



Commission/Board/Committee Name: ZONING BOARD OF APPEALS

Date of Meeting: Tuesday, January 19, 2021

Time of meeting: 7 PM

Location of Meeting: Lower Level of Village Hall, 517 Desplaines Avenue, Forest Park, IL 60130

AGENDA:

Roll Call

Approval of minutes from the meeting of July 20, 2020

Unfinished Business:

1. _____
2. _____
3. _____
4. _____

New Business:

1. ZBA2021-01 Request for conditional use approval for drive thru facilities
2. _____
3. _____
4. _____
5. _____
6. _____

Public Comment

Adjournment

Village of Forest Park Memorandum

TO: Zoning Board of Appeals

FROM: Steve Glinke, Director

SUBJECT: **PC 2021-01** 7201 Madison Street
Petitioner: Forest Park Holdings LLC

DATE OF REPORT: January 11, 2021
DATE OF ZONING BOARD OF APPEALS MEETING: January 19, 2021

PROJECT OVERVIEW: The petitioner/property owner is requesting approval to construct a 2,400 square foot restaurant with a drive-through on the currently vacant lot (approximately 21,000 square feet) located on the northwest corner of Madison St. and Harlem Ave. The current zoning requires a conditional use permit for the drive-through facility.

GENERAL PROPERTY INFORMATION

Applicant's Name: Forest Park Holdings LLC
Property Owner's Name: Jay Javors
Common Property Address: 7201 Madison Street
Common Location: On the north side of Madison Street at Harlem Ave.
Neighboring Property Land Use(s): North – DBD/ Commercial
South – DBD/Commercial
West – DBD/Commercial
East – Other Jurisdiction
Comprehensive Plan Designation: Downtown Commercial
Existing Use of Property: Vacant lot
Proposed Use of Property: Restaurant with drive-through
Existing Property Zoning: DBD – Downtown Business District
Property Size: • 141.68' x 148 (20,968.64 square feet)
Total Lot Coverage as Existing: • 0

Bulk Area Regulations:

Regulation	Requirement	Proposed
Front yard setback	= to adjoining structure	Same
Rear yard setback	25' or 20% of lot depth	64'
Side/East setback	0 feet	0'
Side/West setback	0 feet	0'
Min. Lot Area/Dwelling	n/a	n/a
Lot Cov (with residential)	n/a	n/a
Minimum Dwelling Unit Size	n/a	n/a
Building height	4 stories 50'	22'
Off-street parking	None in DBD	23



PROJECT DOCUMENTS:

The following documents, submitted by the developer are attached to this report as Exhibit 1.

1. Project Description
2. Site Plan, dated November 5, 2020
3. Floor Plan
4. Fire Truck Turning Plan, dated October 21, 2020
5. Site Analysis Plan, dated October 21, 2020
6. Landscape Plan, dated December 4, 2020
7. Lighting Plan, dated November 9, 2020
8. Elevations/Signage Plans, dated December 7, 2020
9. Perspective Rendering (looking northwest), dated November 5, 2020
10. Traffic Impact Study, updated October 15, 2020

PROJECT DESCRIPTION:

The petitioner is the owner of this vacant property which previously received approval for a multi-tenant retail strip center in 2018. The applicant is proposing a 2,400 square foot Chipotle restaurant with a drive-through for online/mobile order pick-up only (no window ordering). The site currently has three full-access entry points; the applicant is proposing to close one of them and to make the Madison Street access point right-in, right-out only. Before the site was vacant, it was a gas station and convenience store. The drive-through is proposed to include room for stacking of seven cars. The site plan proposes 22 parking spaces (two of which will be designed for “take out” and two for cars having come out of the drive-through) plus two ADA spaces.

STANDARDS FOR CONDITIONAL USE:

In reviewing and determining whether to approve or disapprove a conditional use permit, the Zoning Board of Appeals and Village Council shall consider the criteria established in 9-10-7 of the Village of Forest Park Zoning Code. The criteria and staff's evaluation of the applications compliance with those criteria are as follows:

1. That the establishment, maintenance, or operation of the conditional use will not be detrimental to, or endanger the public health, safety, morals, comfort, or general welfare;
2. That the conditional use will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood;
3. That the establishment of the conditional use will not impede the normal and orderly development and improvement of the surrounding property for uses permitted in the district;
4. That adequate utilities, access roads, drainage and/or necessary facilities have been or are being provided;
5. That adequate measures have been or will be taken to provide ingress and egress so designed as to minimize traffic congestion in the public streets;
6. That the proposed conditional use is not contrary to the objectives of the current comprehensive plan for the village of Forest Park; and,
7. That the conditional use shall, in all other respects, conform to the applicable regulations of the district in which it is located, except as such regulations may, in each instance, be modified pursuant to the recommendations of the board.

STAFF REVIEW:

The new restaurant would serve as an active use of the parcel that has been vacant for several years. The project as proposed would add several new site improvements including access management for the curb cuts and a welcome to Forest Park sign. The project, with conditions, would comply with all applicable development standards in the zoning code and meets the standards for a conditional use permit outlined above. Should the Zoning Board of Appeals wish to support the request, the following sample motion is provided:

Based on the submitted petition and testimony provided, I move that the Zoning Board of Appeals recommend to the Village Council approval of the Site Plan associated with ZBA2021-01 subject to the following conditions:

1. ***The site shall be constructed in substantial compliance with the "Project Documents" identified in this report and available in the Department of Public Health and Safety.***
2. ***All construction shall comply with the Building Code of the Village of Forest Park, with final plans subject to review and approval by the Village Engineer and Director of Public Health and Safety.***

3. *No building permits and no Certificate of Occupancy for the Subject Property shall be issued by the Department of Public Health and Safety to the Owner unless all debts owed to the Village of Forest Park by the Owner have been paid in full prior to the issuance of such permits or certificate.*
4. *Any violation of the above conditions will result in a violation of the Municipal code of the Village of Forest Park and the owner may be subject to fines for each day said violation exists.*
5. *Additional information shall be submitted, subject to review and approval by staff, for loading.*
6. *Additional information shall be submitted subject to review and approval by staff, regarding onsite signage.*
7. *Additional information shall be submitted regarding the hours of operation for the drive-through facility.*

**CHIPOTLE RESTAURANT
NWC MADISON ST. & HARLEM AVE.
FOREST PARK, IL**

PROJECT DESCRIPTION

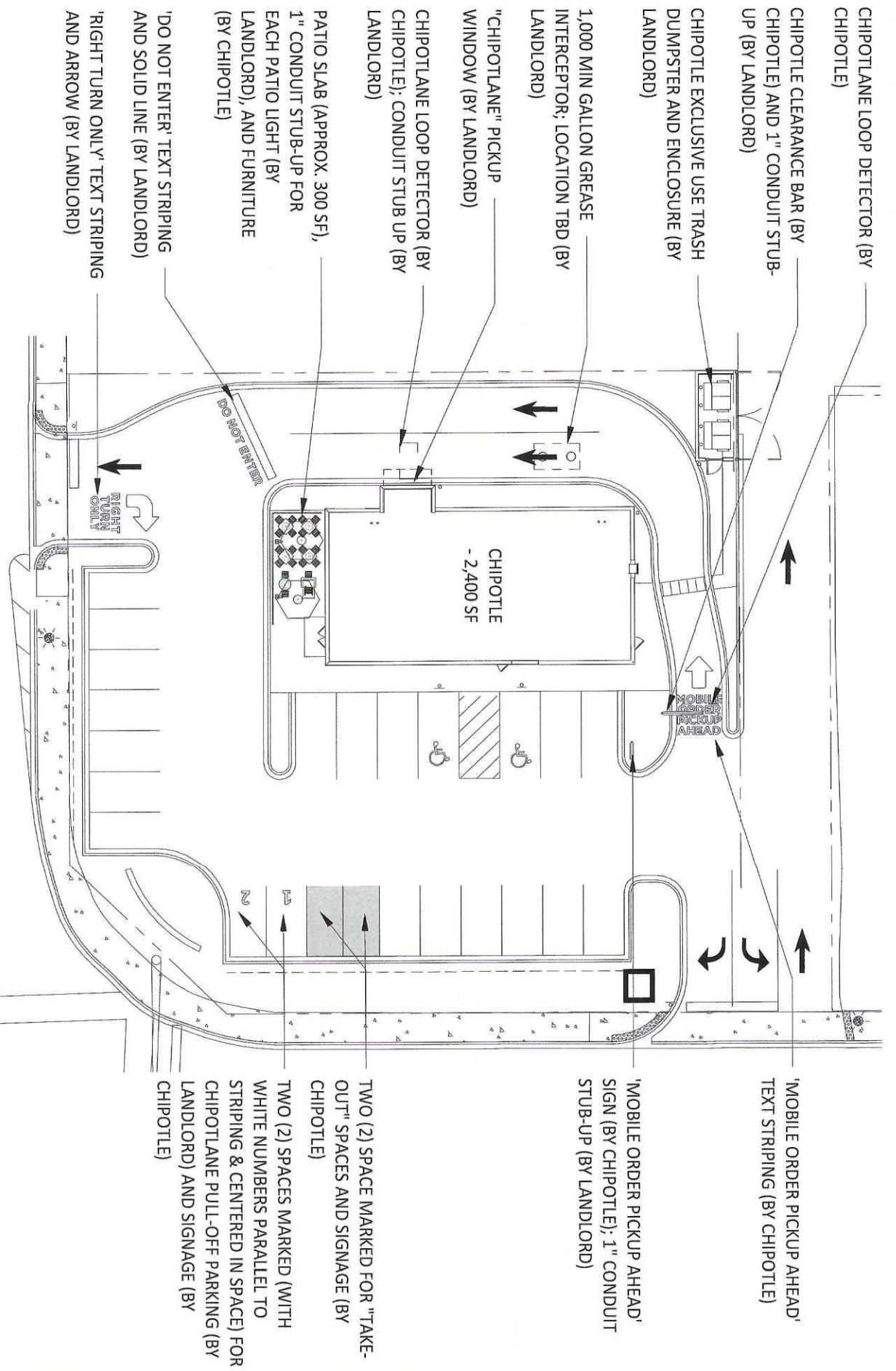
Applicant is proposing to develop a 2,400 sf Chipotle restaurant on the subject 21,000 sf site, with on-site parking for 23 cars. Ingress and egress to and from Harlem Avenue will be enhanced by widening the contiguous alley which will be marked for one in-bound and 2 out-bound traffic lanes (this will also benefit Parky's which will continue to use the alley for access by its customers as well).

The existing curb cut on Harlem will be eliminated thus reducing the total number of access points. The access on Madison will be via the existing westerly curb cut.

The Applicant will install extensive landscaping and will provide a base for the Village to install a Welcome to Forest Park sign.

Chipotle will have a drive-through window for pre-ordered pick-up only. No ordering in the drive-through lane is contemplated. This type of operation has been successfully utilized by Chipotle at other locations and is well suited during periods of COVID restrictions. There will be interior food service (when permissible) and a beer and wine serving license will be applied for.

*NOTE: DRAWING IS NOT TO SCALE



SITE PLAN

SKETCH FOR:

"HARLEM & MADISON"

North Harlem Avenue & Madison Street
Forest Park, IL 60302

STORE NO.: 3968

05 NOVEMBER, 2020

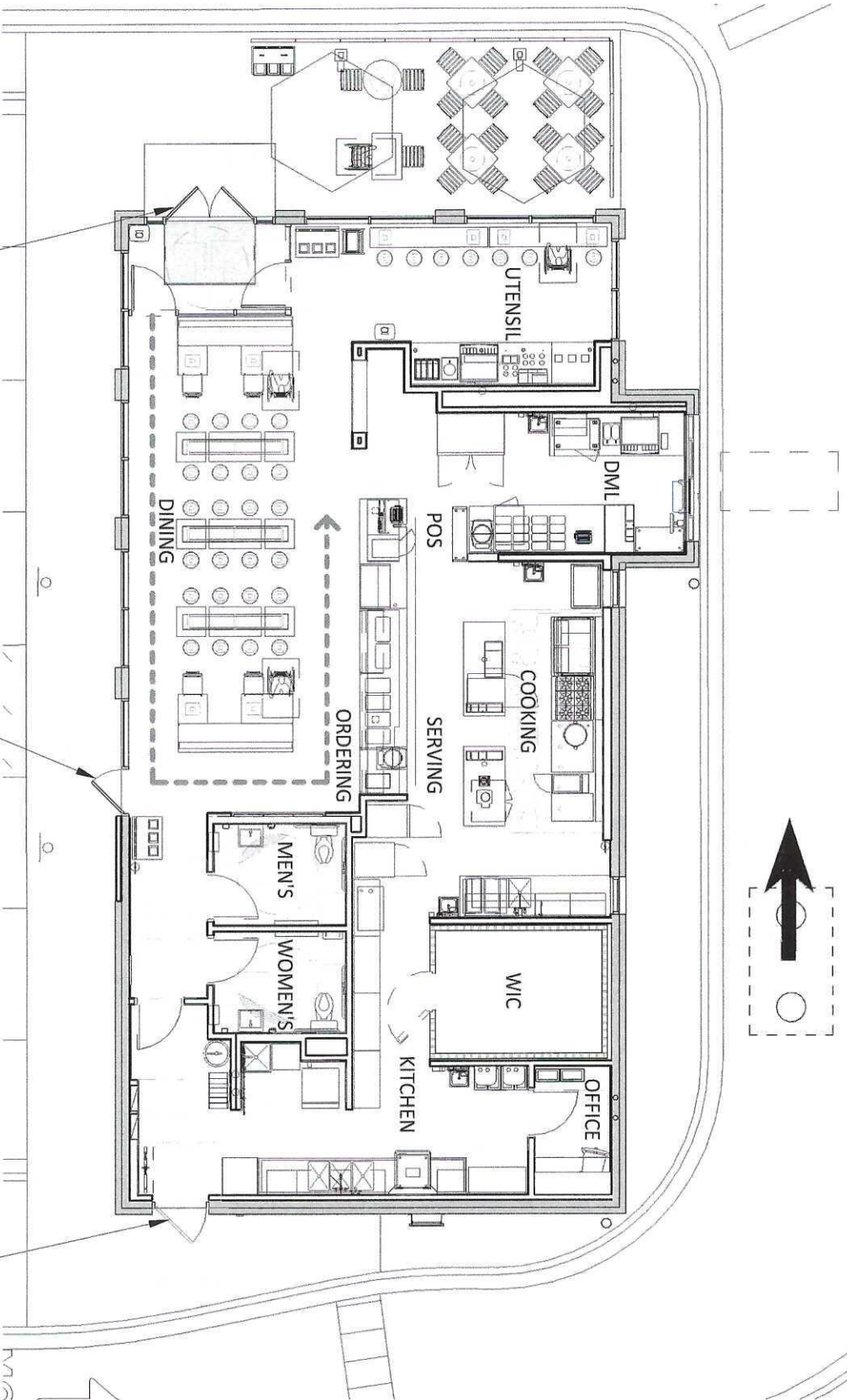




6'-0" NEW WIDE STYLE MAIN ENTRY DOOR
(BY LANDLORD)
COLOR: BRONZE ANODIZED

3'-0" NEW WIDE STYLE SECONDARY
EGRESS DOOR (BY LANDLORD)
COLOR: BRONZE ANODIZED

3'-6" REAR DOOR (BY LANDLORD)
COLOR: DARK BRONZE



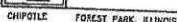
SKETCH FOR:

"HARLEM & MADISON"
North Harlem Avenue & Madison Street
Forest Park, IL 60302
STORE NO.: 3968
05 NOVEMBER, 2020

FLOOR PLAN

2,400 SF
43 INTERIOR SEATS
20 EXTERIOR SEATS





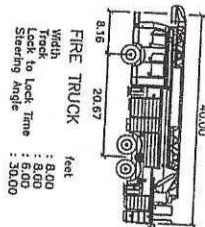
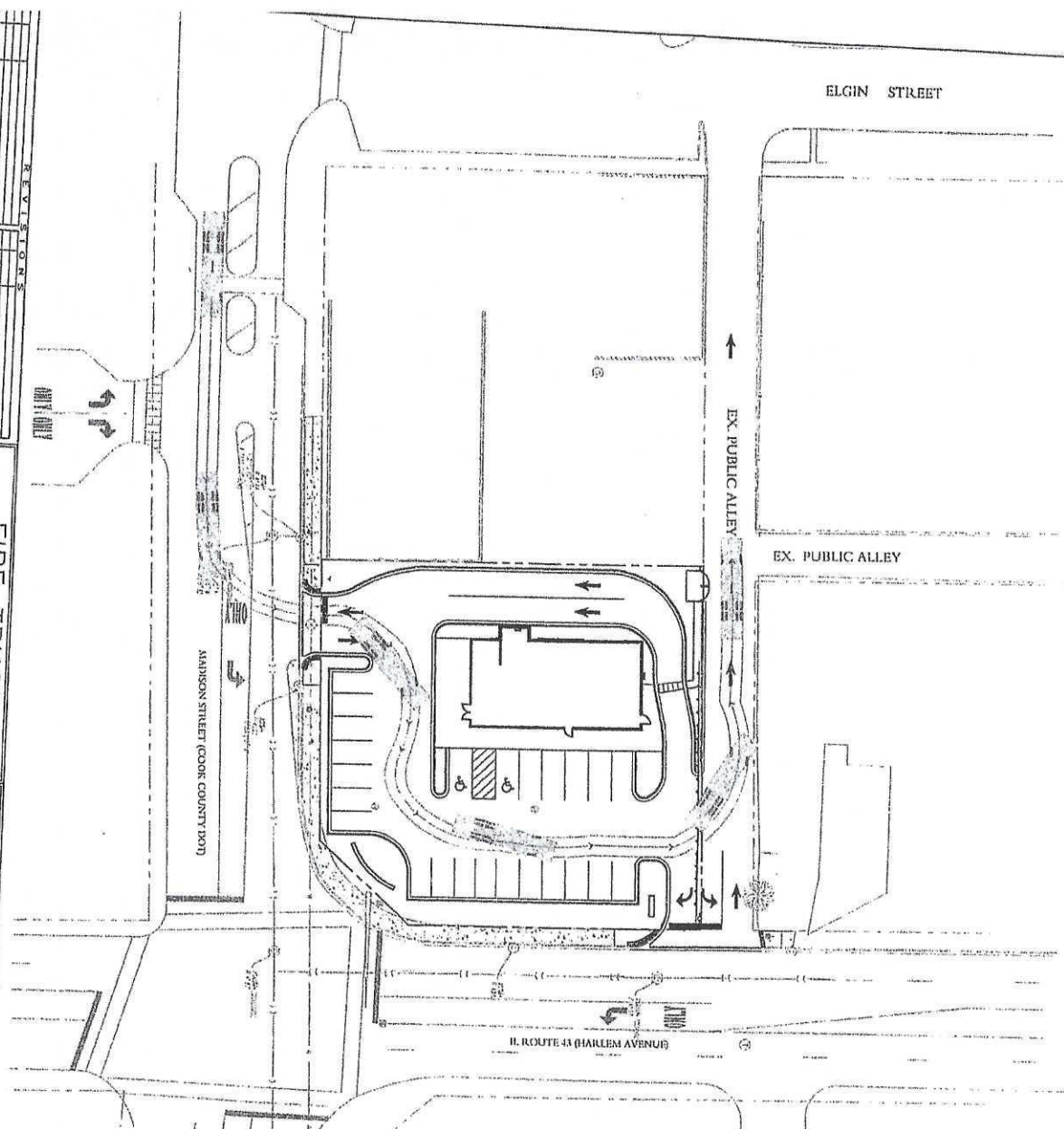
FIRE TRUCK TURNING PLAN

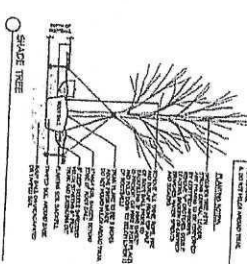
CHIPOTLE
NWC MADISON ST. & HARLEM AVE.
FOREST PARK, ILLINOIS

Craig R. Knacke & Associates
Civil Engineers, P.C.
14141 Sunset Drive • Greenfield, IL 60140
TEL: (708) 728-1000
FAX: (708) 728-1001
E-MAIL: CRK@CRKAE.COM

C1.2

CHIPOTLE FOREST PARK, ILLINOIS





HARLEM AVENUE (IL ROUTE 43)

MADISON STREET

LANDSCAPE PLAN

LANDSCAPE NOTES

- [illegible]

CLIENT NAME:
Kodak Exposure P.C.
211000 Broadway
Oyster Bay, NY 11578

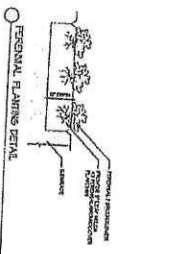
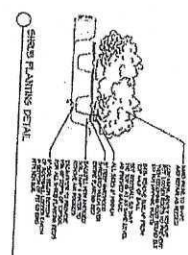
ARCHITECT:

CIVIL ENGINEER

GENERAL CONTRACTOR

CHIPOTLE
NWC Madison Street and Harlem Avenue
Forest Park, Illinois

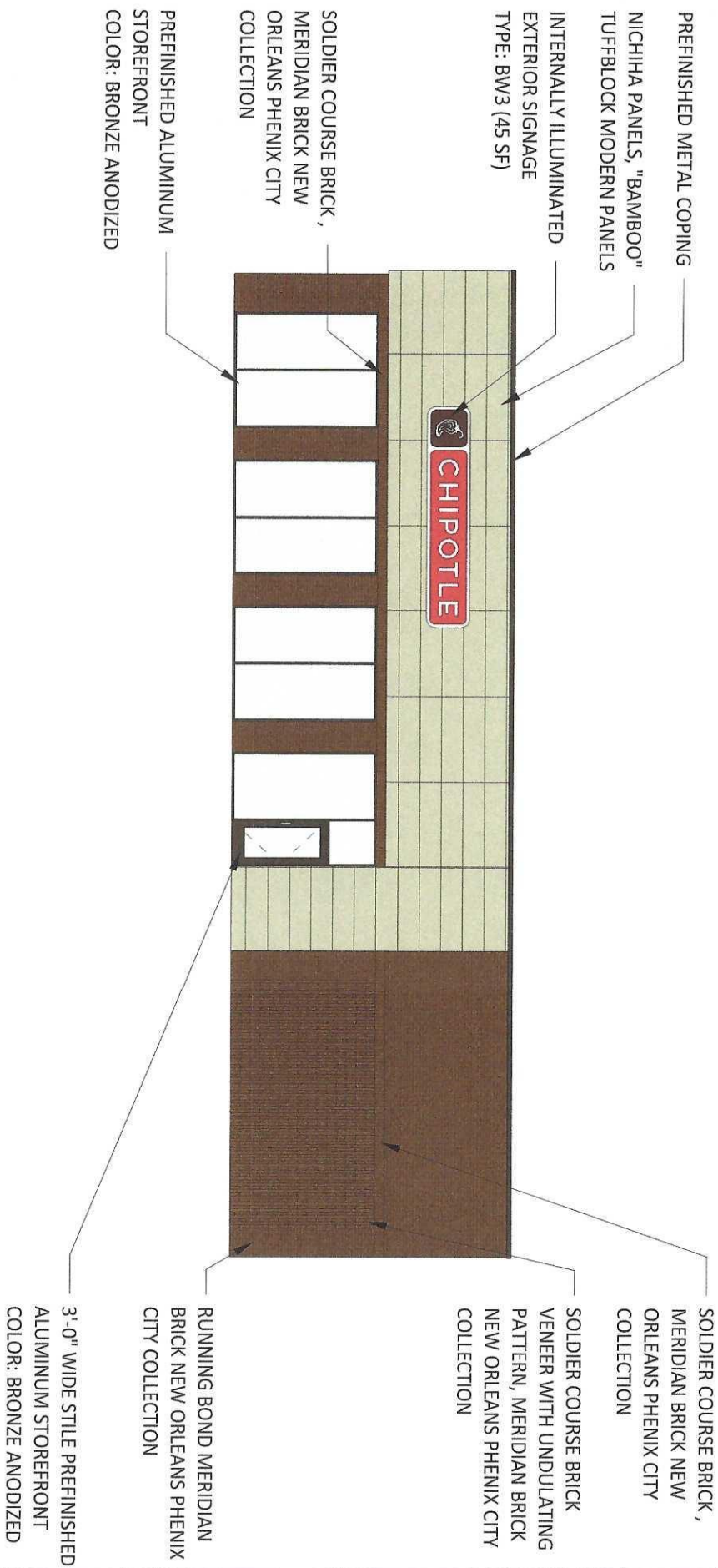
PLANT LIST

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NOT FOR CONSTRUCTION

LANDSCAPE
PLAN

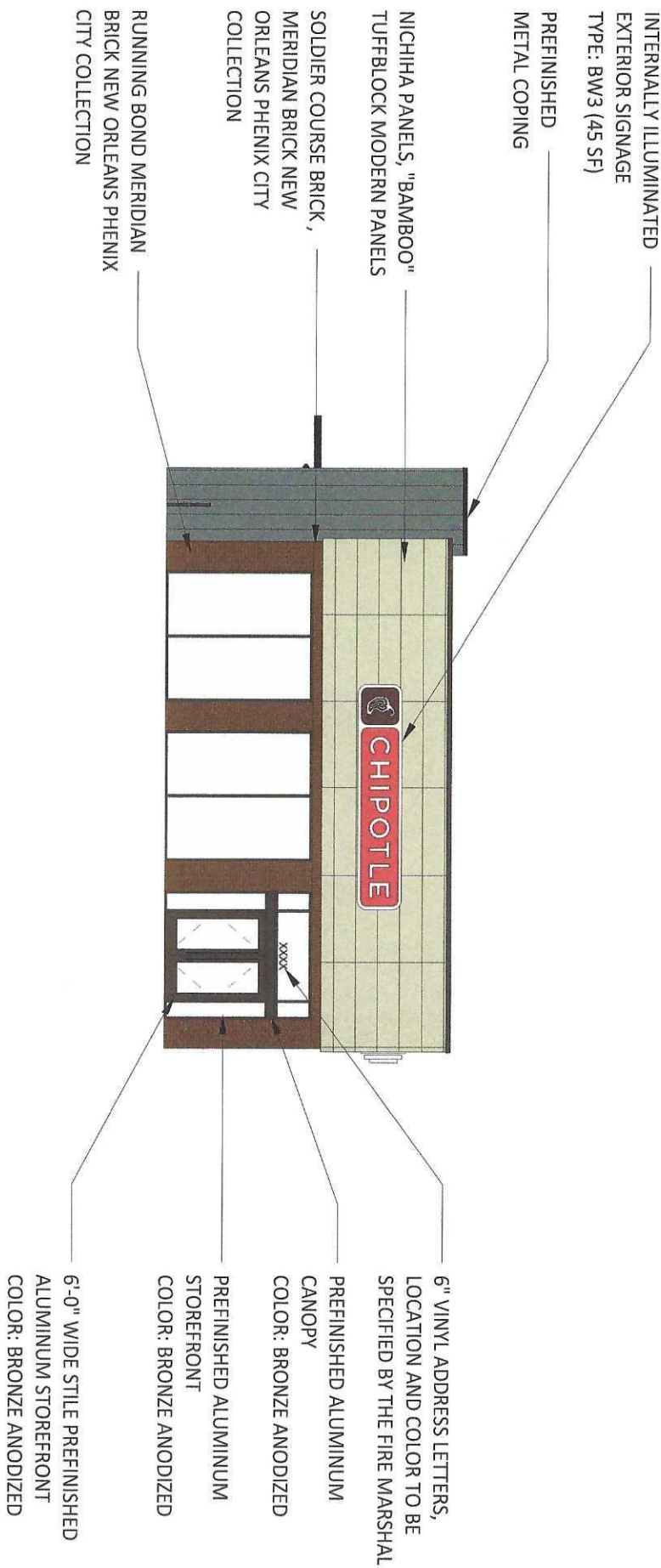
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LEASE EXHIBITS FOR:

