TRAFFIC ANALYSIS FOR 55th STREET AND WESTERN AVENUE

West 55th Street and Western Avenue
Clarendon Hills, Illinois
DuPage County

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Introduction

KrohVan RE Services intends to develop the existing site southwest of 55th Street and Western Avenue into a strip mall with an attached Dunkin Donuts. A driving force for the success of any commercial development is safe and efficient access. It is recognized that the development of this site will increase local traffic volumes, especially at the intersection of 55th Street and Western Avenue. Therefore, the primary purpose of this report is to document the impacts of the generated traffic and support the need for new traffic signals at the 55th Street and Western Avenue intersection. This report will also document potential drive thru queue length impacts on the adjacent roads.

Methodology

Existing traffic volumes are taken from physical peak hour traffic counts conducted by Artisan Consulting Engineers, LLC on October 20, 2021, from 6:45 AM to 9:00 AM and 4:00 PM to 6:00 PM for the intersection of 55th Street and Western Avenue. Traffic projections are derived from the ITE Trip Generation Manual, 11th Edition. Traffic data was analyzed using McTrans HCS 2010 Streets software.

Dunkin Donut service times are taken from three physical counts conducted by Artisan Consulting Engineers, LLC. The first count was conducted on November 1, 2021, from 7:00 AM to 8:15 AM at the Dunkin Donuts located at 8058 North Second Street, Machesney Park, Illinois, 61115. A second count was conducted on January 20, 2022, from 6:45 AM to 9:15 AM at the Dunkin Donuts located at 522 Ogden Avenue, Downers Grove, Illinois, 60515. A third count was conducted on January 26, 2022, from 6:45 AM to 9:00 AM at the Dunkin Donuts located at 19 West 63rd Street, Westmont, Illinois, 60559. Additionally, the percentages of customers using the drive thru versus entering the store were counted at this location.

Crash data was provided by the Clarendon Hills Police Department.

Site Conditions

Existing Conditions

The existing site is approximately 1.64 acres of land southwest of the 55th Street and Western Avenue intersection in Clarendon Hills, Illinois. The former Tracy's Tavern resides on the northern half of the property consisting of a 2,100 square foot building, a small garage, and 70 stall parking lot. An access to this property is present 130 feet south of 55th Street on Western Avenue. A residential property is located in the southeast corner of the site while an undeveloped grass field is present in the southwest corner. Residential properties surround the area on both 55th Street and Western Avenue. 55th Street is a four-lane roadway with a 35-mph speed limit while Western Avenue is a two-lane roadway with a

Figure 1: Existing Conditions

25-mph speed limit. There is a jog of 90 feet along 55th Street which separates the northern and southern legs of Western Avenue. The intersection of 55th Street and Western Avenue is a two way stop controlled intersection with stop signs present for Western Avenue traffic.

Proposed Conditions

The proposed site will be divided into a 1.07 acre northern property and a 0.57 acre southern property. A 5,359 square foot strip mall facing 55th Street will be centrally located on the northern property with a 936 square foot Dunkin Donuts attached to the east. A dual-lane drive thru accommodating 22 vehicles will wrap around the building for Dunkin Donuts customers. Thirty parking stalls will be located north of the building with twenty facing 55th Street and ten facing the storefront. An additional eleven parking stalls will be located on the western side of the property. Landscape buffers and sound fencing will surround the southern and western sides of the northern property while sidewalk and trees will be present on the northern and eastern sides. For access into the northern property, the existing access on Western Avenue will be removed and a new entrance will be constructed to the north to align with Coventry Court. A new right-in/right-out access will also serve the northern property for eastbound traffic on 55th Street. The southern property will feature a 6,800 square foot office building located on the western half of the property. A twenty-two stall parking lot will fill the remainder of the property east of the office building. For access into the southern property, a new entrance will be constructed off Western Avenue. In order to accommodate the generated traffic for both properties, signals at the intersection of 55th Street and Western Avenue will be proposed.

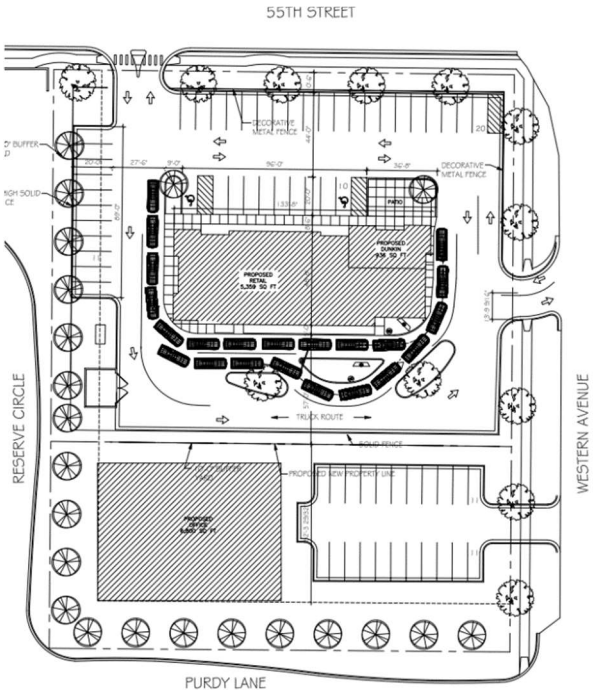


Figure 2: Proposed Conditions

Existing Traffic Volumes

Existing AM Peak

A morning traffic count was conducted on Wednesday, October 20, 2021, at the intersection of 55th Street and Western Avenue from 6:45 AM to 9:00 AM. From the count, the hour of 7:15 AM to 8:15 AM was determined to be the peak hour of traffic for the intersection. Under the current conditions, eastbound traffic operates at level of service (LOS) A with an 8.8 second per vehicle (s/veh) delay and westbound traffic operates at LOS B with a 10.6 s/veh delay. Both northbound and southbound traffic operates at LOS E with a 45.4 s/veh and 44.1 s/veh delay respectively. (See Appendix A1 and C1)

Existing PM Peak

A morning traffic count was conducted on Wednesday, October 20, 2021, at the intersection of 55th Street and Western Avenue from 4:00 PM to 6:00 PM. From the count, the hour of 4:45 PM to 5:45 PM was determined to be the peak hour of traffic for the intersection. Under the current conditions, westbound traffic operates at LOS A with a 9.8 s/veh delay, eastbound traffic operates at LOS B with a 10.8 s/veh

delay, northbound traffic operates at LOS E with a 47.1 s/veh delay, and southbound traffic operates at LOS F with a 137.3 s/veh delay. (See Appendix A2 and C2)

Development Traffic Volumes

Trips for the proposed strip mall, Dunkin Donuts, and office building were generated by the Institute of Transportation Engineer's Trip Generation Manual, 11th Edition. Results for the AM peak hour are summarized in Table 1 below while results for the PM peak hour can be found in Table 2. A full distribution of traffic entering and exiting the site can be found in Appendix B.

Land Use	Trips Generated	Proposed	Total Trips	Trips Entering	Trips Leaving
Strip Retail Plaza	7.60 trips per 1,000 SF GLA	5,359 SF	41	21	20
Coffee/Donut Shop with Drive-Through	101.27 trips per 1,000 SF GFA	936 SF	95	48	47
Small Office Building	2.61 trips per 1,000 SF GFA	6,800 SF	18	11	7
Totals			***154***	***80***	***74***

Table 1: AM Peak Trip Generation Table

Land Use	Trips Generated	Proposed	Total Trips	Trips Entering	Trips Leaving
Strip Retail Plaza	13.24 trips per 1,000 SF GLA	5,359 SF	71	38	33
Coffee/Donut Shop with Drive-Through	43.65 trips per 1,000 SF GFA	936 SF	41	21	20
Small Office Building	3.15 trips per 1,000 SF GFA	6,800 SF	22	9	13
Totals			***134***	***68***	***66***

Table 2: PM Peak Trip Generation Table

Proposed AM Peak (No Signal)

The proposed AM peak was analyzed first under existing conditions with no traffic signals at the intersection. The traffic generated from the proposed site has the largest impact on northbound traffic. The 34 generated trips added to northbound traffic give it a LOS F with an 195.5 s/veh delay. Only 3 generated trips are added to southbound traffic, however, this direction also increases to LOS F with a 68.8 second delay per vehicle. Eastbound traffic remains at LOS A with an 8.8 s/veh delay while westbound traffic remains at LOS B with a 11.0 s/veh delay. The massive increase in delays for northbound traffic is primarily a result of the generated northbound traffic struggling to find gaps in eastbound/westbound traffic to complete a left turn or through movement. A full distribution of traffic entering and exiting the site can be found in Appendix C3 while a HCS traffic summary can be found in Appendix A3.

Proposed AM Peak (With Signal)

The proposed AM peak was then analyzed with traffic signals at the intersection. With the addition of the traffic signals, eastbound traffic operates at LOS B with a 13.5 s/veh delay while westbound traffic operates at LOS B with a 11.3 s/veh delay. Both northbound and southbound traffic operates at LOS D with a 54.6 s/veh and 54.5 s/veh delay respectively. The intersection operates at LOS B with a 15.8 s/veh delay. A full distribution of traffic entering and exiting the site can be found in Appendix C3 while a HCS traffic summary can be found in Appendix A5.

