



Intersection Traffic Analysis

The intersection of Ogden Avenue at Iroquois Center Access Drive will be analyzed to determine the existing traffic conditions, as well as the projected traffic conditions after the restaurant is completed. For this analysis, we will consider the 2023 existing traffic, as well as the projected traffic in the year 2029, which is anticipated to be 5 years after the restaurant is built. In 2029, both the no build and build scenarios will be analyzed to compare the direct effects of the redevelopment.

Traffic counts were collected on Saturday, October 28th and Wednesday, November 1st to determine peak hour turning movement counts. Projected traffic volumes were obtained from CMAP to project the design year 2029 no build turning movement counts.

Additional traffic generated by the proposed redevelopment can be estimated by utilizing the 11th edition of the *Institute of Transportation Engineers (ITE) Trip Generation Manual*. The tables in the *ITE Trip Generation Manual* estimate the ingress and egress traffic for both morning and evening peak traffic conditions for various types of land uses. The trip generation estimate is shown in **Table 1**.

TABLE 1 – TRIP GENERATION ESTIMATE

Land Use	ITE Code	Square Footage	AM		Mid-Day		PM		Saturday	
			Peak Hour		Peak Hour		Peak Hour		Peak Hour	
			In	Out	In	Out	In	Out	In	Out
Fast Food Restaurant w/ Drive Thru	934	5,025	115	110	130	125	85	80	140	135
Common Trip Reduction (10%)			12	11	13	13	9	8	14	14
TOTAL TRIPS			103	99	117	112	76	72	126	121
Pass-By Trip Reduction (40%)			46	44	52	50	34	32	56	54

Developments that are placed in a mixed-use shopping center may also be subject to a reduction of site-generated traffic through common trips. Common trips are patrons of the restaurant that are also visiting other businesses within the shopping center. Those trips may be subtracted from the overall trip generation estimate. In this shopping center, a variety of land uses are present, but most of these businesses are not restaurants. Therefore, a common trip reduction of 10% was applied to this estimate.

Many new developments which consist of commercial, or retail land uses may consider the impacts of pass-by trips, or traffic which is already on the roadway network which will now patronize the new business. These site trips would, therefore, not be considered “new” to the area. For this development, it was assumed that pass-by trips would be a significant portion of the site traffic, as it is reasonable to expect motorists to stop at the proposed restaurant on their way to work or home. The *ITE Trip Generation Handbook* recommends a reduction up to 40-50% for this type of restaurant. For this site, the pass-by reduction would apply to through vehicles on Ogden Avenue, and 40% of the site generated turning trips from Ogden Avenue were subtracted from the through volumes.



Naperville Chick-fil-A Traffic Analysis

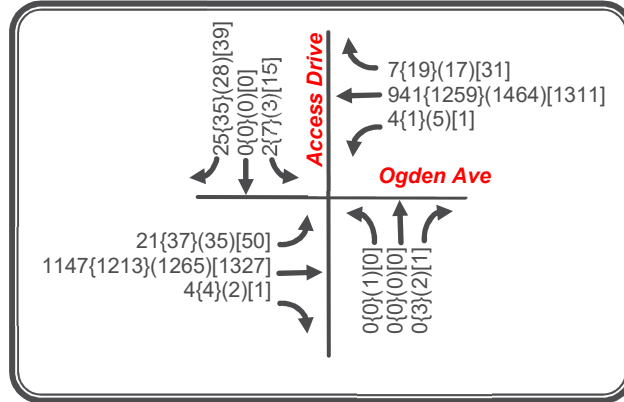
It should be noted that the existing Cuisine of India restaurant is expected to be demolished as part of this redevelopment. This restaurant does generate some traffic, which was included in the traffic data collected. It would be reasonable to subtract this traffic from the turning movement counts before adding in the proposed Chick-fil-A traffic. However, the Cuisine of India traffic is likely small and was not subtracted from the design volumes before adding the new site-generated traffic. This results in a more conservative analysis of the proposed restaurant.

Based on the existing traffic counts and the distribution of traffic entering and exiting the Iroquois Center shopping plaza, it was determined that approximately 70% of the projected trips would access the site from the southwest, and 30% would access the site from the northeast on Ogden Avenue. Additionally, the counts suggest that few vehicles attempt to exit the shopping center by making a left turn from the Access Drive onto Ogden Avenue because of the high traffic volumes. Therefore, it was assumed that of the 30% of site traffic leaving the restaurant and desiring to travel northeast, 10% would attempt a left turn from the Access Drive onto Ogden Avenue, and 20% would exit the shopping center via the Iroquois Avenue access drives, and make the left turn at the signalized intersection.

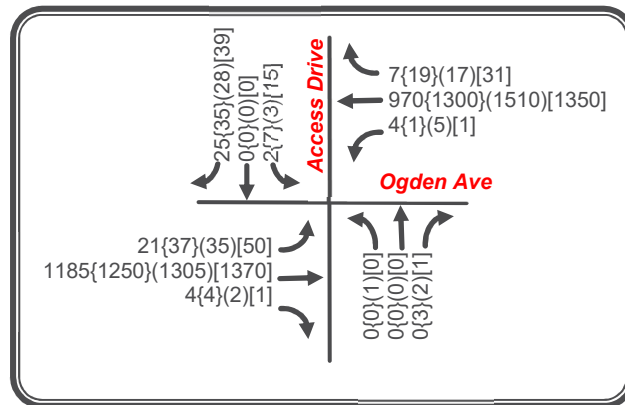
The existing, projected no build, and build volumes are presented in **Figure 2**.

FIGURE 2 – VOLUME DIAGRAMS

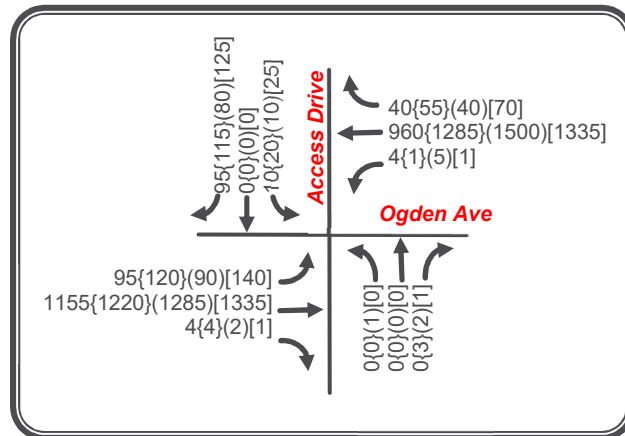
2023 EXISTING VOLUMES



2029 NO BUILD VOLUMES



2029 BUILD VOLUMES



Legend

Peak Hour Volumes:

AM{MD}{PM}[SAT]



Naperville Chick-fil-A Traffic Analysis

Three scenarios were analyzed to evaluate the impacts of the proposed development. Using Synchro 11, an existing analysis was performed using the current geometry and turning movement counts to evaluate how the intersection currently performs. A 2029 no build analysis was also performed to determine how the existing geometry would fare under future volumes without the development. Finally, a 2029 build analysis evaluates the intersection with the influence of the site-generated traffic volumes. Results are shown in **Table 2**.

TABLE 2 –TRAFFIC OPERATIONS COMPARISON

Location / Critical Movements	Ogden Avenue at Iroquois Center Access Drive											
	AM Peak Hour			Mid-Day Peak Hour			PM Peak Hour			SAT Peak Hour		
	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS	Queue
2023 Existing Conditions												
EB Left	10.5	B	3'	12.9	B	6'	14.7	B	7'	13.3	B	9'
WB Left	11.2	B	1'	11.6	B	0'	11.9	B	1'	12.3	B	0'
SB Left	26.0	D	1'	43.1	E	5'	48.0	E	3'	47.1	E	13'
SB Right	12.6	B	4'	15.0	C	8'	17.1	C	7'	15.5	C	9'
NB Left/Right	N/A	N/A	N/A	13.6	B	1'	24.4	C	1'	14.3	B	0'
2029 No Build Conditions												
EB Left	10.7	B	3'	13.3	B	7'	15.2	C	8'	13.6	B	9'
WB Left	11.4	B	1'	11.8	B	0'	12.2	B	1'	12.6	B	0'
SB Left	26.9	D	1'	45.6	E	6'	51.1	F	3'	50.1	F	14'
SB Right	12.8	B	4'	15.4	C	8'	17.6	C	8'	15.9	C	9'
NB Left/Right	N/A	N/A	N/A	13.8	B	1'	25.5	D	1'	14.6	B	0'
2029 Build Conditions												
EB Left	11.7	B	14'	15.6	C	27'	17.4	C	24'	16.4	C	34'
WB Left	11.3	B	1'	11.6	B	0'	12.1	B	1'	12.3	B	0'
SB Left	32.8	D	6'	65.4	F	24'	62.7	F	12'	73.2	F	32'
SB Right	14.4	B	19'	19.0	C	34'	20.8	C	27'	20.4	C	40'
NB Left/Right	N/A	N/A	N/A	13.6	B	1'	34.1	D	2'	14.4	B	0'

The analysis indicates that under current conditions, the intersection performs acceptably. The turning movements on Ogden Avenue are analyzed at LOS B with minimal queueing. The southbound approach of Iroquois Center Access Drive experiences higher delays, with grades of LOS E. The volumes for this movement are low, but delays are higher because of the high conflicting traffic volumes on Ogden Avenue. As previously stated, it is likely that many of the cars who leave the shopping center desiring to make the southbound left to travel eastbound on Ogden Avenue avoid the high delays by using the access points on Iroquois Avenue to make the left turn on Ogden Avenue at the signalized intersection. The 2029 no build analysis predicts similar operations, with southbound left turn grades moving to LOS F during the PM and Saturday peaks.