"HARLEM & MADISON"
North Harlem Avenue & Madison Street
Forest Park, IL 60302
STORE NO.: 3968
07 DECEMBER, 2020



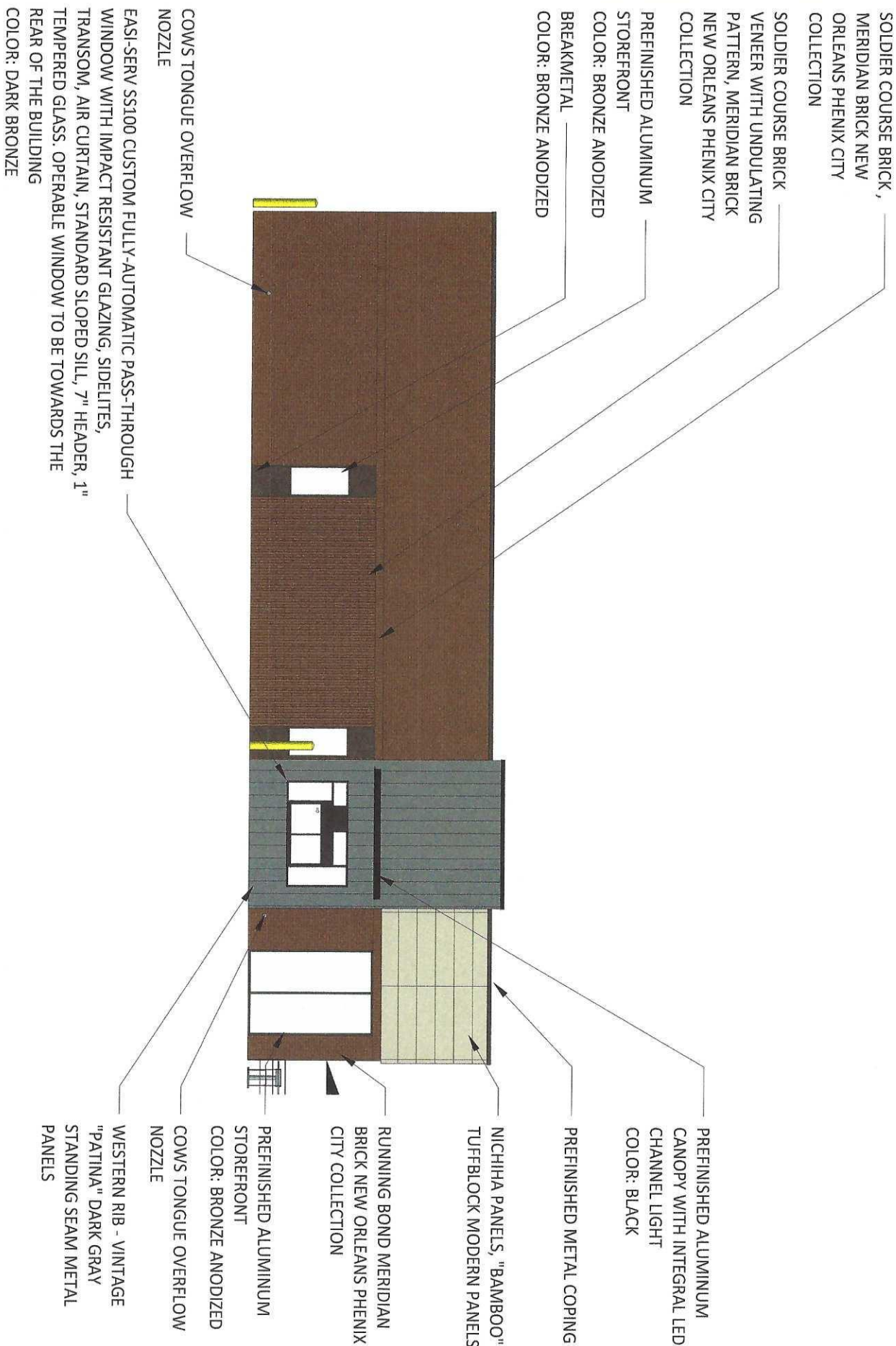


ELEVATION

LEASE EXHIBITS FOR:

"HARLEM & MADISON"
 North Harlem Avenue & Madison Street
 Forest Park, IL 60302
 STORE NO.: 3968
 07 DECEMBER, 2020





ELEVATION

LEASE EXHIBITS FOR:

"HARLEM & MADISON"
North Harlem Avenue & Madison Street

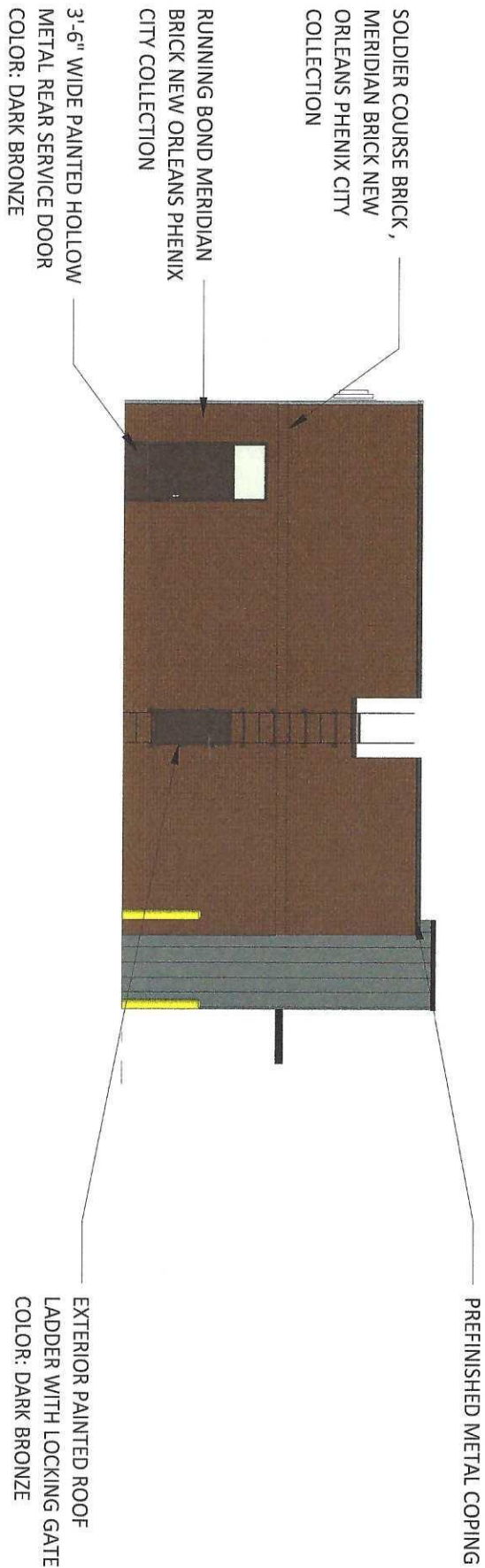
Forest Park, IL 60302

STORE NO.: 3968

07 DECEMBER, 2020



*NOTE: DRAWING IS NOT TO SCALE



ELEVATION

LEASE EXHIBITS FOR:

"HARLEM & MADISON"

North Harlem Avenue & Madison Street
Forest Park, IL 60302

STORE NO.: 3968

07 DECEMBER, 2020



NOTE: DRAWING IS NOT TO SCALE



SKETCH FOR:
"HARLEM & MADISON"

North Harlem Avenue & Madison Street
Forest Park, IL 60302
STORE NO. 3968
05 NOVEMBER, 2020

PERSPECTIVE



TRAFFIC IMPACT STUDY

625 Forest Edge Drive, Vernon Hills, IL 60061

TEL 847.478.9700 ■ FAX 847.478.9701

www.gha-engineers.com

To: **Steve Glinke**
Village of Forest Park

From: William C. Grieve, P.E., PTOE
Senior Transportation Engineer

Justin Opitz, AICP
Transportation Planner

Date: November 5, 2015
Updated October 15, 2020

Subject: ***Proposed Commercial Development
Harlem Avenue (IL 43) @ Madison Street - NW Corner
Forest Park, Illinois***

PART I. PROJECT CONTEXT AND SUMMARY STATEMENT

Gewalt Hamilton Associates, Inc. (GHA) has conducted a traffic impact study (TIS) for the above captioned project. As proposed, a former gas station that is now a vacant lot in the northwest corner of the Harlem Avenue (IL 43) / Madison Street intersection in Forest Park, Illinois would be developed with a restaurant. A Chipotle with an online/mobile order pick-up lane would be built. It is important to note that the Chipotle online/mobile order pick-up lane will only serve online/mobile orders and not provide traditional drive-thru operations where customers are able to order from a menu board.

The following summarizes our TIS findings and provides various recommendations for your consideration. *Exhibits* and *Appendices* referenced are located at the end of this document.

Briefly summarizing, we believe that the adjacent roadways and the site access drives can accommodate the restaurant's traffic activity. And traffic operations compared to the previous gas station use may indeed be more efficient and safer. Reasons include:

- A sizeable amount of restaurant trips will be made by traffic already traveling on Harlem Avenue and Madison Street, which will help minimize the impacts on that key intersection.
- The site's location along several bus routes and the fairly close proximity to the CTA Blue Line train station will help promote non-auto trips.
- The site currently has three full access drives; two on Madison Street and one on Harlem Avenue. Only one drive on Madison will remain, as the site will use the existing alley on Harlem that borders on the north. This is an excellent example of access management policy and will help promote pedestrian mobility.
- Sufficient online/mobile order pick-up lane stacking is provided, so as to not detrimentally impact on-site circulation

PART II. BACKGROUND INFORMATION

Site Location Map and Photo Inventory

Exhibit 1 provides an aerial of the site location and *Exhibit 2* provides a photo inventory of current roadway operations. Pertinent comments on the adjacent roadways and traffic operations include:

- Harlem Avenue (IL 43) is a major north-south route throughout the Chicagoland region that is under the jurisdiction of the Illinois Department of Transportation (IDOT) and is classified as a Strategic Regional Arterial (SRA). Harlem has a five lane pavement section with two through travel lanes in each direction plus a center lane for left turn lanes. The posted speed limit on Harlem is 30-mph.

CTA bus routes 305, 307, and 757 and PACE bus route 757 operate along Harlem Avenue adjacent to the site. The CTA Harlem Avenue Blue Line train station is located about ½ mile to the north.

- Madison Street is an east-west collector street that is under local jurisdiction. Madison Street has a left-turn lane, through lane, and shared through-right turn lane in the westbound direction at Harlem Avenue. In the eastbound direction at Harlem Avenue, Madison Street has a left-turn lane and a shared through-right turn lane. Madison street narrows to one lane in each direction with parking on both sides of the roadway as it enters the Forest Park commercial corridor just to the west. Furthermore, Madison Street narrows to one lane in each direction, provides bikes lanes and parking on both sides east of Harlem Avenue.

CTA bus routes 305, 318, and 320 and PACE bus route 757 operate along Madison Street adjacent to the site.

- The Harlem / Madison intersection has traffic signal control. Separate left turn lanes, crosswalks, and pedestrian timers are provided on all intersection approaches.

Existing Traffic

GHA conducted weekday morning (6:00 AM to 9:00 AM) peak hour, weekday evening (4:00 PM to 6:00 PM) peak hour, and Saturday midday (11:00 AM to 1:00 PM) traffic counts at the Harlem Avenue intersections with Madison Street and the alley to the north on Thursday, September 19 and Saturday, September 21, 2019. No unusual events occurred during the counts, such as road construction, emergency vehicle activity, or severe weather, which would have impacted the collected data. The traffic count summary sheets are provided in *Appendix A*.

Exhibit 3 illustrates the traffic volumes for the weekday morning (7:00 to 8:00 AM) and evening (3:00 to 4:00 PM) and Saturday midday (Noon to 1:00 PM) peak hours. Also shown are the Average Daily Traffic (ADT) volumes from IDOT. Pertinent comments and observations from the count data include:

- As noted, the weekday evening peak hour at the Harlem / Madison intersection actually occurred late afternoon from 3:00-4:00 PM. This is not an unusual occurrence along routes such as Harlem Avenue that serve a myriad of users, such as regional trips, locally generated employment center trips, business trips, and resident trips.

- The weekday morning, weekday evening, and Saturday midday peak hour volumes and travel patterns at the Harlem / Madison intersection were very similar.
- The alley that borders the site on the north had very limited traffic activity.

PART III. TRAFFIC EVALUATION

Site Access

Exhibit 4 illustrates the site plan originally prepared by Camburas & Theodore, Ltd. and later modified Gewalt Hamilton Associates on October 9, 2020. Site access will include:

- One drive will be provided on Madison Street that will be limited to only right-in and right-out (RIRO) trips.
- Access on Harlem Avenue will be provided via the east-west alley which borders on the north. One inbound lane will be provided along with two separate outbound left and right turning lanes.

Key Finding. It should be noted the site currently has three full access drives; two on Madison Street and one on Harlem Avenue. Only one drive on Madison Street will remain limited to RIRO trips. This is an excellent example of access management policy and will help promote pedestrian mobility.

Project Traffic Characteristics

Exhibit 5 – Part A lists the traffic generation calculations for the proposed retail center, based on rate data published by the Institute of Transportation Engineers (ITE) *10th Edition Trip Generation Manual* (see *Appendix B*).

Discussion Point. The traffic generations are probably overstated, because vehicles already “passing by” on the adjacent streets will make a portion of the site trips. In addition, this location may attract a significant percentage of non-auto trips (e.g. neighborhood walking, biking, and bus trips), which aren’t generally factored into the ITE trip generation rates.

Discussion Point. It should be stated that this site previously had a gas station with 6-8 pump positions and a convenience store operating less than 10 years ago. The gas station may also have been open 24 hours. This suggests that the proposed uses should not generate that much more additional traffic, if any.

Exhibit 5 – Part B provides the anticipated trip distribution, which is primarily based on current / anticipated travel patterns and the access operations. As expected, the vast majority of trips would be oriented along Harlem Avenue, especially considering that the access on Madison Street will be limited RIRO movements. The distribution also reflects the convenience of right turn movements, for example as a quick stop at Chipotle for dinner on the way home from work.

Discussion Point. Per *Exhibit 5 – Part B*, 50% of approaching and 40% of departing retail center traffic will be “intercepted” away from the Harlem Avenue / Madison intersection by the site drives.

Site and Total Traffic

Exhibit 6 illustrates the Site Traffic assignment, which is based on the project traffic characteristics summarized in *Exhibit 5* (e.g. traffic generations and trip distribution) and the site access drives. IDOT generally requires that the existing volumes be increased to reflect other growth in the area for a “Buildout + 5 year” analysis. CMAP was contacted and provided Year 2050 traffic projections (see *Appendix C*). Construction is expected to be completed in the Year 2021, so the analysis horizon becomes the Year 2026. The anticipated annual compounded growth rate on the area roadways is 0.16%.

Site traffic and the existing volumes (see *Exhibit 3*) were combined to produce the Total Traffic assignment, which is illustrated in *Exhibit 7*. Per the CMAP information, the Total Traffic assignment includes 0.16% growth along both Harlem Avenue and Madison Street.

Discussion Point. The total traffic volumes are probably overstated, because the ITE allowed discount for “pass-by” trips was not taken, nor were the generations (see *Exhibit 5*) reduced for walking, biking, and bus trips that may be generated.

Intersection Capacity Analyses

The capacity analysis parameters are listed in Part A, as published in the Transportation Research Board’s (TRB) 2016 Highway Capacity Manual (HCM). At signalized intersections, Level of Service (LOS) “reports” traffic operations using the letter designations “A” (best) through “F” (worst) and measures the “control delay” per vehicle in seconds. LOS C is often referred to as intersection “design” guideline and LOS D is usually considered as providing the lower threshold of “acceptable” operations. LOS E and F are usually considered “unacceptable”.

At unsignalized intersections, the HCM methodology reports the results differently for Two-Way Stop Controlled (TWSC) or All-Way Stop Controlled (AWSC) intersections. For TWSC intersections, LOS is reported for conflicting movements on the major street (i.e. left turns onto the minor approach) and for each movement on the stopped approach. Approach “control delay” is also reported in seconds per vehicle. Results of AWSC analyses are slightly different. LOS is reported for each stopped approach as well as an average overall intersection “control delay” in seconds per vehicle. LOS C and D continue to be considered “design” and “acceptable” operations respectively.

Per the IDOT web-site and GHA area data collection, the percent heavy vehicles values were set at 10% on Harlem Avenue and 3% on Madison Street. The results of the capacity analyses are shown in *Exhibit 8* and the HCS printouts are located in *Appendix D*.

Traffic Impact Discussion

Reviewing the existing traffic volumes (see *Exhibit 3*), the site traffic characteristics and assignment, and the total traffic assignment (see *Exhibits 5, 6, and 7*) indicates that:

- New restaurant traffic would comprise less than 1% of the volumes entering the Harlem Avenue / Madison Street intersection during the weekday morning peak hour. The restaurant is expected to generate 5 trips during the morning peak hour, which is about 1 trip every 12 minutes.

- New restaurant traffic would comprise about 2% of the volumes entering the Harlem Avenue / Madison Street intersection during the weekday evening peak hour. The restaurant is expected to generate 78 trips during the evening peak hour, which is about 1 trip every minute.
- New restaurant traffic would comprise about 3.5% of the volumes entering the Harlem Avenue / Madison Street intersection during the Saturday midday peak hour. The restaurant is expected to generate 132 trips during the Saturday midday peak hour, which is about 2 trips every minute.
- The results of the capacity analyses (see *Exhibit 8*) indicate that operations would be minimally impacted at the key Harlem Avenue / Madison Street intersection, with only about 1.0 seconds of additional calculated delay for each peak hour. Additionally, operations at the Harlem / alley intersection will remain within acceptable LOS levels at LOS D during the weekday evening peak hour and Saturday midday peak hour. It should be noted that the eastbound left-turn lane will operate at LOS F during all peak hours. This is typical throughout the Chicagoland region for an alley/collector access drive that connects to an arterial roadway.

Key Finding. Based on the above, the site impacts on traffic volumes and operations at the Harlem / Madison intersection are nominal. Thus, our recommendations focus on the access operations and site plan elements.

PART IV. RECOMMENDATIONS

Access Operations

Harlem Avenue @ Alley / Access Drive

1. The alley will be widened to provide one inbound and two outbound lanes, striped for separate left and right turns. This will allow alley traffic exiting to the south to more readily make their turn, while those exiting to the north await a gap in both directions of through traffic on Harlem Avenue.
2. Exiting site traffic should have Stop control.
3. The existing sidewalk should be reconstructed across the driveway that is to be closed.

Madison Street Access Drive

1. A right-in and right-out (RIRO) access drive will be provided with signage to instruct drivers. "Right-Turn Only" signage will be provided for outbound movements. Additionally, "No Left-Turn" signage will be provided for vehicles travelling eastbound along Madison Street.
2. Based on a review of the site and total traffic assignments (see *Exhibits 6 and 7*), a westbound right turn lane should not be needed.
3. Appropriate directional signing to the Chipotle online/mobile order pick-up lane will be beneficial.
4. The sidewalk should be reconstructed across the driveways that are to be closed.

Online/Mobile Order Pick-Up Lane Operations

Chipotle proposes to operate an online/mobile order pick-up lane for their customers. Characteristics of this include:

- The pick-up window will be located on the west side of the building and will provide stacking for 7 vehicles from the food pick-up window prior to reaching the north-south site circulation aisle (see *Exhibit 4*). It should be noted that the Chipotle online/mobile order pick-up lane will only serve online/mobile orders and not provide traditional drive-thru operations where customers are able to order from a menu board. Many fast-food and fast-casual restaurants are beginning to implement this technology and it is assumed to be widespread in the coming years. The COVID-19 pandemic has accelerated the pace of demand for restaurants that provide pick-up lanes that support mobile-centric no-contact operations.
- The industry expects potentially up to 65% of all business to utilize the convenience of the drive-thru in the near future. This will undoubtedly help to minimize the customer parking demands.

Key Finding. Based on the above characteristics and discussion, adequate Chipotle online/mobile order pick-up lane stacking will be provided.

Parking and Internal Circulation

On-site planning elements that are included in the Camburas & Theodore, Ltd and later modified by GHA site plan (see *Exhibit 4*):

- As proposed, 26 parking spaces would be provided which translates to a parking ratio of about 10.83 spaces per 1000 square feet. This supply is above what is typically found in inner suburbs that have a large percentage of walking and transit trips.

Key Finding. Based on the above parking data and anticipated business operations, the 26 spaces proposed should be sufficient to accommodate the Chipotle peak parking demands.

- The drive aisle around the building would provide two-way operations. On-site signage is to be provided to direct traffic properly to avoid wrong-way turns / maneuvers.
- A bicycle parking rack should be provided to encourage non-auto trips.

PART V. TECHNICAL ADDENDUM

The following *Exhibits* and *Appendix* were previously referenced. They provide technical support for our observations, findings, and recommendations discussed in the text.

