

**PROPOSED PLACE OF WORSHIP DEVELOPMENT
27 WINONA DRIVE, WHITCHURCH STOUFFVILLE, ONTARIO**

TRAFFIC IMPACT STUDY

PROJECT No. n 2271

Prepared By:



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Version History

Version Number	Reason for Issue	Issue Date
01	1 st Submission	2024-09-12
02	2 nd DA Submission (Issued for ZBA)	2025-03-20
03	3 rd DA Submission (Issued for ZBA)	2025-12-12

Abbreviations

AM	: Morning peak hours	EBL	: Eastbound left
Ave.	: Avenue	EBT	: Eastbound through
AHV	: Average Hourly Volume	EBR	: Eastbound right
Blvd.	: Boulevard	EBTR	: Eastbound through right
Dr.	: Drive	EBLTR	: Eastbound left through right
EX2022:	Existing 2024 Conditions	WBL	: Westbound Left
FB2027:	Future Background 2027 Condition Traffic	WBT	: Westbound through
FB2032:	Future Background 2032Condition Traffic	WBR	: Westbound right
FB2037:	Future Background 2037 Condition Traffic	WBTR	: Westbound through right
FT2027:	Future Total 2027 Condition Traffic	WBLTR	: Westbound left through right
FT2032:	Future Total 2032 Condition Traffic	NBL	: Northbound left
FT2037:	Future Total 2037 Condition Traffic	NBT	: Northbound through
GFA	: Gross Floor Area	NBR	: Northbound right
HCM	: Highway Capacity Manual	NBLTR	: Northbound left through right
ITE	: Institute of Transportation Engineers	SBL	: Southbound left
LOS	: Level of service	SBT	: Southbound through
LUC	: Land-use Code	SBR	: Southbound right
OTM	: Ontario Traffic Manual	SBTL	: Southbound through left
PM	: Afternoon peak hours	SBLTR	: Southbound left through right
PHV	: Peak Hour Volume	veh/hr	: Vehicles/ hour
S	: second	ZBL	: Zoning By-Law
St.	: Street		
The Town:	Whitchurch-Stouffville		
The Region:	York Region		
TIS	: Traffic Impact Study		
TWLTL	: Two Way Left Turn Lane		
TAC	: Transportation Association Canada		
TMC	: Turning Movement Count		
v/c	: volume to capacity ratio		
Veh	: Vehicle		

1 Introduction

n Engineering Inc. has been retained to provide traffic consulting services in support of the proposed Place of Worship (Mosque) development. The subject site is located at 27 Winona Dr, Whitchurch-Stouffville, Ontario. The location is illustrated in Figure 1.

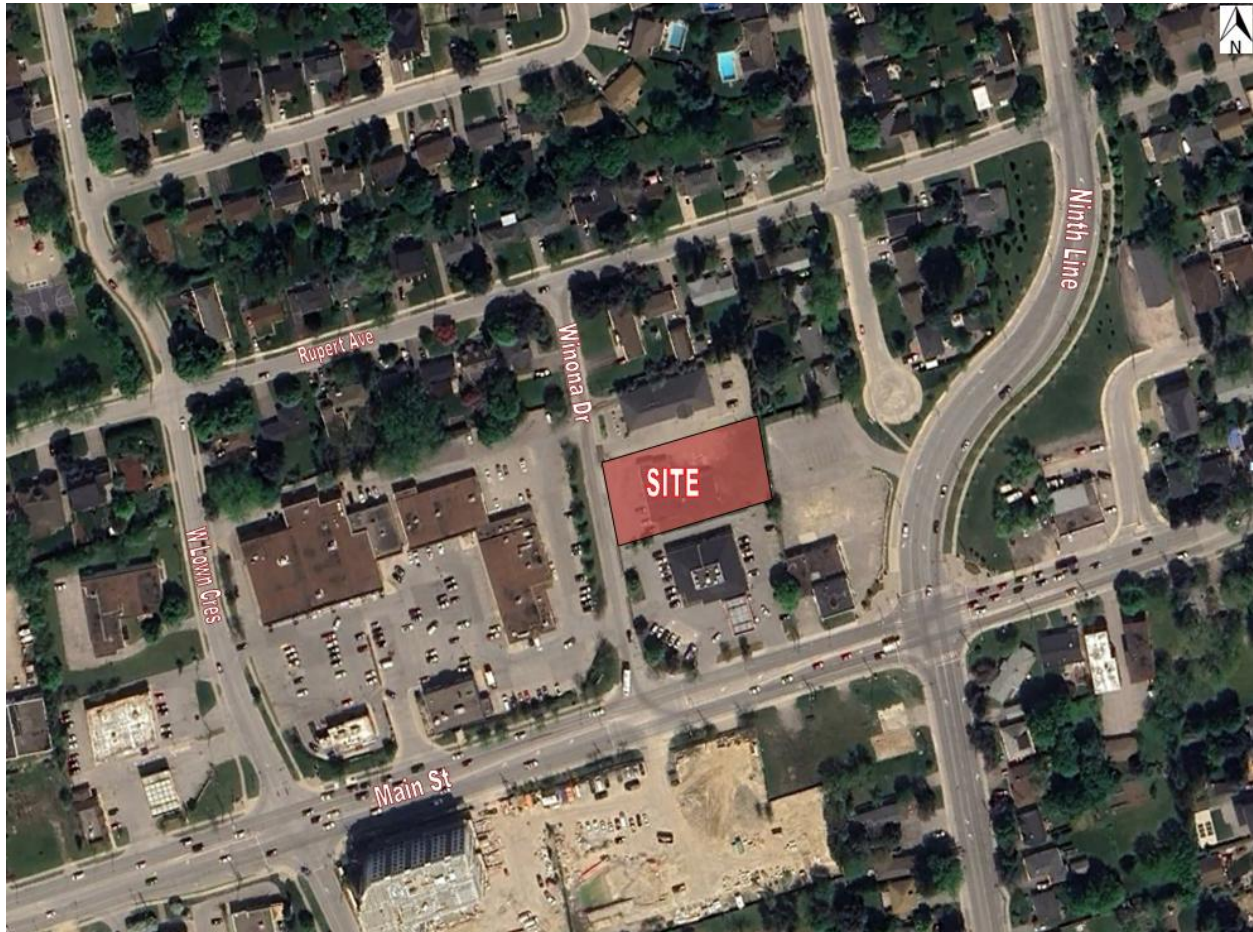


Figure 1 - Site Location

2 Proposed Development

As per the site plan provided by n Architecture Inc. (refer Appendix B), the proposed place of worship (Mosque) is a 3 storey building with total GFA of 1931 m² with the following facilities:

- Men Prayer Hall with GFA 544.77 m²;
- Women Prayer Hall with GFA 135.3 m²
- Lounge Area with GFA 62.1 m²

- Office Space with GFA 41.7 m² GFA
- 76 Parking spaces (incl. barrier free).

The site is accessible via proposed two full movement entrances both of which come off of Winona Dr. A majority of the properties surrounding the proposed development are commercial with some residential. The site plan is shown in Figure 2.

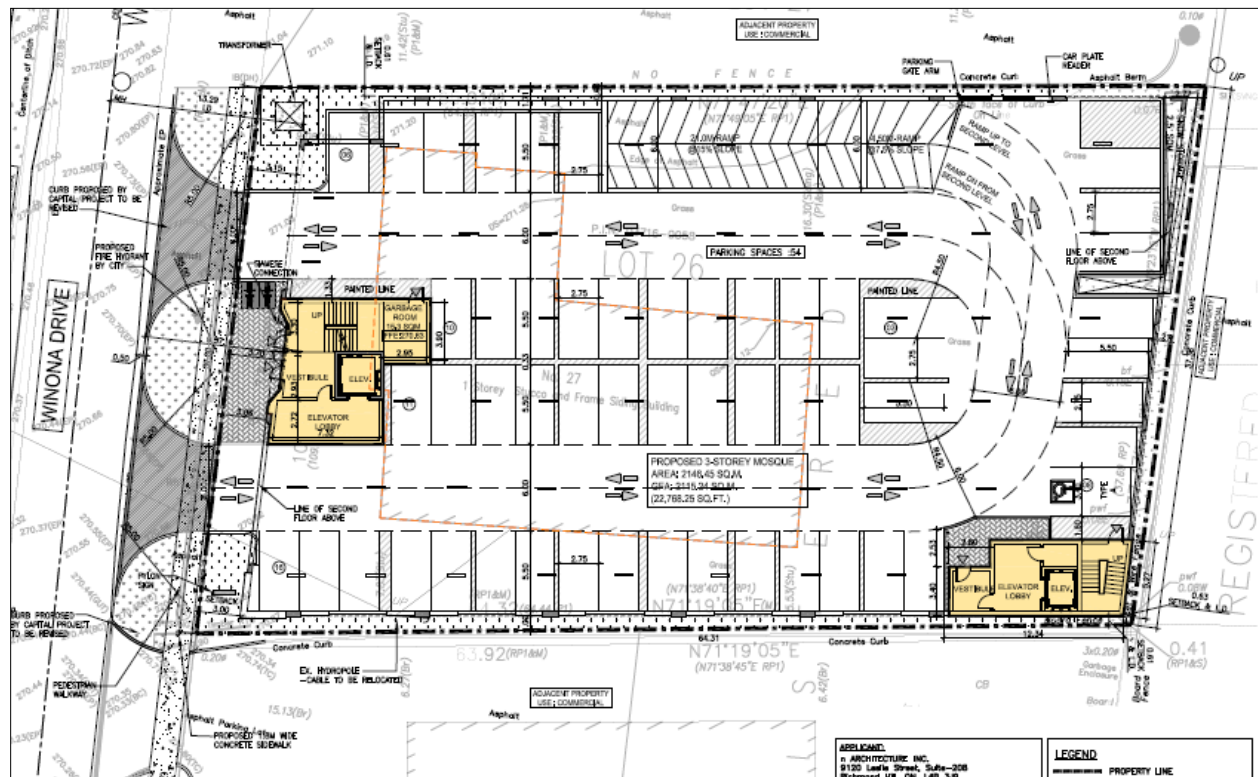


Figure 2- Proposed Site Plan by n Architecture Inc.

2.1 Mosque a space for Community Gathering

A mosque is a place of worship for Muslims, where congregants gather to perform prayers (*salat*) and participate in various religious and community activities. Muslims observe five daily prayers at specific times: early morning (*Fajr*), midday (*Dhuhr*), afternoon (*Asr*), evening (*Maghrib*), and night (*Isha*).

Special prayers include the Friday prayer, the Tarawih prayer during late nights in the month of Ramadan, and the Eid prayers held twice a year, which typically draw larger congregations than regular daily prayers. In addition to prayer services, mosques often host community gatherings, children's Islamic studies, funeral services, and other religious functions.

Among these activities, the five daily prayers and the Friday congregational prayer are the core functions that define the mosque's role as a focal point within an urban and transportation planning context.

Currently, Darul-Khair Mosque is operating temporarily in a commercial plaza located at 86 Ringwood Dr in Stouffville. The proposed mosque at 27 Winona Dr is intended to serve as the permanent location for Darul-Khair Mosque.

Refer to Appendix D for detailed information on the current activities and functions of Darul-Khair at 86 Ringwood Drive.

2.2 Mosques in Canadian Cities

Similar to schools, mosques are essential elements of the neighborhood fabric in towns and cities with Muslim communities. In urbanized areas of Islamic countries, most trips to local mosques are made on foot, as mosques are typically located within a 5 to 10-minute walking distance. Larger or special-purpose mosques may provide parking facilities to accommodate congregants traveling from wider catchment areas.

In the context of Canadian cities, however, mosques primarily generate vehicular trips, as users are more widely dispersed and rely on various transportation modes (e.g., cars, buses, bicycles). Despite this, daily prayers typically attract fewer attendees due to lower accessibility, with the exception of evening prayers, which tend to have higher participation.

The highest volume of congregants occurs during Friday prayers. To address capacity constraints and accommodate work schedules, many mosques schedule multiple Friday prayer sessions. This practice helps distribute attendance and manage parking demand during peak times.

The existing mosques within the Stouffville area (York Region), are generally located within a 3 to 5 km radius of each other. This proximity provides residents with convenient access to their nearest mosque, reducing travel distances and alleviating parking pressure during Friday prayers.

Smaller mosques situated in commercial plazas may face parking shortages during Friday prayer times, which coincide with peak parking demand for nearby businesses.

3 Scope of Work

The TIS study focuses on the analysis of existing and future traffic operations at the following intersections, illustrated in Figure 3:

- A. Ninth Line & Main St (Signalized)
- B. Winona Dr & Main St (Signalized)
- C. Proposed Site Entrance1 & Winona Dr (Unsignalized)
- D. Proposed Site Entrance 2 & Winona Dr (Unsignalized)
- E. Winona Dr & Rupert Ave (Unsignalized)
- F. Ninth Line & Rupert Ave (Unsignalized)

The time periods used for this study were at Friday Midday Peak, PM peak and Saturday PM Peak hours which are considered to be the busiest timing for a mosque. The study area and studied traffic periods were all confirmed with the staff at the Town of Whitchurch-Stouffville and York Region. Refer to Appendix A for the approved Terms of Reference and email correspondence.



Figure 3- Study Area

4 Study Methodology

The study methodology and criteria's used to analyze specific transportation modes are described in this section. The criteria set in the *Transportation Mobility Plan Guideline for Development Applications for York Region* and *Transportation Impact Study Guideline for Development Applications for York Region* was used for analysis of traffic conditions and scenarios.

4.1 Pedestrian Mode Performance

Pedestrian traffic operations at the study area intersections were analyzed based upon the *Transportation Mobility Plan Guideline for Development Applications for York Region*. Pedestrian Level of Service Criteria is shown in Table 1.

Table 1 - Pedestrian Level of Service Criteria

Level of Service	Segment	Intersection
A	≥2.0 m sidewalk with minimum 3.5 m buffer including planting and edge zone; or ≥3.0 m multi-use path	■ ≥2.0 m sidewalk with minimum 3.5 m buffer including planting and edge zone; or ≥3.0 m multi-use path ■ Pedestrian signal head with sufficient pedestrian clearance time ■ Clearly delineated cross-walk
B	≥1.5 m sidewalk with minimum 1.0 m buffer including edge zone; or	■ ≥1.5 m sidewalk with minimum 1.0 m buffer including edge zone; or <3.0 m multi-use path ■ Pedestrian signal head with sufficient pedestrian clearance time ■ Clearly delineated cross-walk
C	≥1.5 m curb-faced sidewalk (no buffer)	■ ≥1.5 m curb-faced sidewalk (no buffer) ■ Pedestrian signal head with sufficient pedestrian clearance time ■ Clearly delineated cross-walk
D	<1.5 m of sidewalk	■ <1.5 m sidewalk ■ Pedestrian signal head sufficient pedestrian clearance time ■ No clearly delineated cross-walk
E	Paved shoulder or no sidewalk provision	■ Paved shoulder or no sidewalk provision ■ No pedestrian signal head ■ No clearly delineated cross-walk
F	No sidewalk provision	■ No sidewalk provision ■ No pedestrian signal head ■ Not clearly delineated cross-walk

As per the *Transportation Mobility Plan Guideline for Development Applications for York Region*, the Pedestrian LOS Target is C or better for these categories.

4.2 Bicycle Mode Performance

Bicycle traffic operations at the study area intersections were analyzed based upon the *Transportation Mobility Plan Guideline for Development Applications for York Region*. Bicycle Level of Service Criteria is shown in Table 2.

Table 2 - Bicycle Level of Service Criteria

Level of Service	Segment	Intersection
A	Separated cycling facilities (e.g. cycle tracks, multi-use path)	Separated cycling facilities Bicycle box or clearly delineated bicycle treatment or bicycle signal head
B	≥ 1.8 m dedicated cycling facilities (e.g. bicycle lanes with and without buffer)	> 1.8 m dedicated cycling facilities (e.g. bicycle lanes with and without buffer), Bicycle box, clearly delineated bicycle treatment or bicycle signal head
C	< 1.8 m dedicated cycling facilities with no buffer	< 1.8 m dedicated cycling facilities with no buffer, Bicycle box, clearly delineated bicycle treatment or bicycle signal head
D	≤ 1.5 m bicycle lane with no buffer	≤ 1.5 m bicycle lane and no buffer Bicycle treatment
E	Shared facilities (e.g. signed routes, sharrows or paved shoulder with minimum 1.2 m in constrained area)	Shared facilities (e.g. signed routes, sharrows or paved shoulder with minimum 1.2 m in constrained area) No clearly delineated bicycle treatment
F	No bicycle provision	No bicycle provision

As per the *Transportation Mobility Plan Guideline for Development Applications for York Region* the Bicycle LOS Target is C or better for these categories.

4.3 Transit Mode Performance

Transit performance has been studied based on the results of Synchro capacity analysis, transit frequency and accessibility level as defined in *The Transportation Mobility Guidelines for Development Applications for York Region*. The Level of Service Criteria defined by the guidelines for transit performance analysis shown in Table 3 is as follows:

Table 3 - Transit Level of Service Criteria

LOS	Access to Transit Stops	Transit Headway	Intersection Approach (Transit or Curb lanes)	
			Delay (s/veh)	v/c
A	90% within $\leq 200\text{m}$	≤ 5 minutes	≤ 10	0 to 0.6
B	90% within $\leq 500\text{m}$ and 70% within $\leq 200\text{m}$	$> 5 - 10$ minutes	$> 10-20$	0.61-0.7
C	90% within $\leq 500\text{m}$ and 50% $\leq 200\text{m}$	$> 10 - 15$ minutes	$> 20-35$	0.71 to 0.8
D	100% within $\leq 600\text{m}$	$> 15 - 20$ minutes	$> 35-55$	0.81 to 0.9
E	100% within $\leq 800\text{m}$	$> 20 - 30$ minutes	$> 55-80$	0.91-1.0
F	100% within $> 800\text{m}$	> 30 minutes	> 80	> 1.0

The guideline has set a target Transit LOS C or better for Access to Transit Stops and Transit Headways and LOS D or better for Intersection Approach.

4.4 Automobile Mode Performance

Auto traffic operations at the study area intersections were analyzed based upon the Highway Capacity Manual (HCM 2000) using the Synchro (ver.11). SimTraffic was used to simulate traffic operations to achieve 95th percentile queue length. For all intersections, the volume to capacity (v/c) ratio, control delay (s/veh), level of service (LOS), and 95th percentile queue length were tabulated for each scenario. Level of service is based on average vehicle delay as per HCM which is illustrated in Table 4.

Table 4 - Automobile HCM LOS Criteria

LOS	Signalized Intersection Delay (s/veh)	Signalized Intersection V/C Ratio	Unsignalized Intersection Delay (s/veh)
A	≤ 10	0-0.6	≤ 10
B	$> 10-20$	0.61 – 0.70	$> 10-15$
C	$> 20-35$	0.71 – 0.80	$> 15-25$
D	$> 35-55$	0.81 – 0.9	$> 25-35$
E	$> 55-80$	0.91 – 1.00	$> 35-50$
F	> 80	> 1.00	> 50

As per the *Transportation Impact Study Guideline for Development Applications for York Region*, critical movements are highlighted in yellow for each intersection capacity analysis where:

- LOS is 'E' or worse (LOS as defined by delay or speed);
- An intersection where the overall v/c ratio will exceed 0.85 in urban areas or 0.70 in rural areas;
- An individual movement v/c ratio will exceed 0.85 in urban areas or 0.70 in rural areas;

- An exclusive turning movement which will result in 95th percentile queues exceeding the available storage length;
- Exclusive left and right turn lanes that are inaccessible due to the length of queues in the adjacent through lane.

5 Existing Condition

This section provides a comprehensive analysis of the current conditions that will be used as basis for analysis and comparison of the future scenarios.

5.1 Existing Street Network

Main Street is located south of the site area and runs east to west. This road is a two-way urban arterial road with designated left turn lanes as drivers approach signalized intersections. The posted speed limit on Main St is 50km/h.

Ninth Line is a regional road runs in a north-south direction under the jurisdiction of York Region. Ninth Line has two travel lanes with TWLT median lane and sidewalks on both sides.

There are also delineated cycle lanes on both sides of the road section between Rupert Ave & Main St. The intersection of 9th line at Main St is signalized and have dedicated left and right turn lanes on Northbound approach for traffic to turn left and right onto Main St. The posted speed limit is 50km/h in the vicinity of the site.

