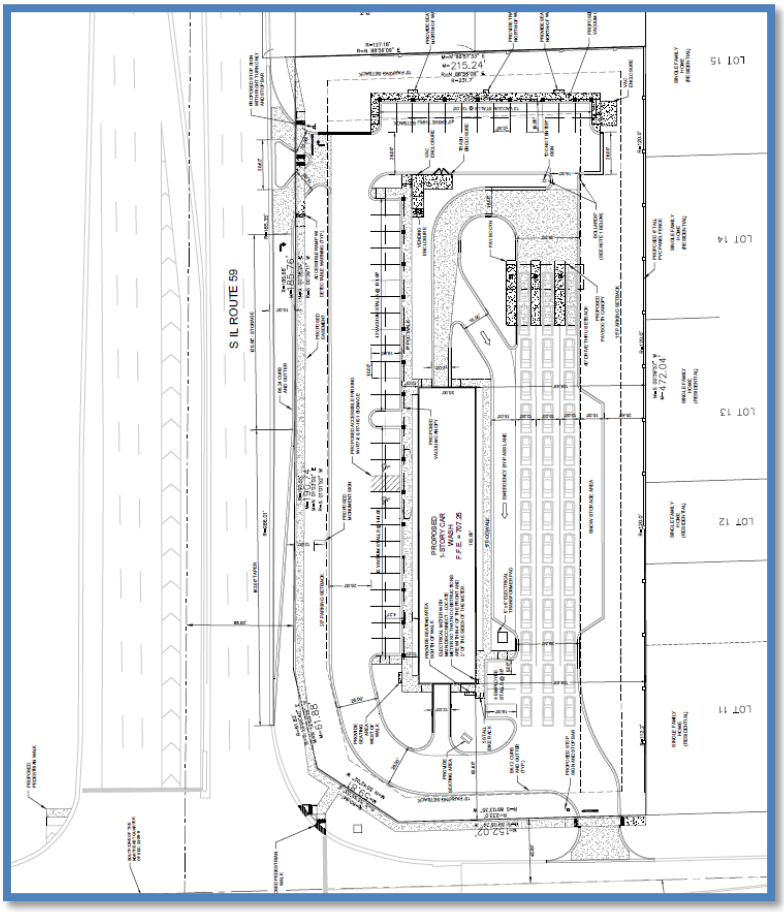
JET BRITE CAR WASH
Northeast Corner of IL 59 with 83rd Street
NAPERVILLE, ILLINOIS

Traffic Impact Study



Prepared for:

Naperville

Illinois Department of Transportation

April 2022

KNIGHT
Engineers & Architects

Knight E/A, Inc.
221 North LaSalle Street
Suite 300
Chicago, IL 60601

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EXECUTIVE SUMMARY

Knight E/A, Inc. (Knight) was retained by Jet Brite Services, Inc. to prepare a traffic impact study for a Jet Brite Car Wash planned for the parcel in the northeast corner of the intersections of IL 59 with 83rd Street/Montgomery Road in Naperville, Illinois. The lot is bounded by IL 59 to the west, "Keep it Clean" Cleaning Services to the north, residential homes to the east, and 83rd Street to the south. The existing site is primarily forested and provides a curb cut at the southeast corner of the site off 83rd Street. The development is proposed to provide one car wash tunnel with three pay stations/queuing lanes able to accommodate at least 50 vehicles as well as provide 44 total vacuum parking spaces. Access to the car wash facility will be provided via a full access driveway off 83rd Street at the southeast corner of the lot and a right-in/right-out access driveway off IL 59 at the northwest corner of the lot.

To understand and evaluate the traffic operations of the surrounding roadway operations, the area surrounding the signalized intersection of IL 59 with 83rd Street/Montgomery Road was included in the study area. Vehicular, pedestrian, and bicycle traffic counts were obtained for this intersection using video data collection. Vehicle trips were estimated for the car wash and distributed over the roadway network in order to determine the projected traffic operations for the area.

The existing and projected traffic operations were analyzed using the HCM's Highway Capacity software. Based on the results of the analysis and observations of the study area, the following recommendations and conclusions were determined.

- IL 59 is designated as a Strategic Regional Arterial (SRA) by the Illinois Department of Transportation (IDOT). SRA's are designed for mobility and to augment the region's expressway system. The roadway is designed to carry high volumes of traffic along the route at Level of Service (LOS) C or better.
- The existing intersection meets SRA traffic operation LOS standards for the IL 59 through movements during the weekday morning, weekday evening, and Saturday midday peak hours. In order to provide LOS C on the major route, the minor movements operate at higher delays due to the long cycle lengths and limited green time, but vehicles on the side road typically clear the intersection within a single cycle.
- Under projected conditions, signal timings for the intersection of IL 59 with 83rd Street will be modified to ensure the north-south mainline will continue to meet SRA LOS standards for the through movements. Minor movements will continue to operate with higher delays due to the long cycle length and limited green time.
- Access to the site will be adequately accommodated by the proposed full access drive via 83rd Street and the right-in/right-out access drive via IL 59. Both intersections will operate at acceptable levels of service during each peak hour. A dedicated, right turn lane will be provided for the right-in/right-out access drive to provide adequate deceleration distance.
- At the intersection of 83rd Street with the South Access Drive, 'Do Not Block Driveway' (MUTCD R10-7) signage should be provided to minimize any blockages resulting from westbound 83rd Street queuing at the signalized intersection. Projected delays and queuing for the inbound left-turn movement is minimal and will not impact operations at the IL 59 / 83rd Street intersection.
- The site will provide stacking to accommodate at least 50 vehicles on site prior to entering the car wash tunnel without impacting internal circulation or the operation of the access drive. The site's three pay stations/queuing lanes will provide adequate capacity to prevent queues from spilling out onto the adjacent roadways.

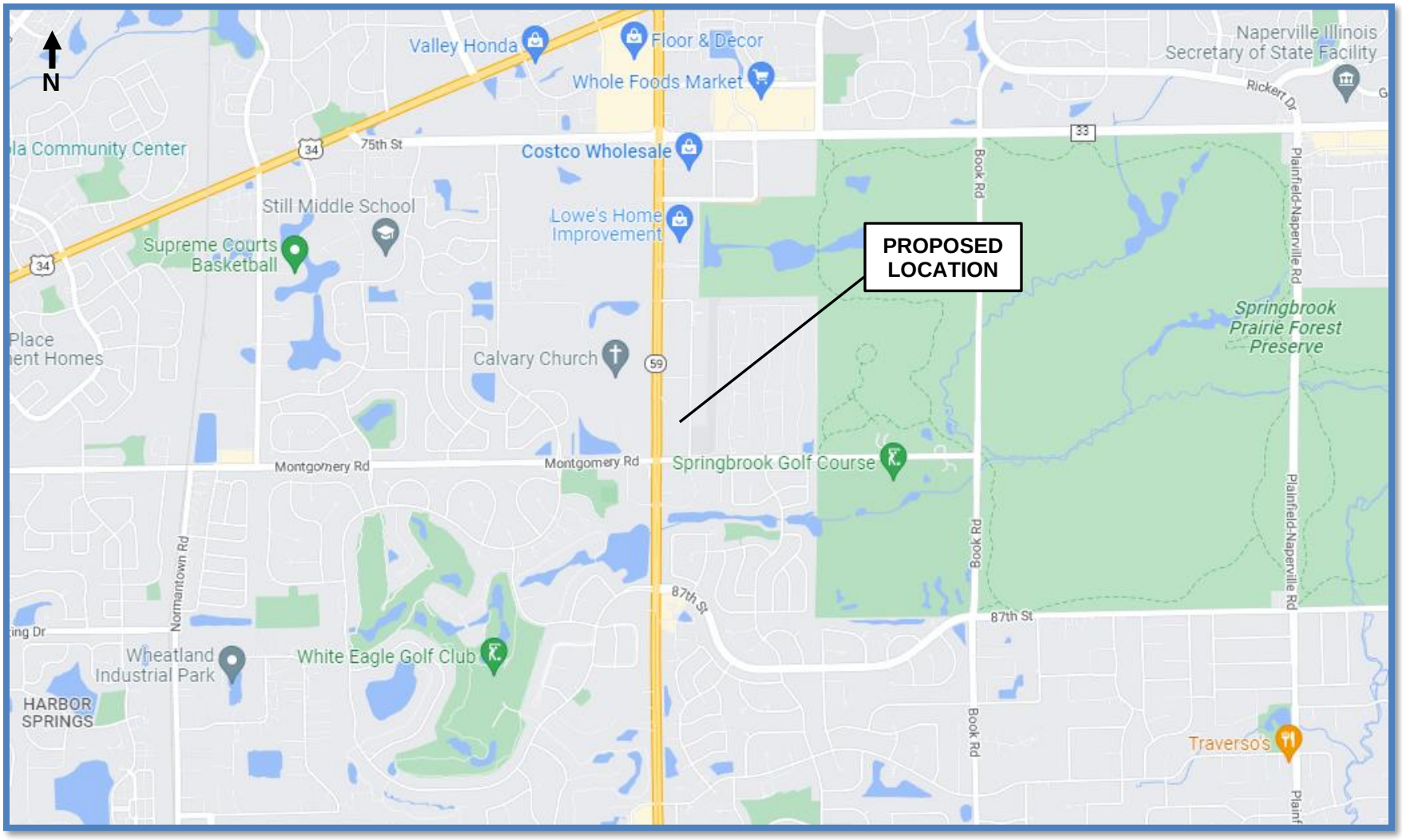
1 – INTRODUCTION

Knight E/A, Inc. was retained by Jet Brite Services, Inc. to prepare a traffic impact study for the proposed Jet Brite Car Wash to be located at in the northeast corner of the intersection of IL 59 with 83rd Street/Montgomery Road in Naperville, Illinois. This development will provide one car wash tunnel with three pay stations/queuing lanes able to accommodate at least 50 vehicles. It will also provide 44 vacuum parking spaces and four standard employee parking spaces for use before or after the car wash.

Access to the car wash will be provided via a full access driveway off 83rd Street at the southeast corner of the site and a right-in/right-out access at the northwest corner of the site from IL 59. The proposed development will occupy the currently forested lot. There is an existing curb cut located in the southeast corner of the site.

The purpose of this study is to determine the projected impacts on traffic operations and identify any necessary improvements/modifications to the roadway network or traffic control. As a part of this study, the existing roadway network surrounding the site was observed, quantified, and analyzed to determine the operation at the study intersection during the weekday morning, weekday evening and Saturday midday hourly peak traffic volumes. New trips generated based on the size and characteristics of the car wash were determined and assigned to the roadway network to evaluate future traffic conditions. This report presents and documents the existing data utilized for the analysis, summarizes the evaluation of traffic conditions on the surrounding roadway network, details the potential impact of the projected traffic on the adjacent roadway network, and identifies recommendations to mitigate operational issues.

A map of the study location is presented in **Exhibit 1.1** while **Exhibit 1.2** shows an aerial of study area and identifies the intersections included in the analysis.



Source: Google

Exhibit 1.1: Site Location Map

Source: Google

Exhibit 1.2: Aerial of Study Area

2 – EXISTING CONDITIONS

The study area and adjacent roadways were evaluated through field data collection and traffic counts. Information regarding the characteristics and operation are based on field investigation, video and in-person observations, and publicly published data. A detailed summary of the findings are as follows.

2.1 Study Area

The study area surrounds the intersection of IL 59 and 83rd Street/Montgomery Road in the City of Naperville. A number of commercial and retail spaces are located along IL 59 while 83rd Street/Montgomery Road generally provide access to residential subdivisions. The Calvary Christian School Campus is located in the northwest corner of the intersection and the Naper Aero Club Airport is located to the east of the site. This location is approximately two miles south of the Fox Valley Mall and surrounding retail/commercial uses.

2.2 Existing Roadway Characteristics

A description of the existing roadway system within the study area is explained below and is illustrated in **Exhibit 2.1**.

IL 59 is a north-south other principal arterial generally providing three through lanes in each direction separated by a landscaped median within the vicinity of the site. It is under the jurisdiction of the Illinois Department of Transportation (IDOT), which has designated it as a Strategic Regional Arterial (SRA). IL 59 is under traffic signal control at its intersection with 83rd Street where it provides exclusive left-turn and right-turn lanes in both directions. It has a posted speed limit of 45 mph. According to the 2019 data published by IDOT, it carries an Average Annual Daily Traffic (AADT) volume of 49,300 vehicles per day. IL 59 is also a designated Class II truck route (state maintained).

83rd Street/Montgomery Road is an east-west major collector generally providing one lane in each direction. The roadway name is 83rd Street to the east of IL 59 and Montgomery Road to the west of IL 59. At its signalized intersection with IL 59, it provides an exclusive left-turn lane and a combined through/right-turn lane in both directions. 2016 AADT data from IDOT shows that the roadway carries 12,200 vehicles per day west of IL 59 and 8,600 vehicles per day east of IL 59. Traffic counts conducted in 2020 show that the roadway carried 8,650 vehicles, although this was likely impacted by the COVID-19 pandemic and the resulting stay-at-home order. 83rd Street has a posted speed limit of 40 mph.

PACE provides daily bus service (route 559) along IL 59 through the study area. There is a bus stop located for each direction just south of the IL 59 and 83rd Street / Montgomery Road intersection. No shelters, benches or concrete pads exist at the stops. A PACE sign indicating the route number is posted at both bus stop locations.

There are existing sidewalks provided on the south side of 83rd Street / Montgomery Road and on the east side of IL 59 south of 83rd Street / Montgomery Road.

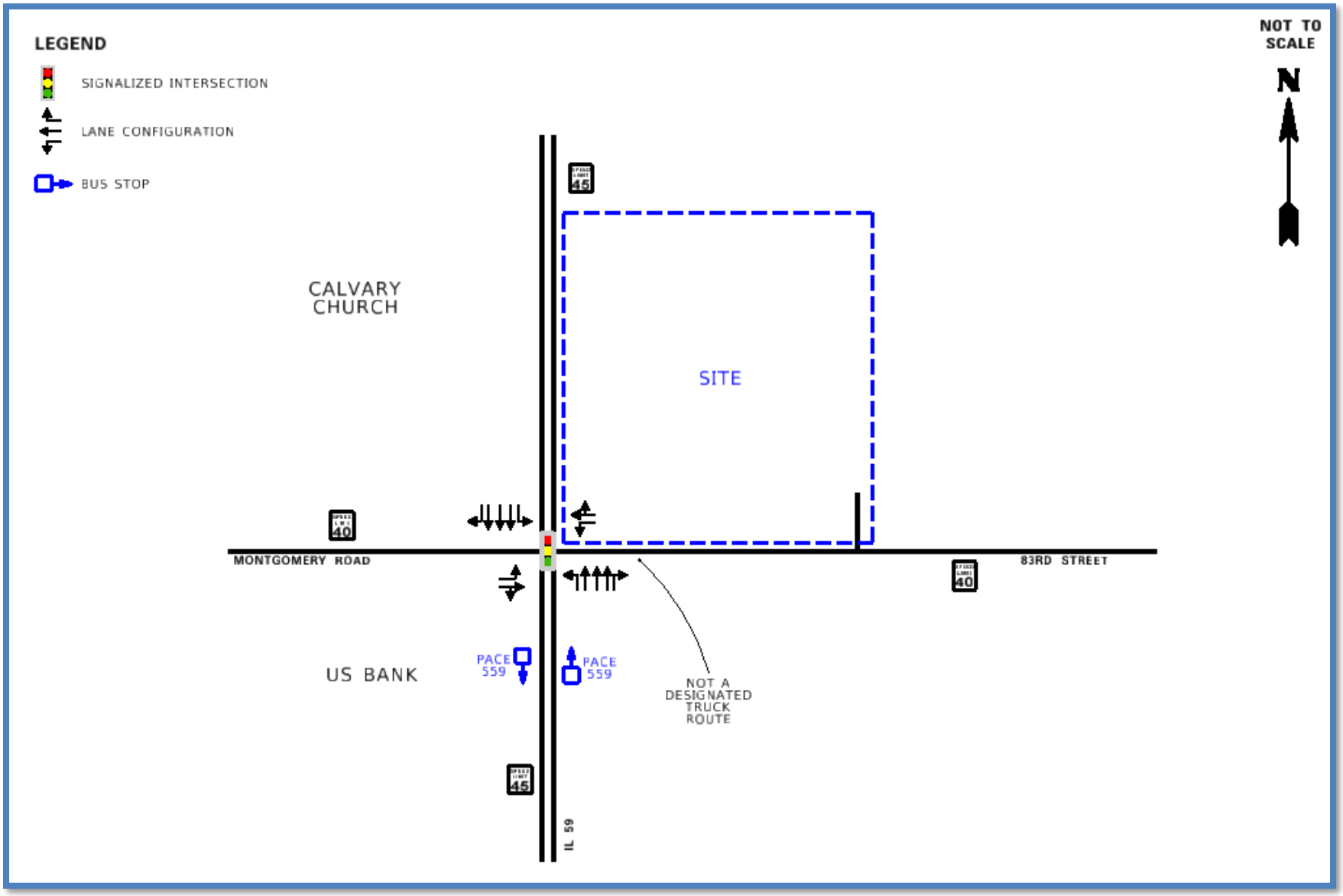


Exhibit 2.1 – Existing Conditions

2.3 Traffic Count Data

In order to determine existing traffic operations, vehicle, pedestrian, and bicycle traffic counts were conducted at the intersection of IL 59 with 83rd Street. This data was collected on Thursday, March 17, 2022 during the weekday morning (6:30 to 9:30 A.M.) and evening (4:00 to 7:00 P.M.) peak periods as well as on Saturday, March 19, 2022 during the midday (11:00 to 3:00 P.M.) peak period using Miovision Scout Video Data Collection Units.

The result of the traffic counts indicate that overall peak traffic conditions of the roadway network take place from 7:15 A.M. to 8:15 A.M. during the morning peak hour, 4:45 P.M. to 5:45 P.M. during the evening peak hour, and 2:00 P.M. to 3:00 P.M. during the Saturday midday peak hour. It should be noted that the pedestrian and bicycle traffic observed in the area was minimal.

The existing weekday morning, weekday evening and Saturday midday peak hour traffic volumes are illustrated in **Exhibit 2.2**.

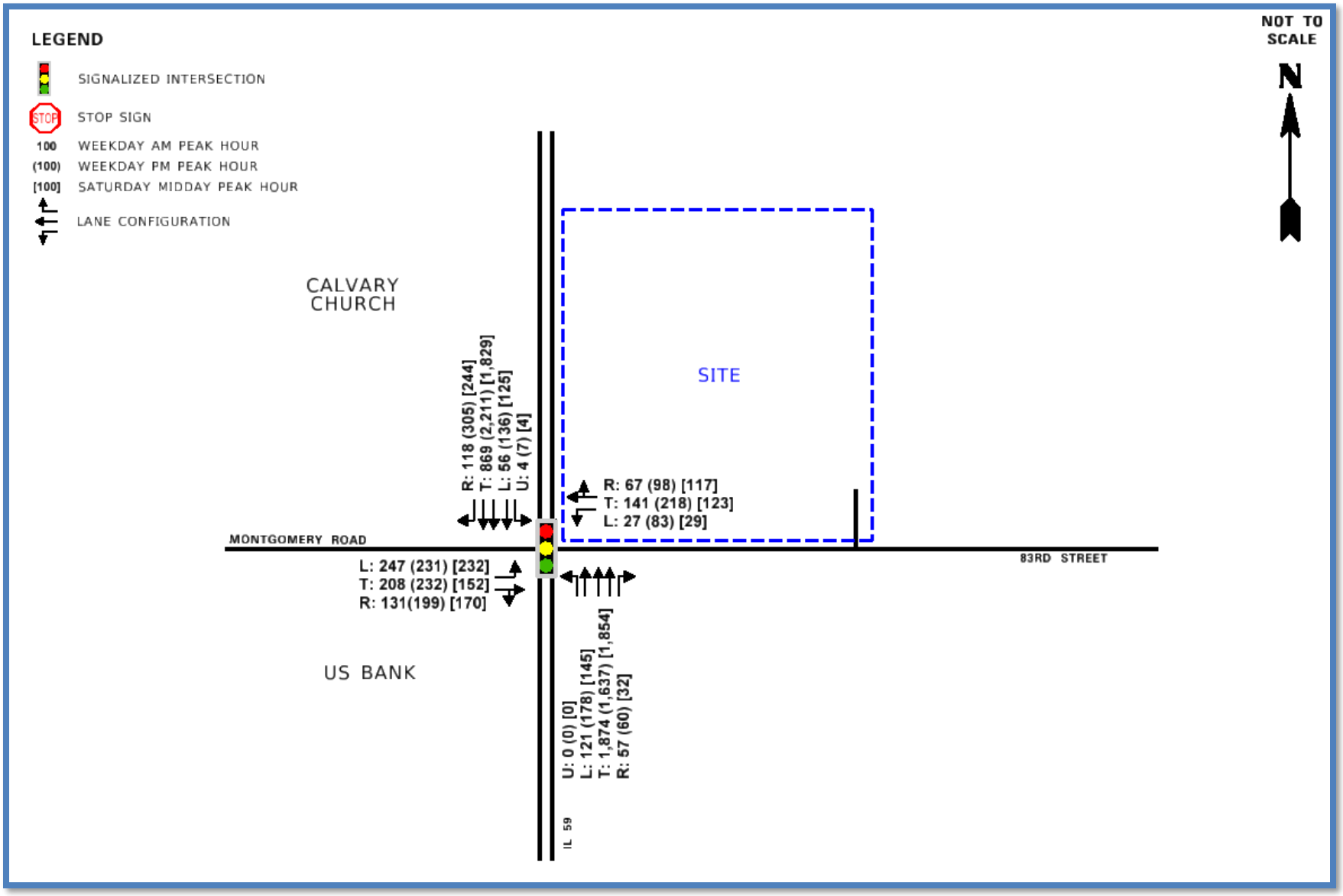


Exhibit 2.2 – Existing Traffic Volumes

3 – PROPOSED REDEVELOPMENT AND PROJECTED CONDITIONS

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

3.1 Proposed Site and Redevelopment

The proposed car wash facility is bounded by IL 59 to the west, “Keep it Clean” Cleaning Services to the north, residential homes to the east, and 83rd Street to the south. The existing site is primarily forested and provides a curb cut at the southeast corner of the site off 83rd Street.

