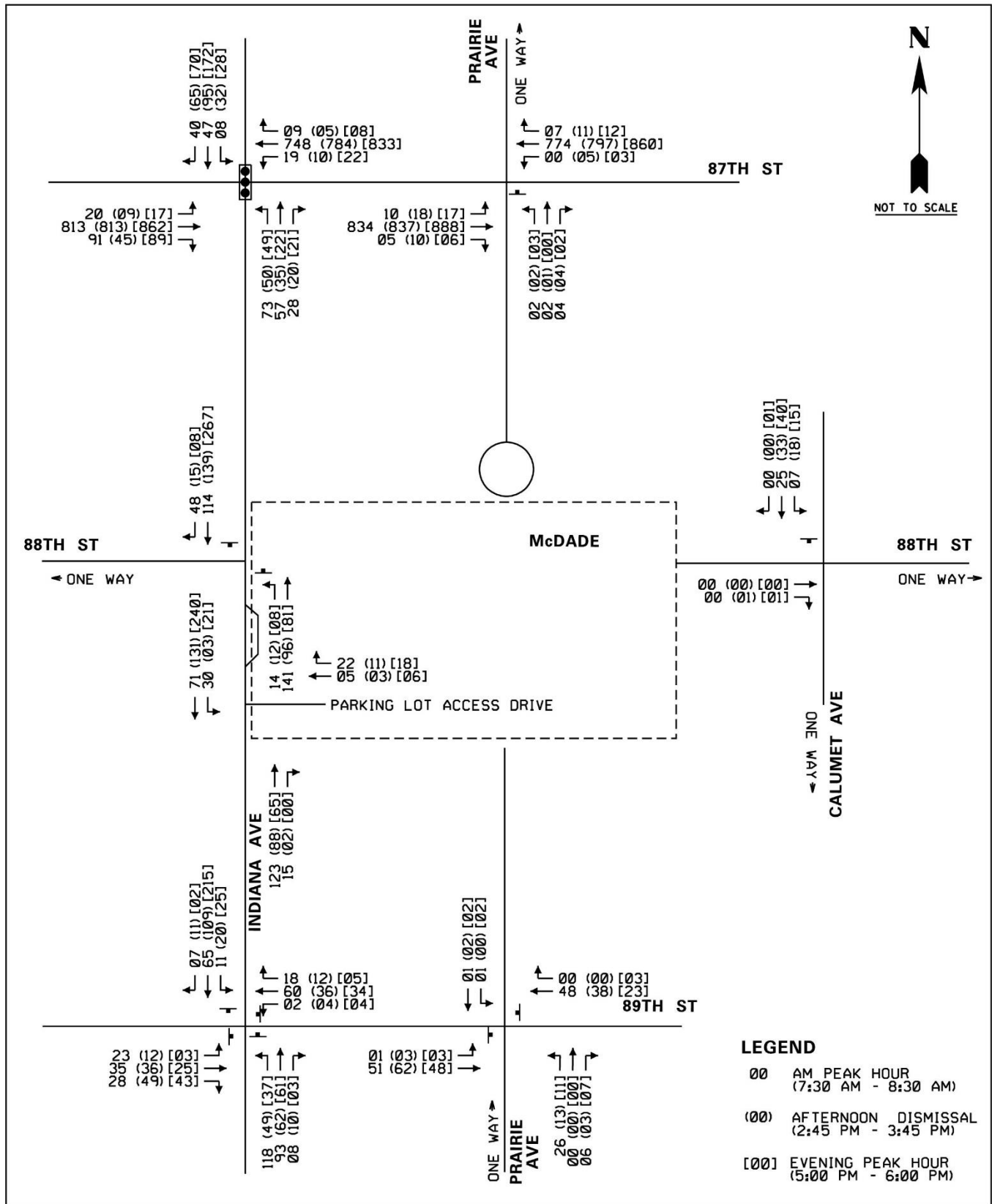
- Indiana Avenue with 87<sup>th</sup> Street
- Indiana Avenue with 88<sup>th</sup> Street
- Indiana Avenue with McDade Parking Lot Access Drive
- Indiana Avenue with 89<sup>th</sup> Street
- 87<sup>th</sup> Street with Prairie Avenue
- 89<sup>th</sup> Street with Prairie Avenue
- 88<sup>th</sup> Street with Calumet Avenue

Based on input from the PBCC, counts were conducted on Thursday, October 25, 2018 to capture the morning peak period (7:00 A.M. to 9:00 P.M.), the afternoon school dismissal period (2:00 P.M. to 4:00 P.M.), and the evening peak period (5:00 P.M. to 9:00 P.M.). In addition, a Miovision Scout Unit was also located near the drop-off/pick-up lay-by lane on Indiana Avenue for additional counts and video observations.

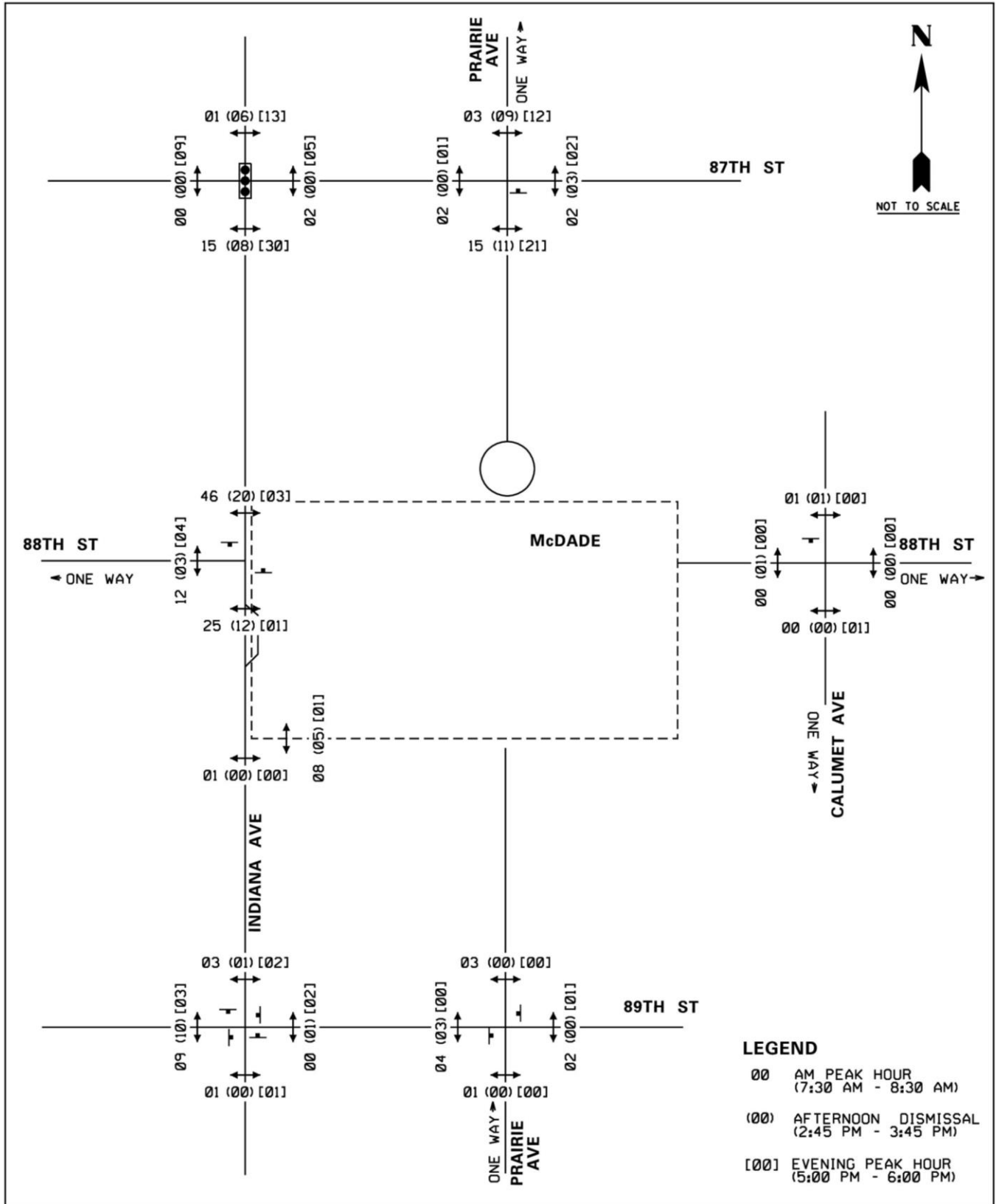
The results indicate that overall peak traffic conditions of the street network take place from 7:30 A.M. to 8:30 A.M. during the morning peak hour, 2:45 P.M. to 3:45 P.M. during the afternoon school dismissal peak period, and 5:00 P.M. to 6:00 P.M. during the evening peak hour. These volumes demonstrate the overall demand within the study area. The existing weekday morning, afternoon school dismissal, and evening peak hour traffic volumes are illustrated in **Exhibit 2.2** and pedestrian volumes are illustrated in **Exhibit 2.3**. It should be noted that bicycle traffic at all intersections was minimal within the study area (less than five) and therefore not included in the exhibits.



**Exhibit 2.1 – Existing Conditions**



**Exhibit 2.2 – Existing Traffic Volumes**



**Exhibit 2.3 – Existing Pedestrian Volumes**

## **2.4 Existing School Characteristics and Drop-off/Pick-Up Operation**

The following description of the school and its morning drop-off and afternoon pick-up periods are based on information acquired from school officials, field observations made during the morning and afternoon on October 30, 2018 throughout the study area, and from observations of the Miovision Scout Data Collection Unit videos from October 25, 2018 at each intersection and of the lay-by lane.

The existing James E. McDade Classical School serves 195 students Kindergarten through sixth grade. It currently has a total of 17 faculty and staff with an ideal capacity of 240 students. While it is part of the Chicago Public School (CPS) System, McDade Classical is a selective enrollment school with students chosen based on applications and testing. A typical school day is in session from 7:45 A.M. to 2:45 P.M. Students are to be dropped off no earlier than 7:30 A.M. (no supervision prior to that time). Following the school dismissal, an “After Care” program (provided by “Something to Build Upon”) as well as McDade school activities are provided. The “After Care” program, similar to a daycare, is provided from 2:45 P.M. to 6:00 P.M. every day school is in session and the after-school activities are enrichment programs typically offered several days per week. Overall, approximately 100 students participate in the After Care program or McDade’s after-school activities.

It is important to note that most, if not all, faculty/staff drive to work and park within the parking lot. Also, only approximately five students live in the neighborhood. A significant majority of the students, (approximately 93 percent) are located within McDade’s CPS bus boundary, which extends between 38<sup>th</sup> Street and 106<sup>th</sup> Street (city boundaries are east-west limits). Other students utilize private van transportation (particularly for after-school daycares) and a select few require SCR Medical transportation. For safety and efficiency, parents/guardians are instructed to avoid using the parking lot and west side of Indiana Avenue when dropping off or picking up. During the morning and afternoon peak periods, three cones are located near the intersection of Indiana Avenue with 88<sup>th</sup> Street to prevent drop-off/pick-up between the crosswalks and conflicts with buses. However, these cones were not observed to be located within the street and therefore were not serving their intended purpose.

### **2.4.1 Morning School Drop-Off Period**

Starting around 7:25 A.M., multiple full-length school buses arrive and park along Indiana Avenue and within the lay-by lane and subsequently unload around 7:30 A.M. Also around this time, a crossing guard is positioned at the southwest corner of the intersection of Indiana Avenue with 88<sup>th</sup> Street to assist pedestrians across the north and south legs of the intersection. Student drop off increases significantly after 7:30 A.M. and continues to the start of school with all students proceeding to the northeast side of the building, where they will enter through Door #2. Drop-off activity primarily occurs within the parking lot, lay-by lane, both sides of 88<sup>th</sup> Street, and both sides of Indiana Avenue (mostly near 88<sup>th</sup> Street). Some notable safety issues that were observed include double parking (including by buses), students not crossing at the crosswalk, and parking between the crosswalks opposite 88<sup>th</sup> Street. Furthermore, several vehicles were parked within the lay-by lane for extended periods of time, resulting in less space for vehicles waiting to drop off. Activity decreased around 7:45 A.M., although occasional drop offs continued until around 8:15 A.M., when the crossing guard left the intersection.



No students were observed walking to the school. Furthermore, while breaks in the fence surrounding the campus are provided at the north and south termini of Prairie Street and the west terminus of 88<sup>th</sup> Street, no drop-off activity was observed at these locations. It should be noted the existing parking lot was approximately half-full with most vehicles parked on the western half of the lot. This allowed for a large area for vehicles to turn around before/after dropping off their student near the northeast corner of the school. Egress from the parking lot operated efficiently with minimal delays. Overall, intersections in the area during the morning drop-off period continued to operate efficiently, including the signalized intersection of Indiana Avenue with 87<sup>th</sup> Street. Occasional queuing occurred at the intersection of Indiana Avenue with 88<sup>th</sup> Street primarily due to the crossing guard and pedestrians.

#### **2.4.2 Afternoon School Pick-up Period**

Prior to 2:30 P.M., parents/guardians were already parked along Indiana Avenue and 88<sup>th</sup> Street and full-length buses were located within the lay-by lane. As additional buses arrived, they extended south beyond the parking lot access drive. One bus was required to double-park due to the curbside parking on the east side of Indiana Avenue. At 2:30 P.M., a staff member closed one half of the parking lot access drive and was stationed there to allow vehicles to exit, but not permit any pick-up activity within the parking lot. Leading up to the dismissal, private transportation vans also arrived and parked on Indiana Avenue and 88<sup>th</sup> Street. Some of these vans were observed to park illegally or have difficulty parallel parking along the curbside. Parents/guardians began exiting their vehicle to retrieve their student, with many of them congregating near Door #1 (northwest corner of the school).

Prior to the release of students at 2:45 P.M., two staff members (one of which was wearing a reflective vest) were observed along Indiana Avenue in front of the school to assist students onto the buses. At 2:45 P.M., students are dismissed, parents/guardians collected their students, and returned to their vehicles. By 2:50 P.M., the first school bus departed the school and the last bus departed within five minutes. After 2:55 P.M., activity decreased significantly and the majority of the remaining pick-up activity occurred within the lay-by lane. It should be noted that the SCR Medical transportation van was parked within the parking lot prior to 2:30 P.M. and departed directly from there.

Overall, most intersections continued to operate efficiently during the peak afternoon pick-up period. Westbound queuing was observed at the signalized intersection of 87<sup>th</sup> Street with Indiana Avenue, although this was primarily due to the downstream intersections. As previously stated, the increase in pedestrians cause occasional queuing along Indiana Avenue at 88<sup>th</sup> Street. Given the minimal outbound trips from the parking lot, exiting vehicles operate efficiently.

### 3 – PROPOSED EXPANSION/RENOVATION AND PROJECTED CONDITIONS

This section of the report outlines the proposed expansion/renovation, summarizes site-specific traffic characteristics, and identifies other characteristics impacting the analysis of future conditions.

#### 3.1 Description and Characteristics of the Proposed Expansion/Renovation

The annex expansion/renovation will allow McDade Classical to serve the seventh and eighth grades by increasing ideal capacity by nearly 60 students to 300 total students (increase of 105 students when compared to existing enrollment). With the increase, three faculty/staff will be added for a total of 20. As proposed, a one-story annex will be provided in the northeast corner of the existing school primarily providing a new gymnasium with two classrooms, restrooms, and lockers. The exterior of the site will also receive two new play lots, reconfigured landscaping and pedestrian paths, a new marquee, and new trash enclosure. The remaining renovations/improvements, which will occur within the existing building, will include converting the existing gymnasium, storage, and a portion of the library to serve as a lunchroom/multi-purpose room and kitchen. Furthermore, the school will update classrooms, offices, bathrooms, auxiliary spaces, and the library.

It should be noted that no changes to the parking lot access drive are planned. However, the parking lot will lose approximately ten parking spaces, providing a total of 30 spaces in the future due to the modifications. No significant changes are anticipated for to the drop-off/pick-up procedures.

#### 3.2 Trip Generation, Distribution and Assignment

In order to more accurately represent the impact of the school's proposed increase in students, Knight utilized the existing traffic counts and video (recorded on Thursday, October 25, 2018) to estimate the increase in future traffic volumes. To do so, the traffic counts were analyzed and manual counts of drop-off/pick-up activity and other school-related traffic were conducted using the Miovision Scout Data Collection Unit videos during the morning drop-off and afternoon pick-up periods. This data is summarized in **Table 3.1**. The vehicle trip generation rate per student and resulting increase in vehicle trips are also shown in this table. It should be noted that in order to provide a conservative analysis and account for any school-related trips during the peak hours that were not captured by the video observations, the total observed trips were increased by ten percent. Furthermore, these trip generation rates assume each student that is dropped off/picked up accounts for one inbound and one outbound trip.

To determine school traffic during the evening peak hour, time-of-day distribution data from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10<sup>th</sup> Edition, was utilized. The manual provides hourly percentages of weekday daily traffic per one hour period for elementary schools. A ratio of the evening peak hour (approximately 5.9 percent of a school's daily traffic) to the morning peak hour percentages along with the observed school-related traffic determined the total evening peak hour traffic generated by the school.

**Table 3.1: Existing and Projected School Trip Generation**

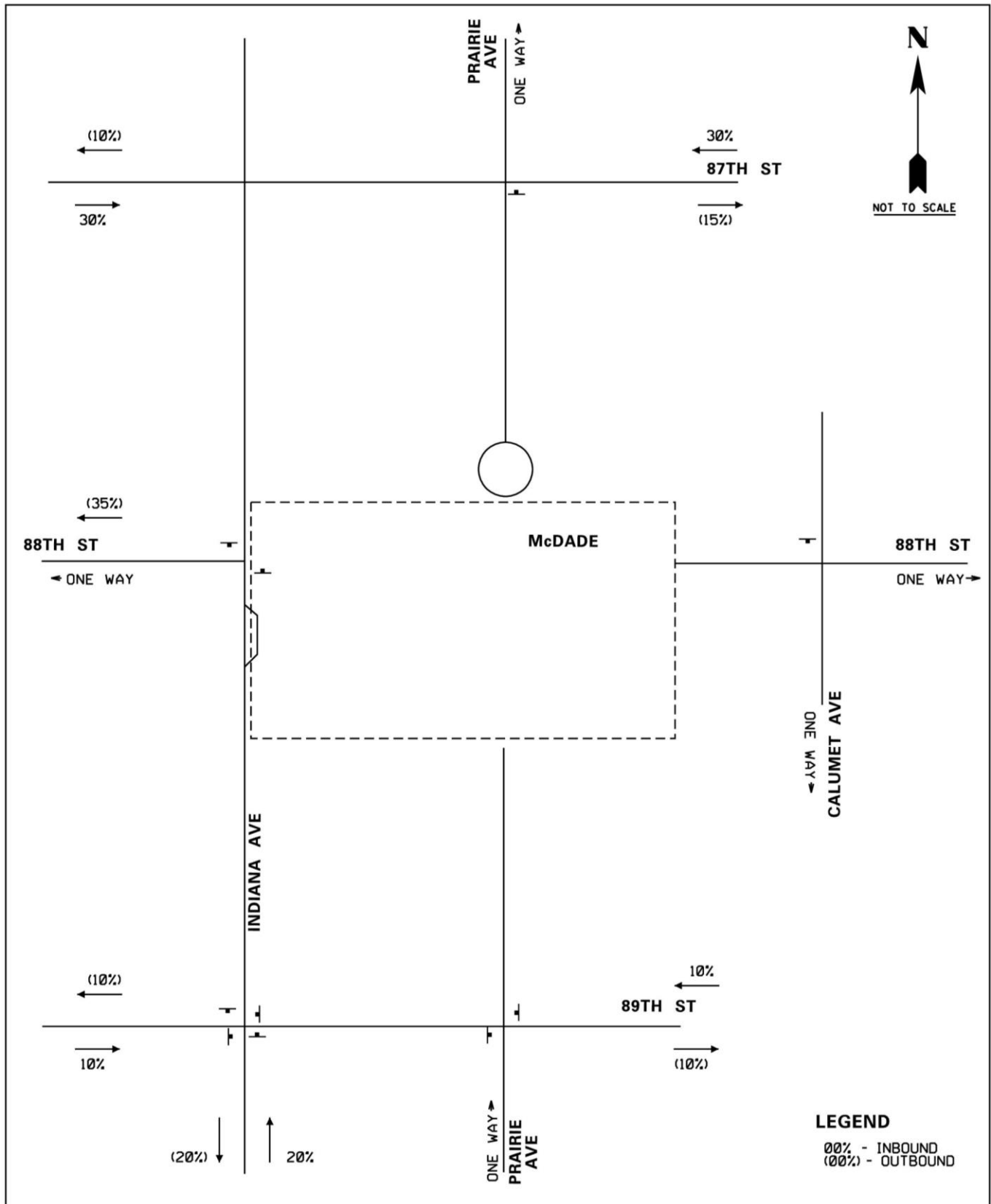
	Morning Arrival Peak (7:30 to 8:30 A.M.)			Afternoon Dismissal Peak (2:45-3:45 P.M.)			Evening Peak (5:00-6:00 P.M.)		
	In	Out	Total	In	Out	Total	In	Out	Total
Observed Existing Drop-off/Pick-up Activity (195 students)	122 <sup>1</sup>	--	--	--	50 <sup>1</sup>	--	21 <sup>2</sup>	--	--
10% Increase <sup>3</sup>	12	--	--	--	5	--	2	--	--
Estimated Total School-Related Trips	134	134	268	55	55	110	23	23	46
Vehicle Trips per Student	0.69	0.69	1.37	0.28	0.28	0.56	0.12	0.12	0.24
Proposed Trip Increase (105 Additional Students <sup>4</sup> )	72	72	144	30	30	60	12	12	24
<b>Total Estimated Trip Generation</b>	<b>206</b>	<b>206</b>	<b>412</b>	<b>85</b>	<b>85</b>	<b>170</b>	<b>35</b>	<b>35</b>	<b>70</b>
<sup>1</sup> – Based on manual counts of Miovision Scout Data Collection Unit videos during the morning drop-off and afternoon pick-up periods. <sup>2</sup> – Based on time-of-day distribution data for ITE Land Use Code 520 (Elementary School) relative to the morning arrival peak period. <sup>3</sup> – Percent increase provided to account for any vehicles not captured during the manual count of school-related traffic. <sup>4</sup> – Assuming 300-student Ideal Capacity.									

As seen from the table, roughly 70 percent of the students are dropped off in the morning while only about 30 percent of the total student population is picked up in the evening. This translates to approximately 1.37 trips per student during the morning arrival peak hour while the afternoon dismissal peak hour generates approximately 0.56 trips per student. With the increased capacity (approximately 105 additional students), the school would generate 72 and 30 additional drop-off/pick-up trips during the morning arrival and afternoon dismissal peak hours, respectively.

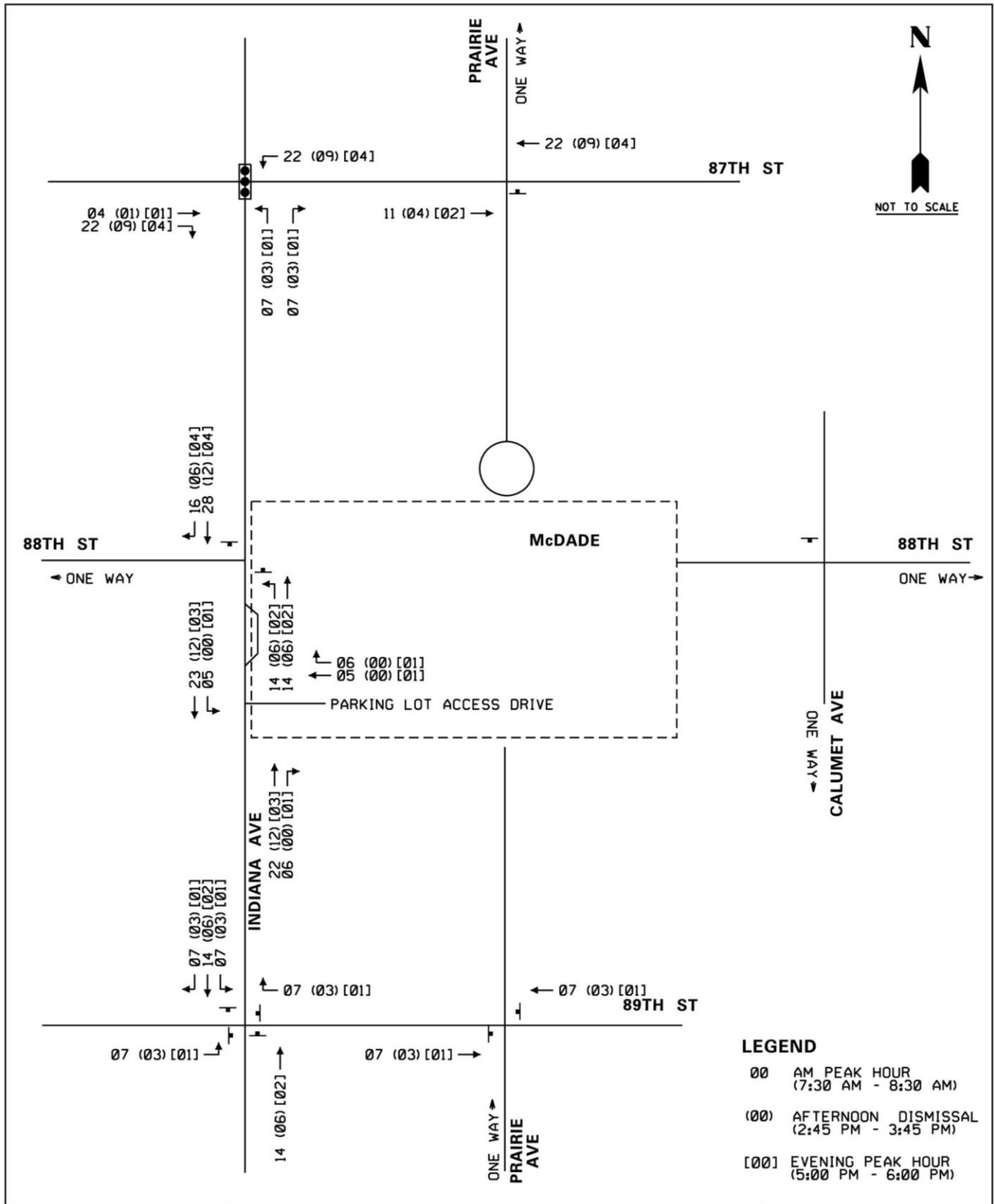
Since there will be limited modifications to the drop-off/pick-up operations, the existing traffic to and from the school was not modified. The existing routes of arrival and departure from the school within the study area were utilized to determine the trip distribution for the projected trips, which can be seen in **Exhibit 3.1**. Trips were then assigned to the study intersections in accordance with the trip distribution, which are shown in **Exhibit 3.2**.

### 3.3 Projected Traffic Volumes

Per standard practice, background traffic projections were developed for a “build plus five” design horizon year. A growth factor of 0.5 percent per year was applied to the existing traffic volumes along the arterial street within the study area. Therefore, the existing traffic volumes were increased by a total of 3.0 percent at the intersections of 87<sup>th</sup> Street with Indiana Avenue and Prairie Avenue and added to the additional school trips to determine the Year 2024 projected volumes, which are shown in **Exhibit 3.3**. Pedestrian volumes surrounding the school were also increased for the analysis.