Winona Drive is a local road under the jurisdiction of the Town of Whitchurch-Stouffville that runs in a north-south direction and provides direct access to the site. Although the road runs in an urbanized commercial area but Pedestrian facilities are not provided along Winona Drive.

As per the information from the Capital Projects Department of Town of Stouffville, a road construction project is in pipeline for Winona Dr which improves the current ROW and provides sidewalk connection. The intersection of Winona Dr at Main St is signalized. The assumed speed limit is 50km/h in the vicinity of the site.

Rupert Ave is a 2 lane local road under the jurisdiction of the Town of Whitchurch-Stouffville that runs on east west direction. The road intersects with both Winona Dr and 9th Line Road which will play important role in providing access to the northbound traffic for the facility.

There is a sidewalk on one side of the road. The intersections of Rupert Ave at Winona Dr and 9th Line are Two Way Stop Controlled. The posted speed limit is 40km/h in the vicinity of the site.

5.2 Existing Transit Services

The York Region Transit provides transit services in the town of Whitchurch-Stouffville. The 9th Line bus route travels from Hwy 48 to 10th Line in the town and travels from Whitchurch-Stouffville down to Markham. This bus travels only from Monday to Friday.

The Mobility On-Request provides service to York Region from Stouffville and is available weekday midday and evening and can be used by commuters to book a ride prior to their departure time.

York Region Transit also provides 417 Line Bill Hogarth School Special – Mo/Af with 66 stops. This bus departs from Hoover Park Dr/Sandiford Dr (Stouffville) and ends at Bur Oak Av/ Donald Sim Av (Markham).

Go Transit Route 70 provides service on Main St. This line runs from Railway St at Albert St to Markham Unionville GO Station and travels along many municipal, regional and provincial roadways. There are four bus stops on Main St within 250m of the proposed development for pedestrians to use the available transit services. Go Train Station is also located within 5 minutes walking distance from the proposed site. Refer Appendix C for all three transit maps.

Table 5 – Bus Transit Headway

Route	AM Peak	Midday	PM Peak	Evening
Bust Rout 9- 9th Line	35 minutes	35 minutes	35 minutes	50 minutes
Go Transit 71 Stouffville	45-60 minutes	60 minutes	45-60 minutes	60 minutes

**Source: YRT.ca , Gotransit.ca*

5.3 Existing Pedestrian Facilities

Despite the fact that Winona Dr is providing access to many commercial landuses, there is no sidewalk provided on this street. Providing sidewalks along the Winona Dr would connect both pedestrian network on Main St and Rupert Ave as well as provide pedestrian access to the site.

As per the information from the Capital Projects Department of Town of Stouffville, a road construction project is in pipeline for Winona Dr which proposes sidewalk on the western side.

The project is in tendering stage and is expected to start soon. This will enhance the pedestrian connectivity to all properties as well as connect both Main St & Rupert Ave sidewalks.

The site plan also proposes a pedestrian connection and sidewalk on eastern side of Winona Drive so that it can provide access to the proposed site and connect to the Main St sidewalk (Refer Appendix B).

5.4 Existing Cycling Network

There are no cycling lanes or routes existing within the study area except a small stretch of delineated cycle lanes on 9th Line between Rupert Ave and Main Street. Cyclists have been using the existing sidewalk in the study area to travel via bikes. Refer to Appendix C for the York Region Cycling Map.

5.5 Existing Traffic Volume

Turning movement counts at the identified intersections were collected by Accu – Traffic Inc. on Friday July 19th, 2024 from 12:00 PM – 3:00 PM for Midday Peak Hour, and from 4:30 PM to 8:30 PM for PM Peak hour and on Saturday July 20th, 2024 from 4:30 PM – 8:30 PM which are considered to be busiest timing for the mosque.

Additionally, traffic data was collected at the intersection of 9th Line & Main St on 17th and 18th January 2025 for the same peak periods to assess the traffic impact and the capacity of that intersection as well. The 2024 volumes are factored based on 2% annual traffic growth rate to obtain the traffic volumes for base year 2025. Figure 4 presents the traffic volumes for the year 2024 and 2025.

The existing base year traffic volumes are shown in Figure 5 and are utilized in the Intersection Capacity Analysis. The existing traffic volume data also provides heavy vehicle percentages which are utilized in the Synchro simulation. Refer Appendix E for the Existing 2025 Condition Peak Hour traffic volume data.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

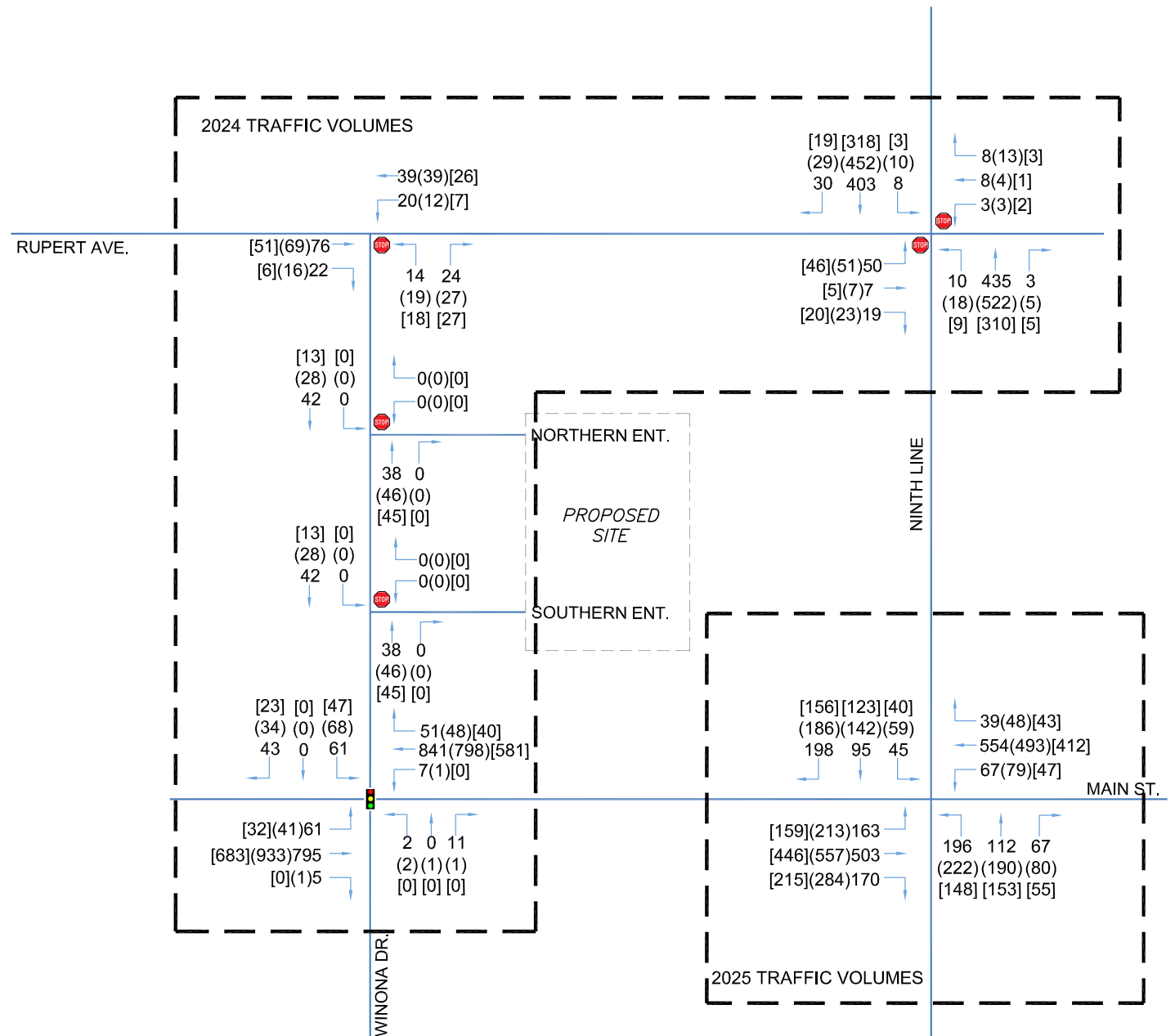


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**2024 & 2025 PEAK HOUR
TRAFFIC VOLUMES**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

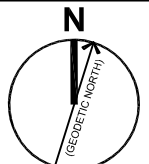
22-71

DATE: 25 NOVEMBER 2025

SCALE: NTS

DRAWING NO.:

FIG-4



PROJECT NORTH

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

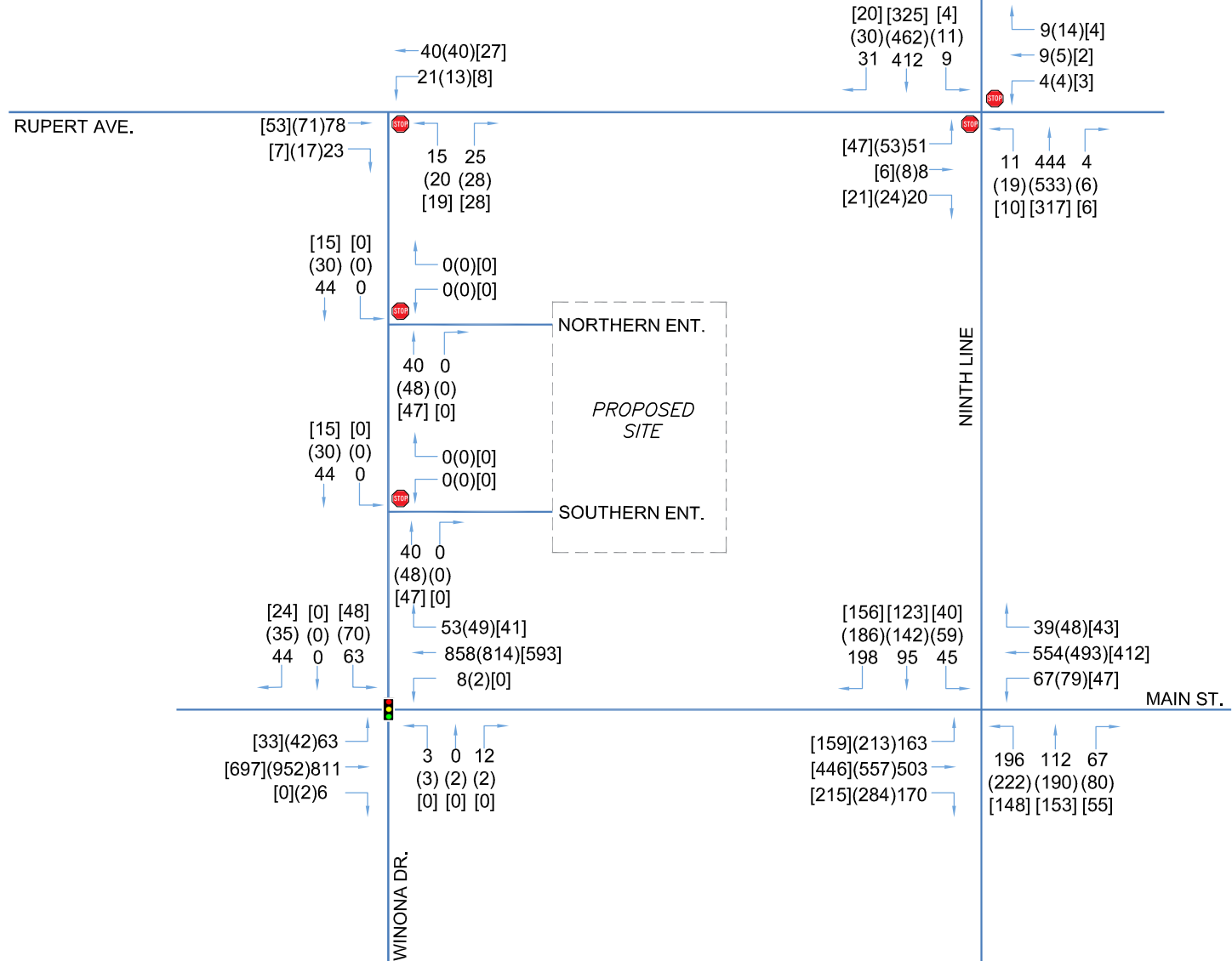


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**EXISTING 2025 CONDITION
PEAK HOUR TRAFFIC
VOLUMES**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

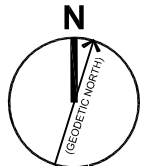
22-71

DATE: 25 NOVEMBER 2025

SCALE: NTS

DRAWING NO.:

FIG-5



5.6 Existing 2025 Condition Pedestrian Mode Performance

The Existing 2025 condition Level of Service results for Pedestrian Mode outputted based on criteria provided in York Region guidelines for segments and intersections are shown in Table 6.

Table 6 - Existing 2025 Condition Pedestrian Mode LOS

Intersection	Direction	Description	(LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	9 th Line	A	A
	Southbound		B	B
Main St & Winona Dr	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	Winona Dr	F	F
	Southbound		F	F
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		F	F
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		F	F
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound		B	B
	Northbound	Winona Dr	F	F
	Southbound		F	F
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound		B	F
	Northbound	9th Line	A	A
	Southbound		B	B

The Pedestrian LOS target of C or better for the segment and signalized intersections of 9th Line and Winona Dr at Main St are met. However, the Winona Dr Segment LOS is level F due to lack of pedestrian sidewalk. Similarly the segment LOS for Rupert Ave meets the requirement but the intersection LOS is not met as there is no delineated cross walk at the mentioned sections for the pedestrian to cross.

5.7 Existing 2024 Condition Bicycle Mode Performance

The Existing 2025 condition Level of Service results for Bicycle Mode outputted from Synchro at the intersections and based on criteria provided in York Region guidelines for segments are shown below in Table 7.

Table 7 - Existing 2025 Condition Bicycle Mode Level of Service

Intersection	Direction	Description	Level of Service (LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	9 th Line	D	D
	Southbound	9 th Line	D	D
Main St & Winona Dr	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	9th Line	D	D
	Southbound	9th Line	D	D

The Bicycle LOS target of C or better for the segment at Main St and signalized intersection is achieved. However, the LOS of unsignalized intersection for Bicycle mode is not met as there are no cycling facilities provided.

5.8 Existing 2025 Condition Transit Mode Performance

The existing 2025 Transit Level of Service has been calculated based on the given parameters in the Transportation Mobility Guidelines for York Region and the capacity analysis for the lane utilized by transit service. Table 8 shows the Transit LOS for existing condition. Detailed information has been provided in the Appendix F.

Table 8 - Existing 2025 Condition Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	C	C	C	A	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

The results of the analysis indicate that the intersections approach lanes can accommodate the available transit service at LOS C which meets the guideline's target. However, the transit frequency is low as both York region buses and Go Transit buses headway is more than 30 minutes. The same service frequency (Headway) has been assumed for future background and future total conditions.

5.9 Existing 2025 Condition Intersection Capacity Analysis

The Synchro analysis results under the Existing 2025 condition are summarized in Table 9 for the Signalized and Unsignalized intersections, respectively.

The Intersection Capacity analysis was performed using Synchro 11, incorporating Highway Capacity Manual (HCM 2000) methodology. The Synchro parameters were inputted with reference to *TIS Guidelines for Development Applications* from the York Region. The signal timing plans were obtained from the York Region for the signalized intersections of 9th Line and Winona Dr at Main St. The signal timing report from Synchro and signal timing plan are both provided in Appendix G. The detailed Existing 2025 Condition automobile Synchro analysis reports are provided in Appendix H.

Table 9 - Existing 2025 Condition Intersection Capacity Analysis

Intersection	Turning Movement	Friday Midday Peak Hour				Friday PM Peak Hour				SAT PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	
9th Line & Main St	Overall		C	33.3			C	30.1			C	29.6		
	EBL	0.61	C	28.6	71.6	0.64	C	25.3	73.6	0.45	C	22.3	68.8	35.0
	EBT	0.87	D	49.5	123.3	0.84	D	41.0	121.1	0.77	D	39.4	105.1	
	EBR	0.14	C	27.9	23.0	0.22	C	24.2	45.4	0.15	C	26.5	26.0	
	WBL	0.41	C	29.4	38.5	0.43	C	25.5	23.5	0.21	C	26.6	18.4	50.0
	WBTR	0.57	C	34.6	68.5	0.45	C	28.0	57.1	0.47	C	33.4	50.4	
	NBL	0.33	B	18.4	40.2	0.46	C	22.5	55.1	0.27	B	18.1	34.4	100.0
	NBT	0.16	C	23.5	35.4	0.33	C	30.0	48.8	0.22	C	23.6	36.2	
	NBR	0.05	C	22.1	15.6	0.05	C	26.0	14.2	0.04	C	21.4	12.0	
	SBL	0.09	C	22.2	13.8	0.14	C	25.3	21.6	0.09	C	22.7	12.8	100.0
	STB	0.16	C	27.4	25.7	0.28	C	32.8	43.0	0.21	C	27.7	34.2	
	SBR	0.13	C	27.1	25.5	0.13	C	30.5	19.6	0.11	C	26.3	20.3	130.0
Winona Dr & Main St	Overall		A	6.8			A	6.6			A	5.1		
	EBL	0.18	A	4.3	36.2	0.11	A	3.7	26.3	0.06	A	2.3	9.5	30
	EBTR	0.33	A	4.2	73.1	0.38	A	4.4	63.7	0.26	A	2.7	18.6	
	WBL	0.02	A	3.0	7.6	0.01	A	2.9	2.1					35
	WBTR	0.37	A	4.4	45.7	0.35	A	4.3	49.0	0.24	A	2.7	35.9	
	NBLTR	0.01	D	39.1	10.8	0.03	D	39.6	7.0					
	SBLTR	0.52	D	44.2	31.4	0.52	D	44.9	26.4	0.45	D	50	23.3	
Southern Site Ent & Winona Dr	WBLR	0.00	A	0.0		0.00	A	0.0		0.00	A	0.0		
	SBLT	0.00		0.0		0.00		0.0		0.00		0.0		
Northern Site Ent & Winona Dr	WBLR	0.00	A	0.0		0.00	A	0.0		0.00	A	0.0		
	SBLT	0.00		0.0		0.00		0.0		0.00		0.0		
Rupert Ave & Winona Dr	WBLT	0.02	A	2.7	3.3	0.01	A	1.9	3.2	0.01	A	1.8	3.2	
	NBLR	0.05	A	9.3	13.5	0.06	A	9.2	12.3	0.05	A	9	12.1	
9th Line & Rupert Ave	EBLTR	0.19	B	14.8	18.5	0.23	C	16.8	20.5	0.14	B	12.4	16.2	
	WBLTR	0.05	B	13.0	13.3	0.05	B	13.4	11.7	0.02	B	11.2	11.4	
	NBL	0.01	A	8.7	8.6	0.02	A	8.5	9.5	0.01	A	8.0	4.1	50
	SBL	0.01	A	8.4	3.1	0.01	A	8.7	5.0	0.00	A	8.0		

As per the overall analysis, the intersections are expected to operate with acceptable LOS C or better for both Friday Midday, Friday PM Peak and Saturday PM Peak hours with residual capacity at all movements for Existing 2025 condition. Some critical movements are observed in the operational analysis which are highlighted in the table and explained below:

Intersection of Main St & 9th Line

- The 95th percentile queue length of EBL movement exceeds the available storage length.
- The v/c ratio at EBT movement is exceeding the Region's threshold value at Friday Midday peak hour. Similarly the 95th percentile queue length of EBT movement indicates that the left turning traffic is disturbed due to increased queue length on through lane.

These movements will be closely monitored for the future scenarios. All other intersections perform at LOS of D or better and there is no critical movement observed.

6 Future Background Condition

This section provides a comprehensive analysis of the future background conditions for the intersections in the study area before the proposed development is built.

6.1 Corridor Growth

n Engineering Inc. decided to hire Accu – Traffic Inc. to acquire the most recent traffic counts at the specified intersections. According to the review of Traffic Impact Studies conducted in this area, most of the background development studies considered a 2% annual growth rate for the future projections. Therefore, in this study, the annual traffic growth rate of 2% has been considered for the estimation of future traffic.

The expected build out year of the proposed development is assumed as 2027, therefore, monitoring development traffic was considered for full build out year 2027, 2032, 2037 five year and 10 years after occupancy.