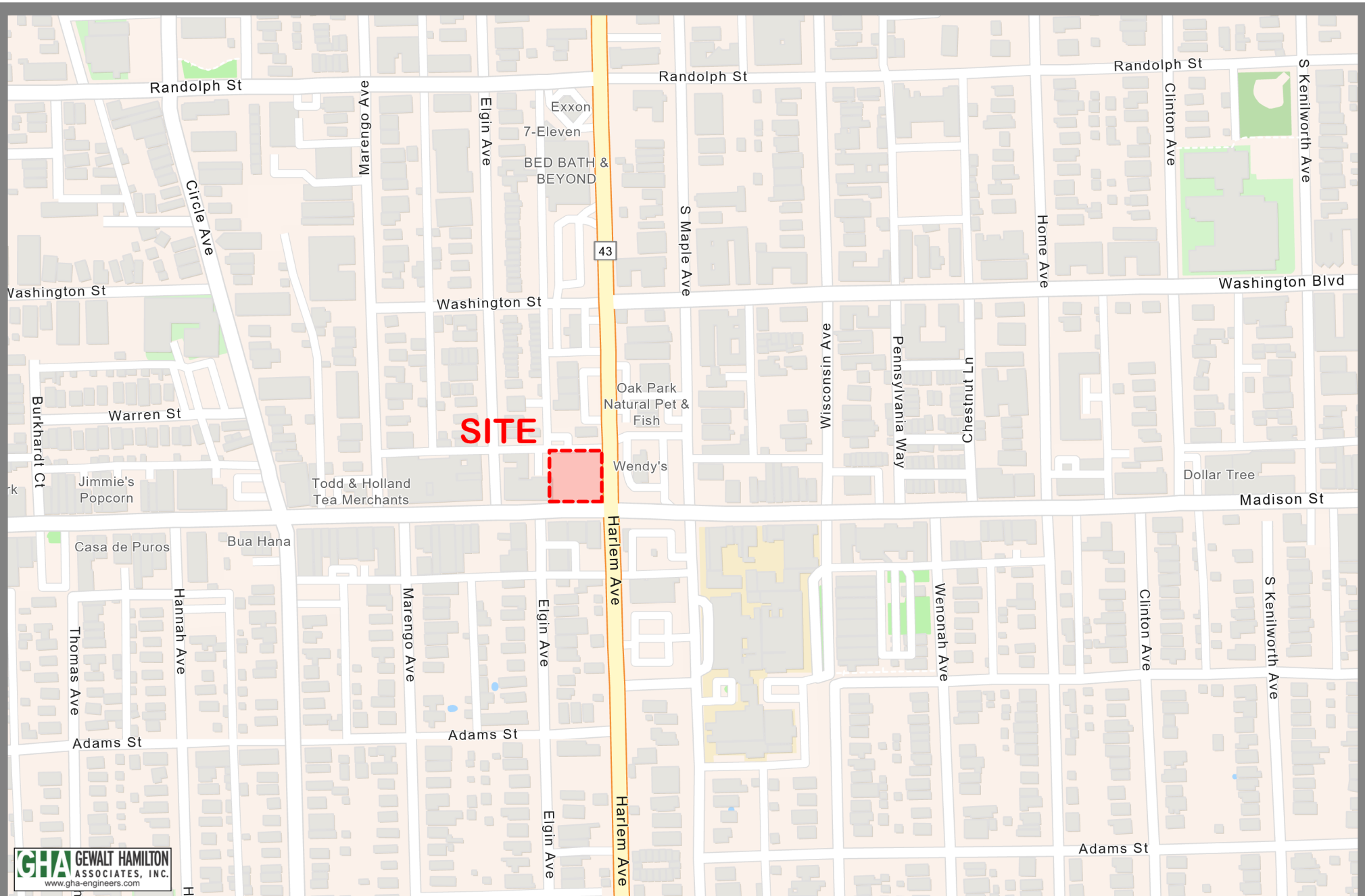
Exhibits

1. Site Location Map
2. Photo Inventory
3. Existing Traffic
4. Site Plan
5. Project Traffic Characteristics
6. Site Traffic
7. Total Traffic
8. Intersection Capacity Analyses

Appendix

- A. Traffic Count Summaries
- B. ITE 10th Edition Trip Generation Manual Pages
- C. CMAP Correspondence
- D. Capacity Analysis Worksheets

EXHIBITS



1 inch = 530 Feet

Map Center: 87.80393°W 41.8798°N

Exhibit 1 - Location Map

Proposed Commercial Development
Forest Park, IL



Alley and Harlem Ave. facing North



Alley and Harlem Ave. facing South



Alley and Harlem Ave. facing East



Alley and Harlem Ave. facing West

Legend:

- XX — Weekday Morning Peak Hour (7:00–8:00AM)
- (XX) — Weekday Evening Peak Hour (3:00–4:00PM)
- [XX] — Saturday Midday Peak Hour (12:00–1:00PM)
- XX — Average Daily Traffic (ADT)
-  — Existing Traffic Signal

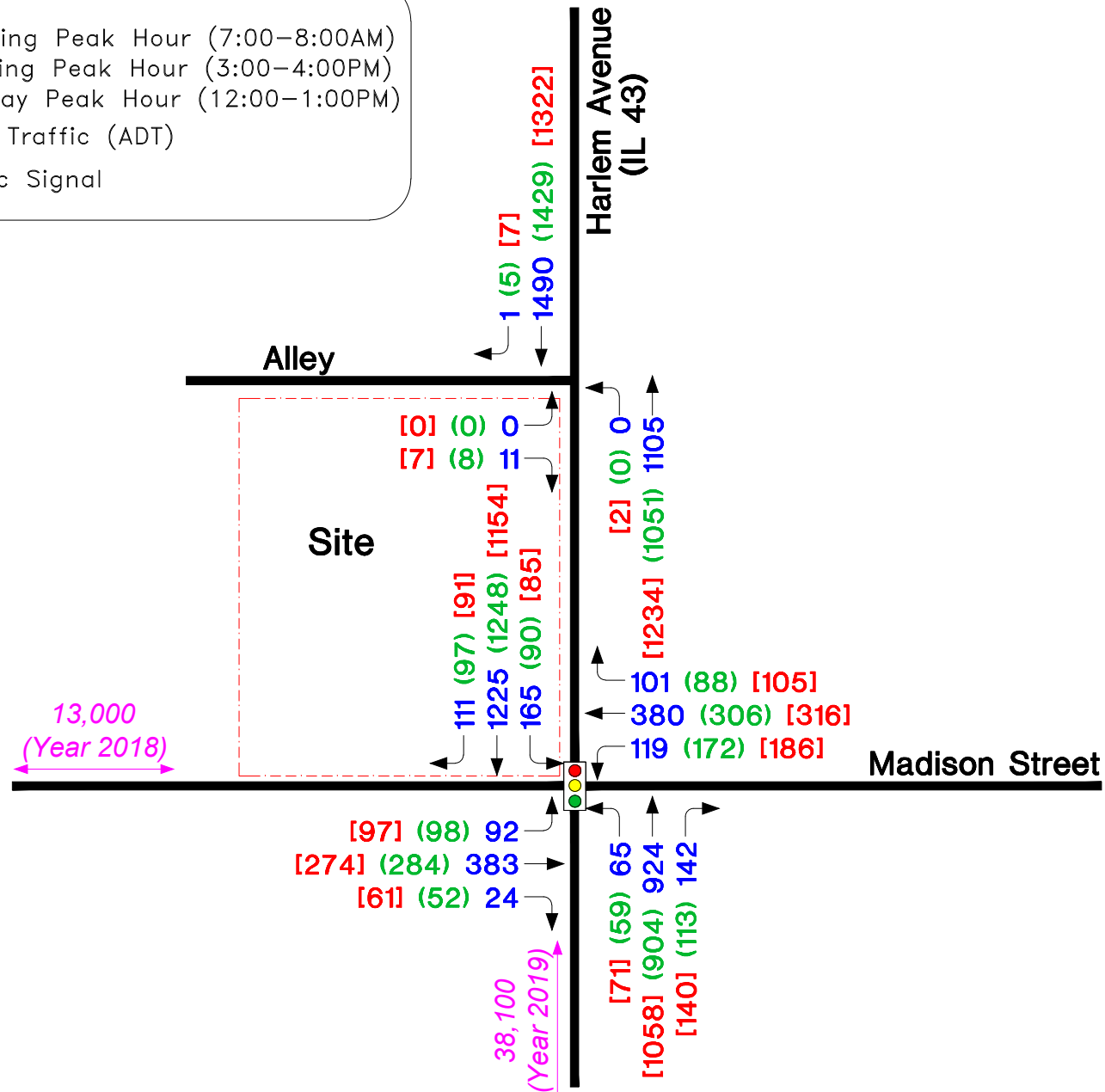


Exhibit 4 - Site Plan

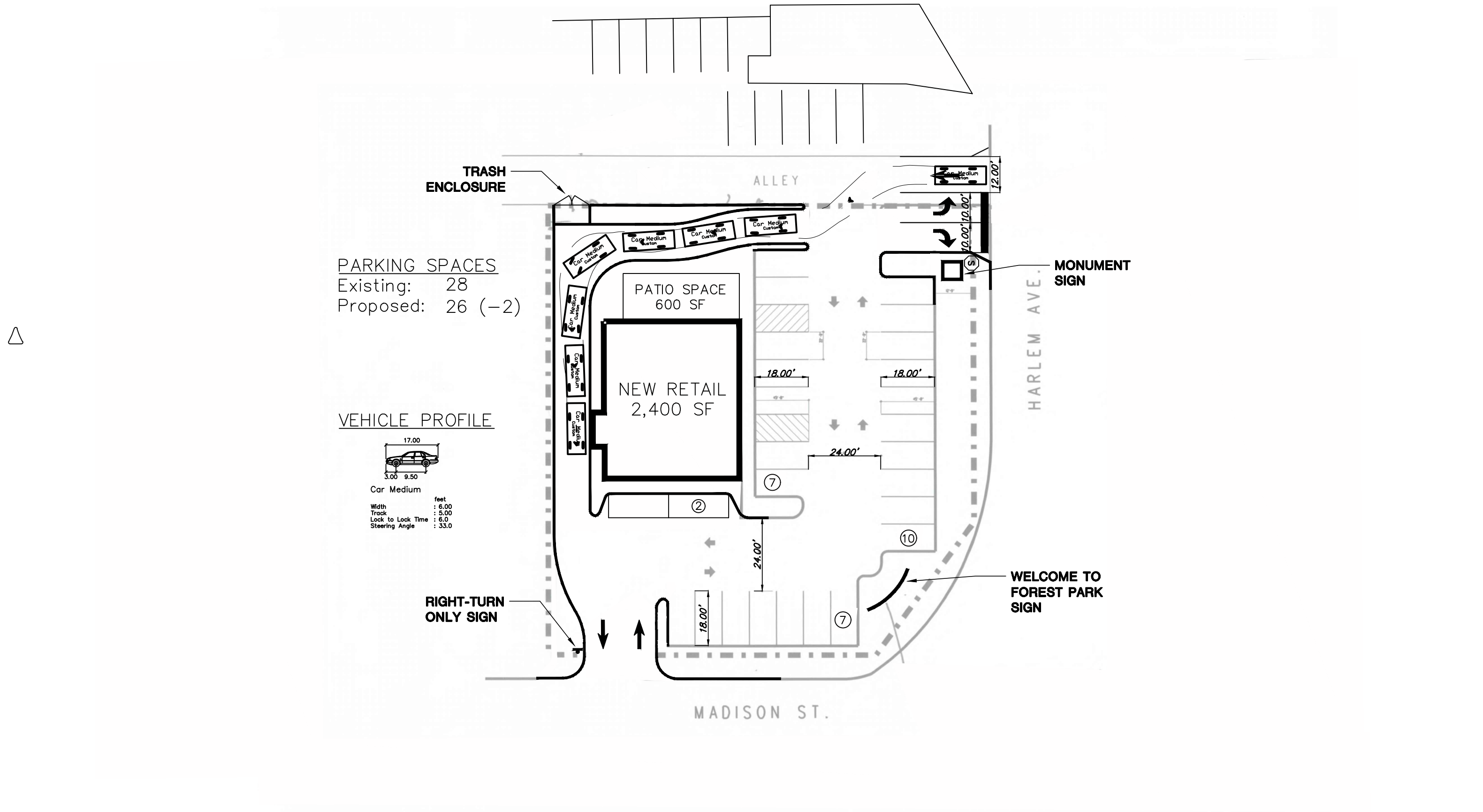


Exhibit 5
Project Traffic Characteristics
Proposed Commercial Development - Forest Park, Illinois

Part A. Traffic Generation Calculations

	Size	ITE Code	Weekday Peak Hours						Saturday Peak Hour			Daily
			Morning			Evening			Midday			Sum
			In	Out	Sum	In	Out	Sum	In	Out	Sum	
Fast-Food Restaurant with Drive-Thru	2,400 SF	#934										
	Walk-in		3	2	5	14	13	27	23	23	46	395
	Drive-thru		0	0	0	26	25	51	44	42	86	735
	Totals =		3	2	5	40	38	78	67	65	132	1,130

Notes:

- 1) ITE Code #930 (Fast-Casual Restaurant) was utilized for the Morning Peak Hour.
- 2) Sources: Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition).
- 3) Industry standard is shifting toward increased drive-through trips, as such, 65% of trips are drive-through oriented.
- 4) No discounts were taken for non-auto trips, which could be as much as 20% for the restaurant due to the location.

Part B. Trip Distribution

Route & Direction	Percent Use	
	Approach Site From	Depart Site To
Harlem Avenue		
- North of Site	60%	10%
- South of Madison Street	10%	60%
Madison Street		
- East of Harlem Avenue	10%	10%
- West of Site	20%	20%
Totals =	100%	100%

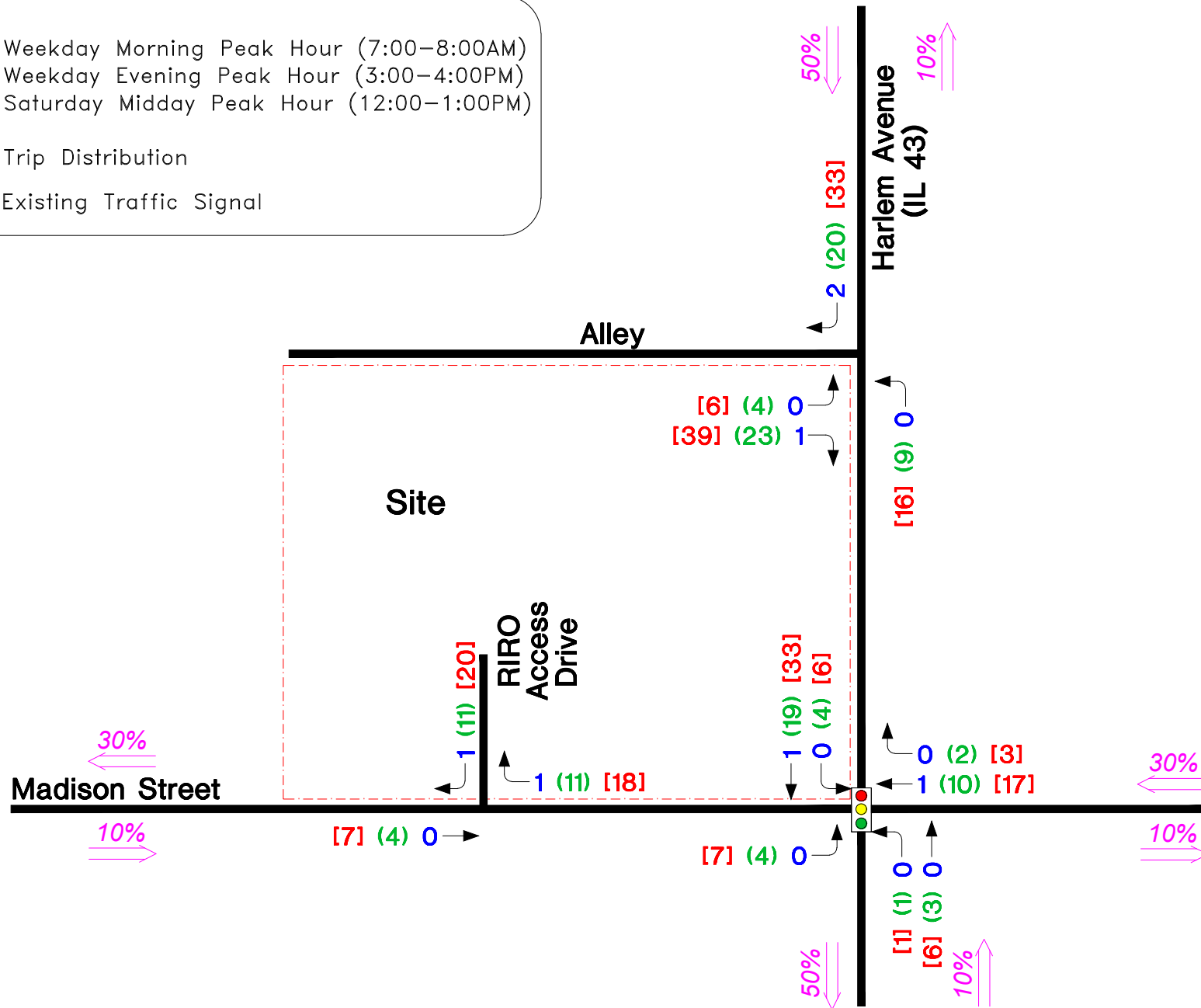
Legend:

- XX** — Weekday Morning Peak Hour (7:00–8:00AM)
- (XX)** — Weekday Evening Peak Hour (3:00–4:00PM)
- [XX]** — Saturday Midday Peak Hour (12:00–1:00PM)

XX% — Trip Distribution



— Existing Traffic Signal



Legend:

- XX — Weekday Morning Peak Hour (7:00–8:00AM)
- (XX) — Weekday Evening Peak Hour (3:00–4:00PM)
- [XX] — Saturday Midday Peak Hour (12:00–1:00PM)
-  — Existing Traffic Signal

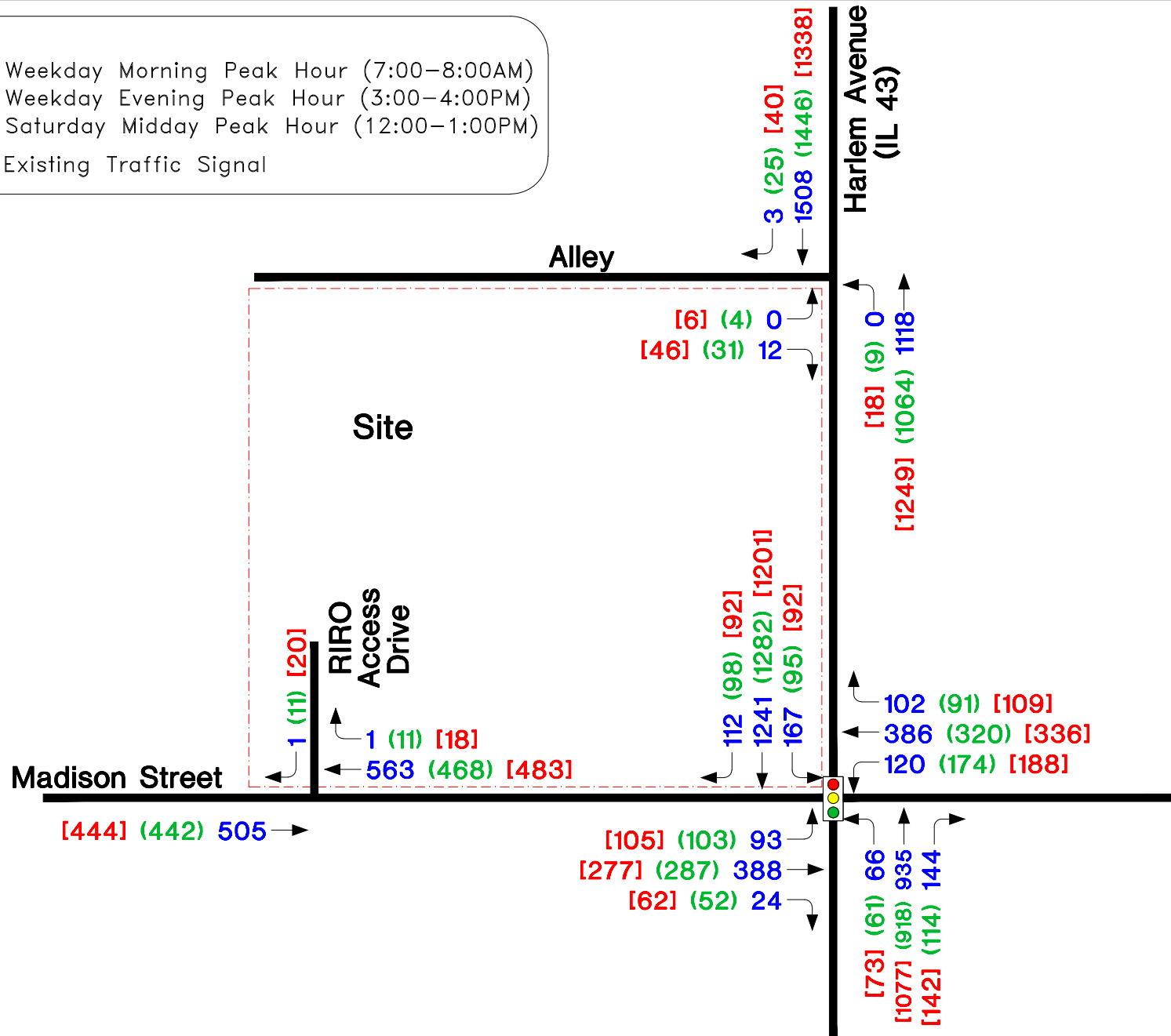


Exhibit 8

Intersection Capacity Analyses

Proposed Commercial Development - Forest Park, IL.

Part A. Parameters - Type of Traffic Control (Source: 2016 Highway Capacity Manual)

I. Traffic Signals

LOS	Delay (sec / veh)	Description
A	£ 10	All signal phases clear waiting vehicles without delay
B	>10 and £ 20	Minimal delay experienced on select signal phases
C	>20 and £ 35	Some delay experienced on several phases; often used as design criteria
D	>35 and £ 55	Usually considered as the acceptable delay standard
E	>55 and £ 80	Very long delays experienced during the peak hours
F	>80	Unacceptable delays experienced throughout the peak hours

II. Stop Sign

LOS	Delay (sec / veh)
A	£ 10
B	>10 and £ 15
C	>15 and £ 25
D	>25 and £ 35
E	>35 and £ 50
F	>50

Part B. Results

Part B. Results	Traffic Control & Roadway Conditions	LOS Per Movement Group By Approach												Intersection / Approach	
		> = Shared Lane - = Non Critical or not Allowed Movement													
		Eastbound			Westbound			Northbound			Southbound			Delay (sec / veh)	LOS
1. Harlem Ave. @ Madison St.	Traffic Signal	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	Intersection Delay	
A. Weekday Morning Peak Hour Existing Traffic (see Exhibit 3) Total Traffic - Year 2026 (see Exhibit 7)	• Current	D	D	<	D	D	<	B	B	<	B	B	<	24.4	C
	• Current	D	D	<	D	D	<	B	B	<	B	B	<	24.7	C
B. Weekday Evening Peak Hour Existing Traffic (see Exhibit 3) Total Traffic - Year 2026 (see Exhibit 7)	• Current	D	D	<	D	D	<	B	B	<	B	B	<	22.5	C
	• Current	D	D	<	D	D	<	B	B	<	B	B	<	23.1	C
C. Saturday Midday Peak Hour Existing Traffic (see Exhibit 3) Total Traffic - Year 2026 (see Exhibit 7)	• Current	D	D	<	D	D	<	B	B	<	B	B	<	22.8	C
	• Current	D	D	<	D	D	<	B	B	<	B	B	<	23.7	C
2. Harlem Ave. @ Alley	TWSC - EB Stops	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	EB Approach Delay	
A. Weekday Morning Peak Hour Existing Traffic (see Exhibit 3) Total Traffic - Year 2026 (see Exhibit 7)	• Current	>	C	<	-	-	-	B	-	-	-	-	-	16.7	C
	• Current	F	-	C	-	-	-	B	-	-	-	-	-	16.9	C
B. Weekday Evening Peak Hour Existing Traffic (see Exhibit 3) Total Traffic - Year 2026 (see Exhibit 7)	• Current	>	C	<	-	-	-	B	-	-	-	-	-	16.0	C
	• Current	F	-	C	-	-	-	B	-	-	-	-	-	28.8	D
C. Saturday Midday Peak Hour Existing Traffic (see Exhibit 3) Total Traffic - Year 2026 (see Exhibit 7)	• Current	>	C	<	-	-	-	B	-	-	-	-	-	15.0	B
	• Current	F	-	C	-	-	-	B	-	-	-	-	-	31.6	D