**Exhibit 3.1 – Trip Distribution**



**Exhibit 3.2 – Trip Assignment**





## 4 – TRAFFIC ANALYSIS AND RECOMMENDATIONS

This section of the report summarizes the process and results of the traffic analysis for the existing and projected conditions during the morning, afternoon dismissal, and evening peak hours. It will also provide recommendations to mitigate/improve upon conditions in the future.

### 4.1 Analysis Procedure

Traffic volume data was analyzed with the Synchro/SimTraffic 9.0 traffic capacity analysis/simulation software in order to determine the quality of operation in the existing and proposed street networks. Operation is characterized according to the amount of control delay at each approach and quantified into a level of service (LOS). The LOS grades shown below, which are provided in the Transportation Research Board's *Highway Capacity Manual (HCM)*, quantify and categorize a driver's discomfort, frustration, fuel consumption, and travel times experienced as a result of intersection control and the resulting traffic queuing. A detailed description of each LOS rating can be found in **Table 4.1**. **Table 4.2** presents the range of control delay for each LOS rating as detailed in the *HCM*. Because signalized intersections are expected to carry a larger volume of vehicles and stopping is required during red time, note that higher delays are tolerated for the corresponding LOS ratings. In order to accurately analyze the signalized intersection, signal timings for the intersection were acquired from CDOT. Based on the *HCM* methodologies, capacity results for the existing intersections were identified for each of the study intersections and are summarized in **Table 4.3** below. **Table 4.4** summarizes the results for the projected conditions.

**Table 4.1: Level of Service Descriptions<sup>1</sup>**

Level of Service	Description
A	Minimal control delay; traffic operates at primarily free-flow conditions; unimpeded movement within traffic stream.
B	Minor control delay at signalized intersections; traffic operates at a fairly unimpeded level with slightly restricted movement within traffic stream.
C	Moderate control delay; movement within traffic stream more restricted than at LOS B; formation of queues contributes to lower average travel speeds.
D	Considerable control delay that may be substantially increased by small increases in flow; average travel speeds continue to decrease.
E	High control delay; average travel speed no more than 33 percent of free flow speed.
F	Extremely high control delay; extensive queuing and high volumes create exceedingly restricted traffic flow.

<sup>1</sup>Highway Capacity Manual

**Table 4.2: Level of Service Grading Criteria<sup>1</sup>**

Level of Service	Control Delay per Vehicle (s/veh) at:	
	Unsignalized Intersections	Signalized Intersections
A	0 – 10	0 – 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F <sup>2</sup>	> 50	> 80

<sup>1</sup>Highway Capacity Manual

<sup>2</sup>All movements with a Volume to Capacity (v/c) ratio greater than 1.0 receive a rating of LOS F.

**Table 4.3: Results of the Capacity Analyses – Existing Conditions**

	Morning Arrival Peak (7:30 to 8:30 A.M.)		Afternoon Dismissal Peak (2:45-3:45 P.M.)		Evening Peak (5:00-6:00 P.M.)	
	LOS	Delay	LOS	Delay	LOS	Delay
<b>Indiana Avenue with 87<sup>th</sup> Street (Signalized)</b>						
Overall	B	10.5	B	10.3	B	10.8
Eastbound Approach	B	10.0	A	9.5	A	9.6
Westbound Approach	A	9.2	A	9.3	A	9.3
Northbound Approach	B	18.5	B	16.9	B	16.0
Southbound Approach	B	12.8	B	14.9	B	18.2
<b>Indiana Avenue with 88<sup>th</sup> Street (All-Way Stop)</b>						
Overall	A	8.5	A	8.0	A	8.7
Northbound Approach	A	8.7	A	7.9	A	7.7
Southbound Approach	A	8.3	A	8.0	A	9.0
<b>Indiana Avenue with McDade Parking Lot Access Drive (One-Way Stop)</b>						
Westbound Approach	A	9.8	A	9.2	A	9.2
<b>Indiana Avenue with 89<sup>th</sup> Street (All-Way Stop)</b>						
Overall	A	9.1	A	8.4	A	8.6
Eastbound Approach	A	8.6	A	8.2	A	7.8
Westbound Approach	A	8.4	A	8.0	A	8.1
Northbound Approach	A	9.8	A	8.5	A	8.2
Southbound Approach	A	8.5	A	8.6	A	9.2
<b>87<sup>th</sup> Street with Prairie Avenue (One-Way Stop)</b>						
Northbound Approach	C	21.2	C	20.5	C	23.9
<b>89<sup>th</sup> Street with Prairie Avenue (Two-Way Stop)</b>						
Eastbound Approach	A	9.8	A	9.7	A	9.6
Westbound Approach	A	9.8	A	9.5	A	9.3
<b>88<sup>th</sup> Street with Calumet Avenue (All-Way Stop)</b>						
Overall	A	7.2	A	7.3	A	7.3
Eastbound Approach	A	7.2	A	6.4	A	6.5
Southbound Approach	N/A	N/A	A	7.3	A	7.3

**Table 4.4: Results of the Capacity Analyses – Projected Conditions**

	Morning Arrival Peak (7:30 to 8:30 A.M.)		Afternoon Dismissal Peak (2:45-3:45 P.M.)		Evening Peak (5:00-6:00 P.M.)	
	LOS	Delay	LOS	Delay	LOS	Delay
<b>Indiana Avenue with 87th Street (Signalized)</b>						
Overall	B	11.1	B	10.6	B	11.0
Eastbound Approach	B	10.4	A	9.7	A	9.8
Westbound Approach	B	10.0	A	9.6	A	9.6
Northbound Approach	B	18.7	B	16.9	B	16.0
Southbound Approach	B	12.7	B	15.0	B	18.5
<b>Indiana Avenue with 88th Street (All-Way Stop)</b>						
Overall	A	9.1	A	8.1	A	8.8
Northbound Approach	A	9.3	A	8.1	A	7.8
Southbound Approach	A	8.9	A	8.2	A	9.2
<b>Indiana Avenue with McDade Parking Lot Access Drive (One-Way Stop)</b>						
Westbound Approach	B	10.5	A	9.3	A	9.4
<b>Indiana Avenue with 89th Street (All-Way Stop)</b>						
Overall	A	9.5	A	8.6	A	8.8
Eastbound Approach	A	8.9	A	8.4	A	7.9
Westbound Approach	A	8.7	A	8.1	A	8.1
Northbound Approach	B	10.4	A	8.6	A	8.2
Southbound Approach	A	8.9	A	8.8	A	9.4
<b>87th Street with Prairie Avenue (One-Way Stop)</b>						
Northbound Approach	C	22.9	C	21.7	D	25.4
<b>89th Street with Prairie Avenue (Two-Way Stop)</b>						
Eastbound Approach	A	9.9	A	9.7	A	9.6
Westbound Approach	A	9.9	A	9.5	A	9.3
<b>88th Street with Calumet Avenue (All-Way Stop)</b>						
Overall	A	7.2	A	7.3	A	7.3
Eastbound Approach	A	7.2	A	6.4	A	6.5
Southbound Approach	N/A	N/A	A	7.3	A	7.3

## **4.2 Discussion of Existing and Projected Operation**

The results of the analysis show that all intersections operate efficiently with acceptable delays and levels of service during each peak hour under existing conditions. A significant portion of the traffic on these streets is related to the school, and therefore peak within a 20 to 30 minute period surrounding the start or end of the school day. During these times, the intersections continue to operate with minimal delay, although, as previously stated, some additional delay is observed adjacent to the school due to conflicts with drop-off/pick-up traffic and pedestrians. The signalized intersection of Indiana Avenue with 87<sup>th</sup> Street generally operates with minimal delay with minor street queues generally clearing with each signal cycle. However, additional delays are observed for 87<sup>th</sup> Street traffic due to back-ups from downstream intersections, particularly for westbound traffic.

Under projected conditions, all intersections continue to operate at adequate levels of service with minimal increases in delay. The additional traffic to and from the school will be accommodated by the existing infrastructure and no capacity improvements are required at this time. However, in order to improve pedestrian safety in the area, the installation of pedestrian signal countdown timers should be considered for all legs at the intersection of Indiana Avenue with 87<sup>th</sup> Street. Furthermore, to improve pedestrian safety at the intersection of Calumet Avenue with 88<sup>th</sup> Street, high visibility crosswalk striping should be provided on the south and west legs.

## **4.3 Future School Drop-Off/Pick-Up Procedures**

With the proposed annex expansion/renovation, the school will need to slightly modify its existing arrival/departure procedures to determine where students will enter and exit the school. However, this should not significantly impact vehicular drop-off/pick-up operation. To improve/mitigate drop-off and pick-up activity under existing and projected conditions, the following recommendations are made.

- Continue to encourage parents/guardians to drop-off and pick-up their student on the east side of Indiana Avenue and on both sides of 88<sup>th</sup> Street. They should also be instructed to avoid parking within the lay-by lane for extended periods of time.
- Provide additional parking restrictions on school days (7:00 A.M. to 4:30 P.M.) south of the parking lot access drive. The restriction should be long enough to accommodate any buses unable to park along the school frontage. This will prevent buses from needing to double-park due to a legally-parked vehicle.
- Place the three existing cones within the street on the east side of the intersection of Indiana Avenue with 88<sup>th</sup> Street to more effectively prevent conflicts with buses and drop-off/pick-up activity within the intersection.
- Station a staff member at the lay-by lane during the morning and afternoon peak periods to actively limit the improper use of the lay-by lane and curbside. The presence of this staff member would likely reduce the frequency of vehicles parking for relatively long periods of time within the lay-by lane, double-parking, and loading within the intersection of Indiana Avenue with 88<sup>th</sup> Street.
- Consideration should be given to allowing private transportation vans to pick up students within the school parking lot or should be instructed to arrive after the buses depart from the lay-by lane. Observations of these over-sided vans noted difficulty parking along the curbside or illegal parking.



- Monitor the parking lot to determine if drop-off activity should be restricted to during the morning arrival period. The decrease in vacant spaces within the parking lot may limit the ability for drop-off activity to turn around within the lot. Similar to the afternoon dismissal period, a staff member should be stationed at the entrance to prevent drop-off traffic from entering.
- Consideration should be given to extending the existing lay-by lane to the south to maximize the school's adjacent curbside. By increasing this lane by approximately 50 feet, it will reduce the frequency of double-parking and parking within the intersection of Indiana Avenue with 88<sup>th</sup> Street as well as allow an additional school bus to park within the lane. To prevent the lay-by lane from being used to avoid the existing speed hump, the speed hump may need to be relocated south of the parking lot access drive.

## 5 – CONCLUSIONS AND RECOMMENDATIONS

Based on Knight's review of the proposed annex expansion/renovations for McDade Classical Elementary School and the existing and future traffic conditions in the area, the following conclusions and recommendations are provided.

- The existing intersections operate at acceptable Levels of Service (LOS) and adequately accommodate the existing traffic in the area.
- The annex expansion/renovations will increase the school's ideal capacity from 240 to 300 students, allow the school to serve 105 additional students compared to its current enrollment.
- Based on observations/counts of existing drop-off and pick-up operation, approximately 1.37 vehicle trips per student are made during the morning peak hour and 0.56 trips per student during the afternoon peak hour. These rates account for one inbound trip and one outbound trip per student.
- The proposed increase of 105 students would result in approximately 72 additional drop-off trips during the morning peak hour and 30 additional pick-up trips during the afternoon peak hour.
- Under projected conditions, all intersections would continue to operate at acceptable LOS with minimal increases in delay. Therefore, no capacity improvements/modifications are required at this time.
- In order to improve pedestrian safety in the area, consideration should be given to the installation of pedestrian countdown timers for all legs at the intersection of Indiana Avenue with 87<sup>th</sup> Street and install high visibility crosswalk striping on the south and west legs at the intersection of Calumet Avenue with 88<sup>th</sup> Street.
- Recommendations were made in regards to the existing and projected drop-off/pick-up operation as specified in **Section 4.3** of the report.

# **JAMES E. MCDADE CLASSICAL ELEMENTARY SCHOOL PROPOSED ANNEX EXPANSION/RENOVATION**

---

## **Traffic Impact Study Appendix**

### **TRAFFIC COUNT DATA**

Indiana Avenue with 87<sup>th</sup> Street  
Indiana Avenue with 88<sup>th</sup> Street  
Indiana Avenue with McDade Parking Lot Access Drive  
Indiana Avenue with 89<sup>th</sup> Street  
87<sup>th</sup> Street with Prairie Avenue  
89<sup>th</sup> Street with Prairie Avenue  
88<sup>th</sup> Street with Calumet Avenue

### **HIGHWAY CAPACITY ANALYSIS REPORTS**

Existing Morning Peak Hour  
Existing Afternoon Dismissal Peak Hour  
Existing Evening Peak Hour  
Projected Morning Peak Hour  
Projected Afternoon Dismissal Peak Hour  
Projected Evening Peak Hour

# **JAMES E. MCDADE CLASSICAL ELEMENTARY SCHOOL PROPOSED ANNEX EXPANSION/RENOVATION**

---

## **Traffic Impact Study Appendix**

### **TRAFFIC COUNT DATA**

Indiana Avenue with 87<sup>th</sup> Street

Indiana Avenue with 88<sup>th</sup> Street

Indiana Avenue with McDade Parking Lot Access Drive

Indiana Avenue with 89<sup>th</sup> Street

87<sup>th</sup> Street with Prairie Avenue

89<sup>th</sup> Street with Prairie Avenue

88<sup>th</sup> Street with Calumet Avenue

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Indiana Avenue & 87th Street

Chicago, IL

7:00 - 9:00 AM

File Name : 87th & Indiana 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Indiana Avenue From North				87th Street From East				Indiana Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	0	7	12	1	172	1	174	13	16	1	30	0	124	5	129	345
07:15 AM	4	5	7	16	6	181	2	189	14	6	2	22	2	143	14	159	386
07:30 AM	2	19	14	35	10	191	1	202	33	17	13	63	6	185	37	228	528
07:45 AM	1	11	11	23	5	175	2	182	19	21	8	48	4	220	21	245	498
Total	12	35	39	86	22	719	6	747	79	60	24	163	12	672	77	761	1757
08:00 AM	2	7	8	17	3	173	4	180	8	10	5	23	5	205	21	231	451
08:15 AM	3	10	7	20	1	197	2	200	13	9	2	24	5	194	12	211	455
08:30 AM	4	10	8	22	0	156	3	159	13	15	4	32	4	216	15	235	448
08:45 AM	5	6	12	23	3	142	1	146	7	10	3	20	1	231	9	241	430
Total	14	33	35	82	7	668	10	685	41	44	14	99	15	846	57	918	1784
Grand Total	26	68	74	168	29	1387	16	1432	120	104	38	262	27	1518	134	1679	3541
Apprch %	15.5	40.5	44		2	96.9	1.1		45.8	39.7	14.5		1.6	90.4	8		
Total %	0.7	1.9	2.1	4.7	0.8	39.2	0.5	40.4	3.4	2.9	1.1	7.4	0.8	42.9	3.8	47.4	
PC	25	65	71	161	29	1326	16	1371	114	100	37	251	25	1450	130	1605	3388
% PC	96.2	95.6	95.9	95.8	100	95.6	100	95.7	95	96.2	97.4	95.8	92.6	95.5	97	95.6	95.7
SU	1	3	3	7	0	50	0	50	4	4	1	9	1	56	3	60	126
% SU	3.8	4.4	4.1	4.2	0	3.6	0	3.5	3.3	3.8	2.6	3.4	3.7	3.7	2.2	3.6	3.6
MU	0	0	0	0	0	11	0	11	2	0	0	2	1	12	1	14	27
% MU	0	0	0	0	0	0.8	0	0.8	1.7	0	0	0.8	3.7	0.8	0.7	0.8	0.8



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Chicago, IL

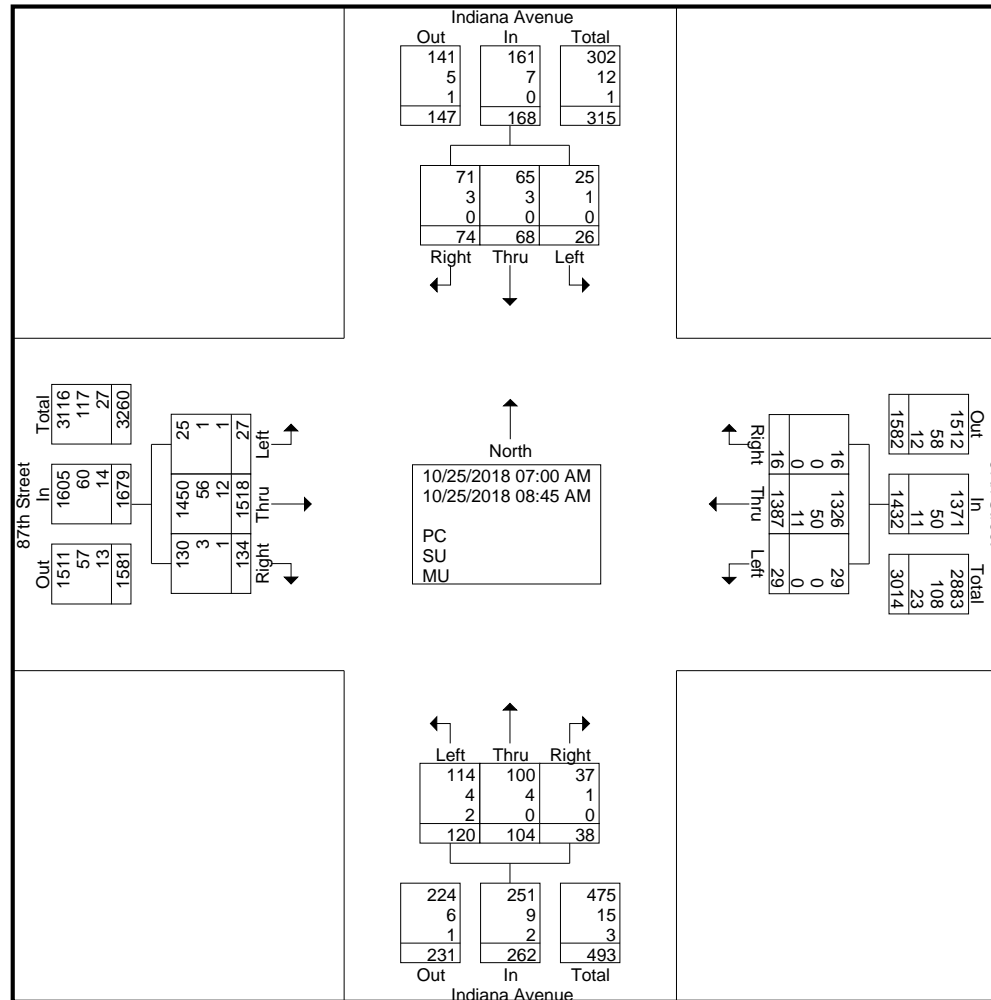
7:00 - 9:00 AM

File Name : 87th & Indiana 7-9 AM

Site Code :

Start Date : 10/25/2018

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Indiana Avenue & 87th Street

Chicago, IL

7:00 - 9:00 AM

File Name : 87th & Indiana 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North				87th Street From East				Indiana Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	2	19	14	35	10	191	1	202	33	17	13	63	6	185	37	228	528
07:45 AM	1	11	11	23	5	175	2	182	19	21	8	48	4	220	21	245	498
08:00 AM	2	7	8	17	3	173	4	180	8	10	5	23	5	205	21	231	451
08:15 AM	3	10	7	20	1	197	2	200	13	9	2	24	5	194	12	211	455
Total Volume	8	47	40	95	19	736	9	764	73	57	28	158	20	804	91	915	1932
% App. Total	8.4	49.5	42.1		2.5	96.3	1.2		46.2	36.1	17.7		2.2	87.9	9.9		
PHF	.667	.618	.714	.679	.475	.934	.563	.946	.553	.679	.538	.627	.833	.914	.615	.934	.915

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:00 AM				07:45 AM			
+0 mins.	2	19	14	35	10	191	1	202	13	16	1	30	4	220	21	245
+15 mins.	1	11	11	23	5	175	2	182	14	6	2	22	5	205	21	231
+30 mins.	2	7	8	17	3	173	4	180	33	17	13	63	5	194	12	211
+45 mins.	3	10	7	20	1	197	2	200	19	21	8	48	4	216	15	235
Total Volume	8	47	40	95	19	736	9	764	79	60	24	163	18	835	69	922
% App. Total	8.4	49.5	42.1		2.5	96.3	1.2		48.5	36.8	14.7		2	90.6	7.5	
PHF	.667	.618	.714	.679	.475	.934	.563	.946	.598	.714	.462	.647	.900	.949	.821	.941

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87th Street & Indiana Avenue

Chicago, IL

2:00 - 4:00 PM

File Name : 87th & Indiana 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Indiana Avenue From North				87th Street From East				Indiana Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
02:00 PM	4	10	10	24	6	188	0	194	6	2	1	9	0	171	9	180	407
02:15 PM	3	16	16	35	8	175	3	186	11	5	1	17	1	183	14	198	436
02:30 PM	6	22	13	41	8	197	3	208	13	4	3	20	1	182	16	199	468
02:45 PM	8	18	12	38	4	190	0	194	18	8	6	32	3	206	24	233	497
Total	21	66	51	138	26	750	6	782	48	19	11	78	5	742	63	810	1808
03:00 PM	6	13	16	35	3	197	1	201	14	10	7	31	0	180	10	190	457
03:15 PM	7	16	9	32	2	181	1	184	9	6	6	21	2	194	13	209	446
03:30 PM	6	35	10	51	2	188	1	191	15	12	4	31	5	215	12	232	505
03:45 PM	13	31	30	74	3	200	2	205	12	7	3	22	2	224	10	236	537
Total	32	95	65	192	10	766	5	781	50	35	20	105	9	813	45	867	1945
Grand Total	53	161	116	330	36	1516	11	1563	98	54	31	183	14	1555	108	1677	3753
Apprch %	16.1	48.8	35.2		2.3	97	0.7		53.6	29.5	16.9		0.8	92.7	6.4		
Total %	1.4	4.3	3.1	8.8	1	40.4	0.3	41.6	2.6	1.4	0.8	4.9	0.4	41.4	2.9	44.7	
PC	52	158	114	324	35	1454	11	1500	94	53	30	177	14	1502	106	1622	3623
% PC	98.1	98.1	98.3	98.2	97.2	95.9	100	96	95.9	98.1	96.8	96.7	100	96.6	98.1	96.7	96.5
SU	1	3	2	6	1	50	0	51	4	1	1	6	0	39	1	40	103
% SU	1.9	1.9	1.7	1.8	2.8	3.3	0	3.3	4.1	1.9	3.2	3.3	0	2.5	0.9	2.4	2.7
MU	0	0	0	0	0	12	0	12	0	0	0	0	0	14	1	15	27
% MU	0	0	0	0	0	0.8	0	0.8	0	0	0	0	0	0.9	0.9	0.9	0.7

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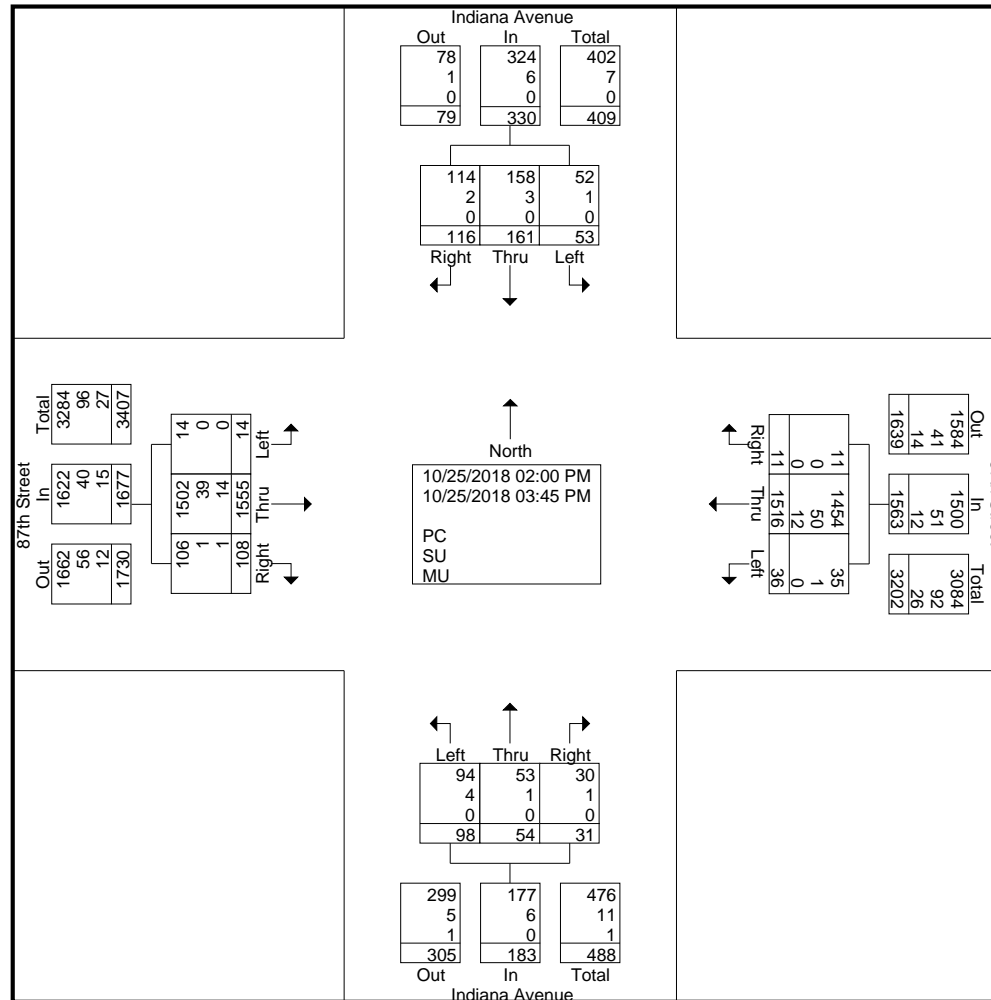
87th Street & Indiana Avenue  
Chicago, IL  
2:00 - 4:00 PM

File Name : 87th & Indiana 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 2



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Chicago, IL

2:00 - 4:00 PM

File Name : 87th & Indiana 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North				87th Street From East				Indiana Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:00 PM																	
03:00 PM	6	13	16	35	3	197	1	201	14	10	7	31	0	180	10	190	457
03:15 PM	7	16	9	32	2	181	1	184	9	6	6	21	2	194	13	209	446
03:30 PM	6	35	10	51	2	188	1	191	15	12	4	31	5	215	12	232	505
03:45 PM	13	31	30	74	3	200	2	205	12	7	3	22	2	224	10	236	537
Total Volume	32	95	65	192	10	766	5	781	50	35	20	105	9	813	45	867	1945
% App. Total	16.7	49.5	33.9		1.3	98.1	0.6		47.6	33.3	19		1	93.8	5.2		
PHF	.615	.679	.542	.649	.833	.958	.625	.952	.833	.729	.714	.847	.450	.907	.865	.918	.905