After the addition of site traffic, delays are expected to increase. For the eastbound left movement, which is expected to receive 70% of the entering trips, delays are predicted to increase by no more than 3 seconds in all peak hours, while operating at LOS C or better. 95th percentile queues are predicted to be two vehicles or fewer, which can be easily accommodated by the center turn lane. The southbound right turning movement is expected to remain at LOS C or better with delay increases of 4-5 seconds. The southbound left turning movement is predicted to see



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larger increases in delays. The movement is predicted at LOS F in the no build scenario during the mid-day, PM, and Saturday peaks, which is consistent with the no build analysis. Again, because of the high delays, many vehicles are expected to find an alternate route. Queues for the southbound approach are predicted at 40' or less, indicating that queueing impacts internal to the Iroquois Center development are not expected.

The analysis predicts that the intersection of Ogden Avenue at Iroquois Center Access Drive is able to accommodate the projected site-generated traffic. The Ogden Avenue approaches have sufficient capacity and are unlikely to experience significant impacts. The southbound approach of the Access Drive is expected to see higher delays with the additional exiting traffic, though the analysis predicts it will be similar to the existing delays without the restaurant. However, alternate routes exist to provide a way for drivers to avoid making a left turn onto Ogden Avenue.

Drive-Thru Queue Evaluation

An evaluation of the drive-thru queue capacity was requested by the City to demonstrate that the drive-thru queue will not spill outside of the proposed drive-thru lanes and impede traffic on the neighboring streets. The Chick-fil-A will have a two-lane drive-thru from the entrance to the exit of the drive-thru. This lane design is being used at several other recently built restaurants and is designed to maximize efficiency. The design can accommodate two lanes for ordering, paying, and order pick-up along the south, east, and north sides of the building. The design as laid out shows stacking capacity for up to 65 vehicles.

During peak periods, Chick-fil-A employees use handheld tablets to place orders and take payments from both lanes, and at the pick-up window, employees walk up to cars to deliver the food. In off-peak periods, where less capacity is required, the drive-thru can be operated with standard ordering boards, and the lanes can be tapered down to a single lane for pick-up after the ordering point.

A study was previously done to evaluate the drive-thru processing efficiency of Chick-fil-A restaurants. Drive-thru operations were observed at two restaurants in Brookfield, Wisconsin on August 31 and September 1, 2020 from 12:00 to 1:00 p.m. The study determined the average order processing time for vehicles in longer drive-thru queues. At these sites, team members in the drive-thru lanes took orders with tablets, similar to the method proposed at the Naperville store. The primary difference is that at the Brookfield sites, the drive-thru lanes taper to a single lane at the pick-up window. The Naperville site is proposed to have two continuous drive-thru lanes, meaning that the Brookfield observations represent a conservative estimate of the drive-thru processing time, and that the Naperville restaurant should be capable of faster service times.

Data was collected regarding the speed at which drive-thru queues were processed. To determine how many cars the drive-thru can process and how long queues may stretch, the efficiency of the operation was analyzed. To accomplish this task, 16 cars entering an existing queue in the drive-thru lanes were observed at random. The time was noted when the subject vehicle joined the back of the queue, and when the vehicle left the drive-thru after receiving its order. The number of vehicles processed in the drive-thru between the subject vehicle entering and leaving was recorded. The overall time the subject vehicle spent in line was divided by the number of vehicles processed to determine an average vehicle processing time. This gives a snapshot of how quickly the restaurant can process drive-thru queues.

The average processing time from the two Brookfield restaurants was 20 seconds per vehicle and 30 seconds per vehicle, for queues ranging from 7 vehicles to 30 vehicles. Additionally, the highest recorded processing time of the



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16 observations was 40 seconds per vehicle. This means that at the slowest observed processing pace, a vehicle left the drive-thru with its order every 40 seconds during the peak periods. We can estimate the average hourly processing capacity of the drive-thru by dividing one hour (3600 seconds) by the processing time. Conservatively assuming that the drive-thru operates at the observed maximum vehicle processing time of 40 seconds per vehicle over the course of the full hour would give a baseline hourly processing capacity. This calculation of 3600 seconds divided by 40 seconds per vehicle reveals that the drive thru can process a minimum of 90 vehicles per hour, with potential for higher capacity if the queue processing time is closer to the average rate of between 20 and 30 seconds per vehicle.

For this analysis, the drive-thru demand is assumed to be the trip generation estimate for entering vehicles during the peak hours. This will be a very conservative estimate, as some of the entering vehicles will park and either order and carry out from inside the restaurant, or dine in. **Table 3** summarizes the estimate of the drive-thru processing capacity.

TABLE 3 – DRIVE-THRU PROCESSING CAPACITY

	<i>Vehicle Processing Capacity (40 seconds/vehicle)</i>		
	<i>Weekday Mid-Day</i>	<i>Weekday Evening</i>	<i>Saturday Mid-Day</i>
Theoretical Peak Hourly Demand	130 veh/hr	85 veh/hr	140 veh/hr
Drive-Thru Queue Storage	-65	-65	-65
Remaining Vehicles to be Processed	65	20	75
Hourly Processing Capacity	90	90	90
Excess Drive-Thru Capacity	25 vehicles	70 vehicles	15 vehicles

By subtracting the queue storage and the hourly processing capacity of the drive-thru from the observed demand, an estimate can be made of the excess drive-thru capacity or potential queue spillover during each peak hour. The analysis indicates that the theoretical hourly capacity of the drive-thru lanes is greater than the estimated demand in all peak hours. The restaurant is very likely to be able to accommodate drive-thru queues within the dedicated drive-thru lanes. It should be noted that even in an extreme case where drive-thru queues may extend beyond the lane, there is additional queueing space within the Chick-fil-A lot before a queue would reach the Access Drive. Because of the very long drive-thru queue storage area in the lanes and on the site, queue spillover is highly unlikely.



Parking Lot Capacity

Because the Iroquois Center parking lots are shared among the various land uses, an evaluation of the parking lot capacity for the shopping center was also conducted as part of the study. The combined projected parking demand for the shopping center and the proposed restaurant was compared to the number of available parking spaces after the development. There are approximately 504 existing parking spaces that will remain after the redevelopment in all the shared lot areas. The Chick-fil-A lot will contain an additional 56 parking spaces, for a total of 560 parking spaces.

Each of the land uses in the shopping center was considered for parking requirements, based on the Institute of Transportation Engineers (ITE) *Parking Generation, 5th Edition*. ITE provides either an average parking demand rate or a fitted curve equation based on their study data for peak parking demand by land use. ITE also provides data on the percentage of peak parking demand each hour, as experienced by each land use.

Chick-fil-A falls under ITE Land Use Code 934 – Fast-Food Restaurant with Drive-Through Window. The proposed building is approximately 5,025 square feet (s.f.). The shopping center contains various businesses including fitness, restaurants, medical clinics, and a community center. Several of these land uses have their own categories within the ITE manual. The rest of the miscellaneous retail and salon businesses were classified as Land Use 820 – Shopping Center.

Hourly parking demands for each land use were calculated and summed for the Iroquois Center for a weekday and a Saturday. A mid-day peak hour (12:00pm) and an evening peak hour (6:00pm) were considered on the weekday, and a mid-day Saturday peak (1:00pm) were used for the analysis, as these were the times that were predicted to have the highest parking demand for all land uses within the Iroquois Center. A weekday morning peak hour was not analyzed because of the relatively low demand for the shopping center. The peak period parking demands for the shopping center are summarized in **Table 4**, and are compared to the City of Naperville's parking code requirements.

TABLE 4 – ITE PARKING DEMAND AND CODE REQUIREMENTS

Land Use	Building Size (s.f.)	ITE Land Use Code	ITE Parking Demand			City of Naperville Parking Code Requirement
			Weekday		Saturday	
			Mid-Day	Evening	Mid-Day	
Fast Food (Chick-fil-A)	5,025	934	43	27	46	85
High Turnover Restaurant (Joy Yee Noodles)	3,345	932	30	31	40	34
Recreational Community Center (Xilin Asian Community Center)	21,824	495	67	80	25	218
Fitness (Planet Fitness, Xhaolin Kung Fu)	19,691	492	48	108	55	79
Medical Clinics (DuPage Medical Group, Iroquois Dental Center)	4,952	630	15	3	14	25
Shopping Center (remaining businesses)	17,002	820	124	108	87	75
Total			327	357	267	516

According to ITE parking rates, the highest parking demand is projected to be 357 vehicles during the weekday evening peak period. Compared to the 560 available parking spaces, the overall parking utilization is predicted to be 64%. The analysis indicates that the parking supply is expected to be adequate for the development plans based on ITE code. The additional 36% of unutilized parking supply will likely aid in traffic circulation, as available parking spaces reduce the amount of time vehicles must spend driving through the lot, searching for a parking space. The 560 provided parking spaces also exceed the City's code requirements.