6.2 Background Development

The staffs at the Town of Whitchurch-Stouffville have informed n Engineering Inc. about future proposed developments in the vicinity. The Stouffville Development Activity map provided details on 12 future developments within a one-kilometre radius of the subject site. Below is the list of background development sites:

- 180 Mostar St & 35 Innovator Ave
- 185-195 Mostar St
- 33 Weldon St
- 338 Elm Rd, 124 Fairview & 340 Glad Park Ave
- 5676 Main St
- 5827 Main St
- 5917 Main St
- 5945 Main St
- 5964 Main St & 28 Fairview
- 5991 Main St
- 6052 Main St
- NW of 9th Line & Elm Rd

For the purpose of this study, developments that are already built have been excluded from the study as their traffic is captured during the traffic count. A field visit was conducted by n Engineering and the following sites were found already constructed and occupied:

- 180 Mostar St & 35 Innovator Ave
- 6052 Main St
- 5917 Main St

All background developments have been assumed to take occupancy before or until the year 2027. The trips of background developments were obtained from their respective TIS reports. Refer Appendix I for the Excerpts of TIS reports.

The trips of each future background development that had limited intersections have been routed to other study intersections and distributed based on existing/anticipated travel patterns and with the use of engineering judgement to determine possible routing from surrounding population and employment land use areas.

Refer to Appendix I for figures depicting trip assignments for all background developments to convey how trips are assigned through all study intersections.

Figure 6 below shows the locations of the future background developments in the vicinity of the subject site.

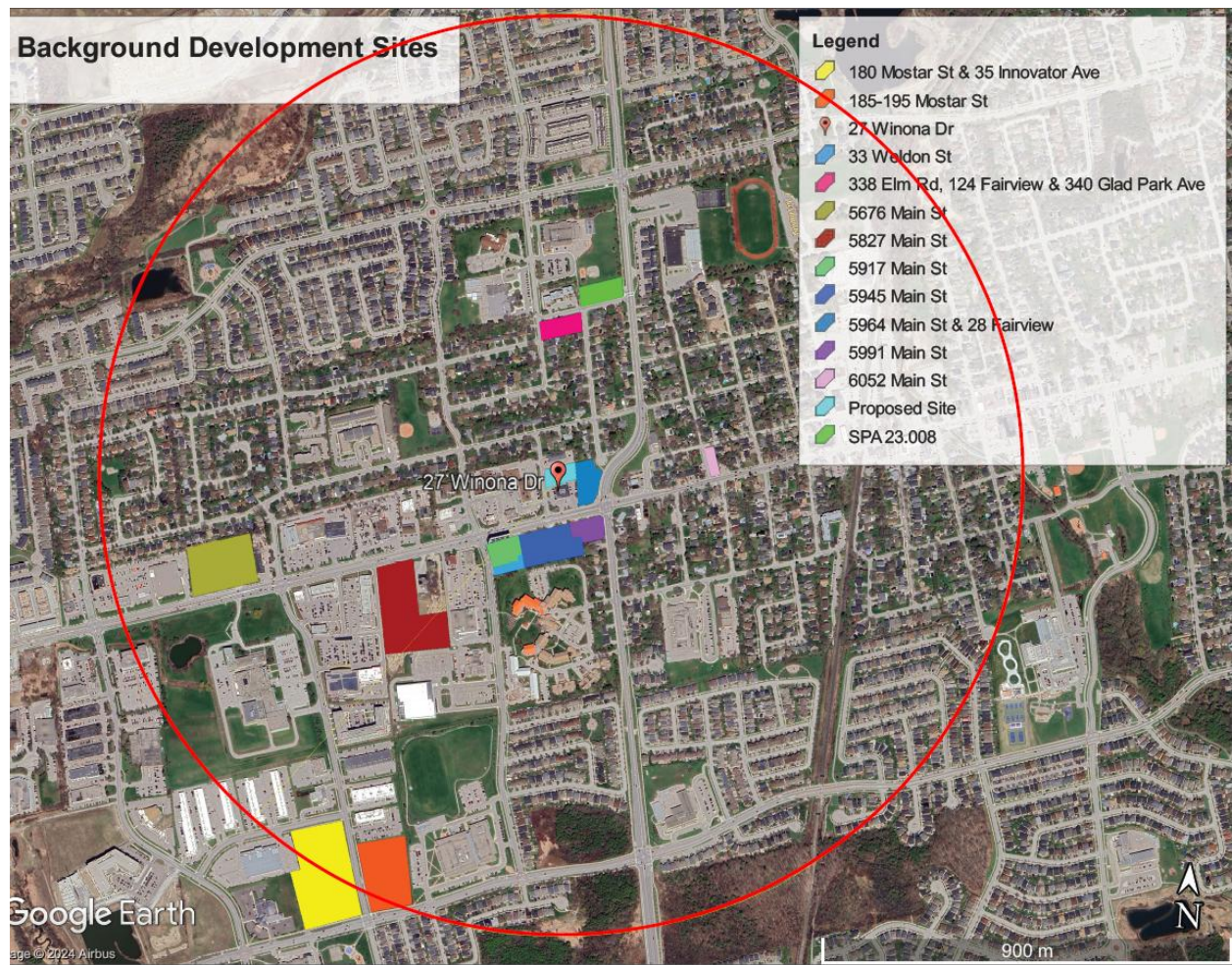


Figure 6 - Future Background Developments Map

Figure 7 below shows the total trips generated from all future background developments distributed through the study area intersections. Refer Appendix J for the individual background development TMC diagram.

6.3 Future Background 2027

The traffic volumes of the Future Background 2027 were generated by applying the growth rate to the Existing Conditions volumes. Similarly the trips generated by all future background developments have also been combined with the expanded traffic volumes and used for analysis of intersection's capacity for Future Background 2027 condition. The Future Background 2027 Condition Peak Hour Traffic Volumes are shown in Figure 7.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

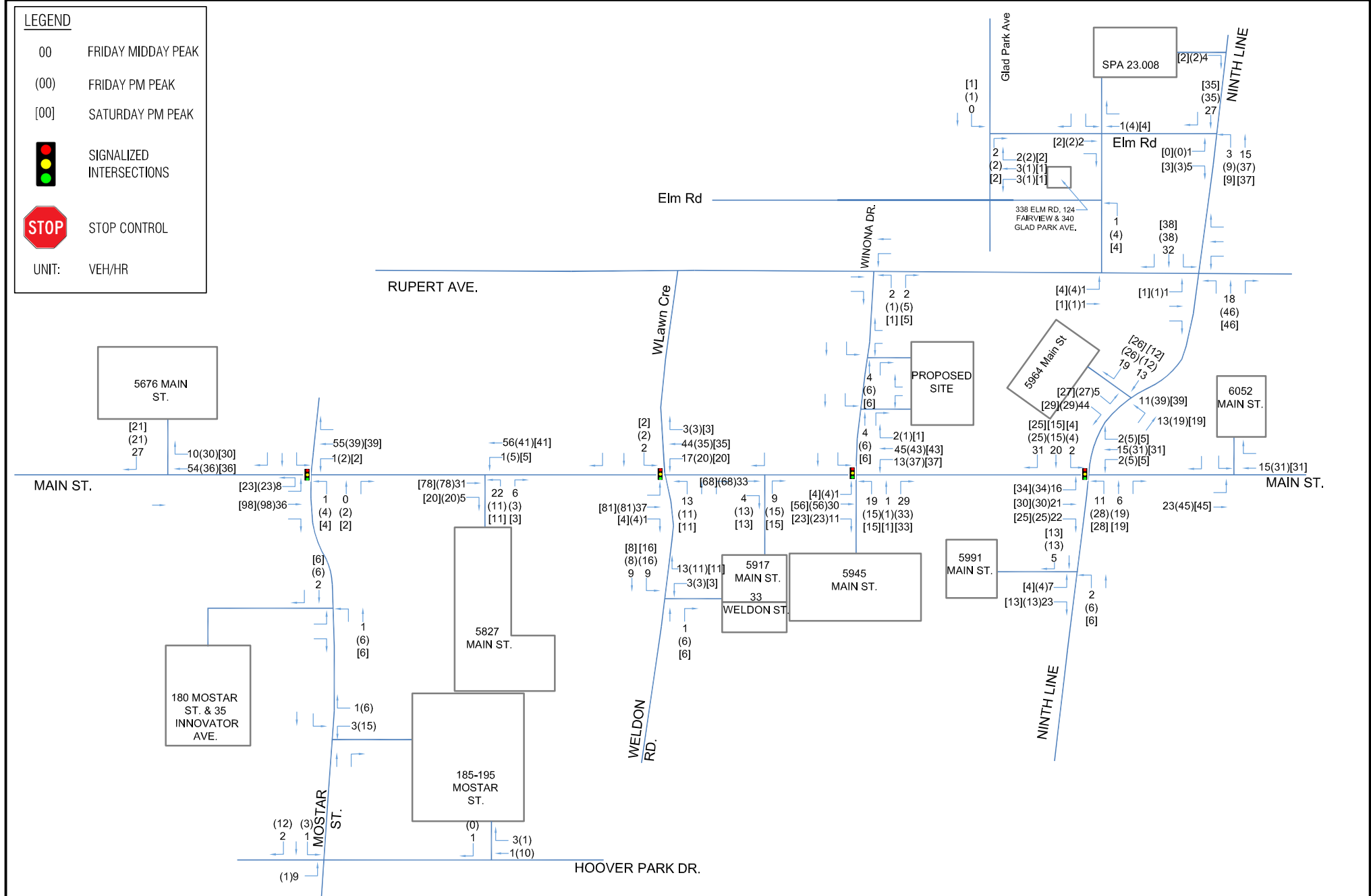


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**BACKGROUND
DEVELOPMENT TRIPS**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

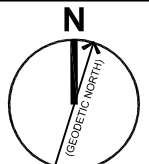
22-71

DATE: 25 NOVEMBER 2025

SCALE: NTS

DRAWING NO.:

FIG-7



PROJECT NORTH

UNIT: VEH/HR



6.4 Future Background 2027 Condition Pedestrian Mode Performance

The Future Background 2027 condition Level of Service results for Pedestrian Mode outputted based on criteria provided in York Region guidelines for segments and intersections are shown below in Table 10.

Table 10 - Future Background 2027 Condition Pedestrian Mode LOS

Intersection	Direction	Description	(LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	9 th Line	A	A
	Southbound		B	B
Main St & Winona Dr	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	Winona Dr	F	C
	Southbound		B	B
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		B	B
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		B	B
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound		B	B
	Northbound	Winona Dr	F	F
	Southbound		B	B
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound		B	C
	Northbound	9th Line	A	A
	Southbound		B	B

The Pedestrian LOS target of C or better for the segment and signalized intersection of Winona Dr at Main St are met and the Winona Dr Segment LOS on southbound also improved as a result of Capital Project construction. Similarly the segment LOS for Rupert Ave meets the requirement but the intersection LOS is not met as there is no delineated cross walk at the mentioned sections for the pedestrian to cross.

6.5 Future Background 2027 Bicycle Mode Performance

The Future Background 2027 condition Level of Service results for Bicycle Mode outputted from Synchro for the intersections and based on criteria provided in York Region guidelines for segments are shown below in Table 11.

Table 11 - Future Background 2027 Bicycle Mode for AM & PM Peak Hours

Intersection	Direction	Description	Level Of Service (LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	9 th Line	D	D
	Southbound	9 th Line	D	D
Main St & Winona Dr	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	9th Line	D	D
	Southbound	9th Line	D	D

The Bicycle LOS target of C or better for the segment at Main St and signalized intersection is achieved. However, the LOS of unsignalized intersection for Bicycle mode is not met as there are no cycling facilities provided.

6.6 Future Background 2027 Transit Mode Performance

The Future Background 2027 Transit Level of Service has been calculated based on the given parameters in the Transportation Mobility Guidelines for York Region and the capacity analysis for the lane utilized by transit service. Table 12 shows the Transit LOS for Future Background 2027 condition. Detailed information has been provided in the Appendix F.

Table 12 Future Background 2027 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI P M	SAT PM	FRI Midday	FRI P M	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	C	B	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

The results of the analysis indicate that the intersections can accommodate the available transit service at LOS D for westbound transit lane while all other lanes meet the guideline's target. However, the transit frequency is low as both York region buses and Go Transit buses headway is more than 30 minutes which results in a LOS F.

6.7 Future Background 2027 Condition Intersection Capacity Analysis

The Synchro analysis results under the Future Background 2027 condition are summarized in Table 13 for the Signalized and Unsignalized intersections, respectively.

The Intersection Capacity analysis was performed using Synchro 11, incorporating Highway Capacity Manual (HCM 2000) methodology. The Synchro parameters were inputted with reference to *TIS Guidelines for Land Development Applications* from York Region. The signal timing plans were obtained from the York Region for the signalized intersections of 9th Line and Winona Dr at Main St. The signal timing reports from Synchro and signal timing plans are both provided in Appendix G. The detailed Future Background Automobile Synchro reports are provided in Appendix H.

Table 13 - Future Background 2027 Condition Intersection Capacity Analysis

Intersection	Turning Movement	Friday Midday Peak Hour				Friday PM Peak Hour				SAT PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	
9th Line & Main St	Overall		D	36.5			C	34.9			C	31.2		
	EBL	0.74	D	37.5	72.3	0.81	D	39.1	72.0	0.58	C	24.3	73.1	35.0
	EBT	0.93	E	59.4	123.3	0.93	D	53.8	123.2	0.83	D	43.6	125.7	
	EBR	0.18	C	28.4	58.4	0.28	C	25.6	41.8	0.20	C	26.8	45.0	
	WBL	0.50	C	31.5	25.4	0.52	C	27.7	30.5	0.28	C	27.5	23.8	50.0
	WBTR	0.61	D	35.3	71.2	0.49	C	28.3	65.5	0.52	C	34.0	54.7	
	NBL	0.38	B	19.1	45.0	0.57	C	25.3	62.0	0.35	B	19.4	37.3	100.0
	NBT	0.18	C	24.1	25.4	0.39	C	32.1	56.9	0.28	C	26.2	45.5	
	NBR	0.05	C	22.4	14.3	0.06	C	27.1	21.3	0.04	C	23.2	14.9	
	SBL	0.10	C	22.7	14.6	0.17	C	26.3	21.6	0.10	C	22.8	15.5	100.0
	STB	0.20	C	28.5	30.8	0.33	C	34.6	45.5	0.25	C	29.4	35.9	
	SBR	0.16	C	28.0	27.7	0.15	C	31.8	27.4	0.13	C	27.7	26.8	130.0
Winona Dr & Main St	Overall	-	A	7.7			A	7.5			A	6.1	-	
	EBL	0.21	A	5.0	51.4	0.14	A	4.2	69.8	0.07	A	2.5	12.0	30
	EBTR	0.36	A	4.6	99.3	0.43	A	5.0	151.2	0.31	A	3.1	25.5	
	WBL	0.06	A	3.5	10.4	0.13	A	4.3	23.8	0.08	A	2.6	15.4	35
	WBTR	0.41	A	4.9	57.5	0.38	A	4.7	66.7	0.27	A	2.9	40.6	
	NBLTR	0.17	D	38.7	23.3	0.14	D	38.6	19.0	0.15	D	44.1	16.6	
	SBLTR	0.51	D	42.5	32.2	0.52	D	42.6	35.3	0.45	D	47.2	32.7	
Southern Site Ent & Winona Dr	WBLR	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	
	SBLT	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	
Northern Site Ent & Winona Dr	WBLR	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	
	SBLT	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	
Rupert Ave & Winona Dr	WBLT	0.02	A	2.6	4.8	0.01	A	1.8	2.3	0.01	A	1.7	2.3	
	NBLR	0.05	A	9.3	12.6	0.07	A	9.2	14.1	0.06	A	9.0	12.6	
9th Line & Rupert Ave	EBLTR	0.22	C	15.9	19.3	0.27	C	18.8	22.4	0.16	B	13.3	14.3	
	WBLTR	0.05	B	13.5	14.0	0.06	B	14.3	12.2	0.02	B	11.8	5.8	
	NBL	0.01	A	8.8	6.0	0.02	A	8.7	9.7	0.01	A	8.2	4.9	50
	SBL	0.01	A	8.5	4.5	0.01	A	9.1	6.1	0.00	A	8.1	3.8	

As per the overall analysis, the intersections are expected to operate with acceptable LOS C or better for both Friday Midday, Friday PM Peak and Saturday PM Peak hours with residual capacity at all movements for Future Background 2027 condition. Some critical movements are observed in the operational analysis which are highlighted in the table and explained below:

Intersection of Main St & 9th Line

- The 95th percentile queue length of EBL movement further worsened and continues to exceed the available storage length.
- The LOS and v/c ratio at EBT movement is further worsened and continues to exceed the Region's threshold value at Friday Midday and PM peak hours. Similarly the 95th percentile queue length of EBT movement indicates that the left turning traffic is disturbed due to increased queue length on through lane.

Intersection of Main St & Winona Dr

- The 95th percentile queue length of EBL movement exceeds the available storage length at both Friday Midday and PM peak hours.

Comparing FB 2027 with EX 2025 condition scenario, it is observed that the background traffic has affected the capacity of signalized intersections. These movements will be closely monitored for the future scenarios.

All other unsignalized intersections perform at LOS of D or better and there is no critical movement observed.

6.8 Future Background 2032

The traffic volumes of the Future Background 2032 were generated by applying the growth rate to the Existing Condition volumes and adding the trips generated by background developments. The Future Background 2032 Condition TMC diagram is shown in Figure 9.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

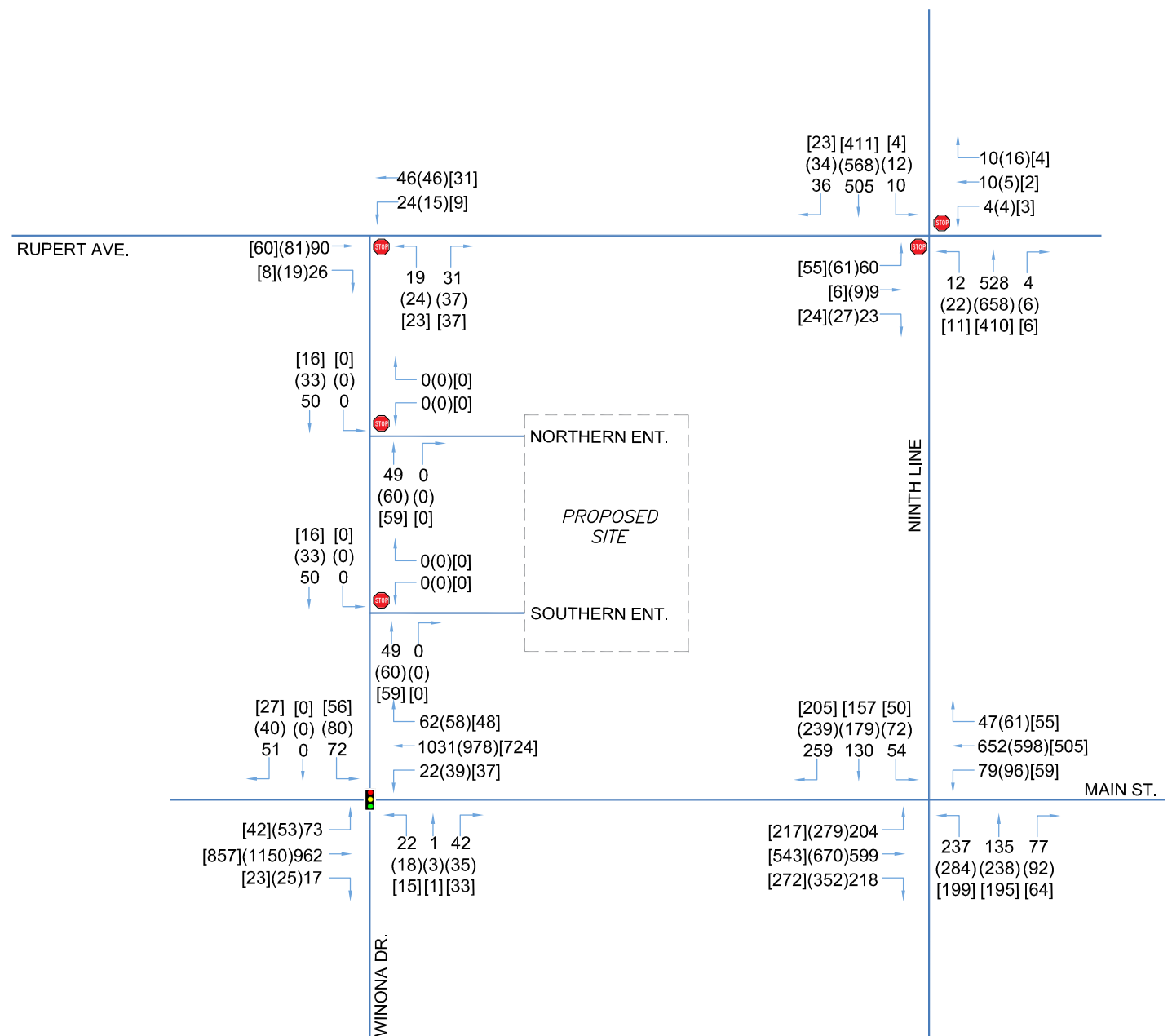


SIGNALIZED INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**FUTURE BACKGROUND
2032 CONDITION PEAK
HOUR TRAFFIC VOLUMES**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

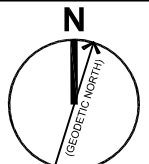
22-71

DATE: 25 NOVEMBER 2025

SCALE: NTS

DRAWING NO.:

FIG-9



PROJECT NORTH

6.9 Future Background 2032 Condition Pedestrian Mode Performance

The Future Background 2032 condition Level of Service results for Pedestrian Mode outputted based on criteria provided by York Region guidelines are shown for segments and intersections below in Table 14.