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM				02:15 PM				02:45 PM				03:00 PM			
+0 mins.	6	13	16	35	8	175	3	186	18	8	6	32	0	180	10	190
+15 mins.	7	16	9	32	8	197	3	208	14	10	7	31	2	194	13	209
+30 mins.	6	35	10	51	4	190	0	194	9	6	6	21	5	215	12	232
+45 mins.	13	31	30	74	3	197	1	201	15	12	4	31	2	224	10	236
Total Volume	32	95	65	192	23	759	7	789	56	36	23	115	9	813	45	867
% App. Total	16.7	49.5	33.9		2.9	96.2	0.9		48.7	31.3	20		1	93.8	5.2	
PHF	.615	.679	.542	.649	.719	.963	.583	.948	.778	.750	.821	.898	.450	.907	.865	.918

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87th Street & Indiana Avenue

Chicago, IL

5:00 - 9:00 PM

File Name : 87th & Indiana 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Indiana Avenue From North				87th Street From East				Indiana Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
05:00 PM	2	44	18	64	3	211	2	216	15	3	4	22	5	222	18	245	547
05:15 PM	8	55	25	88	4	201	3	208	15	5	5	25	7	204	15	226	547
05:30 PM	6	41	15	62	8	204	2	214	11	6	9	26	2	221	34	257	559
05:45 PM	12	32	12	56	7	216	1	224	8	8	3	19	3	209	22	234	533
Total	28	172	70	270	22	832	8	862	49	22	21	92	17	856	89	962	2186
06:00 PM	9	34	11	54	4	206	1	211	9	3	3	15	4	214	20	238	518
06:15 PM	7	16	14	37	3	173	4	180	10	2	2	14	6	217	17	240	471
06:30 PM	3	30	11	44	3	180	3	186	6	6	2	14	3	205	16	224	468
06:45 PM	5	17	8	30	1	188	1	190	10	3	5	18	2	203	17	222	460
Total	24	97	44	165	11	747	9	767	35	14	12	61	15	839	70	924	1917
07:00 PM	9	4	9	22	2	148	0	150	9	0	1	10	5	188	19	212	394
07:15 PM	4	3	5	12	3	156	0	159	5	1	1	7	2	210	18	230	408
07:30 PM	8	11	2	21	3	138	2	143	7	2	3	12	1	197	10	208	384
07:45 PM	1	9	7	17	4	138	3	145	5	0	1	6	1	191	8	200	368
Total	22	27	23	72	12	580	5	597	26	3	6	35	9	786	55	850	1554
08:00 PM	2	9	9	20	0	158	3	161	4	3	1	8	3	149	14	166	355
08:15 PM	2	8	3	13	8	126	2	136	3	3	1	7	0	161	12	173	329
08:30 PM	3	2	8	13	1	133	0	134	10	4	4	18	4	174	16	194	359
08:45 PM	2	3	5	10	1	133	0	134	5	2	2	9	1	172	14	187	340
Total	9	22	25	56	10	550	5	565	22	12	8	42	8	656	56	720	1383
Grand Total	83	318	162	563	55	2709	27	2791	132	51	47	230	49	3137	270	3456	7040
Apprch %	14.7	56.5	28.8		2	97.1	1		57.4	22.2	20.4		1.4	90.8	7.8		
Total %	1.2	4.5	2.3	8	0.8	38.5	0.4	39.6	1.9	0.7	0.7	3.3	0.7	44.6	3.8	49.1	
PC	82	313	162	557	55	2663	26	2744	132	51	47	230	49	3100	270	3419	6950
% PC	98.8	98.4	100	98.9	100	98.3	96.3	98.3	100	100	100	100	100	98.8	100	98.9	98.7
SU	1	5	0	6	0	44	1	45	0	0	0	0	0	32	0	32	83
% SU	1.2	1.6	0	1.1	0	1.6	3.7	1.6	0	0	0	0	0	1	0	0.9	1.2
MU	0	0	0	0	0	2	0	2	0	0	0	0	0	5	0	5	7
% MU	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0.2	0	0.1	0.1

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Chicago, IL 60606

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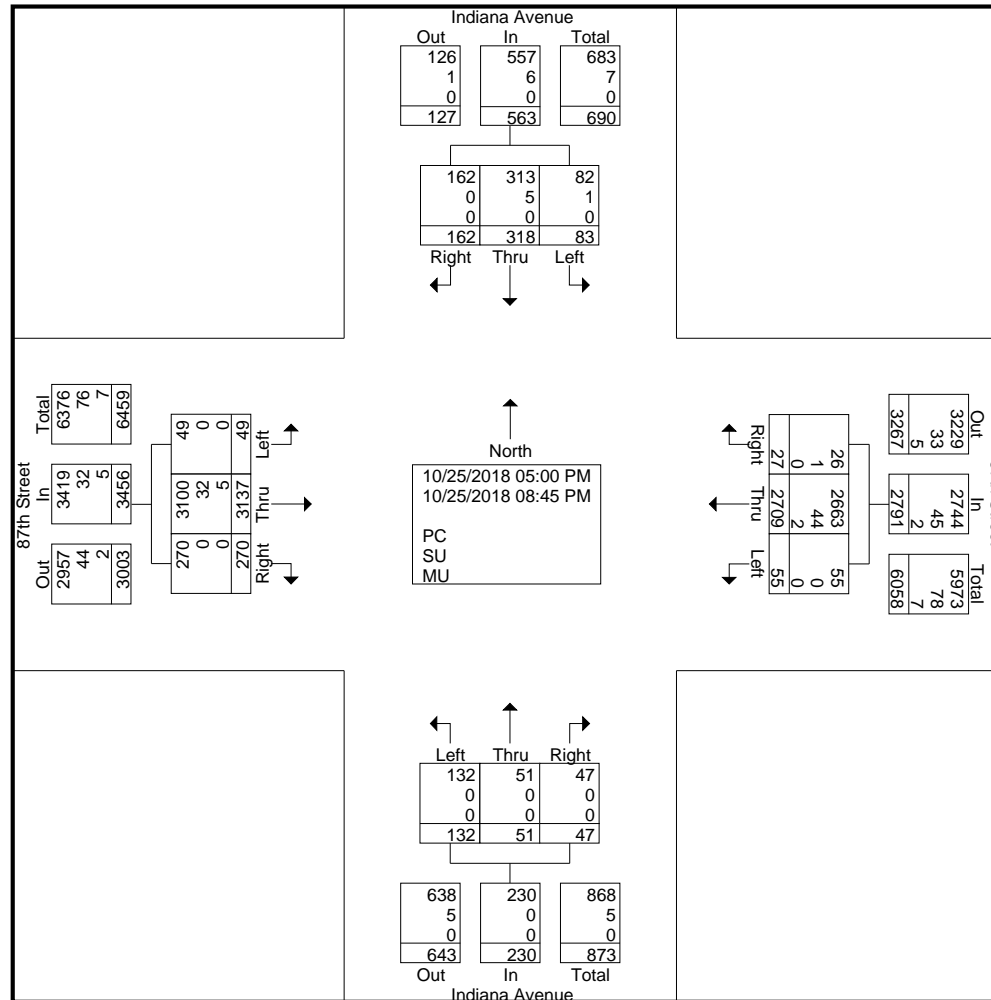
87th Street & Indiana Avenue  
Chicago, IL  
5:00 - 9:00 PM

File Name : 87th & Indiana 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 2



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87th Street & Indiana Avenue

Chicago, IL

5:00 - 9:00 PM

File Name : 87th & Indiana 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North				87th Street From East				Indiana Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	44	18	64	3	211	2	216	15	3	4	22	5	222	18	245	547
05:15 PM	8	55	25	88	4	201	3	208	15	5	5	25	7	204	15	226	547
05:30 PM	6	41	15	62	8	204	2	214	11	6	9	26	2	221	34	257	559
05:45 PM	12	32	12	56	7	216	1	224	8	8	3	19	3	209	22	234	533
Total Volume	28	172	70	270	22	832	8	862	49	22	21	92	17	856	89	962	2186
% App. Total	10.4	63.7	25.9		2.6	96.5	0.9		53.3	23.9	22.8		1.8	89	9.3		
PHF	.583	.782	.700	.767	.688	.963	.667	.962	.817	.688	.583	.885	.607	.964	.654	.936	.978

Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:30 PM			
+0 mins.	2	44	18	64	3	211	2	216	15	3	4	22	2	221	34	257
+15 mins.	8	55	25	88	4	201	3	208	15	5	5	25	3	209	22	234
+30 mins.	6	41	15	62	8	204	2	214	11	6	9	26	4	214	20	238
+45 mins.	12	32	12	56	7	216	1	224	8	8	3	19	6	217	17	240
Total Volume	28	172	70	270	22	832	8	862	49	22	21	92	15	861	93	969
% App. Total	10.4	63.7	25.9		2.6	96.5	0.9		53.3	23.9	22.8		1.5	88.9	9.6	
PHF	.583	.782	.700	.767	.688	.963	.667	.962	.817	.688	.583	.885	.625	.974	.684	.943



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88th Street & Indiana Avenue

Chicago, IL

7:00 - 9:00 PM

File Name : 88th & Indiana 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

Start Time	Indiana Avenue From North			Indiana Avenue From South			88th Street From West			Int. Total
	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	
07:00 AM	4	1	5	0	27	27	0	0	0	32
07:15 AM	15	8	23	1	23	24	0	0	0	47
07:30 AM	31	27	58	7	47	54	0	0	0	112
07:45 AM	33	15	48	6	47	53	0	0	0	101
Total	83	51	134	14	144	158	0	0	0	292
08:00 AM	29	3	32	1	18	19	0	0	0	51
08:15 AM	21	3	24	0	29	29	0	0	0	53
08:30 AM	22	2	24	1	28	29	0	0	0	53
08:45 AM	17	1	18	1	20	21	0	0	0	39
Total	89	9	98	3	95	98	0	0	0	196
Grand Total	172	60	232	17	239	256	0	0	0	488
Apprch %	74.1	25.9		6.6	93.4		0	0		
Total %	35.2	12.3	47.5	3.5	49	52.5	0	0	0	
PC	165	60	225	15	228	243	0	0	0	468
% PC	95.9	100	97	88.2	95.4	94.9	0	0	0	95.9
SU	6	0	6	2	9	11	0	0	0	17
% SU	3.5	0	2.6	11.8	3.8	4.3	0	0	0	3.5
MU	1	0	1	0	2	2	0	0	0	3
% MU	0.6	0	0.4	0	0.8	0.8	0	0	0	0.6

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88th Street & Indiana Avenue

Chicago, IL

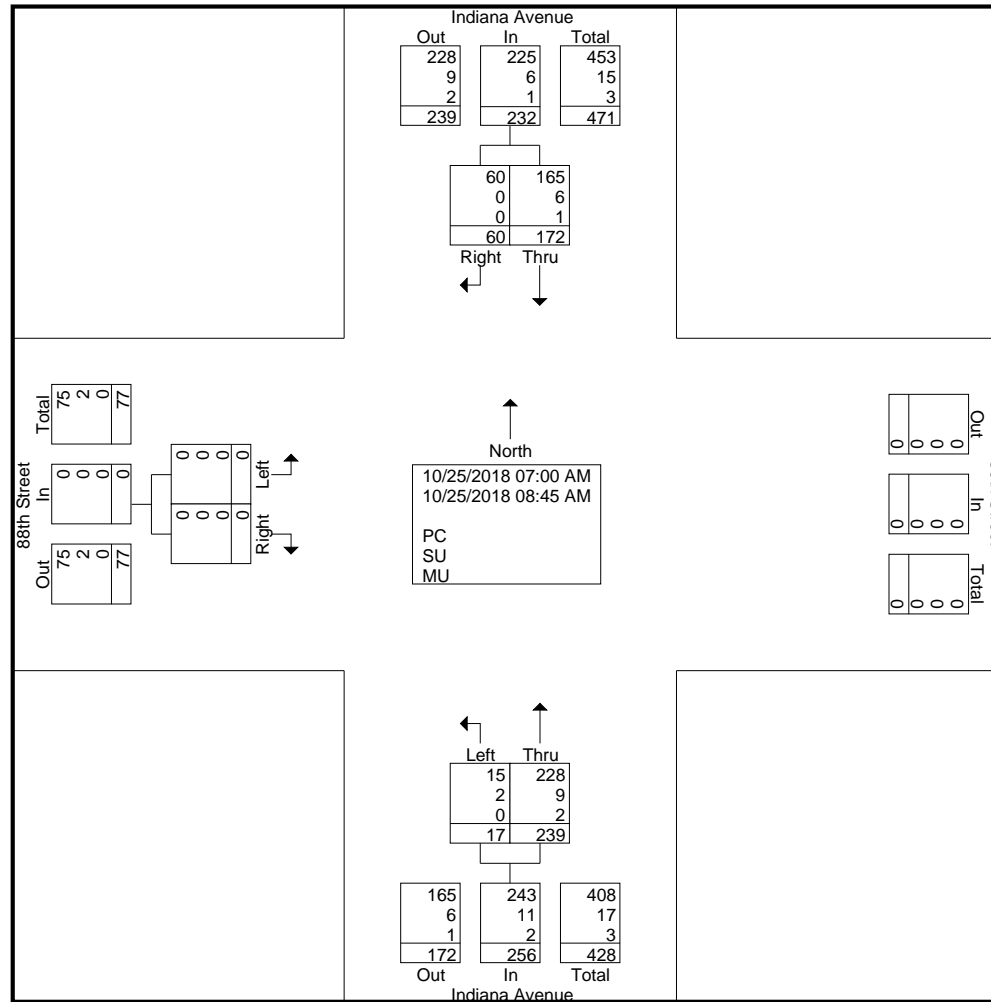
7:00 - 9:00 PM

File Name : 88th & Indiana 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 2



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88th Street & Indiana Avenue

Chicago, IL

7:00 - 9:00 PM

File Name : 88th & Indiana 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North			Indiana Avenue From South			88th Street From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	31	27	58	7	47	54	0	0	0	112
07:45 AM	33	15	48	6	47	53	0	0	0	101
08:00 AM	29	3	32	1	18	19	0	0	0	51
08:15 AM	21	3	24	0	29	29	0	0	0	53
Total Volume	114	48	162	14	141	155	0	0	0	317
% App. Total	70.4	29.6		9	91		0	0		
PHF	.864	.444	.698	.500	.750	.718	.000	.000	.000	.708

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:30 AM			07:00 AM			07:00 AM		
+0 mins.	31	27	58	0	27	27	0	0	0
+15 mins.	33	15	48	1	23	24	0	0	0
+30 mins.	29	3	32	7	47	54	0	0	0
+45 mins.	21	3	24	6	47	53	0	0	0
Total Volume	114	48	162	14	144	158	0	0	0
% App. Total	70.4	29.6		8.9	91.1		0	0	
PHF	.864	.444	.698	.500	.766	.731	.000	.000	.000

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88th Street & Indiana Avenue

Chicago, IL

2:00 - 4:00 PM

File Name : 88th & Indiana 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Indiana Avenue From North			Indiana Avenue From South			88th Street From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
02:00 PM	21	4	25	0	9	9	0	0	0	34
02:15 PM	25	7	32	0	13	13	0	0	0	45
02:30 PM	36	12	48	1	22	23	0	0	0	71
02:45 PM	38	7	45	7	24	31	0	0	0	76
Total	120	30	150	8	68	76	0	0	0	226
03:00 PM	24	4	28	2	28	30	0	0	0	58
03:15 PM	31	1	32	3	18	21	0	0	0	53
03:30 PM	46	3	49	0	26	26	0	0	0	75
03:45 PM	34	4	38	0	25	25	0	0	0	63
Total	135	12	147	5	97	102	0	0	0	249
Grand Total	255	42	297	13	165	178	0	0	0	475
Apprch %	85.9	14.1		7.3	92.7		0	0		
Total %	53.7	8.8	62.5	2.7	34.7	37.5	0	0	0	
PC	247	42	289	11	159	170	0	0	0	459
% PC	96.9	100	97.3	84.6	96.4	95.5	0	0	0	96.6
SU	7	0	7	2	6	8	0	0	0	15
% SU	2.7	0	2.4	15.4	3.6	4.5	0	0	0	3.2
MU	1	0	1	0	0	0	0	0	0	1
% MU	0.4	0	0.3	0	0	0	0	0	0	0.2

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88th Street & Indiana Avenue

Chicago, IL

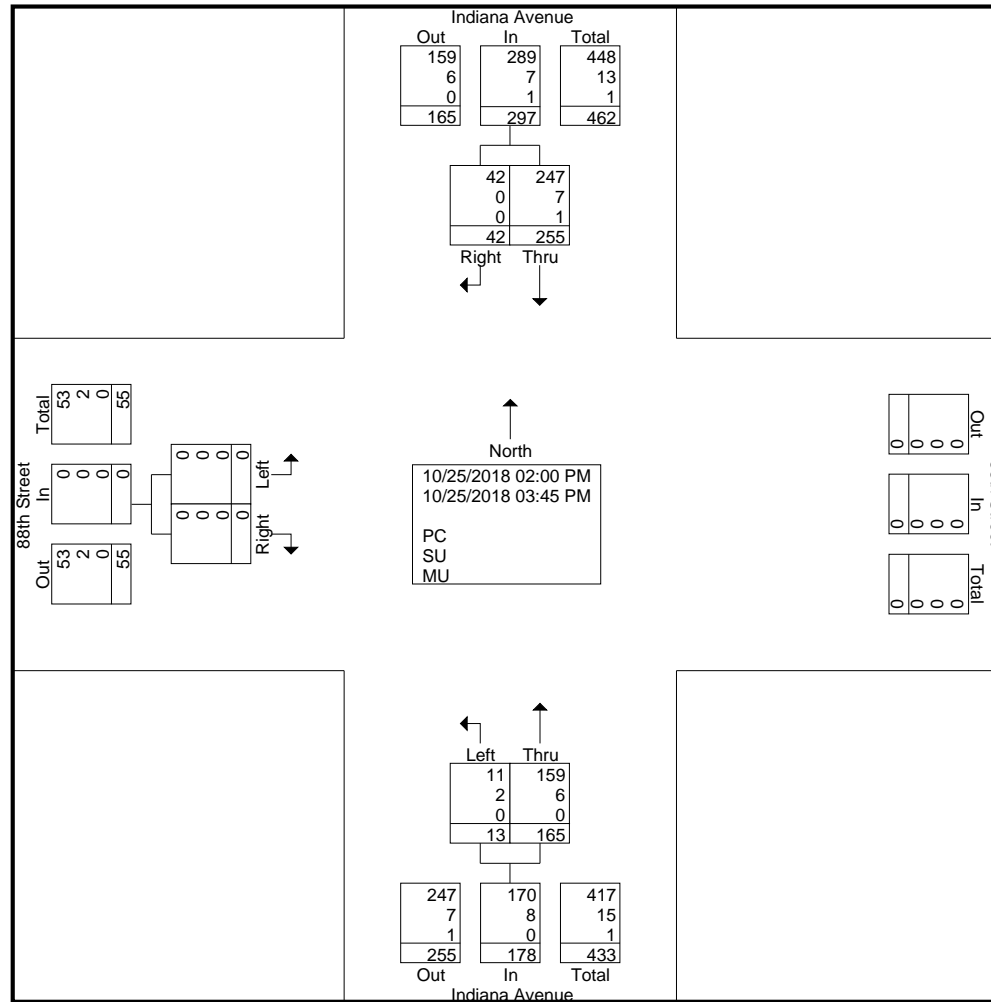
2:00 - 4:00 PM

File Name : 88th & Indiana 2-4 PM

Site Code :

Start Date : 10/25/2018

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Chicago, IL

2:00 - 4:00 PM

File Name : 88th & Indiana 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North			Indiana Avenue From South			88th Street From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:45 PM										
02:45 PM	38	7	45	7	24	31	0	0	0	76
03:00 PM	24	4	28	2	28	30	0	0	0	58
03:15 PM	31	1	32	3	18	21	0	0	0	53
03:30 PM	46	3	49	0	26	26	0	0	0	75
Total Volume	139	15	154	12	96	108	0	0	0	262
% App. Total	90.3	9.7		11.1	88.9		0	0		
PHF	.755	.536	.786	.429	.857	.871	.000	.000	.000	.862

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:45 PM			02:45 PM			02:00 PM		
+0 mins.	38	7	45	7	24	31	0	0	0
+15 mins.	24	4	28	2	28	30	0	0	0
+30 mins.	31	1	32	3	18	21	0	0	0
+45 mins.	46	3	49	0	26	26	0	0	0
Total Volume	139	15	154	12	96	108	0	0	0
% App. Total	90.3	9.7		11.1	88.9		0	0	
PHF	.755	.536	.786	.429	.857	.871	.000	.000	.000

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88th Street & Indiana Avenue

Chicago, IL

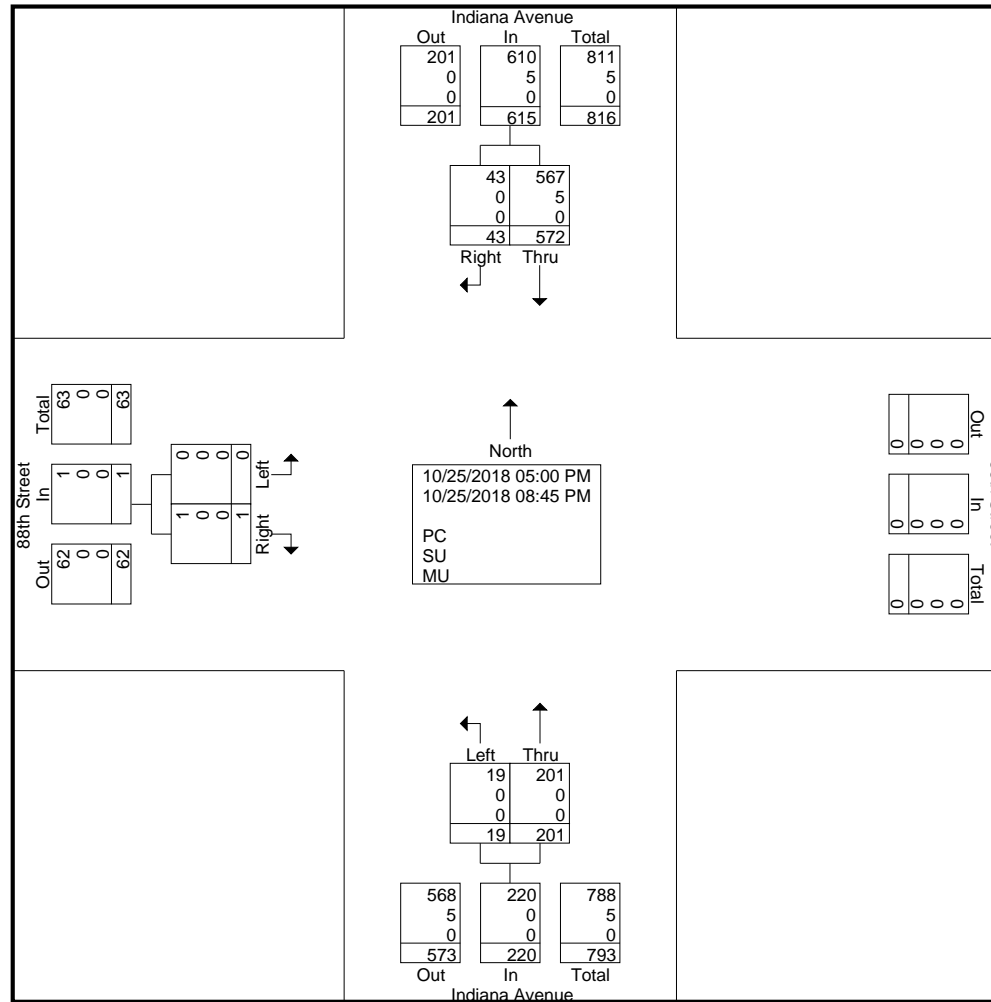
5:00 - 9:00 PM

File Name : 88th & Indiana 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 2





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88th Street & Indiana Avenue

Chicago, IL

5:00 - 9:00 PM

File Name : 88th & Indiana 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North			Indiana Avenue From South			88th Street From West			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	64	0	64	3	21	24	0	0	0	88
05:15 PM	71	3	74	1	20	21	0	0	0	95
05:30 PM	75	2	77	2	21	23	0	0	0	100
05:45 PM	57	3	60	2	19	21	0	0	0	81
Total Volume	267	8	275	8	81	89	0	0	0	364
% App. Total	97.1	2.9		9	91		0	0		
PHF	.890	.667	.893	.667	.964	.927	.000	.000	.000	.910

Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:30 PM		
+0 mins.	64	0	64	3	21	24	0	0	0
+15 mins.	71	3	74	1	20	21	0	0	0
+30 mins.	75	2	77	2	21	23	0	0	0
+45 mins.	57	3	60	2	19	21	0	1	1
Total Volume	267	8	275	8	81	89	0	1	1
% App. Total	97.1	2.9		9	91		0	100	
PHF	.890	.667	.893	.667	.964	.927	.000	.250	.250

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Indiana Avenue & McDade Parking Access

Chicago, IL

7:00 - 9:00 AM

File Name : Indiana\_Avenue & Parking Access 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Indiana Avenue From North			Parking Access From East			Indiana Avenue From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	1	3	4	0	0	0	26	2	28	32
07:15 AM	6	9	15	2	2	4	23	4	27	46
07:30 AM	10	10	20	1	11	12	38	9	47	79
07:45 AM	11	27	38	1	9	10	42	2	44	92
Total	28	49	77	4	22	26	129	17	146	249
08:00 AM	3	25	28	1	0	1	20	0	20	49
08:15 AM	1	18	19	0	1	1	23	0	23	43
08:30 AM	1	20	21	0	0	0	29	0	29	50
08:45 AM	0	17	17	0	0	0	22	0	22	39
Total	5	80	85	1	1	2	94	0	94	181
Grand Total	33	129	162	5	23	28	223	17	240	430
Apprch %	20.4	79.6		17.9	82.1		92.9	7.1		
Total %	7.7	30	37.7	1.2	5.3	6.5	51.9	4	55.8	
PC	33	122	155	5	23	28	210	17	227	410
% PC	100	94.6	95.7	100	100	100	94.2	100	94.6	95.3
SU	0	6	6	0	0	0	11	0	11	17
% SU	0	4.7	3.7	0	0	0	4.9	0	4.6	4
MU	0	1	1	0	0	0	2	0	2	3
% MU	0	0.8	0.6	0	0	0	0.9	0	0.8	0.7