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Conclusion

A review of the traffic operations, drive-thru processing capacity, and parking demand for the proposed Naperville Chick-fil-A was completed. Based on the analysis, the existing intersection of Ogden Avenue and Iroquois Center Access Drive is expected to be able to accommodate the additional entering traffic. It is expected that high delays for vehicles leaving the site and desiring to head northeast on Ogden Avenue will likely cause many vehicles to exit the shopping center via Iroquois Avenue and utilize the signalized intersection at Ogden Avenue to continue northeast on Ogden Avenue.

The proposed drive-thru queue storage lanes are very likely to accommodate the drive-thru demand. Queues are not expected to spill beyond the drive-thru lanes.

The demand for shared parking lot for the Iroquois Center was demonstrated to be less than the parking supply. According to expected parking demand rates, it is estimated that the parking lot will be approximately 64% utilized during the highest demand parking period. The number of provided spaces also exceed the City's code requirements. Therefore, the parking is expected to be adequate for vehicle parking and traffic circulation.



Naperville Chick-fil-A Traffic Analysis

Appendix

Site Plan

Traffic Counts

Synchro Outputs



Chick-fil-A
5200 Buffington Road
Atlanta, Georgia
30349-2998



HRGreen.com

HRGreen

CHICK-FIL-A

NAPERVILLE (IL) FSU

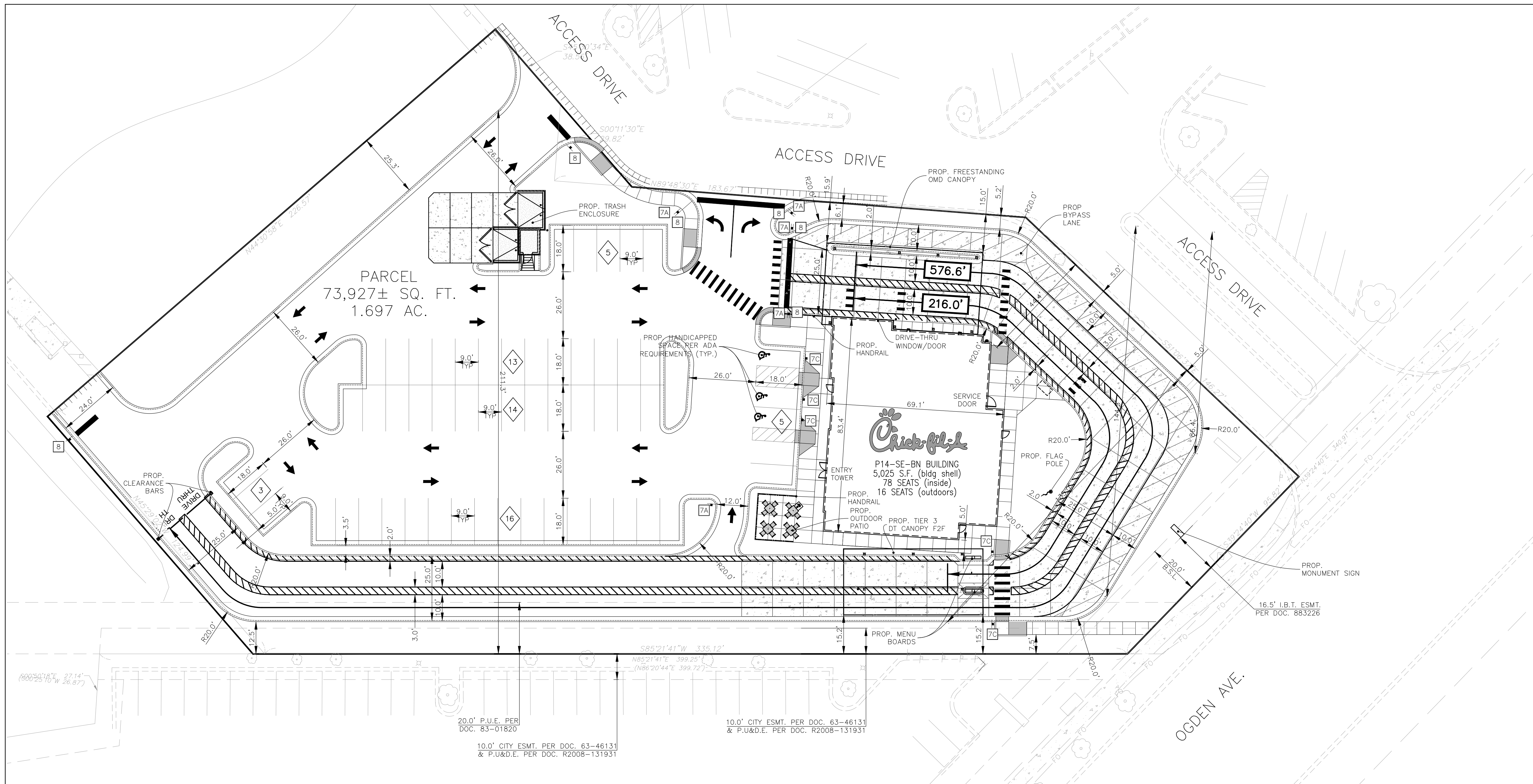
1163 E. OGDEN AVE.
NAPERVILLE, IL 60563

FSR# 05590

REVISION SCHEDULE
NO. DATE DESCRIPTION

PRELIMINARY

ENGINEER'S PROJECT #	2302569
PRINTED FOR	PRELIMINARY
DATE	10/16/2023
DRAWN BY:	MRJ
CHECKED BY:	JFV
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SHEET	SITE PLAN
SHEET NUMBER	CON-A



HATCH LEGEND

	DENOTES STANDARD PAVEMENT SECTION
	DENOTES CONCRETE SECTION
	DENOTES PROP. SIDEWALK
	DENOTES AREA OF DEPRESSED SIDEWALK
	DENOTES AREA OF DEPRESSED CURB AND GUTTER WITH LENGTH NOTED ON PLANS.
	DENOTES REVERSE CURB & GUTTER

SIGN LEGEND

	DENOTES "DO NOT ENTER" R5-1, 30" X 30" (TYP.)
	DENOTES "HANDICAPPED PARKING" R7-8, 12" X 18" (TYP.) DENOTES "\$250 FINE" R7-1101 6" X 12" (TYP.)
	DENOTES "PEDESTRIAN CROSSWALK" 12" X 18" (TYP.)
	DENOTES "STOP" R1-1, 30" X 30" (TYP.)

SITE DATA:

- ZONING: B3 PUD (GENERAL COMMERCIAL DISTRICT)
- LOT SIZE: 73,927± SQ. FT. (1.697 AC.)

BUILDING AREA:

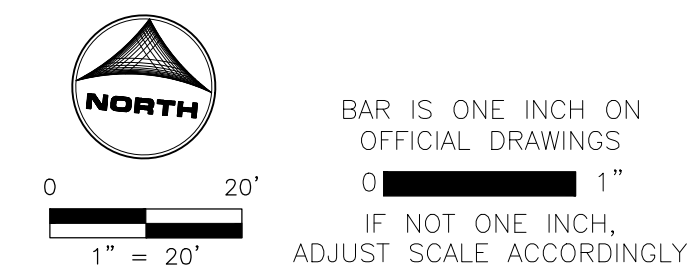
- BUILDING FOOT PRINT: 5,025± SQ. FT.
- FLOOR AREA RATIO (F.A.R.) = 0.068
- NUMBER OF EMPLOYEES DURING LARGEST SHIFT = 15 EMPLOYEES

PARKING DATA:

- TYPICAL PARKING WIDTH: 9.0'
- TYPICAL PARKING LENGTH: 18.0'
- TYPICAL ISLE WIDTH: 26.0'
- REGULAR PARKING SPACES PROVIDED: 53
- ADA PARKING SPACES PROVIDED: 3
- TOTAL PARKING SPACES PROVIDED: 56

PARKING FORMULA:
17 SPACES PER 1,000 SQ. FT. OF GFA
(5,025/1,000 X 17 = 85 STALLS)