Proposed PM Peak (No Signal)

Next he proposed PM peak was analyzed under existing conditions with no traffic signals at the intersection. The traffic generated from the proposed site has the largest impact on northbound traffic. The 41 generated trips added to northbound traffic give it a LOS F with a 354.9 s/veh delay. Only 3 generated trips are added to southbound traffic, however, this direction also increases to LOS F with a 331.4 second delay per vehicle. Eastbound traffic moves to LOS B with an 10.8 s/veh delay while westbound traffic remains at LOS B with a 10.2 s/veh delay. The massive increase in delays for northbound traffic is once again primarily the result of the generated northbound traffic struggling to find gaps in eastbound/westbound traffic to complete a left turn or through movement. A full distribution of traffic entering and exiting the site can be found in Appendix C4 while a HCS traffic summary can be found in Appendix A4.

Proposed PM Peak (With Signal)

The proposed PM peak was then analyzed with traffic signals at the intersection. With the addition of the traffic signals, eastbound traffic operates at LOS B with a 13.2 s/veh delay while westbound traffic operates at LOS B with a 17.7 s/veh delay. Both northbound and southbound traffic operates at LOS D with a 48.7 s/veh and 54.1 s/veh delay respectively. The intersection operates at LOS B with a 17.5 s/veh delay. A full distribution of traffic entering and exiting the site can be found in Appendix C4 while a HCS traffic summary can be found in Appendix A6.

Summary of Findings

The addition of traffic generated from the strip mall, Dunkin Donuts, and office building creates massive delays for northbound and southbound traffic under existing conditions with no traffic signal present. The addition of a traffic signal at the intersection improves delays to northbound, southbound, and westbound traffic. Eastbound traffic sees a slight increase in delay compared to the existing condition with no traffic signal present. This is not a perfect comparison, however, as the level of service for eastbound and westbound traffic is only accounting for left and right turns. Therefore it should be noted that eastbound and westbound through traffic that would pass through the unsignalized intersection without delay will now face delays with the presence of a traffic signal.

	Northbound	Southbound	Eastbound	Westbound	Intersection
Existing Conditions	LOS E 45.5 s/veh	LOS E 44.1 s/veh	LOS A 8.8 s/veh	LOS B 10.6 s/veh	- -
Proposed (No Signal)	LOS F 195.5 s/veh	LOS F 68.8 s/veh	LOS A 8.8 s/veh	LOS B 11.0 s/veh	- -
Proposed (With Signal)	LOS D 54.6 s/veh	LOS D 54.5 s/veh	LOS B 13.5 s/veh	LOS B 11.3 s/veh	LOS B 15.8 s/veh

Table 3: AM Peak Hour Delays by Options

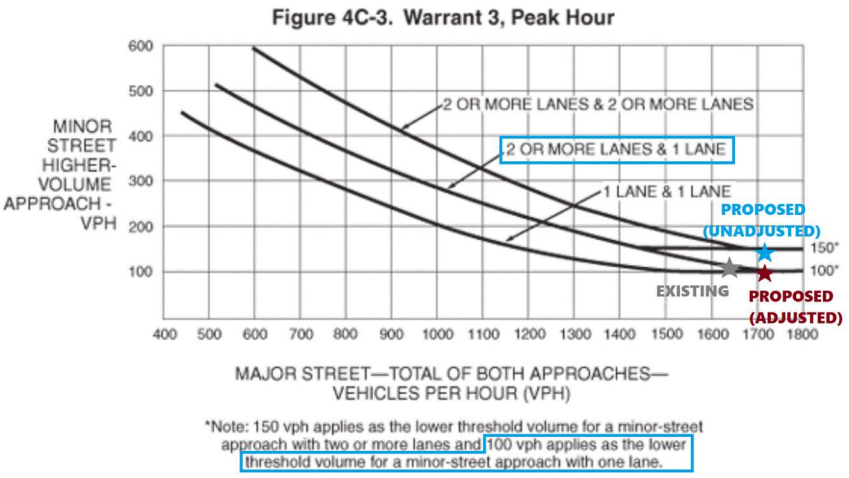
	Northbound	Southbound	Eastbound	Westbound	Intersection
Existing Conditions	LOS E 47.1 s/veh	LOS F 137.3 s/veh	LOS B 10.8 s/veh	LOS A 9.8 s/veh	- -
Proposed (No Signal)	LOS F 354.9 s/veh	LOS F 331.4 s/veh	LOS B 10.8 s/veh	LOS B 10.2 s/veh	- -
Proposed (With Signal)	LOS D 48.7 s/veh	LOS D 54.1 s/veh	LOS B 13.2 s/veh	LOS B 17.7 s/veh	LOS B 17.5 s/veh

Table 4: PM Peak Hour Delays by Options

Signal Warrant Analysis

In order to further determine whether traffic signals are justified at the intersection of 55th Street and Western Avenue, a traffic signal warrant analysis was conducted. Warrants for school crossings, grade crossings, coordinated signal systems, and roadway networks are not applicable for the intersection and were not analyzed. Low pedestrian volumes were observed during traffic counts, and as such the warrant for pedestrian volumes was not analyzed. Data was not available for four-hour and eight-hour periods and as such the warrants for eight-hour and four-hour volume were not analyzed. Using data collected from traffic counts, the peak hour signal warrant was analyzed in addition to the crash experience warrant using data from the Clarendon Hills Police Department.

Warrant 3, Peak Hour



The peak hour signal warrant is intended for use at an intersection where minor-street traffic suffers undue delay when entering or crossing the major-street during an hour of the day. One of the conditions for the peak hour signal warrant to be met is that the plotted point representing vehicles per hour on the major and minor streets be above the applicable curve on MUTCD Figure 4C-3 shown above. For the intersection of 55th Street and Western Avenue, the "2 or More Lanes & 1 Lane" curve will be used. Additionally, 100 vph will be the lower threshold as Western Avenue has one lane approaches. Because the AM Peak Hour has greater traffic volumes than the PM Peak Hour, only the AM Peak will be analyzed. With existing traffic volumes, the 105 veh/hr on Western Avenue's northbound approach and 1,643 veh/hr approaching on 55th Street fall just below the curve. Adding the generated traffic for the site increases Western Avenue northbound traffic to 139 veh/hr and 55th Street to 1,712 veh/hr pushing it above the curve. Adjusting the proposed traffic using the *Pagones Theorem Right-Turn Adjustment Factor* reduces northbound traffic to 96 veh/hr placing it 4 veh/hr below the curve. The criteria for the peak hour signal warrant is met under the proposed condition without the adjustment factor, but falls just shy when using it.

Warrant 7, Crash Experience

The crash experience signal warrant is intended for an intersection where the severity and frequency of crashes creates consideration for a traffic signal. Crashes to be considered under this warrant are those which can improved by the presence of a signal. Crash data was acquired from the Clarendon Hills Police Department for crashes taking place at the intersection of 55th Street and Western Avenue from 2017 to 2021. (See Table 5) Over the course of five years, 23 crashes occurred at the intersection resulting in a crash rate of 0.56 crashes per million entering vehicles. Data was not available on the types of crashes and if they could be reduced with the presence of a traffic signal, however, due to the low number of reported crashes, the intersection does not meet the necessary criteria for warrant 7.

Year	Crashes
2017	7
2018	8
2019	5
2020	1
2021	2

Table 5: 55th Street and Western Avenue Crash Data

Drive Thru Queue Analysis

Service Rate

In order to determine queue lengths for the proposed Dunkin Donuts, the M/M/1 single-server model was used which utilizes the average arrival rate in relation to the average service rate. To determine the average service rate for a Dunkin Donuts drive through, three drive thru counts were conducted. The first count was conducted on November 1, 2021, from 7:00 AM to 8:15 AM at the Dunkin Donuts located at 8058 North Second Street, Machesney Park, Illinois, 61115. A second count was conducted on January 20, 2022, from 6:45 AM to 9:15 AM at the Dunkin Donuts located at 522 Ogden Avenue, Downers Grove, Illinois, 60515. A third count was conducted on January 26, 2022, from 6:45 AM to 9:00 AM at the Dunkin Donuts located at 19 West 63rd Street, Westmont, Illinois, 60559. The second and third count locations are the closest operating Dunkin Donuts to the proposed site which have drive thru service. The three counts resulted in peak hour service times of 1.39 veh/min, 1.20 veh/min, and 1.37 veh/min respectively, coming to an average service time of 1.32 veh/min or one vehicle served every 45.5 seconds. See Appendix D2 for full count data.