As proposed, the site will be redeveloped to provide a Jet Brite single lane car wash tunnel that is approximately 6,370 square feet and located along the center of the site, as illustrated in **Exhibit 3.1**. Three pay stations and stacking lanes will be located along the east side of the site. Prior to or following the car wash, patrons will be able to utilize one of the 44 vacuum parking spaces located along the north and west side of the site. Four standard parking spaces will be provided for employees as well. Jet Brite Car Wash locations generally operate seven days a week from 7:00 A.M. to 9:00 P.M. with a lower number of patrons arriving during the early morning hours.

3.2 Site Access, Circulation, and Queuing

Access to the site will be provided via a single full access driveway located in the southeast corner of the site from 83rd Street, which will be located at the same position as the existing curb cut. In addition, a right-in/right-out access driveway in the northwest corner will provide access to IL 59. Both access drives will provide one inbound lane and one outbound lane under stop sign control. To minimize adverse operational impacts to northbound IL 59 through traffic, an inbound, dedicated right-turn lane will be provided to the right-in/right-out access to provide adequate deceleration distance. The taper will begin immediately north of the intersection of IL 59 with 83rd Street.

To minimize the impact of queued vehicles on the site and surrounding area, the entrance to the car wash will be provided on the north side of the tunnel, which allows for ample vehicle storage on site. Between the entrance of the tunnel and the three pay stations, approximately eight vehicles can queue without blocking the pay stations. Beyond the pay stations, a staging area will provide three stacking lanes approximately 200 feet long each. An additional 50 feet of stacking could be provided without interfering with internal access or conflicting with vehicles entering or exiting from 83rd Street. Overall, the car wash will provide stacking for approximately 50 vehicles waiting to enter the car wash tunnel.

3.3 Trip Generation, Distribution and Assignment

In order to determine the number of vehicles that will be generated by the redevelopment of the site, trip data from the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition, was utilized. The number of trips is estimated according to a vehicle trip generation rate based on the land use and size of the development. To generate trips for the site, the ITE land use for Automated Car Washes (Land Use Code [LUC] 948) was utilized based on the footprint of the car wash tunnel. However, since ITE does not provide a morning peak hour trip generation rate, the number of trips for the time period are based on one-half of the evening peak period rate.

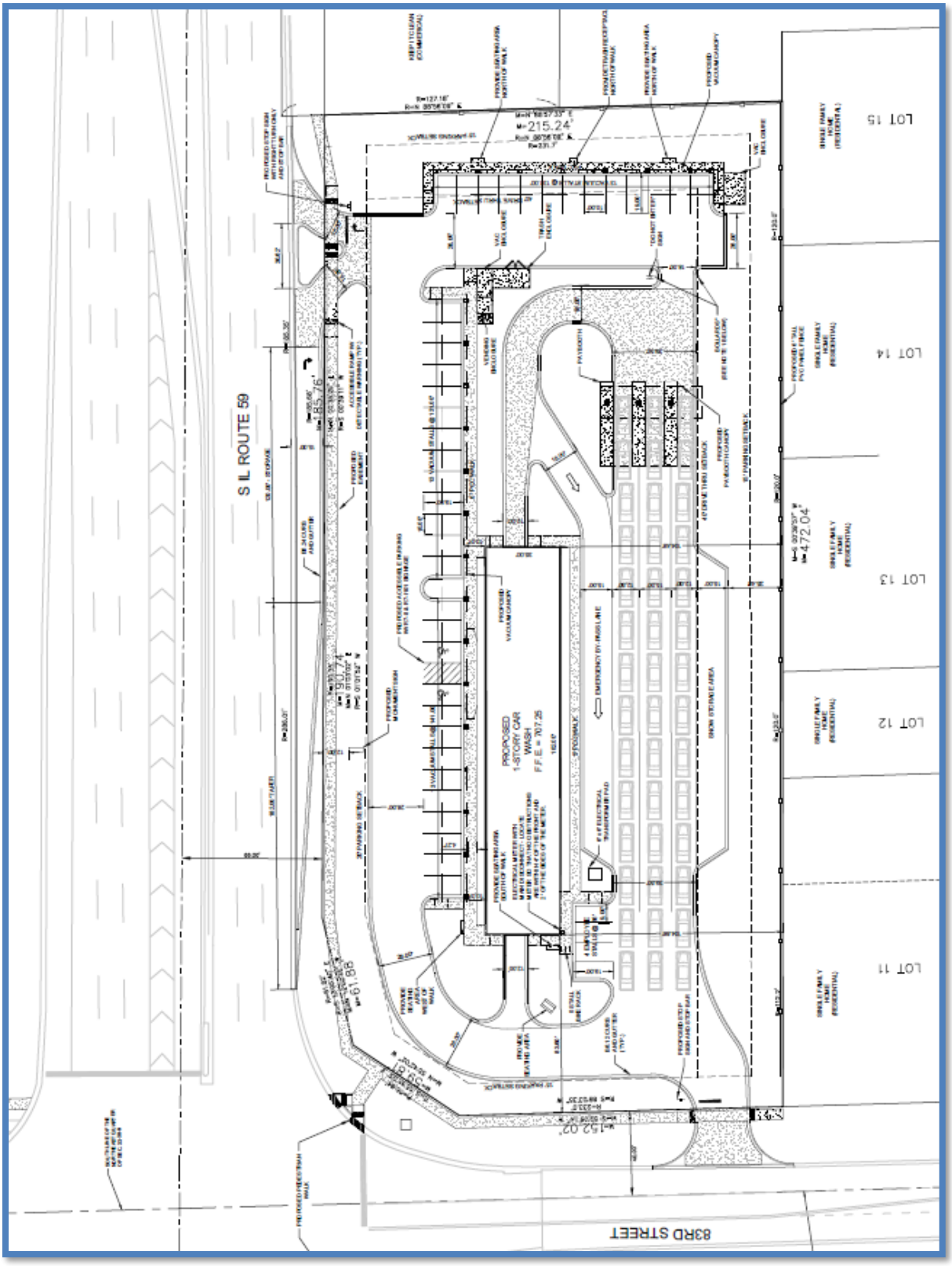


Exhibit 3.1 – Proposed Site Plan

Note that a number of the vehicle trips to and from the car wash will be from vehicles already traveling in the area, particularly via IL 59. These trips, known as pass-by trips, account for drivers attracted to the site while enroute from one destination to another. They are particularly common during the morning and evening peak periods when most drivers are commuting between home and work and can stop at an additional destination without deviating from their existing route. Vehicle-related uses like gas stations can average 60 percent or higher pass-by trip percentages. Since ITE does not provide information for a car wash, a 50 percent pass-by reduction was assumed to account for these types of trips already within the roadway network.

Table 3.1 summarizes the trip generation and pass-by traffic anticipated for the Jet Bright Car Wash facility.

Table 3.1: Projected Trip Generation

	Morning Peak (7:15 – 8:15 A.M.)			Evening Peak (4:45 – 5:45 P.M.)			Saturday Midday (2:00 P.M. – 3:00 P.M.)		
Automated Car Wash (6,370 s.f.)	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Driveway Trips	23	22	45	45	45	90	98	98	196
-50% Pass-By Traffic	-11	-11	-22	-22	-22	-45	-49	-49	-98
TOTAL NEW TRIPS	**12**	**11**	**23**	**23**	**22**	**45**	**49**	**49**	**98**

The existing traffic counts and locations of the proposed access were utilized to determine the trip distribution to and from the car wash for the projected trips, which can be seen in **Exhibit 3.2**. The new trips were then assigned to the study intersections in accordance with the trip distribution, as shown in **Exhibit 3.3**, while **Exhibit 3.4** illustrates the pass-by traffic for the site. Assignment of inbound trips included a number of IL 59 southbound U-Turns to efficiently access the right-in/right-out. U-Turns are permitted at intersections along suburban SRA Routes due to the existing curbed, barrier median, which aids in access control to improve mobility while maintaining safety.

3.3 Projected Traffic Conditions

It appears there are no major developments currently being planned or under construction in the vicinity of the site that will significantly impact traffic operations in the study area. However, to account for the year-to-year traffic volume increases that may not be attributed to any specific development, the existing traffic volumes were increased by background traffic growth factors. This study utilized information provided by the Chicago Metropolitan Agency for Planning (CMAP) to determine the projected growth of traffic in the area. It estimates an approximate growth of 0.4 percent per year along IL 59, 0.46 percent along Montgomery Road, and 0.98 percent per year along 83rd Street. Per standard practice, projected traffic volumes are estimated for a “build plus five” design horizon year. Construction was estimated to be completed in 2023.

Overall, the Year 2028 projected volumes are a sum of the Year 2022 existing volumes increased by the background traffic growth factors, the car wash pass-by traffic, and the new car wash trips. **Exhibit 3.5** illustrates the total projected volumes.

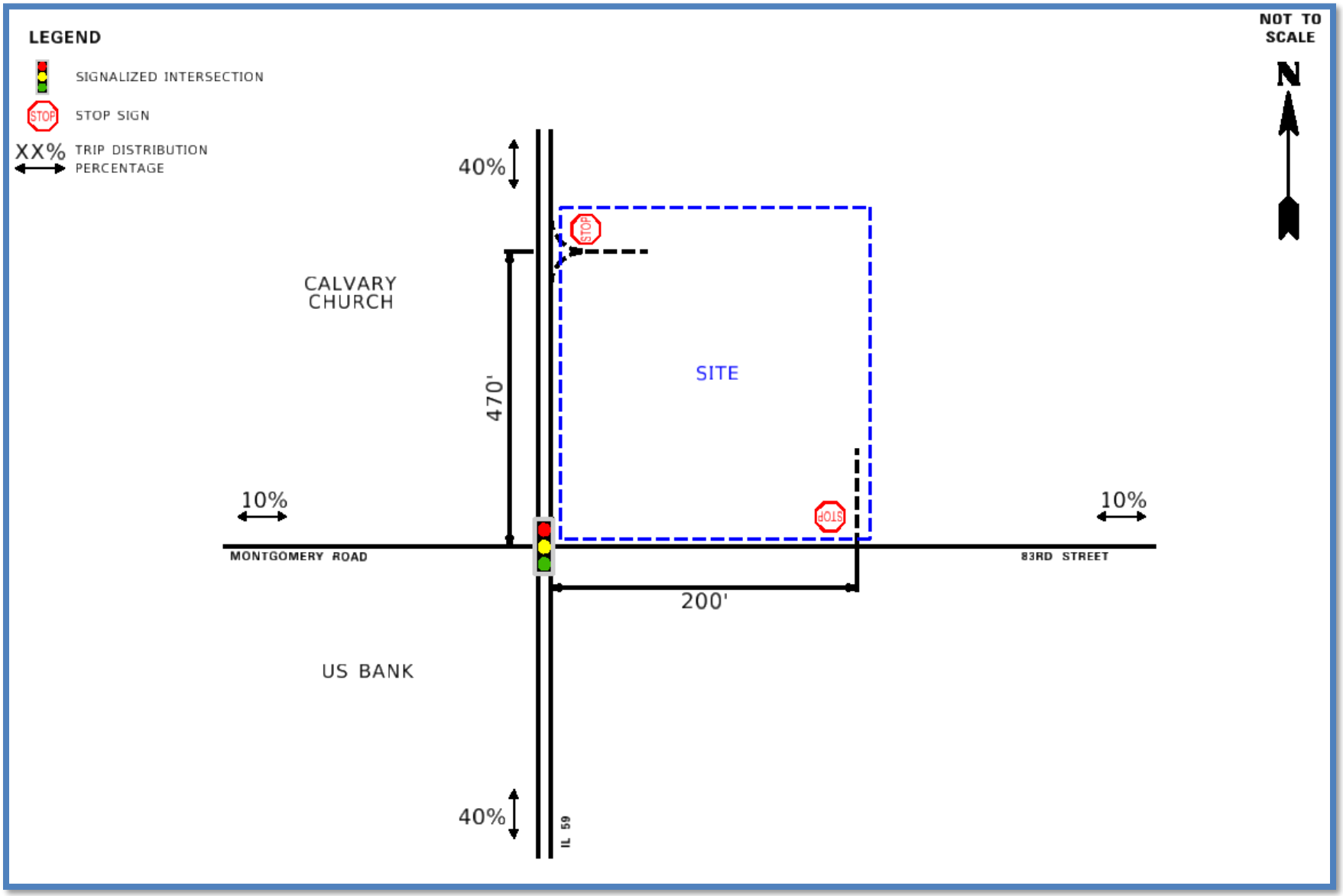


Exhibit 3.2 – Trip Distribution

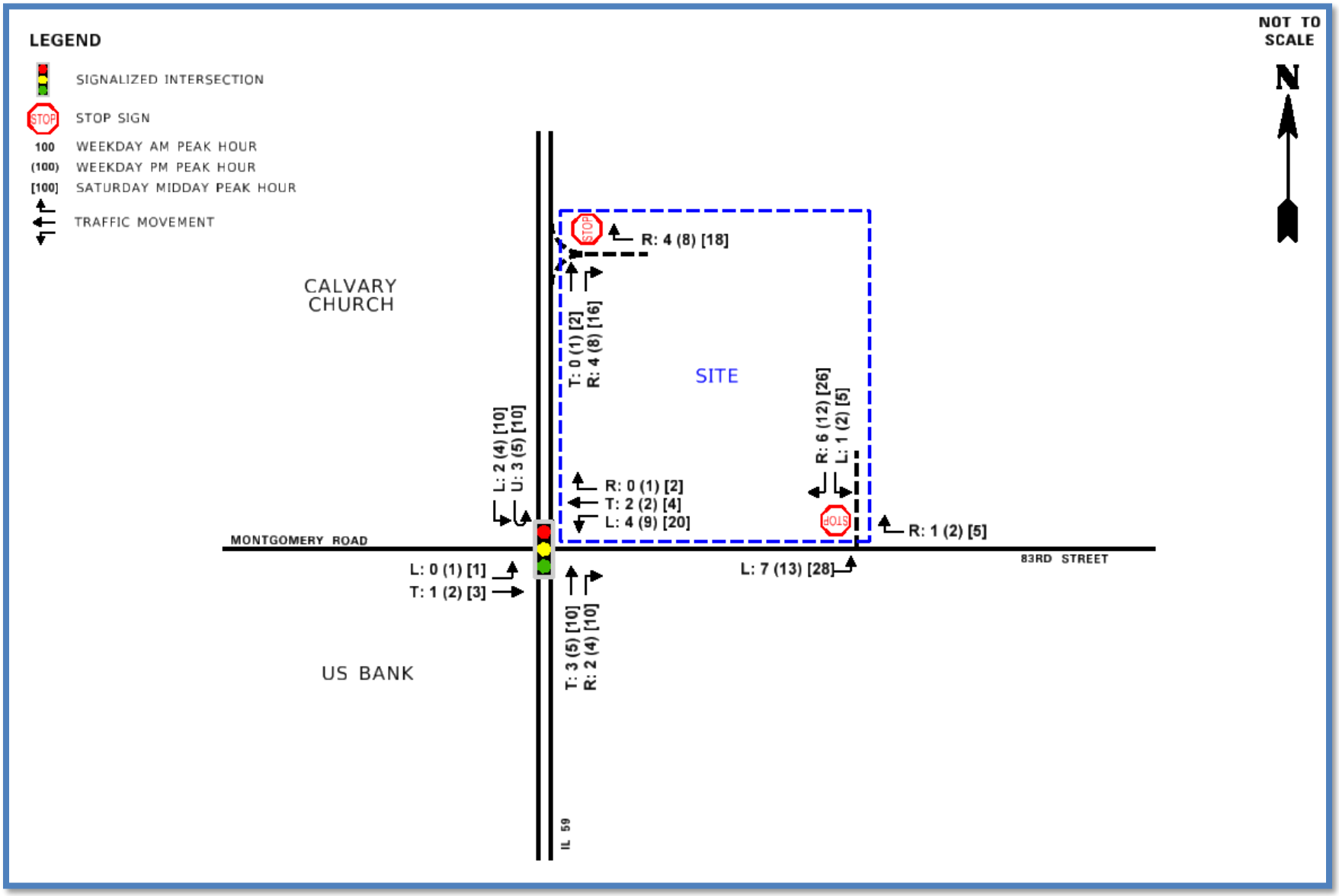


Exhibit 3.3 – New Trip Assignment

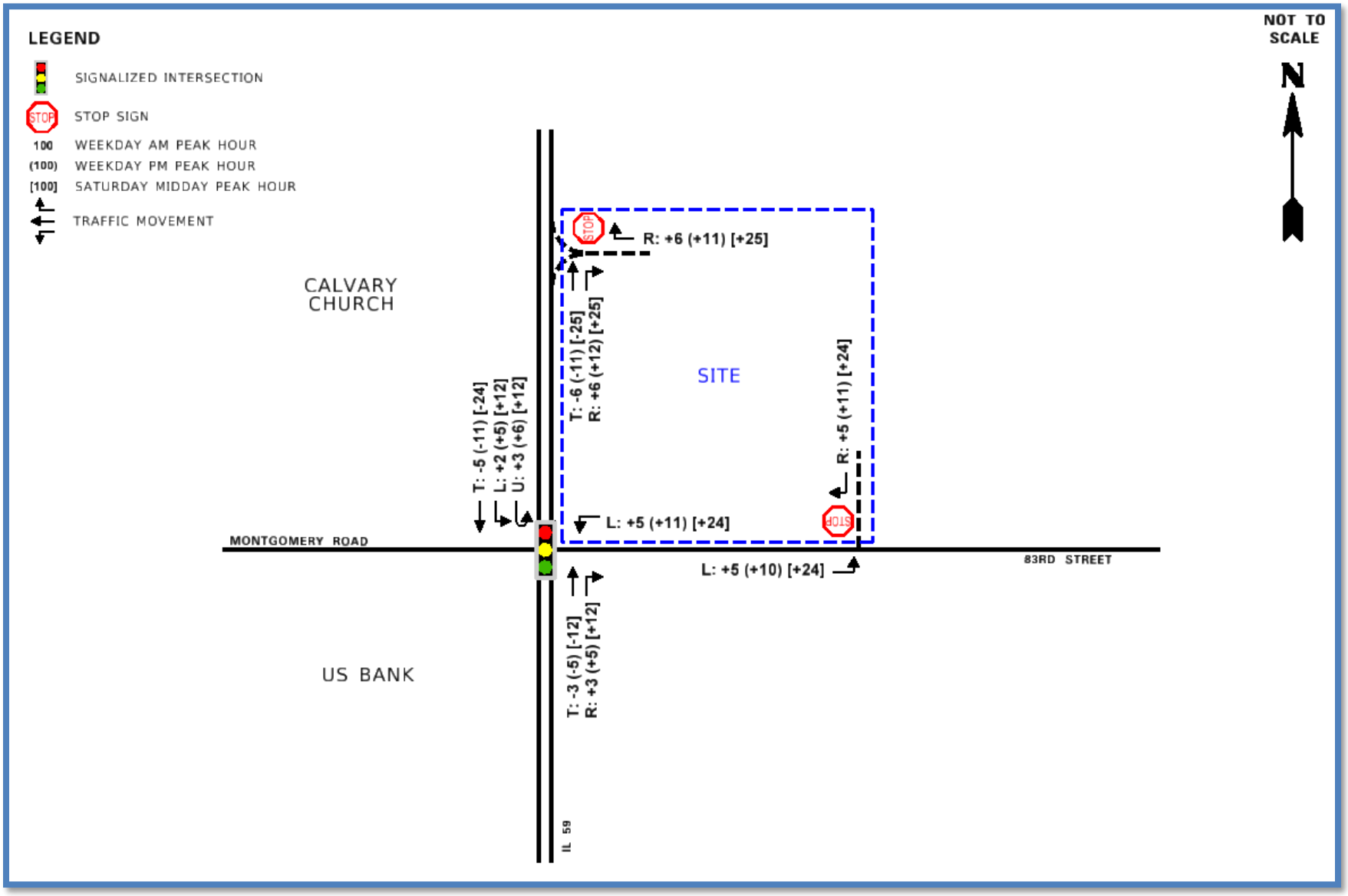


Exhibit 3.4 – Pass-By Trip Assignment

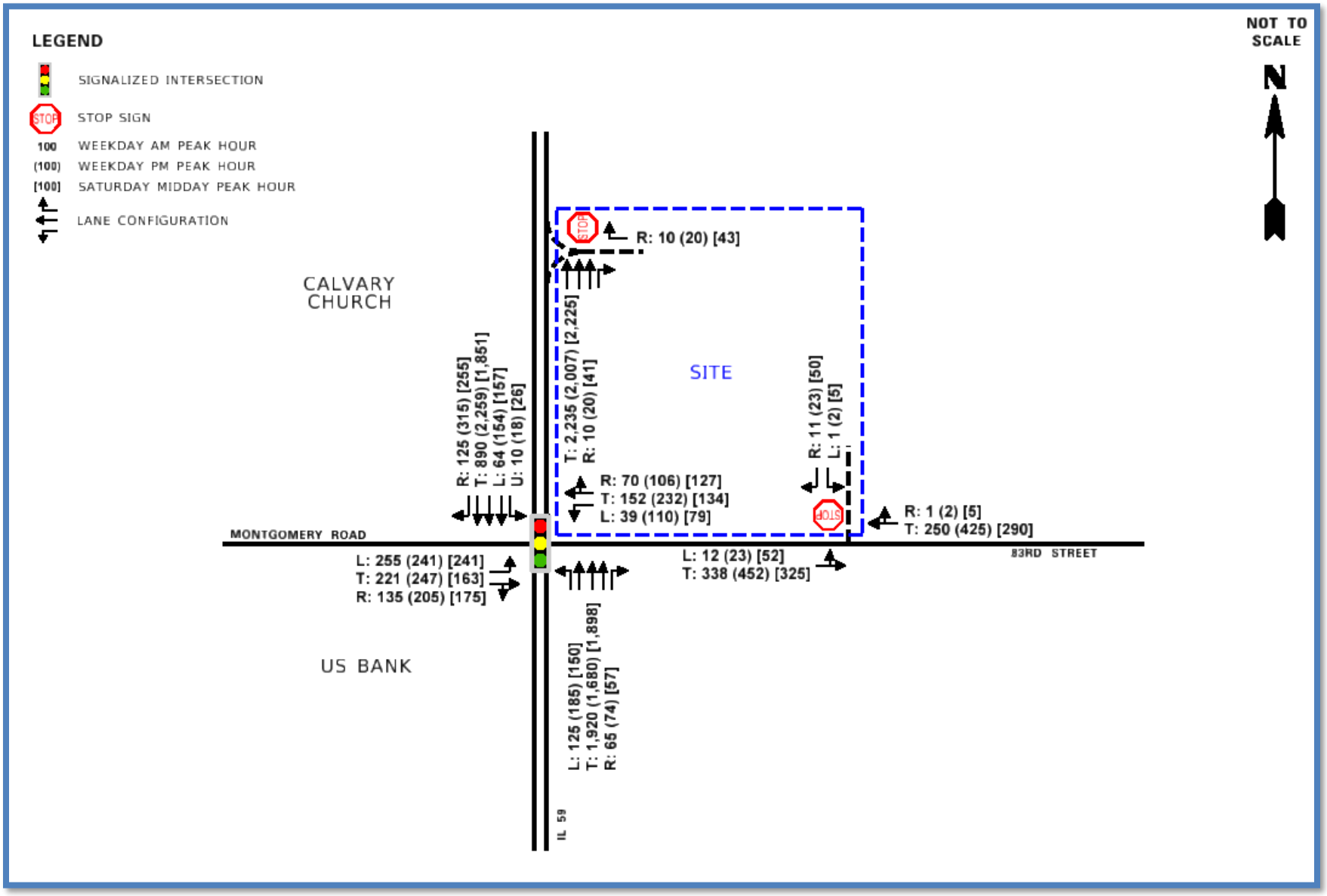


Exhibit 3.5 – Projected Volumes

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 weekday morning and evening and Saturday midday 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 HCS 7 traffic capacity analysis software in order to determine the quality of operation in the existing and proposed roadway 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. Based on the *HCM* methodologies, capacity analysis results for the existing and proposed signalized intersection are summarized in **Table 4.3a**. **Table 4.4a** summarizes the capacity analysis results for the unsignalized intersections. **Table 4.3b** and **Table 4.4b** summarize the 95th percentile queue lengths.