Table 14 - Future Background 2032 Condition Pedestrian Mode LOS

Intersection	Direction	Description	(LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	9 th Line	A	A
	Southbound		B	B
Main St & Winona Dr	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	Winona Dr	F	C
	Southbound		B	B
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		B	B
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		B	B
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound		B	B
	Northbound	Winona Dr	F	F
	Southbound		B	B
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound		B	C
	Northbound	9th Line	A	A
	Southbound		B	B

The Pedestrian LOS target of C or better for the segment and signalized intersection of Winona Dr at Main St are met and the Winona Dr Segment LOS on southbound also improved as a result of Capital Project construction. Similarly the segment LOS for Rupert Ave meets the requirement but the intersection LOS is not met as there is no delineated cross walk at the mentioned sections for the pedestrian to cross.

6.10 Future Background 2032 Bicycle Mode Performance

The Future Background 2032 Condition Level of Service results for Bicycle Mode outputted based on criteria provided by York Region guidelines are shown for segments and intersections in Table 15.

Table 15 - Future Background 2032 Condition Bicycle Mode LOS

Intersection	Direction	Description	Level of Service (LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	9 th Line	D	D
	Southbound	9 th Line	D	D
Main St & Winona Dr	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	9th Line	D	D
	Southbound	9th Line	D	D

The Bicycle LOS target of C or better for the segment at Main St and signalized intersection is achieved. However, the LOS of unsignalized intersection for Bicycle mode is not met as there are no cycling facilities provided.

6.11 Future Background 2032 Condition Transit Mode Performance

The Future Background 2032 Transit Level of Service has been calculated based on the given parameters in the Transportation Mobility Guidelines for York Region and the capacity analysis for the lane utilized by transit service. Table 16 shows the Transit LOS for Future Background 2032 condition. Detailed information has been provided in the Appendix F.

Table 16 Future Background 2032 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	C	B	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

The results of the analysis indicate that the intersections can accommodate the available transit service at LOS D for westbound transit lane while all other lanes meet the guideline's target. However, the transit frequency is low as both York region buses and Go Transit buses headway is more than 30 minutes which results in a LOS F.

6.12 Future Background 2032 Condition Intersection Capacity Analysis

The Future Background 2032 Condition Intersection Capacity analysis for the Friday Midday, Friday PM Peak and Saturday PM Peak Hours are summarized in Table 17 for both Signalized and Unsignalized intersections, respectively.

The Intersection Capacity analysis was performed using Synchro 11, incorporating Highway Capacity Manual (HCM 2000) methodology. The Synchro parameters were inputted with reference to *TIS Guidelines for Land Development Applications* from York Region. The signal timing plans were obtained from the York Region for the signalized intersections of 9th Line and Winona Dr at Main St. The signal timing report from Synchro and signal timing plan are both provided in Appendix G. The detailed Future Background 2032 condition Synchro capacity analysis reports are provided in Appendix H.

Table 17 - Future Background 2032 Condition Intersection Capacity Analysis

Intersection	Turning Movement	Friday Midday Peak Hour				Friday PM Peak Hour				SAT PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	
9th Line & Main St	Overall		D	44.4			D	39.6			C	33.9		
	EBL	0.90	E	62.8	73.9	0.92	E	58.0	74.9	0.67	C	27.4	72.8	35.0
	EBT	1.03	F	83.1	125.3	0.98	E	62.5	110.7	0.90	D	52.1	124.3	
	EBR	0.22	C	28.9	51.4	0.33	C	25.6	64.6	0.24	C	27.4	32.8	
	WBL	0.55	C	34.3	41.2	0.57	C	31.0	28.7	0.36	C	29.0	22.6	50.0
	WBTR	0.67	D	36.9	89.3	0.51	C	28.1	71.2	0.56	C	34.8	59.7	
	NBL	0.43	B	19.4	50.5	0.68	C	31.2	72.3	0.40	C	20.2	40.2	100.0
	NBT	0.20	C	24.4	39.1	0.45	D	35.3	62.7	0.30	C	27.1	46.1	
	NBR	0.05	C	22.6	16.8	0.06	C	29.0	17.8	0.04	C	23.6	15.6	
	SBL	0.11	C	22.7	17.3	0.20	C	27.9	27.9	0.11	C	23.3	19.4	100.0
	STB	0.22	C	28.8	37.8	0.38	D	37.3	55.1	0.28	C	30.4	39.5	
	SBR	0.20	C	28.6	42.7	0.17	C	33.9	29.6	0.14	C	28.4	27.4	130.0
Winona Dr & Main St	Overall		A	8.2	-	-	A	8.0	-	-	A	6.2	-	
	EBL	0.27	A	6.2	64.2	0.18	A	4.9	72.9	0.09	A	2.7	14.5	30
	EBTR	0.40	A	5.1	170.3	0.48	A	5.6	190.3	0.34	A	3.3	25.5	
	WBL	0.07	A	3.8	27.4	0.16	A	4.9	27.2	0.09	A	2.8	14.8	35
	WBTR	0.45	A	5.4	82.1	0.43	A	5.2	72.2	0.29	A	3.1	43.5	
	NBLTR	0.16	D	38.3	24.9	0.14	D	38.2	21.4	0.15	D	43.6	15.2	
	SBLTR	0.55	D	43.2	34.2	0.56	D	43.6	35.9	0.50	D	47.6	30.2	
Southern Site Ent & Winona Dr	WBLR	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	
	SBLT	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	
Northern Site Ent & Winona Dr	WBLR	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	
	SBLT	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	
Rupert Ave & Winona Dr	WBLT	0.02	A	2.7	6.7	0.01	A	1.9	-	0.01	A	1.7	3.3	
	NBLR	0.06	A	9.5	13.6	0.07	A	9.3	13.0	0.07	A	9.1	12.0	
9th Line & Rupert Ave	EBLTR	0.26	C	17.6	20.6	0.33	C	21.7	23.9	0.19	B	14.1	18.2	
	WBLTR	0.06	B	14.3	14.9	0.07	C	15.3	13.5	0.02	B	12.2	9.5	
	NBL	0.01	A	9.0	6.8	0.03	A	8.9	10.0	0.01	A	8.3	7.3	50
	SBL	0.01	A	8.7	5.4	0.02	A	9.4	6.9	0.00	A	8.3	3.8	

As per the overall analysis, the intersections are expected to operate with acceptable LOS D or better for both Friday Midday, Friday PM Peak and Saturday PM Peak hours with residual capacity at all movements for Future Background 2032 condition. The critical movements

observed in the operational analysis have further worsened which are highlighted in the table and explained below:

Intersection of Main St & 9th Line

- The LOS and v/c ratio of EBL movement worsens and exceeds the threshold value for both Friday MIDDAY and PM Peak hours.
- The 95th percentile queue length of EBL movement further worsened and continues to exceed the available storage length.
- The LOS and v/c ratios at EBT movements are further worsened and continue to exceed the Region's threshold value at Friday MIDDAY and PM peak hours. Similarly the 95th percentile queue length of EBT movement indicates that the left turning traffic is disturbed due to increased queue length on through lane.

Intersection of Main St & Winona Dr

- The 95th percentile queue length of EBL movement exceeds the available storage length at both Friday MIDDAY and PM peak hours.

Comparing FB 2027 with FB 2032 condition scenario, it is observed that the increment of background traffic has further affected the capacity of signalized intersections. These movements will be closely monitored for the future scenarios.

All other unsignalized intersections perform at LOS of D or better and there is no critical movement observed.

6.13 Future Background 2037

The traffic volumes of the Future Background 2037 were generated by applying the growth rate to the Existing Condition volumes and adding the trips generated by background developments. The Future Background 2037 Condition TMC diagram is shown in Figure 10.

00	FRIDAY MIDDAY PEAK
(00)	FRIDAY PM PEAK
[00]	SATURDAY PM PEAK

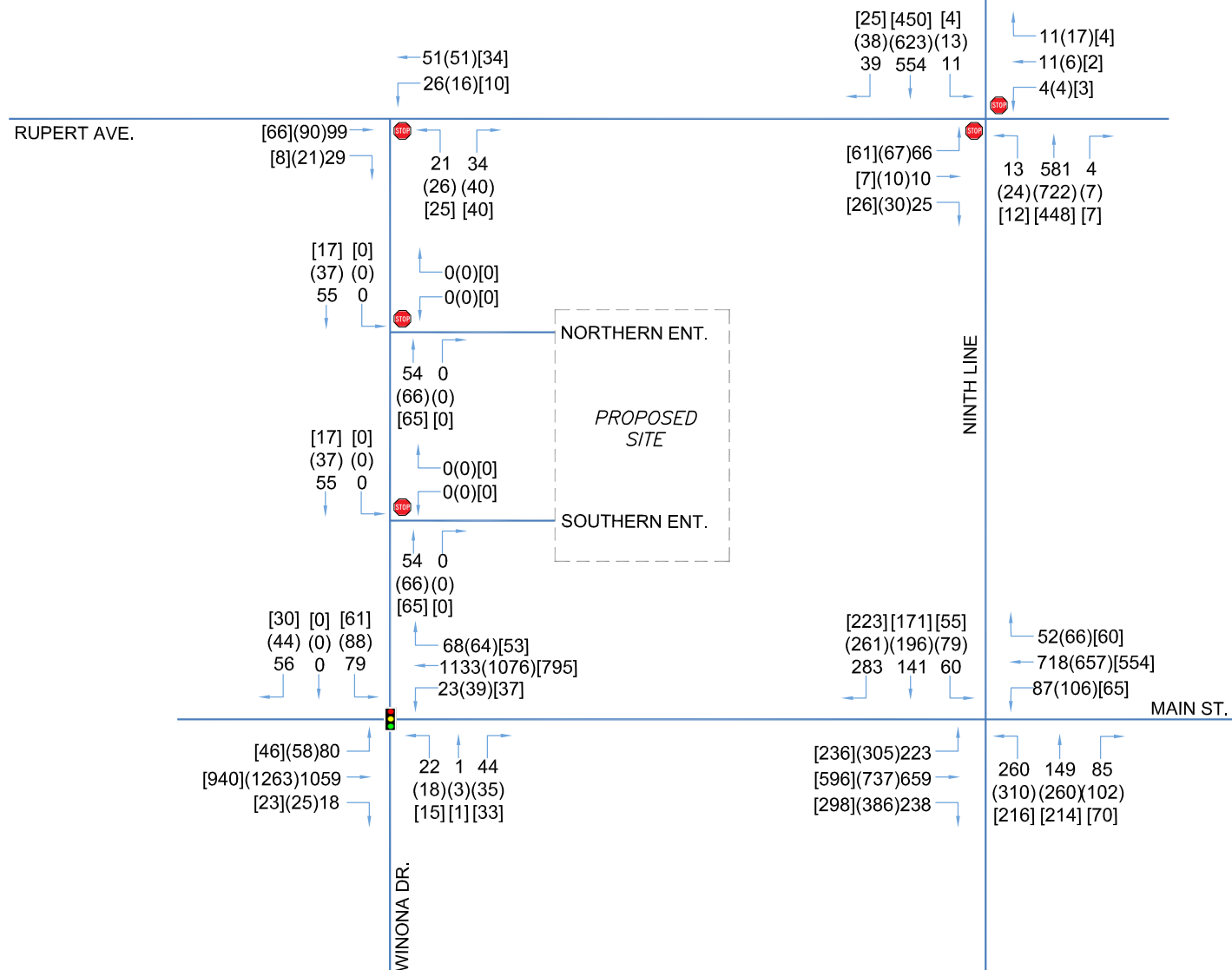


SIGNALIZED INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



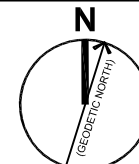
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**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

FUTURE BACKGROUND 2037 CONDITION PEAK HOUR TRAFFIC VOLUMES

22-71

FIG-10



PROJECT NORTH

6.14 Future Background 2037 Condition Pedestrian Mode Performance

The Future Background 2037 condition Level of Service results for Pedestrian Mode outputted based on criteria provided by York Region guidelines for the intersections and segments are shown in Table 18.

Table 18 - Future Background 2037 Condition Pedestrian Mode LOS

Intersection	Direction	Description	(LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	9 th Line	A	A
	Southbound		B	B
Main St & Winona Dr	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	Winona Dr	F	C
	Southbound		B	B
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		B	B
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		B	B
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound		B	B
	Northbound	Winona Dr	F	F
	Southbound		B	B
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound		B	C
	Northbound	9th Line	A	A
	Southbound		B	B

The Pedestrian LOS target of C or better for the segment and signalized intersection of Winona Dr at Main St are met and the Winona Dr Segment LOS on southbound also improved as a result of Capital Project construction. Similarly the segment LOS for Rupert Ave meets the requirement but the intersection LOS is not met as there is no delineated cross walk at the mentioned sections for the pedestrian to cross.

6.15 Future Background 2037 Bicycle Mode Performance

The Future Background 2037 Condition Level of Service results for Bicycle Mode outputted from Synchro for the intersection and for segments based on criteria provided by York Region guidelines are shown below in Table 19.

Table 19 - Future Background 2037 Condition Bicycle Mode LOS

Intersection	Direction	Description	Level of Service (LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	9 th Line	D	D
	Southbound	9 th Line	D	D
Main St & Winona Dr	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	9th Line	D	D
	Southbound	9th Line	D	D

The Bicycle LOS target of C or better for the segment at Main St and signalized intersection is achieved. However, the LOS of unsignalized intersection for Bicycle mode is not met as there are no cycling facilities provided.

6.16 Future Background 2037 Condition Transit Mode Performance

The Future Background 2037 Transit Level of Service has been calculated based on the given parameters in the Transportation Mobility Guidelines for York Region and the capacity analysis for the lane utilized by transit service. Table 20 shows the Transit LOS for Future Background 2037 condition. Detailed information has been provided in the Appendix F.

Table 20 Future Background 2037 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	D	C	A	B
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	D	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

The results of the analysis indicate that the intersections can accommodate the available transit service at LOS D for westbound transit lane while all other lanes meet the guideline's target. However, the transit frequency is low as both York region buses and Go Transit buses headway is more than 30 minutes which results in a LOS F.

6.17 Future Background 2037 Condition Intersection Capacity Analysis

The Future Background 2037 Condition Intersection Capacity analysis for the Friday Midday, Friday PM Peak and Saturday PM Peak Hours are summarized in Table 21 for both Signalized and Unsignalized intersections, respectively.

The Intersection Capacity analysis was performed using Synchro 11, incorporating Highway Capacity Manual (HCM 2000) methodology. The Synchro parameters were inputted with reference to *TIS Guidelines for Land Development Applications* from York Region. The signal timing plans were obtained from the York Region for the signalized intersections of 9th Line and Winona Dr at Main St. The signal timing report from Synchro and signal timing plan are both provided in Appendix G. The detailed Future Background 2037 condition Synchro capacity analysis reports are provided in Appendix H.

Table 21 - Future Background 2037 Condition Intersection Capacity Analysis

Signalized Intersection	Turning Movement	Friday Midday Peak Hour				Friday PM Peak Hour				SAT PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	
9th Line & Main St	Overall		E	60.5			D	50.4			D	39.3		
	EBL	1.09	F	119.2	76.9	1.09	F	108.3	74.9	0.78	C	34.3	75.3	35.0
	EBT	1.17	F	132.4	115.5	1.06	F	85.9	123.5	0.99	E	71.6	127.1	
	EBR	0.27	C	30.5	50.8	0.38	C	26.2	72.8	0.29	C	28.1	51.4	
	WBL	0.54	C	32.4	61.9	0.64	C	34.8	45.4	0.42	C	30.8	21.6	50.0
	WBTR	0.73	D	38.7	86.8	0.56	C	28.7	76.7	0.61	D	36.0	67.5	
	NBL	0.48	C	20.2	59.4	0.77	D	38.0	70.2	0.45	C	20.7	50.8	100.0
	NBT	0.22	C	25.1	36.0	0.50	D	37.2	69.0	0.33	C	27.9	48.8	
	NBR	0.06	C	23.0	19.7	0.07	C	29.9	22.5	0.05	C	23.9	17.9	
	SBL	0.13	C	23.2	19.4	0.24	C	28.4	19.3	0.13	C	23.5	19.5	100.0
	STB	0.24	C	29.6	40.2	0.42	D	38.5	46.7	0.31	C	31.0	41.4	
	SBR	0.27	C	30.3	44.4	0.27	D	36.0	43.8	0.15	C	28.8	32.8	130.0
Winona Dr & Main St	Overall	-	A	8.9	-	-	A	8.7	-	-	A	6.5	-	
	EBL	0.35	A	8.50	70.9	0.23	A	6.0	67.0	0.11	A	3.0	34.2	30
	EBTR	0.45	A	5.7	190.4	0.53	A	6.4	198.5	0.37	A	3.6	116.9	
	WBL	0.08	A	4.20	14.6	0.19	A	5.8	17.4	0.10	A	3.0	15.3	35
	WBTR	0.51	A	6.2	95.4	0.47	A	5.9	79.4	0.33	A	3.4	45.3	
	NBLTR	0.15	D	37.7	29.0	0.13	D	37.6	25.0	0.14	D	43.1	18.9	
	SBLTR	0.59	D	44.2	40.8	0.59	D	44.6	40.4	0.55	D	49.3	33.8	
Southern Site Ent & Winona Dr	WBLR	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	
	SBLT	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	
Northern Site Ent & Winona Dr	WBLR	0.00	A	0.0	0.0	0.00	A	0.0	0.0	0.00	A	0.0	0.0	
	SBLT	0.00	-	0.0	0.0	0.00	-	0.0	0.0	0.00	-	0.0	0.0	
Rupert Ave & Winona Dr	WBLT	0.02	A	2.6	4.8	0.01	A	1.8	2.2	0.01	A	1.7	-	
	NBLR	0.07	A	9.6	13.3	0.08	A	9.5	12.4	0.07	A	9.2	12.5	
9th Line & Rupert Ave	EBLTR	0.31	C	19.9	22.2	0.42	D	26.7	28.5	0.22	C	15.1	19.8	
	WBLTR	0.07	C	15.3	14.9	0.09	C	16.9	12.3	0.02	B	12.6	7.4	
	NBL	0.02	A	9.3	11.5	0.03	A	9.2	10.0	0.01	A	8.4	6.3	50
	SBL	0.01	A	8.9	4.9	0.02	A	9.8	6.4	0.00	A	8.4	4.3	

As per the overall analysis, the intersections are expected to operate with acceptable LOS D or better for both Friday Midday, Friday PM Peak and Saturday PM Peak hours with residual capacity at all movements for Future Background 2037 condition. The critical movements observed in the operational analysis have further worsened which are highlighted in the table and explained below:

Intersection of Main St & 9th Line

- The overall LOS worsened to E
- The LOS and v/c ratio of EBL movement continue to worsen beyond the road capacity and exceeds the threshold values for both Friday Midday and PM Peak hours.
- The 95th percentile queue length of EBL movement further worsened and continues to exceed the available storage length.
- The LOS and v/c ratios at EBT movements are further worsened and continue to exceed the Region's threshold value at Friday Midday, PM peak hours and Saturday PM Peak hour. Similarly the 95th percentile queue length of EBT movement indicates that the left turning traffic is disturbed due to increased queue length on through lane.