Arrival Rate

From the Institute of Transportation Engineer's Trip Generation Manual, 11th Edition, we estimate 48 AM peak hour trips arriving at the proposed Dunkin Donuts site. (See Table 1) Due to Covid limitations, the lobbies of the first two count locations were closed, forcing all customers to use the drive thru. The third location's lobby was open and used to determine the percentage of trips using the drive thru versus entering the store. From 6:45 AM to 9:00 AM, 147 of 173 trips (85%) utilized the drive thru for service. Generally, drive thrus see around 70%-75% of trips use the drive through rather than enter the store. During the count, temperatures reached as low as -5°F possibly causing more

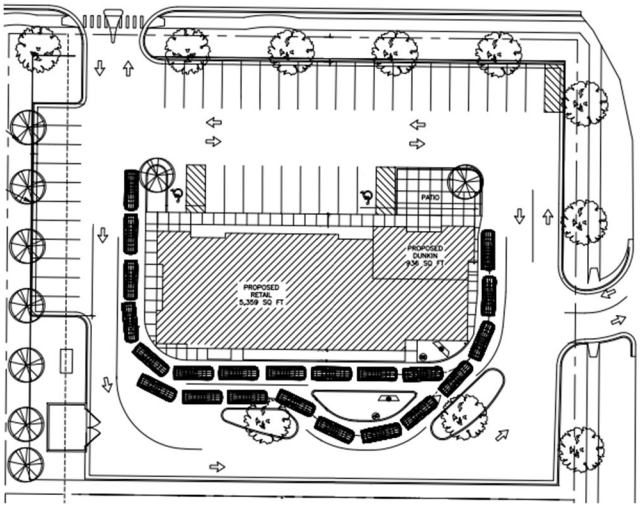


Figure 3: Drive Through Queue

trips then usual to use the drive thru. To be conservative due to the small sample size, the field measured 85% was used to determine drive thru trips despite it likely being high due to conditions. With 48 vehicles arriving during the peak hour, 41 trips can be assumed to use the drive thru. This comes to an arrival rate of 0.68 vehicles per minute or one vehicle arriving every 88.2 seconds.

Analysis

By using the equation $L_q = (\rho\lambda)/(\mu-\lambda)$, where μ equals the service rate of 1.32 veh/min, where λ equals the arrival rate of 0.68 veh/min, and where ρ equals λ/μ, we can determine the average queue length (L_q) of 1 vehicle in the queue.

Vehicles In Queue (X)	Probability (P)	Vehicles in Queue (X)	Probability (P)
1	51.8%	7	1.0%
2	26.8%	8	0.5%
3	13.9%	9	0.3%
4	7.2%	10	0.1%
5	3.7%	11	0.1%
6	1.9%	12	0.0%

Table 6: Drive Thru Queue Probability

By using the equation $P = (\lambda)/(\mu)^X$, where μ equals the service rate of 1.39 veh/min, where λ equals the arrival rate of 1.28 veh/min, and where X equals the number of vehicles in the queue, we can determine the probability (P) that X amount of vehicles will be present in the queue. See Table 6 for drive thru probabilities.

During the AM Peak Hour, there is not projected to be more than 12 vehicles queued at a single time. The proposed dual lane drive thru has storage for 22 vehicles and space for 25 vehicles before 55th Street is impacted. As a result, even under extreme conditions, no impact is expected on 55th Street.

Conclusions

In order to maintain safe and efficient access to the proposed development on the southwest corner of 55th Street and Western Avenue, traffic signals are necessary at the intersection to avoid massive delays to northbound and southbound traffic due generated traffic. The installation of traffic signals are warranted by the peak hour signal warrant when using unadjusted traffic and fall just shy when using the *Pagones Theorem Right-Turn Adjustment Factor.* Traffic signals would not significantly impact eastbound and westbound traffic on 55th Street traffic and are necessary for the intersection to accommodate the generated northbound and southbound traffic. Additionally, no impact is expected on 55th Street from the proposed drive thru due to the amount of vehicle storage provided.

Appendix A – HCS 2010 Summaries

A1 - Existing AM Peak Hour HCS Summary

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst:	*Andrew Hess*	Intersection:	*55th & Western*
Agency/Co.:	*Artisan Consulting*	Jurisdiction:	*Clarendon Hills*
Date Performed:	*10/21/2021*	Analysis Year:	*2021*
Analysis Time Period:	*7:15 AM to 8:15 AM*	Peak Hour Factor:	

Project Description:

East/West Street: *55th Street*	North/South Street: *Western Avenue*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound				Westbound			
Movement	1U	1	2	3	4U	4	5	6
	U	L	T	R	U	L	T	R
Volume (veh/h)		*16*	*1013*	*6*		*18*	*562*	*28*
Percent Heavy Vehicles		*2*	*0*	*0*		*2*	*0*	*0*
Median Type	*Undivided*							
Storage	*1*							
RT Channelized				*0*				*0*
Lanes	*0*		*2*	*0*	*0*		*2*	*0*
Configuration	*LT*			*TR*	*LT*			*TR*
Proportion Time Blocked								

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*9*	*27*	*69*	*16*	*9*	*15*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Left-Turn Lane Storage						
Percent Grade (%)	*0*			*0*		
Flared Approach			*N*			*N*
Storage			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	
Proportion Time Blocked						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (veh/h)	*16*	*18*		*106*			*40*	
C (m) (veh/h)	*972*	*665*		*190*			*131*	
v/c Ratio	*0.02*	*0.03*		*0.56*			*0.31*	
95% Queue Length	*0.05*	*0.08*		*2.95*			*1.19*	
Control Delay (s/veh)	*8.8*	*10.6*		*45.5*			*44.1*	
Movement LOS	*A*	*B*		*E*			*E*	
Approach Delay (s/veh)			*45.5*			*44.1*		
Approach LOS			*E*			*E*		

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A2 - Existing PM Peak Hour HCS Summary

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst:	*Andrew Hess*	Intersection:	*55th & Western*
Agency/Co.:	*Artisan Consulting*	Jurisdiction:	*Clarendon Hills*
Date Performed:	*10/21/2021*	Analysis Year:	*2021*
Analysis Time Period:	*4:45 PM to 5:45 PM*	Peak Hour Factor:	

Project Description:

East/West Street: *55th Street*	North/South Street: *Western Avenue*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound				Westbound			
Movement	1U	1	2	3	4U	4	5	6
	U	L	T	R	U	L	T	R
Volume (veh/h)		*17*	*811*	*11*		*41*	*1047*	*28*
Percent Heavy Vehicles		*2*	*0*	*0*		*2*	*0*	*0*
Median Type	*Undivided*							
Storage	*1*							
RT Channelized				*0*				*0*
Lanes	*0*		*2*	*0*	*0*		*2*	*0*
Configuration	*LT*			*TR*	*LT*			*TR*
Proportion Time Blocked								

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*7*	*9*	*30*	*28*	*6*	*24*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Left-Turn Lane Storage						
Percent Grade (%)	*0*			*0*		
Flared Approach			*N*			*N*
Storage			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	
Proportion Time Blocked						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (veh/h)	*17*	*41*		*46*			*58*	
C (m) (veh/h)	*633*	*792*		*130*			*76*	
v/c Ratio	*0.03*	*0.05*		*0.35*			*0.76*	
95% Queue Length	*0.08*	*0.16*		*1.44*			*3.67*	
Control Delay (s/veh)	*10.8*	*9.8*		*47.1*			*137.3*	
Movement LOS	*B*	*A*		*E*			*F*	
Approach Delay (s/veh)			*47.1*			*137.3*		
Approach LOS			*E*			*F*		

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A3 - Proposed AM Peak Hour (No Signal) HCS Summary

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst:	*Andrew Hess*	Intersection:	*55th & Western*
Agency/Co.:	*Artisan Consulting*	Jurisdiction:	*Clarendon Hills*
Date Performed:	*10/21/2021*	Analysis Year:	*2021*
Analysis Time Period:	*7:15 AM to 8:15 AM*	Peak Hour Factor:	

Project Description:

East/West Street: *55th Street* | North/South Street: *Western Avenue*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound				Westbound			
Movement	1U	1	2	3	4U	4	5	6
	U	L	T	R	U	L	T	R
Volume (veh/h)		*16*	*1050*	*12*		*44*	*562*	*28*
Percent Heavy Vehicles		*2*	*0*	*0*		*2*	*0*	*0*
Median Type	*Undivided*							
Storage	*1*							
RT Channelized				*0*				*0*
Lanes	*0*		*2*	*0*	*0*		*2*	*0*
Configuration	*LT*			*TR*	*LT*			*TR*
Proportion Time Blocked								

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*36*	*31*	*72*	*16*	*12*	*15*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Left-Turn Lane Storage						
Percent Grade (%)	*0*			*0*		
Flared Approach			*N*			*N*
Storage			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	
Proportion Time Blocked						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (veh/h)	*16*	*44*		*140*			*43*	
C (m) (veh/h)	*972*	*640*		*122*			*97*	
v/c Ratio	*0.02*	*0.07*		*1.15*			*0.44*	
95% Queue Length	*0.05*	*0.22*		*8.46*			*1.87*	
Control Delay (s/veh)	*8.8*	*11.0*		*195.5*			*68.8*	
Movement LOS	*A*	*B*		*F*			*F*	
Approach Delay (s/veh)			*195.5*			*68.8*		
Approach LOS			*F*			*F*		

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A4 - Proposed PM Peak Hour (No Signal) HCS Summary