Table 4.1: Level of Service Descriptions[1]

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.

[1]Highway Capacity Manual

Table 4.2: Level of Service Grading Criteria[1]

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[2]	> 50	> 80

[1]Highway Capacity Manual

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

Table 4.3a: Signalized Intersection Capacity Analysis Results – IL 59 with 83rd Street / Montgomery Road

Scenarios	Eastbound			Westbound			Northbound			Southbound			Overall
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing Conditions													
AM Peak Hour (7:15 A.M. – 8:15 A.M.)	D 47.0	E 56.0	--	D 48.5	E 69.0	--	E 72.1	B 17.8	B 11.1	E 75.4	B 16.1	B 14.7	C 27.8
	D – 52.2			E – 66.6			C – 20.8			B – 19.3			
PM Peak Hour (4:45 P.M. – 5:45 P.M.)	F 83.2	F 123.9	--	F 128.5	F 204.4	--	F 99.7	B 18.6	B 13.3	F 92.3	C 29.2	B 18.7	D 50.1
	F – 109.7			F – 188.6			C – 26.1			C – 31.4			
Saturday Midday Peak Hour (2:00 P.M. – 3:00 P.M.)	D 38.9	D 41.9	--	D 38.0	D 53.4	--	E 59.9	C 26.6	B 15.2	E 60.6	C 27.9	B 19.6	C 31.4
	D – 40.7			D – 51.7			C – 28.8			C – 28.9			
Projected Conditions													
AM Peak Hour (7:15 A.M. – 8:15 A.M.)	D 46.9	D 52.5	--	D 46.2	E 61.9	--	E 71.2	C 22.3	B 13.3	E 75.3	B 18.4	B 16.7	C 30.2
	D – 50.1			E – 59.5			C – 24.9			C – 22.1			
PM Peak Hour (4:45 P.M. – 5:45 P.M.)	F 92.1	F 152.7	--	F 137.3	F 216.6	--	F 101.0	C 22.0	B 15.4	F 98.2	C 33.6	C 20.1	E 57.6
	F – 131.6			F – 197.1			C – 29.2			D – 36.1			
Saturday Midday Peak Hour (2:00 P.M. – 3:00 P.M.)	E 61.2	D 54.6	--	D 38.3	D 54.2	--	E 63.4	C 30.7	B 16.6	E 68.6	C 25.8	B 18.5	C 34.7
	E – 57.3			D – 50.5			C – 32.7			C – 28.4			

Table 4.3b: Signalized Intersection 95th Percentile Queues – IL 59 with 83rd Street / Montgomery Road

Scenarios	Eastbound				Westbound				Northbound				Southbound		
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right
Existing Conditions															
AM Peak Hour (7:15 A.M. – 8:15 A.M.)	310’	470’	--		41’	334’	--		215’	406’	29’		111’	205’	75’
PM Peak Hour (4:45 P.M. – 5:45 P.M.)	395’	854’	--		136’	792’	--		355’	385’	37’		283’	717’	227’
Saturday Midday Peak Hour (2:00 P.M. – 3:00 P.M.)	250’	353’	--		32’	305’	--		207’	474’	19’		189’	482’	175’
Projected Conditions															
AM Peak Hour (7:15 A.M. – 8:15 A.M.)	317’	476’	--		58’	335’	--		219’	494’	38’		137’	226’	87’
PM Peak Hour (4:45 P.M. – 5:45 P.M.)	426’	941’	--		218’	862’	--		369’	446’	51’		340’	797’	243’
Saturday Midday Peak Hour (2:00 P.M. – 3:00 P.M.)	170’	415’	--		88’	331’	--		219’	528’	36’		265’	464’	175’

Table 4.4a: Unsignalized Intersection Capacity Analysis Results – Projected Conditions

	AM Peak Hour (7:15 A.M. – 8:15 A.M.)		PM Peak Hour (4:45 P.M. – 5:45 P.M.)		Saturday Midday Peak Hour (2:00 P.M. – 3:00 P.M.)	
	LOS	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**
83rd Street with South Access Driveway						
Southbound Approach	A	9.5	B	10.6	B	10.2
Eastbound Left Turn	A	7.8	A	8.3	A	8.0
IL 59 with Right-In/Right-Out Access Driveway						
Eastbound Right Turn	D	29.0	D	25.9	E	35.7

Table 4.4b: Unsignalized Intersection 95th Percentile Queuing – Projected Conditions

	AM Peak Hour (7:15 A.M. – 8:15 A.M.)	PM Peak Hour (4:45 P.M. – 5:45 P.M.)	Saturday Midday Peak Hour (2:00 P.M. – 3:00 P.M.)
83rd Street with South Access Driveway*			
Southbound Approach	<25 Feet	<25 Feet	<25 Feet
Eastbound Left Turn	<25 Feet	<25 Feet	<25 Feet
IL 59 with Right-In/Right-Out Access			
Eastbound Right Turn	<25 Feet	<25 Feet	28’
*Located approximately 175 feet east of IL 59/83rd Eastbound Stop Bar.			

4.2 Discussion of Operations

The results of the capacity analysis for existing conditions in the study area show that IL 59 with 83rd Street / Montgomery Road intersection operates at Level of Service (LOS) C or D during the peak hours. Since IL 59 is designation as an SRA, the majority of the green time is dedicated to the north-south through movements. SRA routes are required to provide LOS C or better for mainline traffic. To achieve positive progression and coordination between traffic signals, the IL 59 signalized corridor provides long cycle lengths, including 120 seconds during the Saturday midday peak hour, 140 seconds during the weekday morning peak hour, and 160 seconds during the weekday evening peak hour. The long cycle lengths and limited green time for the minor movements result in LOS E or LOS F for the majority of the left-turn and eastbound/westbound through/right-turn movements due to high average vehicle delay. These conditions also can result in long queuing for the minor street movements, although the queues typically clear for all movements within one cycle.

Under projected conditions, the new trips generated by the proposed development will only account for 0.4 percent of the intersection traffic volume at IL 59 with 83rd Street/Montgomery Road during the weekday morning peak hour, 0.6 percent during the weekday evening peak hour, and 1.3 percent during the Saturday midday peak hour. The site-generated traffic along with the background growth result in increases in total traffic causing increases in delay and queuing for all movements. However, signal timing adjustments can be implemented to keep the IL 59 mainline through traffic movements at LOS C. Minor movements will generally continue to clear the intersection within one or two cycles and sustained backups are not expected throughout the peak periods. Furthermore, the increased number of U-Turns will not impact the operation of the southbound left-turn movement. Overall, the intersection is projected to operate at LOS B during the weekday morning and Saturday midday peak hours and LOS E during the weekday evening peak hour.

4.3 Proposed Site Access, Circulation, and Queuing

In addition, adequate stacking for the car wash will be accommodated internally to the site without impacting operations on the surrounding public roadways or conflicting with the internal circulation. Overall, at least 50 vehicles can be stored internally while waiting to enter the car wash. The site will provide two access points including a full access driveway via 83rd Street and a right-in/right-out driveway via IL 59. Both access drives will operate at acceptable levels of service with minimal queuing and delay.

Westbound queues resulting from the signal at IL 59 could potentially block inbound left-turn traffic to the south access driveway on 83rd Street. To minimize this potential, it is recommended that ‘Do Not Block Driveway’ (MUTCD R10-7) signage be placed at this intersection and prevent blockage of the driveway. In order to minimize any mobility impact to IL 59 northbound traffic and maintain uniformity along the roadway, a 185-ft right-turn lane with 200-ft taper will be provided immediately north of the IL 59/83rd Street intersection for the right-in/right-out access driveway. This driveway will allow a majority of the site traffic to enter and exit the development without turning at the traffic signal, particularly during peak periods when the 83rd Street approach is congested. The driveway’s proximity to the signal and platooning of IL 59 will allow for additional gaps in traffic which will improve the operation of the driveway. This driveway will also be utilized by U-Turning vehicles from southbound IL 59 to help reduce the impact of inbound left turning movements along 83rd Street.

5 – CONCLUSIONS AND RECOMMENDATIONS

Based on Knight's review of the proposed Jet Brite Car Wash as well as the existing and future traffic conditions in the area, the following conclusions and recommendations are provided.

- IL 59 is designated as a Strategic Regional Arterial (SRA) by the Illinois Department of Transportation (IDOT). SRA's are designed for mobility and to augment the region's expressway system. The roadway is designed to carry high volumes of traffic along the route at Level of Service (LOS) C or better.
- The existing intersection meets SRA traffic operation LOS standards for the IL 59 through movements during the weekday morning, weekday evening, and Saturday midday peak hours. In order to provide LOS C on the major route, the minor movements operate at higher delays due to the long cycle lengths and limited green time, but vehicles on the side road typically clear the intersection within a single cycle.
- Under projected conditions, signal timings for the intersection of IL 59 with 83rd Street will be modified to ensure the north-south mainline will continue to meet SRA LOS standards for the through movements. Minor movements will continue to operate with higher delays due to the long cycle length and limited green time.
- Access to the site will be adequately accommodated by the proposed full access drive via 83rd Street and the right-in/right-out access drive via IL 59. Both intersections will operate at acceptable levels of service during each peak hour. A dedicated, right turn lane will be provided for the right-in/right-out access drive to provide adequate deceleration distance.
- At the intersection of 83rd Street with the South Access Drive, 'Do Not Block Driveway' (MUTCD R10-7) signage should be provided to minimize any blockages resulting from westbound 83rd Street queuing at the signalized intersection. Projected delays and queuing for the inbound left-turn movement is minimal and will not impact operations at the IL 59 / 83rd Street intersection.
- The site will provide stacking to accommodate at least 50 vehicles on site prior to entering the car wash tunnel without impacting internal circulation or the operation of the access drive. The site's three pay stations/queuing lanes will provide adequate capacity to prevent queues from spilling out onto the adjacent roadways.

JET BRITE CAR WASH
NORTHEAST CORNER OF IL 59 WITH 83RD STREET, NAPERVILLE

Traffic Impact Study Appendix

TRAFFIC COUNT DATA

CMAP PROJECTIONS

TRAFFIC CAPACITY ANALYSIS REPORTS

PROPOSED SITE PLAN

JET BRITE CAR WASH
NORTHEAST CORNER OF IL 59 WITH 83RD STREET, NAPERVILLE

Traffic Impact Study Appendix

TRAFFIC COUNT DATA

IL 59 with 83rd Street / Montgomery Road

IL 59 with 83rd Street
AM

Intersection: IL 59 with 83rd Street
Traffic Count Date: 3/17/2022
Count Time: AM Count (6:30am-9:30am)
North-South Street: IL 59
East-West Street: 83rd Street

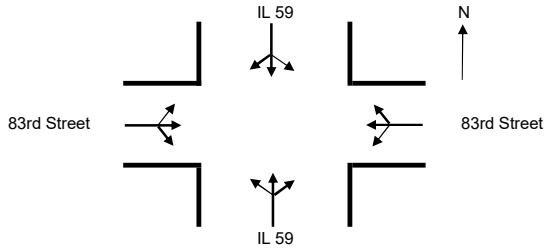
SYSTEM PEAK HOUR: 07:15 - 08:15
INTERSECTION PEAK: --

Weather: 40s and Mostly Cloudy
Day of Week: Thursday

Intersection Allowed Movements: See Diagram

Note: Peds counted; eastbound peds are peds crossing the west leg

INDICATES PROHIBITED MOVEMENT



Total Volume by Hour

		From West					From East					From South					From North					Int	Peak 15-min	Int PHF
Interval:	1:00	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		IL 59			SOUTHBOUND		IL 59			Vehicle		
Start	End	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total		
0:00	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
0:15	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
0:30	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
0:45	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1:00	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1:15	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1:30	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1:45	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
2:00	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
2:15	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
2:30	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
2:45	3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
3:00	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
3:15	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
3:30	4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
3:45	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
4:00	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
4:15	5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
4:30	5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
4:45	5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
5:00	6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
5:15	6:15	3	0	0	0	0	0	0	0	0	0	1	16	0	0	0	0	19	1	0	0	40	40	0.25
5:30	6:30	5	0	0	0	0	0	0	0	0	0	1	26	0	0	0	0	30	1	0	0	63	40	0.39
5:45	6:45	44	29	21	0	0	1	19	9	0	0	20	408	2	0	0	5	189	22	0	0	769	706	0.27
6:00	7:00	89	59	50	0	0	2	41	26	0	0	44	838	5	0	0	14	379	45	0	0	1,592	823	0.48
6:15	7:15	147	94	79	0	0	6	71	44	0	0	72	1,266	13	0	0	18	560	56	0	0	2,426	874	0.69
6:30	7:30	214	149	109	0	0	10	104	57	0	0	94	1,769	26	0	0	28	768	74	0	0	3,402	999	0.85
6:45	7:45	232	165	126	0	0	16	122	62	0	0	103	1,872	38	0	0	29	786	84	0	0	3,635	999	0.91
7:00	8:00	246	189	126	0	0	20	143	67	0	0	113	1,957	49	0	0	39	855	92	0	0	3,896	1,084	0.90
7:15	8:15	247	208	131	0	0	27	141	67	0	0	121	1,874	57	0	0	60	869	118	0	0	3,920	1,084	0.90
7:30	8:30	209	196	134	0	0	33	145	72	0	0	139	1,779	61	0	0	72	930	122	0	0	3,892	1,084	0.90
7:45	8:45	201	200	135	0	0	44	132	79	0	0	138	1,684	59	0	0	86	973	134	0	0	3,865	1,084	0.89
8:00	9:00	194	193	144	0	0	56	137	75	0	0	151	1,539	60	0	0	91	951	138	0	0	3,729	971	0.96
8:15	9:15	188	184	140	0	0	54	148	77	0	0	141	1,598	51	0	0	77	939	136	0	0	3,733	971	0.96
8:30	9:30	216	179	136	0	0	59	135	75	0	0	112	1,512	44	0	0	77	863	152	0	0	3,560	948	0.94
8:45	9:45	167	130	97	0	0	41	111	54	0	0	85	1,122	32	0	0	57	643	109	0	0	2,648	948	0.70
9:00	10:00	115	83	59	0	0	24	63	36	0	0	38	752	17	0	0	33	406	74	0	0	1,700	902	0.47
9:15	10:15	59	38	29	0	0	15	24	16	0	0	11	332	10	0	0	22	204	38	0	0	798	798	0.25
9:30	10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
9:45	10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
10:00	11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
10:15	11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
10:30	11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
10:45	11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00

IL 59 with 83rd Street
AM

Intersection: IL 59 with 83rd Street
Traffic Count Date: 3/17/2022
Count Time: AM Count (6:30am-9:30am)
North-South Street: IL 59
East-West Street: 83rd Street

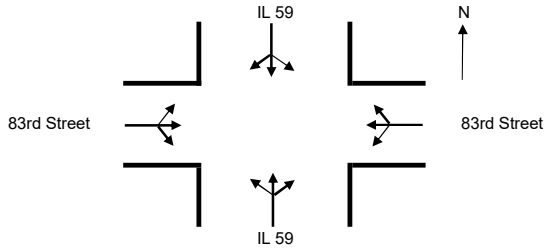
SYSTEM PEAK HOUR: 07:15 - 08:15
INTERSECTION PEAK: --

Weather: 40s and Mostly Cloudy
Day of Week: Thursday

Intersection Allowed Movements: See Diagram

Note: Peds counted; eastbound peds are peds crossing the west leg

INDICATES PROHIBITED MOVEMENT



Total Volume by Hour

		From West					From East					From South					From North					Int	Peak 15-min	Int PHF
Interval:	1:00	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		IL 59			SOUTHBOUND		IL 59			Vehicle		
Start	End	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total		
11:00	12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
11:15	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
11:30	12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
11:45	12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00

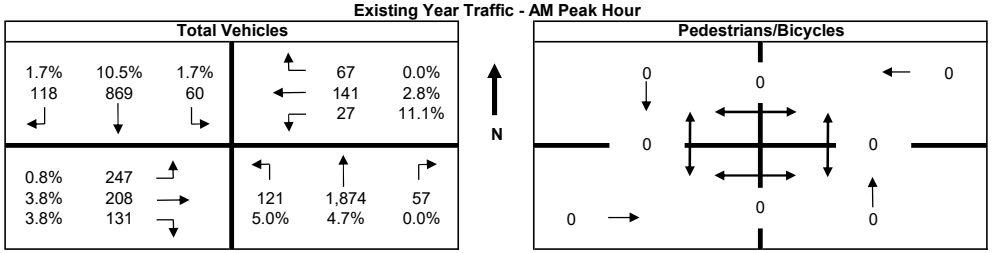
PEAK HOUR INFORMATION

Time Interval: 07:15 - 08:15
Int Peak 1hr Vol: 3,920
Int Peak 15min Vol: 1,084
Int PHF: 0.904

Existing Year Traffic - AM Peak Hour

	From West					From East					From South					From North					Int
	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		IL 59			SOUTHBOUND		IL 59			Vehicle
	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total
Total Volume	247	208	131	0	0	27	141	67	0	0	121	1,874	57	0	0	60	869	118	0	0	3,920
HV Volume	2	8	5	--	--	3	4	0	--	--	6	89	0	--	--	1	91	2	--	--	211
HV%	0.8%	3.8%	3.8%	--	--	11.1%	2.8%	0.0%	--	--	5.0%	4.7%	0.0%	--	--	1.7%	10.5%	1.7%	--	--	5.4%

Existing Year Traffic - AM Peak Hour



IL 59 with 83rd Street
PM

Intersection: IL 59 with 83rd Street
Traffic Count Date: 3/17/2022
Count Time: PM Count (4:00pm-7:00pm)
North-South Street: IL 59
East-West Street: 83rd Street

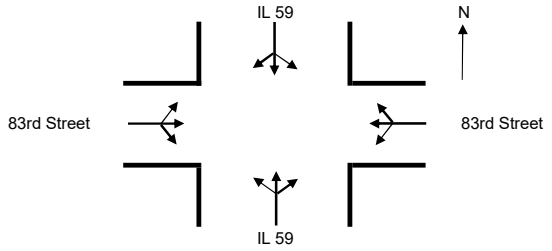
SYSTEM PEAK HOUR: 16:45 - 17:45
INTERSECTION PEAK: --

Weather: 40s and Mostly Cloudy
Day of Week: Thursday

Intersection Allowed Movements: See Diagram

Note: Peds counted; eastbound peds are peds crossing the west leg

INDICATES PROHIBITED MOVEMENT



Total Volume by Hour

		From West					From East					From South					From North					Int	Peak 15-min	Int PHF
Interval:	1:00	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		IL 59			SOUTHBOUND		IL 59			Vehicle		
Start	End	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total		
12:00	13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
12:15	13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
12:30	13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
12:45	13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
13:00	14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
13:15	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
13:30	14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
13:45	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
14:00	15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
14:15	15:15	38	49	53	0	0	16	59	19	0	0	43	300	21	1	0	38	358	59	0	0	1,053	1,053	0.25
14:30	15:30	87	90	110	0	0	26	104	38	0	0	80	582	30	2	0	64	888	152	0	0	2,251	1,198	0.47
14:45	15:45	126	140	160	0	0	42	150	66	0	0	128	939	39	3	0	104	1,354	225	0	0	3,473	1,222	0.71
15:00	16:00	185	185	210	0	0	61	208	92	0	0	164	1,267	56	3	0	147	1,869	293	0	0	4,737	1,264	0.94
15:15	16:15	196	186	203	0	0	62	195	106	0	0	175	1,365	44	3	0	154	2,056	319	0	0	5,061	1,377	0.92
15:30	16:30	208	207	190	0	0	82	207	116	1	0	197	1,458	46	3	1	169	1,988	295	0	0	5,163	1,377	0.94
15:45	16:45	221	219	196	0	0	89	210	111	1	0	188	1,499	51	3	1	156	2,081	291	0	0	5,312	1,377	0.96
16:00	17:00	220	227	189	0	0	97	199	113	1	0	197	1,585	51	3	1	139	2,141	303	0	0	5,461	1,413	0.97
16:15	17:15	234	230	205	0	0	100	215	98	1	0	181	1,559	54	4	1	137	2,107	301	0	0	5,421	1,413	0.96
16:30	17:30	227	226	204	0	0	88	215	91	0	0	166	1,613	57	5	0	136	2,222	298	0	0	5,543	1,422	0.97
16:45	17:45	231	232	199	0	0	83	218	98	0	0	178	1,637	60	4	0	143	2,211	305	0	0	5,595	1,423	0.98
17:00	18:00	230	234	206	0	0	75	235	95	0	0	173	1,577	55	5	0	151	2,163	295	0	0	5,489	1,423	0.96
17:15	18:15	216	211	171	0	0	72	215	99	0	0	186	1,580	54	3	0	156	2,185	293	0	0	5,438	1,423	0.96
17:30	18:30	218	213	180	0	0	76	212	104	0	0	193	1,476	47	1	0	149	2,048	307	0	0	5,223	1,423	0.92
17:45	18:45	220	173	182	0	0	66	190	97	0	1	191	1,446	34	1	0	151	1,991	305	0	0	5,046	1,307	0.97
18:00	19:00	209	140	179	0	0	56	157	93	0	1	195	1,429	28	0	0	140	1,849	303	0	0	4,778	1,286	0.93
18:15	19:15	160	110	152	0	0	39	115	71	0	1	144	1,054	17	0	0	92	1,316	222	0	0	3,492	1,246	0.70
18:30	19:30	104	50	100	0	0	17	61	44	0	1	93	729	10	0	0	59	876	142	0	0	2,285	1,246	0.46
18:45	19:45	46	22	47	0	0	9	31	21	0	0	44	337	6	0	0	23	385	68	0	0	1,039	1,039	0.25
19:00	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
19:15	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
19:30	20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
19:45	20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
20:00	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
20:15	21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
20:30	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
20:45	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
21:00	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
21:15	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
21:30	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
21:45	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
22:00	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
22:15	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
22:30	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
22:45	23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00