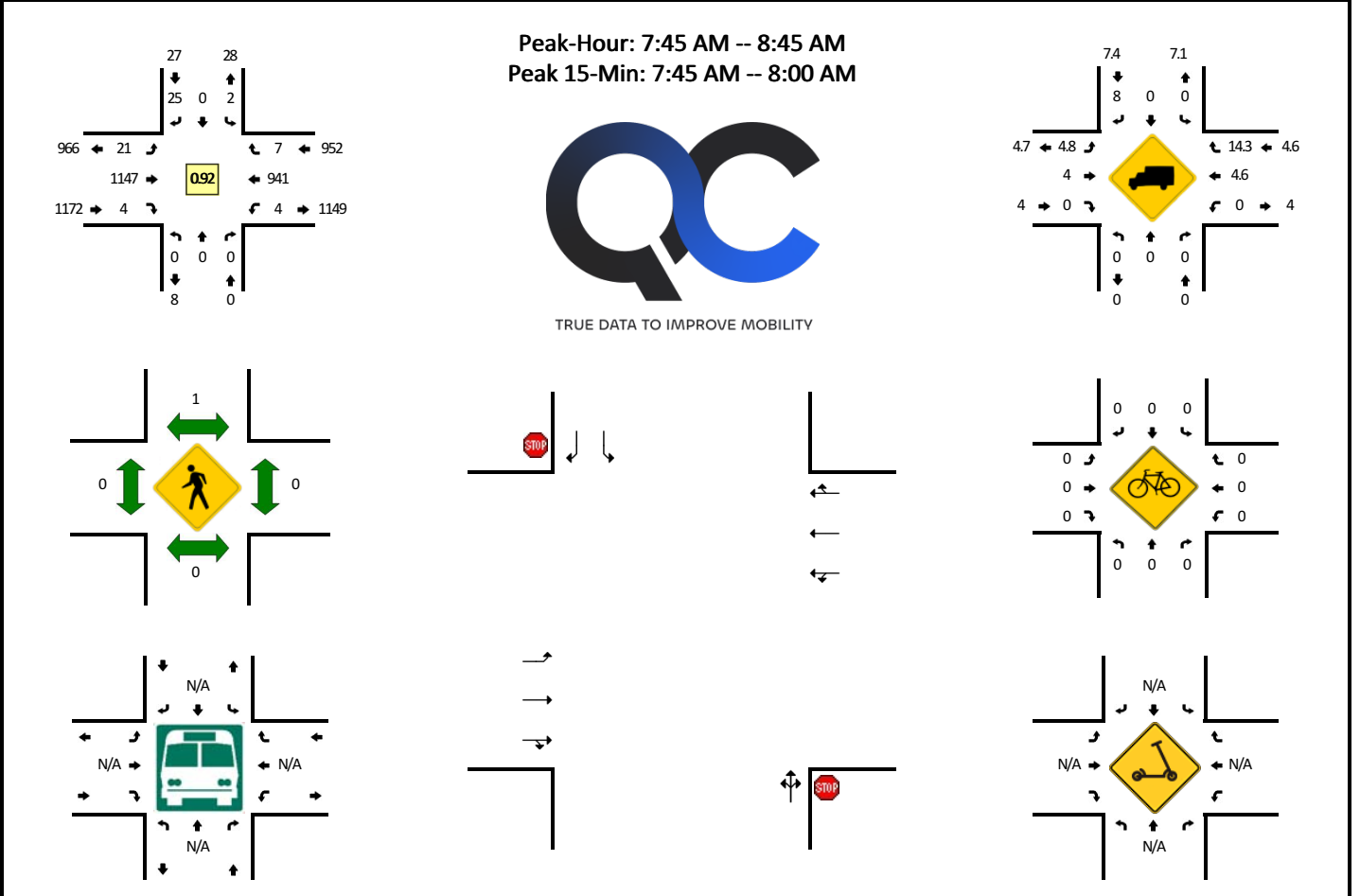
- TOTAL PARKING STALLS REQUIRED = 85 STALLS



PRELIMINARY NOT FOR CONSTRUCTION

LOCATION: Iroquois Center/UltraMed -- E Ogden Ave
CITY/STATE: Naperville, IL

QC JOB #: 16387101
DATE: Wed, Nov 1 2023

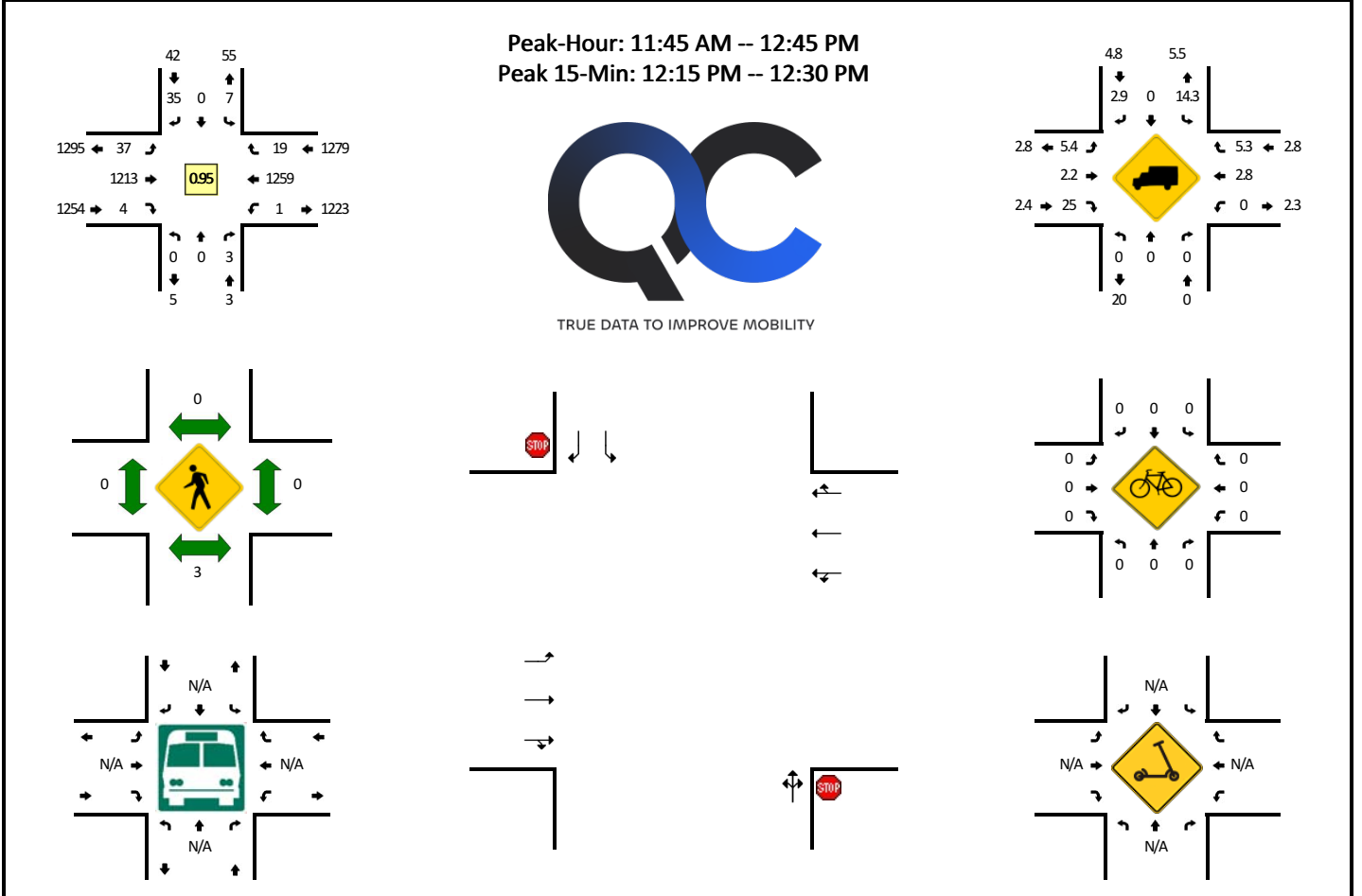


15-Min Count Period Beginning At	Iroquois Center/UltraMed (Northbound)				Iroquois Center/UltraMed (Southbound)				E Ogden Ave (Eastbound)				E Ogden Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	3	0	1	225	0	0	0	154	2	0	385	
7:15 AM	0	0	0	0	1	0	4	0	5	295	1	0	0	179	3	0	488	
7:30 AM	0	0	0	0	0	0	2	0	2	288	0	0	0	209	0	0	501	
7:45 AM	0	0	0	0	0	0	8	0	6	319	1	0	2	245	3	0	584	1958
8:00 AM	0	0	0	0	1	0	6	0	2	298	2	0	0	230	2	0	541	2114
8:15 AM	0	0	0	0	0	0	6	0	7	277	1	0	2	200	1	0	494	2120
8:30 AM	0	0	0	0	1	0	5	0	6	253	0	0	0	266	1	0	532	2151
8:45 AM	0	0	0	0	1	0	1	0	2	293	2	0	0	223	2	0	524	2091
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	0	32	0	24	1276	4	0	8	980	12	0	2336	
Heavy Trucks	0	0	0	0	0	0	0	0	0	56	0	0	0	52	0	0	108	
Buses																		
Pedestrians		0				4				0				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Iroquois Center/UltraMed -- E Ogden Ave
CITY/STATE: Naperville, IL