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst:	*Andrew Hess*	Intersection:	*55th & Western*
Agency/Co.:	*Artisan Consulting*	Jurisdiction:	*Clarendon Hills*
Date Performed:	*10/21/2021*	Analysis Year:	*2021*
Analysis Time Period:	*4:45 PM to 5:45 PM*	Peak Hour Factor:	

Project Description:

East/West Street: *55th Street*	North/South Street: *Western Avenue*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound				Westbound			
Movement	1U	1	2	3	4U	4	5	6
	U	L	T	R	U	L	T	R
Volume (veh/h)		*17*	*843*	*14*		*76*	*1047*	*28*
Percent Heavy Vehicles		*2*	*0*	*0*		*2*	*0*	*0*
Median Type	*Undivided*							
Storage	*1*							
RT Channelized				*0*				*0*
Lanes	*0*		*2*	*0*	*0*		*2*	*0*
Configuration	*LT*			*TR*	*LT*			*TR*
Proportion Time Blocked								

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*40*	*12*	*35*	*28*	*9*	*24*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Left-Turn Lane Storage						
Percent Grade (%)	*0*			*0*		
Flared Approach			*N*			*N*
Storage			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	
Proportion Time Blocked						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*		*LTR*			*LTR*	
v (veh/h)	*17*	*77*		*87*			*61*	
C (m) (veh/h)	*633*	*768*		*63*			*50*	
v/c Ratio	*0.03*	*0.10*		*1.38*			*1.22*	
95% Queue Length	*0.08*	*0.33*		*7.41*			*5.52*	
Control Delay (s/veh)	*10.8*	*10.2*		*354.9*			*331.4*	
Movement LOS	*B*	*B*		*F*			*F*	
Approach Delay (s/veh)			*354.9*			*331.4*		
Approach LOS			*F*			*F*		

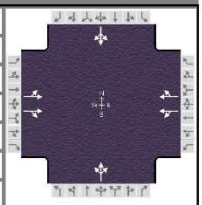
HCS+™ Version 5.6

Generated: 2/1/2022 4:29 PM

A5 - Proposed AM Peak Hour (With Signal) HCS Summary

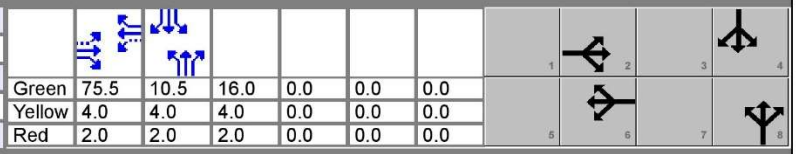
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Artisan Consulting			Duration, h	0.25
Analyst	Andrew Hess	Analysis Date	Feb 3, 2022	Area Type	Other
Jurisdiction	Clarendon Hills	Time Period	AM Peak	PHF	0.98
Intersection	55th Street and Western Av	Analysis Year	2021	Analysis Period	1> 7:00
File Name	Proposed AM Peak Hour (With Signal).xus				
Project Description	Proposed AM Peak (With Signal)				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	16	1050	12	44	562	28	36	31	72	16	12	15

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



	EB			WB			NB			SB		
Green	75.5	10.5		16.0	0.0	0.0	0.0					
Yellow	4.0	4.0		4.0	0.0	0.0	0.0					
Red	2.0	2.0		2.0	0.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		8.0		8.0		12.0		12.0
Phase Duration, s		81.5		81.5		22.0		16.5
Change Period, (*Y*+*Rc*), s		6.0		6.0		6.0		6.0
Max Allow Headway (*MAH*), s		0.0		0.0		3.2		3.1
Queue Clearance Time (g_s), s						8.8		4.3
Green Extension Time (g_e), s		0.0		0.0		0.1		0.0
Phase Call Probability						1.00		1.00
Max Out Probability						0.01		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	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	571		526	291		341		106			36	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1833		1690	1248		1682		1723			1759	
Queue Service Time (g_s), s	0.0		20.1	2.6		11.3		6.8			2.3	
Cycle Queue Clearance Time (g_c), s	19.7		20.1	22.7		11.3		6.8			2.3	
Green Ratio (*g*/*C*)	0.63		0.63	0.63		0.63		0.13			0.09	
Capacity (*c*), veh/h	1184		1063	820		1059		230			154	
Volume-to-Capacity Ratio (*X*)	0.482		0.495	0.355		0.322		0.462			0.232	
Available Capacity (c_a), veh/h	1184		1063	820		1059		230			154	
Back of Queue (*Q*), veh/ln (50th percentile)	8.1		7.5	3.5		4.2		3.3			1.1	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00		0.00	0.00		0.00		0.00			0.00	
Uniform Delay (d_1), s/veh	11.9		12.0	10.2		10.3		48.0			51.0	
Incremental Delay (d_2), s/veh	1.4		1.6	1.2		0.8		6.6			3.5	
Initial Queue Delay (d_3), s/veh	0.0		0.0	0.0		0.0		0.0			0.0	
Control Delay (*d*), s/veh	13.3		13.6	11.4		11.2		54.6			54.5	
Level of Service (LOS)	B		B	B		B		D			D	
Approach Delay, s/veh / LOS	13.5	B		11.3	B		54.6	D		54.5	D	
Intersection Delay, s/veh / LOS	15.8						B					

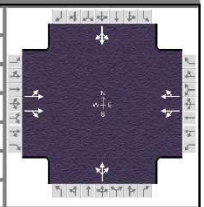
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.1	B	2.8	C	2.7	B
Bicycle LOS Score / LOS	1.4	A	1.0	A	0.7	A	0.5	A

 HCS 2010™ Streets Version 6.65 Generated: 2/3/2022 9:30:41 AM

A6 - Proposed PM Peak Hour (With Signal) HCS Summary

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	Artisan Consulting			Duration, h	0.25
Analyst	Andrew Hess	Analysis Date	Feb 3, 2022	Area Type	Other
Jurisdiction	Clarendon Hills	Time Period	PM Peak	PHF	0.96
Intersection	55th Street and Western Av	Analysis Year	2021	Analysis Period	1> 7:00
File Name	Proposed PM Peak Hour (With Signal).xus				
Project Description	Proposed PM Peak (With Signal)				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	17	833	14	76	1047	28	40	12	35	28	9	24

Signal Information					EB			WB			NB			SB		
Cycle, s	120.0	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	No	Simult. Gap E/W	On	Green	73.5	12.5	16.0	0.0	0.0	0.0						
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
				Red	2.0	2.0	2.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2		6		8		4
Case Number		8.0		8.0		12.0		12.0
Phase Duration, s		79.5		79.5		22.0		18.5
Change Period, (*Y*+*Rc*), s		6.0		6.0		6.0		6.0
Max Allow Headway (*MAH*), s		0.0		0.0		3.1		3.2
Queue Clearance Time (*gs*), s						5.2		5.6
Green Extension Time (*ge*), s		0.0		0.0		0.0		0.0
Phase Call Probability						1.00		1.00
Max Out Probability						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	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	461		436	564		621		54			55	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1779		1687	1405		1688		1794			1724	
Queue Service Time (*gs*), s	0.0		16.2	17.5		27.0		3.2			3.6	
Cycle Queue Clearance Time (*gc*), s	15.3		16.2	33.8		27.0		3.2			3.6	
Green Ratio (*g*/*C*)	0.61		0.61	0.61		0.61		0.13			0.10	
Capacity (*c*), veh/h	1121		1033	895		1034		239			180	
Volume-to-Capacity Ratio (*X*)	0.411		0.422	0.630		0.600		0.226			0.308	
Available Capacity (*ca*), veh/h	1121		1033	895		1034		239			180	
Back of Queue (*Q*), veh/ln (50th percentile)	6.3		6.1	10.5		10.4		1.6			1.7	
Queue Storage Ratio (*RQ*) (50th percentile)	0.00		0.00	0.00		0.00		0.00			0.00	
Uniform Delay (*d1*), s/veh	12.0		12.2	15.3		14.2		46.5			49.7	
Incremental Delay (*d2*), s/veh	1.1		1.3	3.4		2.6		2.2			4.4	
Initial Queue Delay (*d3*), s/veh	0.0		0.0	0.0		0.0		0.0			0.0	
Control Delay (*d*), s/veh	13.1		13.4	18.6		16.8		48.7			54.1	
Level of Service (LOS)	B		B	B		B		D			D	
Approach Delay, s/veh / LOS	13.2		B	17.7		B	48.7		D	54.1		D
Intersection Delay, s/veh / LOS	17.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.1	B	2.1	B	2.8	C	2.7	B
Bicycle LOS Score / LOS	1.2	A	1.5	A	0.6	A	0.6	A