APPENDIX A

Traffic Count Summary Sheets

Turning Movement Data

Start Time	Harlem Ave Southbound					Harlem Ave Northbound					Alley North of Madison St Eastbound					Int. Total
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	
6:00 AM	0	290	0	0	290	150	0	0	0	150	1	0	0	4	1	441
6:15 AM	0	347	0	0	347	218	0	0	0	218	0	0	0	0	0	565
6:30 AM	0	356	0	0	356	234	0	0	0	234	2	0	0	0	2	592
6:45 AM	0	364	0	0	364	250	0	0	0	250	0	0	0	0	0	614
Hourly Total	0	1357	0	0	1357	852	0	0	0	852	3	0	0	4	3	2212
7:00 AM	0	367	0	0	367	252	0	0	0	252	1	0	0	0	1	620
7:15 AM	1	377	0	0	378	257	0	0	0	257	3	0	0	0	3	638
7:30 AM	0	345	0	2	345	292	0	0	0	292	2	0	0	4	2	639
7:45 AM	0	402	0	0	402	298	0	0	0	298	3	0	0	2	3	703
Hourly Total	1	1491	0	2	1492	1099	0	0	0	1099	9	0	0	6	9	2600
8:00 AM	0	366	0	0	366	258	0	0	0	258	3	0	0	1	3	627
8:15 AM	0	334	0	0	334	271	0	0	0	271	2	0	0	3	2	607
8:30 AM	0	361	0	0	361	284	0	0	0	284	2	0	0	0	2	647
8:45 AM	0	340	0	0	340	283	0	0	0	283	1	0	0	2	1	624
Hourly Total	0	1401	0	0	1401	1096	0	0	0	1096	8	0	0	6	8	2505
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	2	336	0	0	338	286	0	0	0	286	3	0	0	4	3	627
3:15 PM	0	371	0	0	371	284	0	0	0	284	3	0	0	7	3	658
3:30 PM	2	359	0	0	361	229	0	0	0	229	0	0	0	7	0	590
3:45 PM	1	363	0	0	364	252	0	0	0	252	2	0	0	4	2	618
Hourly Total	5	1429	0	0	1434	1051	0	0	0	1051	8	0	0	22	8	2493
4:00 PM	0	296	0	2	296	255	0	0	0	255	1	0	0	5	1	552
4:15 PM	0	357	0	1	357	288	0	0	1	288	0	0	0	2	0	645
4:30 PM	2	285	0	0	287	239	0	0	0	239	0	0	0	2	0	526
4:45 PM	1	326	0	0	327	275	0	0	0	275	1	0	0	3	1	603
Hourly Total	3	1264	0	3	1267	1057	0	0	1	1057	2	0	0	12	2	2326
5:00 PM	1	318	0	0	319	262	0	0	0	262	1	0	0	5	1	582
5:15 PM	1	307	0	0	308	255	0	0	0	255	1	0	0	6	1	564
5:30 PM	2	299	0	2	301	266	0	0	0	266	0	0	0	5	0	567
5:45 PM	0	331	0	3	331	263	0	0	0	263	0	0	0	8	0	594
Hourly Total	4	1255	0	5	1259	1046	0	0	0	1046	2	0	0	24	2	2307
Grand Total	13	8197	0	10	8210	6201	0	0	1	6201	32	0	0	74	32	14443
Approach %	0.2	99.8	0.0	-	-	100.0	0.0	0.0	-	-	100.0	0.0	0.0	-	-	-
Total %	0.1	56.8	0.0	-	56.8	42.9	0.0	0.0	-	42.9	0.2	0.0	0.0	-	0.2	-
Lights	13	7913	0	-	7926	5905	0	0	-	5905	32	0	0	-	32	13863
% Lights	100.0	96.5	-	-	96.5	95.2	-	-	-	95.2	100.0	-	-	-	100.0	96.0
Mediums	0	200	0	-	200	207	0	0	-	207	0	0	0	-	0	407
% Mediums	0.0	2.4	-	-	2.4	3.3	-	-	-	3.3	0.0	-	-	-	0.0	2.8
Articulated Trucks	0	84	0	-	84	89	0	0	-	89	0	0	0	-	0	173

% Articulated Trucks	0.0	1.0	-	-	1.0	1.4	-	-	-	1.4	0.0	-	-	-	0.0	1.2
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	4.1	-	-
Pedestrians	-	-	-	10	-	-	-	-	1	-	-	-	-	71	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	95.9	-	-

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Harlem Ave Southbound					Harlem Ave Northbound					Alley North of Madison St Eastbound					Int. Total
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	
7:15 AM	1	377	0	0	378	257	0	0	0	257	3	0	0	0	3	638
7:30 AM	0	345	0	2	345	292	0	0	0	292	2	0	0	4	2	639
7:45 AM	0	402	0	0	402	298	0	0	0	298	3	0	0	2	3	703
8:00 AM	0	366	0	0	366	258	0	0	0	258	3	0	0	1	3	627
Total	1	1490	0	2	1491	1105	0	0	0	1105	11	0	0	7	11	2607
Approach %	0.1	99.9	0.0	-	-	100.0	0.0	0.0	-	-	100.0	0.0	0.0	-	-	-
Total %	0.0	57.2	0.0	-	57.2	42.4	0.0	0.0	-	42.4	0.4	0.0	0.0	-	0.4	-
PHF	0.250	0.927	0.000	-	0.927	0.927	0.000	0.000	-	0.927	0.917	0.000	0.000	-	0.917	0.927
Lights	1	1432	0	-	1433	1024	0	0	-	1024	11	0	0	-	11	2468
% Lights	100.0	96.1	-	-	96.1	92.7	-	-	-	92.7	100.0	-	-	-	100.0	94.7
Mediums	0	42	0	-	42	60	0	0	-	60	0	0	0	-	0	102
% Mediums	0.0	2.8	-	-	2.8	5.4	-	-	-	5.4	0.0	-	-	-	0.0	3.9
Articulated Trucks	0	16	0	-	16	21	0	0	-	21	0	0	0	-	0	37
% Articulated Trucks	0.0	1.1	-	-	1.1	1.9	-	-	-	1.9	0.0	-	-	-	0.0	1.4
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	7	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Count Name: Harlem Avenue @ Alley North of
Madison Street
Site Code:
Start Date: 09/19/2019
Page No: 6

Turning Movement Peak Hour Data (3:00 PM)

[illegible]

Turning Movement Data

Start Time	Harlem Ave Southbound						Westbound Approach Westbound						Harlem Ave Northbound						Alley North of Madison St Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
11:00 AM	0	371	0	0	1	371	4	0	0	0	0	4	5	302	0	0	0	307	3	0	0	0	10	3	685
11:15 AM	1	300	0	0	0	301	3	0	0	0	4	3	4	286	0	0	0	290	2	0	0	0	1	2	596
11:30 AM	1	340	4	0	2	345	5	0	0	0	6	5	6	318	0	0	0	324	2	0	0	0	2	2	676
11:45 AM	0	319	1	0	0	320	3	0	0	0	3	3	6	278	1	0	0	285	1	0	0	0	5	1	609
Hourly Total	2	1330	5	0	3	1337	15	0	0	0	13	15	21	1184	1	0	0	1206	8	0	0	0	18	8	2566
12:00 PM	2	365	0	0	0	367	3	0	1	0	2	4	2	332	0	0	0	334	0	0	0	0	6	0	705
12:15 PM	1	305	2	1	0	309	1	0	0	0	0	1	7	303	1	0	0	311	1	0	0	0	9	1	622
12:30 PM	1	349	0	0	1	350	7	0	1	0	2	8	6	309	0	0	0	315	4	0	0	0	5	4	677
12:45 PM	3	303	4	0	0	310	4	0	1	0	0	5	5	290	1	0	0	296	2	0	0	0	2	2	613
Hourly Total	7	1322	6	1	1	1336	15	0	3	0	4	18	20	1234	2	0	0	1256	7	0	0	0	22	7	2617
1:00 PM	2	294	0	0	0	296	1	0	0	0	0	1	2	215	0	0	0	217	2	0	0	0	4	2	516
1:15 PM	2	291	3	0	0	296	4	0	0	0	2	4	6	265	0	0	0	271	2	0	0	0	5	2	573
1:30 PM	3	385	2	0	0	390	5	0	1	0	2	6	3	291	0	0	2	294	1	0	0	0	3	1	691
1:45 PM	1	327	1	0	0	329	2	0	2	0	2	4	6	268	1	0	0	275	3	0	0	0	4	3	611
Hourly Total	8	1297	6	0	0	1311	12	0	3	0	6	15	17	1039	1	0	2	1057	8	0	0	0	16	8	2391
Grand Total	17	3949	17	1	4	3984	42	0	6	0	23	48	58	3457	4	0	2	3519	23	0	0	0	56	23	7574
Approach %	0.4	99.1	0.4	0.0	-	-	87.5	0.0	12.5	0.0	-	-	1.6	98.2	0.1	0.0	-	-	100.0	0.0	0.0	0.0	-	-	-
Total %	0.2	52.1	0.2	0.0	-	52.6	0.6	0.0	0.1	0.0	-	0.6	0.8	45.6	0.1	0.0	-	46.5	0.3	0.0	0.0	0.0	-	0.3	-
Lights	17	3872	17	1	-	3907	42	0	6	0	-	48	57	3379	4	0	-	3440	22	0	0	0	-	22	7417
% Lights	100.0	98.1	100.0	100.0	-	98.1	100.0	-	100.0	-	-	100.0	98.3	97.7	100.0	-	-	97.8	95.7	-	-	-	-	95.7	97.9
Mediums	0	57	0	0	-	57	0	0	0	0	-	0	1	66	0	0	-	67	1	0	0	0	-	1	125
% Mediums	0.0	1.4	0.0	0.0	-	1.4	0.0	-	0.0	-	-	0.0	1.7	1.9	0.0	-	-	1.9	4.3	-	-	-	-	4.3	1.7
Articulated Trucks	0	20	0	0	-	20	0	0	0	0	-	0	0	12	0	0	-	12	0	0	0	0	-	0	32
% Articulated Trucks	0.0	0.5	0.0	0.0	-	0.5	0.0	-	0.0	-	-	0.0	0.0	0.3	0.0	-	-	0.3	0.0	-	-	-	-	0.0	0.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	4.3	-	-	-	-	-	0.0	-	-	-	-	-	1.8	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	22	-	-	-	-	-	2	-	-	-	-	-	55	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	95.7	-	-	-	-	-	100.0	-	-	-	-	-	98.2	-	-

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive
Vernon Hills, Illinois, United States 60061
(847) 478-9700 poster@gha-engineers.com

Count Name: Harlem Avenue @ Alley North of
Madison Street
Site Code:
Start Date: 09/21/2019
Page No: 3

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Harlem Ave Southbound						Westbound Approach Westbound						Harlem Ave Northbound						Alley North of Madison St Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
11:00 AM	0	371	0	0	1	371	4	0	0	0	0	4	5	302	0	0	0	307	3	0	0	0	10	3	685
11:15 AM	1	300	0	0	0	301	3	0	0	0	4	3	4	286	0	0	0	290	2	0	0	0	1	2	596
11:30 AM	1	340	4	0	2	345	5	0	0	0	6	5	6	318	0	0	0	324	2	0	0	0	2	2	676
11:45 AM	0	319	1	0	0	320	3	0	0	0	3	3	6	278	1	0	0	285	1	0	0	0	5	1	609
Total	2	1330	5	0	3	1337	15	0	0	0	13	15	21	1184	1	0	0	1206	8	0	0	0	18	8	2566
Approach %	0.1	99.5	0.4	0.0	-	-	100.0	0.0	0.0	0.0	-	-	1.7	98.2	0.1	0.0	-	-	100.0	0.0	0.0	0.0	-	-	-
Total %	0.1	51.8	0.2	0.0	-	52.1	0.6	0.0	0.0	0.0	-	0.6	0.8	46.1	0.0	0.0	-	47.0	0.3	0.0	0.0	0.0	-	0.3	-
PHF	0.500	0.896	0.313	0.000	-	0.901	0.750	0.000	0.000	0.000	-	0.750	0.875	0.931	0.250	0.000	-	0.931	0.667	0.000	0.000	0.000	-	0.667	0.936
Lights	2	1303	5	0	-	1310	15	0	0	0	-	15	20	1156	1	0	-	1177	8	0	0	0	-	8	2510
% Lights	100.0	98.0	100.0	-	-	98.0	100.0	-	-	-	-	100.0	95.2	97.6	100.0	-	-	97.6	100.0	-	-	-	-	100.0	97.8
Mediums	0	21	0	0	-	21	0	0	0	0	-	0	1	24	0	0	-	25	0	0	0	0	-	0	46
% Mediums	0.0	1.6	0.0	-	-	1.6	0.0	-	-	-	-	0.0	4.8	2.0	0.0	-	-	2.1	0.0	-	-	-	-	0.0	1.8
Articulated Trucks	0	6	0	0	-	6	0	0	0	0	-	0	0	4	0	0	-	4	0	0	0	0	-	0	10
% Articulated Trucks	0.0	0.5	0.0	-	-	0.4	0.0	-	-	-	-	0.0	0.0	0.3	0.0	-	-	0.3	0.0	-	-	-	-	0.0	0.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	3	-	-	-	-	-	13	-	-	-	-	-	0	-	-	-	-	-	18	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Harlem Ave Southbound						Westbound Approach Westbound						Harlem Ave Northbound						Alley North of Madison St Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
12:00 PM	2	365	0	0	0	367	3	0	1	0	2	4	2	332	0	0	0	334	0	0	0	0	6	0	705
12:15 PM	1	305	2	1	0	309	1	0	0	0	0	1	7	303	1	0	0	311	1	0	0	0	9	1	622
12:30 PM	1	349	0	0	1	350	7	0	1	0	2	8	6	309	0	0	0	315	4	0	0	0	5	4	677
12:45 PM	3	303	4	0	0	310	4	0	1	0	0	5	5	290	1	0	0	296	2	0	0	0	2	2	613
Total	7	1322	6	1	1	1336	15	0	3	0	4	18	20	1234	2	0	0	1256	7	0	0	0	22	7	2617
Approach %	0.5	99.0	0.4	0.1	-	-	83.3	0.0	16.7	0.0	-	-	1.6	98.2	0.2	0.0	-	-	100.0	0.0	0.0	0.0	-	-	-
Total %	0.3	50.5	0.2	0.0	-	51.1	0.6	0.0	0.1	0.0	-	0.7	0.8	47.2	0.1	0.0	-	48.0	0.3	0.0	0.0	0.0	-	0.3	-
PHF	0.583	0.905	0.375	0.250	-	0.910	0.536	0.000	0.750	0.000	-	0.563	0.714	0.929	0.500	0.000	-	0.940	0.438	0.000	0.000	0.000	-	0.438	0.928
Lights	7	1297	6	1	-	1311	15	0	3	0	-	18	20	1208	2	0	-	1230	6	0	0	0	-	6	2565
% Lights	100.0	98.1	100.0	100.0	-	98.1	100.0	-	100.0	-	-	100.0	100.0	97.9	100.0	-	-	97.9	85.7	-	-	-	-	85.7	98.0
Mediums	0	16	0	0	-	16	0	0	0	0	-	0	0	23	0	0	-	23	1	0	0	0	-	1	40
% Mediums	0.0	1.2	0.0	0.0	-	1.2	0.0	-	0.0	-	-	0.0	0.0	1.9	0.0	-	-	1.8	14.3	-	-	-	-	14.3	1.5
Articulated Trucks	0	9	0	0	-	9	0	0	0	0	-	0	0	3	0	0	-	3	0	0	0	0	-	0	12
% Articulated Trucks	0.0	0.7	0.0	0.0	-	0.7	0.0	-	0.0	-	-	0.0	0.0	0.2	0.0	-	-	0.2	0.0	-	-	-	-	0.0	0.5
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	25.0	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	22	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	75.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Turning Movement Data

Start Time	South Harlem Ave Southbound						Madison St Westbound						South Harlem Ave Northbound						Madison St Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
6:00 AM	16	250	18	0	4	284	16	30	24	0	1	70	24	131	12	0	3	167	8	32	5	0	4	45	566
6:15 AM	15	313	19	0	3	347	25	50	18	0	0	93	11	181	6	0	2	198	11	44	14	0	0	69	707
6:30 AM	24	293	48	0	1	365	27	64	22	0	0	113	25	196	11	0	0	232	6	59	11	0	0	76	786
6:45 AM	30	287	47	0	2	364	28	77	30	0	1	135	33	199	12	0	2	244	9	74	25	0	1	108	851
Hourly Total	85	1143	132	0	10	1360	96	221	94	0	2	411	93	707	41	0	7	841	34	209	55	0	5	298	2910
7:00 AM	28	290	44	0	2	362	27	100	39	0	0	166	29	203	10	0	4	242	9	90	24	0	2	123	893
7:15 AM	29	316	32	0	4	377	28	92	32	0	1	152	39	209	18	0	1	266	4	98	21	0	1	123	918
7:30 AM	28	277	51	0	4	356	24	95	16	0	1	135	39	254	19	0	4	312	6	106	22	0	4	134	937
7:45 AM	26	342	38	0	3	406	22	93	32	0	2	147	35	258	18	0	3	311	5	89	25	0	4	119	983
Hourly Total	111	1225	165	0	13	1501	101	380	119	0	4	600	142	924	65	0	12	1131	24	383	92	0	11	499	3731
8:00 AM	23	304	39	0	2	366	25	93	31	0	3	149	26	220	15	0	0	261	7	97	12	0	0	116	892
8:15 AM	31	272	31	0	4	334	29	84	31	0	0	144	33	243	17	0	2	293	9	89	14	0	2	112	883
8:30 AM	40	289	33	0	3	362	32	78	30	0	3	140	34	241	17	0	10	292	7	90	24	0	1	121	915
8:45 AM	31	288	40	0	1	359	26	82	30	0	3	138	51	258	20	0	5	329	5	90	22	0	1	117	943
Hourly Total	125	1153	143	0	10	1421	112	337	122	0	9	571	144	962	69	0	17	1175	28	366	72	0	4	466	3633
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:00 PM	14	308	23	0	15	345	33	61	51	0	2	145	22	244	17	0	7	283	14	64	21	0	6	99	872
3:15 PM	29	327	24	0	2	380	18	80	37	0	5	135	35	251	13	0	12	299	19	63	21	0	4	103	917
3:30 PM	24	308	18	0	3	350	17	76	51	0	2	144	33	204	18	0	8	255	10	61	23	0	6	94	843
3:45 PM	30	305	25	0	0	360	20	89	33	0	3	142	23	205	11	0	6	239	9	96	33	0	5	138	879
Hourly Total	97	1248	90	0	20	1435	88	306	172	0	12	566	113	904	59	0	33	1076	52	284	98	0	21	434	3511
4:00 PM	24	249	22	0	5	295	18	88	34	0	6	140	24	213	17	0	7	254	9	72	24	0	2	105	794
4:15 PM	29	294	37	0	9	360	16	84	36	0	5	136	23	254	12	0	7	289	9	79	23	0	6	111	896
4:30 PM	15	240	31	0	0	286	29	96	45	0	2	170	19	193	16	0	10	228	6	93	23	0	3	122	806
4:45 PM	25	283	22	0	1	330	21	83	37	0	0	141	41	235	16	0	3	292	10	71	18	0	2	99	862
Hourly Total	93	1066	112	0	15	1271	84	351	152	0	13	587	107	895	61	0	27	1063	34	315	88	0	13	437	3358
5:00 PM	17	275	29	0	9	321	34	97	41	0	4	172	25	220	14	0	10	259	13	84	22	0	8	119	871
5:15 PM	25	281	34	0	7	340	21	85	34	0	7	140	21	239	20	0	5	280	9	80	20	0	9	109	869
5:30 PM	28	253	30	0	3	311	20	88	26	0	5	134	32	260	27	0	5	319	14	77	21	0	4	112	876
5:45 PM	42	274	36	0	1	352	14	83	25	0	4	122	33	229	16	0	9	278	6	78	31	0	8	115	867
Hourly Total	112	1083	129	0	20	1324	89	353	126	0	20	568	111	948	77	0	29	1136	42	319	94	0	29	455	3483
Grand Total	623	6918	771	0	88	8312	570	1948	785	0	60	3303	710	5340	372	0	125	6422	214	1876	499	0	83	2589	20626
Approach %	7.5	83.2	9.3	0.0	-	-	17.3	59.0	23.8	0.0	-	-	11.1	83.2	5.8	0.0	-	-	8.3	72.5	19.3	0.0	-	-	-
Total %	3.0	33.5	3.7	0.0	-	40.3	2.8	9.4	3.8	0.0	-	16.0	3.4	25.9	1.8	0.0	-	31.1	1.0	9.1	2.4	0.0	-	12.6	-
Lights	584	6682	749	0	-	8015	547	1882	767	0	-	3196	686	5104	361	0	-	6151	207	1807	465	0	-	2479	19841
% Lights	93.7	96.6	97.1	-	-	96.4	96.0	96.6	97.7	-	-	96.8	96.6	95.6	97.0	-	-	95.8	96.7	96.3	93.2	-	-	95.8	96.2
Mediums	38	155	18	0	-	211	19	62	13	0	-	94	15	149	8	0	-	172	6	62	34	0	-	102	579
% Mediums	6.1	2.2	2.3	-	-	2.5	3.3	3.2	1.7	-	-	2.8	2.1	2.8	2.2	-	-	2.7	2.8	3.3	6.8	-	-	3.9	2.8

Articulated Trucks	1	81	4	0	-	86	4	4	5	0	-	13	9	87	3	0	-	99	1	7	0	0	-	8	206
% Articulated Trucks	0.2	1.2	0.5	-	-	1.0	0.7	0.2	0.6	-	-	0.4	1.3	1.6	0.8	-	-	1.5	0.5	0.4	0.0	-	-	0.3	1.0
Bicycles on Crosswalk	-	-	-	-	5	-	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-	2	-	-	-
% Bicycles on Crosswalk	-	-	-	-	5.7	-	-	-	-	3.3	-	-	-	-	-	2.4	-	-	-	-	-	2.4	-	-	-
Pedestrians	-	-	-	-	83	-	-	-	-	58	-	-	-	-	-	122	-	-	-	-	-	81	-	-	-
% Pedestrians	-	-	-	-	94.3	-	-	-	-	96.7	-	-	-	-	-	97.6	-	-	-	-	-	97.6	-	-	-

Turning Movement Peak Hour Data (7:00 AM)

Start Time	South Harlem Ave Southbound						Madison St Westbound						South Harlem Ave Northbound						Madison St Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
7:00 AM	28	290	44	0	2	362	27	100	39	0	0	166	29	203	10	0	4	242	9	90	24	0	2	123	893
7:15 AM	29	316	32	0	4	377	28	92	32	0	1	152	39	209	18	0	1	266	4	98	21	0	1	123	918
7:30 AM	28	277	51	0	4	356	24	95	16	0	1	135	39	254	19	0	4	312	6	106	22	0	4	134	937
7:45 AM	26	342	38	0	3	406	22	93	32	0	2	147	35	258	18	0	3	311	5	89	25	0	4	119	983
Total	111	1225	165	0	13	1501	101	380	119	0	4	600	142	924	65	0	12	1131	24	383	92	0	11	499	3731
Approach %	7.4	81.6	11.0	0.0	-	-	16.8	63.3	19.8	0.0	-	-	12.6	81.7	5.7	0.0	-	-	4.8	76.8	18.4	0.0	-	-	-
Total %	3.0	32.8	4.4	0.0	-	40.2	2.7	10.2	3.2	0.0	-	16.1	3.8	24.8	1.7	0.0	-	30.3	0.6	10.3	2.5	0.0	-	13.4	-
PHF	0.957	0.895	0.809	0.000	-	0.924	0.902	0.950	0.763	0.000	-	0.904	0.910	0.895	0.855	0.000	-	0.906	0.667	0.903	0.920	0.000	-	0.931	0.949
Lights	104	1191	163	0	-	1458	96	368	114	0	-	578	133	857	63	0	-	1053	22	354	85	0	-	461	3550
% Lights	93.7	97.2	98.8	-	-	97.1	95.0	96.8	95.8	-	-	96.3	93.7	92.7	96.9	-	-	93.1	91.7	92.4	92.4	-	-	92.4	95.1
Mediums	7	22	2	0	-	31	4	10	5	0	-	19	6	43	1	0	-	50	1	26	7	0	-	34	134
% Mediums	6.3	1.8	1.2	-	-	2.1	4.0	2.6	4.2	-	-	3.2	4.2	4.7	1.5	-	-	4.4	4.2	6.8	7.6	-	-	6.8	3.6
Articulated Trucks	0	12	0	0	-	12	1	2	0	0	-	3	3	24	1	0	-	28	1	3	0	0	-	4	47
% Articulated Trucks	0.0	1.0	0.0	-	-	0.8	1.0	0.5	0.0	-	-	0.5	2.1	2.6	1.5	-	-	2.5	4.2	0.8	0.0	-	-	0.8	1.3
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	7.7	-	-	-	-	-	0.0	-	-	-	-	-	8.3	-	-	-	-	-	9.1	-	-
Pedestrians	-	-	-	-	12	-	-	-	-	-	4	-	-	-	-	-	11	-	-	-	-	-	10	-	-
% Pedestrians	-	-	-	-	92.3	-	-	-	-	-	100.0	-	-	-	-	-	91.7	-	-	-	-	-	90.9	-	-

Turning Movement Peak Hour Data (3:00 PM)