QC JOB #: 16387103
DATE: Wed, Nov 1 2023

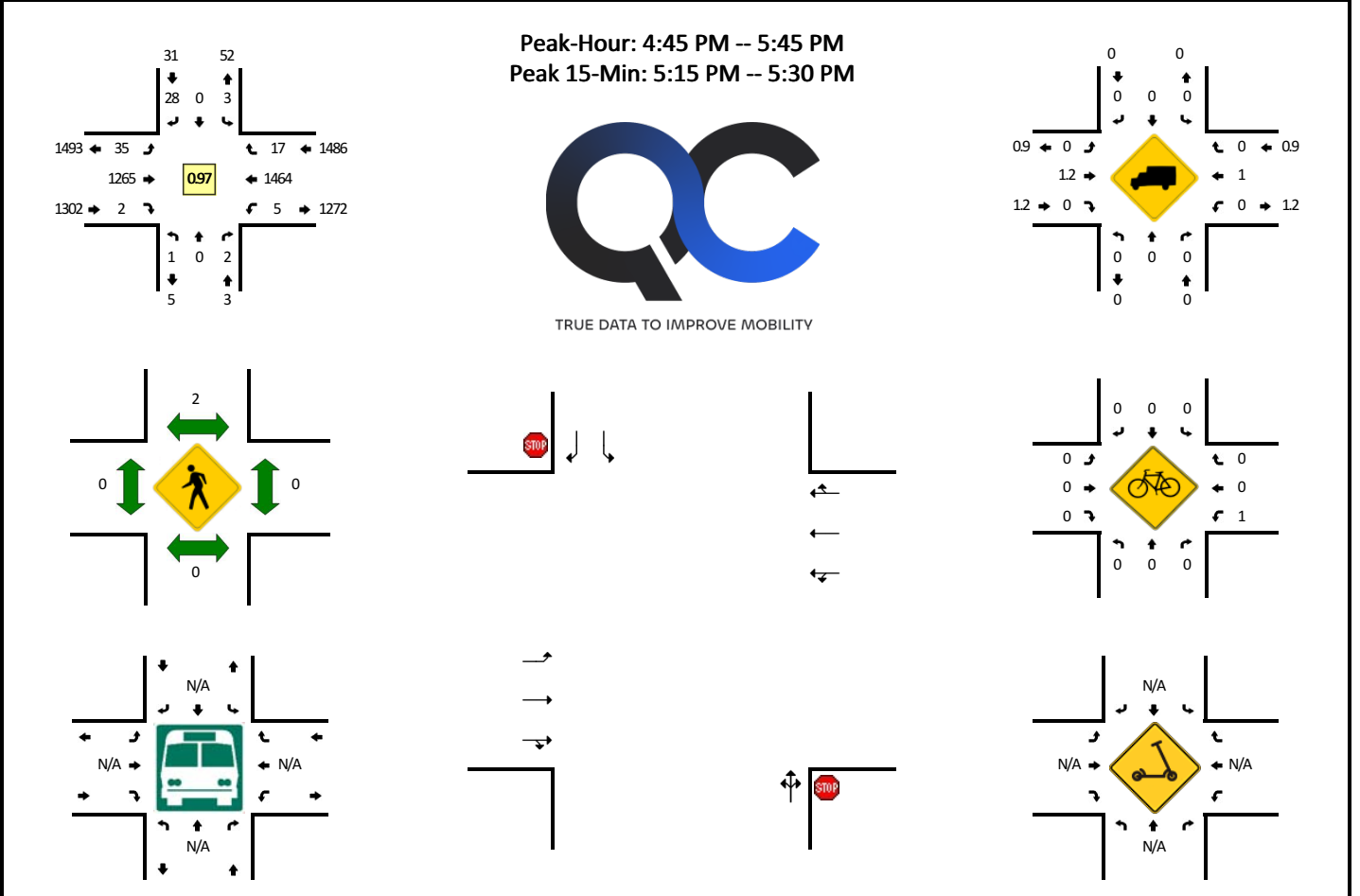


15-Min Count Period Beginning At	Iroquois Center/UltraMed (Northbound)				Iroquois Center/UltraMed (Southbound)				E Ogden Ave (Eastbound)				E Ogden Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	0	0	10	0	6	245	0	0	0	248	6	0	515	
11:15 AM	1	0	1	0	2	0	7	1	3	273	1	0	2	258	9	0	558	
11:30 AM	0	0	3	0	3	0	11	0	13	305	3	0	0	286	2	0	626	
11:45 AM	0	0	2	0	3	0	8	0	5	263	0	0	0	317	8	0	606	2305
12:00 PM	0	0	0	0	2	0	11	0	10	306	1	0	0	289	6	0	625	2415
12:15 PM	0	0	1	0	1	0	8	0	8	331	0	1	0	329	2	0	681	2538
12:30 PM	0	0	0	0	1	0	8	0	13	313	3	0	1	324	3	0	666	2578
12:45 PM	0	0	1	0	1	0	8	0	7	293	2	1	2	277	4	0	596	2568
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	4	0	4	0	32	0	32	1324	0	4	0	1316	8	0	2724	
Heavy Trucks	0	0	0	0	4	0	0	0	8	20	0	0	0	36	0	0	68	
Buses																		
Pedestrians		4				0				0				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:

LOCATION: Iroquois Center/UltraMed -- E Ogden Ave
CITY/STATE: Naperville, IL

QC JOB #: 16387102
DATE: Wed, Nov 1 2023

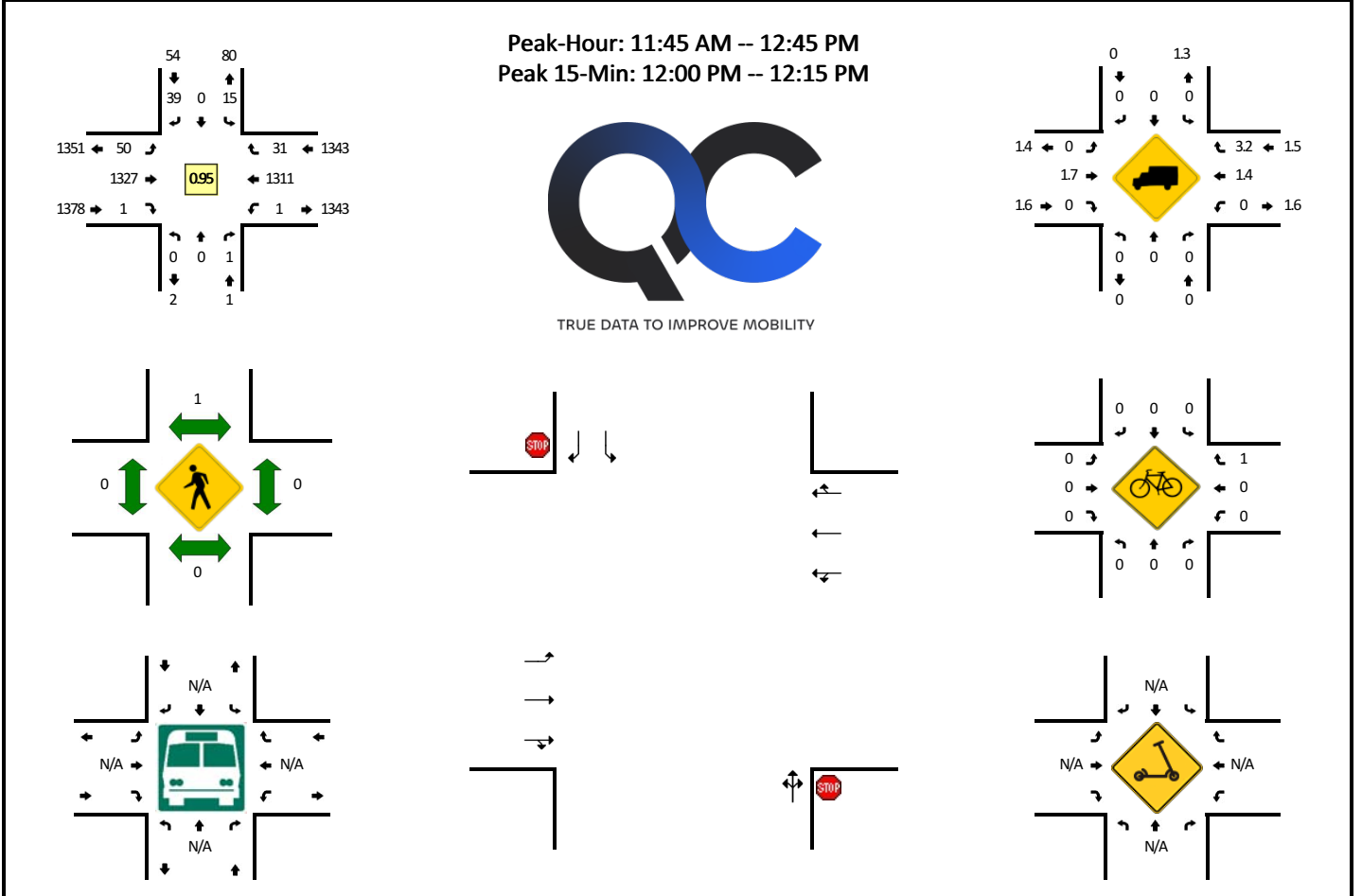


15-Min Count Period Beginning At	Iroquois Center/UltraMed (Northbound)				Iroquois Center/UltraMed (Southbound)				E Ogden Ave (Eastbound)				E Ogden Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	2	0	1	0	8	0	6	330	0	1	1	330	4	0	683	
4:15 PM	0	0	1	0	2	0	5	1	7	316	1	0	0	312	7	1	653	
4:30 PM	0	0	0	0	1	0	11	0	6	290	2	1	0	333	9	0	653	
4:45 PM	1	0	1	0	1	0	5	0	9	300	2	0	2	344	3	1	669	2658
5:00 PM	0	0	0	0	0	0	9	0	11	294	0	0	0	380	6	1	701	2676
5:15 PM	0	0	1	0	2	0	7	0	9	334	0	0	0	374	2	0	729	2752
5:30 PM	0	0	0	0	0	0	7	0	6	337	0	0	1	366	6	0	723	2822
5:45 PM	0	0	0	0	2	0	8	0	4	258	0	0	0	361	11	0	644	2797
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	4	0	8	0	28	0	36	1336	0	0	0	1496	8	0	2916	
Heavy Trucks	0	0	0	0	0	0	0	0	0	12	0	0	0	12	0	0	24	
Buses																	0	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																	0	