 HCS 2010™ Streets Version 6.65 Generated: 2/3/2022 9:30:41 AM

Appendix B – Trip Generation

B1 – Strip Retail Plaza (822) – AM Peak

AM Generation Rate:	7.60 trips per 1,000 SF gross leasing area
Gross Leasing Area:	5,359 SF
AM Trips Generated:	41
AM Directional Distribution:	50% entering, 50% exiting
Generated AM Trips Entering:	21
Existing AM Northbound Traffic:	6% of total
Existing AM Southbound Traffic:	2% of total
Existing AM Eastbound Traffic:	58% of total
Existing AM Westbound Traffic:	34% of total
Generated Northbound AM Trips:	1
Generated Southbound AM Trips:	1
Generated Eastbound AM Trips:	12
Generated Westbound AM Trips:	7
Generated AM Trips Exiting:	20
Existing AM Traffic Heading North:	4% of total
Existing AM Traffic Heading South:	2% of total
Existing AM Traffic Heading East:	61% of total
Existing AM Traffic Heading West:	33% of total
Generated AM Traffic Heading North:	1
Generated AM Traffic Heading South:	1
Generated AM Traffic Heading East:	12
Generated AM Traffic Heading West:	6
Destination Assumption:	*80% of generated trips continue on direction of travel* *20% of generated trips return to origin*
Adjusted Generated AM Traffic Heading North:	1
Adjusted Generated AM Traffic Heading South:	1
Adjusted Generated AM Traffic Heading East:	11
Adjusted Generated AM Traffic Heading West:	7

B2 – Strip Retail Plaza (822) – PM Peak

PM Generation Rate:	13.24 trips per 1,000 SF gross leasing area
Gross Leasing Area:	5,359 SF
PM Trips Generated:	71
PM Directional Distribution:	54% entering, 46% exiting
Generated PM Trips Entering:	38
Existing PM Northbound Traffic:	2% of total
Existing PM Southbound Traffic:	3% of total
Existing PM Eastbound Traffic:	41% of total
Existing PM Westbound Traffic:	54% of total
Generated Northbound PM Trips:	1
Generated Southbound PM Trips:	1
Generated Eastbound PM Trips:	16
Generated Westbound PM Trips:	20
Generated PM Trips Exiting:	33
Existing PM Traffic Heading North:	3% of total
Existing PM Traffic Heading South:	3% of total
Existing PM Traffic Heading East:	42% of total
Existing PM Traffic Heading West:	52% of total
Generated PM Traffic Heading North:	1
Generated PM Traffic Heading South:	1
Generated PM Traffic Heading East:	14
Generated PM Traffic Heading West:	17
Destination Assumption:	*80% of generated trips continue on direction of travel* *20% of generated trips return to origin*
Adjusted Generated PM Traffic Heading North:	1
Adjusted Generated PM Traffic Heading South:	1
Adjusted Generated PM Traffic Heading East:	14
Adjusted Generated PM Traffic Heading West:	17

B3 - Coffee/Donut Shop with Drive Through Window (937) – AM Peak

AM Generation Rate:	101.27 trips per 1,000 SF gross floor area
Gross Floor Area:	936 SF
AM Trips Generated:	95
AM Directional Distribution:	50% entering, 50% exiting
Generated AM Trips Entering:	48
Existing AM Northbound Traffic:	6% of total
Existing AM Southbound Traffic:	2% of total
Existing AM Eastbound Traffic:	58% of total
Existing AM Westbound Traffic:	34% of total
Generated Northbound AM Trips:	3
Generated Southbound AM Trips:	1
Generated Eastbound AM Trips:	28
Generated Westbound AM Trips:	16
Generated AM Trips Exiting:	47
Existing AM Traffic Heading North:	4% of total
Existing AM Traffic Heading South:	2% of total
Existing AM Traffic Heading East:	61% of total
Existing AM Traffic Heading West:	33% of total
Generated AM Traffic Heading North:	2
Generated AM Traffic Heading South:	1
Generated AM Traffic Heading East:	29
Generated AM Traffic Heading West:	15
Destination Assumption:	*80% of generated trips continue on direction of travel* *20% of generated trips return to origin*
Adjusted Generated AM Traffic Heading North:	2
Adjusted Generated AM Traffic Heading South:	1
Adjusted Generated AM Traffic Heading East:	26
Adjusted Generated AM Traffic Heading West:	18

B4 - Coffee/Donut Shop with Drive Through Window (937) – PM Peak

PM Generation Rate:	43.65 trips per 1,000 SF gross floor area
Gross Floor Area:	936 SF
PM Trips Generated:	41
PM Directional Distribution:	50% entering, 50% exiting
Generated PM Trips Entering:	21
Existing PM Northbound Traffic:	2% of total
Existing PM Southbound Traffic:	3% of total
Existing PM Eastbound Traffic:	41% of total
Existing PM Westbound Traffic:	54% of total
Generated Northbound PM Trips:	1
Generated Southbound PM Trips:	1
Generated Eastbound PM Trips:	8
Generated Westbound PM Trips:	11
Generated PM Trips Exiting:	20
Existing PM Traffic Heading North:	3% of total
Existing PM Traffic Heading South:	3% of total
Existing PM Traffic Heading East:	42% of total
Existing PM Traffic Heading West:	52% of total
Generated PM Traffic Heading North:	1
Generated PM Traffic Heading South:	1
Generated PM Traffic Heading East:	8
Generated PM Traffic Heading West:	10
Destination Assumption:	*80% of generated trips continue on direction of travel* *20% of generated trips return to origin*
Adjusted Generated PM Traffic Heading North:	1
Adjusted Generated PM Traffic Heading South:	1
Adjusted Generated PM Traffic Heading East:	8
Adjusted Generated PM Traffic Heading West:	10

B5 – Small Office Building (712) – AM Peak

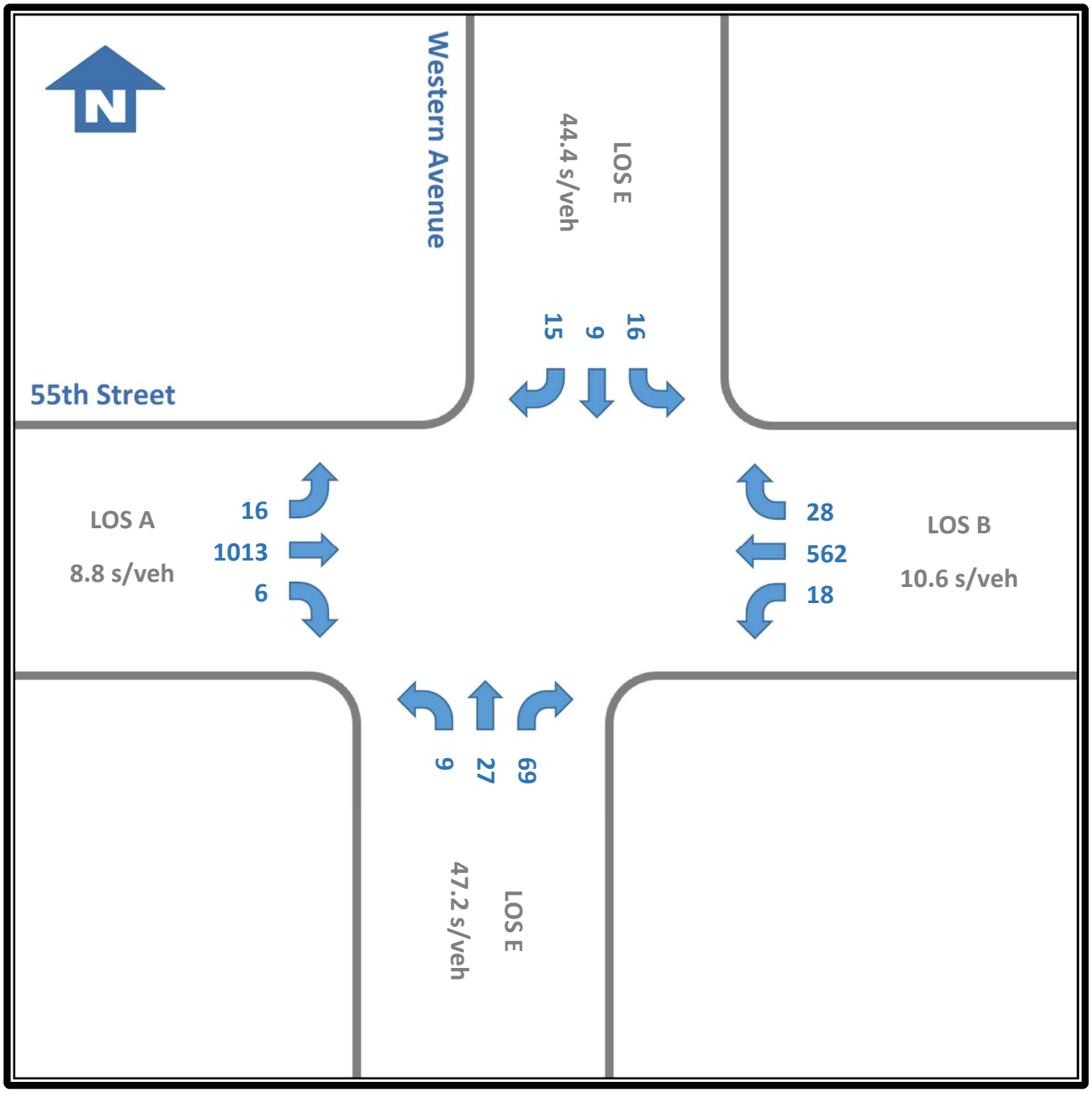
AM Generation Rate:	2.61 trips per 1,000 SF gross floor area
Gross Floor Area:	6,800 SF
AM Trips Generated:	18
AM Directional Distribution:	60% entering, 40% exiting
Generated AM Trips Entering:	11
Existing AM Northbound Traffic:	6% of total
Existing AM Southbound Traffic:	2% of total
Existing AM Eastbound Traffic:	58% of total
Existing AM Westbound Traffic:	34% of total
Generated Northbound AM Trips:	1
Generated Southbound AM Trips:	1
Generated Eastbound AM Trips:	6
Generated Westbound AM Trips:	3
Generated AM Trips Exiting:	7
Existing AM Traffic Heading North:	4% of total
Existing AM Traffic Heading South:	2% of total
Existing AM Traffic Heading East:	61% of total
Existing AM Traffic Heading West:	33% of total
Generated AM Traffic Heading North:	1
Generated AM Traffic Heading South:	1
Generated AM Traffic Heading East:	3
Generated AM Traffic Heading West:	2
Destination Assumption:	*80% of generated trips continue on direction of travel* *20% of generated trips return to origin*
Adjusted Generated AM Traffic Heading North:	1
Adjusted Generated AM Traffic Heading South:	1
Adjusted Generated AM Traffic Heading East:	3
Adjusted Generated AM Traffic Heading West:	2