IL 59 with 83rd Street
PM

Intersection: IL 59 with 83rd Street
Traffic Count Date: 3/17/2022
Count Time: PM Count (4:00pm-7:00pm)
North-South Street: IL 59
East-West Street: 83rd Street

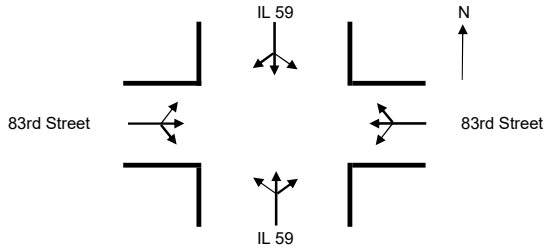
SYSTEM PEAK HOUR: 16:45 - 17:45
INTERSECTION PEAK: --

Weather: 40s and Mostly Cloudy
Day of Week: Thursday

Intersection Allowed Movements: See Diagram

Note: Peds counted; eastbound peds are peds crossing the west leg

INDICATES PROHIBITED MOVEMENT



Total Volume by Hour

		From West					From East					From South					From North					Int	Peak 15-min	Int PHF
Interval:	1:00	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		IL 59			SOUTHBOUND		IL 59			Vehicle		
Start	End	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total		
23:00	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
23:15	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
23:30	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
23:45	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00

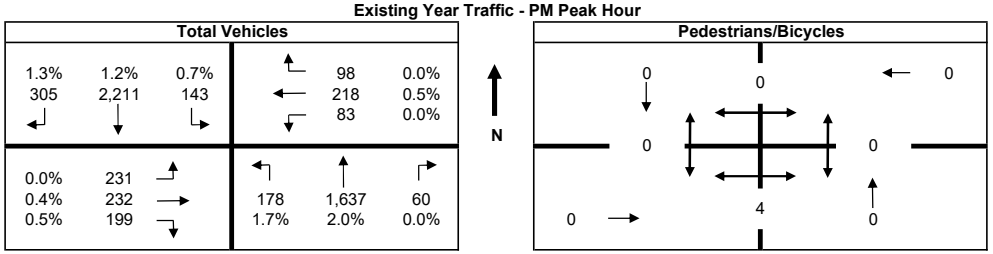
PEAK HOUR INFORMATION

Time Interval: 16:45 - 17:45
Int Peak 1hr Vol: 5,595
Int Peak 15min Vol: 1,423
Int PHF: 0.983

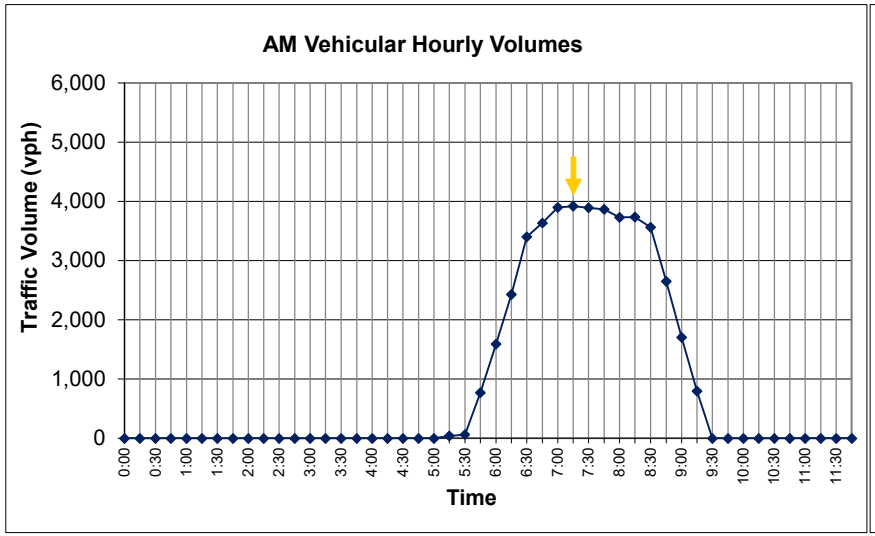
Existing Year Traffic - PM Peak Hour

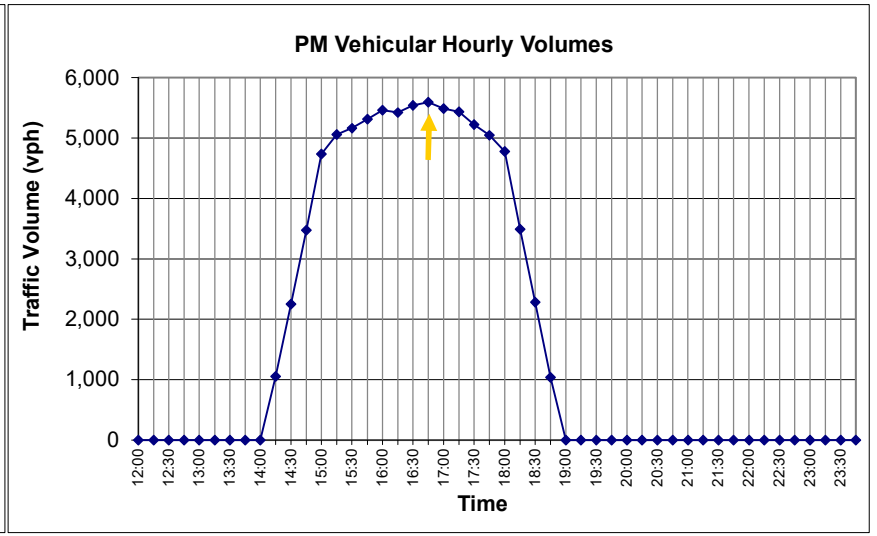
	From West					From East					From South					From North					Int
	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		IL 59			SOUTHBOUND		IL 59			Vehicle
	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total
Total Volume	231	232	199	0	0	83	218	98	0	0	178	1,637	60	4	0	143	2,211	305	0	0	5,595
HV Volume	0	1	1	--	--	0	1	0	--	--	3	33	0	--	--	1	27	4	--	--	71
HV%	0.0%	0.4%	0.5%	--	--	0.0%	0.5%	0.0%	--	--	1.7%	2.0%	0.0%	--	--	0.7%	1.2%	1.3%	--	--	1.3%

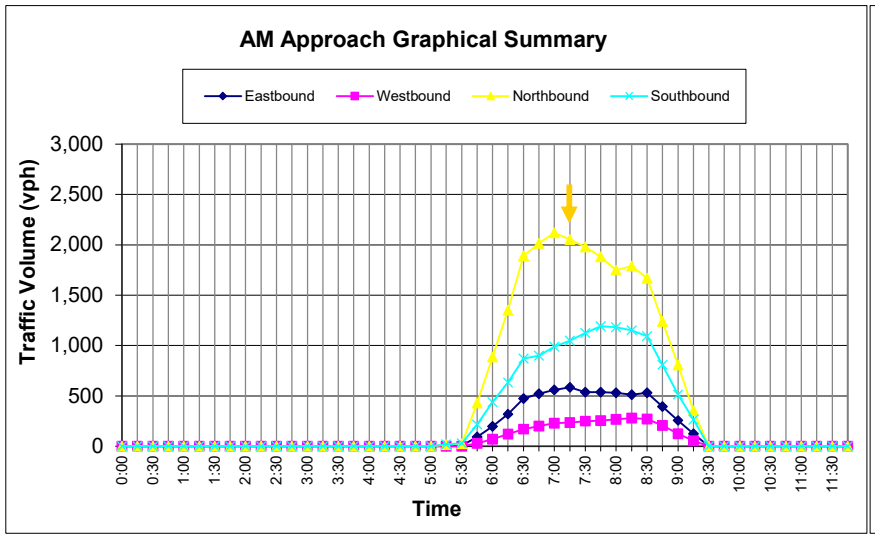
Existing Year Traffic - PM Peak Hour

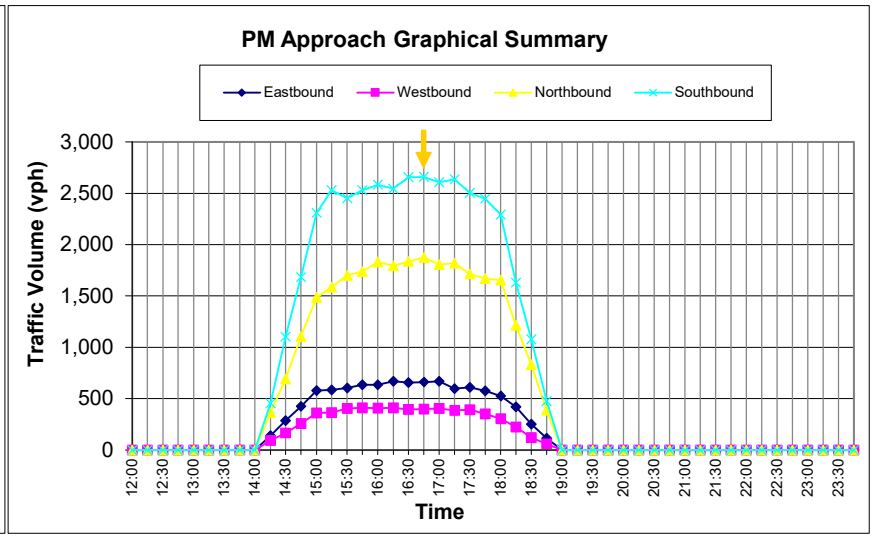


IL 59 with 83rd Street Vehicle Distribution Charts









IL 59 with 83rd Street

AM

SATURDAY

Intersection: IL 59 with 83rd Street
Traffic Count Date: 3/19/2022
Count Time: AM Count (11:00am-12:00pm)
North-South Street: IL 59
East-West Street: 83rd Street

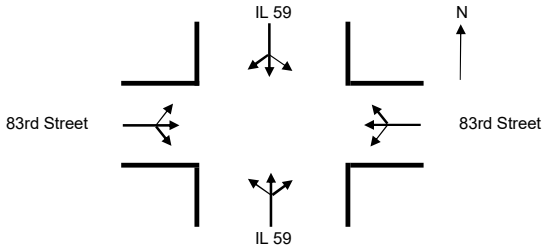
SYSTEM PEAK HOUR: 11:45 - 12:45
INTERSECTION PEAK: --

Weather: 40s and Mostly Cloudy
Day of Week: Saturday

Intersection Allowed Movements: See Diagram

Note: Peds counted; eastbound peds are peds crossing the west leg

INDICATES PROHIBITED MOVEMENT



Total Volume by Hour

		From West					From East					From South					From North					Int	Peak 15-	Int PHF
Interval:	1:00	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		IL 59			SOUTHBOUND		IL 59			Vehicle	min	
Start	End	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total		
0:00	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
0:15	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
0:30	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
0:45	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1:00	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1:15	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1:30	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
1:45	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
2:00	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
2:15	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
2:30	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
2:45	3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
3:00	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
3:15	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
3:30	4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
3:45	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
4:00	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
4:15	5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
4:30	5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
4:45	5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
5:00	6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
5:15	6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
5:30	6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
5:45	6:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
6:00	7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
6:15	7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
6:30	7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
6:45	7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
7:00	8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
7:15	8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
7:30	8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
7:45	8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
8:00	9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
8:15	9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
8:30	9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
8:45	9:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
9:00	10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
9:15	10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
9:30	10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
9:45	10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
10:00	11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
10:15	11:15	72	37	42	0	0	11	18	27	0	0	33	422	8	0	0	26	366	52	0	0	1,114	1,114	0.25
10:30	11:30	129	83	86	0	0	24	47	57	0	0	63	836	15	0	0	56	705	104	0	0	2,205	1,114	0.49
10:45	11:45	191	117	119	0	0	37	93	95	0	0	99	1,286	26	0	0	84	1,103	165	0	0	3,415	1,210	0.71

IL 59 with 83rd Street

AM

SATURDAY

Intersection: IL 59 with 83rd Street
Traffic Count Date: 3/19/2022
Count Time: AM Count (11:00am-12:00pm)
North-South Street: IL 59
East-West Street: 83rd Street

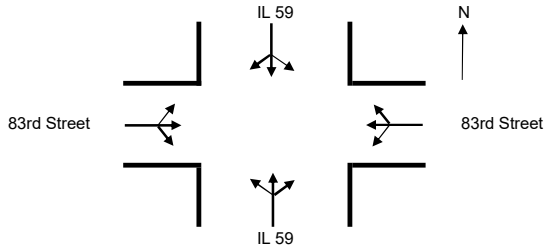
SYSTEM PEAK HOUR: 11:45 - 12:45
INTERSECTION PEAK: --

Weather: 40s and Mostly Cloudy
Day of Week: Saturday

Intersection Allowed Movements: See Diagram

Note: Peds counted; eastbound peds are peds crossing the west leg

INDICATES PROHIBITED MOVEMENT



Total Volume by Hour

		From West					From East					From South					From North					Int	Peak 15-min	Int PHF
Interval:	1:00	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		IL 59			SOUTHBOUND		IL 59			Vehicle		
Start	End	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total		
11:00	12:00	254	155	171	0	0	52	121	136	0	0	135	1,701	40	0	0	108	1,436	226	0	0	4,535	1,210	0.94
11:15	12:15	249	155	169	0	0	50	133	139	0	0	149	1,728	41	0	0	111	1,448	233	0	0	4,605	1,210	0.95
11:30	12:30	255	147	177	0	0	44	139	140	0	0	165	1,780	46	1	0	110	1,512	236	0	0	4,751	1,237	0.96
11:45	12:45	247	155	213	0	0	40	120	129	0	0	172	1,807	43	1	0	105	1,567	239	0	0	4,837	1,296	0.93

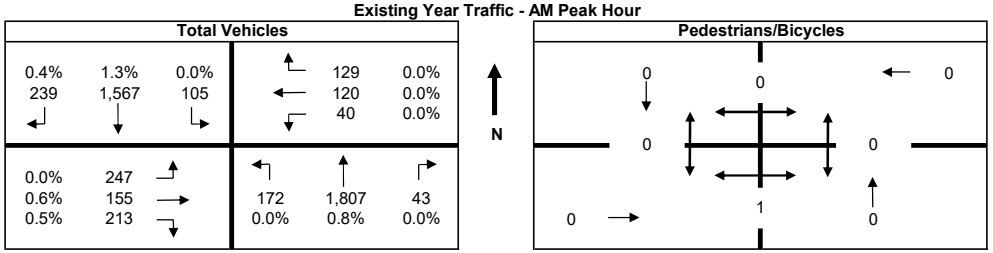
PEAK HOUR INFORMATION

Time Interval: 11:45 - 12:45
Int Peak 1hr Vol: 4,837
Int Peak 15min Vol: 1,296
Int PHF: 0.933

Existing Year Traffic - AM Peak Hour

	From West					From East					From South					From North					Int
	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		IL 59			SOUTHBOUND		IL 59			Vehicle
	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total
Total Volume	247	155	213	0	0	40	120	129	0	0	172	1,807	43	1	0	105	1,567	239	0	0	4,837
HV Volume	0	1	1	--	--	0	0	0	--	--	0	14	0	--	--	0	21	1	--	--	38
HV%	0.0%	0.6%	0.5%	--	--	0.0%	0.0%	0.0%	--	--	0.0%	0.8%	0.0%	--	--	0.0%	1.3%	0.4%	--	--	0.8%

Existing Year Traffic - AM Peak Hour



IL 59 with 83rd Street

PM

SATURDAY

Intersection: IL 59 with 83rd Street
Traffic Count Date: 3/19/2022
Count Time: PM Count (12:00pm-3:00pm)
North-South Street: Michigan Avenue
East-West Street: 83rd Street

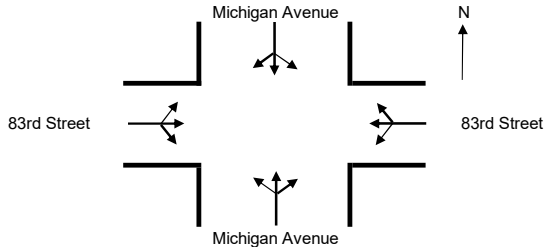
SYSTEM PEAK HOUR: 14:00 - 15:00
INTERSECTION PEAK: --

Weather: 40s and Mostly Cloudy
Day of Week: Saturday

Intersection Allowed Movements: See Diagram

Note: Peds counted; eastbound peds are peds crossing the west leg

INDICATES PROHIBITED MOVEMENT



Total Volume by Hour

		From West					From East					From South					From North					Int	Peak 15-	Int PHF
Interval:	1:00	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		Michigan Avenue			SOUTHBOUND		Michigan Avenue			Vehicle	min	
Start	End	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total		
12:00	13:00	242	158	214	0	0	37	129	124	0	0	180	1,837	43	1	0	104	1,648	254	0	0	4,970	1,296	0.96
12:15	13:15	253	163	204	0	0	34	141	122	0	0	186	1,820	41	1	0	105	1,722	249	0	0	5,040	1,296	0.97
12:30	13:30	267	162	200	0	0	34	140	119	0	0	169	1,801	36	0	0	109	1,740	264	0	0	5,041	1,296	0.97
12:45	13:45	274	151	172	0	0	30	145	108	0	0	167	1,808	36	0	0	124	1,744	268	0	0	5,027	1,282	0.98
13:00	14:00	268	147	158	0	0	27	150	96	0	0	178	1,773	28	0	0	131	1,761	251	0	0	4,968	1,282	0.97
13:15	14:15	253	141	170	0	0	27	143	92	0	0	166	1,818	27	0	0	137	1,762	252	0	0	4,988	1,282	0.97
13:30	14:30	241	146	157	0	0	29	144	97	0	0	165	1,850	28	0	0	135	1,764	245	0	0	5,001	1,282	0.98
13:45	14:45	234	151	154	0	0	27	137	108	0	0	163	1,812	30	0	0	126	1,810	241	0	0	4,993	1,274	0.98
14:00	15:00	232	152	170	0	0	29	123	117	0	0	145	1,854	32	0	0	129	1,829	244	0	0	5,056	1,274	0.99
14:15	15:15	169	116	128	0	0	23	88	93	0	0	104	1,377	26	0	0	93	1,376	189	0	0	3,782	1,274	0.74
14:30	15:30	104	74	93	0	0	14	53	60	0	0	76	898	18	0	0	62	953	126	0	0	2,531	1,274	0.50
14:45	15:45	50	38	55	0	0	11	28	33	0	0	37	452	8	0	0	33	450	62	0	0	1,257	1,257	0.25
15:00	16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
15:15	16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
15:30	16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
15:45	16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
16:00	17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
16:15	17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
16:30	17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
16:45	17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
17:00	18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
17:15	18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
17:30	18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
17:45	18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
18:00	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
18:15	19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
18:30	19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
18:45	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
19:00	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
19:15	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
19:30	20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
19:45	20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
20:00	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
20:15	21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
20:30	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
20:45	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
21:00	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
21:15	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
21:30	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
21:45	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
22:00	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
22:15	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
22:30	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
22:45	23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00

IL 59 with 83rd Street

PM

SATURDAY

Intersection: IL 59 with 83rd Street
Traffic Count Date: 3/19/2022
Count Time: PM Count (12:00pm-3:00pm)
North-South Street: Michigan Avenue
East-West Street: 83rd Street

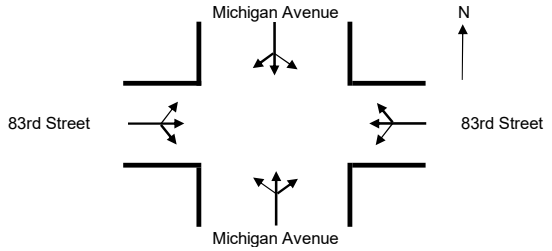
SYSTEM PEAK HOUR: 14:00 - 15:00
INTERSECTION PEAK: --

Weather: 40s and Mostly Cloudy
Day of Week: Saturday

Intersection Allowed Movements: See Diagram

Note: Peds counted; eastbound peds are peds crossing the west leg

INDICATES PROHIBITED MOVEMENT



Total Volume by Hour

		From West					From East					From South					From North					Int	Peak 15-min	Int PHF
Interval:	1:00	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		Michigan Avenue			SOUTHBOUND		Michigan Avenue			Vehicle		
Start	End	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total		
23:00	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
23:15	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
23:30	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
23:45	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00

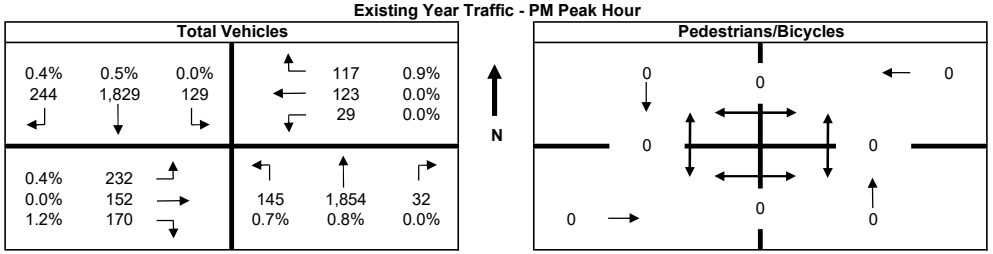
PEAK HOUR INFORMATION

Time Interval: 14:00 - 15:00
Int Peak 1hr Vol: 5,056
Int Peak 15min Vol: 1,274
Int PHF: 0.992