Comments:

LOCATION: Iroquois Center/UltraMed -- E Ogden Ave
CITY/STATE: Naperville, IL

QC JOB #: 16387104
DATE: Sat, Oct 28 2023























15-Min Count Period Beginning At	Iroquois Center/UltraMed (Northbound)				Iroquois Center/UltraMed (Southbound)				E Ogden Ave (Eastbound)				E Ogden Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	1	0	1	0	0	0	11	1	8	287	0	0	0	311	8	0	628	
11:15 AM	0	0	0	0	3	0	4	0	6	281	2	0	1	315	9	0	621	
11:30 AM	0	0	1	0	1	0	7	0	3	284	1	0	0	337	11	0	645	
11:45 AM	0	0	1	0	2	0	5	0	10	310	1	0	1	336	6	0	672	2566
12:00 PM	0	0	0	0	5	0	14	0	18	335	0	1	0	350	8	0	731	2669
12:15 PM	0	0	0	0	3	0	13	0	13	351	0	0	0	329	10	0	719	2767
12:30 PM	0	0	0	0	5	0	7	0	8	331	0	0	0	296	7	0	654	2776
12:45 PM	0	0	0	0	3	0	6	0	3	297	2	0	1	318	7	0	637	2741
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	20	0	56	0	72	1340	0	4	0	1400	32	0	2924	
Heavy Trucks	0	0	0	0	0	0	0	0	0	32	0	0	0	24	4	0	60	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

Comments:





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: AM Peak
 11/13/2023

													
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR	
Lane Configurations													
Traffic Volume (veh/h)	21	1147	4	2	0	25	0	0	0	4	941	7	
Future Volume (Veh/h)	21	1147	4	2	0	25	0	0	0	4	941	7	
Sign Control	Free				Stop			Stop			Free		
Grade	0%				0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	22	1207	4	2	0	26	0	0	0	4	991	7	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None									Raised			
Median storage (veh)												1	
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	998			1650		2258	499	1782	2259	606	1211		
vC1, stage 1 conf vol				1002		1002		1253	1253				
vC2, stage 2 conf vol				648		1255		530	1006				
vCu, unblocked vol	998			1650		2258	499	1782	2259	606	1211		
tC, single (s)	4.2			7.5		6.5	7.1	7.5	6.5	6.9	4.1		
tC, 2 stage (s)				6.5		5.5		6.5	5.5				
tF (s)	2.2			3.5		4.0	3.4	3.5	4.0	3.3	2.2		
p0 queue free %	97			99		100	95	100	100	100	99		
cM capacity (veh/h)	671			174		139	501	135	139	445	583		
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3				
Volume Total	22	805	406	2	26	0	4	661	337				
Volume Left	22	0	0	2	0	0	4	0	0				
Volume Right	0	0	4	0	26	0	0	0	7				
cSH	671	1700	1700	174	501	1700	583	1700	1700				
Volume to Capacity	0.03	0.47	0.24	0.01	0.05	0.02	0.01	0.39	0.20				
Queue Length 95th (ft)	3	0	0	1	4	0	1	0	0				
Control Delay (s)	10.5	0.0	0.0	26.0	12.6	0.0	11.2	0.0	0.0				
Lane LOS	B			D		B	A	B					
Approach Delay (s)	0.2			13.5		0.0	0.0						
Approach LOS				B		A							
Intersection Summary													
Average Delay	0.3												
Intersection Capacity Utilization	50.3%			ICU Level of Service					A				
Analysis Period (min)	15												






















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: MD Peak
 11/13/2023

												
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (veh/h)	37	1213	4	7	0	35	0	0	3	1	1259	19
Future Volume (Veh/h)	37	1213	4	7	0	35	0	0	3	1	1259	19
Sign Control	Free				Stop			Stop			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	39	1277	4	7	0	37	0	0	3	1	1325	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None										Raised	
Median storage (veh)												1
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1345			2056	2696	672	2058	2704	640	1281		
vC1, stage 1 conf vol				1337	1337		1357	1357				
vC2, stage 2 conf vol				720	1359		702	1347				
vCu, unblocked vol	1345			2056	2696	672	2058	2704	640	1281		
tC, single (s)	4.2			7.8	6.5	7.0	7.5	6.5	6.9	4.1		
tC, 2 stage (s)				6.8	5.5		6.5	5.5				
tF (s)	2.2			3.6	4.0	3.3	3.5	4.0	3.3	2.2		
p0 queue free %	92			93	100	91	100	100	99	100		
cM capacity (veh/h)	493			102	104	396	103	96	423	549		
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3			
Volume Total	39	851	430	7	37	3	1	883	462			
Volume Left	39	0	0	7	0	0	1	0	0			
Volume Right	0	0	4	0	37	3	0	0	20			
cSH	493	1700	1700	102	396	423	549	1700	1700			
Volume to Capacity	0.08	0.50	0.25	0.07	0.09	0.01	0.00	0.52	0.27			
Queue Length 95th (ft)	6	0	0	5	8	1	0	0	0			
Control Delay (s)	12.9	0.0	0.0	43.1	15.0	13.6	11.6	0.0	0.0			
Lane LOS	B			E	C	B	B					
Approach Delay (s)	0.4			19.5		13.6		0.0				
Approach LOS				C		B						
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization				55.7%				ICU Level of Service				B
Analysis Period (min)				15								





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: PM Peak
 11/13/2023

													
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR	
Lane Configurations													
Traffic Volume (veh/h)	35	1265	2	3	0	28	1	0	2	5	1464	17	
Future Volume (Veh/h)	35	1265	2	3	0	28	1	0	2	5	1464	17	
Sign Control	Free				Stop			Stop			Free		
Grade	0%				0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	37	1332	2	3	0	29	1	0	2	5	1541	18	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None										Raised		
Median storage (veh)												1	
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1559			2302		2968	780	2216	2976	667	1334		
vC1, stage 1 conf vol				1560		1560		1407	1407				
vC2, stage 2 conf vol				742		1408		810	1569				
vCu, unblocked vol	1559			2302		2968	780	2216	2976	667	1334		
tC, single (s)	4.2			7.5		6.5	7.1	7.5	6.5	6.9	4.1		
tC, 2 stage (s)				6.5		5.5		6.5	5.5				
tF (s)	2.2			3.5		4.0	3.4	3.5	4.0	3.3	2.2		
p0 queue free %	91			97		100	91	99	100	100	99		
cM capacity (veh/h)	406			87		86	326	91	77	406	524		
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3				
Volume Total	37	888	446	3	29	3	5	1027	532				
Volume Left	37	0	0	3	0	1	5	0	0				
Volume Right	0	0	2	0	29	2	0	0	18				
cSH	406	1700	1700	87	326	188	524	1700	1700				
Volume to Capacity	0.09	0.52	0.26	0.03	0.09	0.02	0.01	0.60	0.31				
Queue Length 95th (ft)	7	0	0	3	7	1	1	0	0				
Control Delay (s)	14.7	0.0	0.0	48.0	17.1	24.4	11.9	0.0	0.0				
Lane LOS	B			E		C	C	B					
Approach Delay (s)	0.4			20.0		24.4		0.0					
Approach LOS				C		C							
Intersection Summary													
Average Delay	0.4												
Intersection Capacity Utilization	59.0%			ICU Level of Service					B				
Analysis Period (min)	15												