B6 – Small Office Building (712) – PM Peak

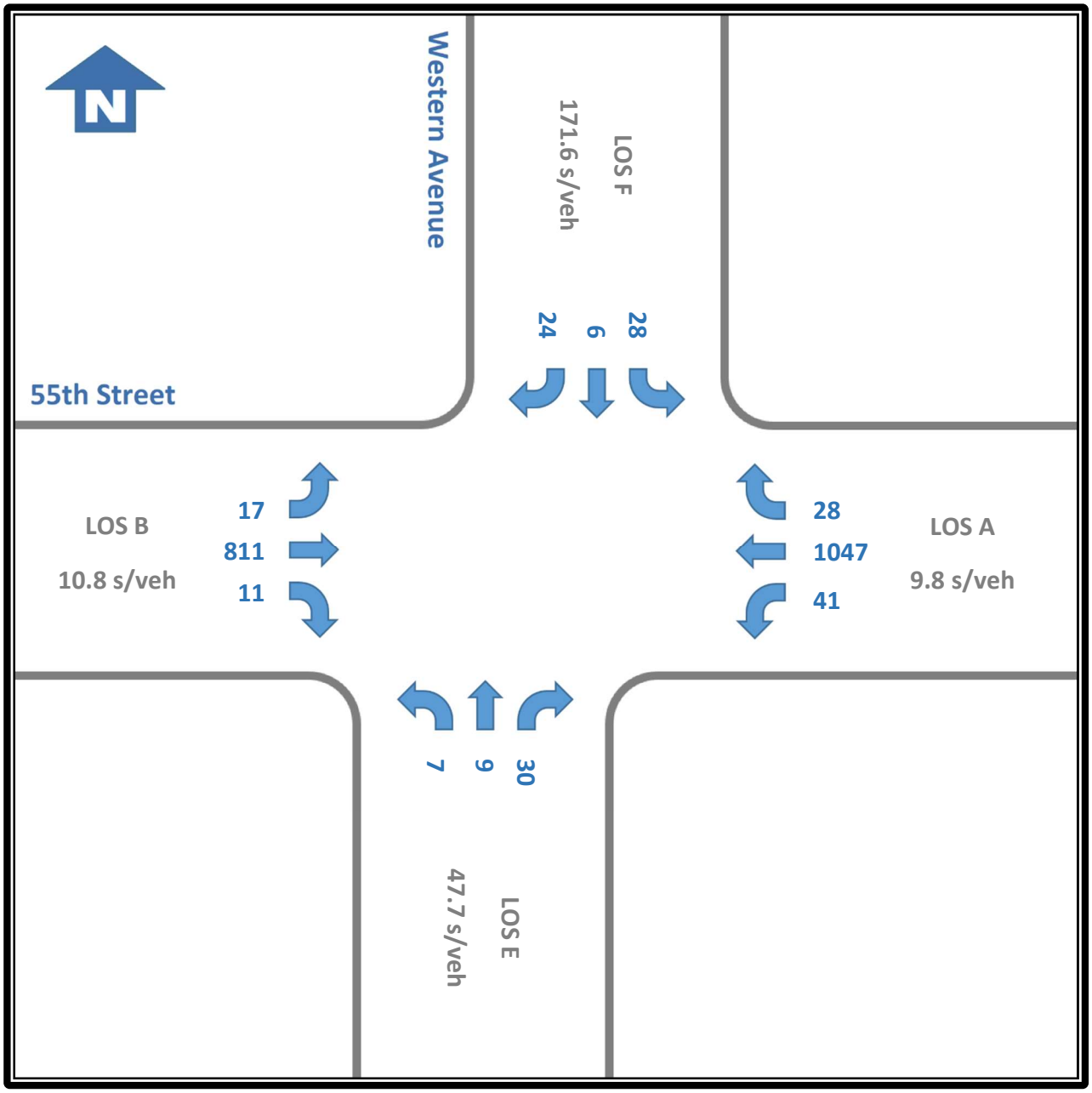
PM Generation Rate:	3.15 trips per 1,000 SF gross floor area
Gross Floor Area:	6,800 SF
PM Trips Generated:	22
PM Directional Distribution:	42% entering, 58% exiting
Generated PM Trips Entering:	9
Existing PM Northbound Traffic:	2% of total
Existing PM Southbound Traffic:	3% of total
Existing PM Eastbound Traffic:	41% of total
Existing PM Westbound Traffic:	54% of total
Generated Northbound PM Trips:	1
Generated Southbound PM Trips:	1
Generated Eastbound PM Trips:	3
Generated Westbound PM Trips:	4
Generated PM Trips Exiting:	13
Existing PM Traffic Heading North:	3% of total
Existing PM Traffic Heading South:	3% of total
Existing PM Traffic Heading East:	42% of total
Existing PM Traffic Heading West:	52% of total
Generated PM Traffic Heading North:	1
Generated PM Traffic Heading South:	1
Generated PM Traffic Heading East:	5
Generated PM Traffic Heading West:	6
Destination Assumption:	*80% of generated trips continue on direction of travel* *20% of generated trips return to origin*
Adjusted Generated PM Traffic Heading North:	1
Adjusted Generated PM Traffic Heading South:	1
Adjusted Generated PM Traffic Heading East:	5
Adjusted Generated PM Traffic Heading West:	6