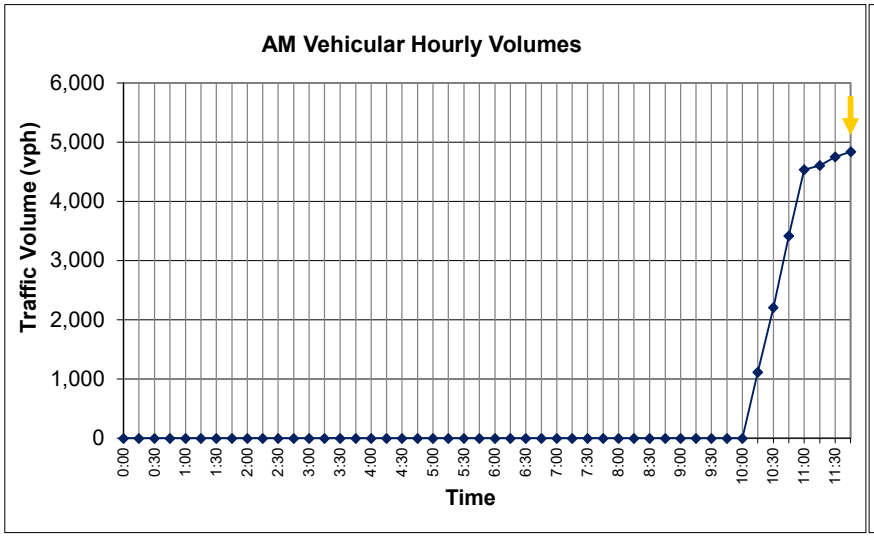
Existing Year Traffic - PM Peak Hour

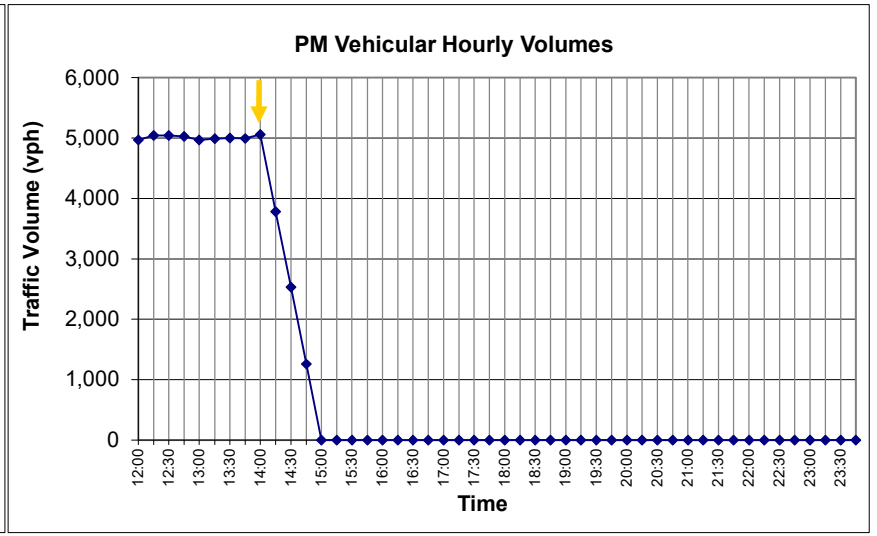
	From West					From East					From South					From North					Int
	EASTBOUND		83rd Street			WESTBOUND		83rd Street			NORTHBOUND		Michigan Avenue			SOUTHBOUND		Michigan Avenue			Vehicle
	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Left	Thru	Right	Peds	Bikes	Total
Total Volume	232	152	170	0	0	29	123	117	0	0	145	1,854	32	0	0	129	1,829	244	0	0	5,056
HV Volume	1	0	2	--	--	0	0	1	--	--	1	15	0	--	--	0	9	1	--	--	30
HV%	0.4%	0.0%	1.2%	--	--	0.0%	0.0%	0.9%	--	--	0.7%	0.8%	0.0%	--	--	0.0%	0.5%	0.4%	--	--	0.6%

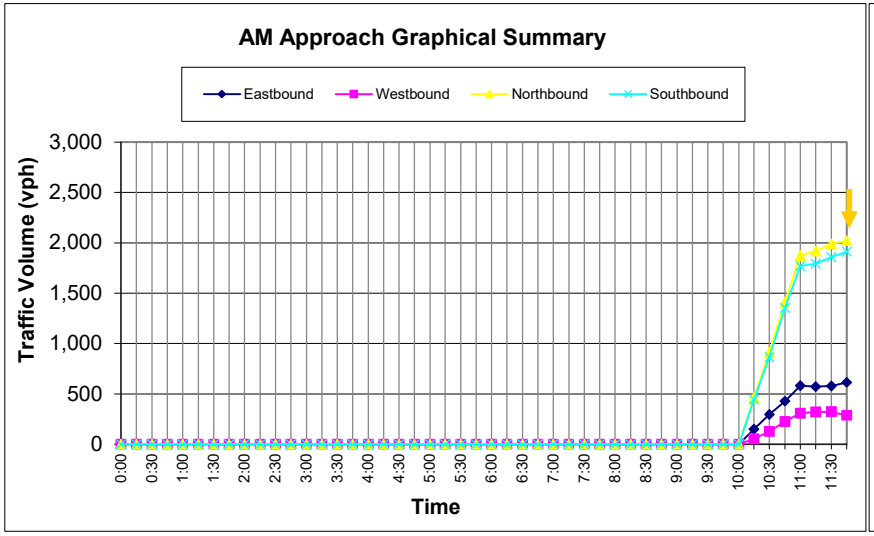
Existing Year Traffic - PM Peak Hour

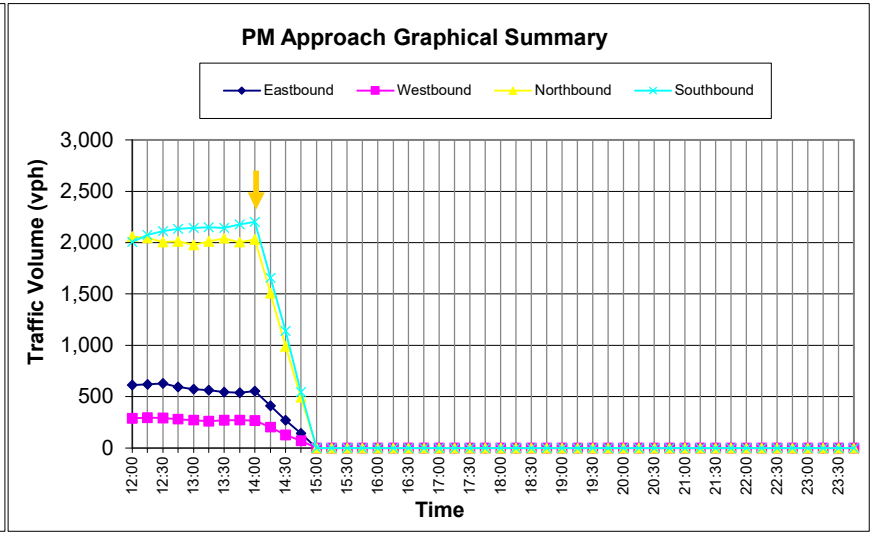


IL 59 with 83rd Street Vehicle Distribution Charts
SATURDAY









JET BRITE CAR WASH
NORTHEAST CORNER OF IL 59 WITH 83RD STREET, NAPERVILLE

Traffic Impact Study Appendix

CMAP PROJECTIONS

CMAP Letter

CMAP Year 2028 Projected Volumes

Chicago Metropolitan Agency for Planning

433 West Van Buren Street
Suite 450
Chicago, IL 60607

312-454-0400
cmap.illinois.gov

April 13, 2022

Matthew Maestranzi, PE, PTOE, RSP1
Senior Traffic Engineer
Knight E/A, Inc.
221 North LaSalle Street
Suite 300
Chicago, IL, 60601

Subject: ***IL 59 @ 83rd Street***
IDOT, City of Naperville

Dear Mr. Maestranzi:

In response to a request made on your behalf and dated April 12, 2022, we have developed year 2050 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current ADT	Year 2050 ADT
IL 59, @ 83rd St	49,300	55,200
83rd St west of IL 59	12,200	13,900
83rd St east of IL 59	8,600	11,300

Traffic projections are developed using existing ADT data provided in the request letter and the results from the December 2021 CMAP Travel Demand Analysis. The regional travel model uses CMAP 2050 socioeconomic projections and assumes the implementation of the ON TO 2050 Comprehensive Regional Plan for the Northeastern Illinois area. The provision of this data in support of your request does not constitute a CMAP endorsement of the proposed development or any subsequent developments.

If you have any questions, please call me at (312) 386-8806.

Sincerely,

Jose Rodriguez, PTP, AICP
Senior Planner, Research & Analysis

cc: Rios (IDOT)
S2022_ForecastTraffic\Naperville\du-19-22\du-19-22.docx

TRAFFIC FORECAST RECORD

Record Number: du-19-22
Type of Report: Projection
Year Sought: 2050
Analyst: JAR
Organization requesting forecast: Knight Engineers Architects
Contact: Matthew Maestranzi, PE, PTOE, RSP
Email or Phone mmaestranzi@knightea.com
Sponsor: IDOT, City of Naperville
Date request was received: April 12, 2022
Date that response was emailed: April 13, 2022
Facility Location: IL 59 @ 83rd Street
Municipality: Naperville

IL 59 with 83rd Street
CMAP PROJECTIONS

n= 28

Data Yr	CMAP Yr
2022	2050

$$FutVol = ExVol(1+r)^n$$

CMAP PROJECTIONS (Annual Growth Rate Calculation)

ROAD SEGMENT	EX ADT	2050 ADT	DIFF	n	Annual Growth Rate r		Prorated ADT 2028 ADT
IL 59 (north leg)	49300	55200	5900	28	0.405%		**50510**
IL 59 (south leg)	49300	55200	5900	28	0.405%		**50510**
83rd St (west leg)	12200	13900	1700	28	0.467%		**12550**
83rd St (east leg)	8600	11300	2700	28	0.980%		**9120**

Average Growth Rates by Intersection Legs	r	Apply To Movements
North and South	**0.405%**	**NBT / SBT**
North and West	**0.436%**	**EBL / SBR**
North and East	**0.692%**	**SBL / WBR**
South and West	**0.436%**	**NBL / EBR**
South and East	**0.692%**	**WBL / NBR**
West and East	**0.723%**	**EBT / WBT**

Current Year: **2022**
Horizon Year: **2028**

n = 6

$$FutVol = ExVol(1+r)^n$$

Annual Growth Rate Applied (r): **0.436%** | **0.723%** | **0.436%** | **r =** **0.692%** | **0.723%** | **0.692%** | **r =** **0.436%** | **0.405%** | **0.692%** | **r =** **0.692%** | **0.405%** | **0.436%**

AM PEAK

	From West				From East				From South				From North			
	EASTBOUND		83rd Street		WESTBOUND		83rd Street		NORTHBOUND		IL 59		SOUTHBOUND		IL 59	
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
Existing Year	247	208	131		27	141	67		121	1874	57		56	869	118	
Horizon Year	255	220	135		30	150	70		125	1920	60		60	895	125	

PM PEAK

	From West				From East				From South				From North			
	EASTBOUND		83rd Street		WESTBOUND		83rd Street		NORTHBOUND		IL 59		SOUTHBOUND		IL 59	
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
Existing Year	231	232	199		83	218	98		178	1637	60		136	2211	305	
Horizon Year	240	245	205		90	230	105		185	1680	65		145	2270	315	

SATURDAY MIDDAY PEAK

	From West				From East				From South				From North			
	EASTBOUND		83rd Street		WESTBOUND		83rd Street		NORTHBOUND		IL 59		SOUTHBOUND		IL 59	
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
Existing Year	232	152	170		29	123	117		145	1854	32		125	1829	244	
Horizon Year	240	160	175		35	130	125		150	1900	35		135	1875	255	

JET BRITE CAR WASH
NORTHEAST CORNER OF IL 59 WITH 83RD STREET, NAPERVILLE

Traffic Impact Study Appendix

TRAFFIC CAPACITY ANALYSIS REPORTS

AM Existing

PM Existing

Saturday Midday Existing

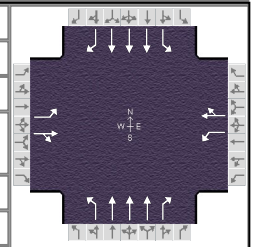
AM Projected

PM Projected

Saturday Midday Projected

HCS7 Signalized Intersection Input Data

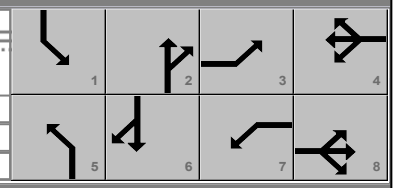
General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd AMEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	247	208	131	27	141	67	121	1874	57	60	869	118

Signal Information			
Cycle, s	140.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	7.0	0.8	66.7	4.0	11.5	22.1						
Yellow	3.5	3.5	4.0	3.5	3.5	4.0						
Red	1.0	1.0	2.0	0.0	0.0	2.0						



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	247	208	131	27	141	67	121	1874	57	60	869	118
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	1	4		11	3		5	5	0	2	11	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	4	4	4	4	4	4
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0		11.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Turn Bay Length, ft	150	0		195	0		410	0	0	410	0	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	40	40	40	40	40	40	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	30.0	50.0	8.0	28.0	20.0	62.0	20.0	62.0
Yellow Change Interval (*Y*), s	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance Interval (R_c), s	0.0	2.0	0.0	2.0	1.0	2.0	1.0	2.0
Minimum Green (G_{min}), s	3	8	3	8	3	15	3	15
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	5.0	3.0	5.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Off	Off	Off	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (*Walk*), s		7.0		0.0		0.0		7.0
Pedestrian Clearance Time (*PC*), s		36.0		0.0		0.0		17.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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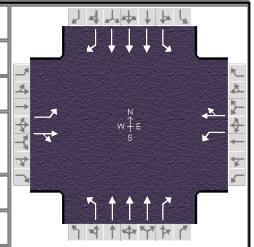
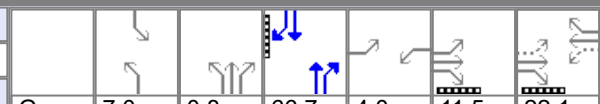
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd AMEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				

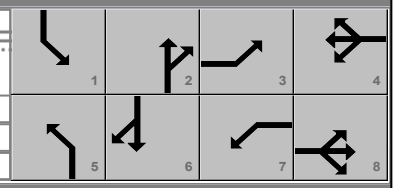


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	247	208	131	27	141	67	121	1874	57	60	869	118

Signal Information			
Cycle, s	140.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	7.0	0.8	66.7	4.0	11.5	22.1
Yellow	3.5	3.5	4.0	3.5	3.5	4.0
Red	1.0	1.0	2.0	0.0	0.0	2.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	22.4	43.0	7.5	28.1	16.8	78.0	11.5	72.7
Change Period, (*Y+R c*), s	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Max Allow Headway (*MAH*), s	4.0	6.0	4.0	6.0	4.0	0.0	4.0	0.0
Queue Clearance Time (*g s*), s	18.4	28.9	4.0	18.8	12.0		6.9	
Green Extension Time (*g e*), s	0.5	4.0	0.0	3.3	0.2	0.0	0.1	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	0.08	0.20	1.00	0.45	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	260	357		28	219		127	1973	60	63	915	124
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1795	1721		1654	1754		1739	1745	1610	1781	1660	1585
Queue Service Time (*g s*), s	16.4	26.9		2.0	16.8		10.0	33.3	1.7	4.9	12.4	4.5
Cycle Queue Clearance Time (*g c*), s	16.4	26.9		2.0	16.8		10.0	33.3	1.7	4.9	12.4	4.5
Green Ratio (*g/C*)	0.31	0.26		0.19	0.16		0.09	0.51	0.51	0.05	0.48	0.48
Capacity (*c*), veh/h	338	455		154	277		152	2691	828	89	2373	755
Volume-to-Capacity Ratio (*X*)	0.768	0.784		0.185	0.791		0.836	0.733	0.072	0.709	0.386	0.164
Back of Queue (*Q*), ft/ln (95 th percentile)	310.1	469.7		41.2	333.6		215	406	29.2	111.1	205.3	74.7
Back of Queue (*Q*), veh/ln (95 th percentile)	12.3	18.2		1.5	13.0		8.3	15.6	1.2	4.4	7.5	2.9
Queue Storage Ratio (*RQ*) (95 th percentile)	2.07	0.00		0.21	0.00		0.52	0.00	0.00	0.27	0.00	0.00
Uniform Delay (*d 1*), s/veh	40.9	47.8		47.9	56.7		60.8	15.9	11.0	65.5	15.6	14.2
Incremental Delay (*d 2*), s/veh	6.1	8.3		0.6	12.2		11.3	1.8	0.2	9.9	0.5	0.5
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	47.0	56.0		48.5	69.0		72.1	17.8	11.1	75.4	16.1	14.7
Level of Service (LOS)	D	E		D	E		E	B	B	E	B	B
Approach Delay, s/veh / LOS	52.2	D		66.6	E		20.8	C		19.3	B	
Intersection Delay, s/veh / LOS	27.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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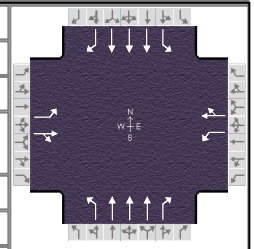
HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd AMEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	247	208	131	27	141	67	121	1874	57	60	869	118

Signal Information			
Cycle, s	140.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	7.0	0.8	66.7	4.0	11.5	22.1						
Yellow	3.5	3.5	4.0	3.5	3.5	4.0						
Red	1.0	1.0	2.0	0.0	0.0	2.0						

Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles and Grade Factor (f_{HVg})	0.992	0.969	0.969	0.914	0.977	1.000	0.961	0.961	1.000	0.984	0.914	0.984
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.908	1.000	1.000	0.908	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.935	0.935		0.945	0.945		0.000	0.847		0.000	0.847
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DDI Factor (f_{DDI})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Movement Saturation Flow Rate (s), veh/h	1795	1056	665	1654	1189	565	1739	5236	1610	1781	4981	1585
Proportion of Vehicles Arriving on Green (P)	0.14	0.26	0.26	0.03	0.16	0.16	0.12	0.69	0.69	0.05	0.64	0.64
Incremental Delay Factor (k)	0.18	0.31		0.11	0.28		0.11	0.50	0.50	0.11	0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Green Ratio (g/C)	0.31	0.26	0.19	0.16	0.09	0.51	0.05	0.48
Permitted Saturation Flow Rate (s_p), veh/h/ln	1171	0	951	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	24.1	0.0	22.1	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	5.3	0.0	8.1	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	5.3		0.4					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln						0		0
Protected Right Effective Green Time (g_R), s						0.0		0.0

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v								
Pedestrian F_s / F_{delay}								
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b								
Bicycle F_w / F_v								

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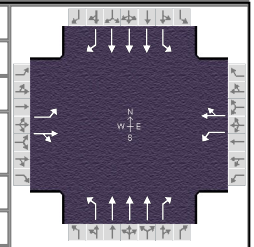
HCS7 Signalized Intersection Results Graphical Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd AMEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				

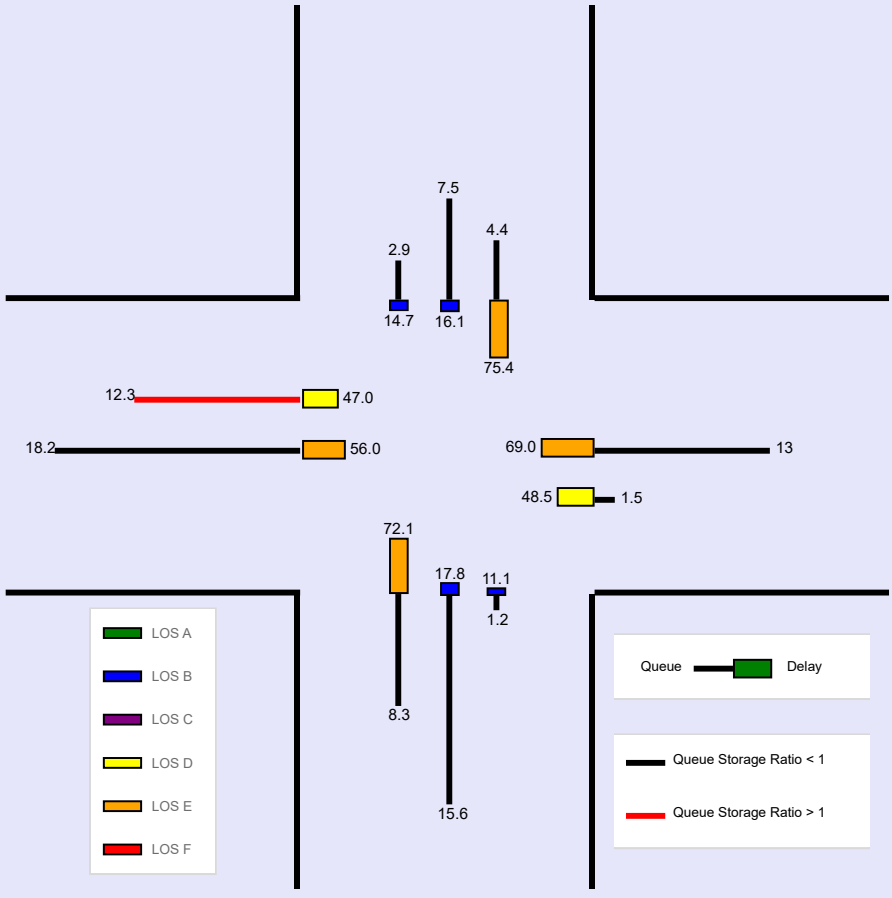


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	247	208	131	27	141	67	121	1874	57	60	869	118

Signal Information			
Cycle, s	140.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	7.0	0.8	66.7	4.0	11.5	22.1	
Yellow	3.5	3.5	4.0	3.5	3.5	4.0	
Red	1.0	1.0	2.0	0.0	0.0	2.0	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)	310.1	469.7		41.2	333.6		215	406	29.2	111.1	205.3	74.7
Back of Queue (*Q*), veh/ln (95 th percentile)	12.3	18.2		1.5	13.0		8.3	15.6	1.2	4.4	7.5	2.9
Queue Storage Ratio (*RQ*) (95 th percentile)	2.07	0.00		0.21	0.00		0.52	0.00	0.00	0.27	0.00	0.00
Control Delay (*d*), s/veh	47.0	56.0		48.5	69.0		72.1	17.8	11.1	75.4	16.1	14.7
Level of Service (LOS)	D	E		D	E		E	B	B	E	B	B
Approach Delay, s/veh / LOS	52.2	D		66.6	E		20.8	C		19.3	B	
Intersection Delay, s/veh / LOS	27.8						C					