Intersection of Main St & Winona Dr

- The 95th percentile queue length of EBL movement exceeds the available storage length at both Friday Midday and PM peak hours.

Comparing FB 2037 with FB 2032 condition scenario, it is observed that the increment of background traffic has further affected the capacity of signalized intersections. These movements will be closely monitored for the future scenarios.

All other unsignalized intersections perform at LOS of D or better and there is no critical movement observed.

7 Trip Generation

Multiple approaches were used to determine the site generated trips. The trip generation rates from ITE Trip Generation Manual provides trip rates for Friday AM and PM peak while there was no trip rate for Midday and Saturday peak hours. The following steps were carried out to estimate the generated trips of the subject area:

- **Trip Rates by ITE Manual:** the Landuse Code 562 provides trip rates for Friday AM and PM peak hour of generator 9.54 and 23.55 respectively. The PM peak hour of generator rate is used to estimate the Friday's Midday peak hour trips as it is considered the busiest time of the mosque.

Similarly, for PM peak hour the trip rate for the peak hour of adjacent street traffic was considered to estimate the Friday's and Saturday's PM Peak hour trips.

- **Trips Rates Based on Place of Worship Policy, City of Brampton:** The City of Brampton has conducted research on places of worship and has provided recommended trip rates

based of the Mosque's Gross Floor Area and Designated Worship Area for AM, Midday and PM peak hours. These rates have been applied to the respective factors to estimate the generated trips.

Table 22 below shows the estimated trips generated by proposed development based on all three trip rates and average values which are considered for intersection capacity analysis. Refer Appendix J for the ITE Manual and Brampton City Policy Excerpts.

Table 22 – Estimated Trips Generated by Proposed Development

Trip Rate Reference	Friday Midday Peak k Hour			Friday PM Peak Hour			Saturday PM Peak Hour		
	Average rate*	IN	OUT	Average rate**	IN	OUT	Average rate**	IN	OUT
Based on ITE Mosque (LUC 562)									
22858 ft²	23.55	43%	57%	4.22	50%	50%	4.22	50%	50%
(A) Trips	539	232	307	97	49	49	97	49	49
Based on Brampton City Policy (Trips/ Total GFA)	Average rate\$	IN	OUT	Average rate\$	IN	OUT	Average rate\$	IN	OUT
Gross Floor Area (22858 ft²)	19.45	74%	26%	3.62	52%	48%	3.62	52%	48%
(B) Trips	445	329	116	83	43	40	83	43	40
Based on Brampton City Policy (Trips/ Designated Worship Area)	Average rate#	IN	OUT	Average rate#	IN	OUT	Average rate #	IN	OUT
(Worship Area) 7320 ft²	44.08	74%	26%	6.83	52%	48%	6.83	52%	48%
(C) Trips	323	239	84	50	26	24	50	26	24
Average of A+B+C Total Site Generated Trips	436	267	169	77	39	37	77	39	37

* (ITE) Friday Peak Hour of Generator

** (ITE) Peak Hour of Adjacent Street Traffic

\$ Peak Hour Trips based on Total Gross Floor Area

Peak Hour Trips based on Designated Worship Area

It is important to note that the trips estimated using the ITE peak-hour generation rates and the GFA-based policy method result in comparatively high values for the Friday midday peak hour. However, given that the Muslim population in the Town of Stouffville is relatively small (approximately 150 families, as reported by the Darul-Khair website), the likelihood of reaching full-capacity demand in the near future is low.

Furthermore, the parking survey conducted at the existing Darul-Khair Mosque in Stouffville observed a total of 110 congregants across both Friday prayer sessions.

Therefore, the average of the three estimation methods was considered as the total trips generated by this site and applied in the capacity analysis, which remains a conservative and robust approach.

7.1 Trip Distribution and Assignment

Trip distribution of site generated traffic was based on the orientation of the site with respect to road network; existing traffic volumes split percentages; and travel patterns. As the Worship purpose trips are usually short distance and local trips, the Transportation Tomorrow Survey results and intercity trips were not used for the trip distribution. Table 23 below shows the percent of trips based on the direction of travel for AM and PM peak hours.

Table 23 - Trip Distribution for AM & PM Peak Hours

Direction of Travel	FRI Midday		FRI PM		SAT PM	
	IN	OUT	IN	OUT	IN	OUT
Eastbound on Main St	35%	26%	36%	26%	36%	28%
Westbound on Main St	27%	37%	23%	31%	25%	31%
Northbound on 9th Line	15%	21%	18%	22%	18%	18%
Southbound on 9th Line	18%	14%	18%	19%	17%	20%
Eastbound on Rupert Ave	4%	1%	3%	1%	3%	1%
Westbound on Rupert Ave	1%	2%	1%	2%	0%	2%
Total	100%	100%	100%	100%	100%	100%

Table 24 below shows the number of trips assigned in the all directions entering and exiting the proposed site development.

Table 24 - Trip Assignment for AM & PM Peak Hours

Direction of Travel	FRI Midday		FRI PM		SAT PM	
	IN	OUT	IN	OUT	IN	OUT
Eastbound on Main St	93	43	14	9	14	10
Westbound on Main St	72	62	9	12	10	12
Northbound on 9th Line	41	35	7	8	7	7
Southbound on 9th Line	48	23	7	7	7	7
Eastbound on Rupert Ave	11	2	1	0	1	0
Westbound on Rupert Ave	2	4	0	1	0	1
Total	267	169	39	37	39	37

The site generated trips are distributed and shown in Figure 11.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

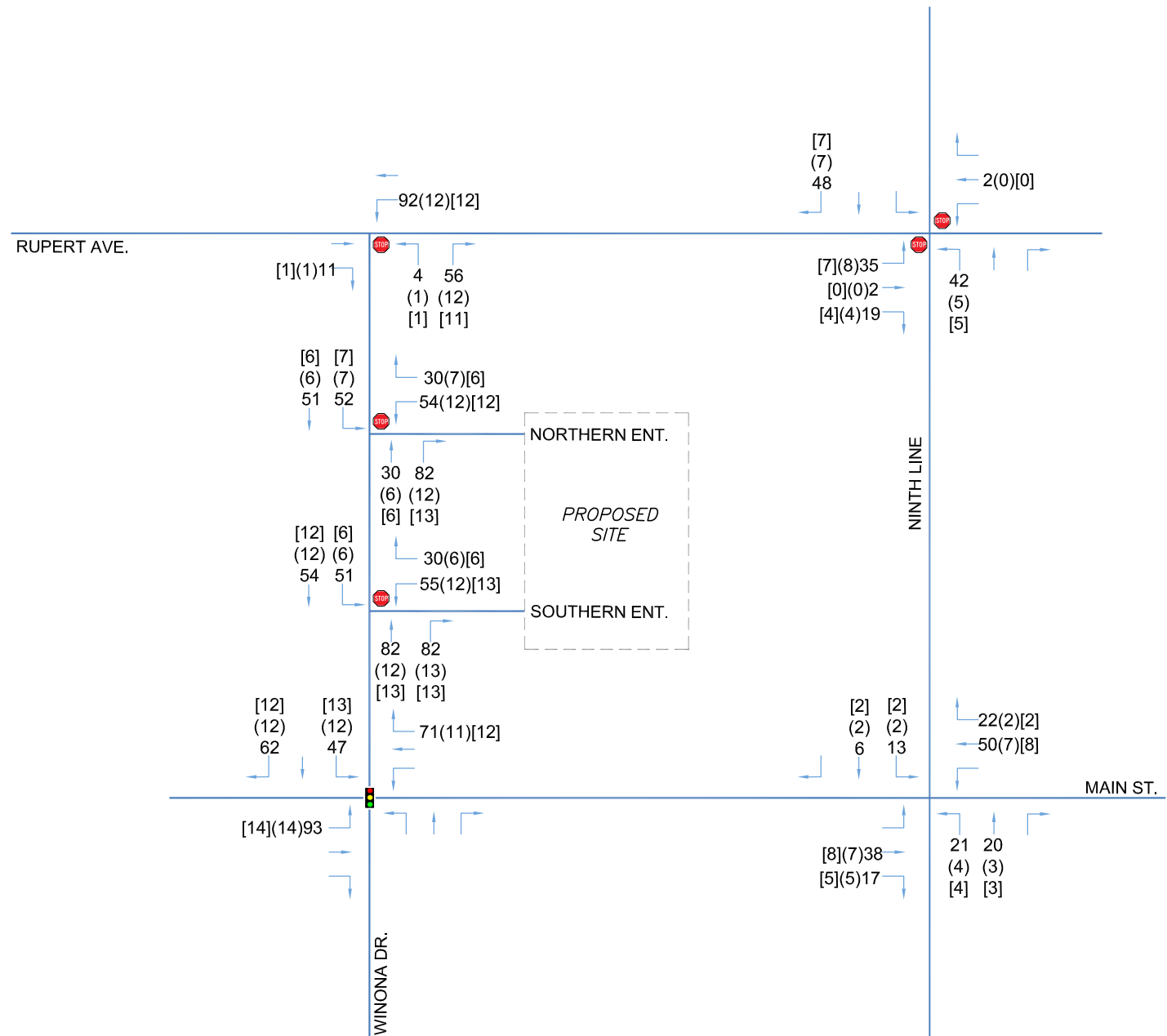


SIGNALIZED INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**TRIPS GENERATED BY
PROPOSED DEVELOPMENT**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

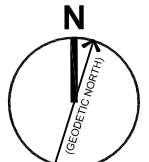
22-71

DATE: 25 NOVEMBER 2025

SCALE: NTS

DRAWING NO.:

FIG-11



PROJECT NORTH

8 Future Total Condition

This section provides a comprehensive analysis of the future total conditions for the intersections in the site area after the proposed development is built out and takes occupancy. The impact on the traffic in the area due to the development is analyzed.

8.1 Future Total 2027

The Future Total traffic volumes for 2027 were generated by adding the site generated trips to the Future Background 2027 traffic volumes. The sum of this produces the Future Total traffic volumes as shown in Figure 12.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

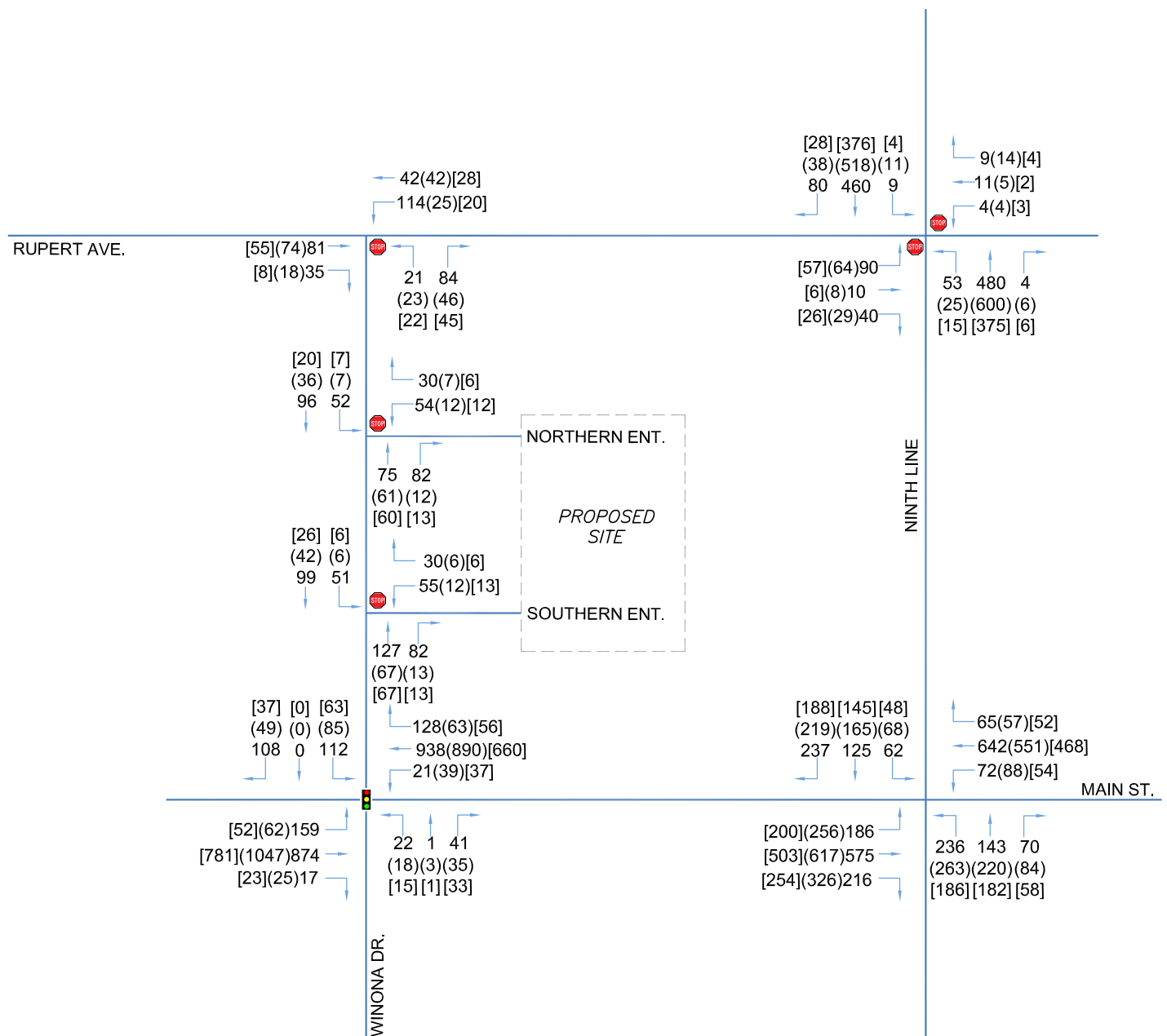


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**FUTURE TOTAL 2027
CONDITION PEAK HOUR
TRAFFIC VOLUMES**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

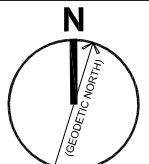
22-71

DATE: 25 NOVEMBER 2025

SCALE: NTS

DRAWING NO.:

FIG-12



PROJECT NORTH

8.2 Future Total 2027 Condition Pedestrian Mode Performance

The Future Total 2027 condition Level of Service results for Pedestrian Mode outputted based on criteria provided by York Region guidelines for segments and intersections are shown below in Table 25.

Table 25 - Future Total 2027 Condition Pedestrian Mode LOS

Intersection	Direction	Description	Level of Service (LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	9 th Line	A	A
	Southbound		B	B
Main St & Winona Dr	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	Winona Dr	F	C
	Southbound		B	B
Southern Site Ent & Winona Dr	Northbound	Winona Dr	B	B
	Southbound		B	B
Northern Site Ent & Winona Dr	Northbound	Winona Dr	B	B
	Southbound		B	B
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound		B	B
	Northbound	Winona Dr	B	B
	Southbound		B	B
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound		B	C
	Northbound	9th Line	A	A
	Southbound		B	B

The Pedestrian LOS target of C or better for the segment and signalized intersections of 9th Line and Winona Dr at Main St are met. Similarly the segment and intersection LOS for Winona Dr at the site entrances and segments are also well improved as a result of road improvement and proposed sidewalks on both side of the road.

8.3 Future Total 2027 Bicycle Mode Performance

The Future Total 2027 Condition Level of Service results for Bicycle Mode outputted based on criteria provided by York Region guidelines for segments and intersections are shown below in Table 26.

Table 26 - Future Total 2027 Condition Bicycle Mode LOS

Intersection	Direction	Description	Level of Service (LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	9 th Line	D	D
	Southbound	9 th Line	D	D
Main St & Winona Dr	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	9th Line	D	D
	Southbound	9th Line	D	D

The Bicycle LOS target of C or better for the segment at Main St and signalized intersection is achieved. However, the LOS of unsignalized intersection for Bicycle mode is not met as there are no cycling facilities provided.

8.4 Future Total 2027 Condition Transit Mode Performance

The Future Total 2027 Transit Level of Service has been calculated based on the given parameters in the Transportation Mobility Guidelines for York Region and the capacity analysis for the lane utilized by transit service. Table 27 shows the Transit LOS for Future Total 2027 condition. Detailed information has been provided in the Appendix F.

Table 27 Future Total 2027 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	C	B	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

The results of the analysis indicate that the intersections can accommodate the available transit service at LOS D or Better which meets the guideline's target. However, the transit frequency is low as both York region buses and Go Transit buses headway is more than 30 minutes which results in a LOS F.

8.5 Future Total 2027 Condition Intersection Capacity Analysis

The Future Total 2027 Condition Intersection Capacity analysis for the Friday Midday, Friday PM Peak and Saturday PM Peak Hours are summarized in Table 28 for both Signalized and Unsignalized intersections, respectively.

The Intersection Capacity analysis was performed using Synchro 11, incorporating Highway Capacity Manual (HCM 2000) methodology. The Synchro parameters were inputted with reference to *TIS Guidelines for Land Development Applications* from York Region. The signal timing plans were obtained from the York Region for the signalized intersections of 9th Line and Winona Dr at Main St. The signal timing reports from Synchro and signal timing plans are both provided in Appendix G. The detailed Future Total 2027 condition Synchro capacity analysis reports are provided in Appendix H.

Table 28 - Future Total 2027 Condition Intersection Capacity Analysis

Signalized Intersection	Turning Movement	Friday Midday Peak Hour				Friday PM Peak Hour				SAT PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	
9th Line & Main St	Overall		D	40.6			D	35.3			C	31.6		
	EBL	0.83	D	49.0	73.9	0.82	D	39.8	73.7	0.59	C	24.6	74.5	35.0
	EBT	0.99	E	71.9	123.6	0.94	D	54.7	130.7	0.84	D	44.8	122.2	
	EBR	0.21	C	28.8	31.7	0.29	C	25.6	48.0	0.21	C	26.9	34.3	
	WBL	0.50	C	32.3	25.6	0.52	C	28.1	29.2	0.29	C	27.7	29.9	50.0
	WBTR	0.68	D	37.2	84.1	0.50	C	28.3	64.3	0.53	C	34.2	58.6	
	NBL	0.42	B	19.4	48.1	0.59	C	25.9	66.9	0.36	B	19.5	51.1	100.0
	NBT	0.21	C	24.7	37.9	0.40	C	32.4	59.8	0.28	C	26.3	39.8	
	NBR	0.05	C	22.6	16.9	0.06	C	27.3	18.2	0.04	C	23.2	15.2	
	SBL	0.13	C	22.7	19.3	0.18	C	26.4	23.7	0.11	C	22.9	19.8	100.0
	STB	0.21	C	28.7	38.0	0.34	C	34.9	53.4	0.26	C	29.5	37.8	
	SBR	0.16	C	28.1	34.9	0.15	C	32.0	28.9	0.13	C	27.8	23.3	130.0
Winona Dr & Main St	Overall		B	13.0			A	8.5			A	7.3		
	EBL	0.65	C	20.3	81.5	0.19	A	5.1	56.6	0.11	A	3.5	19.6	30
	EBTR	0.40	A	7.3	134.1	0.44	A	5.6	97.4	0.32	A	4.0	35.1	
	WBL	0.07	A	5.5	25.5	0.14	A	4.8	25.6	0.09	A	3.4	15.5	35
	WBTR	0.48	A	8.1	85.9	0.40	A	5.3	66.0	0.28	A	3.8	47.5	
	NBLTR	0.12	C	34.5	24.6	0.13	D	37.6	21.2	0.12	D	41.5	17.7	
	SBLTR	0.74	D	49.2	53.4	0.60	D	44.7	36.9	0.51	D	45.7	28.8	
Southern Site Ent & Winona Dr	WBLR	0.14	B	11.3	14.6	0.02	A	9.1	10.2	0.02	A	9.1	9.7	
	SBLT	0.04		2.8	7.8	0.00		1.0	3.3	0.00		1.5		
Northern Site Ent & Winona Dr	WBLR	0.13	B	10.8	14.5	0.02	A	9.0	11.3	0.02	A	9.0	11.3	
	SBLT	0.04		2.9	9.7	0.01		1.3		0.01		2.0	2.3	
Rupert Ave & Winona Dr	WBLT	0.08		5.8	10.2	0.02		2.8	2.2	0.01		3.2	4.2	
	NBLR	0.14	B	10.0	17.9	0.08	A	9.3	11.6	0.08	A	9.1	12.7	
9th Line & Rupert Ave	EBLTR	0.40	C	20.9	32.2	0.31	C	19.8	22.4	0.19	B	13.6	18.6	
	WBLTR	0.07	B	15.0	12.7	0.06	B	14.4	12.1	0.02	B	11.9	10.3	
	NBL	0.31		0.9	17.6	0.39		0.3	9.6	0.24		0.3	4.8	50
	SBL	0.35		0.1	4.4	0.36		0.2	6.0	0.26		0.1	3.1	

As per the overall analysis, the intersections are expected to operate with acceptable LOS D or better for both Friday Midday, Friday PM Peak and Saturday PM Peak hours with residual capacity at all movements for Future Total 2027 condition. The critical movements observed in the operational analysis have further worsened which are highlighted in the table and explained below:

Intersection of Main St & 9th Line

- The 95th percentile queue length of EBL movement continues to exceed the available storage length.
- The LOS and v/c ratios at EBT movements are further worsened and continue to exceed the Region's threshold value at Friday Midday, PM peak hours and Saturday PM Peak hour. Similarly the 95th percentile queues generated on Eastbound through lane indicates that the left turning traffic is disturbed due to increased queue length on through lane.