Appendix C – Traffic Diagrams

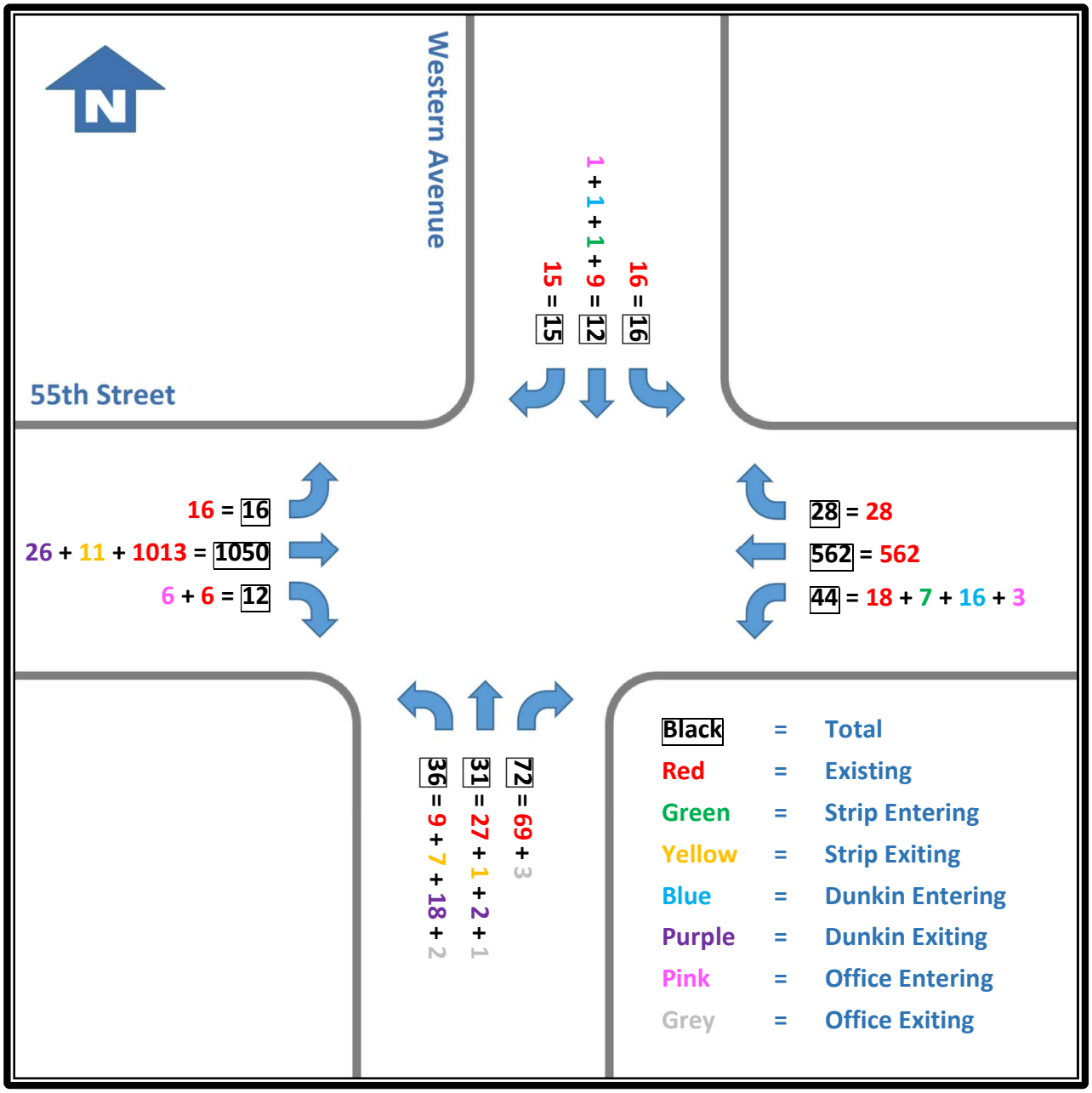
C1 – Existing AM Peak Hour Traffic



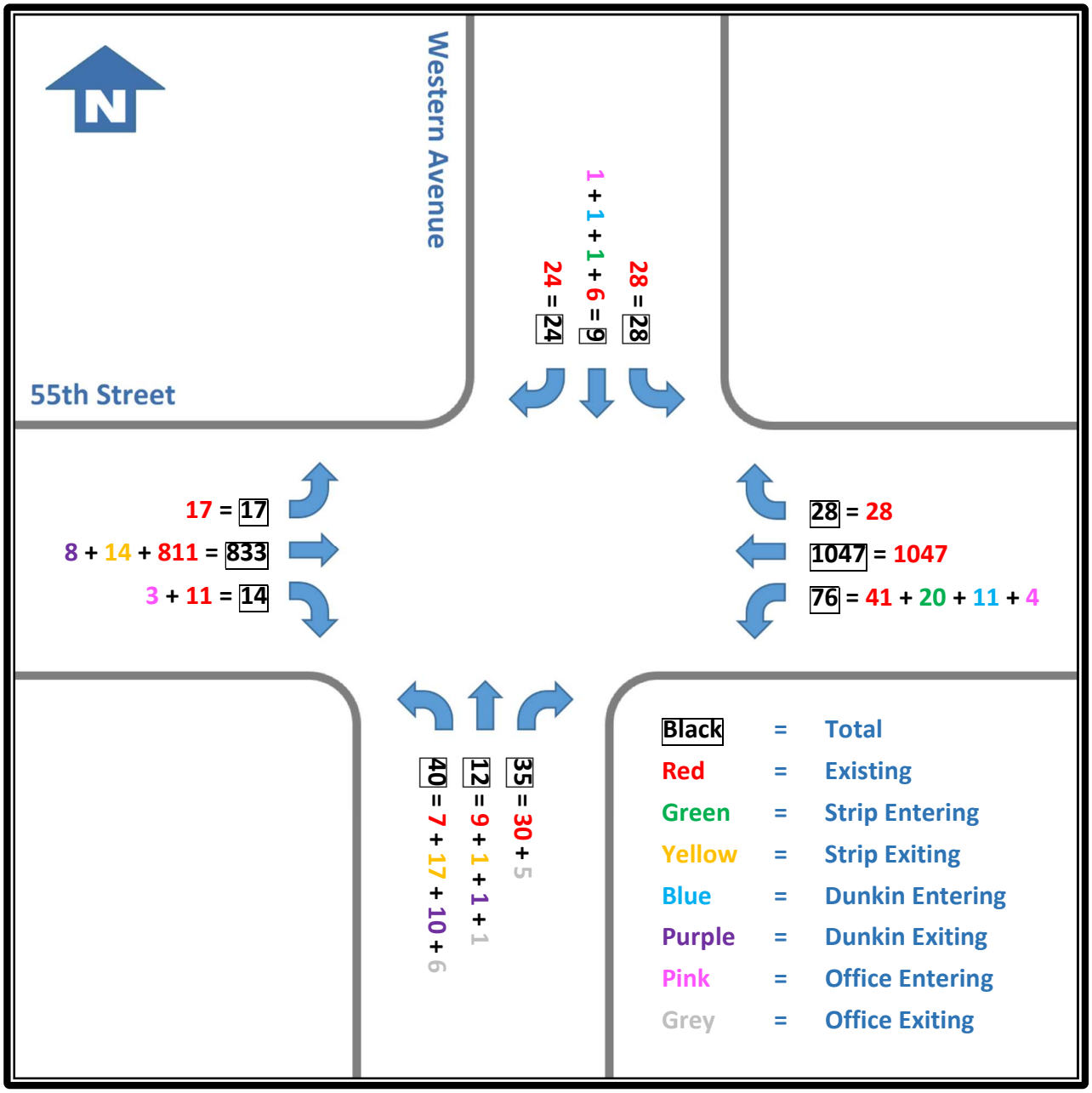
C2 - Existing PM Peak Hour Traffic



C3 - Generated AM Peak Hour Traffic



C4 - Generated PM Peak Hour Traffic



Appendix D – Traffic Count Data

D1 – October 20, 2021, Traffic Count Data

6:45 AM - 7:00 AM *338 vehicles*

	1	0	2
2			2
213			105
0			1
	1	3	8

7:00 AM - 7:15 AM *346 vehicles*

	2	1	0
2			4
203			114
2			2
	2	2	12

7:15 AM - 7:30 AM *448 vehicles*

	3	3	7
2			7
269			132
0			3
	3	4	15

7:30 AM - 7:45 AM *430 vehicles*

	2	1	4
6			5
239			130
3			2
	2	7	29

7:45 AM - 8:00 AM *454 vehicles*

	3	1	3
5			8
261			145
1			6
	2	9	10

8:00 AM - 8:15 AM *456 vehicles*

	7	4	2
3			8
244			155
2			7
	2	7	15

8:15 AM - 8:30 AM *406 vehicles*

	6	2	4
8			2
223			143
4			2
	2	2	8

8:30 AM - 8:45 AM *428 vehicles*

	5	1	3
5			5
220			159
2			5
	5	3	15

8:45 AM - 9:00 AM *395 vehicles*

	4	1	9
1			6
189			152
2			10
	0	5	16

4:00 PM - 4:15 PM *500 vehicles*

	6	3	4
1			5
187			274
4			8
	1	1	6

4:15 PM - 4:30 PM *490 vehicles*

	5	0	5
4			1
201			255
7			7
	1	0	4

4:30 PM - 4:45 PM *492 vehicles*

	8	1	5
5			7
208			237
4			8
	3	2	4

4:45 PM - 5:00 PM *476 vehicles*

	8	0	3
4			5
206			224
2			13
	1	1	9

5:00 PM - 5:15 PM *533 vehicles*

	3	1	5
4			7
214			276
5			9
	0	3	6

5:15 PM - 5:30 PM *537 vehicles*

	7	2	7
7			8
197			281
3			11
	3	3	8

5:30 PM - 5:45 PM *513 vehicles*

	6	3	13
2			8
194			266
1			8
	3	2	7

5:45 PM - 6:00 PM *465 vehicles*

	3	3	8
8			12
159			242
7			13
	2	0	8

Interval	Volume	Peak
6:45-7:00	338	-
7:00-7:15	346	-
7:15-7:30	448	-
7:30-7:45	430	1562
7:45-8:00	454	1678
8:00-8:15	456	1788
8:15-8:30	406	1746
8:30-8:45	428	1744
8:45-9:00	395	1685

Interval	Volume	Peak
4:00-4:15	500	-
4:15-4:30	490	-
4:30-4:45	492	-
4:45-5:00	476	1958
5:00-5:15	533	1991
5:15-5:30	537	2038
5:30-5:45	513	2059
5:45-6:00	465	2048