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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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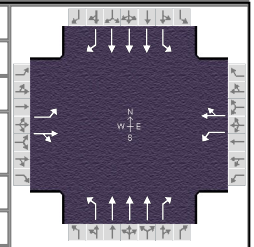
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd PMEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	231	232	199	83	218	98	178	1637	60	143	2211	305

Signal Information			
Cycle, s	160.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.3	3.3		77.9	4.5	11.5	24.0					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	231	232	199	83	218	98	178	1637	60	143	2211	305
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	0	1		0	1		2	2	0	1	1	1
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	4	4	4	4	4	4
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0		11.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Turn Bay Length, ft	150	0		195	0		410	0	0	410	0	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	40	40	40	40	40	40	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	23.0	45.0	8.0	30.0	25.0	82.0	25.0	82.0
Yellow Change Interval (*Y*), s	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance Interval (R_c), s	0.0	2.0	0.0	2.0	1.0	2.0	1.0	2.0
Minimum Green (G_{min}), s	3	8	3	8	3	15	3	15
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (e), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	5.0	3.0	5.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Off	Off	Off	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (*Walk*), s		7.0		0.0		0.0		7.0
Pedestrian Clearance Time (*PC*), s		36.0		0.0		0.0		17.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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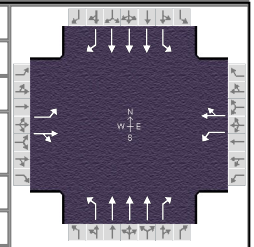
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd PMEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	231	232	199	83	218	98	178	1637	60	143	2211	305

Signal Information			
Cycle, s	160.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.3	3.3	77.9	4.5	11.5	24.0
Yellow	3.5	0.0	4.0	3.5	3.5	4.0
Red	1.0	0.0	2.0	0.0	0.0	2.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	23.0	45.0	8.0	30.0	23.1	87.2	19.8	83.9
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Max Allow Headway (*MAH*), s	4.0	6.0	4.0	6.0	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s	19.8	41.0	6.5	26.0	18.5		15.2	
Green Extension Time (g_e), s	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		0.31	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	243	454		87	333		187	1723	63	151	2327	321
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1741		1810	1786		1781	1788	1610	1795	1802	1598
Queue Service Time (g_s), s	17.8	39.0		4.5	24.0		16.5	29.1	2.1	13.2	56.8	15.4
Cycle Queue Clearance Time (g_c), s	17.8	39.0		4.5	24.0		16.5	29.1	2.1	13.2	56.8	15.4
Green Ratio (*g/C*)	0.28	0.24		0.18	0.15		0.12	0.51	0.51	0.10	0.49	0.49
Capacity (*c*), veh/h	266	424		96	268		208	2720	817	172	2630	777
Volume-to-Capacity Ratio (*X*)	0.916	1.069		0.911	1.242		0.903	0.633	0.077	0.874	0.885	0.413
Back of Queue (*Q*), ft/ln (95 th percentile)	394.6	854.1		136.3	791.5		355.1	384.8	37	282.7	716.9	227.1
Back of Queue (*Q*), veh/ln (95 th percentile)	15.8	33.9		5.5	31.4		14.0	15.1	1.5	11.2	28.5	9.0
Queue Storage Ratio (*RQ*) (95 th percentile)	2.63	0.00		0.70	0.00		0.87	0.00	0.00	0.69	0.00	0.00
Uniform Delay (d_1), s/veh	49.4	60.5		64.7	68.0		66.7	17.5	13.1	68.8	24.4	17.1
Incremental Delay (d_2), s/veh	33.8	63.4		63.8	136.4		33.0	1.1	0.2	23.5	4.8	1.6
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	83.2	123.9		128.5	204.4		99.7	18.6	13.3	92.3	29.2	18.7
Level of Service (LOS)	F	F		F	F		F	B	B	F	C	B
Approach Delay, s/veh / LOS	109.7	F		188.6	F		26.1	C		31.4	C	
Intersection Delay, s/veh / LOS	50.1						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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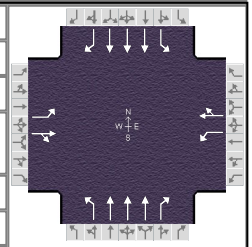
HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd PMEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	231	232	199	83	218	98	178	1637	60	143	2211	305

Signal Information			
Cycle, s	160.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.3	3.3		77.9	4.5	11.5	24.0					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles and Grade Factor (f_{HVg})	1.000	0.992	0.992	1.000	0.992	1.000	0.984	0.984	1.000	0.992	0.992	0.992
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.908	1.000	1.000	0.908	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.923	0.923		0.947	0.947		0.000	0.847		0.000	0.847
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DDI Factor (f_{DDI})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Movement Saturation Flow Rate (s), veh/h	1810	937	804	1810	1232	554	1781	5363	1610	1795	5406	1598
Proportion of Vehicles Arriving on Green (P)	0.12	0.24	0.24	0.03	0.15	0.15	0.16	0.68	0.68	0.13	0.65	0.65
Incremental Delay Factor (k)	0.43	0.50		0.43	0.50		0.36	0.50	0.50	0.23	0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Green Ratio (g/C)	0.28	0.24	0.18	0.15	0.12	0.51	0.10	0.49
Permitted Saturation Flow Rate (s_p), veh/h/ln	1064	0	952	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	26.0	0.0	24.0	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	0.0		0.0					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln						0		0
Protected Right Effective Green Time (g_R), s						0.0		0.0

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v								
Pedestrian F_s / F_{delay}								
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b								
Bicycle F_w / F_v								

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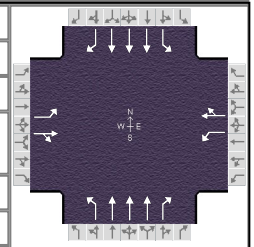
HCS7 Signalized Intersection Results Graphical Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd PMEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				

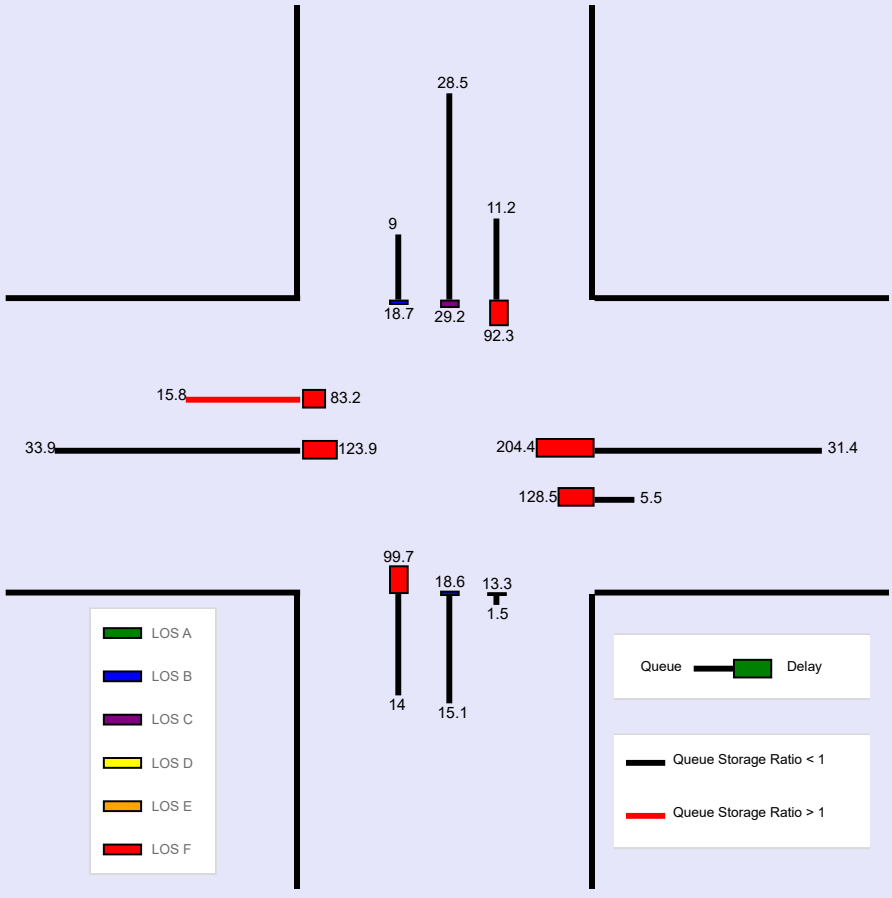


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	231	232	199	83	218	98	178	1637	60	143	2211	305

Signal Information			
Cycle, s	160.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	15.3	3.3		77.9	4.5		11.5		24.0			
Yellow	3.5	0.0		4.0	3.5		3.5		4.0			
Red	1.0	0.0		2.0	0.0		0.0		2.0			

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)	394.6	854.1		136.3	791.5		355.1	384.8	37	282.7	716.9	227.1
Back of Queue (*Q*), veh/ln (95 th percentile)	15.8	33.9		5.5	31.4		14.0	15.1	1.5	11.2	28.5	9.0
Queue Storage Ratio (*RQ*) (95 th percentile)	2.63	0.00		0.70	0.00		0.87	0.00	0.00	0.69	0.00	0.00
Control Delay (*d*), s/veh	83.2	123.9		128.5	204.4		99.7	18.6	13.3	92.3	29.2	18.7
Level of Service (LOS)	F	F		F	F		F	B	B	F	C	B
Approach Delay, s/veh / LOS	109.7	F		188.6	F		26.1	C		31.4	C	
Intersection Delay, s/veh / LOS	50.1						D					



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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

WARNING: If demand exceeds capacity, a multiple-period analysis should be conducted.

--- Comments ---

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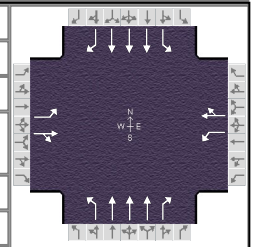
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd SATEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	232	152	170	29	123	117	145	1854	32	129	1829	244

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	11.1	1.2		50.1	3.6	7.7	22.8					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	232	152	170	29	123	117	145	1854	32	129	1829	244
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	1	0		0	0		1	1	0	0	1	1
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	4	4	4	4	4	4
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0		11.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Turn Bay Length, ft	150	0		195	0		410	0	0	410	0	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	40	40	40	40	40	40	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	20.0	45.0	15.0	40.0	20.0	40.0	20.0	40.0
Yellow Change Interval (*Y*), s	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance Interval (R_c), s	0.0	2.0	0.0	2.0	1.0	2.0	1.0	2.0
Minimum Green (G_{min}), s	3	8	3	8	3	15	3	15
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	5.0	3.0	5.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Off	Off	Off	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (*Walk*), s		7.0		0.0		0.0		7.0
Pedestrian Clearance Time (*PC*), s		36.0		0.0		0.0		17.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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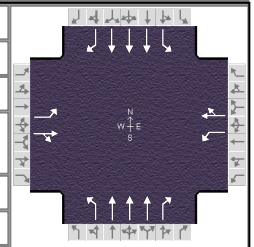
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd SATEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	232	152	170	29	123	117	145	1854	32	129	1829	244

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	11.1	1.2	50.1	3.6	7.7	22.8	
Yellow	3.5	0.0	4.0	3.5	3.5	4.0	
Red	1.0	0.0	2.0	0.0	0.0	2.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	18.3	40.0	7.1	28.8	16.8	57.3	15.6	56.1
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Max Allow Headway (*MAH*), s	4.0	6.1	4.0	6.1	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s	14.7	22.9	3.6	18.4	11.9		10.8	
Green Extension Time (g_e), s	0.1	5.0	0.0	4.4	0.4	0.0	0.3	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	0.06	0.00	0.16	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	244	339		31	253		153	1952	34	136	1925	257
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1795	1735		1810	1747		1795	1802	1610	1810	1802	1598
Queue Service Time (g_s), s	12.7	20.9		1.6	16.4		9.9	36.0	1.1	8.8	36.1	10.9
Cycle Queue Clearance Time (g_c), s	12.7	20.9		1.6	16.4		9.9	36.0	1.1	8.8	36.1	10.9
Green Ratio (*g/C*)	0.33	0.28		0.22	0.19		0.10	0.43	0.43	0.09	0.42	0.42
Capacity (*c*), veh/h	342	492		213	332		184	2309	688	167	2255	666
Volume-to-Capacity Ratio (*X*)	0.714	0.689		0.143	0.760		0.829	0.845	0.049	0.811	0.854	0.385
Back of Queue (*Q*), ft/ln (95 th percentile)	249.9	352.8		32.4	305.4		207.2	473.9	19.1	188.6	482.3	174.5
Back of Queue (*Q*), veh/ln (95 th percentile)	9.9	14.1		1.3	12.2		8.2	18.8	0.8	7.5	19.1	6.9
Queue Storage Ratio (*RQ*) (95 th percentile)	1.67	0.00		0.17	0.00		0.51	0.00	0.00	0.46	0.00	0.00
Uniform Delay (d_1), s/veh	32.9	38.3		37.7	46.0		50.8	22.5	15.0	51.6	23.5	17.9
Incremental Delay (d_2), s/veh	5.9	3.7		0.3	7.4		9.1	4.0	0.1	9.0	4.4	1.7
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	38.9	41.9		38.0	53.4		59.9	26.6	15.2	60.6	27.9	19.6
Level of Service (LOS)	D	D		D	D		E	C	B	E	C	B
Approach Delay, s/veh / LOS	40.7	D		51.7	D		28.8	C		28.9	C	
Intersection Delay, s/veh / LOS	31.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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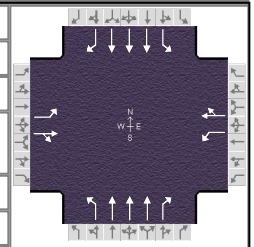
HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd SATEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	232	152	170	29	123	117	145	1854	32	129	1829	244

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	11.1	1.2	50.1	3.6	7.7	22.8						
Yellow	3.5	0.0	4.0	3.5	3.5	4.0						
Red	1.0	0.0	2.0	0.0	0.0	2.0						

Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles and Grade Factor (f_{HVg})	0.992	1.000	0.992	1.000	1.000	0.992	0.992	0.992	1.000	1.000	0.992	0.992
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.908	1.000	1.000	0.908	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.913	0.913		0.919	0.919		0.000	0.847		0.000	0.847
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DDI Factor (f_{DDI})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Movement Saturation Flow Rate (s), veh/h	1795	819	916	1810	895	852	1795	5406	1610	1810	5406	1598
Proportion of Vehicles Arriving on Green (P)	0.12	0.28	0.28	0.03	0.19	0.19	0.14	0.57	0.57	0.12	0.56	0.56
Incremental Delay Factor (k)	0.24	0.23		0.11	0.23		0.11	0.50	0.50	0.11	0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Green Ratio (g/C)	0.33	0.28	0.22	0.19	0.10	0.43	0.09	0.42
Permitted Saturation Flow Rate (s_p), veh/h/ln	1136	0	1058	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	24.8	0.0	22.8	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	6.4	0.0	11.1	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	5.0		0.3					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln						0		0
Protected Right Effective Green Time (g_R), s						0.0		0.0

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v								
Pedestrian F_s / F_{delay}								
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b								
Bicycle F_w / F_v								

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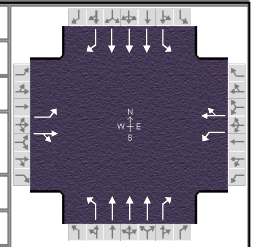
HCS7 Signalized Intersection Results Graphical Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Existing Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2022	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd SATEX.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				

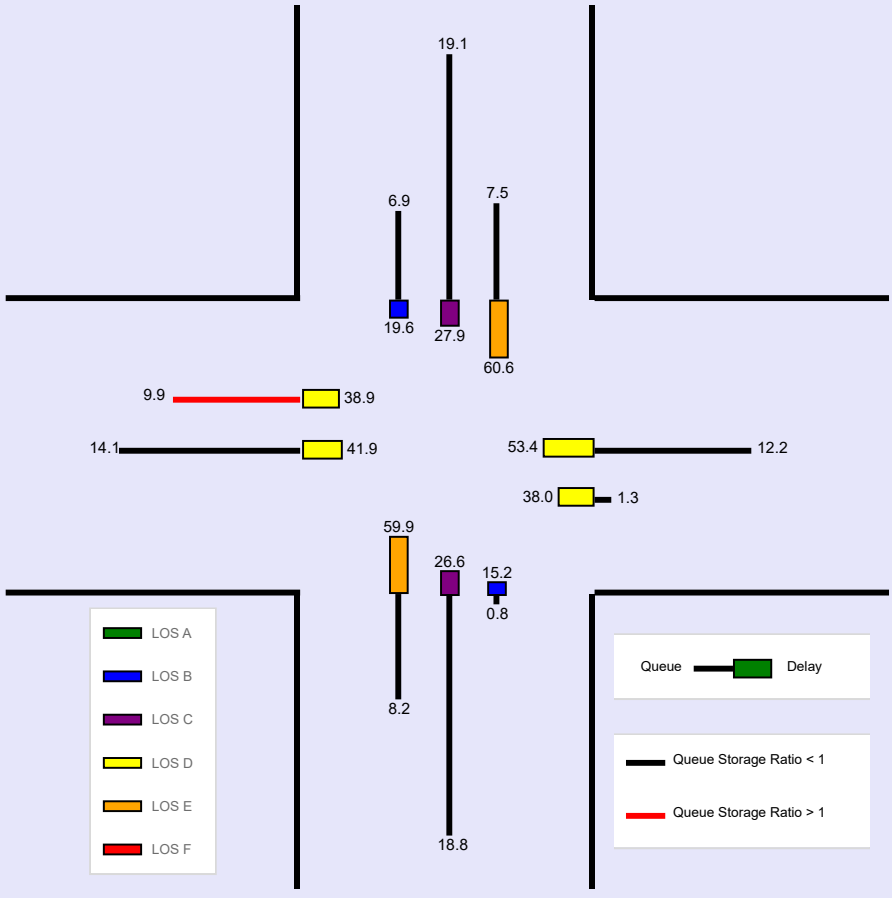


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	232	152	170	29	123	117	145	1854	32	129	1829	244

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	11.1	1.2	50.1	3.6	7.7	22.8						
Yellow	3.5	0.0	4.0	3.5	3.5	4.0						
Red	1.0	0.0	2.0	0.0	0.0	2.0						

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)	249.9	352.8		32.4	305.4		207.2	473.9	19.1	188.6	482.3	174.5
Back of Queue (*Q*), veh/ln (95 th percentile)	9.9	14.1		1.3	12.2		8.2	18.8	0.8	7.5	19.1	6.9
Queue Storage Ratio (*RQ*) (95 th percentile)	1.67	0.00		0.17	0.00		0.51	0.00	0.00	0.46	0.00	0.00
Control Delay (*d*), s/veh	38.9	41.9		38.0	53.4		59.9	26.6	15.2	60.6	27.9	19.6
Level of Service (LOS)	D	D		D	D		E	C	B	E	C	B
Approach Delay, s/veh / LOS	40.7	D		51.7	D		28.8	C		28.9	C	
Intersection Delay, s/veh / LOS	31.4						C					



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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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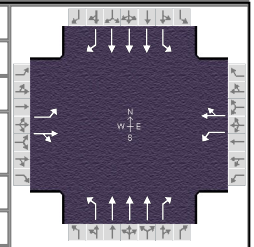
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd AMP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	255	221	135	39	152	70	125	1920	65	74	890	125

Signal Information			
Cycle, s	140.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	8.2	4.5		63.5	4.8	10.5	25.0					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	255	221	135	39	152	70	125	1920	65	74	890	125
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	1	4		11	3		5	5	0	2	11	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	4	4	4	4	4	4
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0		11.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Turn Bay Length, ft	150	0		195	0		410	0	0	410	0	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	40	40	40	40	40	40	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	25.0	60.0	15.0	50.0	20.0	45.0	20.0	45.0
Yellow Change Interval (*Y*), s	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance Interval (R_c), s	0.0	2.0	0.0	2.0	1.0	2.0	1.0	2.0
Minimum Green (G_{min}), s	3	8	3	8	3	15	3	15
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	5.0	3.0	5.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Off	Off	Off	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (*Walk*), s		7.0		0.0		0.0		7.0
Pedestrian Clearance Time (*PC*), s		36.0		0.0		0.0		17.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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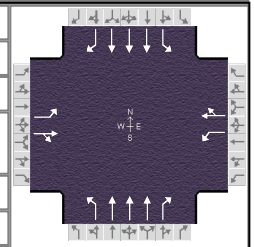
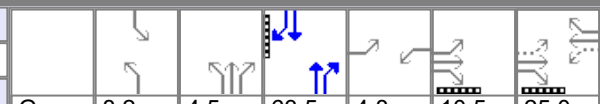
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd AMP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				

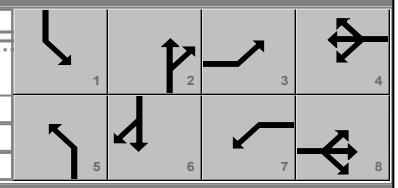


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	255	221	135	39	152	70	125	1920	65	74	890	125

Signal Information			
Cycle, s	140.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