Intersection of Main St & Winona Dr

- The LOS and v/c ratio of EBL movement worsened with the increase in site traffic but remains below the threshold values for both Friday Midday and PM Peak hours.
- 95th percentile queue length exceeds the available storage length.

All other unsignalized intersections perform at LOS of D or better and there is no critical movement observed.

Comparing Future Background 2027 and Future Total 2027 scenarios, it is noticed that the intersections operations almost remain the same for both scenarios with a marginal effect on delay. No new critical movement is generated as a result of site traffic.

This means that the traffic generated by proposed development doesn't have any negative impact on the intersections and can be accommodated by the existing transportation infrastructure without improvement.

8.6 Future Total 2032

The Future Total traffic volumes for horizon year 2032 condition were generated by adding the site generated trips to the Future Background 2032 traffic volumes. The sum of this produces the Future Total traffic volumes as shown in Figure 13.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

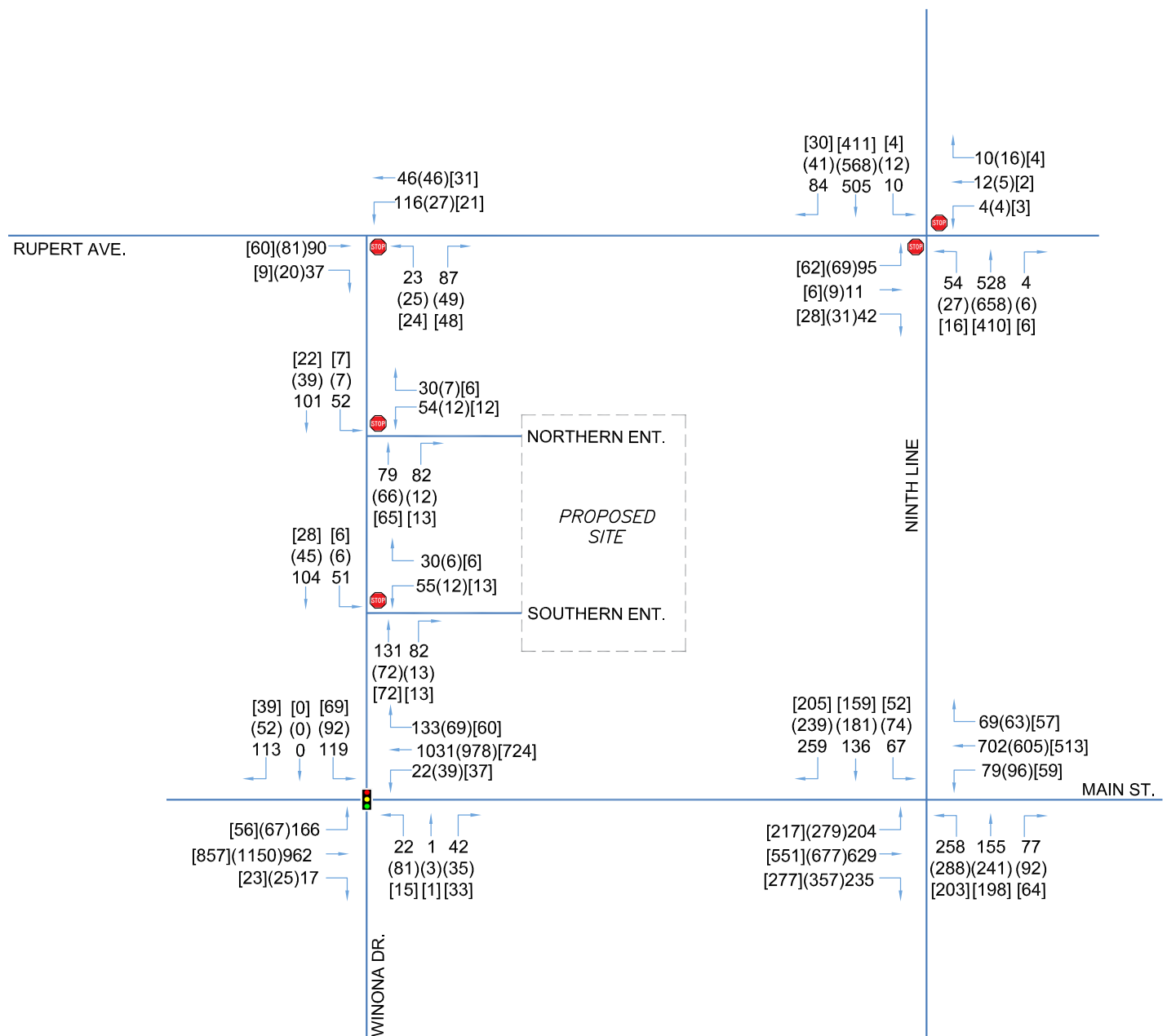


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**FUTURE TOTAL 2032
CONDITION PEAK HOUR
TRAFFIC VOLUMES**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

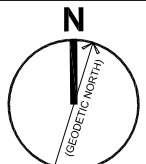
22-71

DATE: 25 NOVEMBER 2025

SCALE: NTS

DRAWING NO.:

FIG-13



8.7 Future Total 2032 Condition Pedestrian Mode Performance

The Future Total 2032 condition Level of Service results for Pedestrian Mode outputted based on criteria provided by York Region guidelines for segments and intersections are shown below in Table 29.

Table 29 - Future Total 2032 Condition Pedestrian Mode LOS

Intersection	Direction	Description	Level of Service (LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	9 th Line	A	A
	Southbound		B	B
Main St & Winona Dr	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	Winona Dr	F	C
	Southbound		B	B
Southern Site Ent & Winona Dr	Northbound	Winona Dr	B	B
	Southbound		B	B
Northern Site Ent & Winona Dr	Northbound	Winona Dr	B	B
	Southbound		B	B
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound		B	B
	Northbound	Winona Dr	B	B
	Southbound		B	B
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound		B	C
	Northbound	9th Line	A	A
	Southbound		B	B

The Pedestrian LOS target of C or better for the segment and signalized intersections of 9th Line and Winona Dr at Main St are met. Similarly the segment and intersection LOS for Winona Dr at the site entrances and segments are also well improved as a result of road improvement and proposed sidewalks on both side of the road.

8.8 Future Total 2032 Bicycle Mode Performance

The Future Total 2032 Condition Level of Service results for Bicycle Mode outputted based on criteria provided by York Region guidelines for segments and intersections are shown below in Table 30.

Table 30 - Future Total 2032 Condition Bicycle Mode LOS

Intersection	Direction	Description	Level of Service (LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	F	F
	Westbound		F	F
	Northbound	9 th Line	D	D
	Southbound		D	D
Main St & Winona Dr	Eastbound	Main St	F	F
	Westbound		F	F
	Northbound	Winona Dr	F	F
	Southbound		F	F
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		F	F
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound		F	F
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound		F	F
	Northbound	Winona Dr	F	F
	Southbound		F	F
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound		F	F
	Northbound	9th Line	D	D
	Southbound		D	D

The Bicycle LOS target of C or better for the segment at Main St and signalized intersection is achieved. However, the LOS of unsignalized intersections continues to remain same as there are no improvement measures or bicycle infrastructure proposed in the near future by Town of Stouffville.

8.9 Future Total 2032 Condition Transit Mode Performance

The Future Total 2032 Transit Level of Service has been calculated based on the given parameters in the Transportation Mobility Guidelines for York Region and the capacity analysis for the lane utilized by transit service. Table 31 shows the Transit LOS for Future Total 2032 condition. Detailed information has been provided in the Appendix F.

Table 31 Future Total 2032 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	C	C	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

The results of the analysis indicate that the intersections can accommodate the available transit service at LOS D or Better which meets the guideline's target. However, the transit frequency is low as both York region buses and Go Transit buses headway is more than 30 minutes which results in a LOS F.

8.10 Future Total 2032 Condition Intersection Capacity Analysis

The Future Total 2032 Condition Intersection Capacity analysis for the Friday Midday, Friday PM Peak and Saturday PM Peak Hours are summarized in Table 32 for both Signalized and Unsignalized intersections, respectively.

The Intersection Capacity analysis was performed using Synchro 11, incorporating Highway Capacity Manual (HCM 2000) methodology. The Synchro parameters were inputted with reference to *TIS Guidelines for Land Development Applications* from York Region. The signal timing plans were obtained from the York Region for the signalized intersections of 9th Line and Winona Dr at Main St. The signal timing reports from Synchro and signal timing plans are both provided in Appendix G. The detailed Future Total 2032 condition Synchro capacity analysis reports are provided in Appendix H.

Table 32 - Future Total 2032 Condition Intersection Capacity Analysis

Signalized Intersection	Turning Movement	Friday Midday Peak Hour				Friday PM Peak Hour				SAT PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	
9th Line & Main St			D	50.9			D	40.3			C	34.5		
	EBL	1.01	F	95.9	74.2	0.93	E	59.8	74.2	0.68	C	27.9	75.5	35.0
	EBT	1.08	F	100.1	111.5	0.98	E	64.0	118.9	0.92	D	54.2	121.6	
	EBR	0.25	C	29.3	45.0	0.33	C	25.6	53.2	0.25	C	27.4	35.4	
	WBL	0.55	C	34.3	59.2	0.58	C	31.3	48.6	0.38	C	29.3	23.0	50.0
	WBTR	0.74	D	39.1	92.3	0.52	C	28.1	78.9	0.57	D	35.0	65.1	
	NBL	0.47	B	19.8	53.0	0.69	C	32.3	72.6	0.41	C	20.3	53.4	100.0
	NBT	0.23	C	25.1	36.3	0.45	D	35.7	64.3	0.31	C	27.3	44.9	
	NBR	0.05	C	22.8	17.9	0.06	C	29.3	16.6	0.04	C	23.7	15.8	
	SBL	0.14	C	22.8	22.7	0.21	C	28.1	29.5	0.12	C	23.3	19.6	100.0
	STB	0.23	C	29.1	42.9	0.38	D	37.5	46.5	0.28	C	30.5	43.5	
	SBR	0.22	C	29.0	35.2	0.18	C	34.2	31.3	0.14	C	28.5	28.2	130.0
Winona Dr & Main St	Overall		B	14.6			A	9.0			A	7.6		
	EBL	0.80	D	36.1	96.6	0.23	A	6.2	67.3	0.13	A	3.8	34.4	30
	EBTR	0.44	A	8.1	182.7	0.49	A	6.3	187.7	0.35	A	4.4	48.3	
	WBL	0.08	A	6.1	34.5	0.16	A	5.4	32.1	0.10	A	3.6	15.2	35
	WBTR	0.53	A	9.1	101.1	0.44	A	5.9	80.4	0.31	A	4.2	52.9	
	NBLTR	0.12	C	34.0	23.1	0.13	D	37.2	23.2	0.11	D	41.0	18.3	
	SBLTR	0.76	D	49.7	55.8	0.63	D	45.6	40.3	0.54	D	46.5	35.7	
Southern Site Ent & Winona Dr	WBLR	0.14	B	11.4	17.2	0.02	A	9.2	10.7	0.02	A	9.1	10.6	
	SBLT	0.04		2.8	9.3	0.00		1.0	3.3	0.00		1.4	3.3	
Northern Site Ent & Winona Dr	WBLR	0.13	B	10.9	15.5	0.02	A	9.1	11.4	0.02	A	9.0	11.3	
	SBLT	0.04		2.8	11.3	0.01		1.2	4.0	0.01		1.9	2.3	
Rupert Ave & Winona Dr	WBLT	0.09		5.7	8.9	0.02		2.8	6.4	0.01		3.0	4.1	
	NBLR	0.15	B	10.2	15.7	0.09	A	9.5	13.4	0.08	A	9.2	13.8	
9th Line & Rupert Ave	EBLTR	0.47	C	24.3	37.0	0.38	C	23.2	28.4	0.21	B	14.5	19.3	
	WBLTR	0.08	C	15.9	16.0	0.07	C	15.4	13.3	0.02	B	12.3	8.3	
	NBL	0.34		0.9	19.9	0.42		0.3	9.5	0.27		0.3	7.8	50
	SBL	0.38		0.1	7.0	0.39		0.2	6.7	0.28		0.1	3.0	

As per the overall analysis, the intersections are expected to operate with acceptable overall LOS D or better for both Friday Midday, Friday PM Peak and Saturday PM Peak hours with residual capacity at all movements for Future Total 2032 condition. The critical movements observed in the operational analysis have further worsened which are highlighted in the table and explained below:

Intersection of Main St & 9th Line

- The LOS and v/c ratio of EBL movement continue to worsen beyond the road capacity and exceeds the threshold values for both Friday Midday and PM Peak hours.
- The 95th percentile queue length of EBL movement further worsened and continues to exceed the available storage length.
- The LOS and v/c ratios at EBT movements are further worsened and continue to exceed the Region's threshold value at Friday Midday, PM peak hours and Saturday PM Peak hour. Similarly the 95th percentile queue length of EBT movement indicates that the left turning traffic is disturbed due to increased queue length on through lane.

Intersection of Main St & Winona Dr

- The LOS and v/c ratio of EBL movement continue to worsen but remains below the threshold values for both Friday Midday and PM Peak hours.
- 95th percentile queue length exceeds the available storage length.

All other unsignalized intersections perform at LOS of D or better and there is no critical movement observed.

When comparing Future Background 2032 and Future Total 2032 scenarios, it is noticed that the intersections operations almost remain the same for both scenarios with a marginal effect on delay and v/c ratio. No new critical movement is generated as a result of site traffic.

This means that the traffic generated by proposed development doesn't have any negative impact on the intersections and can be accommodated by the existing transportation infrastructure without improvement.

8.11 Future Total 2037

The Future Total traffic volumes for 2037 were generated by adding the site generated trips to the Future Total 2037 traffic volumes. The sum of this produces the Future Total traffic volumes as shown in Figure 14.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

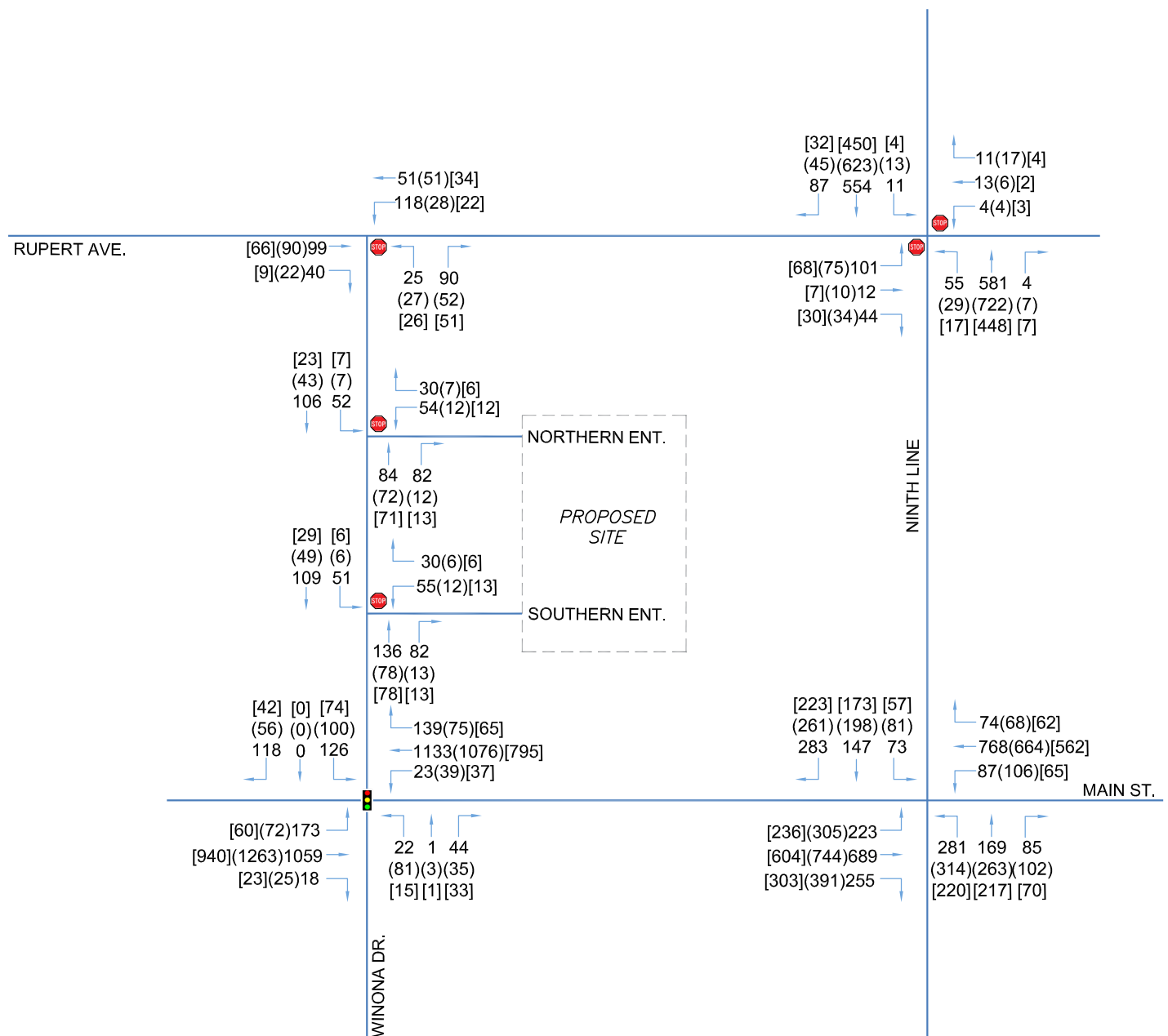


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416-258-9741
E: info@nengineering.com
www.nengineering.com

PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**FUTURE TOTAL 2037
CONDITION PEAK HOUR
TRAFFIC VOLUMES**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

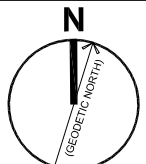
22-71

DATE: 25 NOVEMBER 2025

SCALE: NTS

DRAWING NO.:

FIG-14



8.12 Future Total 2037 Condition Pedestrian Mode Performance

The Future Total 2037 condition Level of Service results for Pedestrian Mode outputted based on criteria provided by York Region guidelines for segments and intersections are shown below in Table 33.