Start Time	South Harlem Ave Southbound						Madison St Westbound						South Harlem Ave Northbound						Madison St Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
3:00 PM	14	308	23	0	15	345	33	61	51	0	2	145	22	244	17	0	7	283	14	64	21	0	6	99	872
3:15 PM	29	327	24	0	2	380	18	80	37	0	5	135	35	251	13	0	12	299	19	63	21	0	4	103	917
3:30 PM	24	308	18	0	3	350	17	76	51	0	2	144	33	204	18	0	8	255	10	61	23	0	6	94	843
3:45 PM	30	305	25	0	0	360	20	89	33	0	3	142	23	205	11	0	6	239	9	96	33	0	5	138	879
Total	97	1248	90	0	20	1435	88	306	172	0	12	566	113	904	59	0	33	1076	52	284	98	0	21	434	3511
Approach %	6.8	87.0	6.3	0.0	-	-	15.5	54.1	30.4	0.0	-	-	10.5	84.0	5.5	0.0	-	-	12.0	65.4	22.6	0.0	-	-	-
Total %	2.8	35.5	2.6	0.0	-	40.9	2.5	8.7	4.9	0.0	-	16.1	3.2	25.7	1.7	0.0	-	30.6	1.5	8.1	2.8	0.0	-	12.4	-
PHF	0.808	0.954	0.900	0.000	-	0.944	0.667	0.860	0.843	0.000	-	0.976	0.807	0.900	0.819	0.000	-	0.900	0.684	0.740	0.742	0.000	-	0.786	0.957
Lights	90	1193	87	0	-	1370	82	296	166	0	-	544	113	877	56	0	-	1046	50	277	93	0	-	420	3380
% Lights	92.8	95.6	96.7	-	-	95.5	93.2	96.7	96.5	-	-	96.1	100.0	97.0	94.9	-	-	97.2	96.2	97.5	94.9	-	-	96.8	96.3
Mediums	7	39	3	0	-	49	5	10	4	0	-	19	0	13	2	0	-	15	2	7	5	0	-	14	97
% Mediums	7.2	3.1	3.3	-	-	3.4	5.7	3.3	2.3	-	-	3.4	0.0	1.4	3.4	-	-	1.4	3.8	2.5	5.1	-	-	3.2	2.8
Articulated Trucks	0	16	0	0	-	16	1	0	2	0	-	3	0	14	1	0	-	15	0	0	0	0	-	0	34
% Articulated Trucks	0.0	1.3	0.0	-	-	1.1	1.1	0.0	1.2	-	-	0.5	0.0	1.5	1.7	-	-	1.4	0.0	0.0	0.0	-	-	0.0	1.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	3.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	20	-	-	-	-	-	12	-	-	-	-	-	32	-	-	-	-	-	21	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	97.0	-	-	-	-	-	100.0	-	-

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Count Name: South Harlem Avenue & Madison
Street
Site Code:
Start Date: 09/21/2019
Page No: 1

Turning Movement Data

Start Time	South Harlem Ave Southbound						Madison St Westbound						South Harlem Ave Northbound						Madison St Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
11:00 AM	25	327	27	0	4	379	25	73	50	0	1	148	36	269	19	0	6	324	15	55	18	0	10	88	939
11:15 AM	21	257	22	0	4	300	25	99	48	0	3	172	36	236	24	0	5	296	9	55	31	0	3	95	863
11:30 AM	26	306	15	0	9	347	24	77	44	0	5	145	49	290	16	0	10	355	12	64	21	0	1	97	944
11:45 AM	26	261	32	0	5	319	30	89	63	0	2	182	44	227	24	0	8	295	16	73	27	0	3	116	912
Hourly Total	98	1151	96	0	22	1345	104	338	205	0	11	647	165	1022	83	0	29	1270	52	247	97	0	17	396	3658
12:00 PM	30	318	22	0	6	370	28	61	44	0	3	133	39	288	11	0	3	338	13	63	23	0	3	99	940
12:15 PM	14	264	22	0	6	300	30	75	53	0	4	158	41	253	27	0	7	321	14	79	26	0	6	119	898
12:30 PM	26	321	16	0	3	363	22	83	39	0	5	144	31	278	20	0	3	329	9	64	21	0	2	94	930
12:45 PM	21	251	25	0	12	297	25	97	50	0	2	172	29	239	13	0	10	281	25	68	27	0	6	120	870
Hourly Total	91	1154	85	0	27	1330	105	316	186	0	14	607	140	1058	71	0	23	1269	61	274	97	0	17	432	3638
1:00 PM	29	251	17	0	14	297	19	69	47	0	2	135	37	176	16	0	5	229	15	65	30	0	3	110	771
1:15 PM	18	256	21	0	3	295	28	89	47	0	1	164	39	203	17	0	7	259	21	83	35	0	7	139	857
1:30 PM	34	323	32	0	1	389	28	75	45	0	1	148	32	241	10	0	5	283	9	71	28	0	5	108	928
1:45 PM	26	276	25	0	9	327	26	84	45	0	4	155	24	220	15	0	4	259	20	77	27	0	2	124	865
Hourly Total	107	1106	95	0	27	1308	101	317	184	0	8	602	132	840	58	0	21	1030	65	296	120	0	17	481	3421
Grand Total	296	3411	276	0	76	3983	310	971	575	0	33	1856	437	2920	212	0	73	3569	178	817	314	0	51	1309	10717
Approach %	7.4	85.6	6.9	0.0	-	-	16.7	52.3	31.0	0.0	-	-	12.2	81.8	5.9	0.0	-	-	13.6	62.4	24.0	0.0	-	-	-
Total %	2.8	31.8	2.6	0.0	-	37.2	2.9	9.1	5.4	0.0	-	17.3	4.1	27.2	2.0	0.0	-	33.3	1.7	7.6	2.9	0.0	-	12.2	-
Lights	286	3349	273	0	-	3908	305	962	561	0	-	1828	428	2859	210	0	-	3497	172	810	301	0	-	1283	10516
% Lights	96.6	98.2	98.9	-	-	98.1	98.4	99.1	97.6	-	-	98.5	97.9	97.9	99.1	-	-	98.0	96.6	99.1	95.9	-	-	98.0	98.1
Mediums	10	46	1	0	-	57	4	9	10	0	-	23	8	48	2	0	-	58	6	5	13	0	-	24	162
% Mediums	3.4	1.3	0.4	-	-	1.4	1.3	0.9	1.7	-	-	1.2	1.8	1.6	0.9	-	-	1.6	3.4	0.6	4.1	-	-	1.8	1.5
Articulated Trucks	0	16	2	0	-	18	1	0	4	0	-	5	1	13	0	0	-	14	0	2	0	0	-	2	39
% Articulated Trucks	0.0	0.5	0.7	-	-	0.5	0.3	0.0	0.7	-	-	0.3	0.2	0.4	0.0	-	-	0.4	0.0	0.2	0.0	-	-	0.2	0.4
Bicycles on Crosswalk	-	-	-	-	5	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	4	-	-
% Bicycles on Crosswalk	-	-	-	-	6.6	-	-	-	-	-	9.1	-	-	-	-	-	0.0	-	-	-	-	-	7.8	-	-
Pedestrians	-	-	-	-	71	-	-	-	-	-	30	-	-	-	-	-	73	-	-	-	-	-	47	-	-
% Pedestrians	-	-	-	-	93.4	-	-	-	-	-	90.9	-	-	-	-	-	100.0	-	-	-	-	-	92.2	-	-

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive
Vernon Hills, Illinois, United States 60061
(847) 478-9700 poster@gha-engineers.com

Count Name: South Harlem Avenue & Madison
Street
Site Code:
Start Date: 09/21/2019
Page No: 3

Turning Movement Peak Hour Data (11:00 AM)

Start Time	South Harlem Ave Southbound						Madison St Westbound						South Harlem Ave Northbound						Madison St Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
11:00 AM	25	327	27	0	4	379	25	73	50	0	1	148	36	269	19	0	6	324	15	55	18	0	10	88	939
11:15 AM	21	257	22	0	4	300	25	99	48	0	3	172	36	236	24	0	5	296	9	55	31	0	3	95	863
11:30 AM	26	306	15	0	9	347	24	77	44	0	5	145	49	290	16	0	10	355	12	64	21	0	1	97	944
11:45 AM	26	261	32	0	5	319	30	89	63	0	2	182	44	227	24	0	8	295	16	73	27	0	3	116	912
Total	98	1151	96	0	22	1345	104	338	205	0	11	647	165	1022	83	0	29	1270	52	247	97	0	17	396	3658
Approach %	7.3	85.6	7.1	0.0	-	-	16.1	52.2	31.7	0.0	-	-	13.0	80.5	6.5	0.0	-	-	13.1	62.4	24.5	0.0	-	-	-
Total %	2.7	31.5	2.6	0.0	-	36.8	2.8	9.2	5.6	0.0	-	17.7	4.5	27.9	2.3	0.0	-	34.7	1.4	6.8	2.7	0.0	-	10.8	-
PHF	0.942	0.880	0.750	0.000	-	0.887	0.867	0.854	0.813	0.000	-	0.889	0.842	0.881	0.865	0.000	-	0.894	0.813	0.846	0.782	0.000	-	0.853	0.969
Lights	94	1132	94	0	-	1320	102	335	202	0	-	639	162	1000	82	0	-	1244	48	245	92	0	-	385	3588
% Lights	95.9	98.3	97.9	-	-	98.1	98.1	99.1	98.5	-	-	98.8	98.2	97.8	98.8	-	-	98.0	92.3	99.2	94.8	-	-	97.2	98.1
Mediums	4	15	1	0	-	20	2	3	3	0	-	8	3	18	1	0	-	22	4	2	5	0	-	11	61
% Mediums	4.1	1.3	1.0	-	-	1.5	1.9	0.9	1.5	-	-	1.2	1.8	1.8	1.2	-	-	1.7	7.7	0.8	5.2	-	-	2.8	1.7
Articulated Trucks	0	4	1	0	-	5	0	0	0	0	-	0	0	4	0	0	-	4	0	0	0	0	-	0	9
% Articulated Trucks	0.0	0.3	1.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.4	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	13.6	-	-	-	-	-	9.1	-	-	-	-	-	0.0	-	-	-	-	-	5.9	-	-
Pedestrians	-	-	-	-	19	-	-	-	-	-	10	-	-	-	-	-	29	-	-	-	-	-	16	-	-
% Pedestrians	-	-	-	-	86.4	-	-	-	-	-	90.9	-	-	-	-	-	100.0	-	-	-	-	-	94.1	-	-

Turning Movement Peak Hour Data (12:00 PM)

Start Time	South Harlem Ave Southbound						Madison St Westbound						South Harlem Ave Northbound						Madison St Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
12:00 PM	30	318	22	0	6	370	28	61	44	0	3	133	39	288	11	0	3	338	13	63	23	0	3	99	940
12:15 PM	14	264	22	0	6	300	30	75	53	0	4	158	41	253	27	0	7	321	14	79	26	0	6	119	898
12:30 PM	26	321	16	0	3	363	22	83	39	0	5	144	31	278	20	0	3	329	9	64	21	0	2	94	930
12:45 PM	21	251	25	0	12	297	25	97	50	0	2	172	29	239	13	0	10	281	25	68	27	0	6	120	870
Total	91	1154	85	0	27	1330	105	316	186	0	14	607	140	1058	71	0	23	1269	61	274	97	0	17	432	3638
Approach %	6.8	86.8	6.4	0.0	-	-	17.3	52.1	30.6	0.0	-	-	11.0	83.4	5.6	0.0	-	-	14.1	63.4	22.5	0.0	-	-	-
Total %	2.5	31.7	2.3	0.0	-	36.6	2.9	8.7	5.1	0.0	-	16.7	3.8	29.1	2.0	0.0	-	34.9	1.7	7.5	2.7	0.0	-	11.9	-
PHF	0.758	0.899	0.850	0.000	-	0.899	0.875	0.814	0.877	0.000	-	0.882	0.854	0.918	0.657	0.000	-	0.939	0.610	0.867	0.898	0.000	-	0.900	0.968
Lights	89	1131	85	0	-	1305	105	314	182	0	-	601	137	1035	70	0	-	1242	59	272	93	0	-	424	3572
% Lights	97.8	98.0	100.0	-	-	98.1	100.0	99.4	97.8	-	-	99.0	97.9	97.8	98.6	-	-	97.9	96.7	99.3	95.9	-	-	98.1	98.2
Mediums	2	15	0	0	-	17	0	2	4	0	-	6	3	19	1	0	-	23	2	2	4	0	-	8	54
% Mediums	2.2	1.3	0.0	-	-	1.3	0.0	0.6	2.2	-	-	1.0	2.1	1.8	1.4	-	-	1.8	3.3	0.7	4.1	-	-	1.9	1.5
Articulated Trucks	0	8	0	0	-	8	0	0	0	0	-	0	0	4	0	0	-	4	0	0	0	0	-	0	12
% Articulated Trucks	0.0	0.7	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.0	0.4	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.3
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	7.4	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	25	-	-	-	-	-	14	-	-	-	-	-	23	-	-	-	-	-	17	-	-
% Pedestrians	-	-	-	-	92.6	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

APPENDIX B

ITE 10th Edition Trip Generation Manual Pages

Fast Casual Restaurant (930)

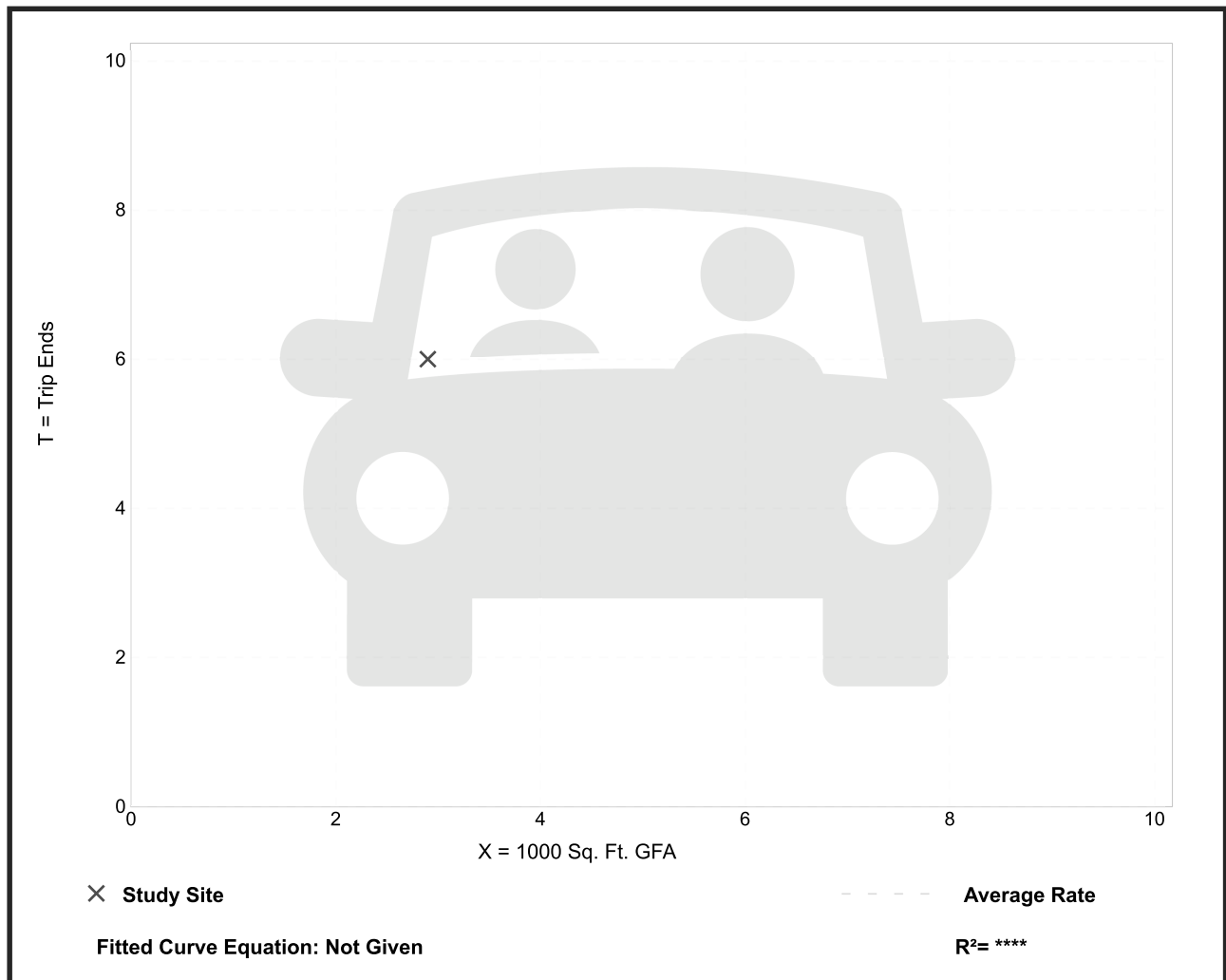
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 3
 Directional Distribution: 67% entering, 33% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.07	2.07 - 2.07	*

Data Plot and Equation

Caution – Small Sample Size



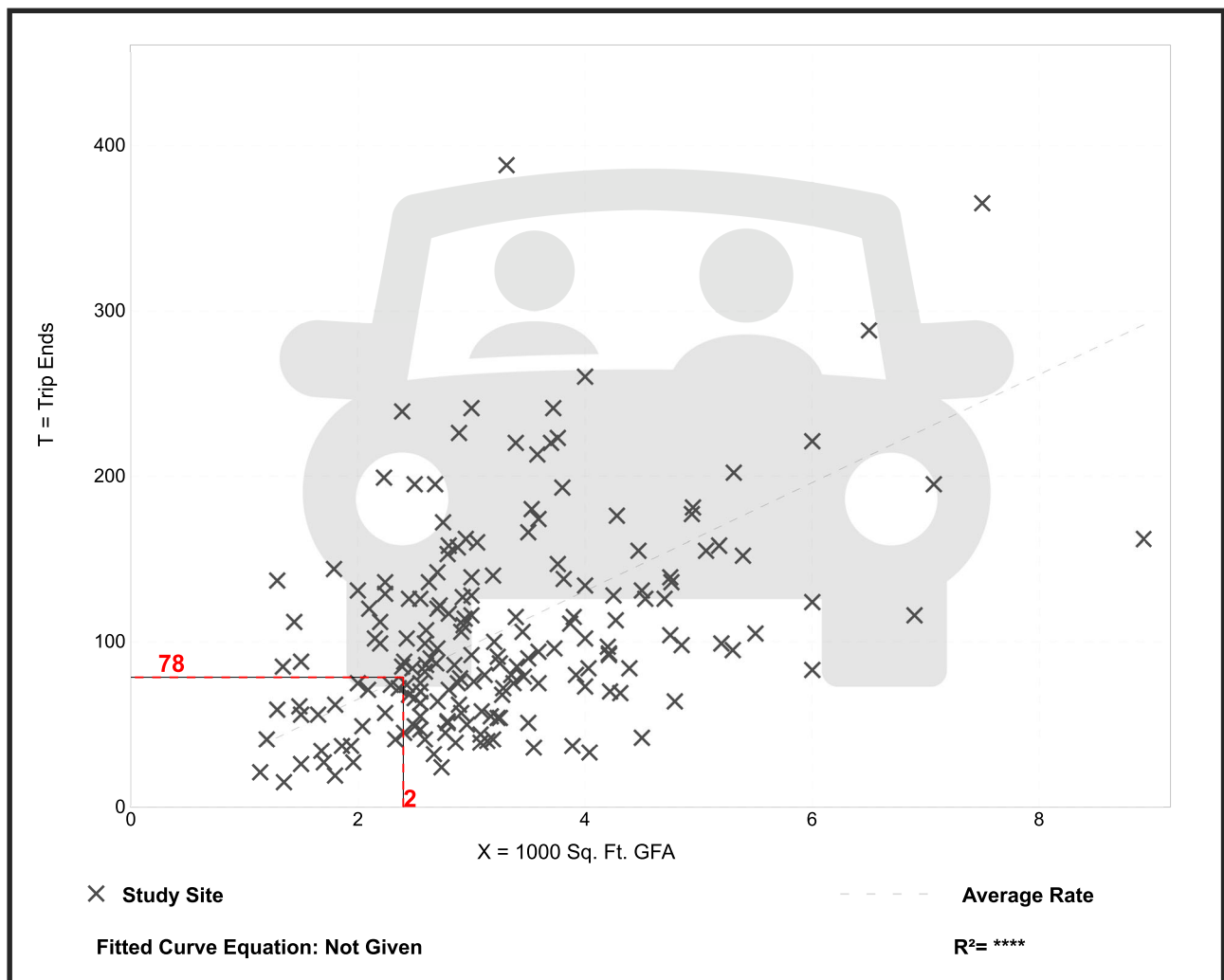
Fast-Food Restaurant with Drive-Through Window (934)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 185
 Avg. 1000 Sq. Ft. GFA: 3
 Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
32.67	8.17 - 117.22	17.87

Data Plot and Equation



Fast-Food Restaurant with Drive-Through Window (934)

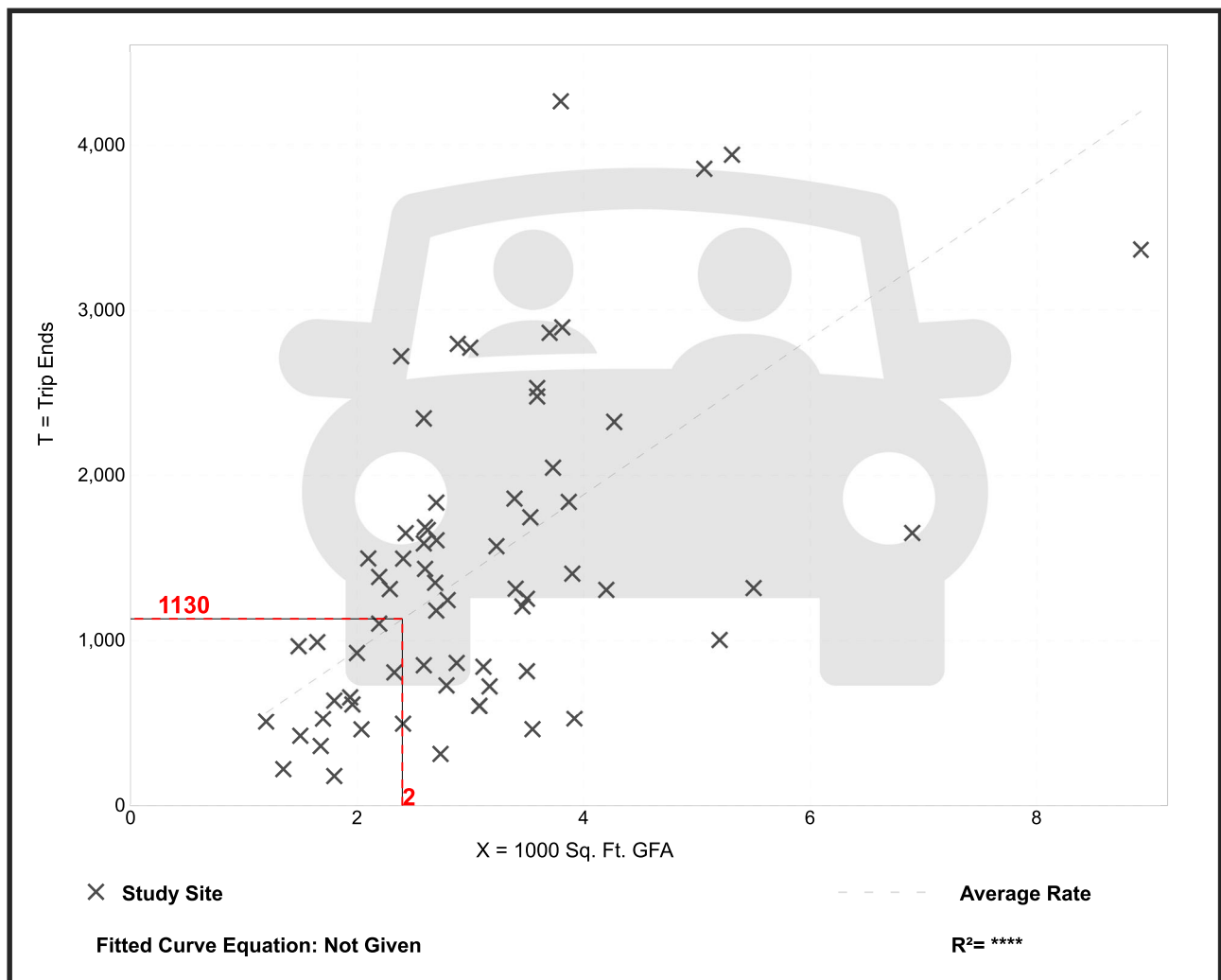
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 67
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
470.95	98.89 - 1137.66	244.44

Data Plot and Equation



APPENDIX C

CMAP Correspondence



Chicago Metropolitan Agency for Planning

233 South Wacker Drive
Suite 800
Chicago, Illinois 60606

312 454 0400
www.cmap.illinois.gov

September 13, 2019

William C. Grieve, P.E, PTOE
Senior Transportation Engineer
Gewalt Hamilton Associates
625 Forest Edge Drive
Vernon Hills, IL 60061