	EB			WB			NB			SB		
Green	8.2	4.5		63.5	4.8	10.5	25.0					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	22.3	45.0	8.3	31.0	17.2	74.0	12.7	69.5
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Max Allow Headway (*MAH*), s	4.0	6.0	4.0	6.0	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s	18.6	30.1	4.8	19.7	12.4		8.0	
Green Extension Time (g_e), s	0.3	5.5	0.0	5.3	0.4	0.0	0.2	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	0.02	0.03	0.04	0.00		0.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	268	375		41	234		132	2021	68	78	937	132
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1795	1723		1654	1756		1739	1745	1610	1781	1660	1585
Queue Service Time (g_s), s	16.6	28.1		2.8	17.7		10.4	39.3	2.2	6.0	13.9	5.2
Cycle Queue Clearance Time (g_c), s	16.6	28.1		2.8	17.7		10.4	39.3	2.2	6.0	13.9	5.2
Green Ratio (*g/C*)	0.33	0.28		0.21	0.18		0.09	0.49	0.49	0.06	0.45	0.45
Capacity (*c*), veh/h	353	479		168	313		158	2542	782	105	2259	719
Volume-to-Capacity Ratio (*X*)	0.760	0.782		0.245	0.746		0.833	0.795	0.088	0.743	0.415	0.183
Back of Queue (*Q*), ft/ln (95 th percentile)	317.2	476.2		57.8	335.3		219.3	494.4	37.9	137.4	226.1	86.9
Back of Queue (*Q*), veh/ln (95 th percentile)	12.6	18.5		2.1	13.1		8.4	19.0	1.5	5.4	8.3	3.4
Queue Storage Ratio (*RQ*) (95 th percentile)	2.11	0.00		0.30	0.00		0.53	0.00	0.00	0.34	0.00	0.00
Uniform Delay (d_1), s/veh	39.1	46.6		45.4	54.5		60.5	19.6	13.1	65.5	17.9	16.1
Incremental Delay (d_2), s/veh	7.8	5.9		0.7	7.3		10.7	2.7	0.2	9.9	0.6	0.6
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	46.9	52.5		46.2	61.9		71.2	22.3	13.3	75.3	18.4	16.7
Level of Service (LOS)	D	D		D	E		E	C	B	E	B	B
Approach Delay, s/veh / LOS	50.1	D		59.5	E		24.9	C		22.1	C	
Intersection Delay, s/veh / LOS	30.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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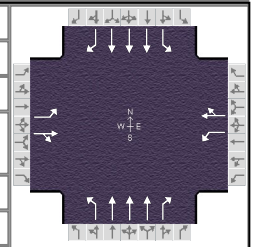
HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd AMP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	255	221	135	39	152	70	125	1920	65	74	890	125

Signal Information			
Cycle, s	140.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	8.2	4.5		63.5	4.8	10.5	25.0					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles and Grade Factor (f_{HVg})	0.992	0.969	0.969	0.914	0.977	1.000	0.961	0.961	1.000	0.984	0.914	0.984
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.908	1.000	1.000	0.908	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.936	0.936		0.946	0.946		0.000	0.847		0.000	0.847
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DDI Factor (f_{DDI})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Movement Saturation Flow Rate (s), veh/h	1795	1070	653	1654	1202	554	1739	5236	1610	1781	4981	1585
Proportion of Vehicles Arriving on Green (P)	0.13	0.28	0.28	0.03	0.18	0.18	0.12	0.65	0.65	0.05	0.60	0.60
Incremental Delay Factor (k)	0.26	0.23		0.11	0.23		0.11	0.50	0.50	0.11	0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Green Ratio (g/C)	0.33	0.28	0.21	0.18	0.09	0.49	0.06	0.45
Permitted Saturation Flow Rate (s_p), veh/h/ln	1156	0	936	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	27.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	7.3	0.0	8.9	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	5.9		0.7					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln						0		0
Protected Right Effective Green Time (g_R), s						0.0		0.0

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v								
Pedestrian F_s / F_{delay}								
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b								
Bicycle F_w / F_v								

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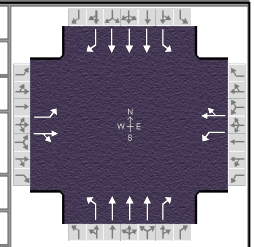
HCS7 Signalized Intersection Results Graphical Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd AMP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				

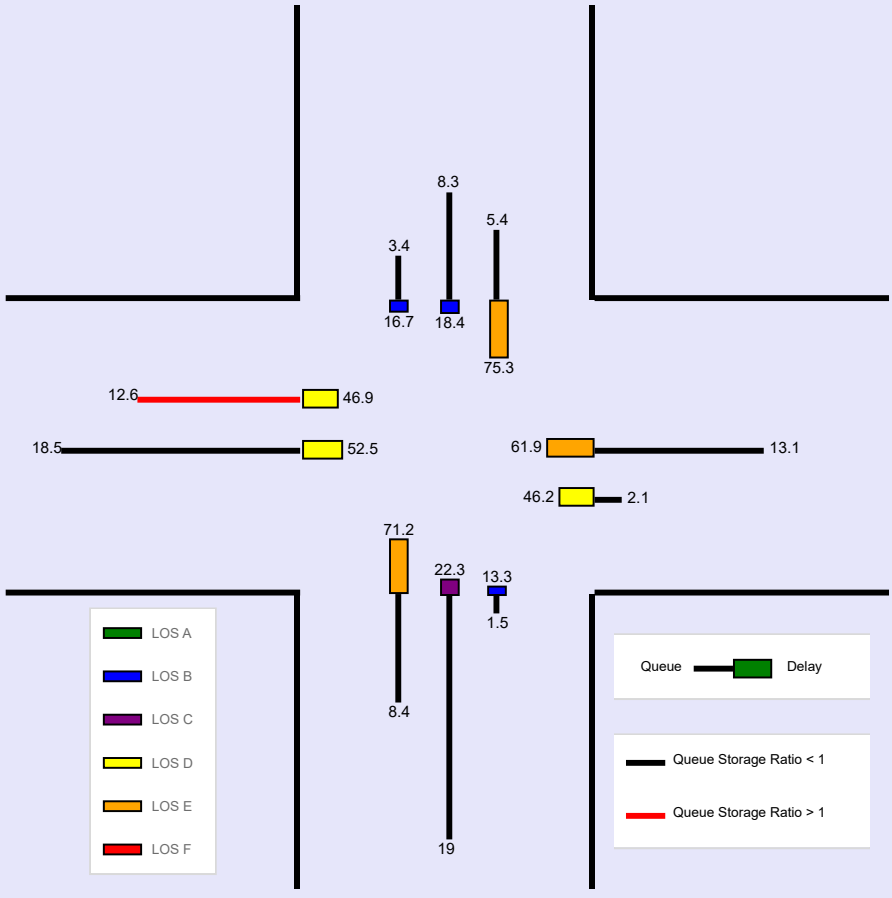


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	255	221	135	39	152	70	125	1920	65	74	890	125

Signal Information			
Cycle, s	140.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	8.2	4.5		63.5	4.8		10.5	25.0				
Yellow	3.5	0.0		4.0	3.5		3.5	4.0				
Red	1.0	0.0		2.0	0.0		0.0	2.0				

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)	317.2	476.2		57.8	335.3		219.3	494.4	37.9	137.4	226.1	86.9
Back of Queue (*Q*), veh/ln (95 th percentile)	12.6	18.5		2.1	13.1		8.4	19.0	1.5	5.4	8.3	3.4
Queue Storage Ratio (*RQ*) (95 th percentile)	2.11	0.00		0.30	0.00		0.53	0.00	0.00	0.34	0.00	0.00
Control Delay (*d*), s/veh	46.9	52.5		46.2	61.9		71.2	22.3	13.3	75.3	18.4	16.7
Level of Service (LOS)	D	D		D	E		E	C	B	E	B	B
Approach Delay, s/veh / LOS	50.1	D		59.5	E		24.9	C		22.1	C	
Intersection Delay, s/veh / LOS	30.2						C					



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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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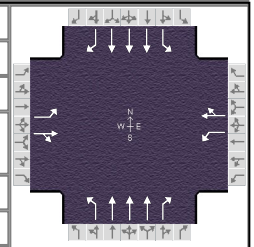
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd PMP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	247	205	110	232	106	185	1680	74	172	2259	315

Signal Information			
Cycle, s	160.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	1.3		76.2	6.5	9.5	25.0					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	247	205	110	232	106	185	1680	74	172	2259	315
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	0	1		0	1		2	2	0	1	1	1
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	4	4	4	4	4	4
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0		11.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Turn Bay Length, ft	150	0		195	0		410	0	0	410	0	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	40	40	40	40	40	40	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	23.0	44.0	10.0	31.0	25.0	81.0	25.0	81.0
Yellow Change Interval (*Y*), s	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance Interval (R_c), s	0.0	2.0	0.0	2.0	1.0	2.0	1.0	2.0
Minimum Green (G_{min}), s	3	8	3	8	3	15	3	15
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (e), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	5.0	3.0	5.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Off	Off	Off	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (*Walk*), s		7.0		0.0		0.0		7.0
Pedestrian Clearance Time (*PC*), s		36.0		0.0		0.0		17.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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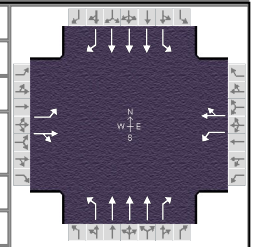
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd PMP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	247	205	110	232	106	185	1680	74	172	2259	315

Signal Information			
Cycle, s	160.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	1.3	76.2	6.5	9.5	25.0	
Yellow	3.5	0.0	4.0	3.5	3.5	4.0	
Red	1.0	0.0	2.0	0.0	0.0	2.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	23.0	44.0	10.0	31.0	23.8	83.5	22.5	82.2
Change Period, (*Y+R c*), s	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Max Allow Headway (*MAH*), s	4.0	6.0	4.0	6.0	4.0	0.0	4.0	0.0
Queue Clearance Time (*g s*), s	20.5	40.0	8.5	27.0	19.2		17.8	
Green Extension Time (*g e*), s	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	1.00	1.00	1.00	1.00		1.00	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	254	476		116	356		195	1768	78	181	2378	332
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1743		1810	1784		1781	1788	1610	1795	1802	1598
Queue Service Time (*g s*), s	18.5	38.0		6.5	25.0		17.2	33.3	2.9	15.8	62.1	16.7
Cycle Queue Clearance Time (*g c*), s	18.5	38.0		6.5	25.0		17.2	33.3	2.9	15.8	62.1	16.7
Green Ratio (*g/C*)	0.29	0.24		0.20	0.16		0.12	0.48	0.48	0.11	0.48	0.48
Capacity (*c*), veh/h	266	414		119	279		214	2598	780	202	2576	761
Volume-to-Capacity Ratio (*X*)	0.955	1.149		0.977	1.276		0.908	0.681	0.100	0.897	0.923	0.436
Back of Queue (*Q*), ft/ln (95 th percentile)	425.9	972.8		178.6	862.2		369.3	445.6	50.6	339.5	796.5	242.7
Back of Queue (*Q*), veh/ln (95 th percentile)	17.0	38.6		7.1	34.2		14.5	17.5	2.0	13.5	31.6	9.6
Queue Storage Ratio (*RQ*) (95 th percentile)	2.84	0.00		0.92	0.00		0.90	0.00	0.00	0.83	0.00	0.00
Uniform Delay (*d 1*), s/veh	49.1	61.0		62.1	67.5		66.3	20.5	15.1	67.1	26.6	18.3
Incremental Delay (*d 2*), s/veh	43.0	91.7		75.2	149.1		34.7	1.5	0.3	31.1	7.0	1.8
Initial Queue Delay (*d 3*), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	92.1	152.7		137.3	216.6		101.0	22.0	15.4	98.2	33.6	20.1
Level of Service (LOS)	F	F		F	F		F	C	B	F	C	C
Approach Delay, s/veh / LOS	131.6	F		197.1	F		29.2	C		36.1	D	
Intersection Delay, s/veh / LOS	57.6						E					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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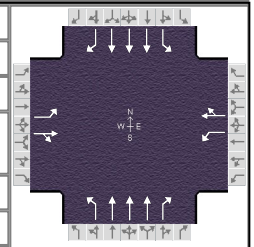
HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd PMP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	247	205	110	232	106	185	1680	74	172	2259	315

Signal Information			
Cycle, s	160.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	1.3		76.2	6.5	9.5	25.0					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles and Grade Factor (f_{HVg})	1.000	0.992	0.992	1.000	0.992	1.000	0.984	0.984	1.000	0.992	0.992	0.992
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.908	1.000	1.000	0.908	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.925	0.925		0.947	0.947		0.000	0.847		0.000	0.847
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DDI Factor (f_{DDI})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Movement Saturation Flow Rate (s), veh/h	1810	952	790	1810	1225	560	1781	5363	1610	1795	5406	1598
Proportion of Vehicles Arriving on Green (P)	0.12	0.24	0.24	0.04	0.16	0.16	0.16	0.65	0.65	0.15	0.64	0.64
Incremental Delay Factor (k)	0.47	0.50		0.48	0.50		0.38	0.50	0.50	0.33	0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Green Ratio (g/C)	0.29	0.24	0.20	0.16	0.12	0.48	0.11	0.48
Permitted Saturation Flow Rate (s_p), veh/h/ln	1042	0	933	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	27.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	0.0		0.0					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln						0		0
Protected Right Effective Green Time (g_R), s						0.0		0.0

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v								
Pedestrian F_s / F_{delay}								
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b								
Bicycle F_w / F_v								

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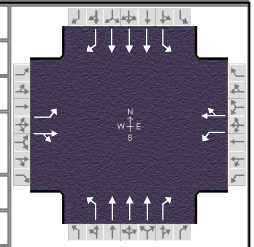
HCS7 Signalized Intersection Results Graphical Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd PMP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				

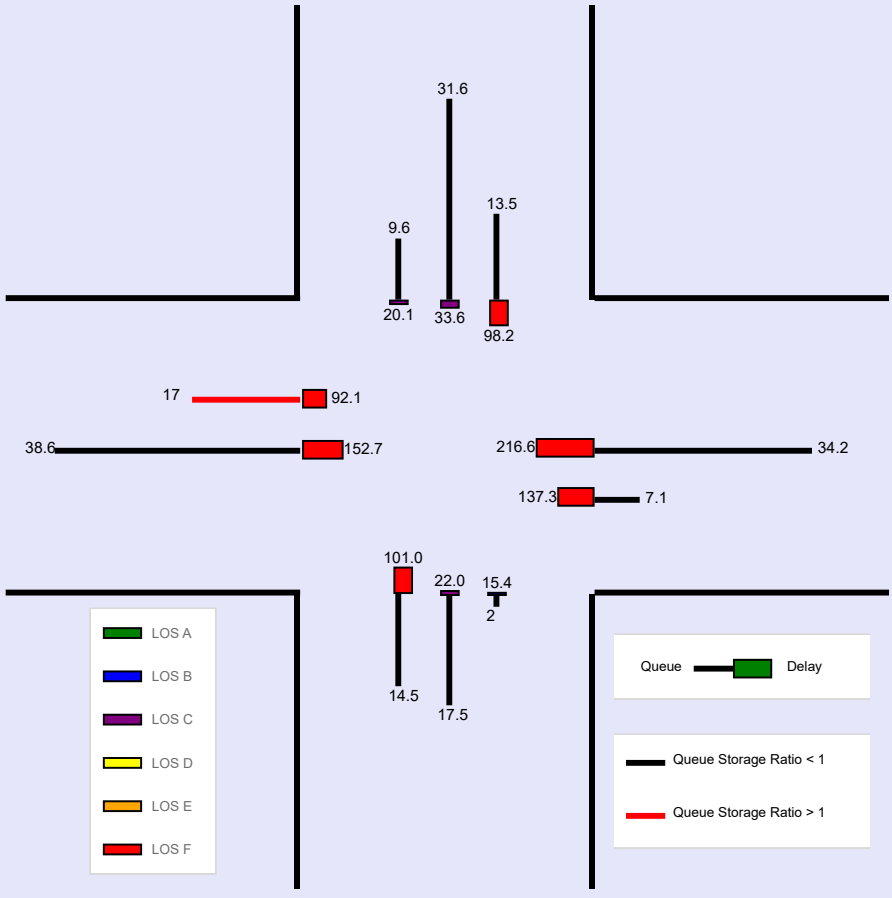


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	247	205	110	232	106	185	1680	74	172	2259	315

Signal Information			
Cycle, s	160.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	18.0	1.3		76.2	6.5	9.5	25.0					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)	425.9	972.8		178.6	862.2		369.3	445.6	50.6	339.5	796.5	242.7
Back of Queue (*Q*), veh/ln (95 th percentile)	17.0	38.6		7.1	34.2		14.5	17.5	2.0	13.5	31.6	9.6
Queue Storage Ratio (*RQ*) (95 th percentile)	2.84	0.00		0.92	0.00		0.90	0.00	0.00	0.83	0.00	0.00
Control Delay (*d*), s/veh	92.1	152.7		137.3	216.6		101.0	22.0	15.4	98.2	33.6	20.1
Level of Service (LOS)	F	F		F	F		F	C	B	F	C	C
Approach Delay, s/veh / LOS	131.6	F		197.1	F		29.2	C		36.1	D	
Intersection Delay, s/veh / LOS	57.6						E					



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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

WARNING: If demand exceeds capacity, a multiple-period analysis should be conducted.

--- Comments ---

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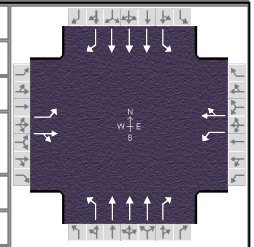
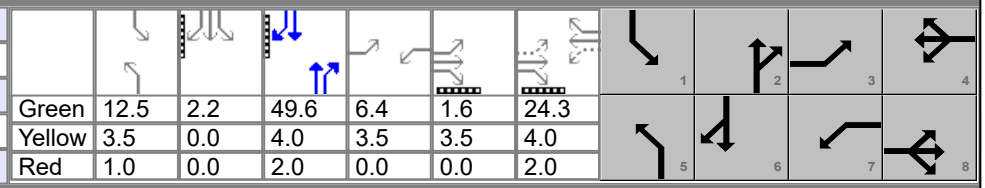
HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd SATP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	163	175	79	134	127	150	1898	57	183	1851	255

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	12.5	2.2		49.6	6.4	1.6	24.3					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	163	175	79	134	127	150	1898	57	183	1851	255
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	1	0		0	0		1	1	0	0	1	1
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	3	3	3	3	3	4	4	4	4	4	4
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	11.0	12.0		11.0	12.0		12.0	12.0	12.0	12.0	12.0	12.0
Turn Bay Length, ft	150	0		195	0		410	0	0	410	0	0
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	40	40	40	40	40	40	45	45	45	45	45	45

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	15.0	39.0	15.0	39.0	15.0	51.0	15.0	51.0
Yellow Change Interval (*Y*), s	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
Red Clearance Interval (R_c), s	0.0	2.0	0.0	2.0	1.0	2.0	1.0	2.0
Minimum Green (G_{min}), s	3	8	3	8	3	15	3	15
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	5.0	3.0	5.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Off	Off	Off	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (*Walk*), s		7.0		0.0		0.0		7.0
Pedestrian Clearance Time (*PC*), s		36.0		0.0		0.0		17.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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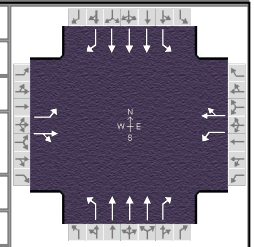
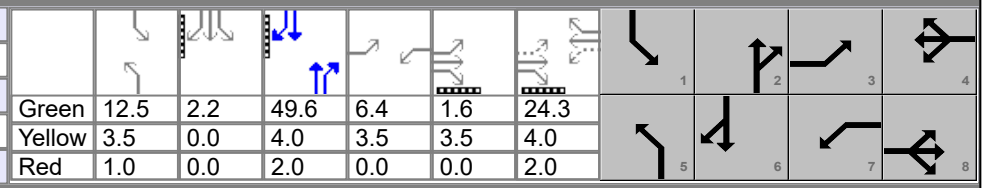
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd SATP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	163	175	79	134	127	150	1898	57	183	1851	255

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	12.5	2.2	49.6	6.4	1.6	24.3
Yellow	3.5	0.0	4.0	3.5	3.5	4.0
Red	1.0	0.0	2.0	0.0	0.0	2.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	2.0	3.0	2.0	3.0
Phase Duration, s	15.0	35.4	9.9	30.3	17.0	55.6	19.2	57.7
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Max Allow Headway (*MAH*), s	4.0	6.1	4.0	6.1	4.0	0.0	4.0	0.0
Queue Clearance Time (g_s), s	13.5	25.3	6.3	19.9	12.3		14.5	
Green Extension Time (g_e), s	0.0	4.0	0.1	4.1	0.2	0.0	0.2	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	0.37	0.28	0.35	0.08		0.53	

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	5	2	12	1	6	16
Adjusted Flow Rate (*v*), veh/h	254	356		83	275		158	1998	60	193	1948	268
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1795	1738		1810	1747		1795	1802	1610	1810	1802	1598
Queue Service Time (g_s), s	11.5	23.3		4.3	17.9		10.3	39.3	2.1	12.5	35.4	11.1
Cycle Queue Clearance Time (g_c), s	11.5	23.3		4.3	17.9		10.3	39.3	2.1	12.5	35.4	11.1
Green Ratio (*g/C*)	0.31	0.24		0.26	0.20		0.10	0.41	0.41	0.12	0.43	0.43
Capacity (*c*), veh/h	291	425		191	353		187	2232	665	222	2330	689
Volume-to-Capacity Ratio (*X*)	0.871	0.836		0.435	0.778		0.843	0.895	0.090	0.870	0.836	0.390
Back of Queue (*Q*), ft/ln (95 th percentile)	170.3	415.3		87.9	330.6		219	528.3	36.2	264.9	463.6	174.8
Back of Queue (*Q*), veh/ln (95 th percentile)	6.8	16.6		3.5	13.2		8.7	21.0	1.4	10.6	18.4	6.9
Queue Storage Ratio (*RQ*) (95 th percentile)	1.14	0.00		0.45	0.00		0.53	0.00	0.00	0.65	0.00	0.00
Uniform Delay (d_1), s/veh	37.5	43.0		36.7	45.3		50.7	24.7	16.3	49.3	22.1	16.9
Incremental Delay (d_2), s/veh	23.6	11.5		1.6	8.9		12.7	6.1	0.3	19.3	3.8	1.7
Initial Queue Delay (d_3), s/veh	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	61.2	54.6		38.3	54.2		63.4	30.7	16.6	68.6	25.8	18.5
Level of Service (LOS)	E	D		D	D		E	C	B	E	C	B
Approach Delay, s/veh / LOS	57.3	E		50.5	D		32.7	C		28.4	C	
Intersection Delay, s/veh / LOS	34.7						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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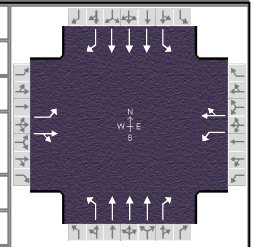
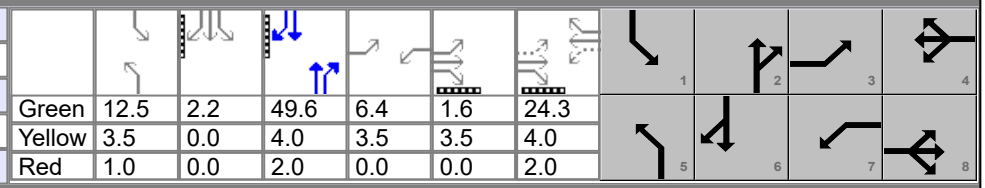
HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd SATP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	163	175	79	134	127	150	1898	57	183	1851	255