7:15 AM - 8:15 AM *1788 vehicles*

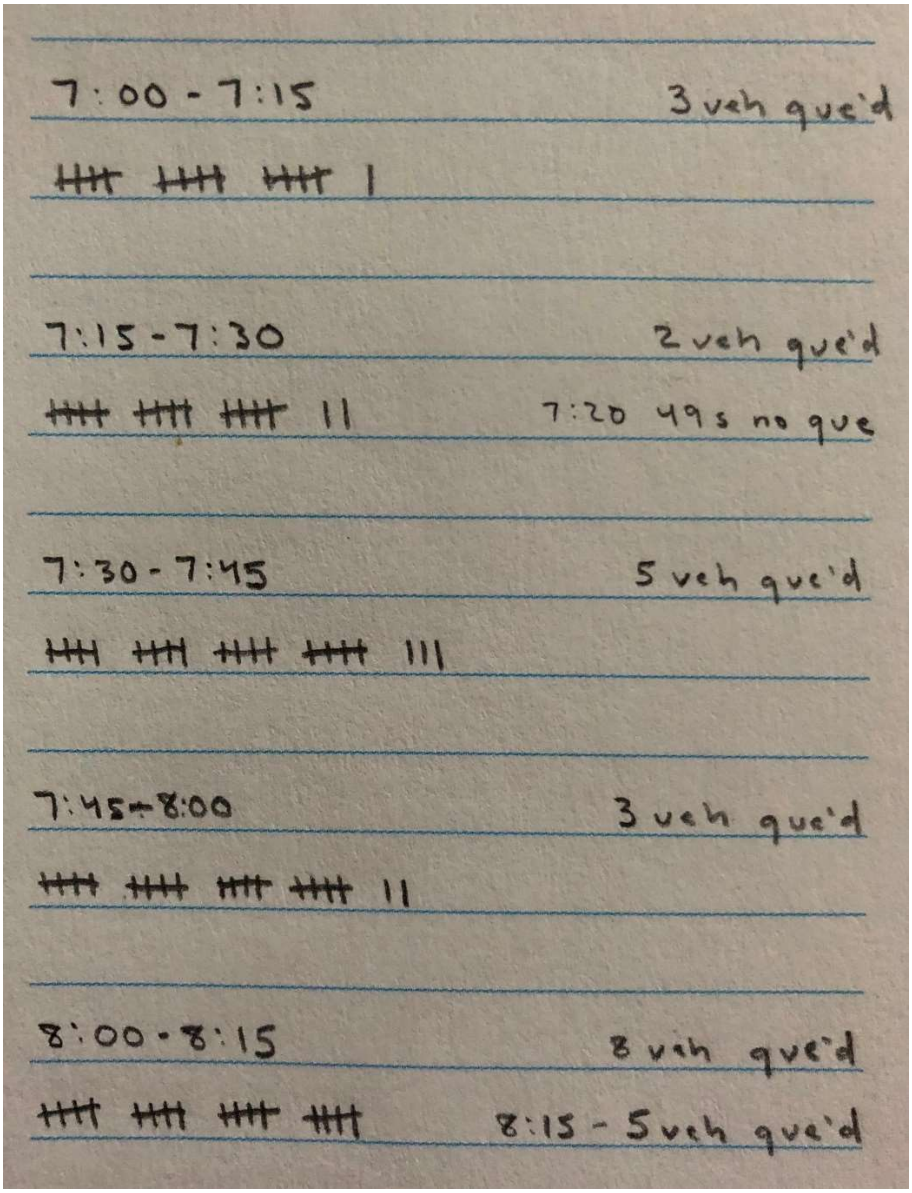
	15	9	16
16			28
1013			562
6			18
	9	27	69

4:45 PM - 5:45 PM *2059 vehicles*

	24	6	28
17			28
811			1047
11			41
	7	9	30

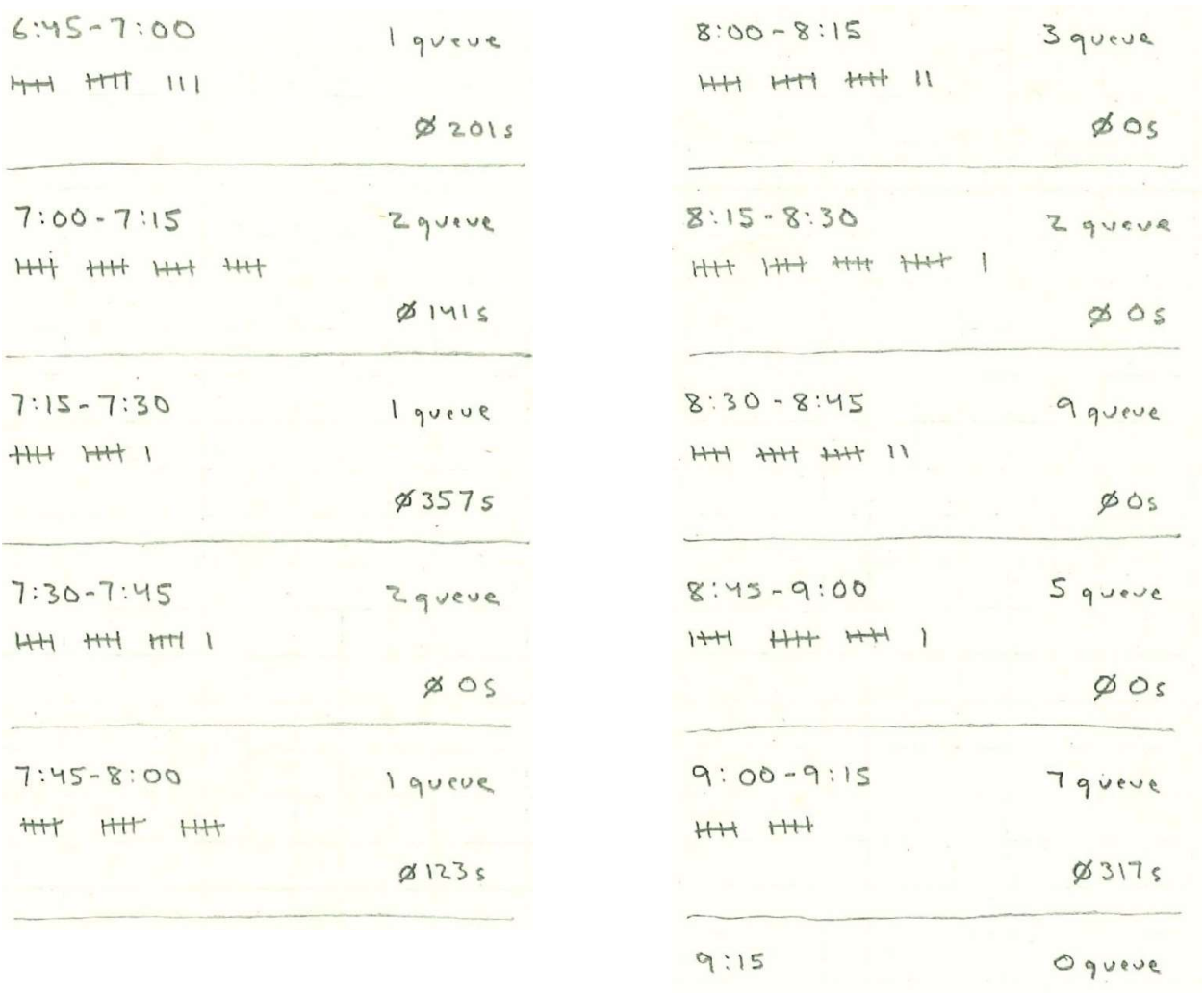
D2 – November 1, 2021, Dunkin Donuts Drive Through Count Data

Period	Number Served	Starting Queue (veh)	Ending Queue (veh)	Time w/ No Queue (min)	Period Length (min)	Average Service Rate (veh/min)
7:00 - 7:15	16	3	2	0.00	15.00	1.07
7:15 - 7:30	17	2	5	0.83	14.17	1.20
7:30 - 7:45	23	5	3	0.00	15.00	1.53
7:45 - 8:00	22	3	8	0.00	15.00	1.47
8:00 - 8:15	20	8	5	0.00	15.00	1.33
Peak Hour Totals	*82*	*2*	*5*	*0.83*	*59.17*	*1.39*



D3 – January 20, 2022, Dunkin Donuts Drive Through Count Data

Period	Number Served	Starting Queue (veh)	Ending Queue (veh)	Time w/ No Queue (min)	Period Length (min)	Average Service Rate (veh/min)
6:45 – 7:00	13	1	2	3.35	11.65	1.12
7:00 – 7:15	20	2	1	2.35	12.65	1.58
7:15 – 7:30	11	1	2	5.95	9.05	1.22
7:30 – 7:45	16	2	1	0.00	15.00	1.07
7:45 – 8:00	15	1	3	2.05	12.95	1.16
8:00 – 8:15	17	3	2	0.00	15.00	1.13
8:15 – 8:30	21	2	9	0.00	15.00	1.40
8:30 – 8:45	17	9	5	0.00	15.00	1.13
8:45 – 9:00	17	5	7	0.00	15.00	1.75
9:00 – 9:15	10	7	0	5.28	9.72	1.03
Peak Hour Totals	*77*	*3*	*7*	*0.00*	*60.00*	*1.20*



D3 – January 26, 2022, Dunkin Donuts Drive Through Count Data

Period	Number Served	Starting Queue (veh)	Ending Queue (veh)	Time w/ No Queue (min)	Period Length (min)	Average Service Rate (veh/min)
6:45 – 7:00	10	3	0	8.65	6.35	1.57
7:00 – 7:15	18	0	2	1.40	13.60	1.32
7:15 – 7:30	18	2	1	2.73	12.27	1.47
7:30 - 7:45	16	1	5	0.48	14.52	1.10
7:45 - 8:00	24	5	4	0.00	15.00	1.60
8:00 - 8:15	15	4	1	0.62	14.38	1.04
8:15 – 8:30	12	1	9	2.15	12.85	0.93
8:30 – 8:45	16	9	7	0.00	15.00	1.07
8:45 – 9:00	18	7	2	2.88	12.12	1.49
Peak Hour Totals	*76*	*0*	*4*	*4.61*	*55.39*	*1.37*