Subject: *Harlem Avenue (IL 43) @ Madison Street*
IDOT

Dear Mr. Grieve:

In response to a request made on your behalf and dated September 13, 2019, we have developed year 2050 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current Volumes	Year 2050 ADT
Harlem Ave north of Madison St	37,000	38,200
Madison St west of Harlem Ave	13,000	13,700

Traffic projections are developed using existing ADT data provided in the request letter and the results from the March 2019 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: Quigley (IDOT)
S:\AdminGroups\ResearchAnalysis\2019_ForecastsTraffic\ForestPark\ck-117-19\ck-117-19.docx

APPENDIX D

Capacity Analysis Worksheets

HCS7 Two-Way Stop-Control Report

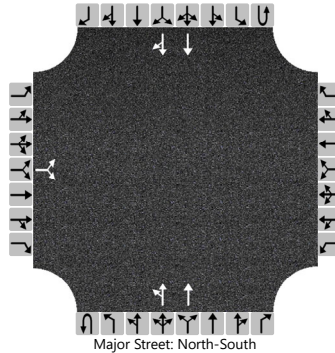
General Information

Analyst	GHA
Agency/Co.	
Date Performed	10.14.20
Analysis Year	2019
Time Analyzed	AM Peak Hour - Existing
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Harlem @ Alley
Jurisdiction	IDOT
East/West Street	Alley
North/South Street	Harlem Avenue
Peak Hour Factor	0.92
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	1	0		0	0	0	0	0	2	0	0	0	2	0
Configuration			LR							LT	T				T	TR
Volume (veh/h)		0		11						0	1105				1490	1
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			12							0						
Capacity, c (veh/h)			321							393						
v/c Ratio			0.04							0.00						
95% Queue Length, Q ₉₅ (veh)			0.1							0.0						
Control Delay (s/veh)			16.7							14.2						
Level of Service (LOS)			C							B						
Approach Delay (s/veh)	16.7								0.0							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

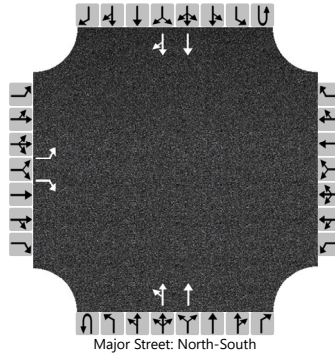
General Information

Analyst	GHA
Agency/Co.	
Date Performed	10.14.20
Analysis Year	2026
Time Analyzed	AM Peak Hour - Total
Intersection Orientation	North-South
Project Description	

Site Information

Intersection	Harlem @ Alley
Jurisdiction	IDOT
East/West Street	Alley
North/South Street	Harlem Avenue
Peak Hour Factor	0.92
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		1	0	1		0	0	0	0	0	2	0	0	0	2	0
Configuration		L		R						LT	T				T	TR
Volume (veh/h)		0		12						0	1118				1508	3
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

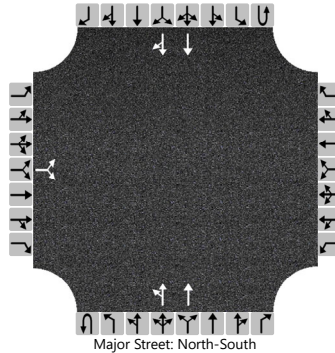
Flow Rate, v (veh/h)		0		13						0						
Capacity, c (veh/h)		35		315						386						
v/c Ratio		0.00		0.04						0.00						
95% Queue Length, Q ₉₅ (veh)		0.0		0.1						0.0						
Control Delay (s/veh)		108.4		16.9						14.3						
Level of Service (LOS)		F		C						B						
Approach Delay (s/veh)	16.9								0.0							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

General Information

Analyst	GHA	Intersection	Harlem @ Alley
Agency/Co.		Jurisdiction	IDOT
Date Performed	10.14.20	East/West Street	Alley
Analysis Year	2019	North/South Street	Harlem Avenue
Time Analyzed	PM Peak Hour - Existing	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

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	1	0		0	0	0	0	0	2	0	0	0	2	0
Configuration			LR							LT	T				T	TR
Volume (veh/h)		0		8						0	1051				1429	5
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

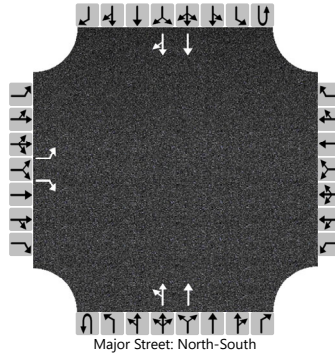
Flow Rate, v (veh/h)			9							0						
Capacity, c (veh/h)			336							416						
v/c Ratio			0.03							0.00						
95% Queue Length, Q ₉₅ (veh)			0.1							0.0						
Control Delay (s/veh)			16.0							13.7						
Level of Service (LOS)			C							B						
Approach Delay (s/veh)	16.0								0.0							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

General Information

Analyst	GHA	Intersection	Harlem @ Alley
Agency/Co.		Jurisdiction	IDOT
Date Performed	10.14.20	East/West Street	Alley
Analysis Year	2026	North/South Street	Harlem Avenue
Time Analyzed	PM Peak Hour - Total	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

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		1	0	1		0	0	0	0	0	2	0	0	0	2	0
Configuration		L		R						LT	T				T	TR
Volume (veh/h)		4		31						9	1064				1446	25
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

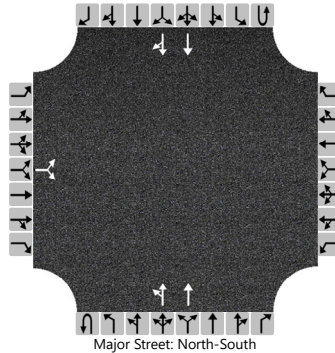
Flow Rate, v (veh/h)		4		34						10						
Capacity, c (veh/h)		36		326						401						
v/c Ratio		0.12		0.10						0.02						
95% Queue Length, Q ₉₅ (veh)		0.4		0.3						0.1						
Control Delay (s/veh)		117.6		17.3						14.2						
Level of Service (LOS)		F		C						B						
Approach Delay (s/veh)	28.8								0.6							
Approach LOS	D															

HCS7 Two-Way Stop-Control Report

General Information

Analyst	GHA	Intersection	Harlem @ Alley
Agency/Co.		Jurisdiction	IDOT
Date Performed	10.14.20	East/West Street	Alley
Analysis Year	2019	North/South Street	Harlem Avenue
Time Analyzed	SAT Peak Hour - Exist	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

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	1	0		0	0	0	0	0	2	0	0	0	2	0
Configuration			LR							LT	T				T	TR
Volume (veh/h)		0		7						2	1234				1322	7
Percent Heavy Vehicles (%)		3		3						3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

Delay, Queue Length, and Level of Service

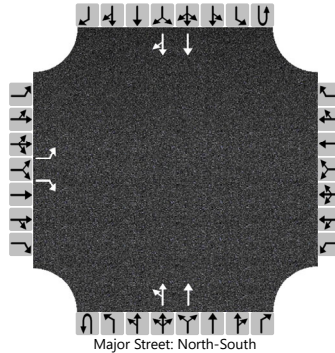
Flow Rate, v (veh/h)			8							2						
Capacity, c (veh/h)			367							460						
v/c Ratio			0.02							0.00						
95% Queue Length, Q ₉₅ (veh)			0.1							0.0						
Control Delay (s/veh)			15.0							12.9						
Level of Service (LOS)			C							B						
Approach Delay (s/veh)	15.0								0.1							
Approach LOS	C															

HCS7 Two-Way Stop-Control Report

General Information

Analyst	GHA	Intersection	Harlem @ Alley
Agency/Co.		Jurisdiction	IDOT
Date Performed	10.14.20	East/West Street	Alley
Analysis Year	2026	North/South Street	Harlem Avenue
Time Analyzed	SAT Peak Hour - Total	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description			

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		1	0	1		0	0	0	0	0	2	0	0	0	2	0
Configuration		L		R						LT	T				T	TR
Volume (veh/h)		6		46						18	1249				1338	40
Percent Heavy Vehicles (%)		3		3					3	3						
Proportion Time Blocked																
Percent Grade (%)	0															
Right Turn Channelized	No															
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5		6.9						4.1						
Critical Headway (sec)		6.86		6.96						4.16						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.53		3.33						2.23						

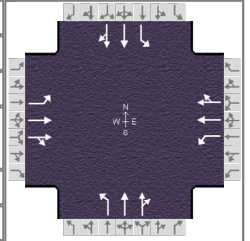
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7		50						20						
Capacity, c (veh/h)		32		352						439						
v/c Ratio		0.20		0.14						0.04						
95% Queue Length, Q ₉₅ (veh)		0.6		0.5						0.1						
Control Delay (s/veh)		144.2		16.9						13.6						
Level of Service (LOS)		F		C						B						
Approach Delay (s/veh)	31.6								1.2							
Approach LOS	D															

HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Peak Hour - Existing	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - AM Exist.xus		
Project Description	4790.900				

A diagram of a four-way intersection. A north arrow is in the center, pointing upwards, with 'N' above it, 'S' below it, 'E' to the right, and 'W' to the left. Arrows indicate traffic flow: on the top approach, two arrows point down; on the bottom approach, two arrows point up; on the left approach, two arrows point right; and on the right approach, two arrows point left. The intersection area is shaded in light blue.



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	92	383	24	119	380	101	65	924	142	165	1225	111

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.4	0.6	67.8	7.6	1.6	22.1		
				Yellow	3.0	3.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

														
1											2		3	4
														
5											6		7	8

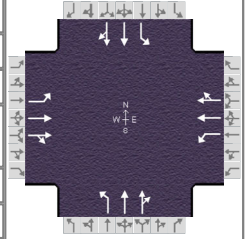
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	92	383	24	119	380	101	65	924	142	165	1225	111
Initial Queue (Q _b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s _o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N _m), man/h	None			None			None			None		
Heavy Vehicles (P _{HV}), %	3	3		3	3		10	10		10	10	
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	4	3	3	4	3	3	4	3	3	4	3
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	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Turn Bay Length, ft	125	0		95	0		170	0		140	0	
Grade (P _g), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	30	30	30	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s	14.0	37.5	14.0	37.5	14.0	59.5	14.0	59.5
Yellow Change Interval (Y), s	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5
Red Clearance Interval (R _c), s	0.0	1.5	0.0	1.5	0.0	1.5	0.0	1.5
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	4.0	3.0	4.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Min	Off	Min	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (Walk), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (PC), s		0.0		0.0		0.0		0.0

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	

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Peak Hour - Existing	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - AM Exist.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	92	383	24	119	380	101	65	924	142	165	1225	111

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.4	0.6	67.8	7.6	1.6	22.1		
				Yellow	3.0	3.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

											
1											
											
2											
											
3											
											
4											
											
5											
											
6											
											
7											
											
8											

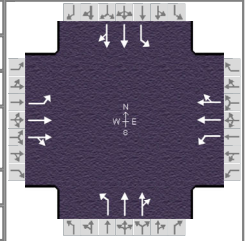
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	10.6	28.1	12.2	29.7	7.4	73.8	11.0	77.3
Change Period, ($Y+R_c$), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.2	5.1	4.2	5.1	4.2	0.0	4.2	0.0
Queue Clearance Time (g_s), s	7.5	15.3	9.1	18.7	4.3		7.5	
Green Extension Time (g_e), s	0.1	5.2	0.1	5.0	0.2	0.0	0.5	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	0.17	1.00	0.22	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	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	97	216	213	125	261	246	68	574	548	174	712	695
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1856	1817	1767	1856	1722	1668	1752	1670	1668	1752	1700
Queue Service Time (g_s), s	5.5	13.1	13.3	7.1	16.1	16.7	2.3	20.2	22.6	5.5	26.5	29.0
Cycle Queue Clearance Time (g_c), s	5.5	13.1	13.3	7.1	16.1	16.7	2.3	20.2	22.6	5.5	26.5	29.0
Green Ratio (g/C)	0.24	0.18	0.18	0.25	0.19	0.19	0.58	0.54	0.54	0.62	0.57	0.57
Capacity (c), veh/h	200	328	321	254	351	326	232	950	905	334	1000	970
Volume-to-Capacity Ratio (X)	0.483	0.658	0.662	0.493	0.742	0.754	0.295	0.604	0.605	0.520	0.712	0.716
Back of Queue (Q), ft/ln (95 th percentile)	115.9	259.4	258.9	147.5	307.5	304.5	42.9	293.5	338.3	101.8	345	394.2
Back of Queue (Q), veh/ln (95 th percentile)	4.5	10.1	10.1	5.8	12.0	11.9	1.6	10.9	12.5	3.8	12.8	14.6
Queue Storage Ratio (RQ) (95 th percentile)	0.93	0.00	0.00	1.55	0.00	0.00	0.25	0.00	0.00	0.73	0.00	0.00
Uniform Delay (d_1), s/veh	39.8	44.4	44.8	38.3	43.9	45.7	15.4	10.7	13.0	13.8	9.6	11.2
Incremental Delay (d_2), s/veh	1.8	3.2	3.3	1.5	4.4	5.2	0.7	2.9	3.0	1.3	4.3	4.5
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	0.0	0.0
Control Delay (d), s/veh	41.6	47.5	48.1	39.7	48.3	51.0	16.0	13.6	16.0	15.1	13.9	15.7
Level of Service (LOS)	D	D	D	D	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	46.7	D		47.7	D		14.8	B		14.8	B	
Intersection Delay, s/veh / LOS	24.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.31	B	2.31	B	2.26	B	2.26	B
Bicycle LOS Score / LOS	0.92	A	1.01	A	1.47	A	1.79	B

HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Peak Hour - Existing	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - AM Exist.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	92	383	24	119	380	101	65	924	142	165	1225	111

Signal Information														
Cycle, s	125.0	Reference Phase	2											
Offset, s	0	Reference Point	Begin											
Uncoordinated	No	Simult. Gap E/W	On	Green	4.4	0.6	67.8	7.6	1.6	22.1				
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	3.0	3.0	4.5	3.0	0.0	4.5				
				Red	0.0	0.0	1.5	0.0	0.0	1.5				

														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

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})	0.977	0.977	0.977	0.977	0.977	0.977	0.922	0.922	0.922	0.922	0.922	0.922
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	1.000	1.000	1.000	1.000	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})		0.979	0.979		0.928	0.928		0.953	0.953		0.971	0.971
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	1767	3456	216	1767	2832	745	1668	2966	456	1668	3166	286
Proportion of Vehicles Arriving on Green (P)	0.06	0.24	0.18	0.07	0.25	0.19	0.04	0.72	0.54	0.06	0.76	0.57
Incremental Delay Factor (k)	0.11	0.15	0.15	0.11	0.16	0.16	0.11	0.50	0.50	0.11	0.50	0.50

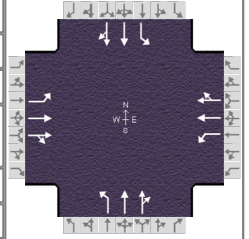
Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Green Ratio (g/C)	0.24	0.18	0.25	0.19	0.58	0.54	0.62	0.57
Permitted Saturation Flow Rate (s_p), veh/h/ln	886	0	952	0	359	0	470	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	22.1	0.0	22.7	0.0	67.8	0.0	69.8	0.0
Permitted Service Time (g_u), s	5.0	0.0	8.8	0.0	40.4	0.0	45.2	0.0
Permitted Queue Service Time (g_{ps}), s	2.1		2.1		6.5		14.4	
Time to First Blockage (g_t), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{ts}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								
Protected Right Effective Green Time (g_R), s								

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.000	1.557	0.000	1.557	0.000	1.557	0.000
Pedestrian F_s / F_{delay}	0.000	0.150	0.000	0.149	0.000	0.103	0.000	0.098
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	353.42	42.36	378.57	41.08	1084.46	13.10	1141.34	11.52
Bicycle F_w / F_v	-3.64	0.43	-3.64	0.52	-3.64	0.98	-3.64	1.30

HCS7 Signalized Intersection Results Graphical Summary

General Information

Agency				Intersection Information		
Analyst	GHA	Analysis Date	Oct 14, 2020	Duration, h	0.250	
Jurisdiction	IDOT	Time Period	AM Peak Hour - Existing	Area Type	Other	
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	PHF	0.95	
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - AM Exist.xus	Analysis Period	1 > 7:00	
Project Description	4790.900					



Demand Information

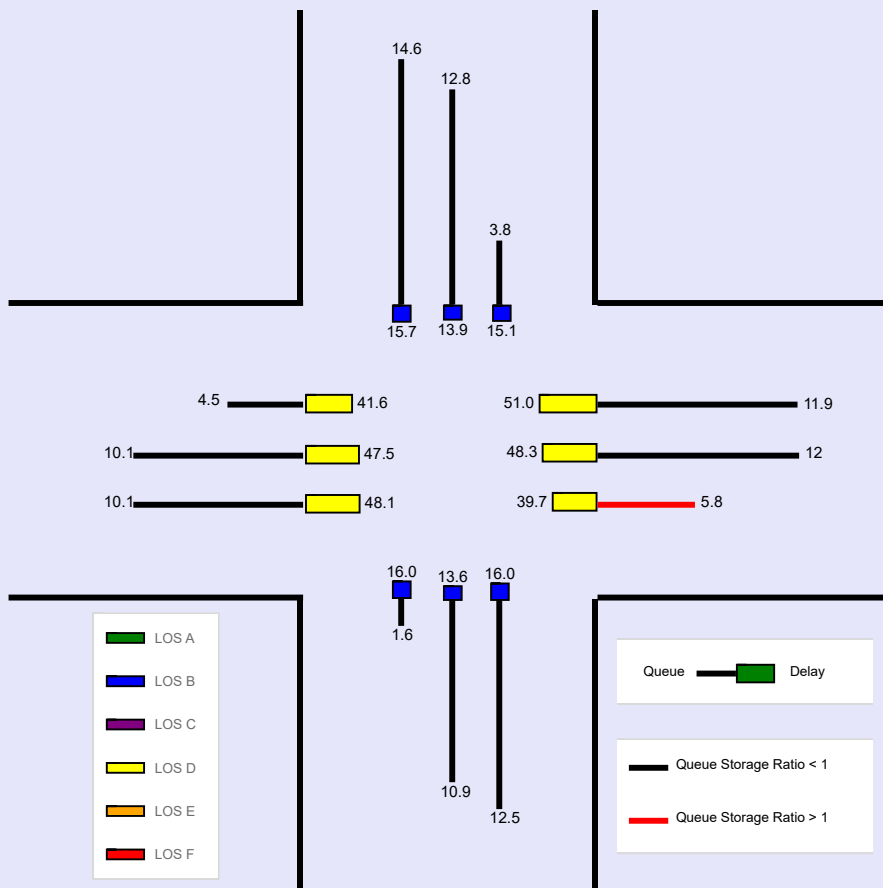
	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	92	383	24	119	380	101	65	924	142	165	1225	111

Signal Information

Cycle, s	125.0	Reference Phase	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											</
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Movement Group Results

Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (Q), ft/ln (95 th percentile)	115.9	259.4	258.9	147.5	307.5	304.5	42.9	293.5	338.3	101.8	345	394.2
Back of Queue (Q), veh/ln (95 th percentile)	4.5	10.1	10.1	5.8	12.0	11.9	1.6	10.9	12.5	3.8	12.8	14.6
Queue Storage Ratio (RQ) (95 th percentile)	0.93	0.00	0.00	1.55	0.00	0.00	0.25	0.00	0.00	0.73	0.00	0.00
Control Delay (d), s/veh	41.6	47.5	48.1	39.7	48.3	51.0	16.0	13.6	16.0	15.1	13.9	15.7
Level of Service (LOS)	D	D	D	D	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	46.7	D		47.7	D		14.8	B		14.8	B	
Intersection Delay, s/veh / LOS	24.4						C					



--- Messages ---

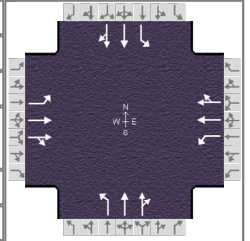
WARNING: One or more minor street movements was assigned an Arrival Type input value other than 3; this implies signal coordination on the minor street.

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 ---

HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Peak Hour - TOTAL	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - AM TOTAL.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	93	388	24	120	386	102	66	935	144	167	1241	112

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.5	0.6	67.4	7.6	1.6	22.4		
				Yellow	3.0	3.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

														
1											2		3	4
														
5											6		7	8

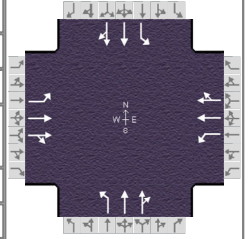
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	93	388	24	120	386	102	66	935	144	167	1241	112
Initial Queue (Q _b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s _o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N _m), man/h	None			None			None			None		
Heavy Vehicles (P _{HV}), %	3	3		3	3		10	10		10	10	
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	4	3	3	4	3	3	4	3	3	4	3
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	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Turn Bay Length, ft	125	0		95	0		170	0		140	0	
Grade (P _g), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	30	30	30	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s	14.0	37.5	14.0	37.5	14.0	59.5	14.0	59.5
Yellow Change Interval (Y), s	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5
Red Clearance Interval (R _c), s	0.0	1.5	0.0	1.5	0.0	1.5	0.0	1.5
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	4.0	3.0	4.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Min	Off	Min	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (Walk), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (PC), s		0.0		0.0		0.0		0.0

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	

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Peak Hour - TOTAL	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - AM TOTAL.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	93	388	24	120	386	102	66	935	144	167	1241	112

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.5	0.6	67.4	7.6	1.6	22.4		
				Yellow	3.0	3.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

											
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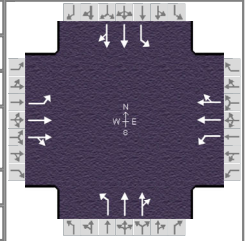
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	10.6	28.4	12.2	29.9	7.5	73.4	11.1	77.0
Change Period, (Y+R _c), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.2	5.1	4.2	5.1	4.2	0.0	4.2	0.0
Queue Clearance Time (g _s), s	7.6	15.4	9.1	18.9	4.3		7.6	
Green Extension Time (g _e), s	0.1	5.3	0.1	5.0	0.2	0.0	0.5	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00		1.00	
Max Out Probability	1.00	0.18	1.00	0.24	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	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	98	218	215	126	264	249	69	581	555	176	720	704
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1856	1817	1767	1856	1722	1668	1752	1670	1668	1752	1701
Queue Service Time (g_s), s	5.6	13.3	13.4	7.1	16.4	16.9	2.3	20.9	23.4	5.6	27.7	30.2
Cycle Queue Clearance Time (g_c), s	5.6	13.3	13.4	7.1	16.4	16.9	2.3	20.9	23.4	5.6	27.7	30.2
Green Ratio (g/C)	0.24	0.18	0.18	0.26	0.19	0.19	0.57	0.54	0.54	0.62	0.57	0.57
Capacity (c), veh/h	201	332	325	255	355	330	227	944	900	329	995	966
Volume-to-Capacity Ratio (X)	0.487	0.658	0.662	0.495	0.744	0.756	0.307	0.616	0.616	0.535	0.724	0.729
Back of Queue (Q), ft/ln (95 th percentile)	116.7	261.3	260.8	148.1	311.4	308.2	44.1	305	349.4	104.2	361.4	411.3
Back of Queue (Q), veh/ln (95 th percentile)	4.6	10.2	10.2	5.8	12.2	12.0	1.6	11.3	12.9	3.9	13.4	15.2
Queue Storage Ratio (RQ) (95 th percentile)	0.93	0.00	0.00	1.56	0.00	0.00	0.26	0.00	0.00	0.74	0.00	0.00
Uniform Delay (d_1), s/veh	39.6	44.1	44.6	38.1	43.7	45.5	15.9	11.1	13.4	14.3	9.9	11.6
Incremental Delay (d_2), s/veh	1.8	3.2	3.3	1.5	4.6	5.4	0.8	3.0	3.2	1.4	4.6	4.8
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	0.0	0.0
Control Delay (d), s/veh	41.4	47.3	47.9	39.5	48.3	51.0	16.6	14.1	16.5	15.6	14.5	16.4
Level of Service (LOS)	D	D	D	D	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	46.4	D		47.6	D		15.4	B		15.5	B	
Intersection Delay, s/veh / LOS	24.7						C					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.31	B		2.31	B		2.26	B		2.26	B	
Bicycle LOS Score / LOS	0.93	A		1.02	A		1.48	A		1.81	B	

HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	AM Peak Hour - TOTAL	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - AM TOTAL.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	93	388	24	120	386	102	66	935	144	167	1241	112

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.5	0.6	67.4	7.6	1.6	22.4		
				Yellow	3.0	3.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