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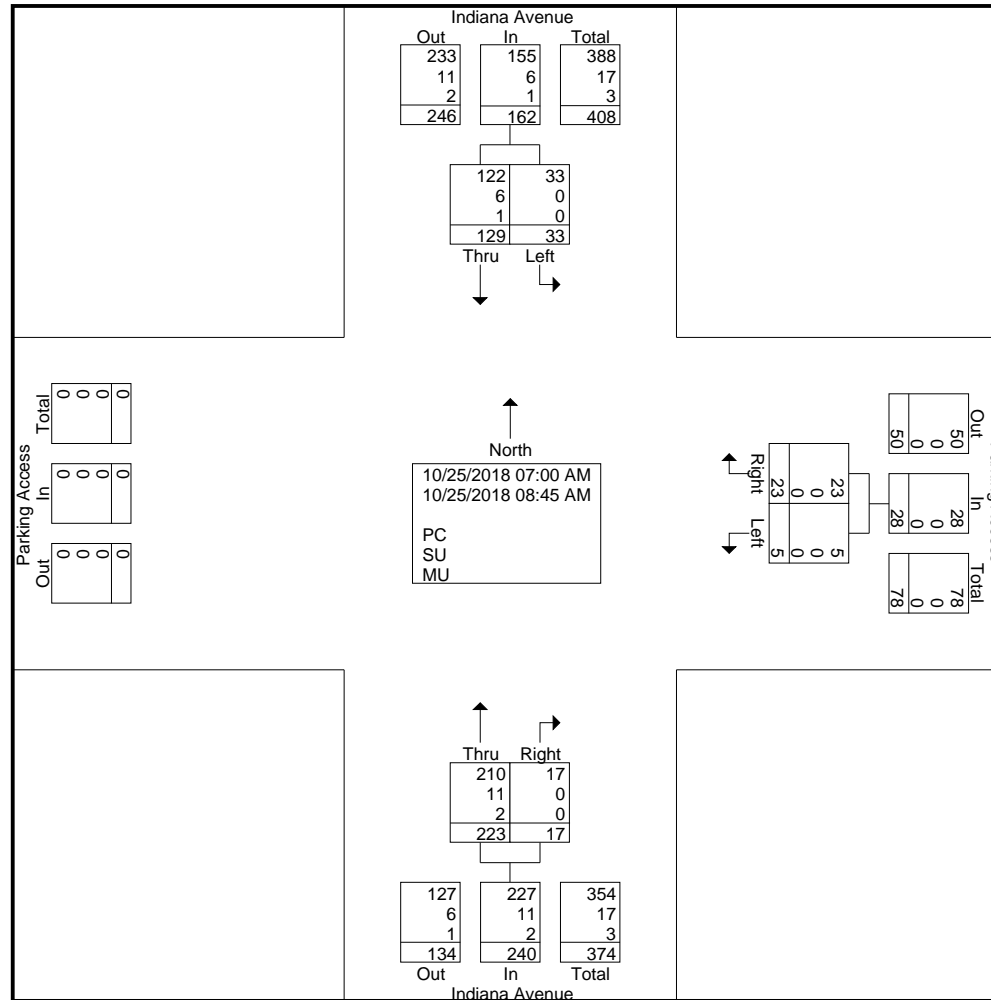
[www.aesser.com](http://www.aesser.com)

File Name : Indiana\_Avenue & Parking Access 7-9 AM

Site Code :

Start Date : 10/25/2018

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File Name : Indiana\_Avenue & Parking Access 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North			Parking Access From East			Indiana Avenue From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	6	9	15	2	2	4	23	4	27	46
07:30 AM	10	10	20	1	11	12	38	9	47	79
07:45 AM	11	27	38	1	9	10	42	2	44	92
08:00 AM	3	25	28	1	0	1	20	0	20	49
Total Volume	30	71	101	5	22	27	123	15	138	266
% App. Total	29.7	70.3		18.5	81.5		89.1	10.9		
PHF	.682	.657	.664	.625	.500	.563	.732	.417	.734	.723

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM			07:15 AM			07:00 AM		
+0 mins.	11	27	38	2	2	4	26	2	28
+15 mins.	3	25	28	1	11	12	23	4	27
+30 mins.	1	18	19	1	9	10	38	9	47
+45 mins.	1	20	21	1	0	1	42	2	44
Total Volume	16	90	106	5	22	27	129	17	146
% App. Total	15.1	84.9		18.5	81.5		88.4	11.6	
PHF	.364	.833	.697	.625	.500	.563	.768	.472	.777

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Indiana Avenue & McDade Parking Access

Chicago, IL

2:00 - 4:00 PM

File Name : Indiana & Parking 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Indiana Avenue From North			Parking Access From East			Indiana Avenue From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
02:00 PM	2	18	20	0	0	0	8	0	8	28
02:15 PM	1	24	25	0	0	0	17	1	18	43
02:30 PM	0	33	33	0	1	1	22	0	22	56
02:45 PM	0	40	40	1	3	4	25	1	26	70
Total	3	115	118	1	4	5	72	2	74	197
03:00 PM	0	23	23	1	5	6	19	0	19	48
03:15 PM	0	30	30	0	3	3	19	1	20	53
03:30 PM	3	38	41	1	0	1	25	0	25	67
03:45 PM	2	34	36	1	6	7	14	1	15	58
Total	5	125	130	3	14	17	77	2	79	226
Grand Total	8	240	248	4	18	22	149	4	153	423
Apprch %	3.2	96.8		18.2	81.8		97.4	2.6		
Total %	1.9	56.7	58.6	0.9	4.3	5.2	35.2	0.9	36.2	
PC	8	232	240	4	18	22	140	4	144	406
% PC	100	96.7	96.8	100	100	100	94	100	94.1	96
SU	0	7	7	0	0	0	9	0	9	16
% SU	0	2.9	2.8	0	0	0	6	0	5.9	3.8
MU	0	1	1	0	0	0	0	0	0	1
% MU	0	0.4	0.4	0	0	0	0	0	0	0.2

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Indiana Avenue & McDade Parking Access

Chicago, IL

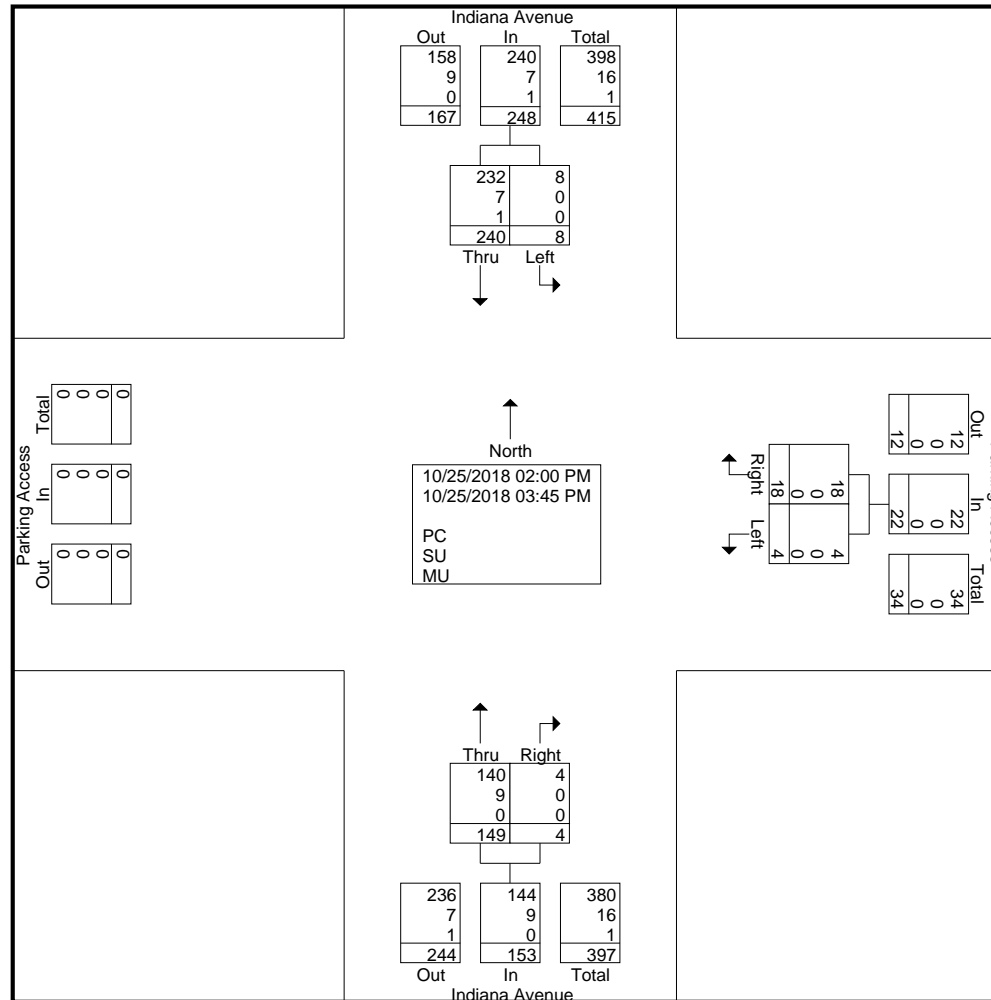
2:00 - 4:00 PM

File Name : Indiana & Parking 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 2



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Indiana Avenue & McDade Parking Access

Chicago, IL

2:00 - 4:00 PM

File Name : Indiana & Parking 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North			Parking Access From East			Indiana Avenue From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:45 PM										
02:45 PM	0	40	40	1	3	4	25	1	26	70
03:00 PM	0	23	23	1	5	6	19	0	19	48
03:15 PM	0	30	30	0	3	3	19	1	20	53
03:30 PM	3	38	41	1	0	1	25	0	25	67
Total Volume	3	131	134	3	11	14	88	2	90	238
% App. Total	2.2	97.8		21.4	78.6		97.8	2.2		
PHF	.250	.819	.817	.750	.550	.583	.880	.500	.865	.850

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:45 PM			03:00 PM			02:45 PM		
+0 mins.	0	40	40	1	5	6	25	1	26
+15 mins.	0	23	23	0	3	3	19	0	19
+30 mins.	0	30	30	1	0	1	19	1	20
+45 mins.	3	38	41	1	6	7	25	0	25
Total Volume	3	131	134	3	14	17	88	2	90
% App. Total	2.2	97.8		17.6	82.4		97.8	2.2	
PHF	.250	.819	.817	.750	.583	.607	.880	.500	.865

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Page No : 1

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# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

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Indiana Avenue & McDade Parking Access

Chicago, IL

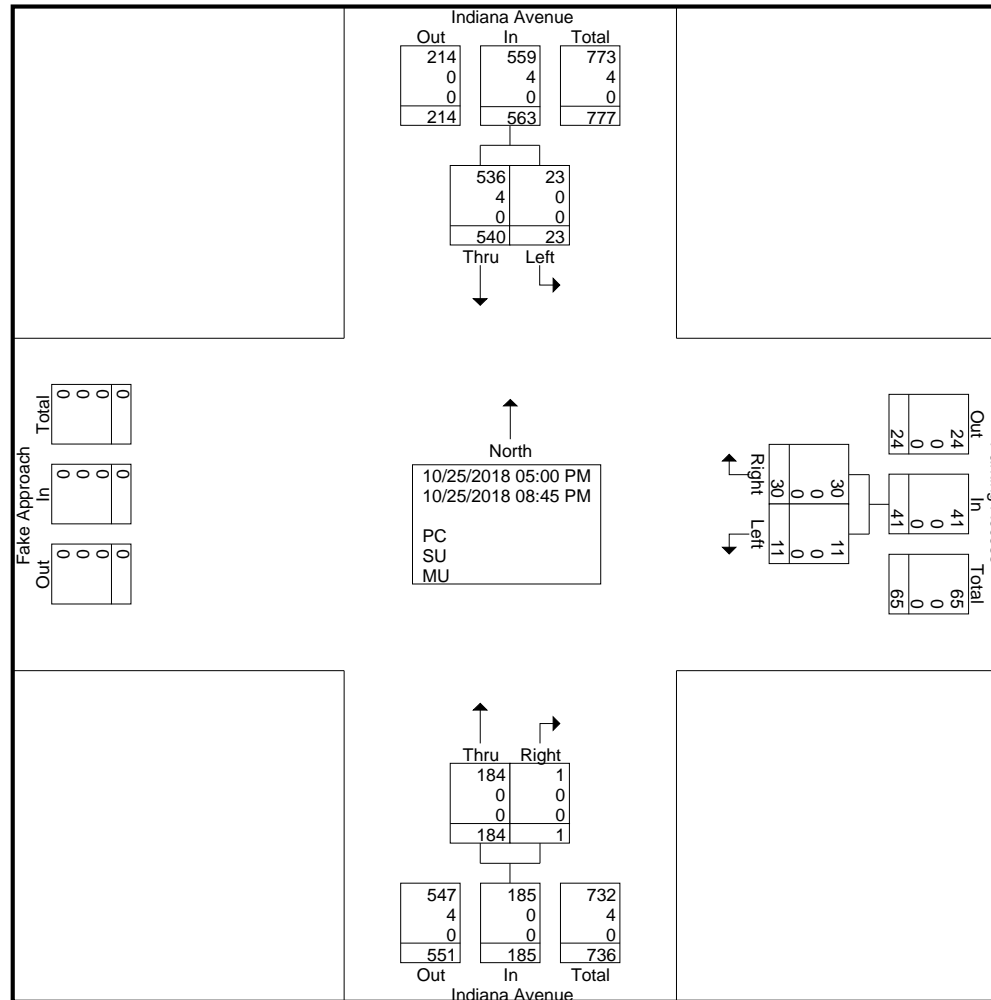
5:00 - 9:00 PM

File Name : Indiana & Parking 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 2



# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

Indiana Avenue & McDade Parking Access

Chicago, IL

5:00 - 9:00 PM

File Name : Indiana & Parking 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North			Parking Access From East			Indiana Avenue From South			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	2	60	62	1	6	7	18	0	18	87
05:15 PM	4	67	71	1	2	3	17	0	17	91
05:30 PM	6	64	70	1	4	5	15	0	15	90
05:45 PM	9	49	58	3	6	9	15	0	15	82
Total Volume	21	240	261	6	18	24	65	0	65	350
% App. Total	8	92		25	75		100	0		
PHF	.583	.896	.919	.500	.750	.667	.903	.000	.903	.962

Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			05:30 PM			05:00 PM		
+0 mins.	2	60	62	1	4	5	18	0	18
+15 mins.	4	67	71	3	6	9	17	0	17
+30 mins.	6	64	70	3	7	10	15	0	15
+45 mins.	9	49	58	2	3	5	15	0	15
Total Volume	21	240	261	9	20	29	65	0	65
% App. Total	8	92		31	69		100	0	
PHF	.583	.896	.919	.750	.714	.725	.903	.000	.903

# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

89th Street & Indiana Avenue

Chicago, IL

7:00 - 9:00 AM

File Name : 89th & Indiana 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Indiana Avenue From North				89th Street From East				Indiana Avenue From South				89th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	3	0	3	0	18	1	19	27	25	1	53	0	2	6	8	83
07:15 AM	2	6	0	8	2	16	4	22	25	17	1	43	1	3	5	9	82
07:30 AM	3	8	2	13	1	12	12	25	44	27	0	71	12	6	7	25	134
07:45 AM	2	25	2	29	1	14	4	19	28	35	1	64	7	6	5	18	130
Total	7	42	4	53	4	60	21	85	124	104	3	231	20	17	23	60	429
08:00 AM	2	19	1	22	0	14	2	16	21	11	5	37	4	9	10	23	98
08:15 AM	4	13	2	19	0	20	0	20	25	20	2	47	0	14	6	20	106
08:30 AM	6	16	1	23	2	15	2	19	21	27	2	50	0	7	8	15	107
08:45 AM	3	12	0	15	0	5	2	7	24	15	1	40	2	12	3	17	79
Total	15	60	4	79	2	54	6	62	91	73	10	174	6	42	27	75	390
Grand Total	22	102	8	132	6	114	27	147	215	177	13	405	26	59	50	135	819
Apprch %	16.7	77.3	6.1		4.1	77.6	18.4		53.1	43.7	3.2		19.3	43.7	37		
Total %	2.7	12.5	1	16.1	0.7	13.9	3.3	17.9	26.3	21.6	1.6	49.5	3.2	7.2	6.1	16.5	
PC	22	94	7	123	6	114	26	146	213	169	13	395	23	58	45	126	790
% PC	100	92.2	87.5	93.2	100	100	96.3	99.3	99.1	95.5	100	97.5	88.5	98.3	90	93.3	96.5
SU	0	8	1	9	0	0	1	1	2	6	0	8	3	1	5	9	27
% SU	0	7.8	12.5	6.8	0	0	3.7	0.7	0.9	3.4	0	2	11.5	1.7	10	6.7	3.3
MU	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
% MU	0	0	0	0	0	0	0	0	0	1.1	0	0.5	0	0	0	0	0.2

# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

89th Street & Indiana Avenue

Chicago, IL

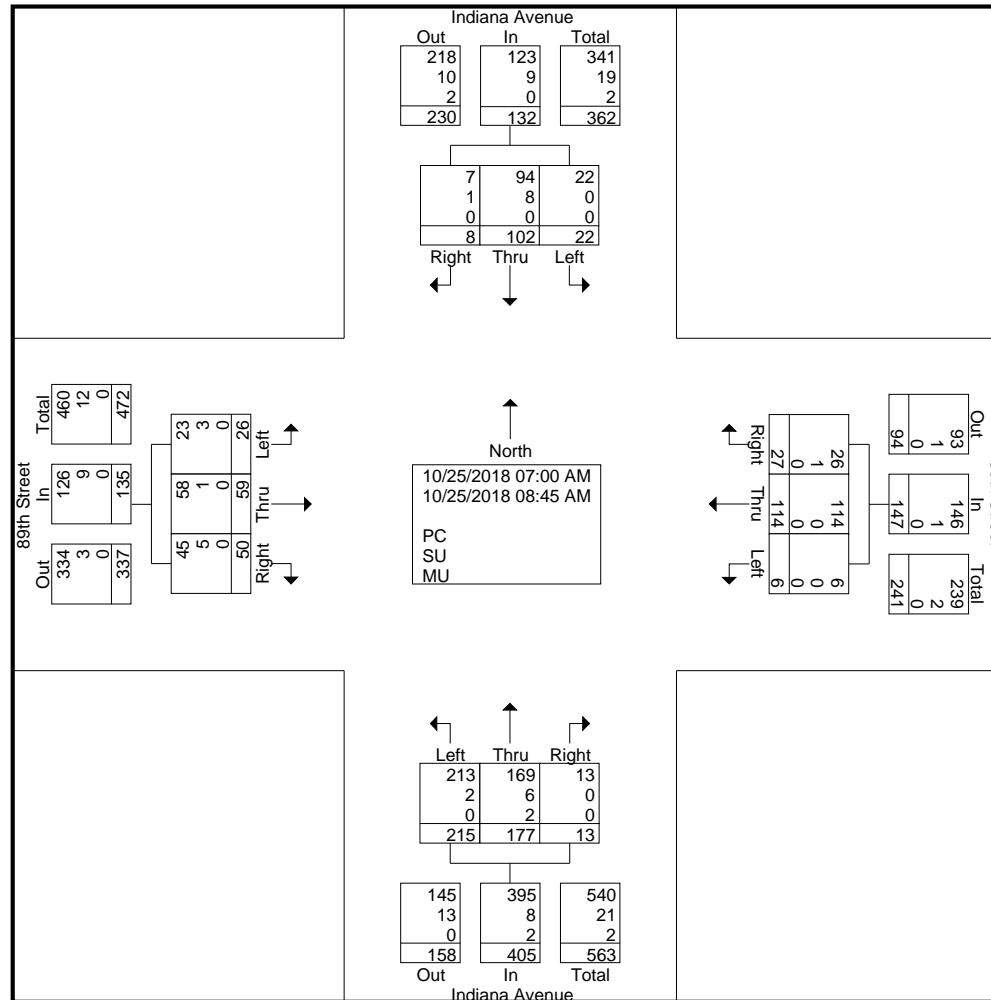
7:00 - 9:00 AM

File Name : 89th & Indiana 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 2



# AES Services, Inc.

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89th Street & Indiana Avenue

Chicago, IL

7:00 - 9:00 AM

File Name : 89th & Indiana 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North				89th Street From East				Indiana Avenue From South				89th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	3	8	2	13	1	12	12	25	44	27	0	71	12	6	7	25	134
07:45 AM	2	25	2	29	1	14	4	19	28	35	1	64	7	6	5	18	130
08:00 AM	2	19	1	22	0	14	2	16	21	11	5	37	4	9	10	23	98
08:15 AM	4	13	2	19	0	20	0	20	25	20	2	47	0	14	6	20	106
Total Volume	11	65	7	83	2	60	18	80	118	93	8	219	23	35	28	86	468
% App. Total	13.3	78.3	8.4		2.5	75	22.5		53.9	42.5	3.7		26.7	40.7	32.6		
PHF	.688	.650	.875	.716	.500	.750	.375	.800	.670	.664	.400	.771	.479	.625	.700	.860	.873

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				07:00 AM				07:30 AM			
+0 mins.	2	25	2	29	0	18	1	19	27	25	1	53	12	6	7	25
+15 mins.	2	19	1	22	2	16	4	22	25	17	1	43	7	6	5	18
+30 mins.	4	13	2	19	1	12	12	25	44	27	0	71	4	9	10	23
+45 mins.	6	16	1	23	1	14	4	19	28	35	1	64	0	14	6	20
Total Volume	14	73	6	93	4	60	21	85	124	104	3	231	23	35	28	86
% App. Total	15.1	78.5	6.5		4.7	70.6	24.7		53.7	45	1.3		26.7	40.7	32.6	
PHF	.583	.730	.750	.802	.500	.833	.438	.850	.705	.743	.750	.813	.479	.625	.700	.860

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# AES Services, Inc.

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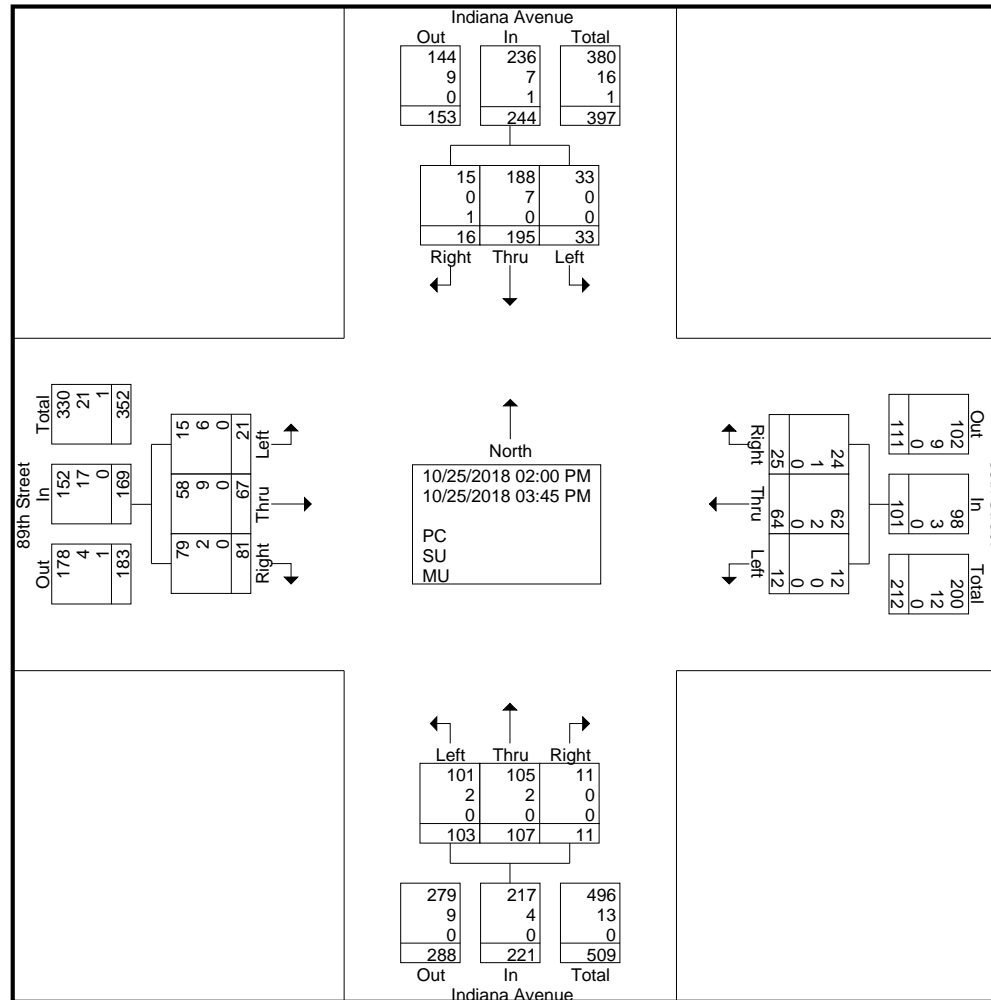
89th Street & Indiana Avenue  
Chicago, IL  
2:00 - 4:00 PM

File Name : 89th & Indiana 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 2



# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

89th Street & Indiana Avenue

Chicago, IL

2:00 - 4:00 PM

File Name : 89th & Indiana 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North				89th Street From East				Indiana Avenue From South				89th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:45 PM																	
02:45 PM	6	34	4	44	1	11	1	13	14	11	2	27	6	10	14	30	114
03:00 PM	7	23	1	31	1	8	2	11	14	17	3	34	2	9	14	25	101
03:15 PM	2	22	3	27	1	9	2	12	11	15	4	30	1	7	9	17	86
03:30 PM	5	30	3	38	1	8	7	16	10	19	1	30	3	10	12	25	109
Total Volume	20	109	11	140	4	36	12	52	49	62	10	121	12	36	49	97	410
% App. Total	14.3	77.9	7.9		7.7	69.2	23.1		40.5	51.2	8.3		12.4	37.1	50.5		
PHF	.714	.801	.688	.795	1.00	.818	.429	.813	.875	.816	.625	.890	.500	.900	.875	.808	.899

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:45 PM				02:00 PM				02:30 PM				02:45 PM			
+0 mins.	6	34	4	44	1	6	4	11	19	17	0	36	6	10	14	30
+15 mins.	7	23	1	31	2	10	1	13	14	11	2	27	2	9	14	25
+30 mins.	2	22	3	27	4	4	7	15	14	17	3	34	1	7	9	17
+45 mins.	5	30	3	38	1	11	1	13	11	15	4	30	3	10	12	25
Total Volume	20	109	11	140	8	31	13	52	58	60	9	127	12	36	49	97
% App. Total	14.3	77.9	7.9		15.4	59.6	25		45.7	47.2	7.1		12.4	37.1	50.5	
PHF	.714	.801	.688	.795	.500	.705	.464	.867	.763	.882	.563	.882	.500	.900	.875	.808



# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

89th Street & Indiana Avenue

Chicago, IL

5:00 - 9:00 PM

File Name : 89th & Indiana 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Indiana Avenue From North				89th Street From East				Indiana Avenue From South				89th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
05:00 PM	2	44	18	64	3	211	2	216	15	3	4	22	5	222	18	245	547
05:15 PM	8	55	25	88	4	201	3	208	15	5	5	25	7	204	15	226	547
05:30 PM	6	41	15	62	8	204	2	214	11	6	9	26	2	221	34	257	559
05:45 PM	12	32	12	56	7	216	1	224	8	8	3	19	3	209	22	234	533
Total	28	172	70	270	22	832	8	862	49	22	21	92	17	856	89	962	2186
06:00 PM	9	34	11	54	4	206	1	211	9	3	3	15	4	214	20	238	518
06:15 PM	7	16	14	37	3	173	4	180	10	2	2	14	6	217	17	240	471
06:30 PM	3	30	11	44	3	180	3	186	6	6	2	14	3	205	16	224	468
06:45 PM	5	17	8	30	1	188	1	190	10	3	5	18	2	203	17	222	460
Total	24	97	44	165	11	747	9	767	35	14	12	61	15	839	70	924	1917
07:00 PM	9	4	9	22	2	148	0	150	9	0	1	10	5	188	19	212	394
07:15 PM	4	3	5	12	3	156	0	159	5	1	1	7	2	210	18	230	408
07:30 PM	8	11	2	21	3	138	2	143	7	2	3	12	1	197	10	208	384
07:45 PM	1	9	7	17	4	138	3	145	5	0	1	6	1	191	8	200	368
Total	22	27	23	72	12	580	5	597	26	3	6	35	9	786	55	850	1554
08:00 PM	2	9	9	20	0	158	3	161	4	3	1	8	3	149	14	166	355
08:15 PM	2	8	3	13	8	126	2	136	3	3	1	7	0	161	12	173	329
08:30 PM	3	2	8	13	1	133	0	134	10	4	4	18	4	174	16	194	359
08:45 PM	2	3	5	10	1	133	0	134	5	2	2	9	1	172	14	187	340
Total	9	22	25	56	10	550	5	565	22	12	8	42	8	656	56	720	1383
Grand Total	83	318	162	563	55	2709	27	2791	132	51	47	230	49	3137	270	3456	7040
Apprch %	14.7	56.5	28.8		2	97.1	1		57.4	22.2	20.4		1.4	90.8	7.8		
Total %	1.2	4.5	2.3	8	0.8	38.5	0.4	39.6	1.9	0.7	0.7	3.3	0.7	44.6	3.8	49.1	
PC	82	313	162	557	55	2663	26	2744	132	51	47	230	49	3100	270	3419	6950
% PC	98.8	98.4	100	98.9	100	98.3	96.3	98.3	100	100	100	100	100	98.8	100	98.9	98.7
SU	1	5	0	6	0	44	1	45	0	0	0	0	0	32	0	32	83
% SU	1.2	1.6	0	1.1	0	1.6	3.7	1.6	0	0	0	0	0	1	0	0.9	1.2
MU	0	0	0	0	0	2	0	2	0	0	0	0	0	5	0	5	7
% MU	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0	0.2	0	0.1	0.1

# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

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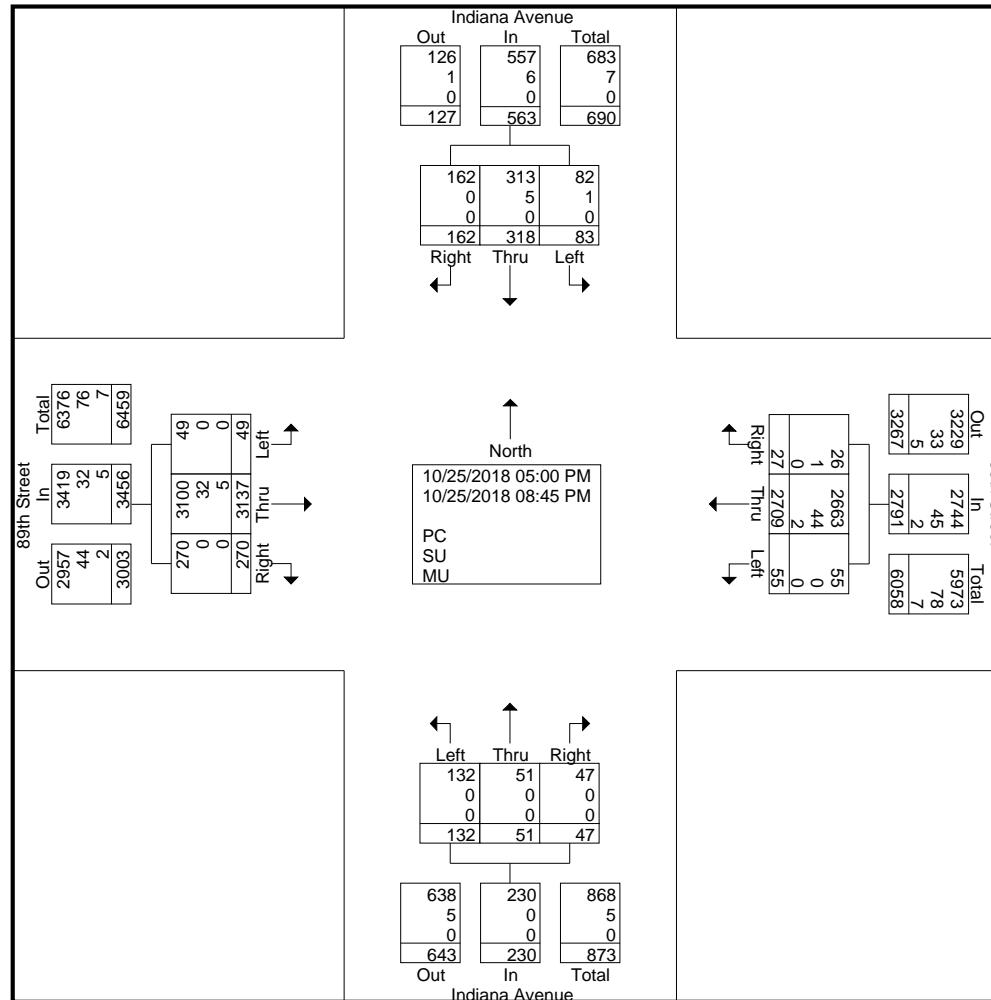
89th Street & Indiana Avenue  
Chicago, IL  
5:00 - 9:00 PM

File Name : 89th & Indiana 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 2



# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

89th Street & Indiana Avenue

Chicago, IL

5:00 - 9:00 PM

File Name : 89th & Indiana 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Indiana Avenue From North				89th Street From East				Indiana Avenue From South				89th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	2	44	18	64	3	211	2	216	15	3	4	22	5	222	18	245	547
05:15 PM	8	55	25	88	4	201	3	208	15	5	5	25	7	204	15	226	547
05:30 PM	6	41	15	62	8	204	2	214	11	6	9	26	2	221	34	257	559
05:45 PM	12	32	12	56	7	216	1	224	8	8	3	19	3	209	22	234	533
Total Volume	28	172	70	270	22	832	8	862	49	22	21	92	17	856	89	962	2186
% App. Total	10.4	63.7	25.9		2.6	96.5	0.9		53.3	23.9	22.8		1.8	89	9.3		
PHF	.583	.782	.700	.767	.688	.963	.667	.962	.817	.688	.583	.885	.607	.964	.654	.936	.978

Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:30 PM			
+0 mins.	2	44	18	64	3	211	2	216	15	3	4	22	2	221	34	257
+15 mins.	8	55	25	88	4	201	3	208	15	5	5	25	3	209	22	234
+30 mins.	6	41	15	62	8	204	2	214	11	6	9	26	4	214	20	238
+45 mins.	12	32	12	56	7	216	1	224	8	8	3	19	6	217	17	240
Total Volume	28	172	70	270	22	832	8	862	49	22	21	92	15	861	93	969
% App. Total	10.4	63.7	25.9		2.6	96.5	0.9		53.3	23.9	22.8		1.5	88.9	9.6	
PHF	.583	.782	.700	.767	.688	.963	.667	.962	.817	.688	.583	.885	.625	.974	.684	.943

# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

87th Street & Prairie Avenue

Chicago, IL

7:00 - 9:00 AM

File Name : 87th & Prairie 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Prairie Avenue From North				87th Street From East				Prairie Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	1	182	1	184	0	0	2	2	1	123	0	124	310
07:15 AM	0	0	0	0	0	188	2	190	0	0	0	0	2	147	1	150	340
07:30 AM	0	0	0	0	0	205	3	208	0	1	2	3	2	197	3	202	413
07:45 AM	0	0	0	0	0	181	3	184	1	1	0	2	1	228	0	229	415
Total	0	0	0	0	1	756	9	766	1	2	4	7	6	695	4	705	1478
08:00 AM	0	0	0	0	0	188	0	188	0	0	1	1	2	217	0	219	408
08:15 AM	0	0	0	0	0	200	1	201	1	0	1	2	5	192	2	199	402
08:30 AM	0	0	0	0	1	168	4	173	0	0	0	0	4	217	2	223	396
08:45 AM	0	0	0	0	0	153	3	156	0	0	0	0	5	234	1	240	396
Total	0	0	0	0	1	709	8	718	1	0	2	3	16	860	5	881	1602
Grand Total	0	0	0	0	2	1465	17	1484	2	2	6	10	22	1555	9	1586	3080
Apprch %	0	0	0		0.1	98.7	1.1		20	20	60		1.4	98	0.6		
Total %	0	0	0	0	0.1	47.6	0.6	48.2	0.1	0.1	0.2	0.3	0.7	50.5	0.3	51.5	
PC	0	0	0	0	2	1407	16	1425	2	2	5	9	22	1479	9	1510	2944
% PC	0	0	0	0	100	96	94.1	96	100	100	83.3	90	100	95.1	100	95.2	95.6
SU	0	0	0	0	0	46	1	47	0	0	1	1	0	64	0	64	112
% SU	0	0	0	0	0	3.1	5.9	3.2	0	0	16.7	10	0	4.1	0	4	3.6
MU	0	0	0	0	0	12	0	12	0	0	0	0	0	12	0	12	24
% MU	0	0	0	0	0	0.8	0	0.8	0	0	0	0	0	0.8	0	0.8	0.8

# AES Services, Inc.

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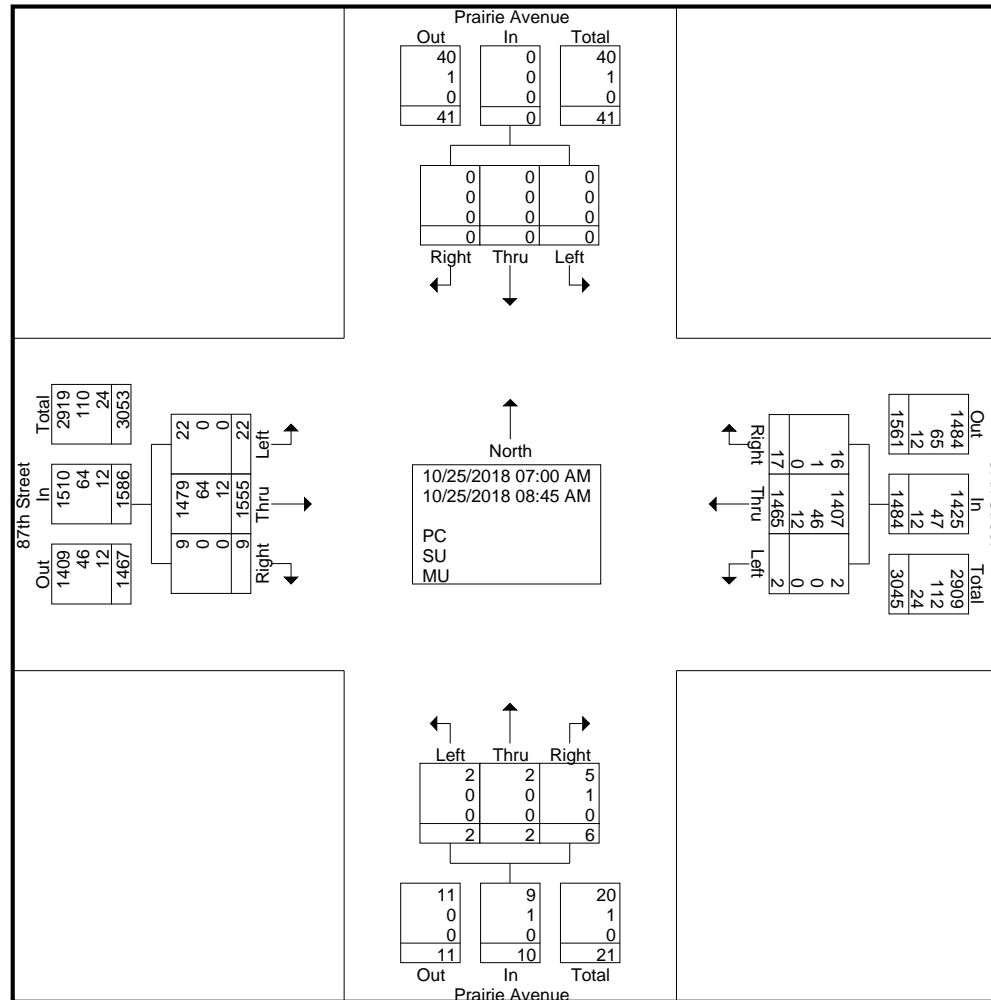
87th Street & Prairie Avenue  
Chicago, IL  
7:00 - 9:00 AM

File Name : 87th & Prairie 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 2



# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

87th Street & Prairie Avenue

Chicago, IL

7:00 - 9:00 AM

File Name : 87th & Prairie 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Prairie Avenue From North				87th Street From East				Prairie Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	<b>205</b>	<b>3</b>	<b>208</b>	0	<b>1</b>	<b>2</b>	<b>3</b>	2	197	<b>3</b>	202	413
07:45 AM	0	0	0	0	0	181	3	184	<b>1</b>	1	0	2	1	<b>228</b>	0	<b>229</b>	<b>415</b>
08:00 AM	0	0	0	0	0	188	0	188	0	0	1	1	2	217	0	219	408
08:15 AM	0	0	0	0	0	200	1	201	1	0	1	2	<b>5</b>	192	2	199	402
Total Volume	0	0	0	0	0	774	7	781	2	2	4	8	10	834	5	849	1638
% App. Total	0	0	0		0	99.1	0.9		25	25	50		1.2	98.2	0.6		
PHF	.000	.000	.000	.000	.000	.944	.583	.939	.500	.500	.500	.667	.500	.914	.417	.927	.987

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:30 AM				07:30 AM				08:00 AM			
+0 mins.	0	0	0	0	0	<b>205</b>	<b>3</b>	<b>208</b>	0	<b>1</b>	<b>2</b>	<b>3</b>	2	217	0	219
+15 mins.	0	0	0	0	0	181	3	184	<b>1</b>	1	0	2	<b>5</b>	192	<b>2</b>	199
+30 mins.	0	0	0	0	0	188	0	188	0	0	1	1	4	217	2	223
+45 mins.	0	0	0	0	0	200	1	201	1	0	1	2	5	<b>234</b>	1	<b>240</b>
Total Volume	0	0	0	0	0	774	7	781	2	2	4	8	16	860	5	881
% App. Total	0	0	0		0	99.1	0.9		25	25	50		1.8	97.6	0.6	
PHF	.000	.000	.000	.000	.000	.944	.583	.939	.500	.500	.500	.667	.800	.919	.625	.918

# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

87th Street & Prairie Avenue

Chicago, IL

2:00 - 4:00 PM

File Name : 87th & Prairie 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

Start Time	Prairie Avenue From North				87th Street From East				Prairie Avenue From South				87th Street From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
02:00 PM	0	0	0	0	1	192	4	197	0	0	0	0	4	171	0	175	372
02:15 PM	0	0	0	0	0	190	2	192	1	0	0	1	3	183	2	188	381
02:30 PM	0	0	0	0	0	202	0	202	1	0	1	2	2	189	0	191	395
02:45 PM	0	0	0	0	1	193	2	196	1	0	0	1	5	206	1	212	409
Total	0	0	0	0	2	777	8	787	3	0	1	4	14	749	3	766	1557
03:00 PM	0	0	0	0	1	211	2	214	0	0	2	2	4	187	2	193	409
03:15 PM	0	0	0	0	0	188	5	193	1	1	0	2	4	200	2	206	401
03:30 PM	0	0	0	0	1	194	2	197	1	0	0	1	4	221	3	228	426
03:45 PM	0	0	0	0	3	204	2	209	0	0	2	2	6	190	3	199	410
Total	0	0	0	0	5	797	11	813	2	1	4	7	18	798	10	826	1646
Grand Total	0	0	0	0	7	1574	19	1600	5	1	5	11	32	1547	13	1592	3203
Apprch %	0	0	0		0.4	98.4	1.2		45.5	9.1	45.5		2	97.2	0.8		
Total %	0	0	0	0	0.2	49.1	0.6	50	0.2	0	0.2	0.3	1	48.3	0.4	49.7	
PC	0	0	0	0	7	1509	19	1535	5	1	4	10	32	1493	11	1536	3081
% PC	0	0	0	0	100	95.9	100	95.9	100	100	80	90.9	100	96.5	84.6	96.5	96.2
SU	0	0	0	0	0	54	0	54	0	0	1	1	0	42	2	44	99
% SU	0	0	0	0	0	3.4	0	3.4	0	0	20	9.1	0	2.7	15.4	2.8	3.1
MU	0	0	0	0	0	11	0	11	0	0	0	0	0	12	0	12	23
% MU	0	0	0	0	0	0.7	0	0.7	0	0	0	0	0	0.8	0	0.8	0.7

# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

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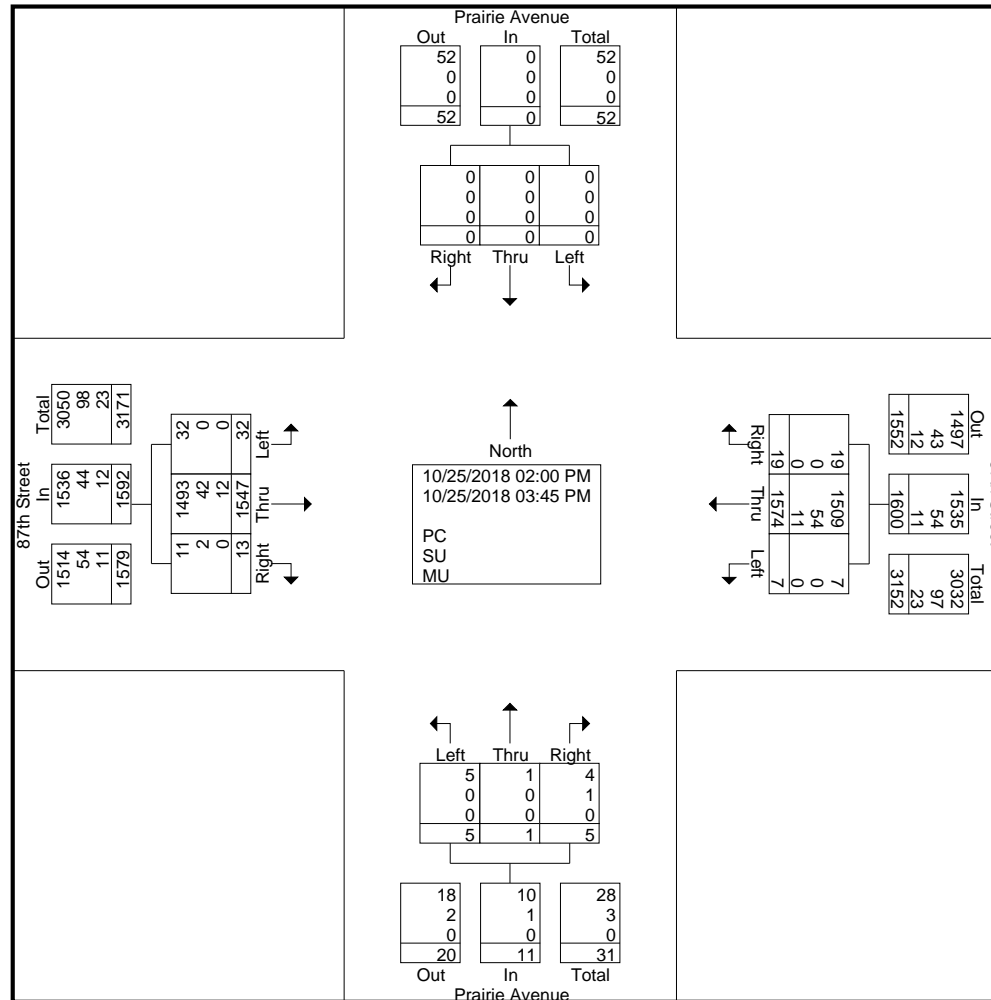
87th Street & Prairie Avenue  
Chicago, IL  
2:00 - 4:00 PM

File Name : 87th & Prairie 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 2





# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

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87th Street & Prairie Avenue

Chicago, IL

2:00 - 4:00 PM

File Name : 87th & Prairie 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Prairie Avenue From North				87th Street From East				Prairie Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:00 PM																	
03:00 PM	0	0	0	0	1	211	2	214	0	0	2	2	4	187	2	193	409
03:15 PM	0	0	0	0	0	188	5	193	1	1	0	2	4	200	2	206	401
03:30 PM	0	0	0	0	1	194	2	197	1	0	0	1	4	221	3	228	426
03:45 PM	0	0	0	0	3	204	2	209	0	0	2	2	6	190	3	199	410
Total Volume	0	0	0	0	5	797	11	813	2	1	4	7	18	798	10	826	1646
% App. Total	0	0	0	0	0.6	98	1.4		28.6	14.3	57.1		2.2	96.6	1.2		
PHF	.000	.000	.000	.000	.417	.944	.550	.950	.500	.250	.500	.875	.750	.903	.833	.906	.966

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM				03:00 PM				02:30 PM				02:45 PM			
+0 mins.	0	0	0	0	1	211	2	214	1	0	1	2	5	206	1	212
+15 mins.	0	0	0	0	0	188	5	193	1	0	0	1	4	187	2	193
+30 mins.	0	0	0	0	1	194	2	197	0	0	2	2	4	200	2	206
+45 mins.	0	0	0	0	3	204	2	209	1	1	0	2	4	221	3	228
Total Volume	0	0	0	0	5	797	11	813	3	1	3	7	17	814	8	839
% App. Total	0	0	0	0	0.6	98	1.4		42.9	14.3	42.9		2	97	1	
PHF	.000	.000	.000	.000	.417	.944	.550	.950	.750	.250	.375	.875	.850	.921	.667	.920

# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

87th Street & Prairie Avenue

Chicago, IL

5:00 - 9:00 PM

File Name : 87th & Prairie 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 1

## Groups Printed- PC - SU - MU

	Prairie Avenue From North				87th Street From East				Prairie Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
05:00 PM	0	0	0	0	0	220	3	223	2	0	0	2	5	217	1	223	448
05:15 PM	0	0	0	0	0	210	6	216	1	0	0	1	3	218	1	222	439
05:30 PM	0	0	0	0	1	216	2	219	0	0	1	1	1	237	1	239	459
05:45 PM	0	0	0	0	0	216	1	217	0	0	0	0	9	213	2	224	441
Total	0	0	0	0	1	862	12	875	3	0	1	4	18	885	5	908	1787
06:00 PM	0	0	0	0	2	218	3	223	2	0	1	3	4	220	2	226	452
06:15 PM	0	0	0	0	0	182	5	187	0	0	0	0	9	211	0	220	407
06:30 PM	0	0	0	0	0	195	5	200	1	0	1	2	1	210	2	213	415
06:45 PM	0	0	0	0	0	199	1	200	0	0	0	0	6	208	1	215	415
Total	0	0	0	0	2	794	14	810	3	0	2	5	20	849	5	874	1689
07:00 PM	1	0	0	1	1	151	3	155	0	1	0	1	7	194	4	205	362
07:15 PM	0	0	0	0	0	157	2	159	1	0	0	1	0	213	2	215	375
07:30 PM	0	0	0	0	0	139	3	142	1	0	0	1	5	202	3	210	353
07:45 PM	0	0	0	0	3	146	4	153	0	2	1	3	5	188	1	194	350
Total	1	0	0	1	4	593	12	609	2	3	1	6	17	797	10	824	1440
08:00 PM	0	0	0	0	2	160	2	164	0	0	0	0	1	153	0	154	318
08:15 PM	0	0	0	0	1	138	2	141	0	0	0	0	3	160	1	164	305
08:30 PM	0	0	0	0	0	135	3	138	0	0	0	0	2	180	0	182	320
08:45 PM	0	0	0	0	0	133	3	136	0	0	0	0	4	172	3	179	315
Total	0	0	0	0	3	566	10	579	0	0	0	0	10	665	4	679	1258
Grand Total	1	0	0	1	10	2815	48	2873	8	3	4	15	65	3196	24	3285	6174
Apprch %	100	0	0		0.3	98	1.7		53.3	20	26.7		2	97.3	0.7		
Total %	0	0	0	0	0.2	45.6	0.8	46.5	0.1	0	0.1	0.2	1.1	51.8	0.4	53.2	
PC	1	0	0	1	10	2769	48	2827	8	2	4	14	64	3158	23	3245	6087
% PC	100	0	0	100	100	98.4	100	98.4	100	66.7	100	93.3	98.5	98.8	95.8	98.8	98.6
SU	0	0	0	0	0	45	0	45	0	1	0	1	1	33	1	35	81
% SU	0	0	0	0	0	1.6	0	1.6	0	33.3	0	6.7	1.5	1	4.2	1.1	1.3
MU	0	0	0	0	0	1	0	1	0	0	0	0	0	5	0	5	6
% MU	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0.2	0.1

# AES Services, Inc.

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Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

87th Street & Prairie Avenue

Chicago, IL

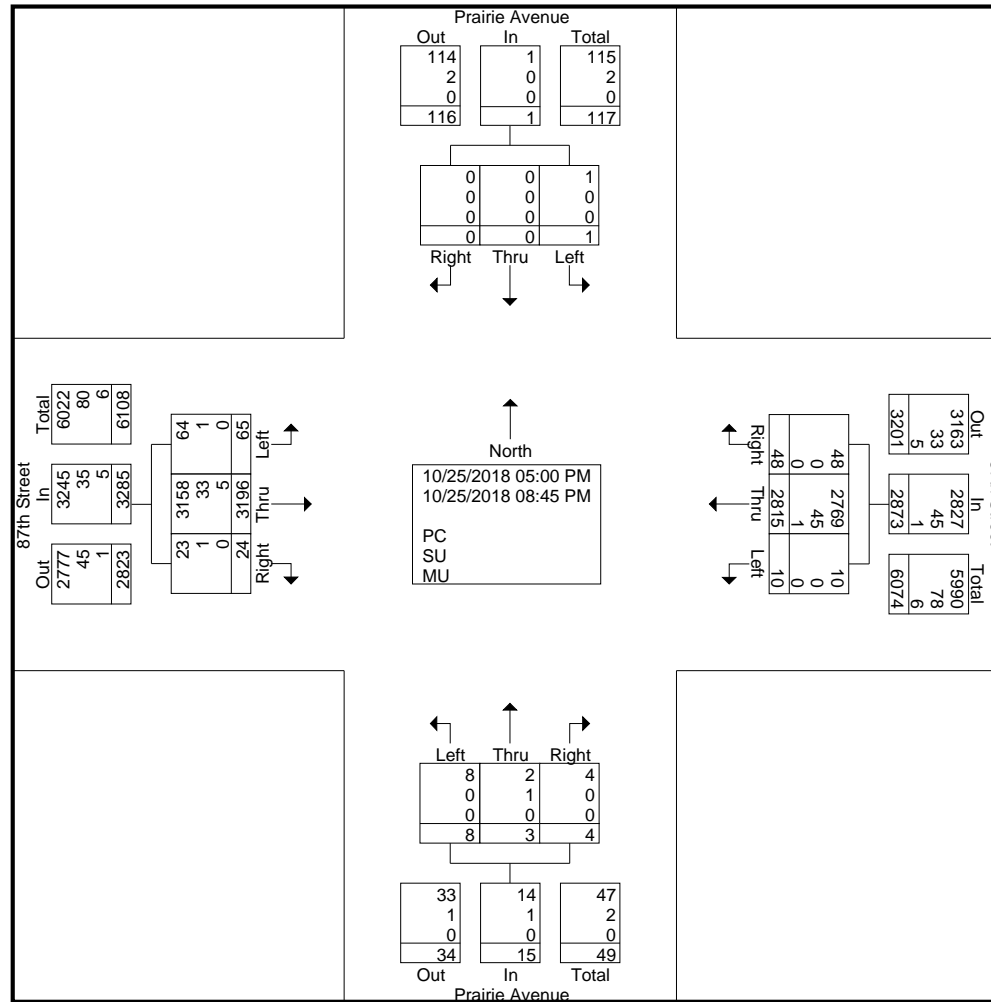
5:00 - 9:00 PM

File Name : 87th & Prairie 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 2



# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

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87th Street & Prairie Avenue

Chicago, IL

5:00 - 9:00 PM

File Name : 87th & Prairie 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Prairie Avenue From North				87th Street From East				Prairie Avenue From South				87th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:15 PM																	
05:15 PM	0	0	0	0	0	210	6	216	1	0	0	1	3	218	1	222	439
05:30 PM	0	0	0	0	1	216	2	219	0	0	1	1	1	237	1	239	459
05:45 PM	0	0	0	0	0	216	1	217	0	0	0	0	9	213	2	224	441
06:00 PM	0	0	0	0	2	218	3	223	2	0	1	3	4	220	2	226	452
Total Volume	0	0	0	0	3	860	12	875	3	0	2	5	17	888	6	911	1791
% App. Total	0	0	0		0.3	98.3	1.4		60	0	40		1.9	97.5	0.7		
PHF	.000	.000	.000	.000	.375	.986	.500	.981	.375	.000	.500	.417	.472	.937	.750	.953	.975

Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	06:15 PM				05:00 PM				07:00 PM				05:15 PM			
+0 mins.	0	0	0	0	0	220	3	223	0	1	0	1	3	218	1	222
+15 mins.	0	0	0	0	0	210	6	216	1	0	0	1	1	237	1	239
+30 mins.	0	0	0	0	1	216	2	219	1	0	0	1	9	213	2	224
+45 mins.	1	0	0	1	0	216	1	217	0	2	1	3	4	220	2	226
Total Volume	1	0	0	1	1	862	12	875	2	3	1	6	17	888	6	911
% App. Total	100	0	0		0.1	98.5	1.4		33.3	50	16.7		1.9	97.5	0.7	
PHF	.250	.000	.000	.250	.250	.980	.500	.981	.500	.375	.250	.500	.472	.937	.750	.953

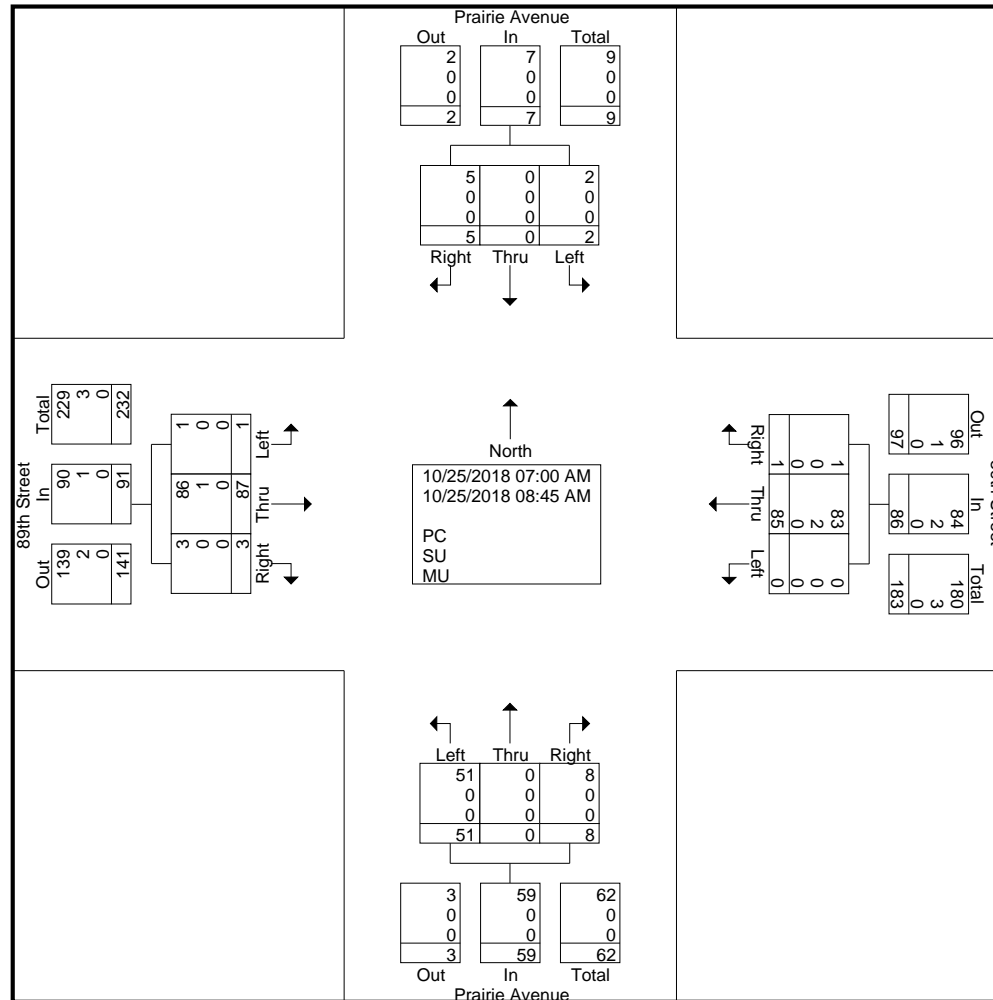
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# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

89th Street & Prairie Avenue

Chicago, IL

7:00 - 9:00 AM

File Name : 89th & Prairie 7-9 AM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Prairie Avenue From North				89th Street From East				Prairie Avenue From South				89th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	0	1	2	0	20	0	20	3	0	1	4	0	6	1	7	33
07:45 AM	0	0	0	0	0	8	0	8	9	0	2	11	0	11	0	11	30
08:00 AM	0	0	0	0	0	10	0	10	6	0	3	9	1	14	0	15	34
08:15 AM	0	0	0	0	0	10	0	10	8	0	0	8	0	18	1	19	37
Total Volume	1	0	1	2	0	48	0	48	26	0	6	32	1	49	2	52	134
% App. Total	50	0	50		0	100	0		81.2	0	18.8		1.9	94.2	3.8		
PHF	.250	.000	.250	.250	.000	.600	.000	.600	.722	.000	.500	.727	.250	.681	.500	.684	.905

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:45 AM				08:00 AM			
+0 mins.	0	0	0	0	0	13	1	14	9	0	2	11	1	14	0	15
+15 mins.	1	0	3	4	0	20	0	20	6	0	3	9	0	18	1	19
+30 mins.	1	0	1	2	0	8	0	8	8	0	0	8	0	12	0	12
+45 mins.	0	0	0	0	0	10	0	10	5	0	1	6	0	15	1	16
Total Volume	2	0	4	6	0	51	1	52	28	0	6	34	1	59	2	62
% App. Total	33.3	0	66.7		0	98.1	1.9		82.4	0	17.6		1.6	95.2	3.2	
PHF	.500	.000	.333	.375	.000	.638	.250	.650	.778	.000	.500	.773	.250	.819	.500	.816

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# AES Services, Inc.

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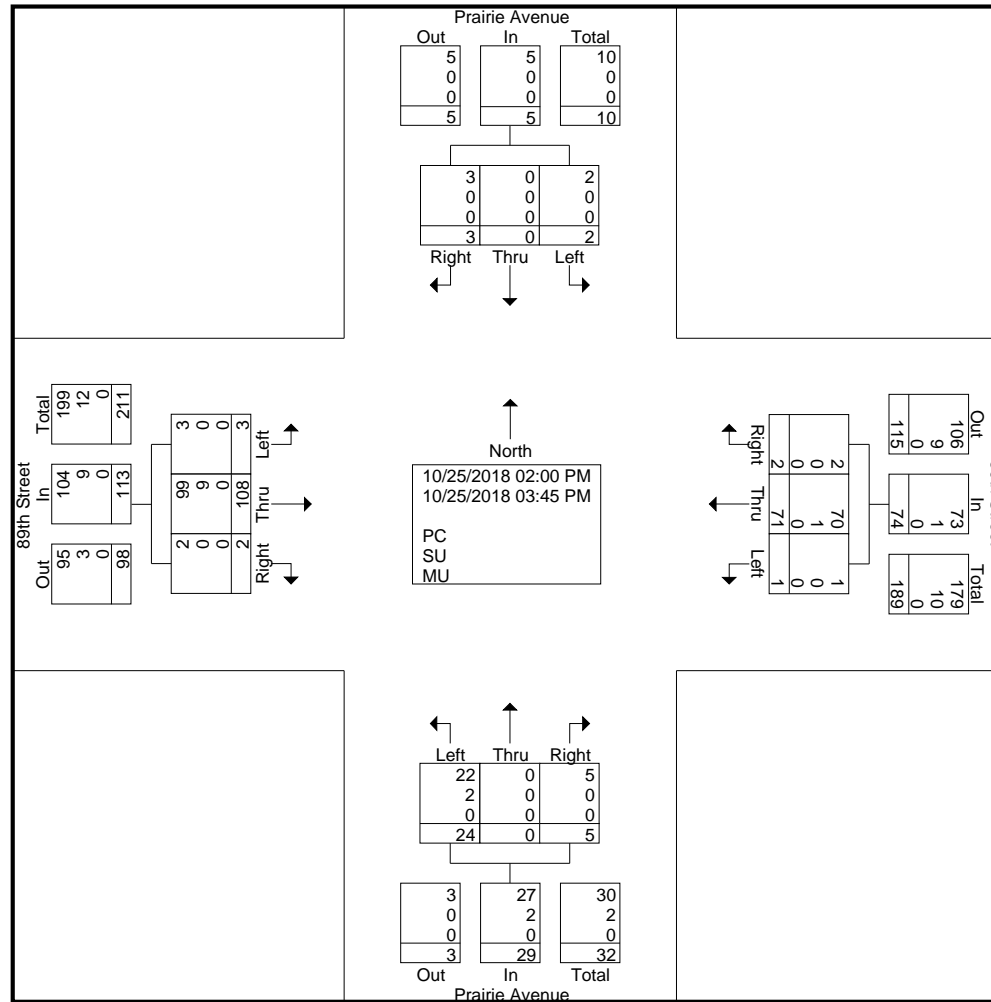
89th Street & Prairie Avenue  
Chicago, IL  
2:00 - 4:00 PM

File Name : 89th & Prairie 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 2



# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

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89th Street & Prairie Avenue

Chicago, IL

2:00 - 4:00 PM

File Name : 89th & Prairie 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Prairie Avenue From North				89th Street From East				Prairie Avenue From South				89th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:45 PM																	
02:45 PM	0	0	1	1	0	10	0	10	3	0	1	4	2	16	1	19	34
03:00 PM	0	0	0	0	0	12	0	12	1	0	1	2	0	15	1	16	30
03:15 PM	0	0	1	1	0	5	0	5	4	0	0	4	1	13	0	14	24
03:30 PM	0	0	0	0	0	11	0	11	5	0	1	6	0	16	0	16	33
Total Volume	0	0	2	2	0	38	0	38	13	0	3	16	3	60	2	65	121
% App. Total	0	0	100		0	100	0		81.2	0	18.8		4.6	92.3	3.1		
PHF	.000	.000	.500	.500	.000	.792	.000	.792	.650	.000	.750	.667	.375	.938	.500	.855	.890

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM				02:15 PM				02:45 PM				02:45 PM			
+0 mins.	1	0	1	2	1	6	0	7	3	0	1	4	2	16	1	19
+15 mins.	1	0	0	1	0	12	0	12	1	0	1	2	0	15	1	16
+30 mins.	0	0	0	0	0	10	0	10	4	0	0	4	1	13	0	14
+45 mins.	0	0	1	1	0	12	0	12	5	0	1	6	0	16	0	16
Total Volume	2	0	2	4	1	40	0	41	13	0	3	16	3	60	2	65
% App. Total	50	0	50		2.4	97.6	0		81.2	0	18.8		4.6	92.3	3.1	
PHF	.500	.000	.500	.500	.250	.833	.000	.854	.650	.000	.750	.667	.375	.938	.500	.855

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# AES Services, Inc.

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Chicago, IL 60606

[www.aesser.com](http://www.aesser.com)

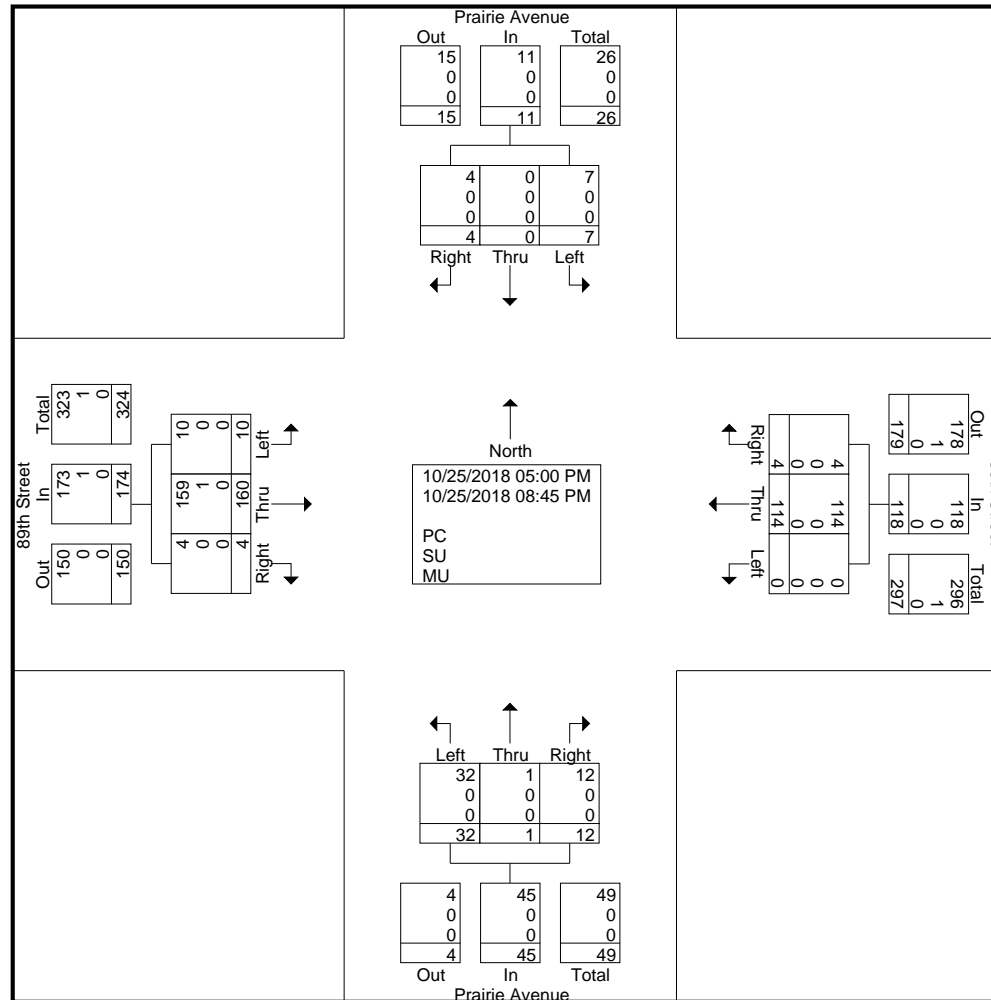
89th Street & Prairie Avenue  
Chicago, IL  
5:00 - 9:00 PM

File Name : 89th & Prairie 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 2



# AES Services, Inc.

111 S Wacker Dr, Ste. 3910

Chicago, IL 60606

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89th Street & Prairie Avenue

Chicago, IL

5:00 - 9:00 PM

File Name : 89th & Prairie 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Prairie Avenue From North				89th Street From East				Prairie Avenue From South				89th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 06:30 PM																	
06:30 PM	1	0	0	1	0	4	2	6	6	0	4	10	1	8	0	9	26
06:45 PM	0	0	1	1	0	6	0	6	2	0	1	3	0	11	0	11	21
07:00 PM	0	0	0	0	0	5	0	5	1	0	1	2	1	12	0	13	20
07:15 PM	1	0	1	2	0	8	1	9	2	0	1	3	1	15	2	18	32
Total Volume	2	0	2	4	0	23	3	26	11	0	7	18	3	46	2	51	99
% App. Total	50	0	50		0	88.5	11.5		61.1	0	38.9		5.9	90.2	3.9		
PHF	.500	.000	.500	.500	.000	.719	.375	.722	.458	.000	.438	.450	.750	.767	.250	.708	.773

Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	06:00 PM				05:00 PM				06:30 PM				05:30 PM			
+0 mins.	1	0	0	1	0	16	0	16	6	0	4	10	0	16	0	16
+15 mins.	2	0	0	2	0	5	0	5	2	0	1	3	0	12	0	12
+30 mins.	1	0	0	1	0	8	0	8	1	0	1	2	3	7	0	10
+45 mins.	0	0	1	1	0	8	0	8	2	0	1	3	1	13	0	14
Total Volume	4	0	1	5	0	37	0	37	11	0	7	18	4	48	0	52
% App. Total	80	0	20		0	100	0		61.1	0	38.9		7.7	92.3	0	
PHF	.500	.000	.250	.625	.000	.578	.000	.578	.458	.000	.438	.450	.333	.750	.000	.813

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88th Street & Calumet Avenue

Chicago, IL

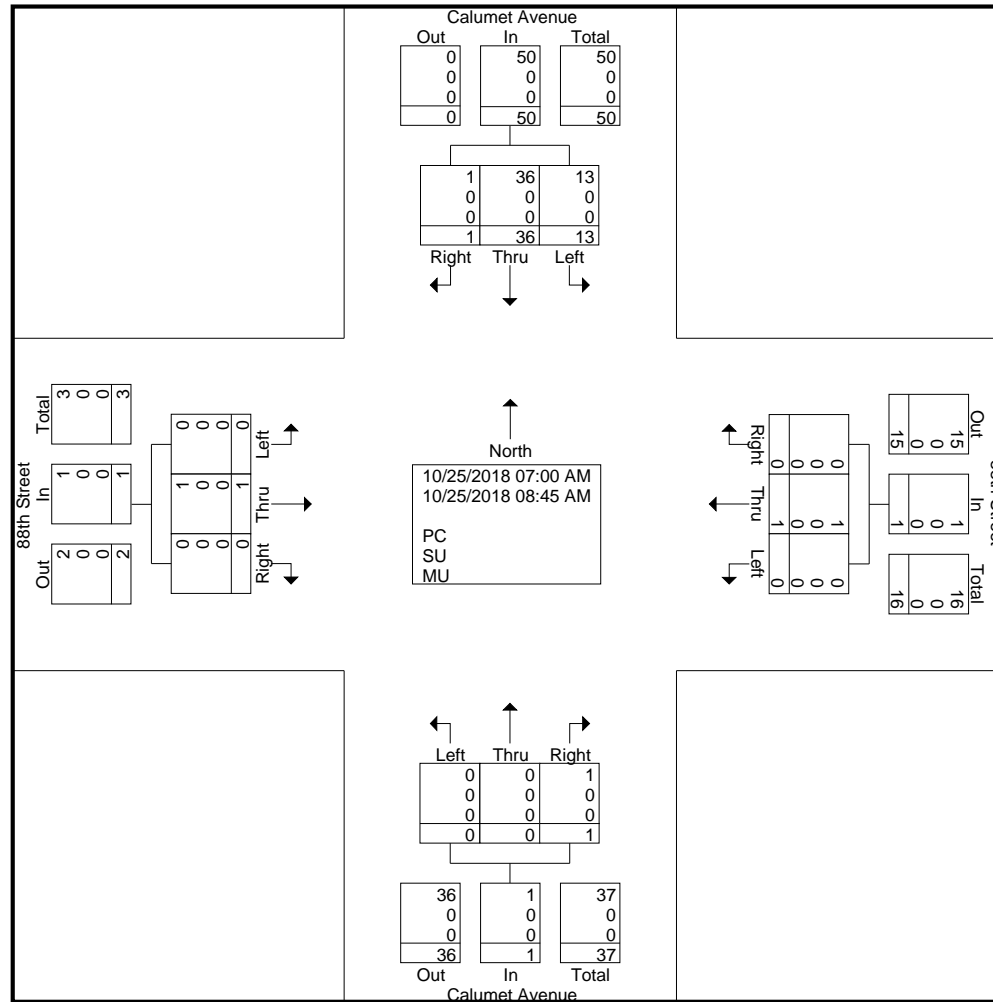
7:00 - 9:00 AM

File Name : 88th & Calumet 7-9 AM

Site Code :

Start Date : 10/25/2018

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88th Street & Calumet Avenue

Chicago, IL

7:00 - 9:00 AM

File Name : 88th & Calumet 7-9 AM

Site Code :

Start Date : 10/25/2018

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	Calumet Avenue From North				88th Street From East				Calumet Avenue From South				88th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	2	5	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
07:15 AM	2	5	0	7	0	1	0	1	0	0	0	0	0	0	0	0	8
07:30 AM	2	12	0	14	0	0	0	0	0	0	1	1	0	0	0	0	15
07:45 AM	1	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	7	25	0	32	0	1	0	1	0	0	1	1	0	0	0	0	34
% App. Total	21.9	78.1	0		0	100	0		0	0	100		0	0	0		
PHF	.875	.521	.000	.571	.000	.250	.000	.250	.000	.000	.250	.250	.000	.000	.000	.000	.567

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:30 AM			
+0 mins.	2	5	0	7	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	2	5	0	7	0	1	0	1	0	0	0	0	0	0	0	0
+30 mins.	2	12	0	14	0	0	0	0	0	0	1	1	0	0	0	0
+45 mins.	1	3	0	4	0	0	0	0	0	0	0	0	0	1	0	1
Total Volume	7	25	0	32	0	1	0	1	0	0	1	1	0	1	0	1
% App. Total	21.9	78.1	0		0	100	0		0	0	100		0	100	0	
PHF	.875	.521	.000	.571	.000	.250	.000	.250	.000	.000	.250	.250	.000	.250	.000	.250



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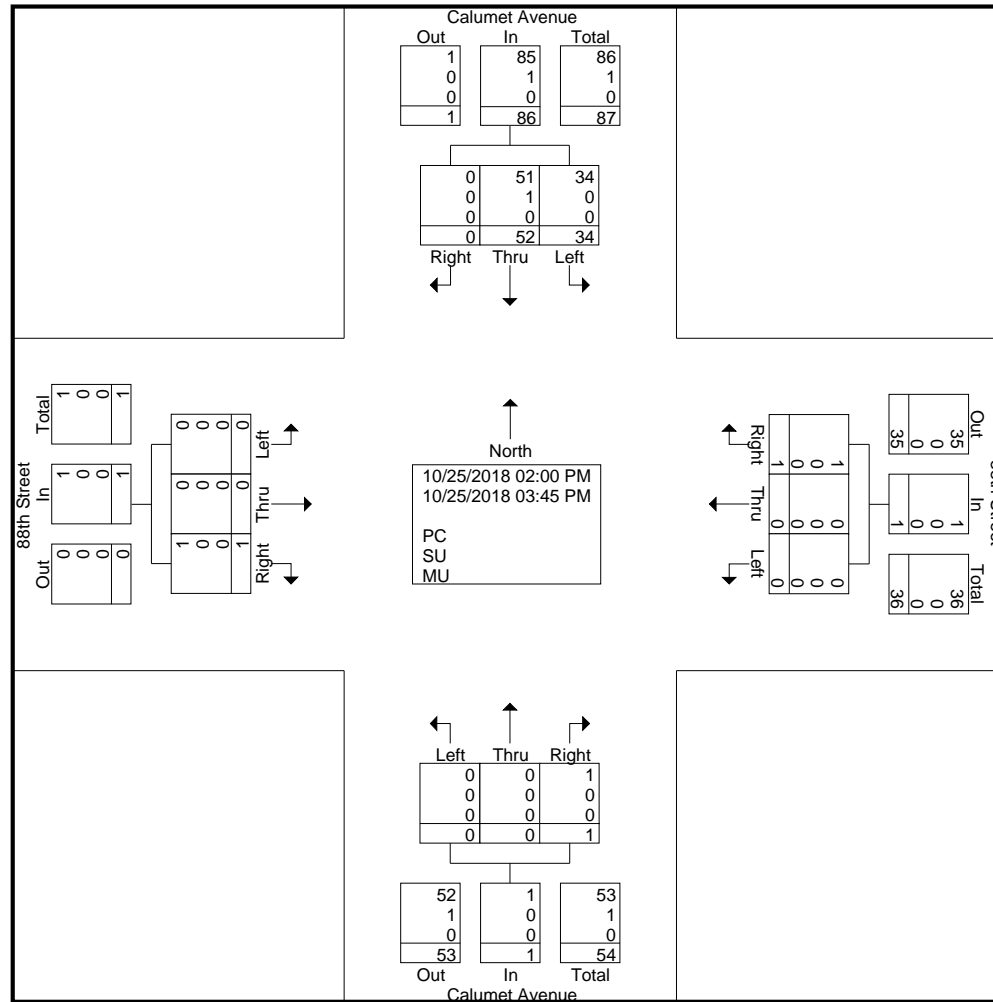
88th Street & Calumet Avenue  
Chicago, IL  
2:00 - 4:00 PM

File Name : 88th & Calumet 2-4 PM

Site Code :

Start Date : 10/25/2018

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88th Street & Calumet Avenue

Chicago, IL

2:00 - 4:00 PM

File Name : 88th & Calumet 2-4 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Calumet Avenue From North				88th Street From East				Calumet Avenue From South				88th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:00 PM																	
03:00 PM	3	6	0	9	0	0	0	0	0	0	0	0	0	0	1	1	10
03:15 PM	3	12	0	15	0	0	1	1	0	0	1	1	0	0	0	0	17
03:30 PM	7	4	0	11	0	0	0	0	0	0	0	0	0	0	0	0	11
03:45 PM	5	11	0	16	0	0	0	0	0	0	0	0	0	0	0	0	16
Total Volume	18	33	0	51	0	0	1	1	0	0	1	1	0	0	1	1	54
% App. Total	35.3	64.7	0		0	0	100		0	0	100		0	0	100		
PHF	.643	.688	.000	.797	.000	.000	.250	.250	.000	.000	.250	.250	.000	.000	.250	.250	.794

Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	03:00 PM				02:30 PM				02:30 PM				02:15 PM			
+0 mins.	3	6	0	9	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	3	12	0	15	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	7	4	0	11	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	5	11	0	16	0	0	1	1	0	0	1	1	0	0	1	1
Total Volume	18	33	0	51	0	0	1	1	0	0	1	1	0	0	1	1
% App. Total	35.3	64.7	0		0	0	100		0	0	100		0	0	100	
PHF	.643	.688	.000	.797	.000	.000	.250	.250	.000	.000	.250	.250	.000	.000	.250	.250

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88th Street & Calumet Avenue