Table 33 - Future Total 2037 Condition Pedestrian Mode LOS

Intersection	Direction	Description	Level of Service (LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	9 th Line	A	A
	Southbound		B	B
Main St & Winona Dr	Eastbound	Main St	C	C
	Westbound		C	C
	Northbound	Winona Dr	F	C
	Southbound		B	B
Southern Site Ent & Winona Dr	Northbound	Winona Dr	B	B
	Southbound		B	B
Northern Site Ent & Winona Dr	Northbound	Winona Dr	B	B
	Southbound		B	B
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound		B	B
	Northbound	Winona Dr	B	B
	Southbound		B	B
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound		B	C
	Northbound	9th Line	A	A
	Southbound		B	B

The Pedestrian LOS target of C or better for the segment and signalized intersections of 9th Line and Winona Dr at Main St are met. Similarly the segment and intersection LOS for Winona Dr at the site entrances and segments are also well improved as a result of road improvement and proposed sidewalks on both side of the road.

8.13 Future Total 2037 Bicycle Mode Performance

The Future Total 2037 Condition Level of Service results for Bicycle Mode outputted from based on criteria provided by York Region guidelines for segments and intersections are shown below in Table 34.

Table 34 - Future Total 2037 Condition Bicycle Mode LOS

Intersection	Direction	Description	(LOS)	
			Segment	Intersection
Maint St & 9 th Line	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	9 th Line	D	D
	Southbound	9 th Line	D	D
Main St & Winona Dr	Eastbound	Main St	F	F
	Westbound	Main St	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Southern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Northern Site Ent & Winona Dr	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
Rupert Ave & Winona Dr	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	Winona Dr	F	F
	Southbound	Winona Dr	F	F
9th Line & Rupert Ave	Eastbound	Rupert Ave	F	F
	Westbound	Rupert Ave	F	F
	Northbound	9th Line	D	D
	Southbound	9th Line	D	D

The Bicycle LOS target of C or better for the segment at Main St and signalized intersection is achieved. However, the LOS of unsignalized intersections continues to remain same as there are no improvement measures or bicycle infrastructure proposed in the near future by Town of Stouffville.

8.14 Future Total 2037 Condition Transit Mode Performance

The Future Total 2037 Transit Level of Service has been calculated based on the given parameters in the Transportation Mobility Guidelines for York Region and the capacity analysis for the lane utilized by transit service. Table 35 shows the Transit LOS for Future Total 2036 condition. Detailed information has been provided in the Appendix F.

Table 35 Future Total 2037 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	D	C	A	B
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	D	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	B	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

The results of the analysis indicate that the intersections can accommodate the available transit service at LOS D or Better which meets the guideline's target. However, the transit frequency is low as both York region buses and Go Transit buses headway is more than 30 minutes which results in a LOS F.

8.15 Future Total 2037 Condition Intersection Capacity Analysis

The Future Total 2037 Condition Intersection Capacity analysis for the Friday Midday, Friday PM Peak and Saturday PM Peak Hours are summarized in Table 36 for both Signalized and Unsignalized intersections, respectively.

The Intersection Capacity analysis was performed using Synchro 11, incorporating Highway Capacity Manual (HCM 2000) methodology. The Synchro parameters were inputted with reference to *TIS Guidelines for Land Development Applications* from York Region. The signal timing plans were obtained from the York Region for the signalized intersections of 9th Line and Winona Dr at Main St. The signal timing report from Synchro and signal timing plan are both provided in Appendix G. The detailed Future Total 2037 condition Synchro capacity analysis reports are provided in Appendix H.

Table 36 - Future Total 2037 Condition Intersection Capacity Analysis

Signalized Intersection	Turning Movement	Friday Midday Peak Hour				Friday PM Peak Hour				SAT PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	
9th Line & Main St			E	69.1			D	51.7			D	40.3		
	EBL	1.23	F	170.1	76.1	1.11	F	113.4	72.0	0.79	D	35.3	75.7	35.0
	EBT	1.22	F	154.0	112.5	1.07	F	89.4	119.6	1.01	E	75.4	122.5	
	EBR	0.30	C	30.9	65.9	0.39	C	26.3	63.3	0.30	C	28.2	51.1	
	WBL	0.54	C	32.4	62.8	0.64	C	34.8	45.8	0.42	C	31.0	30.7	50.0
	WBTR	0.80	D	41.5	103.7	0.56	C	28.8	74.6	0.62	D	36.2	71.5	
	NBL	0.52	C	20.7	59.0	0.79	D	39.0	83.1	0.46	C	20.8	49.9	100.0
	NBT	0.25	C	25.9	40.2	0.50	D	37.4	72.1	0.34	C	28.0	48.8	
	NBR	0.06	C	23.3	16.3	0.07	C	29.9	19.9	0.05	C	24.0	17.4	
	SBL	0.15	C	23.1	19.0	0.25	C	28.5	26.1	0.13	C	23.4	19.7	100.0
	STB	0.25	C	29.8	42.2	0.42	D	38.6	61.6	0.31	C	31.1	43.6	
	SBR	0.28	C	30.5	42.9	0.27	D	36.1	42.8	0.15	C	28.8	32.1	130.0
Winona Dr & Main St	Overall		B	18.5			A	9.8			A	7.8		
	EBL	1.02	F	87.6	99.2	0.30	A	7.7	84.5	0.15	A	4.3	67.5	30
	EBTR	0.49	A	9.1	200.6	0.54	A	7.1	199.7	0.39	A	4.8	110.5	
	WBL	0.10	A	6.7	26.8	0.20	A	6.5	29.9	0.11	A	3.9	23.3	35
	WBTR	0.59	B	10.4	114.2	0.49	A	6.6	78.1	0.34	A	4.5	49.8	
	NBLTR	0.12	C	33.5	27.0	0.12	D	36.8	24.8	0.11	D	40.6	19.5	
Southern Site Ent & Winona Dr	SBLTR	0.77	D	50.4	57.4	0.66	D	47.2	49.4	0.57	D	47.3	36.6	
	WBLR	0.14	B	11.5	19.6	0.02	A	9.2	10.6	0.02	A	9.2	10.3	
Northern Site Ent & Winona Dr	SBLT	0.04		2.7	11.7	0.00		0.9	3.2	0.00		1.4		
	WBLR	0.13	B	11.0	14.8	0.02	A	9.1	12.1	0.02	A	9.1	11.0	
Rupert Ave & Winona Dr	SBLT	0.04		2.8	12.4	0.01		1.1		0.01		1.8		
	WBLT	0.09		5.6	11.7	0.02		2.7	7.4	0.02		3.0	4.7	
9th Line & Rupert Ave	NBLR	0.16	B	10.4	15.5	0.10	A	9.6	11.4	0.09	A	9.3	13.8	
	EBLTR	0.55	D	29.9	37.0	0.47	D	29.2	29.6	0.25	C	15.6	18.8	
	WBLTR	0.09	C	17.1	15.4	0.09	C	17.1	12.2	0.02	B	12.8	8.6	
	NBL	0.37		0.8	20.5	0.47		0.4	10.4	0.29		0.3	6.8	50
9th Line & Rupert Ave	SBL	0.41		0.2	4.4	0.43		0.2	7.5	0.31		0.1	3.8	

As per the overall analysis, the intersections are expected to operate with acceptable LOS D or better for both Friday Midday, Friday PM Peak and Saturday PM Peak hours with residual capacity at all movements for Future Total 2037 condition. The critical movements observed in the operational analysis have further worsened which are highlighted in the table and explained below:

Intersection of Main St & 9th Line

- The overall LOS worsened to E
- The LOS and v/c ratio of EBL movement continue to worsen beyond the road capacity and exceeds the threshold values for both Friday Midday and PM Peak hours.
- The 95th percentile queue length of EBL movement further worsened and continues to exceed the available storage length.
- The LOS and v/c ratios at EBT movements are further worsened and continue to exceed the Region's threshold value at Friday Midday, PM peak hours and Saturday PM Peak hour. Similarly the 95th percentile queue length of EBT movement indicates that the left turning traffic is disturbed due to increased queue length on through lane.

Intersection of Main St & Winona Dr

- The LOS and v/c ratios of EBL movement worsened to 1.02 and F exceeding capacity and the Region's threshold value of 0.85.
- The 95th percentile queue length of EBL movement exceeds the available storage length at Friday Midday, PM and Saturday PM peak hours.

Comparing FB 2037 with FT 2037 condition scenario, it is observed that the increment of background site traffic has further affected the capacity of signalized intersections.

All other unsignalized intersections perform at LOS of D or better and there is no critical movement observed.

When comparing Future Background 2037 and Future Total 2037 scenarios, it is noticed that the intersections operations almost remain the same for both scenarios with a marginal effect on LOS, delay and v/c ratio of the EBL critical movement at the signalized intersection of Main St & 9th Line. However, a new critical movement is observed at the intersection of Winona Dr & Main St as a result of site traffic. All other critical movements remain almost the same with very marginal impact of site generated traffic on the intersection capacity. This condition is mainly due to the background traffic and the growth rates applied to the movements.

Table 37 below shows the comparison of critical movement at different scenarios.

Table 37 – Comparison of Critical Movement at Different Scenarios

Intersection	Horizon Year	Movement	Friday Midday Peak Hour				Friday PM Peak Hour				SAT PM Peak Hour			
			V/C	LOS	Delay (s/veh)	95th Queue (m)	V/C	LOS	Delay (s/veh)	95th Queue (m)	V/C	LOS	Delay (s/veh)	95th Queue (m)
9th Line & Main St	EX 2025	EBL	0.61	C	28.6	71.6	0.64	C	25.3	73.6	0.45	C	22.3	68.8
	FB 2027		0.74	D	37.5	72.3	0.81	D	39.1	72.0	0.58	C	24.3	73.1
	FT 2027		0.83	D	49.0	73.9	0.82	D	39.8	73.7	0.59	C	24.6	74.5
	FB 2032		0.90	E	62.8	73.9	0.92	E	58.0	74.9	0.67	C	27.4	72.8
	FT 2032		1.01	F	95.9	74.2	0.93	E	59.8	74.2	0.68	C	27.9	75.5
	FB2037		1.09	F	119.2	76.9	1.09	F	108.3	74.9	0.78	C	34.3	75.3
	FT 2037		1.23	F	170.1	76.1	1.11	F	113.4	72.0	0.79	D	35.3	75.7
	EX 2025	EBT	0.87	D	49.5	123.3	0.84	D	41.0	121.1	0.77	D	39.4	105.1
	FB 2027		0.93	E	59.4	123.3	0.93	D	53.8	123.2	0.83	D	43.6	125.7
	FT 2027		0.99	E	71.9	123.6	0.94	D	54.7	130.7	0.84	D	44.8	122.2
	FB 2032		1.08	F	100.1	111.5	0.98	E	64.0	118.9	0.92	D	54.2	121.6
	FT 2032		1.10	F	106.7	114.8	0.98	E	64.3	126.5	0.92	D	54.4	123.4
	FB2037		1.17	F	132.4	115.5	1.06	F	85.9	123.5	0.99	E	71.6	127.1
	FT 2037		1.22	F	154.0	112.5	1.07	F	89.4	119.6	1.01	E	75.4	122.5
Main St & Winona Dr	EX 2025	EBT	0.18	A	4.3	36.2	0.11	A	3.7	26.3	0.06	A	2.3	9.5
	FB 2027		0.21	A	5.0	51.4	0.14	A	4.2	69.8	0.07	A	2.5	12.0
	FT 2027		0.65	C	20.3	81.5	0.19	A	5.1	56.6	0.11	A	3.5	19.6
	FB 2032		0.27	A	6.2	64.2	0.18	A	4.9	72.9	0.09	A	2.7	14.5
	FT 2032		0.80	D	36.1	96.6	0.23	A	6.2	67.3	0.13	A	3.8	34.4
	FB2037		0.35	A	8.50	70.9	0.23	A	6.0	67.0	0.11	A	3.0	34.2
	FT 2037		1.02	F	87.6	99.2	0.30	A	7.7	84.5	0.15	A	4.3	67.5

The above table indicates that LOS get to worsen with the background traffic for Friday peak hours while the v/c ratio worsen in the future total scenarios as a result of increase traffic by proposed site.

The Synchro analysis results indicate that the traffic condition is affected with the addition of traffic from the proposed development as compared to Background Development scenarios. In the following sections, options are explored to examine possible mitigation for critical movements.

8.16 Mitigation Measures for Critical Movements

Synchro optimization technique was used to find out mitigation measures for the critical movements. The future total 2037 condition traffic was used as worst case scenario.

8.16.1 Intersection of Main St & 9th Line

Signal Timing Adjustment:

The intersection of Main St & 9th Line was improved by signal timing adjustment. The cycle length is increased by 30 seconds and splits were optimized based on individual lane traffic ratio. Table x shows the optimized signal timing for Friday Midday and PM peak hours respectively.

Table 38 – Proposed Signal Timing Adjustment for Friday Midday & PM Peak Hours

Intersection	Movement	Turn Type	Existing Splits	Min Initial	Optimized Splits for Midday	Optimized PM Peak Splits
Main St & 9 th Line		Cycle Length: 120 s			Cycle Length: 150 s	
	EBL	pm + pt	12	7	27	38
	EBT	-	46	31	81	81
	EBR	Perm	46	31	81	81
	WBL	pm + pt	12	7	12	12
	WBTR	-	46	31	66	55
	NBL	pm + pt	17	7	23	23
	NBT	-	45	10	45	45
	NBR	Perm	45	10	45	45
	SBL	pm + pt	17	7	12	12
	SBT	-	45	10	34	34
	SBR	Perm	45	10	34	34

8.16.2 Intersection of Main St & Winona Dr

Change of Signal Aspect :

Signal timing adjustments were reviewed for the intersection of Main Street and Winona Drive. However, due to the increased eastbound left-turn volumes, the timing modifications alone did not provide meaningful operational improvements. As a result, a protected-plus-permitted left-turn phasing option was evaluated for this approach.

With the addition of a protected eastbound left-turn phase, the intersection operations show considerable improvement. Therefore, it is recommended that the signal indication for the eastbound approach be modified to include a protected left-turn phase. Corresponding signal timing adjustments were also made to accommodate the new phasing. Table 40 presents the proposed signal timing plan.

Table 39 – Proposed Signal Timing Adjustment for Friday Midday Peak Hours

Intersection	Movement	Turn Type	Existing Splits	Min Initial	Turn Type	Optimized Splits	Min Initial
Main St & Winona Dr		Cycle Length: 120 s				Cycle Length: 110 s	
	EBL	Perm	76	19	pm + pt	11	5
	EBT	-			-	76	19
	EBR	Perm			Perm		
	WBL	pm + pt	76	19	Perm	65	19
	WBTR	-			-		
	NBL	Perm	44	10	Perm	34	10
	NBT	-			-		
	NBR	Perm			Perm		
	SBL	pm + pt	44	10	Perm	34	10
	SBT	-			-		
	SBR	Perm			Perm		

Accordingly, intersection capacity analysis was conducted using Synchro to assess the operational improvements in critical movements after recommended measures. Table 40 summarizes the Synchro capacity results. Refer Appendix K for the Synchro Analysis Reports.

Table 40 – Proposed Signal Timing Adjustment for Friday Midday Peak Hours

Signalized Intersection	Turning Movement	Friday Midday Peak Hour				Friday PM Peak Hour				SAT PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	V/C	LOS	Delay (s/veh)	95 th % Queue (m)	
9th Line & Main St			D	39			D	42.7			C	31.4		
	EBL	0.75	C	32.2	72.8	0.80	C	32.4	70.2	0.64	C	22.2	73.6	35.0
	EBT	0.92	D	51.0	121.9	0.93	D	52.6	121.9	0.86	D	40.2	125.6	
	EBR	0.24	C	24.4	54.8	0.37	C	25.3	56.9	0.24	C	22.5	36.9	
	WBL	0.59	D	35.2	48.2	0.75	D	50.4	60.7	0.36	C	26.3	22.0	50.0
	WBTR	0.69	D	36.7	108.2	0.62	D	37.8	90.8	0.57	C	32.0	72.0	
	NBL	0.64	C	32.8	83.1	0.84	D	49.5	105.8	0.54	C	25.5	52.1	100.0
	NBT	0.31	D	35.9	51.4	0.53	D	45.5	87.0	0.40	C	32.9	45.8	
	NBR	0.06	C	31.9	19.7	0.07	D	36.4	30.2	0.05	C	27.7	17.1	
	SBL	0.22	D	37.1	27.9	0.28	D	40.4	28.2	0.16	C	27.5	19.7	100.0
	STB	0.37	D	45.9	49.3	0.55	D	54.9	73.7	0.37	D	36.1	42.8	
	SBR	0.22	D	43.1	45.0	0.18	D	46.7	39.4	0.15	C	32.7	28.5	130.0
Winona Dr & Main St	Overall						B	10.8			A	8.7		
	EBL	0.77	C	26.2	82.7	0.25	A	6.1	73.5	0.14	A	3.4	55.1	30
	EBTR	0.48	A	7.8	164	0.53	A	6.1	196.9	0.37	A	4	112.9	
	WBL	0.09	A	9.9	18.9	0.19	A	9.1	31.1	0.11	A	5.8	23.4	35
	WBTR	0.68	B	16.3	111.5	0.56	B	10.9	75.1	0.37	A	7	46.1	
	NBLTR	0.13	C	34.5	27.5	0.14	D	37.1	25.3	0.13	D	45.8	22.1	
	SBLTR	0.76	D	51	56.1	0.54	D	42.2	41.9	0.43	D	48.9	42.5	

9 Site Access Review

This section will review the site accesses proposed in regards with the site access spacing, sight distance and on-site circulation criteria provided in the Transportation Association of Canada (TAC) Guidelines Manual.

9.1 Access Spacing

The site plan has proposed two entrances coming off of Winona Dr providing access to the site. Currently, Winona Dr doesn't have sidewalks and curbs, a sidewalk is proposed on Winona Dr to connect the facility with Main St and facilitate pedestrian access to the site. The proposed entrances meet minimum spacing, drive Aisle width and curb radiuses as per TAC Manuals access and OPSD standards. Figure 15 below shows the spacing distance of the access driveways from the nearest main intersection.



Figure 15 - Site Access Spacing via Google Maps

9.2 Sight Distance Analysis

The available sight lines at the accesses were calculated from the TAC Geometric Design Guide for Canadian Roads (GDGCR) Guidelines dated June 2017 – Chapter 9. Section 9.9 was reviewed to identify all appropriate cases applicable to the site access entrance.

Intersection sight distance is calculated using equation 9.9.1 from the GDGCR as outlined below:

$$ISD = 0.278 * V_{major} * t_g$$

Where;

ISD = Intersection Sight Distance

V_{major} = design speed of roadway (km/h)

t_g = assumed time gap for vehicles to turn from stop onto roadway (s)

The design speed of Winona Dr is assumed as 50 km/hr. Table 41 below outlines the sight distance analysis for the proposed site entrance.