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})	0.977	0.977	0.977	0.977	0.977	0.977	0.922	0.922	0.922	0.922	0.922	0.922
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	1.000	1.000	1.000	1.000	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})		0.979	0.979		0.928	0.928		0.953	0.953		0.971	0.971
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	1767	3459	213	1767	2836	742	1668	2965	456	1668	3167	285
Proportion of Vehicles Arriving on Green (P)	0.06	0.24	0.18	0.07	0.26	0.19	0.04	0.72	0.54	0.06	0.76	0.57
Incremental Delay Factor (k)	0.11	0.15	0.15	0.11	0.16	0.17	0.11	0.50	0.50	0.11	0.50	0.50

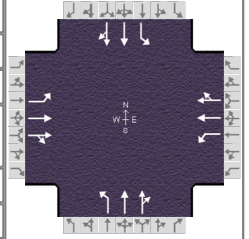
Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Green Ratio (g/C)	0.24	0.18	0.26	0.19	0.57	0.54	0.62	0.57
Permitted Saturation Flow Rate (s_p), veh/h/ln	880	0	947	0	352	0	464	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	22.4	0.0	22.9	0.0	67.4	0.0	69.4	0.0
Permitted Service Time (g_u), s	5.0	0.0	8.9	0.0	38.8	0.0	44.0	0.0
Permitted Queue Service Time (g_{ps}), s	2.2		2.2		7.0		15.5	
Time to First Blockage (g_t), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{ts}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								
Protected Right Effective Green Time (g_R), s								

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.000	1.557	0.000	1.557	0.000	1.557	0.000
Pedestrian F_s / F_{delay}	0.000	0.150	0.000	0.149	0.000	0.104	0.000	0.099
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	357.72	42.14	382.79	40.86	1077.72	13.29	1135.53	11.68
Bicycle F_w / F_v	-3.64	0.44	-3.64	0.53	-3.64	0.99	-3.64	1.32

HCS7 Signalized Intersection Results Graphical Summary

General Information

Agency				Intersection Information		
Analyst	GHA	Analysis Date	Oct 14, 2020	Duration, h	0.250	
Jurisdiction	IDOT	Time Period	AM Peak Hour - TOTAL	Area Type	Other	
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	PHF	0.95	
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - AM TOTAL.xus	Analysis Period	1 > 7:00	
Project Description	4790.900					



Demand Information

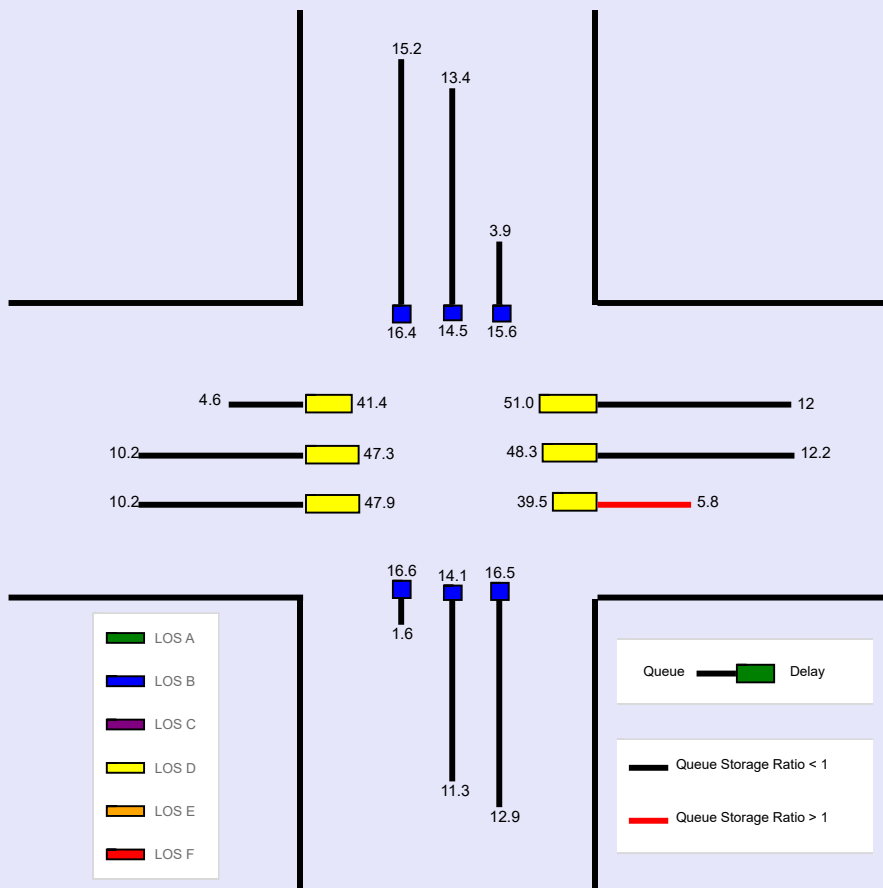
	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	93	388	24	120	386	102	66	935	144	167	1241	112

Signal Information

Cycle, s	125.0	Reference Phase	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Movement Group Results

Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (Q), ft/ln (95 th percentile)	116.7	261.3	260.8	148.1	311.4	308.2	44.1	305	349.4	104.2	361.4	411.3
Back of Queue (Q), veh/ln (95 th percentile)	4.6	10.2	10.2	5.8	12.2	12.0	1.6	11.3	12.9	3.9	13.4	15.2
Queue Storage Ratio (RQ) (95 th percentile)	0.93	0.00	0.00	1.56	0.00	0.00	0.26	0.00	0.00	0.74	0.00	0.00
Control Delay (d), s/veh	41.4	47.3	47.9	39.5	48.3	51.0	16.6	14.1	16.5	15.6	14.5	16.4
Level of Service (LOS)	D	D	D	D	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	46.4	D		47.6	D		15.4	B		15.5	B	
Intersection Delay, s/veh / LOS	24.7						C					



--- Messages ---

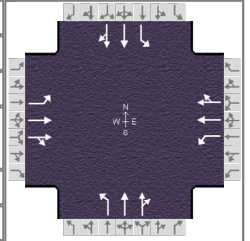
WARNING: One or more minor street movements was assigned an Arrival Type input value other than 3; this implies signal coordination on the minor street.

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 ---

HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Peak Hour - EXIST	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - PM EXIST.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	98	284	52	172	306	88	59	904	113	90	1248	97

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.0	1.1	73.4	8.2	2.8	17.6		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

											
1											
											
5											

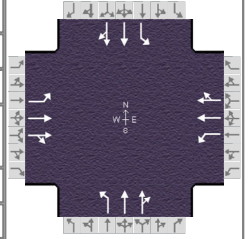
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	98	284	52	172	306	88	59	904	113	90	1248	97
Initial Queue (Q _b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s _o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N _m), man/h	None			None			None			None		
Heavy Vehicles (P _{HV}), %	3	3		3	3		10	10		10	10	
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	4	3	3	4	3	3	4	3	3	4	3
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	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Turn Bay Length, ft	125	0		95	0		170	0		140	0	
Grade (P _g), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	30	30	30	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s	14.0	35.0	14.0	35.0	14.0	62.0	14.0	62.0
Yellow Change Interval (Y), s	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5
Red Clearance Interval (R _c), s	0.0	1.5	0.0	1.5	0.0	1.5	0.0	1.5
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	4.0	3.0	4.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Min	Off	Min	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (Walk), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (PC), s		0.0		0.0		0.0		0.0

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	

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Peak Hour - EXIST	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - PM EXIST.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	98	284	52	172	306	88	59	904	113	90	1248	97

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.0	1.1	73.4	8.2	2.8	17.6		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

											
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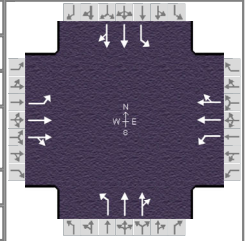
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	11.2	23.6	14.0	26.4	7.0	79.4	8.0	80.4
Change Period, (Y+R _c), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.2	5.2	4.2	5.2	4.2	0.0	4.2	0.0
Queue Clearance Time (g _s), s	8.1	13.7	12.8	15.8	3.8		4.8	
Green Extension Time (g _e), s	0.1	4.0	0.0	4.0	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	0.17	1.00	0.15	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	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	103	180	174	181	213	202	62	546	525	95	715	701
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1856	1756	1767	1856	1714	1668	1752	1683	1668	1752	1707
Queue Service Time (g_s), s	6.1	11.3	11.7	10.8	13.3	13.8	1.8	14.5	16.8	2.8	23.1	25.5
Cycle Queue Clearance Time (g_c), s	6.1	11.3	11.7	10.8	13.3	13.8	1.8	14.5	16.8	2.8	23.1	25.5
Green Ratio (g/C)	0.21	0.14	0.14	0.24	0.16	0.16	0.62	0.59	0.59	0.63	0.60	0.60
Capacity (c), veh/h	209	261	247	262	303	280	244	1028	988	348	1043	1016
Volume-to-Capacity Ratio (X)	0.493	0.688	0.703	0.692	0.703	0.721	0.255	0.531	0.531	0.272	0.686	0.689
Back of Queue (Q), ft/ln (95 th percentile)	128.9	234.6	233.6	231	263.8	261.8	34.2	215.6	245.4	50.7	279.1	330
Back of Queue (Q), veh/ln (95 th percentile)	5.0	9.2	9.1	9.0	10.3	10.2	1.3	8.0	9.1	1.9	10.3	12.2
Queue Storage Ratio (RQ) (95 th percentile)	1.03	0.00	0.00	2.43	0.00	0.00	0.20	0.00	0.00	0.36	0.00	0.00
Uniform Delay (d_1), s/veh	42.5	48.2	49.2	40.8	46.1	47.8	12.8	7.2	9.0	10.6	7.6	9.0
Incremental Delay (d_2), s/veh	1.8	4.5	5.1	7.6	4.2	4.9	0.5	2.0	2.0	0.4	3.7	3.8
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	0.0	0.0
Control Delay (d), s/veh	44.3	52.7	54.3	48.3	50.3	52.7	13.4	9.2	11.0	11.0	11.3	12.8
Level of Service (LOS)	D	D	D	D	D	D	B	A	B	B	B	B
Approach Delay, s/veh / LOS	51.4	D		50.5	D		10.2	B		12.0	B	
Intersection Delay, s/veh / LOS	22.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.31	B	2.31	B	2.25	B	2.25	B
Bicycle LOS Score / LOS	0.86	A	0.98	A	1.42	A	1.73	B

HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Peak Hour - EXIST	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - PM EXIST.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	98	284	52	172	306	88	59	904	113	90	1248	97

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.0	1.1	73.4	8.2	2.8	17.6		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

												
1	2	3	4	5	6	7	8	9	10	11	12	13

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})	0.977	0.977	0.977	0.977	0.977	0.977	0.922	0.922	0.922	0.922	0.922	0.922
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	1.000	1.000	1.000	1.000	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})		0.946	0.946		0.924	0.924		0.961	0.961		0.974	0.974
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	1767	3059	553	1767	2783	787	1668	3053	382	1668	3210	249
Proportion of Vehicles Arriving on Green (P)	0.07	0.19	0.14	0.09	0.22	0.16	0.03	0.78	0.59	0.04	0.79	0.60
Incremental Delay Factor (k)	0.11	0.15	0.15	0.26	0.15	0.15	0.11	0.50	0.50	0.11	0.50	0.50

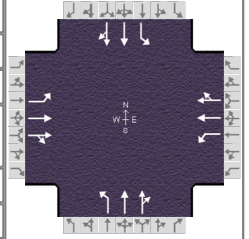
Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Green Ratio (g/C)	0.21	0.14	0.24	0.16	0.62	0.59	0.63	0.60
Permitted Saturation Flow Rate (s_p), veh/h/ln	964	0	1019	0	355	0	494	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	17.6	0.0	19.4	0.0	73.4	0.0	73.4	0.0
Permitted Service Time (g_u), s	4.6	0.0	6.0	0.0	46.9	0.0	56.6	0.0
Permitted Queue Service Time (g_{ps}), s	1.6		2.9		5.6		4.0	
Time to First Blockage (g_t), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{ts}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								
Protected Right Effective Green Time (g_R), s								

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.000	1.557	0.000	1.557	0.000	1.557	0.000
Pedestrian F_s / F_{delay}	0.000	0.154	0.000	0.152	0.000	0.095	0.000	0.093
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	281.79	46.13	326.38	43.77	1173.65	10.67	1190.58	10.24
Bicycle F_w / F_v	-3.64	0.38	-3.64	0.49	-3.64	0.93	-3.64	1.25

HCS7 Signalized Intersection Results Graphical Summary

General Information

Agency				Intersection Information		
Analyst	GHA	Analysis Date	Oct 14, 2020	Duration, h	0.250	
Jurisdiction	IDOT	Time Period	PM Peak Hour - EXIST	Area Type	Other	
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	PHF	0.95	
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - PM EXIST.xus	Analysis Period	1 > 7:00	
Project Description	4790.900					



Demand Information

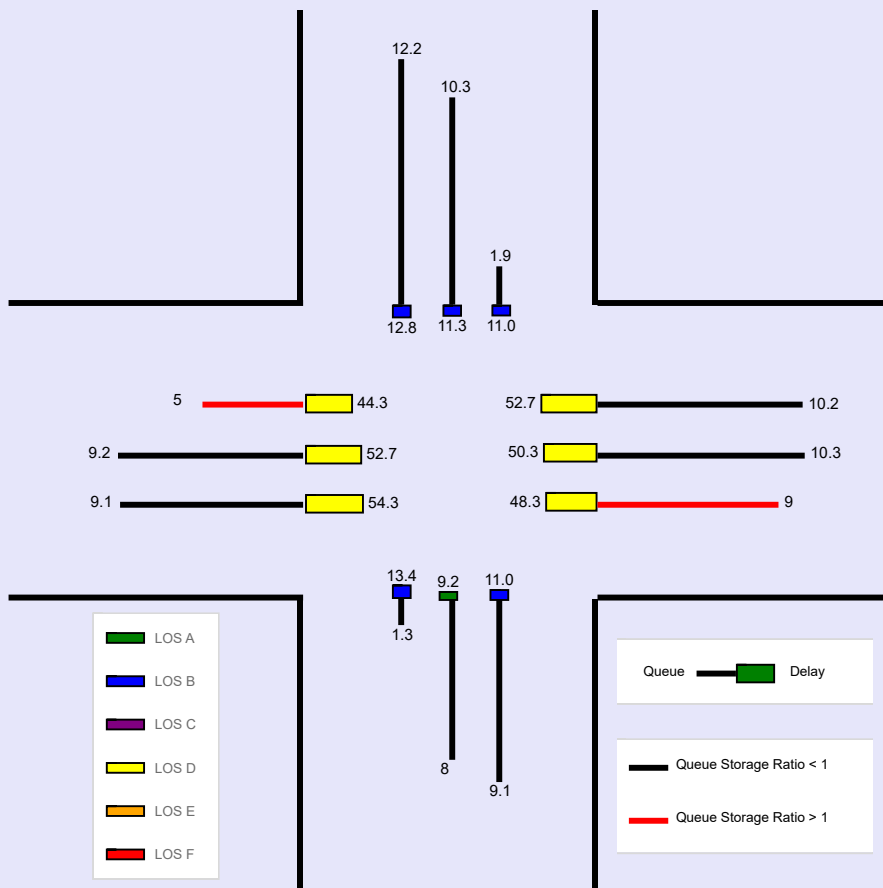
	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	98	284	52	172	306	88	59	904	113	90	1248	97

Signal Information

Cycle, s	125.0	Reference Phase	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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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)	128.9	234.6	233.6	231	263.8	261.8	34.2	215.6	245.4	50.7	279.1	330
Back of Queue (Q), veh/ln (95 th percentile)	5.0	9.2	9.1	9.0	10.3	10.2	1.3	8.0	9.1	1.9	10.3	12.2
Queue Storage Ratio (RQ) (95 th percentile)	1.03	0.00	0.00	2.43	0.00	0.00	0.20	0.00	0.00	0.36	0.00	0.00
Control Delay (d), s/veh	44.3	52.7	54.3	48.3	50.3	52.7	13.4	9.2	11.0	11.0	11.3	12.8
Level of Service (LOS)	D	D	D	D	D	D	B	A	B	B	B	B
Approach Delay, s/veh / LOS	51.4		D	50.5		D	10.2		B	12.0		B
Intersection Delay, s/veh / LOS	22.5						C					



--- Messages ---

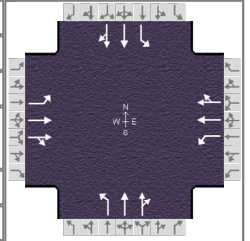
WARNING: One or more minor street movements was assigned an Arrival Type input value other than 3; this implies signal coordination on the minor street.

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 ---

HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Peak Hour - TOTAL	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - PM TOTAL.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	103	287	52	174	320	91	61	918	114	95	1282	98

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.1	1.2	72.8	8.5	2.5	18.0		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

												
1	2	3	4	5	6	7	8	9	10	11	12	13

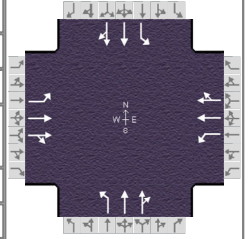
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	103	287	52	174	320	91	61	918	114	95	1282	98
Initial Queue (Q _b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s _o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N _m), man/h	None			None			None			None		
Heavy Vehicles (P _{HV}), %	3	3		3	3		10	10		10	10	
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	4	3	3	4	3	3	4	3	3	4	3
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	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Turn Bay Length, ft	125	0		95	0		170	0		140	0	
Grade (P _g), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	30	30	30	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s	14.0	35.0	14.0	35.0	14.0	62.0	14.0	62.0
Yellow Change Interval (Y), s	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5
Red Clearance Interval (R _c), s	0.0	1.5	0.0	1.5	0.0	1.5	0.0	1.5
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	4.0	3.0	4.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Min	Off	Min	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (Walk), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (PC), s		0.0		0.0		0.0		0.0

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	

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Peak Hour - TOTAL	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - PM TOTAL.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	103	287	52	174	320	91	61	918	114	95	1282	98

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.1	1.2	72.8	8.5	2.5	18.0		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

											
1	2	3	4	5	6	7	8	9	10	11	12

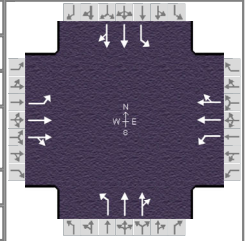
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	11.5	24.0	14.0	26.5	7.1	78.8	8.2	79.9
Change Period, (Y+R _c), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.2	5.2	4.2	5.2	4.2	0.0	4.2	0.0
Queue Clearance Time (g _s), s	8.4	13.7	12.9	16.5	3.9		5.0	
Green Extension Time (g _e), s	0.1	4.1	0.0	4.0	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	0.18	1.00	0.19	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	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	108	181	175	183	222	210	64	554	533	100	733	719
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1856	1757	1767	1856	1715	1668	1752	1684	1668	1752	1708
Queue Service Time (g_s), s	6.4	11.4	11.7	10.9	13.9	14.5	1.9	15.3	17.6	3.0	25.0	27.5
Cycle Queue Clearance Time (g_c), s	6.4	11.4	11.7	10.9	13.9	14.5	1.9	15.3	17.6	3.0	25.0	27.5
Green Ratio (g/C)	0.21	0.14	0.14	0.24	0.16	0.16	0.61	0.58	0.58	0.63	0.59	0.59
Capacity (c), veh/h	208	267	253	264	304	281	234	1020	980	342	1036	1010
Volume-to-Capacity Ratio (X)	0.520	0.679	0.694	0.693	0.731	0.748	0.275	0.543	0.543	0.292	0.708	0.712
Back of Queue (Q), ft/ln (95 th percentile)	135.4	235.1	233.9	233.1	275.5	273.1	36	224.4	255.9	54.3	305	355.8
Back of Queue (Q), veh/ln (95 th percentile)	5.3	9.2	9.1	9.1	10.8	10.7	1.3	8.3	9.5	2.0	11.3	13.2
Queue Storage Ratio (RQ) (95 th percentile)	1.08	0.00	0.00	2.45	0.00	0.00	0.21	0.00	0.00	0.39	0.00	0.00
Uniform Delay (d_1), s/veh	42.2	47.8	48.8	40.7	46.3	48.0	13.6	7.6	9.3	10.9	8.0	9.4
Incremental Delay (d_2), s/veh	2.0	4.3	4.8	7.6	4.8	5.6	0.6	2.1	2.2	0.5	4.1	4.3
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	0.0	0.0
Control Delay (d), s/veh	44.2	52.1	53.6	48.3	51.0	53.5	14.2	9.6	11.5	11.4	12.1	13.7
Level of Service (LOS)	D	D	D	D	D	D	B	A	B	B	B	B
Approach Delay, s/veh / LOS	50.8		D		51.1		D		10.8		B	
Intersection Delay, s/veh / LOS	23.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.31	B	2.31	B	2.25	B	2.25	B
Bicycle LOS Score / LOS	0.87	A	1.00	A	1.44	A	1.77	B

HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	PM Peak Hour - TOTAL	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - PM TOTAL.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	103	287	52	174	320	91	61	918	114	95	1282	98

Signal Information												
Cycle, s	125.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.1	1.2	72.8	8.5	2.5	18.0		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

														
1											2		3	4
														
5											6		7	8

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})	0.977	0.977	0.977	0.977	0.977	0.977	0.922	0.922	0.922	0.922	0.922	0.922
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	1.000	1.000	1.000	1.000	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})		0.947	0.947		0.924	0.924		0.961	0.961		0.975	0.975
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	1767	3064	548	1767	2790	781	1668	3056	379	1668	3215	245
Proportion of Vehicles Arriving on Green (P)	0.07	0.19	0.14	0.09	0.22	0.16	0.03	0.78	0.58	0.04	0.79	0.59
Incremental Delay Factor (k)	0.11	0.15	0.15	0.26	0.15	0.15	0.11	0.50	0.50	0.11	0.50	0.50

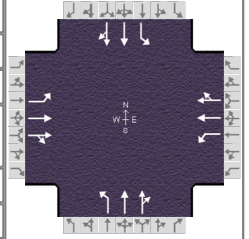
Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Green Ratio (g/C)	0.21	0.14	0.24	0.16	0.61	0.58	0.63	0.59
Permitted Saturation Flow Rate (s_p), veh/h/ln	948	0	1016	0	343	0	486	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	18.0	0.0	19.5	0.0	72.8	0.0	72.9	0.0
Permitted Service Time (g_u), s	4.0	0.0	6.3	0.0	44.4	0.0	55.2	0.0
Permitted Queue Service Time (g_{ps}), s	1.8		2.9		6.5		4.6	
Time to First Blockage (g_t), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{ts}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								
Protected Right Effective Green Time (g_R), s								

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.000	1.557	0.000	1.557	0.000	1.557	0.000
Pedestrian F_s / F_{delay}	0.000	0.153	0.000	0.151	0.000	0.096	0.000	0.094
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	288.00	45.80	327.96	43.68	1164.30	10.91	1182.95	10.43
Bicycle F_w / F_v	-3.64	0.38	-3.64	0.51	-3.64	0.95	-3.64	1.28

HCS7 Signalized Intersection Results Graphical Summary

General Information

Agency				Intersection Information		
Analyst	GHA	Analysis Date	Oct 14, 2020	Duration, h	0.250	
Jurisdiction	IDOT	Time Period	PM Peak Hour - TOTAL	Area Type	Other	
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	PHF	0.95	
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - PM TOTAL.xus	Analysis Period	1 > 7:00	
Project Description	4790.900					



Demand Information

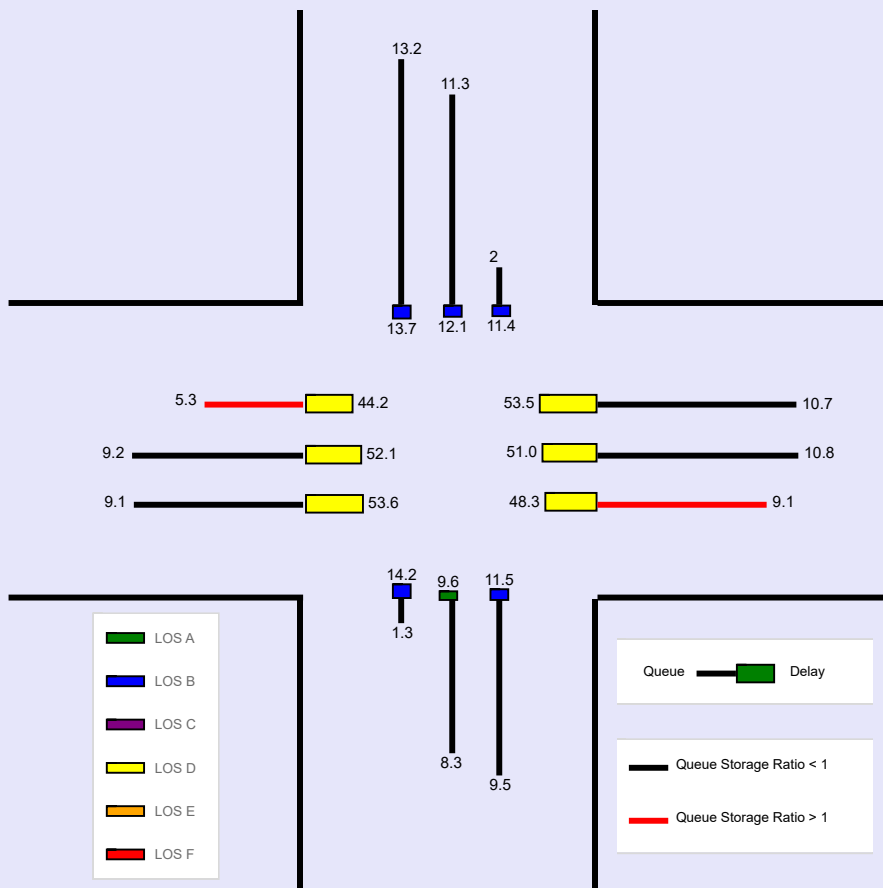
	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	103	287	52	174	320	91	61	918	114	95	1282	98

Signal Information

Cycle, s	125.0	Reference Phase	2						
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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)	135.4	235.1	233.9	233.1	275.5	273.1	36	224.4	255.9	54.3	305	355.8
Back of Queue (Q), veh/ln (95 th percentile)	5.3	9.2	9.1	9.1	10.8	10.7	1.3	8.3	9.5	2.0	11.3	13.2
Queue Storage Ratio (RQ) (95 th percentile)	1.08	0.00	0.00	2.45	0.00	0.00	0.21	0.00	0.00	0.39	0.00	0.00
Control Delay (d), s/veh	44.2	52.1	53.6	48.3	51.0	53.5	14.2	9.6	11.5	11.4	12.1	13.7
Level of Service (LOS)	D	D	D	D	D	D	B	A	B	B	B	B
Approach Delay, s/veh / LOS	50.8		D	51.1		D	10.8		B	12.8		B
Intersection Delay, s/veh / LOS	23.1						C					



--- Messages ---

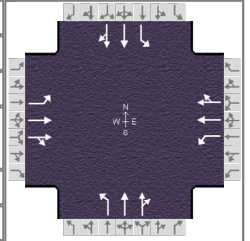
WARNING: One or more minor street movements was assigned an Arrival Type input value other than 3; this implies signal coordination on the minor street.