Chicago, IL

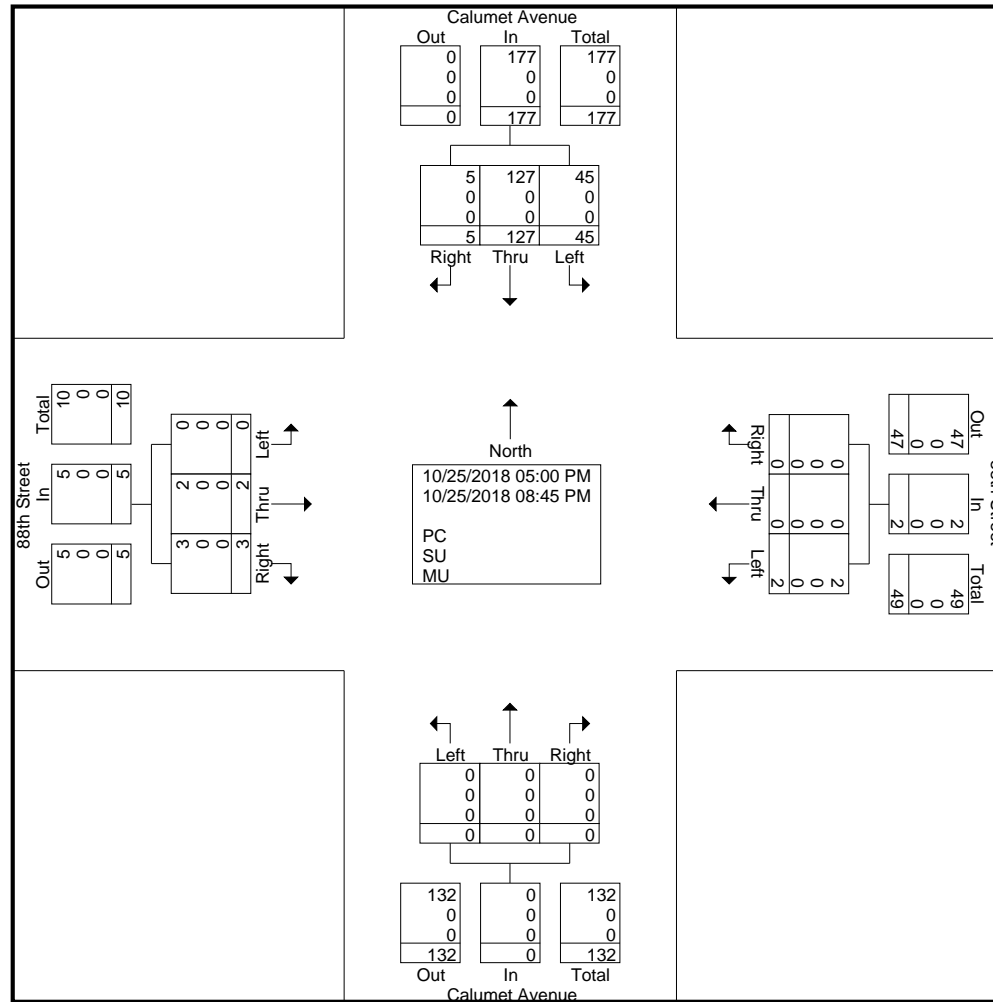
5:00 - 9:00 PM

File Name : 88th & Calumet 5-9 PM

Site Code :

Start Date : 10/25/2018

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88th Street & Calumet Avenue

Chicago, IL

5:00 - 9:00 PM

File Name : 88th & Calumet 5-9 PM

Site Code :

Start Date : 10/25/2018

Page No : 3

	Calumet Avenue From North				88th Street From East				Calumet Avenue From South				88th Street From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	3	8	0	11	0	0	0	0	0	0	0	0	0	0	1	1	12
05:15 PM	2	9	0	11	1	0	0	1	0	0	0	0	0	0	0	0	12
05:30 PM	3	9	1	13	0	0	0	0	0	0	0	0	0	0	0	0	13
05:45 PM	7	14	0	21	0	0	0	0	0	0	0	0	0	0	0	0	21
Total Volume	15	40	1	56	1	0	0	1	0	0	0	0	0	0	1	1	58
% App. Total	26.8	71.4	1.8		100	0	0		0	0	0		0	0	100		
PHF	.536	.714	.250	.667	.250	.000	.000	.250	.000	.000	.000	.000	.000	.000	.250	.250	.690

Peak Hour Analysis From 05:00 PM to 08:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:30 PM			
+0 mins.	3	8	0	11	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	2	9	0	11	1	0	0	1	0	0	0	0	0	0	0	0
+30 mins.	3	9	1	13	0	0	0	0	0	0	0	0	1	1	2	
+45 mins.	7	14	0	21	0	0	0	0	0	0	0	0	1	0	1	
Total Volume	15	40	1	56	1	0	0	1	0	0	0	0	2	1	3	
% App. Total	26.8	71.4	1.8		100	0	0		0	0	0		0	66.7	33.3	
PHF	.536	.714	.250	.667	.250	.000	.000	.250	.000	.000	.000	.000	.500	.250	.375	

# **JAMES E. MCDADE CLASSICAL ELEMENTARY SCHOOL PROPOSED ANNEX EXPANSION/RENOVATION**

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## **Traffic Impact Study Appendix**

### **HIGHWAY CAPACITY ANALYSIS REPORTS**

Existing Morning Peak Hour

Existing Afternoon Dismissal Peak Hour

Existing Evening Peak Hour

Projected Morning Peak Hour


Projected Afternoon Dismissal Peak Hour

Projected Evening Peak Hour

# Lanes, Volumes, Timings

## 1: Indiana Avenue & 87th Street

11/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔	↔		↔	↔
Traffic Volume (vph)	20	813	91	19	748	9	73	57	28	8	47	40
Future Volume (vph)	20	813	91	19	748	9	73	57	28	8	47	40
Satd. Flow (prot)	0	3377	0	0	3465	0	0	1485	1463	0	1524	1449
Flt Permitted		0.930			0.922			0.822			0.964	
Satd. Flow (perm)	0	3144	0	0	3197	0	0	1255	1443	0	1479	1449
Satd. Flow (RTOR)		30			3				30			43
Lane Group Flow (vph)	0	1005	0	0	844	0	0	141	30	0	60	43
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	41.0	41.0		41.0	41.0		24.0	24.0	24.0	24.0	24.0	24.0
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Act Effct Green (s)		37.0			37.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.57			0.57			0.31	0.31		0.31	0.31
v/c Ratio		0.56			0.46			0.37	0.06		0.13	0.09
Control Delay		10.0			9.2			20.9	7.1		17.3	6.5
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		10.0			9.2			20.9	7.1		17.3	6.5
LOS		B			A			C	A		B	A
Approach Delay		10.0			9.2			18.5			12.8	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)		114			92			43	0		17	0
Queue Length 95th (ft)		163			131			88	16		42	19
Internal Link Dist (ft)		351			365			596			532	
Turn Bay Length (ft)									25			25
Base Capacity (vph)		1802			1821			386	464		455	475
Starvation Cap Reductn		0			0			0	0		0	0
Spillback Cap Reductn		0			0			0	0		0	0
Storage Cap Reductn		0			0			0	0		0	0
Reduced v/c Ratio		0.56			0.46			0.37	0.06		0.13	0.09

### Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 32 (49%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 10.5

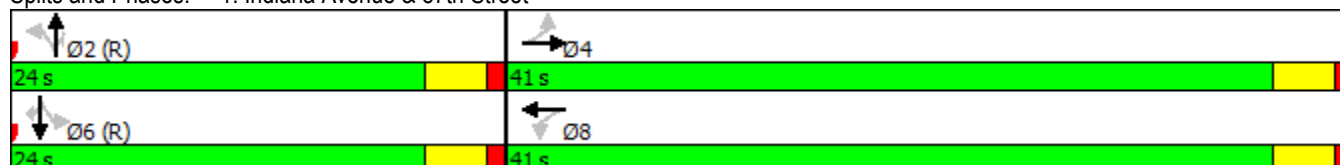
Intersection LOS: B

Intersection Capacity Utilization 63.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Indiana Avenue & 87th Street





# HCM Unsignalized Intersection Capacity Analysis

## 2: Indiana Avenue & 88th Street

11/06/2018












Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↕	↕	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	14	141	114	48
Future Volume (vph)	0	0	14	141	114	48
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	0	0	20	199	161	68
Direction, Lane #	NB 1	SB 1				
Volume Total (vph)	219	229				
Volume Left (vph)	20	0				
Volume Right (vph)	0	68				
Hadj (s)	0.11	-0.13				
Departure Headway (s)	4.2	4.0				
Degree Utilization, x	0.26	0.25				
Capacity (veh/h)	837	894				
Control Delay (s)	8.7	8.3				
Approach Delay (s)	8.7	8.3				
Approach LOS	A	A				
Intersection Summary						
Delay			8.5			
Level of Service			A			
Intersection Capacity Utilization			34.7%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Indiana Avenue & Parking Lot Access Drive

















11/06/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	22	123	15	30	71
Future Volume (Veh/h)	5	22	123	15	30	71
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Hourly flow rate (vph)	7	31	171	21	42	99
Pedestrians	8		1			
Lane Width (ft)	10.0		12.0			
Walking Speed (ft/s)	3.5		3.5			
Percent Blockage	1		0			
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	374	190			200	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	374	190			200	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	96			97	
cM capacity (veh/h)	608	852			1376	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	38	192	141			
Volume Left	7	0	42			
Volume Right	31	21	0			
cSH	793	1700	1376			
Volume to Capacity	0.05	0.11	0.03			
Queue Length 95th (ft)	4	0	2			
Control Delay (s)	9.8	0.0	2.5			
Lane LOS	A		A			
Approach Delay (s)	9.8	0.0	2.5			
Approach LOS	A					
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			27.6%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 4: Indiana Avenue & 89th Street
















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	35	28	2	60	18	118	93	8	11	65	7
Future Volume (vph)	23	35	28	2	60	18	118	93	8	11	65	7
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	26	40	32	2	69	21	136	107	9	13	75	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	98	92	252	96								
Volume Left (vph)	26	2	136	13								
Volume Right (vph)	32	21	9	8								
Hadj (s)	-0.02	-0.12	0.13	0.10								
Departure Headway (s)	4.9	4.8	4.6	4.8								
Degree Utilization, x	0.13	0.12	0.32	0.13								
Capacity (veh/h)	681	693	747	705								
Control Delay (s)	8.6	8.4	9.8	8.5								
Approach Delay (s)	8.6	8.4	9.8	8.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.1									
Level of Service			A									
Intersection Capacity Utilization			36.8%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 5: Prairie Avenue & 87th Street

















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	834	5	0	774	7	2	2	4	0	0	0
Future Volume (Veh/h)	10	834	5	0	774	7	2	2	4	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	10	842	5	0	782	7	2	2	4	0	0	0
Pedestrians		2			2			15			3	
Lane Width (ft)		12.0			12.0			14.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			2			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		445										
pX, platoon unblocked				0.86			0.86	0.86	0.86	0.86	0.86	
vC, conflicting volume	792			862			1272	1672	440	1236	1670	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	792			505			984	1449	13	942	1448	400
tC, single (s)	4.1			4.1			7.5	6.5	7.2	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	99			100			99	98	100	100	100	100
cM capacity (veh/h)	838			902			169	110	856	181	110	605
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1							
Volume Total	431	426	391	398	8							
Volume Left	10	0	0	0	2							
Volume Right	0	5	0	7	4							
cSH	838	1700	902	1700	231							
Volume to Capacity	0.01	0.25	0.00	0.23	0.03							
Queue Length 95th (ft)	1	0	0	0	3							
Control Delay (s)	0.4	0.0	0.0	0.0	21.2							
Lane LOS	A				C							
Approach Delay (s)	0.2		0.0		21.2							
Approach LOS					C							
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization			40.9%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 6: Prairie Avenue & 89th Street















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	51	0	0	48	0	26	0	6	1	0	1
Future Volume (Veh/h)	1	51	0	0	48	0	26	0	6	1	0	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	1	56	0	0	53	0	29	0	7	1	0	1
Pedestrians		4			2			1			3	
Lane Width (ft)		12.0			12.0			12.0			8.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	98	74	6	95	70	8	5			9		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	98	74	6	95	70	8	5			9		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	93	100	100	93	100	98			100		
cM capacity (veh/h)	824	799	1078	827	800	1075	1623			1621		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	57	53	36	2								
Volume Left	1	0	29	1								
Volume Right	0	0	7	1								
cSH	800	800	1623	1621								
Volume to Capacity	0.07	0.07	0.02	0.00								
Queue Length 95th (ft)	6	5	1	0								
Control Delay (s)	9.8	9.8	5.9	3.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.8	9.8	5.9	3.6								
Approach LOS	A	A										
Intersection Summary												
Average Delay			8.8									
Intersection Capacity Utilization			15.5%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 7: Calumet Avenue & 88th Street



















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	7	25	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	7	25	0
Peak Hour Factor	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	12	44	0
Direction, Lane #	EB 1	SB 1										
Volume Total (vph)	0	56										
Volume Left (vph)	0	12										
Volume Right (vph)	0	0										
Hadj (s)	0.00	0.04										
Departure Headway (s)	4.0	3.9										
Degree Utilization, x	0.00	0.06										
Capacity (veh/h)	887	910										
Control Delay (s)	7.0	7.2										
Approach Delay (s)	0.0	7.2										
Approach LOS	A	A										
Intersection Summary												
Delay	7.2											
Level of Service	A											
Intersection Capacity Utilization	13.3%		ICU Level of Service				A					
Analysis Period (min)	15											

# Lanes, Volumes, Timings

## 1: Indiana Avenue & 87th Street

11/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	813	45	10	784	5	50	35	20	32	95	65
Future Volume (vph)	9	813	45	10	784	5	50	35	20	32	95	65
Satd. Flow (prot)	0	3471	0	0	3465	0	0	1502	1463	0	1546	1478
Flt Permitted		0.946			0.943			0.799			0.922	
Satd. Flow (perm)	0	3287	0	0	3271	0	0	1236	1463	0	1443	1478
Satd. Flow (RTOR)		14			1				22			71
Lane Group Flow (vph)	0	952	0	0	878	0	0	93	22	0	139	71
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	41.0	41.0		41.0	41.0		24.0	24.0	24.0	24.0	24.0	24.0
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Act Effect Green (s)		37.0			37.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.57			0.57			0.31	0.31		0.31	0.31
v/c Ratio		0.51			0.47			0.24	0.05		0.31	0.14
Control Delay		9.5			9.3			19.0	7.8		19.7	5.7
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		9.5			9.3			19.0	7.8		19.7	5.7
LOS		A			A			B	A		B	A
Approach Delay		9.5			9.3			16.9			14.9	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		105			96			27	0		42	0
Queue Length 95th (ft)		149			136			61	14		84	25
Internal Link Dist (ft)		351			365			596			532	
Turn Bay Length (ft)									25			25
Base Capacity (vph)		1877			1862			380	465		444	503
Starvation Cap Reductn		0			0			0	0		0	0
Spillback Cap Reductn		0			0			0	0		0	0
Storage Cap Reductn		0			0			0	0		0	0
Reduced v/c Ratio		0.51			0.47			0.24	0.05		0.31	0.14

### Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 32 (49%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.51

Intersection Signal Delay: 10.3

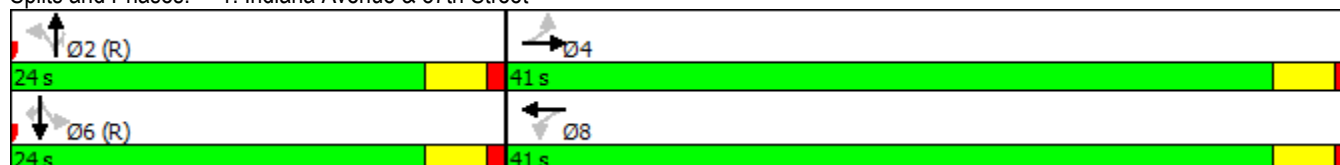
Intersection LOS: B

Intersection Capacity Utilization 51.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Indiana Avenue & 87th Street



# HCM Unsignalized Intersection Capacity Analysis

## 2: Indiana Avenue & 88th Street

11/06/2018












Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↕	↕	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	12	96	139	15
Future Volume (vph)	0	0	12	96	139	15
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	0	14	112	162	17
Direction, Lane #	NB 1	SB 1				
Volume Total (vph)	126	179				
Volume Left (vph)	14	0				
Volume Right (vph)	0	17				
Hadj (s)	0.11	-0.01				
Departure Headway (s)	4.2	4.0				
Degree Utilization, x	0.15	0.20				
Capacity (veh/h)	846	890				
Control Delay (s)	7.9	8.0				
Approach Delay (s)	7.9	8.0				
Approach LOS	A	A				
Intersection Summary						
Delay			8.0			
Level of Service			A			
Intersection Capacity Utilization			28.4%	ICU Level of Service		A
Analysis Period (min)			15			



# HCM Unsignalized Intersection Capacity Analysis

## 3: Indiana Avenue & Parking Lot Access Drive

















11/06/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	11	88	2	3	131
Future Volume (Veh/h)	3	11	88	2	3	131
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	4	13	104	2	4	154
Pedestrians	5					
Lane Width (ft)	10.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	272	110			111	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	272	110			111	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	99	99			100	
cM capacity (veh/h)	717	945			1449	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	17	106	158			
Volume Left	4	0	4			
Volume Right	13	2	0			
cSH	879	1700	1449			
Volume to Capacity	0.02	0.06	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	9.2	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			19.3%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 4: Indiana Avenue & 89th Street
















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	12	36	49	4	36	12	49	62	10	20	109	11
Future Volume (vph)	12	36	49	4	36	12	49	62	10	20	109	11
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
Hourly flow rate (vph)	13	40	54	4	40	13	54	69	11	22	121	12
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	107	57	134	155								
Volume Left (vph)	13	4	54	22								
Volume Right (vph)	54	13	11	12								
Hadj (s)	-0.11	-0.07	0.06	0.04								
Departure Headway (s)	4.5	4.6	4.5	4.5								
Degree Utilization, x	0.13	0.07	0.17	0.19								
Capacity (veh/h)	735	715	756	760								
Control Delay (s)	8.2	8.0	8.5	8.6								
Approach Delay (s)	8.2	8.0	8.5	8.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.4								
Level of Service				A								
Intersection Capacity Utilization				28.4%	ICU Level of Service	A						
Analysis Period (min)				15								

# HCM Unsignalized Intersection Capacity Analysis

## 5: Prairie Avenue & 87th Street

















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	837	10	5	797	11	2	1	4	0	0	0
Future Volume (Veh/h)	18	837	10	5	797	11	2	1	4	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	19	863	10	5	822	11	2	1	4	0	0	0
Pedestrians					3			11			9	
Lane Width (ft)					12.0			14.0			0.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		445										
pX, platoon unblocked				0.86			0.86	0.86	0.86	0.86	0.86	
vC, conflicting volume	842			884			1338	1769	450	1324	1768	426
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	842			537			1065	1567	32	1049	1567	426
tC, single (s)	4.1			4.1			7.5	6.5	7.3	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	98			99			99	99	100	100	100	100
cM capacity (veh/h)	802			884			148	92	828	151	93	583
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1							
Volume Total	450	442	416	422	7							
Volume Left	19	0	5	0	2							
Volume Right	0	10	0	11	4							
cSH	802	1700	884	1700	240							
Volume to Capacity	0.02	0.26	0.01	0.25	0.03							
Queue Length 95th (ft)	2	0	0	0	2							
Control Delay (s)	0.7	0.0	0.2	0.0	20.5							
Lane LOS	A		A		C							
Approach Delay (s)	0.4		0.1		20.5							
Approach LOS					C							
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			47.3%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 6: Prairie Avenue & 89th Street















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	62	0	0	38	0	13	0	3	0	0	2
Future Volume (Veh/h)	3	62	0	0	38	0	13	0	3	0	0	2
Sign Control	Stop				Stop				Free		Free	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	70	0	0	43	0	15	0	3	0	0	2
Pedestrians	3											
Lane Width (ft)	12.0											
Walking Speed (ft/s)	3.5											
Percent Blockage	0											
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	57	37	4	68	36	2	5				3	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	57	37	4	68	36	2	5				3	
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.2				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.3				2.2	
p0 queue free %	100	92	100	100	95	100	99				100	
cM capacity (veh/h)	897	833	1082	862	847	1089	1573				1632	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	73	43	18	2								
Volume Left	3	0	15	0								
Volume Right	0	0	3	2								
cSH	836	847	1573	1632								
Volume to Capacity	0.09	0.05	0.01	0.00								
Queue Length 95th (ft)	7	4	1	0								
Control Delay (s)	9.7	9.5	6.1	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.7	9.5	6.1	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay				9.0								
Intersection Capacity Utilization				19.9%	ICU Level of Service				A			
Analysis Period (min)				15								

# HCM Unsignalized Intersection Capacity Analysis

## 7: Calumet Avenue & 88th Street


11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	1	0	0	0	0	0	0	18	33	0
Future Volume (vph)	0	0	1	0	0	0	0	0	0	18	33	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	1	0	0	0	0	0	0	23	41	0
Direction, Lane #	EB 1	SB 1										
Volume Total (vph)	1	64										
Volume Left (vph)	0	23										
Volume Right (vph)	1	0										
Hadj (s)	-0.60	0.09										
Departure Headway (s)	3.4	4.0										
Degree Utilization, x	0.00	0.07										
Capacity (veh/h)	1021	888										
Control Delay (s)	6.4	7.3										
Approach Delay (s)	6.4	7.3										
Approach LOS	A	A										
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			13.7%	ICU Level of Service		A						
Analysis Period (min)			15									

# Lanes, Volumes, Timings

## 1: Indiana Avenue & 87th Street

11/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔	↔		↔	↔
Traffic Volume (vph)	17	862	89	22	833	8	49	22	21	28	172	70
Future Volume (vph)	17	862	89	22	833	8	49	22	21	28	172	70
Satd. Flow (prot)	0	3510	0	0	3532	0	0	1542	1507	0	1556	1507
Flt Permitted		0.937			0.921			0.752			0.959	
Satd. Flow (perm)	0	3292	0	0	3256	0	0	1195	1482	0	1502	1476
Satd. Flow (RTOR)		27			2				21			55
Lane Group Flow (vph)	0	988	0	0	880	0	0	72	21	0	205	71
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	41.0	41.0		41.0	41.0		24.0	24.0	24.0	24.0	24.0	24.0
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Act Effct Green (s)		37.0			37.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.57			0.57			0.31	0.31		0.31	0.31
v/c Ratio		0.52			0.47			0.20	0.04		0.44	0.14
Control Delay		9.6			9.3			18.4	7.9		21.8	7.9
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		9.6			9.3			18.4	7.9		21.8	7.9
LOS		A			A			B	A		C	A
Approach Delay		9.6			9.3			16.0			18.2	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		110			96			21	0		64	4
Queue Length 95th (ft)		154			136			49	13		120	30
Internal Link Dist (ft)		351			365			596			532	
Turn Bay Length (ft)									25			25
Base Capacity (vph)		1885			1854			367	470		462	492
Starvation Cap Reductn		0			0			0	0		0	0
Spillback Cap Reductn		0			0			0	0		0	0
Storage Cap Reductn		0			0			0	0		0	0
Reduced v/c Ratio		0.52			0.47			0.20	0.04		0.44	0.14

### Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 32 (49%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 10.8

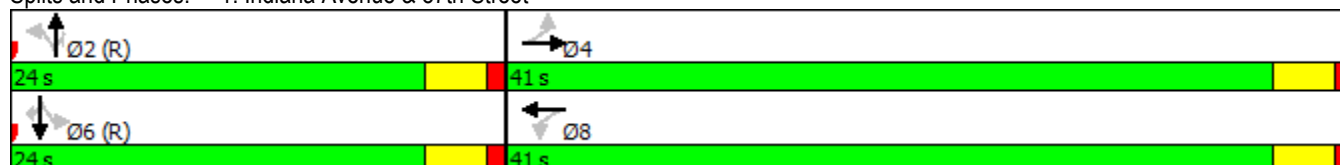
Intersection LOS: B

Intersection Capacity Utilization 82.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Indiana Avenue & 87th Street



# HCM Unsignalized Intersection Capacity Analysis

## 2: Indiana Avenue & 88th Street

11/06/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↕	↕	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	8	81	267	8
Future Volume (vph)	0	0	8	81	267	8
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	0	9	89	293	9
Direction, Lane #	NB 1	SB 1				
Volume Total (vph)	98	302				
Volume Left (vph)	9	0				
Volume Right (vph)	0	9				
Hadj (s)	0.02	0.00				
Departure Headway (s)	4.2	4.0				
Degree Utilization, x	0.11	0.33				
Capacity (veh/h)	838	895				
Control Delay (s)	7.7	9.0				
Approach Delay (s)	7.7	9.0				
Approach LOS	A	A				
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			24.9%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Indiana Avenue & Parking Lot Access Drive

11/06/2018



















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	18	65	0	21	240
Future Volume (Veh/h)	6	18	65	0	21	240
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	6	19	68	0	22	250
Pedestrians	1					
Lane Width (ft)	10.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	363	69			69	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	363	69			69	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			99	
cM capacity (veh/h)	631	999			1544	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	25	68	272			
Volume Left	6	0	22			
Volume Right	19	0	0			
cSH	876	1700	1544			
Volume to Capacity	0.03	0.04	0.01			
Queue Length 95th (ft)	2	0	1			
Control Delay (s)	9.2	0.0	0.7			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	0.7			
Approach LOS	A					
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			30.5%		ICU Level of Service	A
Analysis Period (min)			15			



# HCM Unsignalized Intersection Capacity Analysis

## 4: Indiana Avenue & 89th Street
















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	25	43	4	34	5	37	61	3	25	215	2
Future Volume (vph)	3	25	43	4	34	5	37	61	3	25	215	2
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	3	26	44	4	35	5	38	62	3	26	219	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	73	44	103	247								
Volume Left (vph)	3	4	38	26								
Volume Right (vph)	44	5	3	2								
Hadj (s)	-0.35	-0.02	0.06	0.05								
Departure Headway (s)	4.4	4.8	4.5	4.3								
Degree Utilization, x	0.09	0.06	0.13	0.30								
Capacity (veh/h)	747	689	764	798								
Control Delay (s)	7.8	8.1	8.2	9.2								
Approach Delay (s)	7.8	8.1	8.2	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			25.2%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 5: Prairie Avenue & 87th Street

















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	888	6	3	860	12	3	0	2	0	0	0
Future Volume (Veh/h)	17	888	6	3	860	12	3	0	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	17	906	6	3	878	12	3	0	2	0	0	0
Pedestrians		1			2			21			12	
Lane Width (ft)		12.0			12.0			14.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			2			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		445										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	902			933			1410	1872	479	1393	1869	458
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	902			565			1127	1671	30	1107	1668	458
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			98	100	100	100	100	100
cM capacity (veh/h)	749			843			129	78	864	136	79	555
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1							
Volume Total	470	459	442	451	5							
Volume Left	17	0	3	0	3							
Volume Right	0	6	0	12	2							
cSH	749	1700	843	1700	196							
Volume to Capacity	0.02	0.27	0.00	0.27	0.03							
Queue Length 95th (ft)	2	0	0	0	2							
Control Delay (s)	0.7	0.0	0.1	0.0	23.9							
Lane LOS	A		A		C							
Approach Delay (s)	0.3		0.1		23.9							
Approach LOS					C							
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			47.5%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 6: Prairie Avenue & 89th Street