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	12.5	2.2	49.6	6.4	1.6	24.3
Yellow	3.5	0.0	4.0	3.5	3.5	4.0
Red	1.0	0.0	2.0	0.0	0.0	2.0

Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicles and Grade Factor (f_{HVg})	0.992	1.000	0.992	1.000	1.000	0.992	0.992	0.992	1.000	1.000	0.992	0.992
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.908	1.000	1.000	0.908	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.915	0.915		0.919	0.919		0.000	0.847		0.000	0.847
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DDI Factor (f_{DDI})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Movement Saturation Flow Rate (s), veh/h	1795	838	900	1810	897	850	1795	5406	1610	1810	5406	1598
Proportion of Vehicles Arriving on Green (P)	0.10	0.24	0.24	0.05	0.20	0.20	0.14	0.55	0.55	0.16	0.57	0.57
Incremental Delay Factor (k)	0.40	0.31		0.11	0.27		0.15	0.50	0.50	0.24	0.50	0.50

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	6.0	4.5	6.0
Green Ratio (g/C)	0.31	0.24	0.26	0.20	0.10	0.41	0.12	0.43
Permitted Saturation Flow Rate (s_p), veh/h/ln	1113	0	1042	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	26.3	0.0	24.3	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	6.4	0.0	4.0	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	6.4		1.8					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln						0		0
Protected Right Effective Green Time (g_R), s						0.0		0.0

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v								
Pedestrian F_s / F_{delay}								
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b								
Bicycle F_w / F_v								

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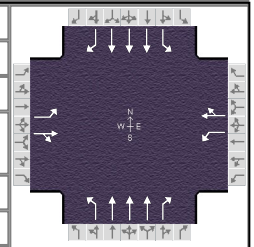
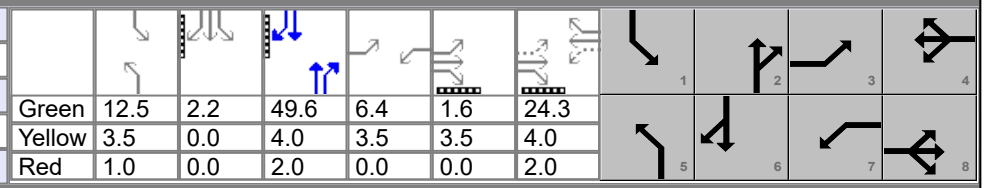
HCS7 Signalized Intersection Results Graphical Summary

General Information				Intersection Information	
Agency	Knight E/A, Inc.			Duration, h	0.250
Analyst	RAC	Analysis Date	Apr 12, 2022	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Projected Peak Hour	PHF	0.95
Urban Street	IL 59	Analysis Year	2028	Analysis Period	1> 7:15
Intersection	IL 59 / 83rd Street	File Name	7767.01 - IL59-83rd SATP.xus		
Project Description	7767.01 - IL 59 Jet Brite - Naperville				



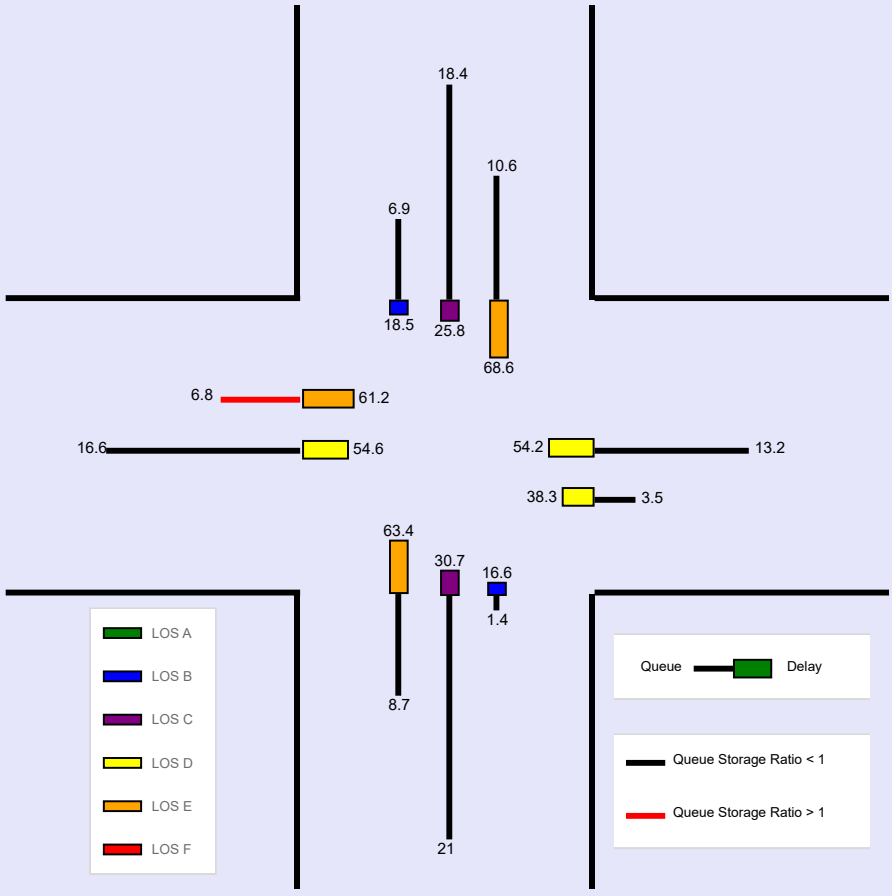
Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	163	175	79	134	127	150	1898	57	183	1851	255

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	12.5	2.2		49.6	6.4	1.6	24.3					
Yellow	3.5	0.0		4.0	3.5	3.5	4.0					
Red	1.0	0.0		2.0	0.0	0.0	2.0					

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (*Q*), ft/ln (95 th percentile)	170.3	415.3		87.9	330.6		219	528.3	36.2	264.9	463.6	174.8
Back of Queue (*Q*), veh/ln (95 th percentile)	6.8	16.6		3.5	13.2		8.7	21.0	1.4	10.6	18.4	6.9
Queue Storage Ratio (*RQ*) (95 th percentile)	1.14	0.00		0.45	0.00		0.53	0.00	0.00	0.65	0.00	0.00
Control Delay (*d*), s/veh	61.2	54.6		38.3	54.2		63.4	30.7	16.6	68.6	25.8	18.5
Level of Service (LOS)	E	D		D	D		E	C	B	E	C	B
Approach Delay, s/veh / LOS	57.3	E		50.5	D		32.7	C		28.4	C	
Intersection Delay, s/veh / LOS	34.7						C					



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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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HCS7 Two-Way Stop-Control Report

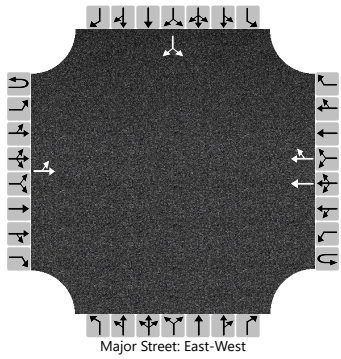
General Information

Analyst	RAC
Agency/Co.	Knight E/A, Inc.
Date Performed	4/13/2022
Analysis Year	2028
Time Analyzed	AM Projected
Intersection Orientation	East-West
Project Description	7767,01 - Jet Brite Car Wash - Naperville

Site Information

Intersection	83rd Street/South Access
Jurisdiction	IDOT
East/West Street	83rd Street
North/South Street	South Access
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	2	0		0	0	0		0	1	0
Configuration		LT					T	TR							LR	
Volume (veh/h)		12	338				250	1						1		11
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		13													13	
Capacity, c (veh/h)		1312													816	
v/c Ratio		0.01													0.02	
95% Queue Length, Q_{95} (veh)		0.0													0.0	
Control Delay (s/veh)		7.8													9.5	
Level of Service (LOS)		A													A	
Approach Delay (s/veh)		0.4												9.5		
Approach LOS														A		

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HCS7 Two-Way Stop-Control Report

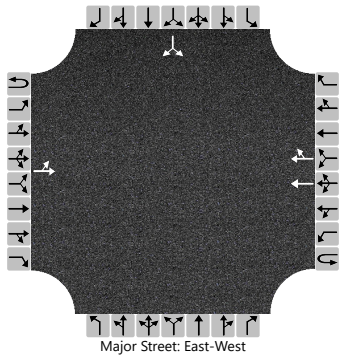
General Information

Analyst	RAC
Agency/Co.	Knight E/A, Inc.
Date Performed	4/13/2022
Analysis Year	2028
Time Analyzed	PM Projected
Intersection Orientation	East-West
Project Description	7767,01 - Jet Brite Car Wash - Naperville

Site Information

Intersection	83rd Street/South Access
Jurisdiction	IDOT
East/West Street	83rd Street
North/South Street	South Access
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	2	0		0	0	0		0	1	0
Configuration		LT					T	TR							LR	
Volume (veh/h)		23	452				425	2						2		23
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		24													26	
Capacity, c (veh/h)		1122													668	
v/c Ratio		0.02													0.04	
95% Queue Length, Q_{95} (veh)		0.1													0.1	
Control Delay (s/veh)		8.3													10.6	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)		0.6												10.6		
Approach LOS														B		

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HCS7 Two-Way Stop-Control Report

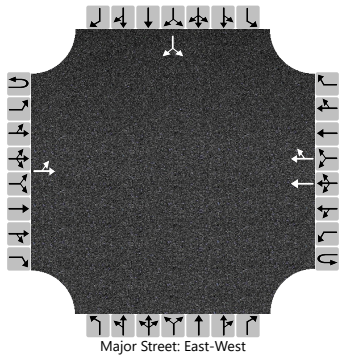
General Information

Analyst	RAC
Agency/Co.	Knight E/A, Inc.
Date Performed	4/13/2022
Analysis Year	2028
Time Analyzed	Sat Midday PM
Intersection Orientation	East-West
Project Description	7767,01 - Jet Brite Car Wash - Naperville

Site Information

Intersection	83rd Street/South Access
Jurisdiction	IDOT
East/West Street	83rd Street
North/South Street	South Access
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	2	0		0	0	0		0	1	0
Configuration		LT					T	TR							LR	
Volume (veh/h)		52	325				290	5						5		50
Percent Heavy Vehicles (%)		0												0		0
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.5		6.9
Critical Headway (sec)		4.10												6.80		6.90
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.20												3.50		3.30

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		55													58	
Capacity, c (veh/h)		1261													756	
v/c Ratio		0.04													0.08	
95% Queue Length, Q_{95} (veh)		0.1													0.2	
Control Delay (s/veh)		8.0													10.2	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)		1.5												10.2		
Approach LOS														B		

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HCS7 Two-Way Stop-Control Report

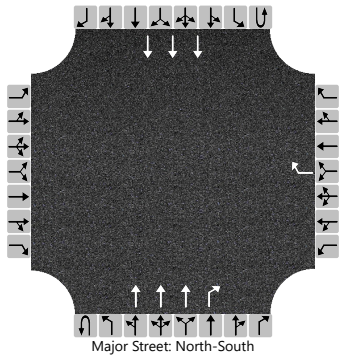
General Information

Analyst	RAC
Agency/Co.	Knight E/A, Inc.
Date Performed	4/13/2022
Analysis Year	2028
Time Analyzed	AM Projected
Intersection Orientation	North-South
Project Description	7767.01 - Jet Brite Car Wash - Naperville

Site Information

Intersection	IL 59 / RIRO
Jurisdiction	IDOT
East/West Street	RIRO
North/South Street	IL 59
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	1	0	0	3	1	0	0	3	0
Configuration								R			T	R			T	
Volume (veh/h)								10			2235	10			1089	
Percent Heavy Vehicles (%)								0								
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized						Yes					No					
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)								7.1								
Critical Headway (sec)								7.10								
Base Follow-Up Headway (sec)								3.9								
Follow-Up Headway (sec)								3.90								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								11								
Capacity, c (veh/h)								160								
v/c Ratio								0.07								
95% Queue Length, Q_{95} (veh)								0.2								
Control Delay (s/veh)								29.0								
Level of Service (LOS)								D								
Approach Delay (s/veh)						29.0										
Approach LOS						D										

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HCS7 Two-Way Stop-Control Report

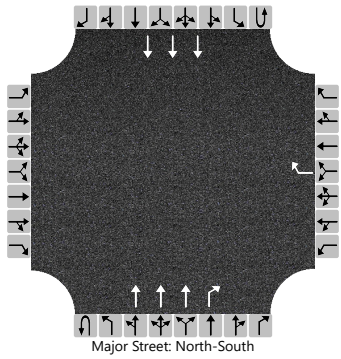
General Information

Analyst	RAC
Agency/Co.	Knight E/A, Inc.
Date Performed	4/13/2022
Analysis Year	2028
Time Analyzed	PM Projected
Intersection Orientation	North-South
Project Description	7767.01 - Jet Brite Car Wash - Naperville

Site Information

Intersection	IL 59 / RIRO
Jurisdiction	IDOT
East/West Street	RIRO
North/South Street	IL 59
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	1	0	0	3	1	0	0	3	0
Configuration								R			T	R			T	
Volume (veh/h)								20			2007	20			2746	
Percent Heavy Vehicles (%)								0								
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized						Yes					No					
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)								7.1								
Critical Headway (sec)								7.10								
Base Follow-Up Headway (sec)								3.9								
Follow-Up Headway (sec)								3.90								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								21								
Capacity, c (veh/h)								193								
v/c Ratio								0.11								
95% Queue Length, Q_{95} (veh)								0.4								
Control Delay (s/veh)								25.9								
Level of Service (LOS)								D								
Approach Delay (s/veh)						25.9										
Approach LOS						D										

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HCS7 Two-Way Stop-Control Report

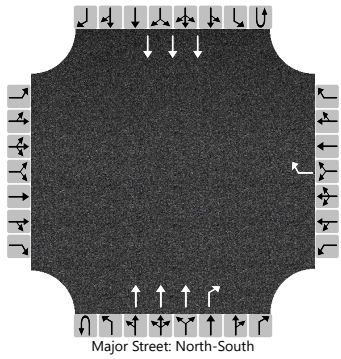
General Information

Analyst	RAC
Agency/Co.	Knight E/A, Inc.
Date Performed	4/13/2022
Analysis Year	2028
Time Analyzed	Sat Midday Projected
Intersection Orientation	North-South
Project Description	7767.01 - Jet Brite Car Wash - Naperville

Site Information

Intersection	IL 59 / RIRO
Jurisdiction	IDOT
East/West Street	RIRO
North/South Street	IL 59
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	0	1	0	0	3	1	0	0	3	0
Configuration								R			T	R			T	
Volume (veh/h)								43			2225	41			2289	
Percent Heavy Vehicles (%)								0								
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized						Yes					No					
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)								7.1								
Critical Headway (sec)								7.10								
Base Follow-Up Headway (sec)								3.9								
Follow-Up Headway (sec)								3.90								

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)								45								
Capacity, c (veh/h)								162								
v/c Ratio								0.28								
95% Queue Length, Q_{95} (veh)								1.1								
Control Delay (s/veh)								35.7								
Level of Service (LOS)								E								
Approach Delay (s/veh)						35.7										
Approach LOS						E										

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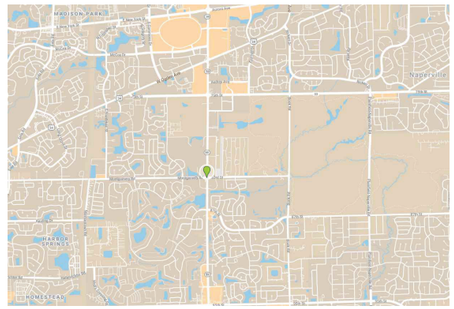
JET BRITE CAR WASH
NORTHEAST CORNER OF IL 59 WITH 83RD STREET, NAPERVILLE

Traffic Impact Study Appendix

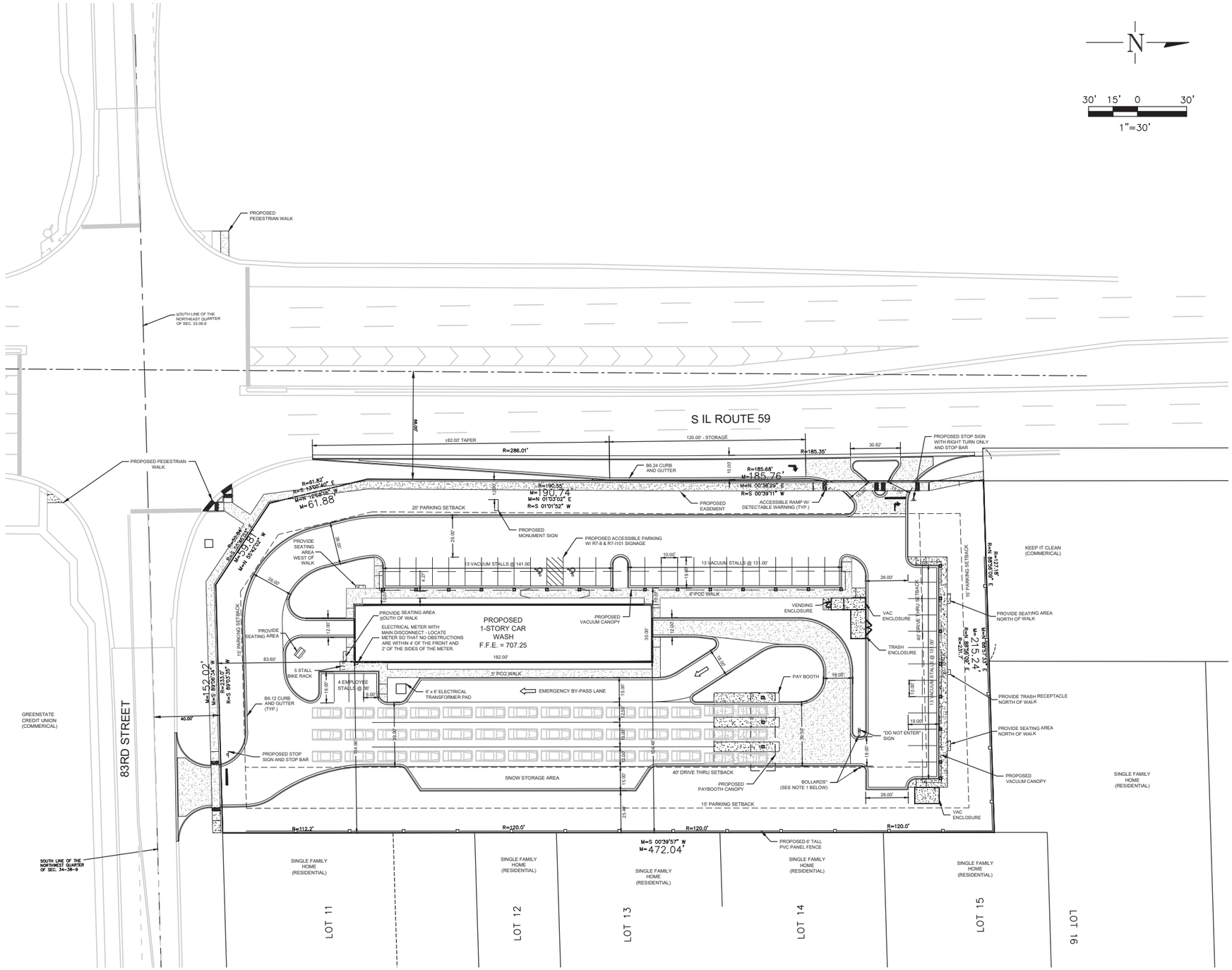
PROPOSED SITE PLAN



LOCATION MAP

SITE DATA

EXISTING ZONING:	RESIDENTIAL
PROPOSED ZONING:	B2 (PUD)
TOTAL LOT AREA:	99,970 S.F. (2.295 AC)
OPEN SPACE AREA:	21,367 S.F. (0.490 AC)
OPEN SPACE AREA PERCENT:	21.35%
EXISTING IMPERVIOUS AREA:	~0 S.F.
PROPOSED IMPERVIOUS AREA:	64,686 S.F.
REQUIRED STORMWATER DETENTION:	43,996 CF (1.01 AC-FT)
PROVIDED STORMWATER DETENTION:	44,000 CF (1.01 AC-FT)
BUILDING AREA:	6,370 S.F.
ACCESSORY STRUCTURE AREA:	459 S.F.
FAR ALLOWABLE:	0.325
FAR PROPOSED:	0.068
REQUIRED PARKING:	29 (4.5 SPACES/ 1000 GROSS SF)
PROPOSED PARKING:	43 SPACES (TOTAL INCLUDING ACCESSIBLE PARKING)
REQUIRED STACKING:	10 ENTERING WASH 2 EXITING WASH
PROPOSED STACKING:	42
BICYCLE PARKING PROVIDED:	5 SPACES



NOTES:
1. * PROPOSED EMERGENCY BY-PASS EXIT. BOLLARDS WITH CHAIN CROSSING AND SIGNAGE TO BE PROVIDED TO RESTRICT GENERAL ACCESS. IN THE EVENT OF AN EMERGENCY, ONSITE STAFF WILL ASSIST WITH VACATING THE PAY BOOTH AND WASH DRIVE AREA.

DATE	REVISIONS
12/14/22	REVISED PER CITY REVIEW 12/5/22
1/13/23	REVISED PER CITY REVIEW 1/11/23

SCALE	AS NOTED
DRAWN	C.A.B.
CHECKED	L.G.K.
APPROVED	
DATE	11/4/22
ISSUED FOR	ENTITLEMENT

VEENSTRA & KIMM INC.

JET BRITE CAR WASH
IL 59 AND 83RD STREET NAPERVILLE, IL

552 W. Boughton Road • Bolingbrook, IL 60440
630-755-0293 • 888-630-2034

SITE PLAN

DWG. NO.
C-2
1 OF 1
PROJECT #6692

PLOTTED: Wednesday, January 18, 2023 9:02:51 AM

X-REFS: 7767.01 ALTA Survey Copy
FILE PATH: B:\0600\669 JET BRITE SERVICES, INC\6692 JET BRITE, NAPERVILLE CAR WASH\CADD\DRAWINGS\DESIGN DEVELOPMENT\CIVIL\X_SITE

JOB NO. 6662 VEENSTRA & KIMM, INC., DESIGN FIRM REGISTRATION NUMBER 184.001939