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 ---

HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Peak Hour - EXIST	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	Analysis Period	1> 12:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - SAT EXIST.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	97	274	61	186	316	105	71	1058	140	85	1154	91

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.4	0.5	68.7	7.8	2.4	18.3		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

														
1											2		3	4
														
5											6		7	8

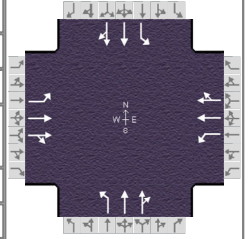
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	97	274	61	186	316	105	71	1058	140	85	1154	91
Initial Queue (Q _b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s _o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N _m), man/h	None			None			None			None		
Heavy Vehicles (P _{HV}), %	3	3		3	3		10	10		10	10	
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	4	3	3	4	3	3	4	3	3	4	3
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	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Turn Bay Length, ft	125	0		95	0		170	0		140	0	
Grade (P _g), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	30	30	30	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s	13.2	38.4	13.2	38.4	13.2	55.2	13.2	55.2
Yellow Change Interval (Y), s	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5
Red Clearance Interval (R _c), s	0.0	1.5	0.0	1.5	0.0	1.5	0.0	1.5
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	4.0	3.0	4.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Min	Off	Min	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (Walk), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (PC), s		0.0		0.0		0.0		0.0

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	

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Peak Hour - EXIST	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	Analysis Period	1> 12:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - SAT EXIST.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	97	274	61	186	316	105	71	1058	140	85	1154	91

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.4	0.5	68.7	7.8	2.4	18.3		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

											
1	2	3	4	5	6	7	8	9	10	11	12

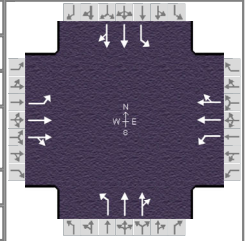
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	10.8	24.3	13.2	26.7	7.4	74.7	7.9	75.1
Change Period, (Y+R _c), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.2	5.2	4.2	5.2	4.2	0.0	4.2	0.0
Queue Clearance Time (g _s), s	7.8	13.1	12.2	16.2	4.2		4.6	
Green Extension Time (g _e), s	0.1	4.5	0.0	4.5	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	0.10	1.00	0.11	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	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	102	180	173	196	229	215	75	643	618	89	663	648
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1856	1739	1767	1856	1698	1668	1752	1680	1668	1752	1706
Queue Service Time (g_s), s	5.8	10.6	11.1	10.2	13.6	14.2	2.2	20.4	23.2	2.6	21.2	23.1
Cycle Queue Clearance Time (g_c), s	5.8	10.6	11.1	10.2	13.6	14.2	2.2	20.4	23.2	2.6	21.2	23.1
Green Ratio (g/C)	0.22	0.15	0.15	0.25	0.17	0.17	0.61	0.57	0.57	0.61	0.58	0.58
Capacity (c), veh/h	210	283	265	272	320	293	265	1002	961	284	1009	983
Volume-to-Capacity Ratio (X)	0.486	0.636	0.652	0.721	0.715	0.734	0.282	0.641	0.644	0.315	0.657	0.659
Back of Queue (Q), ft/ln (95 th percentile)	120.3	221.2	220.1	240.8	268	265.7	40.6	270	325.8	48.3	274.5	313.7
Back of Queue (Q), veh/ln (95 th percentile)	4.7	8.6	8.6	9.4	10.5	10.4	1.5	10.0	12.1	1.8	10.2	11.6
Queue Storage Ratio (RQ) (95 th percentile)	0.96	0.00	0.00	2.53	0.00	0.00	0.24	0.00	0.00	0.35	0.00	0.00
Uniform Delay (d_1), s/veh	39.9	44.8	46.0	40.0	43.5	45.4	12.7	8.5	10.5	12.4	8.4	9.6
Incremental Delay (d_2), s/veh	1.7	3.4	3.8	9.0	4.2	5.0	0.6	3.1	3.3	0.6	3.3	3.5
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	0.0	0.0
Control Delay (d), s/veh	41.6	48.1	49.8	48.9	47.7	50.4	13.3	11.7	13.8	13.0	11.7	13.1
Level of Service (LOS)	D	D	D	D	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	47.3	D		49.0	D		12.8	B		12.4	B	
Intersection Delay, s/veh / LOS	22.8						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.31	B	2.31	B	2.25	B	2.25	B
Bicycle LOS Score / LOS	0.86	A	1.01	A	1.59	B	1.64	B

HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Peak Hour - EXIST	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	Analysis Period	1> 12:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - SAT EXIST.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	97	274	61	186	316	105	71	1058	140	85	1154	91

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.4	0.5	68.7	7.8	2.4	18.3		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

												
1	2	3	4	5	6	7	8	9	10	11	12	13

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})	0.977	0.977	0.977	0.977	0.977	0.977	0.922	0.922	0.922	0.922	0.922	0.922
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	1.000	1.000	1.000	1.000	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})		0.937	0.937		0.915	0.915		0.959	0.959		0.974	0.974
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	1767	2949	646	1767	2679	875	1668	3031	400	1668	3206	252
Proportion of Vehicles Arriving on Green (P)	0.07	0.20	0.15	0.09	0.23	0.17	0.04	0.76	0.57	0.04	0.77	0.58
Incremental Delay Factor (k)	0.11	0.15	0.15	0.28	0.15	0.15	0.11	0.50	0.50	0.11	0.50	0.50

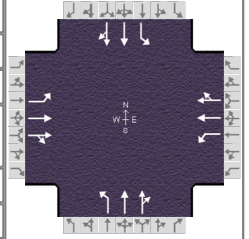
Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Green Ratio (g/C)	0.22	0.15	0.25	0.17	0.61	0.57	0.61	0.58
Permitted Saturation Flow Rate (s_p), veh/h/ln	939	0	1020	0	393	0	412	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	18.3	0.0	19.7	0.0	68.7	0.0	68.7	0.0
Permitted Service Time (g_u), s	4.5	0.0	7.2	0.0	44.0	0.0	45.4	0.0
Permitted Queue Service Time (g_{ps}), s	1.7		4.9		5.8		6.4	
Time to First Blockage (g_t), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{ts}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								
Protected Right Effective Green Time (g_R), s								

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.000	1.557	0.000	1.557	0.000	1.557	0.000
Pedestrian F_s / F_{delay}	0.000	0.151	0.000	0.149	0.000	0.096	0.000	0.095
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	304.72	43.11	344.49	41.11	1144.23	10.99	1152.21	10.78
Bicycle F_w / F_v	-3.64	0.38	-3.64	0.53	-3.64	1.10	-3.64	1.16

HCS7 Signalized Intersection Results Graphical Summary

General Information

Agency				Intersection Information		
Analyst	GHA	Analysis Date	Oct 14, 2020	Duration, h	0.250	
Jurisdiction	IDOT	Time Period	SAT Peak Hour - EXIST	Area Type	Other	
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2019	PHF	0.95	
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - SAT EXIST.xus	Analysis Period	1 > 12:00	
Project Description	4790.900					



Demand Information

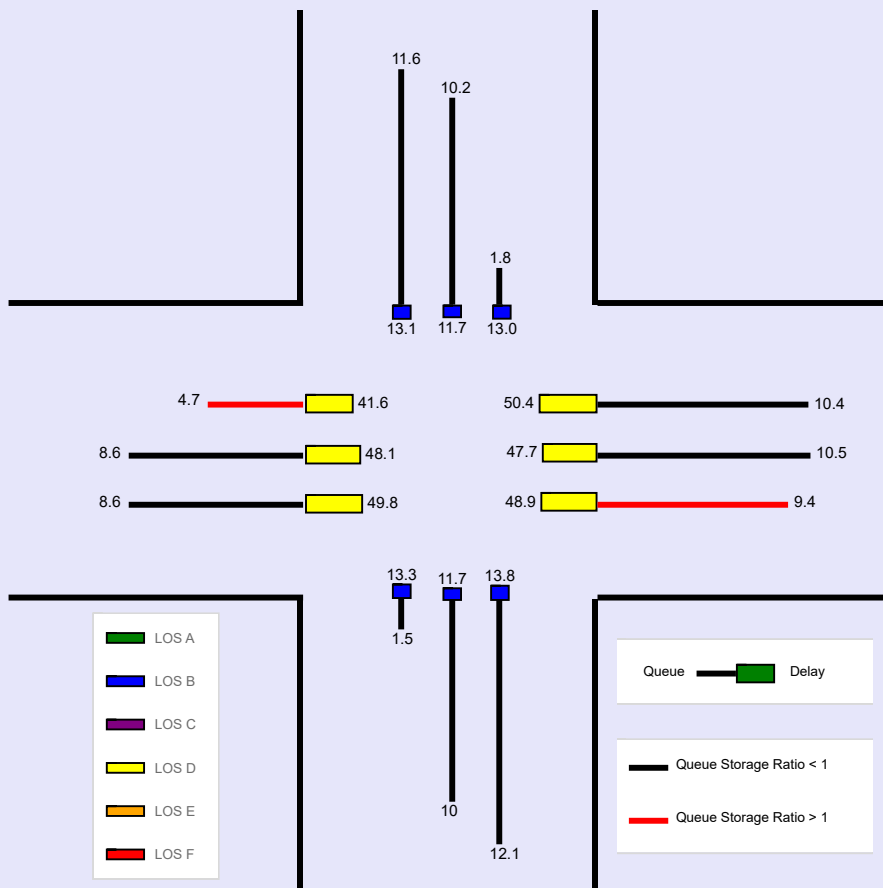
	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	97	274	61	186	316	105	71	1058	140	85	1154	91

Signal Information

Cycle, s	120.0	Reference Phase	2						
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Movement Group Results

Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Back of Queue (Q), ft/ln (95 th percentile)	120.3	221.2	220.1	240.8	268	265.7	40.6	270	325.8	48.3	274.5	313.7
Back of Queue (Q), veh/ln (95 th percentile)	4.7	8.6	8.6	9.4	10.5	10.4	1.5	10.0	12.1	1.8	10.2	11.6
Queue Storage Ratio (RQ) (95 th percentile)	0.96	0.00	0.00	2.53	0.00	0.00	0.24	0.00	0.00	0.35	0.00	0.00
Control Delay (d), s/veh	41.6	48.1	49.8	48.9	47.7	50.4	13.3	11.7	13.8	13.0	11.7	13.1
Level of Service (LOS)	D	D	D	D	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	47.3	D		49.0	D		12.8	B		12.4	B	
Intersection Delay, s/veh / LOS	22.8						C					



--- Messages ---

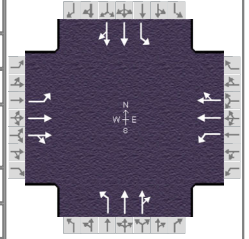
WARNING: One or more minor street movements was assigned an Arrival Type input value other than 3; this implies signal coordination on the minor street.

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 ---

HCS7 Signalized Intersection Input Data

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Peak Hour - TOTAL	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - SAT TOTAL.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	105	277	62	188	336	109	73	1077	142	92	1201	92

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.5	0.7	67.1	8.2	2.0	19.5		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

											
1											
											
5											

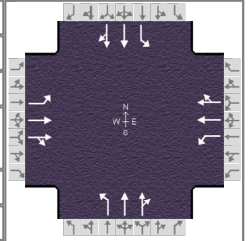
Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	105	277	62	188	336	109	73	1077	142	92	1201	92
Initial Queue (Q _b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s _o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N _m), man/h	None			None			None			None		
Heavy Vehicles (P _{HV}), %	3	3		3	3		10	10		10	10	
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	4	3	3	4	3	3	4	3	3	4	3
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	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Turn Bay Length, ft	125	0		95	0		170	0		140	0	
Grade (P _g), %		0			0			0			0	
Speed Limit, mi/h	30	30	30	30	30	30	30	30	30	30	30	30

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G _{max}) or Phase Split, s	13.2	38.4	13.2	38.4	13.2	55.2	13.2	55.2
Yellow Change Interval (Y), s	3.0	4.5	3.0	4.5	3.0	4.5	3.0	4.5
Red Clearance Interval (R _c), s	0.0	1.5	0.0	1.5	0.0	1.5	0.0	1.5
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	4.0	3.0	4.0	3.0	7.0	3.0	7.0
Recall Mode	Off	Min	Off	Min	Off	Min	Off	Min
Dual Entry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Walk (Walk), s		0.0		0.0		0.0		0.0
Pedestrian Clearance Time (PC), s		0.0		0.0		0.0		0.0

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	

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Peak Hour - TOTAL	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - SAT TOTAL.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	105	277	62	188	336	109	73	1077	142	92	1201	92

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.5	0.7	67.1	8.2	2.0	19.5		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

											
1	2	3	4	5	6	7	8	9	10	11	12

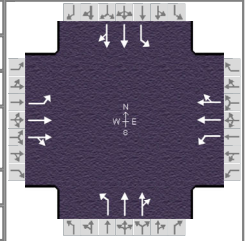
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	7	4	3	8	5	2	1	6
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	4.0
Phase Duration, s	11.2	25.5	13.2	27.5	7.5	73.1	8.2	73.8
Change Period, ($Y+R_c$), s	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Max Allow Headway (MAH), s	4.2	5.2	4.2	5.2	4.2	0.0	4.2	0.0
Queue Clearance Time (g_s), s	8.2	13.0	12.2	17.0	4.3		4.9	
Green Extension Time (g_e), s	0.1	4.7	0.0	4.5	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	0.11	1.00	0.14	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	7	4	14	3	8	18	5	2	12	1	6	16
Adjusted Flow Rate (v), veh/h	111	182	175	198	242	227	77	654	629	97	688	673
Adjusted Saturation Flow Rate (s), veh/h/ln	1767	1856	1739	1767	1856	1701	1668	1752	1680	1668	1752	1708
Queue Service Time (g_s), s	6.2	10.6	11.0	10.2	14.4	15.0	2.3	22.7	25.3	2.9	24.4	26.3
Cycle Queue Clearance Time (g_c), s	6.2	10.6	11.0	10.2	14.4	15.0	2.3	22.7	25.3	2.9	24.4	26.3
Green Ratio (g/C)	0.23	0.16	0.16	0.26	0.18	0.18	0.60	0.56	0.56	0.60	0.56	0.56
Capacity (c), veh/h	216	302	283	282	333	305	246	980	939	272	989	964
Volume-to-Capacity Ratio (X)	0.513	0.603	0.618	0.702	0.727	0.744	0.312	0.667	0.670	0.356	0.695	0.698
Back of Queue (Q), ft/ln (95 th percentile)	128.4	218.9	218.1	238	279.9	276.7	43.6	306.8	359.3	54.5	321.8	359.7
Back of Queue (Q), veh/ln (95 th percentile)	5.0	8.5	8.5	9.3	10.9	10.8	1.6	11.4	13.3	2.0	11.9	13.3
Queue Storage Ratio (RQ) (95 th percentile)	1.03	0.00	0.00	2.50	0.00	0.00	0.26	0.00	0.00	0.39	0.00	0.00
Uniform Delay (d_1), s/veh	38.9	43.5	44.8	39.2	43.0	44.9	14.2	9.6	11.7	13.6	9.5	10.8
Incremental Delay (d_2), s/veh	1.9	2.7	3.1	7.6	4.3	5.1	0.7	3.6	3.8	0.8	4.0	4.2
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	0.0	0.0
Control Delay (d), s/veh	40.8	46.2	47.9	46.8	47.2	49.9	14.9	13.2	15.5	14.4	13.5	15.0
Level of Service (LOS)	D	D	D	D	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	45.6	D		48.0	D		14.4	B		14.2	B	
Intersection Delay, s/veh / LOS	23.7						C					

Multimodal Results	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	2.31	B		2.31	B		2.26	B		2.25	B	
Bicycle LOS Score / LOS	0.87	A		1.04	A		1.61	B		1.69	B	

HCS7 Signalized Intersection Intermediate Values

General Information				Intersection Information	
Agency				Duration, h	0.250
Analyst	GHA	Analysis Date	Oct 14, 2020	Area Type	Other
Jurisdiction	IDOT	Time Period	SAT Peak Hour - TOTAL	PHF	0.95
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	Analysis Period	1> 7:00
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - SAT TOTAL.xus		
Project Description	4790.900				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	105	277	62	188	336	109	73	1077	142	92	1201	92

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	Begin									
Uncoordinated	No	Simult. Gap E/W	On	Green	4.5	0.7	67.1	8.2	2.0	19.5		
				Yellow	3.0	0.0	4.5	3.0	0.0	4.5		
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	1.5	0.0	0.0	1.5		

														
1											2		3	4
											5	6	7	8

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})	0.977	0.977	0.977	0.977	0.977	0.977	0.922	0.922	0.922	0.922	0.922	0.922
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	1.000	1.000	1.000	1.000	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})		0.937	0.937		0.916	0.916		0.959	0.959		0.975	0.975
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	1767	2945	649	1767	2695	861	1668	3033	399	1668	3214	246
Proportion of Vehicles Arriving on Green (P)	0.07	0.22	0.16	0.09	0.24	0.18	0.04	0.75	0.56	0.04	0.75	0.56
Incremental Delay Factor (k)	0.11	0.15	0.15	0.27	0.15	0.15	0.11	0.50	0.50	0.11	0.50	0.50

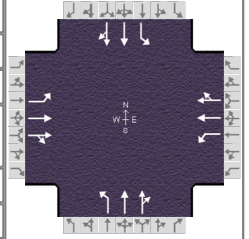
Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.0	6.0	3.0	6.0	3.0	6.0	3.0	6.0
Green Ratio (g/C)	0.23	0.16	0.26	0.18	0.60	0.56	0.60	0.56
Permitted Saturation Flow Rate (s_p), veh/h/ln	917	0	1016	0	374	0	403	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	19.5	0.0	20.5	0.0	67.1	0.0	67.1	0.0
Permitted Service Time (g_u), s	4.5	0.0	8.5	0.0	39.5	0.0	41.7	0.0
Permitted Queue Service Time (g_{ps}), s	2.1		4.9		7.1		8.0	
Time to First Blockage (g_t), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{ts}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								
Protected Right Effective Green Time (g_R), s								

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.000	1.557	0.000	1.557	0.000	1.557	0.000
Pedestrian F_s / F_{delay}	0.000	0.150	0.000	0.148	0.000	0.098	0.000	0.097
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	325.31	42.07	358.49	40.42	1118.29	11.66	1129.40	11.37
Bicycle F_w / F_v	-3.64	0.39	-3.64	0.55	-3.64	1.12	-3.64	1.20

HCS7 Signalized Intersection Results Graphical Summary

General Information

Agency				Intersection Information		
Analyst	GHA	Analysis Date	Oct 14, 2020	Duration, h	0.250	
Jurisdiction	IDOT	Time Period	SAT Peak Hour - TOTAL	Area Type	Other	
Urban Street	Harlem Ave. (IL 43)	Analysis Year	2026	PHF	0.95	
Intersection	Harlem Ave. @ Madison...	File Name	Harlem @ Madison - SAT TOTAL.xus	Analysis Period	1 > 7:00	
Project Description	4790.900					



Demand Information

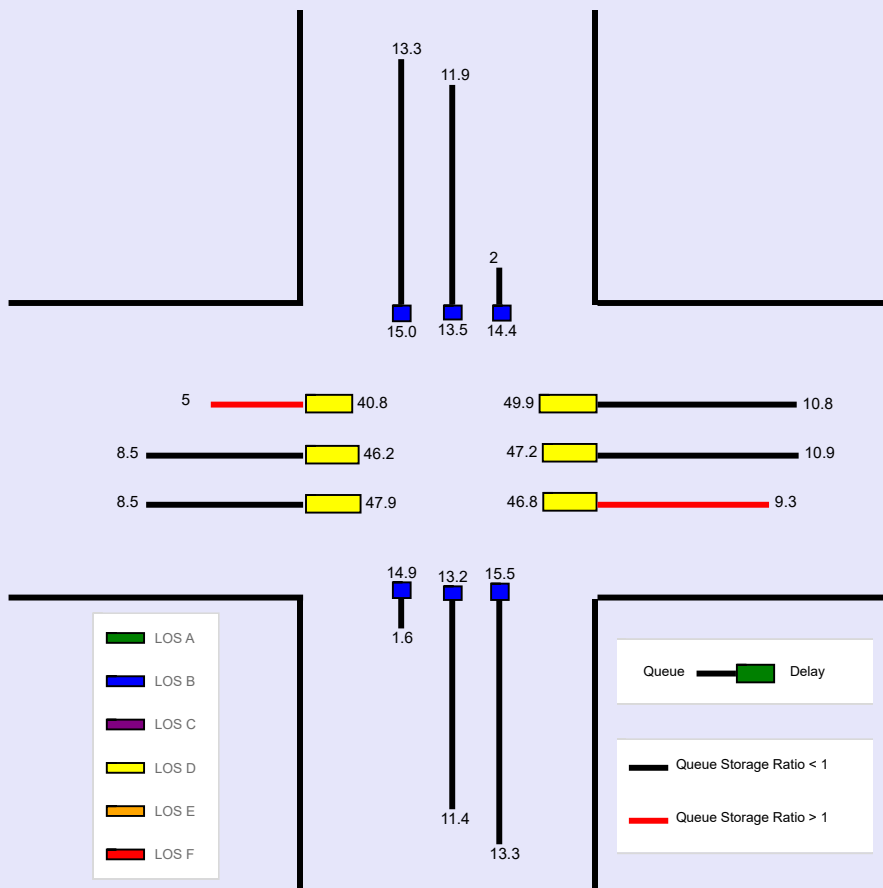
	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	105	277	62	188	336	109	73	1077	142	92	1201	92

Signal Information

Cycle, s	120.0	Reference Phase	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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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)	128.4	218.9	218.1	238	279.9	276.7	43.6	306.8	359.3	54.5	321.8	359.7
Back of Queue (Q), veh/ln (95 th percentile)	5.0	8.5	8.5	9.3	10.9	10.8	1.6	11.4	13.3	2.0	11.9	13.3
Queue Storage Ratio (RQ) (95 th percentile)	1.03	0.00	0.00	2.50	0.00	0.00	0.26	0.00	0.00	0.39	0.00	0.00
Control Delay (d), s/veh	40.8	46.2	47.9	46.8	47.2	49.9	14.9	13.2	15.5	14.4	13.5	15.0
Level of Service (LOS)	D	D	D	D	D	D	B	B	B	B	B	B
Approach Delay, s/veh / LOS	45.6		D	48.0		D	14.4		B	14.2		B
Intersection Delay, s/veh / LOS	23.7						C					



--- Messages ---

WARNING: One or more minor street movements was assigned an Arrival Type input value other than 3; this implies signal coordination on the minor street.

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 ---