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	48	0	0	23	3	11	0	7	2	0	1
Future Volume (Veh/h)	3	48	0	0	23	3	11	0	7	2	0	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	4	62	0	0	30	4	14	0	9	3	0	1
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	58	44	0	71	40	6	1			10		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	58	44	0	71	40	6	1			10		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	93	100	100	96	100	99			100		
cM capacity (veh/h)	907	840	1090	865	846	1082	1635			1621		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	66	34	23	4								
Volume Left	4	0	14	3								
Volume Right	0	4	9	1								
cSH	843	868	1635	1621								
Volume to Capacity	0.08	0.04	0.01	0.00								
Queue Length 95th (ft)	6	3	1	0								
Control Delay (s)	9.6	9.3	4.4	5.4								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.6	9.3	4.4	5.4								
Approach LOS	A	A										
Intersection Summary												
Average Delay			8.5									
Intersection Capacity Utilization			15.3%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 7: Calumet Avenue & 88th Street

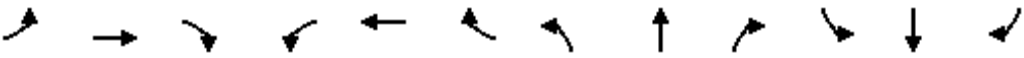
11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	1	0	0	0	0	0	0	15	40	1
Future Volume (vph)	0	0	1	0	0	0	0	0	0	15	40	1
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	0	0	1	0	0	0	0	0	0	22	58	1
Direction, Lane #	EB 1	SB 1										
Volume Total (vph)	1	81										
Volume Left (vph)	0	22										
Volume Right (vph)	1	1										
Hadj (s)	-0.60	0.05										
Departure Headway (s)	3.5	3.9										
Degree Utilization, x	0.00	0.09										
Capacity (veh/h)	1007	899										
Control Delay (s)	6.5	7.3										
Approach Delay (s)	6.5	7.3										
Approach LOS	A	A										
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			13.7%		ICU Level of Service		A					
Analysis Period (min)			15									

# Lanes, Volumes, Timings

## 1: Indiana Avenue & 87th Street

11/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔	↔		↔	↔
Traffic Volume (vph)	21	842	116	42	771	9	82	59	36	8	48	41
Future Volume (vph)	21	842	116	42	771	9	82	59	36	8	48	41
Satd. Flow (prot)	0	3366	0	0	3461	0	0	1483	1463	0	1524	1449
Flt Permitted		0.928			0.858			0.810			0.963	
Satd. Flow (perm)	0	3126	0	0	2978	0	0	1236	1443	0	1477	1449
Satd. Flow (RTOR)		37			3				39			45
Lane Group Flow (vph)	0	1064	0	0	894	0	0	153	39	0	61	45
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	41.0	41.0		41.0	41.0		24.0	24.0	24.0	24.0	24.0	24.0
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Act Effct Green (s)		37.0			37.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.57			0.57			0.31	0.31		0.31	0.31
v/c Ratio		0.59			0.53			0.40	0.08		0.13	0.09
Control Delay		10.4			10.0			21.7	6.6		17.3	6.4
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		10.4			10.0			21.7	6.6		17.3	6.4
LOS		B			B			C	A		B	A
Approach Delay		10.4			10.0			18.7			12.7	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		124			102			47	0		17	0
Queue Length 95th (ft)		176			146			95	18		42	20
Internal Link Dist (ft)		351			365			596			532	
Turn Bay Length (ft)									25			25
Base Capacity (vph)		1795			1696			380	471		454	477
Starvation Cap Reductn		0			0			0	0		0	0
Spillback Cap Reductn		0			0			0	0		0	0
Storage Cap Reductn		0			0			0	0		0	0
Reduced v/c Ratio		0.59			0.53			0.40	0.08		0.13	0.09

### Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 32 (49%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 11.1

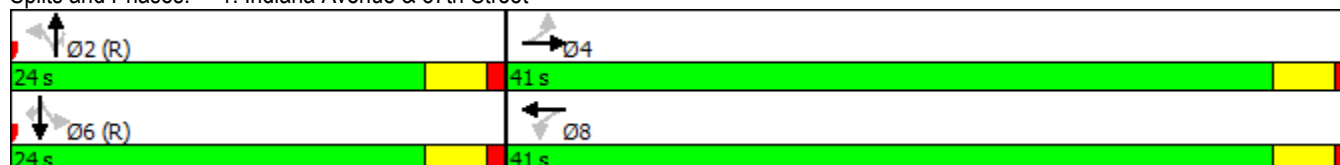
Intersection LOS: B

Intersection Capacity Utilization 76.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Indiana Avenue & 87th Street



# HCM Unsignalized Intersection Capacity Analysis

## 2: Indiana Avenue & 88th Street

11/06/2018












Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↕	↕	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	28	160	142	64
Future Volume (vph)	0	0	28	160	142	64
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	0	0	39	225	200	90
Direction, Lane #	NB 1	SB 1				
Volume Total (vph)	264	290				
Volume Left (vph)	39	0				
Volume Right (vph)	0	90				
Hadj (s)	0.13	-0.14				
Departure Headway (s)	4.3	4.0				
Degree Utilization, x	0.31	0.32				
Capacity (veh/h)	823	875				
Control Delay (s)	9.3	8.9				
Approach Delay (s)	9.3	8.9				
Approach LOS	A	A				
Intersection Summary						
Delay			9.1			
Level of Service			A			
Intersection Capacity Utilization			42.4%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Indiana Avenue & Parking Lot Access Drive

















11/06/2018

									
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations									
Traffic Volume (veh/h)	10	28	150	21	35	94			
Future Volume (Veh/h)	10	28	150	21	35	94			
Sign Control	Stop		Free			Free			
Grade	0%		0%			0%			
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72			
Hourly flow rate (vph)	14	39	208	29	49	131			
Pedestrians	10		2						
Lane Width (ft)	10.0		12.0						
Walking Speed (ft/s)	3.5		3.5						
Percent Blockage	1		0						
Right turn flare (veh)									
Median type			None			None			
Median storage veh									
Upstream signal (ft)									
pX, platoon unblocked									
vC, conflicting volume	464	232			247				
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	464	232			247				
tC, single (s)	6.4	6.2			4.1				
tC, 2 stage (s)									
tF (s)	3.5	3.3			2.2				
p0 queue free %	97	95			96				
cM capacity (veh/h)	534	805			1320				
Direction, Lane #	WB 1	NB 1	SB 1						
Volume Total	53	237	180						
Volume Left	14	0	49						
Volume Right	39	29	0						
cSH	710	1700	1320						
Volume to Capacity	0.07	0.14	0.04						
Queue Length 95th (ft)	6	0	3						
Control Delay (s)	10.5	0.0	2.4						
Lane LOS	B		A						
Approach Delay (s)	10.5	0.0	2.4						
Approach LOS	B								
Intersection Summary									
Average Delay		2.1							
Intersection Capacity Utilization		30.7%	ICU Level of Service	A					
Analysis Period (min)		15							

# HCM Unsignalized Intersection Capacity Analysis

## 4: Indiana Avenue & 89th Street

11/06/2018
















																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control		Stop			Stop			Stop			Stop									
Traffic Volume (vph)	30	35	28	2	60	25	118	112	8	18	79	14								
Future Volume (vph)	30	35	28	2	60	25	118	112	8	18	79	14								
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87								
Hourly flow rate (vph)	34	40	32	2	69	29	136	129	9	21	91	16								
Direction, Lane #	EB 1	WB 1	NB 1	SB 1																
Volume Total (vph)	106	100	274	128																
Volume Left (vph)	34	2	136	21																
Volume Right (vph)	32	29	9	16																
Hadj (s)	0.01	-0.15	0.13	0.08																
Departure Headway (s)	5.0	4.9	4.7	4.9																
Degree Utilization, x	0.15	0.14	0.36	0.17																
Capacity (veh/h)	649	667	730	693																
Control Delay (s)	8.9	8.7	10.4	8.9																
Approach Delay (s)	8.9	8.7	10.4	8.9																
Approach LOS	A	A	B	A																
Intersection Summary																				
Delay			9.5																	
Level of Service			A																	
Intersection Capacity Utilization			38.2%	ICU Level of Service					A											
Analysis Period (min)			15																	



# HCM Unsignalized Intersection Capacity Analysis

## 5: Prairie Avenue & 87th Street

















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	871	5	0	820	7	2	2	4	0	0	0
Future Volume (Veh/h)	10	871	5	0	820	7	2	2	4	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	10	880	5	0	828	7	2	2	4	0	0	0
Pedestrians		2			2			16			3	
Lane Width (ft)		12.0			12.0			14.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			2			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		445										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	838			901			1334	1756	460	1302	1756	422
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	838			514			1027	1527	0	988	1526	422
tC, single (s)	4.1			4.1			7.5	6.5	7.2	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	99			100			99	98	100	100	100	100
cM capacity (veh/h)	805			881			155	97	859	165	97	584
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1							
Volume Total	450	445	414	421	8							
Volume Left	10	0	0	0	2							
Volume Right	0	5	0	7	4							
cSH	805	1700	881	1700	210							
Volume to Capacity	0.01	0.26	0.00	0.25	0.04							
Queue Length 95th (ft)	1	0	0	0	3							
Control Delay (s)	0.4	0.0	0.0	0.0	22.9							
Lane LOS	A				C							
Approach Delay (s)	0.2		0.0		22.9							
Approach LOS					C							
Intersection Summary												
Average Delay			0.2									
Intersection Capacity Utilization			41.9%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 6: Prairie Avenue & 89th Street















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	58	0	0	55	0	26	0	6	1	0	1
Future Volume (Veh/h)	1	58	0	0	55	0	26	0	6	1	0	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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
Hourly flow rate (vph)	1	64	0	0	60	0	29	0	7	1	0	1
Pedestrians		4			2			1			3	
Lane Width (ft)		12.0			12.0			12.0			8.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	101	74	6	99	70	8	5			9		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	101	74	6	99	70	8	5			9		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	92	100	100	93	100	98			100		
cM capacity (veh/h)	814	799	1078	816	800	1075	1623			1621		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	65	60	36	2								
Volume Left	1	0	29	1								
Volume Right	0	0	7	1								
cSH	799	800	1623	1621								
Volume to Capacity	0.08	0.07	0.02	0.00								
Queue Length 95th (ft)	7	6	1	0								
Control Delay (s)	9.9	9.9	5.9	3.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.9	9.9	5.9	3.6								
Approach LOS	A	A										
Intersection Summary												
Average Delay			8.9									
Intersection Capacity Utilization			15.5%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 7: Calumet Avenue & 88th Street

11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	7	25	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	7	25	0
Peak Hour Factor	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	12	44	0
Direction, Lane #	EB 1	SB 1										
Volume Total (vph)	0	56										
Volume Left (vph)	0	12										
Volume Right (vph)	0	0										
Hadj (s)	0.00	0.04										
Departure Headway (s)	4.0	3.9										
Degree Utilization, x	0.00	0.06										
Capacity (veh/h)	887	910										
Control Delay (s)	7.0	7.2										
Approach Delay (s)	0.0	7.2										
Approach LOS	A	A										
Intersection Summary												
Delay		7.2										
Level of Service		A										
Intersection Capacity Utilization		13.3%	ICU Level of Service	A								
Analysis Period (min)		15										

# Lanes, Volumes, Timings

## 1: Indiana Avenue & 87th Street

11/06/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔	↔		↔	↔
Traffic Volume (vph)	9	839	55	19	808	5	55	36	24	33	98	67
Future Volume (vph)	9	839	55	19	808	5	55	36	24	33	98	67
Satd. Flow (prot)	0	3467	0	0	3465	0	0	1502	1463	0	1546	1478
Flt Permitted		0.946			0.924			0.789			0.920	
Satd. Flow (perm)	0	3283	0	0	3205	0	0	1220	1463	0	1440	1478
Satd. Flow (RTOR)		17			1				26			74
Lane Group Flow (vph)	0	992	0	0	914	0	0	100	26	0	144	74
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	41.0	41.0		41.0	41.0		24.0	24.0	24.0	24.0	24.0	24.0
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Act Effct Green (s)		37.0			37.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.57			0.57			0.31	0.31		0.31	0.31
v/c Ratio		0.53			0.50			0.27	0.06		0.33	0.15
Control Delay		9.7			9.6			19.4	7.5		19.9	5.6
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		9.7			9.6			19.4	7.5		19.9	5.6
LOS		A			A			B	A		B	A
Approach Delay		9.7			9.6			16.9			15.0	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		112			102			30	0		43	0
Queue Length 95th (ft)		157			145			65	15		87	25
Internal Link Dist (ft)		351			365			596			532	
Turn Bay Length (ft)									25			25
Base Capacity (vph)		1876			1824			375	468		443	506
Starvation Cap Reductn		0			0			0	0		0	0
Spillback Cap Reductn		0			0			0	0		0	0
Storage Cap Reductn		0			0			0	0		0	0
Reduced v/c Ratio		0.53			0.50			0.27	0.06		0.33	0.15

### Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 32 (49%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.53

Intersection Signal Delay: 10.6

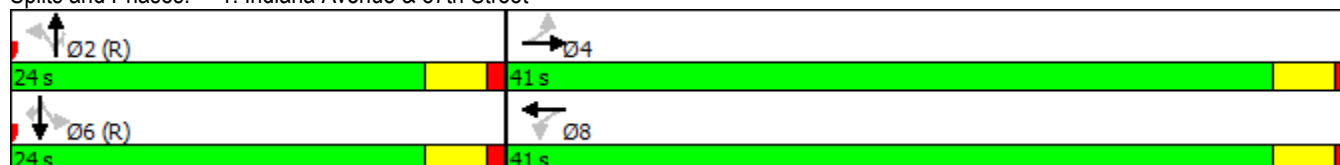
Intersection LOS: B

Intersection Capacity Utilization 56.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Indiana Avenue & 87th Street



# HCM Unsignalized Intersection Capacity Analysis

## 2: Indiana Avenue & 88th Street

11/06/2018












Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↕	↕	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	18	106	151	21
Future Volume (vph)	0	0	18	106	151	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	0	0	21	123	176	24
Direction, Lane #	NB 1	SB 1				
Volume Total (vph)	144	200				
Volume Left (vph)	21	0				
Volume Right (vph)	0	24				
Hadj (s)	0.12	-0.03				
Departure Headway (s)	4.2	4.0				
Degree Utilization, x	0.17	0.22				
Capacity (veh/h)	839	889				
Control Delay (s)	8.1	8.2				
Approach Delay (s)	8.1	8.2				
Approach LOS	A	A				
Intersection Summary						
Delay			8.1			
Level of Service			A			
Intersection Capacity Utilization			33.7%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Indiana Avenue & Parking Lot Access Drive

















11/06/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	11	104	2	3	143
Future Volume (Veh/h)	3	11	104	2	3	143
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	4	13	122	2	4	168
Pedestrians	6					
Lane Width (ft)	10.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	305	129			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	305	129			130	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	99	99			100	
cM capacity (veh/h)	686	922			1424	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	17	124	172			
Volume Left	4	0	4			
Volume Right	13	2	0			
cSH	853	1700	1424			
Volume to Capacity	0.02	0.07	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	9.3	0.0	0.2			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	0.2			
Approach LOS	A					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			19.9%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 4: Indiana Avenue & 89th Street
















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	36	49	4	36	15	49	72	10	23	115	14
Future Volume (vph)	15	36	49	4	36	15	49	72	10	23	115	14
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
Hourly flow rate (vph)	17	40	54	4	40	17	54	80	11	26	128	16
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	111	61	145	170								
Volume Left (vph)	17	4	54	26								
Volume Right (vph)	54	17	11	16								
Hadj (s)	-0.08	-0.10	0.06	0.03								
Departure Headway (s)	4.6	4.7	4.6	4.5								
Degree Utilization, x	0.14	0.08	0.18	0.21								
Capacity (veh/h)	717	704	748	754								
Control Delay (s)	8.4	8.1	8.6	8.8								
Approach Delay (s)	8.4	8.1	8.6	8.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			30.9%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 5: Prairie Avenue & 87th Street

11/06/2018

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	867	10	5	830	11	2	1	4	0	0	0
Future Volume (Veh/h)	19	867	10	5	830	11	2	1	4	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	20	894	10	5	856	11	2	1	4	0	0	0
Pedestrians					3			12			10	
Lane Width (ft)					12.0			14.0			0.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		445										
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	877			916			1389	1838	467	1376	1838	444
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	877			548			1105	1633	20	1089	1632	444
tC, single (s)	4.1			4.1			7.5	6.5	7.3	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	97			99			99	99	100	100	100	100
cM capacity (veh/h)	779			865			136	83	834	139	83	567
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1							
Volume Total	467	457	433	439	7							
Volume Left	20	0	5	0	2							
Volume Right	0	10	0	11	4							
cSH	779	1700	865	1700	222							
Volume to Capacity	0.03	0.27	0.01	0.26	0.03							
Queue Length 95th (ft)	2	0	0	0	2							
Control Delay (s)	0.7	0.0	0.2	0.0	21.7							
Lane LOS	A		A		C							
Approach Delay (s)	0.4		0.1		21.7							
Approach LOS					C							
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			48.8%		ICU Level of Service				A			
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 6: Prairie Avenue & 89th Street















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	65	0	0	41	0	13	0	3	0	0	2
Future Volume (Veh/h)	3	65	0	0	41	0	13	0	3	0	0	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	73	0	0	46	0	15	0	3	0	0	2
Pedestrians		3										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		3.5										
Percent Blockage		0										
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	58	37	4	69	36	2	5			3		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	58	37	4	69	36	2	5			3		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.3			2.2		
p0 queue free %	100	91	100	100	95	100	99			100		
cM capacity (veh/h)	893	833	1082	858	847	1089	1573			1632		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	76	46	18	2								
Volume Left	3	0	15	0								
Volume Right	0	0	3	2								
cSH	835	847	1573	1632								
Volume to Capacity	0.09	0.05	0.01	0.00								
Queue Length 95th (ft)	7	4	1	0								
Control Delay (s)	9.7	9.5	6.1	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.7	9.5	6.1	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			9.1									
Intersection Capacity Utilization			20.1%	ICU Level of Service						A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 7: Calumet Avenue & 88th Street


11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	1	0	0	0	0	0	0	18	33	0
Future Volume (vph)	0	0	1	0	0	0	0	0	0	18	33	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	0	1	0	0	0	0	0	0	23	41	0
Direction, Lane #	EB 1	SB 1										
Volume Total (vph)	1	64										
Volume Left (vph)	0	23										
Volume Right (vph)	1	0										
Hadj (s)	-0.60	0.09										
Departure Headway (s)	3.4	4.0										
Degree Utilization, x	0.00	0.07										
Capacity (veh/h)	1021	888										
Control Delay (s)	6.4	7.3										
Approach Delay (s)	6.4	7.3										
Approach LOS	A	A										
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			13.7%	ICU Level of Service		A						
Analysis Period (min)			15									

# Lanes, Volumes, Timings

## 1: Indiana Avenue & 87th Street

11/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔	↔		↔	↔
Traffic Volume (vph)	18	889	96	27	858	8	51	23	23	29	177	72
Future Volume (vph)	18	889	96	27	858	8	51	23	23	29	177	72
Satd. Flow (prot)	0	3508	0	0	3529	0	0	1542	1507	0	1556	1507
Flt Permitted		0.935			0.907			0.747			0.958	
Satd. Flow (perm)	0	3283	0	0	3207	0	0	1186	1482	0	1500	1475
Satd. Flow (RTOR)		29			2				23			55
Lane Group Flow (vph)	0	1023	0	0	912	0	0	75	23	0	211	73
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Total Split (s)	41.0	41.0		41.0	41.0		24.0	24.0	24.0	24.0	24.0	24.0
Total Lost Time (s)		4.0			4.0			4.0	4.0		4.0	4.0
Act Effct Green (s)		37.0			37.0			20.0	20.0		20.0	20.0
Actuated g/C Ratio		0.57			0.57			0.31	0.31		0.31	0.31
v/c Ratio		0.54			0.50			0.21	0.05		0.46	0.15
Control Delay		9.8			9.6			18.6	7.7		22.1	8.1
Queue Delay		0.0			0.0			0.0	0.0		0.0	0.0
Total Delay		9.8			9.6			18.6	7.7		22.1	8.1
LOS		A			A			B	A		C	A
Approach Delay		9.8			9.6			16.0			18.5	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		115			102			22	0		66	5
Queue Length 95th (ft)		162			145			51	14		124	31
Internal Link Dist (ft)		351			365			596			532	
Turn Bay Length (ft)									25			25
Base Capacity (vph)		1881			1826			364	471		461	491
Starvation Cap Reductn		0			0			0	0		0	0
Spillback Cap Reductn		0			0			0	0		0	0
Storage Cap Reductn		0			0			0	0		0	0
Reduced v/c Ratio		0.54			0.50			0.21	0.05		0.46	0.15

### Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 65

Offset: 32 (49%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 11.0

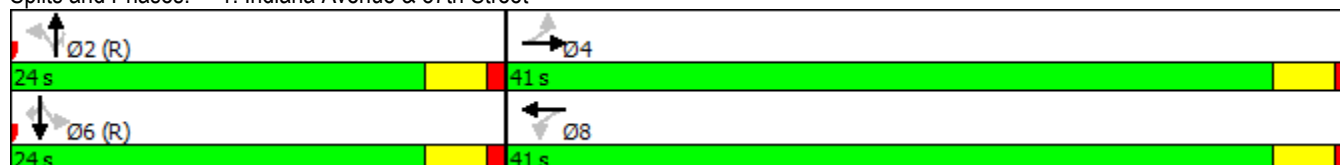
Intersection LOS: B

Intersection Capacity Utilization 86.9%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Indiana Avenue & 87th Street



# HCM Unsignalized Intersection Capacity Analysis

## 2: Indiana Avenue & 88th Street

11/06/2018












Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↕	↕	
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	0	0	10	86	280	12
Future Volume (vph)	0	0	10	86	280	12
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	0	11	95	308	13
Direction, Lane #	NB 1	SB 1				
Volume Total (vph)	106	321				
Volume Left (vph)	11	0				
Volume Right (vph)	0	13				
Hadj (s)	0.02	-0.01				
Departure Headway (s)	4.2	4.0				
Degree Utilization, x	0.12	0.36				
Capacity (veh/h)	834	895				
Control Delay (s)	7.8	9.2				
Approach Delay (s)	7.8	9.2				
Approach LOS	A	A				
Intersection Summary						
Delay			8.8			
Level of Service			A			
Intersection Capacity Utilization			25.8%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 3: Indiana Avenue & Parking Lot Access Drive

















11/06/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	7	19	71	1	22	252
Future Volume (Veh/h)	7	19	71	1	22	252
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	7	20	74	1	23	263
Pedestrians	2					
Lane Width (ft)	10.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	386	76			77	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	386	76			77	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	98			98	
cM capacity (veh/h)	611	989			1532	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	27	75	286			
Volume Left	7	0	23			
Volume Right	20	1	0			
cSH	852	1700	1532			
Volume to Capacity	0.03	0.04	0.02			
Queue Length 95th (ft)	2	0	1			
Control Delay (s)	9.4	0.0	0.7			
Lane LOS	A		A			
Approach Delay (s)	9.4	0.0	0.7			
Approach LOS	A					
Intersection Summary						
Average Delay		1.2				
Intersection Capacity Utilization		31.1%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 4: Indiana Avenue & 89th Street
















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	25	43	4	34	6	37	66	3	26	226	3
Future Volume (vph)	4	25	43	4	34	6	37	66	3	26	226	3
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	4	26	44	4	35	6	38	67	3	27	231	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	74	45	108	261								
Volume Left (vph)	4	4	38	27								
Volume Right (vph)	44	6	3	3								
Hadj (s)	-0.34	-0.03	0.05	0.05								
Departure Headway (s)	4.5	4.8	4.5	4.4								
Degree Utilization, x	0.09	0.06	0.14	0.32								
Capacity (veh/h)	736	682	760	796								
Control Delay (s)	7.9	8.1	8.2	9.4								
Approach Delay (s)	7.9	8.1	8.2	9.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.8									
Level of Service			A									
Intersection Capacity Utilization			26.2%	ICU Level of Service					A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 5: Prairie Avenue & 87th Street

















11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	917	6	3	890	12	3	0	2	0	0	0
Future Volume (Veh/h)	18	917	6	3	890	12	3	0	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	18	936	6	3	908	12	3	0	2	0	0	0
Pedestrians		1			2			23			13	
Lane Width (ft)		12.0			12.0			14.0			0.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			3			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		445										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	933			965			1459	1937	496	1441	1934	474
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	933			577			1165	1734	19	1144	1731	474
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			97	100	100	100	100	100
cM capacity (veh/h)	729			824			119	70	867	126	71	542
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1							
Volume Total	486	474	457	466	5							
Volume Left	18	0	3	0	3							
Volume Right	0	6	0	12	2							
cSH	729	1700	824	1700	182							
Volume to Capacity	0.02	0.28	0.00	0.27	0.03							
Queue Length 95th (ft)	2	0	0	0	2							
Control Delay (s)	0.7	0.0	0.1	0.0	25.4							
Lane LOS	A		A		D							
Approach Delay (s)	0.4		0.1		25.4							
Approach LOS					D							
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			49.0%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 6: Prairie Avenue & 89th Street

11/06/2018















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	49	0	0	24	3	11	0	7	2	0	1
Future Volume (Veh/h)	3	49	0	0	24	3	11	0	7	2	0	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	4	64	0	0	31	4	14	0	9	3	0	1
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					3.5							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	58	44	0	72	40	6	1			10		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	58	44	0	72	40	6	1			10		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	92	100	100	96	100	99			100		
cM capacity (veh/h)	905	840	1090	862	846	1082	1635			1621		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	68	35	23	4								
Volume Left	4	0	14	3								
Volume Right	0	4	9	1								
cSH	843	867	1635	1621								
Volume to Capacity	0.08	0.04	0.01	0.00								
Queue Length 95th (ft)	7	3	1	0								
Control Delay (s)	9.6	9.3	4.4	5.4								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.6	9.3	4.4	5.4								
Approach LOS	A	A										
Intersection Summary												
Average Delay			8.5									
Intersection Capacity Utilization			15.4%		ICU Level of Service				A			
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 7: Calumet Avenue & 88th Street

11/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	1	0	0	0	0	0	0	15	40	1
Future Volume (vph)	0	0	1	0	0	0	0	0	0	15	40	1
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	0	0	1	0	0	0	0	0	0	22	58	1
Direction, Lane #	EB 1	SB 1										
Volume Total (vph)	1	81										
Volume Left (vph)	0	22										
Volume Right (vph)	1	1										
Hadj (s)	-0.60	0.05										
Departure Headway (s)	3.5	3.9										
Degree Utilization, x	0.00	0.09										
Capacity (veh/h)	1007	899										
Control Delay (s)	6.5	7.3										
Approach Delay (s)	6.5	7.3										
Approach LOS	A	A										
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			13.7%	ICU Level of Service		A						
Analysis Period (min)			15									