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: SAT
 11/13/2023

													
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR	
Lane Configurations													
Traffic Volume (veh/h)	50	1327	1	15	0	39	0	0	1	1	1311	31	
Future Volume (Veh/h)	50	1327	1	15	0	39	0	0	1	1	1311	31	
Sign Control	Free				Stop			Stop			Free		
Grade	0%				0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	53	1397	1	16	0	41	0	0	1	1	1380	33	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None										Raised		
Median storage (veh)												1	
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1413			2204	2902	706	2236	2918	699	1398			
vC1, stage 1 conf vol				1398	1398		1504	1504					
vC2, stage 2 conf vol				806	1504		733	1415					
vCu, unblocked vol	1413			2204	2902	706	2236	2918	699	1398			
tC, single (s)	4.1			7.5	6.5	6.9	7.5	6.5	6.9	4.1			
tC, 2 stage (s)				6.5	5.5		6.5	5.5					
tF (s)	2.2			3.5	4.0	3.3	3.5	4.0	3.3	2.2			
p0 queue free %	89			84	100	89	100	100	100	100			
cM capacity (veh/h)	489			101	89	383	82	79	387	495			
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3				
Volume Total	53	931	467	16	41	1	1	920	493				
Volume Left	53	0	0	16	0	0	1	0	0				
Volume Right	0	0	1	0	41	1	0	0	33				
cSH	489	1700	1700	101	383	387	495	1700	1700				
Volume to Capacity	0.11	0.55	0.27	0.16	0.11	0.00	0.00	0.54	0.29				
Queue Length 95th (ft)	9	0	0	13	9	0	0	0	0				
Control Delay (s)	13.3	0.0	0.0	47.1	15.5	14.3	12.3	0.0	0.0				
Lane LOS	B			E	C	B	B						
Approach Delay (s)	0.5			24.4		14.3		0.0					
Approach LOS				C		B							
Intersection Summary													
Average Delay				0.7									
Intersection Capacity Utilization	60.6%			ICU Level of Service					B				
Analysis Period (min)	15												





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: AM
 11/13/2023

												
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (veh/h)	21	1185	4	2	0	25	0	0	0	4	970	7
Future Volume (Veh/h)	21	1185	4	2	0	25	0	0	0	4	970	7
Sign Control	Free				Stop			Stop			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	1247	4	2	0	26	0	0	0	4	1021	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None									Raised		
Median storage (veh)												1
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1028			1700		2328	514	1838	2329	626	1251	
vC1, stage 1 conf vol				1032		1032		1293	1293			
vC2, stage 2 conf vol				668		1295		544	1036			
vCu, unblocked vol	1028			1700		2328	514	1838	2329	626	1251	
tC, single (s)	4.2			7.5		6.5	7.1	7.5	6.5	6.9	4.1	
tC, 2 stage (s)				6.5		5.5		6.5	5.5			
tF (s)	2.2			3.5		4.0	3.4	3.5	4.0	3.3	2.2	
p0 queue free %	97			99		100	95	100	100	100	99	
cM capacity (veh/h)	654			166		132	490	127	132	432	563	
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3			
Volume Total	22	831	420	2	26	0	4	681	347			
Volume Left	22	0	0	2	0	0	4	0	0			
Volume Right	0	0	4	0	26	0	0	0	7			
cSH	654	1700	1700	166	490	1700	563	1700	1700			
Volume to Capacity	0.03	0.49	0.25	0.01	0.05	0.00	0.01	0.40	0.20			
Queue Length 95th (ft)	3	0	0	1	4	0	1	0	0			
Control Delay (s)	10.7	0.0	0.0	26.9	12.8	0.0	11.4	0.0	0.0			
Lane LOS	B			D		B	A	B				
Approach Delay (s)	0.2			13.8		0.0	0.0					
Approach LOS				B		A						
Intersection Summary												
Average Delay				0.3								
Intersection Capacity Utilization				51.6%		ICU Level of Service				A		
Analysis Period (min)				15								





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: MD
 11/13/2023

																	
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR					
Lane Configurations																	
Traffic Volume (veh/h)	37	1250	4	7	0	35	0	0	3	1	1300	19					
Future Volume (Veh/h)	37	1250	4	7	0	35	0	0	3	1	1300	19					
Sign Control	Free				Stop			Stop			Free						
Grade	0%				0%			0%			0%						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95					
Hourly flow rate (vph)	39	1316	4	7	0	37	0	0	3	1	1368	20					
Pedestrians																	
Lane Width (ft)																	
Walking Speed (ft/s)																	
Percent Blockage																	
Right turn flare (veh)																	
Median type	None									Raised							
Median storage (veh)										1							
Upstream signal (ft)																	
pX, platoon unblocked																	
vC, conflicting volume	1388			2119		2778		694		2119		2786		660		1320	
vC1, stage 1 conf vol				1380		1380				1396		1396					
vC2, stage 2 conf vol				739		1398				723		1390					
vCu, unblocked vol	1388			2119		2778		694		2119		2786		660		1320	
tC, single (s)	4.2			7.8		6.5		7.0		7.5		6.5		6.9		4.1	
tC, 2 stage (s)				6.8		5.5				6.5		5.5					
tF (s)	2.2			3.6		4.0		3.3		3.5		4.0		3.3		2.2	
p0 queue free %	92			93		100		90		100		100		99		100	
cM capacity (veh/h)	474			96		98		383		97		91		410		530	
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3								
Volume Total	39	877	443	7	37	3	1	912	476								
Volume Left	39	0	0	7	0	0	1	0	0								
Volume Right	0	0	4	0	37	3	0	0	20								
cSH	474	1700	1700	96	383	410	530	1700	1700								
Volume to Capacity	0.08	0.52	0.26	0.07	0.10	0.01	0.00	0.54	0.28								
Queue Length 95th (ft)	7	0	0	6	8	1	0	0	0								
Control Delay (s)	13.3	0.0	0.0	45.6	15.4	13.8	11.8	0.0	0.0								
Lane LOS	B			E		C		B		B							
Approach Delay (s)	0.4			20.2		13.8		0.0									
Approach LOS				C		B											
Intersection Summary																	
Average Delay				0.5													
Intersection Capacity Utilization				56.8%		ICU Level of Service				B							
Analysis Period (min)				15													





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: PM
 11/13/2023

																	
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR					
Lane Configurations																	
Traffic Volume (veh/h)	35	1305	2	3	0	28	1	0	2	5	1510	17					
Future Volume (Veh/h)	35	1305	2	3	0	28	1	0	2	5	1510	17					
Sign Control	Free				Stop			Stop			Free						
Grade	0%				0%			0%			0%						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95					
Hourly flow rate (vph)	37	1374	2	3	0	29	1	0	2	5	1589	18					
Pedestrians																	
Lane Width (ft)																	
Walking Speed (ft/s)																	
Percent Blockage																	
Right turn flare (veh)																	
Median type	None									Raised							
Median storage (veh)												1					
Upstream signal (ft)																	
pX, platoon unblocked																	
vC, conflicting volume	1607			2371		3058		804		2282		3066		688		1376	
vC1, stage 1 conf vol				1608		1608				1449		1449					
vC2, stage 2 conf vol				763		1450				834		1617					
vCu, unblocked vol	1607			2371		3058		804		2282		3066		688		1376	
tC, single (s)	4.2			7.5		6.5		7.1		7.5		6.5		6.9		4.1	
tC, 2 stage (s)				6.5		5.5				6.5		5.5					
tF (s)	2.2			3.5		4.0		3.4		3.5		4.0		3.3		2.2	
p0 queue free %	90			96		100		91		99		100		99		99	
cM capacity (veh/h)	389			81		81		314		85		72		393		505	
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3								
Volume Total	37	916	460	3	29	3	5	1059	548								
Volume Left	37	0	0	3	0	1	5	0	0								
Volume Right	0	0	2	0	29	2	0	0	18								
cSH	389	1700	1700	81	314	179	505	1700	1700								
Volume to Capacity	0.10	0.54	0.27	0.04	0.09	0.02	0.01	0.62	0.32								
Queue Length 95th (ft)	8	0	0	3	8	1	1	0	0								
Control Delay (s)	15.2	0.0	0.0	51.1	17.6	25.5	12.2	0.0	0.0								
Lane LOS	C			F		C		D		B							
Approach Delay (s)	0.4			20.8		25.5		0.0									
Approach LOS				C		D											
Intersection Summary																	
Average Delay				0.4													
Intersection Capacity Utilization				60.3%		ICU Level of Service				B							
Analysis Period (min)				15													





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: SAT
 11/13/2023

												
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (veh/h)	50	1370	1	15	0	39	0	0	1	1	1350	31
Future Volume (Veh/h)	50	1370	1	15	0	39	0	0	1	1	1350	31
Sign Control	Free				Stop			Stop			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	53	1442	1	16	0	41	0	0	1	1	1421	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None									Raised		
Median storage (veh)												1
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1454			2268	2988	727	2302	3004	722	1443		
vC1, stage 1 conf vol				1440	1440		1548	1548				
vC2, stage 2 conf vol				828	1549		754	1456				
vCu, unblocked vol	1454			2268	2988	727	2302	3004	722	1443		
tC, single (s)	4.1			7.5	6.5	6.9	7.5	6.5	6.9	4.1		
tC, 2 stage (s)				6.5	5.5		6.5	5.5				
tF (s)	2.2			3.5	4.0	3.3	3.5	4.0	3.3	2.2		
p0 queue free %	89			83	100	89	100	100	100	100		
cM capacity (veh/h)	471			96	84	371	77	74	374	476		
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3			
Volume Total	53	961	482	16	41	1	1	947	507			
Volume Left	53	0	0	16	0	0	1	0	0			
Volume Right	0	0	1	0	41	1	0	0	33			
cSH	471	1700	1700	96	371	374	476	1700	1700			
Volume to Capacity	0.11	0.57	0.28	0.17	0.11	0.00	0.00	0.56	0.30			
Queue Length 95th (ft)	9	0	0	14	9	0	0	0	0			
Control Delay (s)	13.6	0.0	0.0	50.1	15.9	14.6	12.6	0.0	0.0			
Lane LOS	B			F	C	B	B					
Approach Delay (s)	0.5			25.5		14.6		0.0				
Approach LOS				D		B						
Intersection Summary												
Average Delay				0.7								
Intersection Capacity Utilization				62.1%			ICU Level of Service			B		
Analysis Period (min)	15											





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: AM
 11/13/2023

												
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR
Lane Configurations												
Traffic Volume (veh/h)	95	1155	4	10	0	95	0	0	0	4	960	40
Future Volume (Veh/h)	95	1155	4	10	0	95	0	0	0	4	960	40
Sign Control	Free				Stop			Stop			Free	
Grade	0%				0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	100	1216	4	11	0	100	0	0	0	4	1011	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None										Raised	
Median storage (veh)												1
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1053			1848	2460	526	2032	2479	610	1220		
vC1, stage 1 conf vol				1040	1040		1418	1418				
vC2, stage 2 conf vol				808	1420		614	1061				
vCu, unblocked vol	1053			1848	2460	526	2032	2479	610	1220		
tC, single (s)	4.2			7.5	6.5	7.1	7.5	6.5	6.9	4.1		
tC, 2 stage (s)				6.5	5.5		6.5	5.5				
tF (s)	2.2			3.5	4.0	3.4	3.5	4.0	3.3	2.2		
p0 queue free %	84			92	100	79	100	100	100	99		
cM capacity (veh/h)	639			140	108	481	85	96	442	579		
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3			
Volume Total	100	811	409	11	100	0	4	674	379			
Volume Left	100	0	0	11	0	0	4	0	0			
Volume Right	0	0	4	0	100	0	0	0	42			
cSH	639	1700	1700	140	481	1700	579	1700	1700			
Volume to Capacity	0.16	0.48	0.24	0.08	0.21	0.00	0.01	0.40	0.22			
Queue Length 95th (ft)	14	0	0	6	19	0	1	0	0			
Control Delay (s)	11.7	0.0	0.0	32.8	14.4	0.0	11.3	0.0	0.0			
Lane LOS	B			D	B	A	B					
Approach Delay (s)	0.9			16.3		0.0		0.0				
Approach LOS				C		A						
Intersection Summary												
Average Delay				1.2								
Intersection Capacity Utilization				50.5%		ICU Level of Service					A	
Analysis Period (min)				15								





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: MD
 11/13/2023

													
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR	
Lane Configurations													
Traffic Volume (veh/h)	120	1220	4	20	0	115	0	0	3	1	1285	55	
Future Volume (Veh/h)	120	1220	4	20	0	115	0	0	3	1	1285	55	
Sign Control	Free				Stop			Stop			Free		
Grade	0%				0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	126	1284	4	21	0	121	0	0	3	1	1353	58	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None										Raised		
Median storage (veh)												1	
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1411			2281	2924	706	2338	2951	644	1288			
vC1, stage 1 conf vol				1384	1384		1538	1538					
vC2, stage 2 conf vol				897	1540		800	1413					
vCu, unblocked vol	1411			2281	2924	706	2338	2951	644	1288			
tC, single (s)	4.2			7.8	6.5	7.0	7.5	6.5	6.9	4.1			
tC, 2 stage (s)				6.8	5.5		6.5	5.5					
tF (s)	2.2			3.6	4.0	3.3	3.5	4.0	3.3	2.2			
p0 queue free %	73			74	100	68	100	100	99	100			
cM capacity (veh/h)	464			80	77	376	50	50	420	545			
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3				
Volume Total	126	856	432	21	121	3	1	902	509				
Volume Left	126	0	0	21	0	0	1	0	0				
Volume Right	0	0	4	0	121	3	0	0	58				
cSH	464	1700	1700	80	376	420	545	1700	1700				
Volume to Capacity	0.27	0.50	0.25	0.26	0.32	0.01	0.00	0.53	0.30				
Queue Length 95th (ft)	27	0	0	24	34	1	0	0	0				
Control Delay (s)	15.6	0.0	0.0	65.4	19.0	13.6	11.6	0.0	0.0				
Lane LOS	C			F	C	B	B						
Approach Delay (s)	1.4			25.9		13.6		0.0					
Approach LOS				D		B							
Intersection Summary													
Average Delay				1.9									
Intersection Capacity Utilization	62.8%			ICU Level of Service						B			
Analysis Period (min)	15												





















HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: PM
 11/13/2023

																	
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR					
Lane Configurations																	
Traffic Volume (veh/h)	90	1285	2	10	0	80	1	0	2	5	1500	40					
Future Volume (Veh/h)	90	1285	2	10	0	80	1	0	2	5	1500	40					
Sign Control	Free				Stop			Stop			Free						
Grade	0%				0%			0%			0%						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95					
Hourly flow rate (vph)	95	1353	2	11	0	84	1	0	2	5	1579	42					
Pedestrians																	
Lane Width (ft)																	
Walking Speed (ft/s)																	
Percent Blockage																	
Right turn flare (veh)																	
Median type	None									Raised							
Median storage (veh)										1							
Upstream signal (ft)																	
pX, platoon unblocked																	
vC, conflicting volume	1621			2478		3155		810		2428		3175		678		1355	
vC1, stage 1 conf vol				1610		1610				1544		1544					
vC2, stage 2 conf vol				868		1545				884		1631					
vCu, unblocked vol	1621			2478		3155		810		2428		3175		678		1355	
tC, single (s)	4.2			7.5		6.5		7.1		7.5		6.5		6.9		4.1	
tC, 2 stage (s)				6.5		5.5				6.5		5.5					
tF (s)	2.2			3.5		4.0		3.4		3.5		4.0		3.3		2.2	
p0 queue free %	75			85		100		73		98		100		99		99	
cM capacity (veh/h)	384			73		68		310		54		43		400		514	
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3								
Volume Total	95	902	453	11	84	3	5	1053	568								
Volume Left	95	0	0	11	0	1	5	0	0								
Volume Right	0	0	2	0	84	2	0	0	42								
cSH	384	1700	1700	73	310	127	514	1700	1700								
Volume to Capacity	0.25	0.53	0.27	0.15	0.27	0.02	0.01	0.62	0.33								
Queue Length 95th (ft)	24	0	0	12	27	2	1	0	0								
Control Delay (s)	17.4	0.0	0.0	62.7	20.8	34.1	12.1	0.0	0.0								
Lane LOS	C			F		C		D		B							
Approach Delay (s)	1.1			25.7		34.1		0.0									
Approach LOS				D		D											
Intersection Summary																	
Average Delay				1.3													
Intersection Capacity Utilization				62.4%		ICU Level of Service				B							
Analysis Period (min)				15													

HCM Unsignalized Intersection Capacity Analysis
 4: Ogden Ave & Ultramed Access Drive/Iroquois Center Access Drive

Timing Plan: SAT
 11/13/2023

													
Movement	NBL	NBR	NBR2	SEL	SET	SER	NWL	NWT	NWR	SWL2	SWL	SWR	
Lane Configurations													
Traffic Volume (veh/h)	140	1335	1	25	0	125	0	0	1	1	1335	70	
Future Volume (Veh/h)	140	1335	1	25	0	125	0	0	1	1	1335	70	
Sign Control	Free				Stop			Stop			Free		
Grade	0%				0%			0%			0%		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	
Hourly flow rate (vph)	147	1405	1	26	0	132	0	0	1	1	1405	74	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None										Raised		
Median storage (veh)												1	
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	1479			2442	3144	740	2536	3180	703	1406			
vC1, stage 1 conf vol				1444	1444		1700	1700					
vC2, stage 2 conf vol				998	1700		836	1481					
vCu, unblocked vol	1479			2442	3144	740	2536	3180	703	1406			
tC, single (s)	4.1			7.5	6.5	6.9	7.5	6.5	6.9	4.1			
tC, 2 stage (s)				6.5	5.5		6.5	5.5					
tF (s)	2.2			3.5	4.0	3.3	3.5	4.0	3.3	2.2			
p0 queue free %	68			66	100	64	100	100	100	100			
cM capacity (veh/h)	461			78	63	364	33	31	385	492			
Direction, Lane #	NB 1	NB 2	NB 3	SE 1	SE 2	NW 1	SW 1	SW 2	SW 3				
Volume Total	147	937	469	26	132	1	1	937	542				
Volume Left	147	0	0	26	0	0	1	0	0				
Volume Right	0	0	1	0	132	1	0	0	74				
cSH	461	1700	1700	78	364	385	492	1700	1700				
Volume to Capacity	0.32	0.55	0.28	0.34	0.36	0.00	0.00	0.55	0.32				
Queue Length 95th (ft)	34	0	0	32	40	0	0	0	0				
Control Delay (s)	16.4	0.0	0.0	73.2	20.4	14.4	12.3	0.0	0.0				
Lane LOS	C			F	C	B	B						
Approach Delay (s)	1.6			29.1		14.4		0.0					
Approach LOS				D		B							
Intersection Summary													
Average Delay	2.2												
Intersection Capacity Utilization	66.1%			ICU Level of Service					C				
Analysis Period (min)	15												