Table 41 - Sight Distance Analysis

Feature	Right Turn From Site Entrance	Left Turn From Site Entrance
Access Type	Full Movement	Full Movement
Intersection Control	Stop (Driveway)	Stop (Driveway)
Case	b1	b2
Design Speed of the Major Road <i>V_{major}</i>	50 km/h	50 km/h
Time Gap for Minor Road Vehicle to Enter Major Road <i>t_g</i>	6.5 s	7.5 s
Grade of Roadway	Less than 3%	Less than 3%
Horizontal Alignment of Roadway	Straight	Straight
Sight Distance Required* (m)	90	105
Measured Sight Distance	90.0	90.0
Minimum Sight Distance Satisfied	Yes	No
TAC Reference	Table 9.9.6	Table 9.9.4

*Site Distance Required values calculated using Equation 9.9.1 in GDGCR

Based on the roadway geometry of Winona Drive and the proposed access configuration, both entrances have clear sight lines due to the straight road alignment and absence of visual obstructions such as trees or hydro poles. The required sight distance for right-turn movements is satisfied. Although the minimum sight distance for left-turn movements is not fully met because of the limited overall length of Winona Drive, the short street segment and its low operating speeds reduce the likelihood of vehicles travelling at higher speeds. Therefore, no significant sight-visibility concerns are anticipate

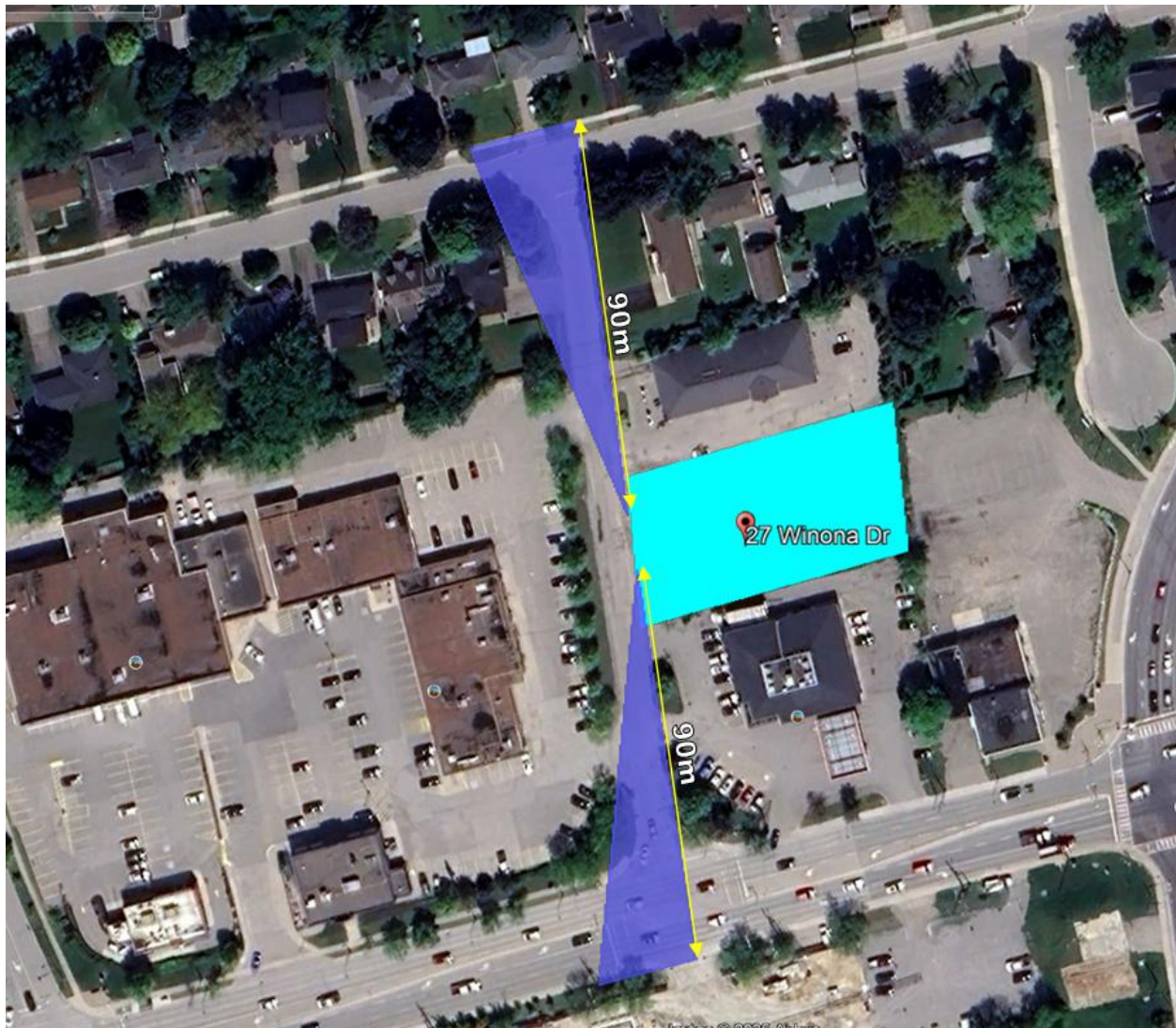


Figure 16- Visibility Triangles at the Site Entrance

9.3 Internal Site Circulation

Detailed Vehicle Maneuvering Diagrams (VMD) for the design vehicle have been provided in Appendix L. Drawings TR-02 and TR-03 demonstrate that the turning movements for the design vehicle (passenger car) can be safely accommodated based on the proposed site geometry, access widths, and the number of access points.

To effectively manage the second-floor parking operations and vehicle movements on the access ramp, it is recommended that the ramp be gate-controlled, supported by an automated parking monitoring system with variable message signs (VMS). This system will provide real-time information to users and ensure safe traffic operations on the ramp, while also helping to manage and optimize the use of the parking facility.

A Pavement Marking & Signage Plan has been prepared based on OTM manual to regulate and streamline the traffic at the site. Refer to Appendix M for the Pavement Marking & Signage Plan.

10 Parking Review

As per the Town of Whitchurch-Stouffville Zoning By-law, the proposed development requires 76 parking spaces. Parking calculations provided in the site plan provided by n Architecture Inc. is shown in Table 42.

Table 42 – Parking Calculations

Land-use	Parking Rate as per ZBL	Required Spaces	Provided Spaces
Men's Prayer Hall (544.77 m ²)	10 space/100 m ² GFA	54.4	54
Women's Prayer Hall (135.3)		13.5	14
Lounge Area(62.1 m ²)		6.2	6
Office	4 Spaces/100 m ² GFA	1.6	2
Total		75	76

Table 42 indicates that 75 parking spaces are required under the zoning by-law, while the site plan proposes a total of 76 spaces. Therefore, the proposed parking supply meets the minimum by-law requirements. In addition, bike racks are included in the site plan to support and encourage active transportation.

11 Transportation Demand Management

The purpose of a TDM plan is to create a greener transportation system for the future by decreasing auto trips and encourage commuters or pedestrians to choose other modes of travel (transit, walking, cycling, etc). TDM recommendations for the proposed development have been provided in Table 43 using the *York Region Transportation Master Plan* and *York Region Transportation Mobility Plan Guidelines for Development Applications*. The TDM checklist has been completed according to non-residential developments.

The proposed development is on a major urban arterial and around multiple future residential background developments. There are bus stops within 100 meters of the proposed site and pedestrian/cycling connections to these bus stops already exist. The TDM measures that apply to this development have been checked off below.

Table 43 - TDM Checklist

No.	TDM Measures	Requirement	Responsibility	Remarks	Cost Estimate
1	Transit incentives (i.e. Presto cards)	Yes	York Region to provide	-	Presto Cards sell for \$6, plus a minimum load
2	Information packages (YRT/Viva maps, Go schedules, cycling maps)	Yes	Applicant	-	Free printed copies Available by emailing transportation@york.ca
3	Communication strategy and physical location to deliver PRESTO cards and information packages	Yes	Applicant	-	\$500
4	Outreach programs	Yes	York Region to provide	-	-
5	Pedestrian Connection	Yes	Applicant	Included	Approx \$50000
6	Ped/Cycling connections to transit facilities	Yes	Applicant	Included	N/A
7	Bicycle parking/shelter	Yes	Applicant	To Consider	\$750
Total					\$51250

12 Summary

This Traffic Impact Study (TIS) evaluates the traffic impact of the proposed Place of Worship (Mosque) development at 27 Winona Dr, Whitchurch-Stouffville, Ontario.

The proposed development is 3 storey building including with total GFA of 2123.58 m², and 78 parking spaces (55 stilt parking spaces at the ground floor and 23 spaces at the 2nd floor.

The proposed development will generate a total of inbound and outbound 436 Friday Midday peak hour trips and 77 PM peak hour trips on Friday and Saturday respectively.

Peak hour traffic was studied based on the busy time of the mosque and traffic data was collected at two signalized intersection and two unsignalized intersections.

Capacity analysis was conducted for Friday Midday, Friday PM Peak and Saturday PM Peak under Existing, Future Background and Future Total scenarios for pedestrian mode performance, bicycle mode performance, transit mode performance and automobile mode performance. Synchro 11 was utilized with HCM 2000 and SimTraffic was applied to analyze intersections in study area. Level of service, v/c ratio, control delay and 95th percentile queue

were evaluated as per the *Transportation Impact Study Guideline for Development Applications for York Region*.

The pedestrian mode performance indicate that the pedestrian LOS target of C or better for signalized intersection and segment on Mains St is met, also the proposed sidewalk on Winona drive improves the segment LOS while it doesn't meet the target for other unsignalized intersections.

The bicycle mode performance did not meet the LOS target of C or better for unsignalized intersections for existing, future background, and future total conditions.

The transit mode performance meets the target level of service for approach lanes for existing, future background and future total conditions.

Based on the Synchro analysis results under Existing and Future conditions for the automobile mode performance, the overall LOS analysis for the signalized intersection operates at an acceptable LOS D or better for all scenarios. Critical movements were observed at all scenarios at two signalized intersections as a result of increased background traffic. The site generated trips also had marginal effect on the critical movements.

The site entrances perform at excellent LOS B or better. Furthermore, the access spacing, drive isle, curb radiuses meet the minimum access standards.

Vehicle manoeuvring diagrams have been analysed to ensure on sit circulation for the design vehicles. A Pavements Marking and Signage Plan has been provided to regulate the site traffic.

Recommended TDM measures have been provided in Table 43 based on the guidelines to encourage active transportation alternatives.

Based on the Town of Stouffville Zoning By-Law, the proposed development requires 76 parking spaces. The site plan has provided 78 parking spaces which meets the Zoning by-law requirements.

13 Recommendation

1. Signal timing adjustments are proposed for the intersection of Main Street and 9th Line to improve operational performance. The cycle length is recommended to be increased by 30 seconds.

2. At the intersection of Winona Drive and Main Street, it is recommended that the eastbound signal indication be modified to include a protected left-turn phase to accommodate increasing left-turn volumes and enhance safety.
3. To ensure safe vehicle movements on the second-floor parking level, it is recommended that the access ramp be controlled by an automated gate system.
4. Automated parking monitoring sensors, integrated with variable message signs (VMS), are recommended to provide real-time parking availability information to users and to ensure safe and efficient traffic circulation along the ramp and within the parking facility.

We trust that this study adequately addresses the requirements for The Town of Whitchurch-Stouffville and satisfies any access and transportation concerns associated with the site plan. Should you have any questions, please contact the undersigned.

Respectfully submitted,

(Report Prepared by)

Sultan Ahmad Azizi M.Tech. EIT.
Transportation Analyst,
n Engineering Inc.

(Report Reviewed by)

Abu S Ziauddin P. Eng. M.Eng
Head of Engineering
n Engineering Inc.



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APPENDIX A

Approved Terms of Reference & Email Correspondence

Sultan Ahmad | nEngineering Inc

From: Schleihauf, David [David.Schleihauf@york.ca]
Sent: July 9, 2024 1:41 PM
To: Sultan Ahmad | nEngineering Inc
Cc: 'Abu Ziauddin | nEngineering Inc.'; Bui, Vi
Subject: RE: n2271 | RE:27 Winona Dr. Stouffville, TOR For Traffic Impact Study

Hello Sultan,

Please find our comments below regarding the TOR.

1. The transportation study shall be consistent with the Region's [Transportation Mobility Plan Guidelines](#) (November 2016).
2. Please include the intersection of Ninth Line / Rupert Avenue.
3. We accept growth calculations in three different ways, namely from historic AADT analysis, EMME model analysis or from recently approved studies in the area. Please document the approach used in the report.
4. Traffic Counts, Signal Timings, model outputs, and historical AADTs or model outputs can be purchased through [traffic.data@york.ca](#) (if necessary).
5. As per the Region's [2024 10-Year Roads and Transit Capital Construction Program](#), there are no planned improvements in the vicinity of the site.
6. We defer to the Town to provide relevant background developments to include in the study.

Please note, this is not an approval, the Region will provide additional detailed comments when a study is submitted for review.

Regards,

Our working hours may be different. Please do not feel obligated to reply outside of your scheduled working hours. Let's work together to help foster healthy work-life boundaries.

David Schleihauf, P.Eng. | Senior Transportation Planner, Transportation Development Planning, Transportation & Infrastructure Planning Branch, Public Works Department

1-877-464-9675 ext. 77857

Our Mission: **Working together to serve our thriving communities – today and tomorrow**

From: Sultan Ahmad | nEngineering Inc <sa@nengineering.com>
Sent: Monday, July 8, 2024 8:18 AM
To: Schleihauf, David <David.Schleihauf@york.ca>
Cc: 'Abu Ziauddin | nEngineering Inc.' <az@nengineering.com>; Bui, Vi <Vi.Bui@york.ca>
Subject: n2271 | RE:27 Winona Dr. Stouffville, TOR For Traffic Impact Study

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Hello David,

Thanks for your email,

Attached is the ToR which also contains feedback from the Town in redlines.

Regards,



nEngineering Inc



Sultan Ahmad Azizi | Transportation Analyst

9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 416-256-9741

<http://nengineering.com/> | <https://www.facebook.com/nArchitectureInc>

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From: Schleihau, David [<mailto:David.Schleihau@york.ca>]

Sent: July 5, 2024 2:01 PM

To: Sultan Ahmad | nEngineering Inc

Cc: 'Abu Ziauddin | nEngineering Inc.'; Bui, Vi

Subject: RE: n2271 | 27 Winona Dr. Stouffville, TOR For Traffic Impact Study

Hello Sultan,

Is there an attachment to review?

Quickly, signal timing and traffic data for Regional intersections can be requested from traffic.data@york.ca.

Regards,

Our working hours may be different. Please do not feel obligated to reply outside of your scheduled working hours. Let's work together to help foster healthy work-life boundaries.

David Schleihau, P.Eng. | Senior Transportation Planner, Transportation Development Planning, Transportation & Infrastructure Planning Branch, Public Works Department

1-877-464-9675 ext. 77857

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From: Mollett, Calvin <Calvin.Mollett@york.ca>

Sent: Friday, July 5, 2024 1:57 PM

To: Schleihau, David <David.Schleihau@york.ca>

Cc: 'Abu Ziauddin | nEngineering Inc.' <az@nengineering.com>; Sultan Ahmad | nEngineering Inc <sa@nengineering.com>; 'Nitin Malhotra | n Architecture Inc.' <nm@narchitecture.com>

Subject: RE: n2271 | 27 Winona Dr. Stouffville, TOR For Traffic Impact Study

David

Please review and get back to Sultan.

Kind Regards

Our working hours may be different. Please do not feel obligated to reply outside of your scheduled working hours. Let's work together to help foster healthy work-life boundaries.

Calvin J. Mollett, M.Eng, P.Eng | Program Manager, Development Engineering, Economic and Development Services, Corporate Services Department

The Regional Municipality of York | 17250 Yonge Street | Newmarket, ON L3Y 6Z1
1-877-464-9675 ext. 75755 | C:905-716-5535 | Calvin.Mollett@york.ca | york.ca

From: Sultan Ahmad | nEngineering Inc <sa@nengineering.com>
Sent: Friday, July 5, 2024 11:51 AM
To: Mollett, Calvin <Calvin.Mollett@york.ca>
Cc: 'Abu Ziauddin | nEngineering Inc.' <az@nengineering.com>; 'Nitin Malhotra | n Architecture Inc.' <nm@narchitecture.com>
Subject: FW: n2271 | 27 Winona Dr. Stouffville, TOR For Traffic Impact Study

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Hello Calvin,

I hope you are doing well,
I am working on Traffic Impact Study for the proposed project located at 27 Winona Dr, Stouffville.
In order to proceed with the TIS, I would like to get feedback from the York Region on the TOR so to make sure everything is covered.

Also, for this study, I would need the signal timing plan for Main St & Winona Dr. Intersection.

Your comments or directing this email to relevant department would be highly appreciated.

Regards,



Sultan Ahmad Azizi | Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 416-256-9741
<http://nengineering.com/> | <https://www.facebook.com/nArchitectureInc>

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Sultan Ahmad | nEngineering Inc

From: Monika Dhungana [monika.dhungana@townofws.ca]
Sent: July 5, 2024 10:52 AM
To: Sultan Ahmad | nEngineering Inc; Brandon Slopach
Cc: 'Nitin Malhotra | n Architecture Inc.'; 'Abu Ziauddin | nEngineering Inc.'; 'Joline Bouhamdan | n Architecture Inc.'
Subject: RE: n2271 | 27 Winona Dr. Stouffville, TOR For Traffic Impact Study
Attachments: TOR for TIS 27 Winona Dr1- comment.pdf

Hello Sultan,
Apologies for delay, as I was sick for several days. Please find some comments included in attached file.
TIS reports from Background Developments will be shared through a separate email.

Regards,
Monika



MONIKA DHUNGANA, M. Sc., P. Eng.

Senior Development Engineer | Engineering and Public Works
111 Sandiford Drive, Stouffville, Ontario L4A 0Z8
t: 905-640-1900 ext. 2291 | tf: 855-642-TOWN | townofws.ca



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From: Sultan Ahmad | nEngineering Inc <sa@nengineering.com>
Sent: Friday, July 5, 2024 9:37 AM
To: Monika Dhungana <monika.dhungana@townofws.ca>; Brandon Slopach <brandon.slopach@townofws.ca>
Cc: 'Nitin Malhotra | n Architecture Inc.' <nm@narchitecture.com>; 'Abu Ziauddin | nEngineering Inc.' <az@nengineering.com>; 'Joline Bouhamdan | n Architecture Inc.' <jb@narchitecture.com>
Subject: RE: n2271 | 27 Winona Dr. Stouffville, TOR For Traffic Impact Study

Hello Brandon and Monika,

I tried to call and left you a voice mail this morning. I was wondering if you were able to check my email regarding the ToR for Traffic Impact study.

Your response in this regard would be highly appreciated.

Regards,



n Engineering Inc



Sultan Ahmad Azizi | Transportation Analyst

9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 416-256-9741

<http://nengineering.com/> | <https://www.facebook.com/nArchitectureInc>

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From: Sultan Ahmad | nEngineering Inc [<mailto:sa@nengineering.com>]

Sent: July 3, 2024 8:55 AM

To: 'Monika Dhungana'

Cc: 'Nitin Malhotra | n Architecture Inc.'; 'Abu Ziauddin | nEngineering Inc.'; 'Joline Bouhamdan | n Architecture Inc.'; 'Brandon Slopach'

Subject: RE: n2271 | 27 Winona Dr. Stouffville, TOR For Traffic Impact Study

Hello Monika,

I believe Brandon referred the below email to you which missed the attachment. I am reattaching the ToR for your review. Your feedback in this regard would be highly appreciated.

Regards,



n Engineering Inc



Sultan Ahmad Azizi | Transportation Analyst

9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 416-256-9741

<http://nengineering.com/> | <https://www.facebook.com/nArchitectureInc>

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From: Brandon Slopach [<mailto:brandon.slopach@townofws.ca>]

Sent: July 2, 2024 3:12 PM

To: Sultan Ahmad | nEngineering Inc

Cc: 'Nitin Malhotra | n Architecture Inc.'; 'Abu Ziauddin | nEngineering Inc.'; 'Joline Bouhamdan | n Architecture Inc.'; Monika Dhungana

Subject: RE: n2271 | 27 Winona Dr. Stouffville, TOR For Traffic Impact Study

Hello Brandon,

I hope this email finds you well,

I am contacting you on behalf of n Engineering Inc. regarding the Traffic Impact Study required for the development application (Place of Worship) proposed at 27 Winona Dr, Whitchurch Stouffville, On.

Attached is the scope of work defined for the Traffic Impact Study.

I would appreciate if you could provide your feedback on this or connect me with relevant department to discuss the scope and direct us to the right steps.

In addition to the review of ToR, I would like to also request the following:

1. Signal timing Plan currently in use for the Intersection of Main St & Winona Dr
2. Any recent traffic data available on the mentioned intersections
3. TIS reports of any background development projects that might need to be considered in our study

Standing by for next steps.

Regards,



n Engineering Inc



Sultan Ahmad Azizi | Transportation Analyst

9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 416-256-9741

<http://nengineering.com/> | <https://www.facebook.com/nArchitectureInc>

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Date: July 02, 2024

RE: n2271 | Proposed Place of Worship Development at 27 Winona Dr, Stouffville, Ontario

Subject: Terms of Reference for Traffic Impact Study

n Engineering Inc. has been retained by the owner to conduct a Traffic Impact Study (TIS) in support of the Site Plan Application Process for the proposed Place of Worship development. The subject site is located at 27 Winona Dr, Whitchurch Stouffville, Ontario.

The TIS is to comply with Region of York Guidelines, the terms of reference are listed below. Please review and recommend.

Proposed Development

As per preliminary Site Plan, the proposed development is 3 Storey Place of Worship (Mosque) including its facilities (Gym, Office space, Funeral Room) with a total GFA 2399.15 m² and 59 parking spaces.

The site is accessible via two full movement entrances coming off of Winona Dr. Figure 1 shows the preliminary Site plan for the proposed development.

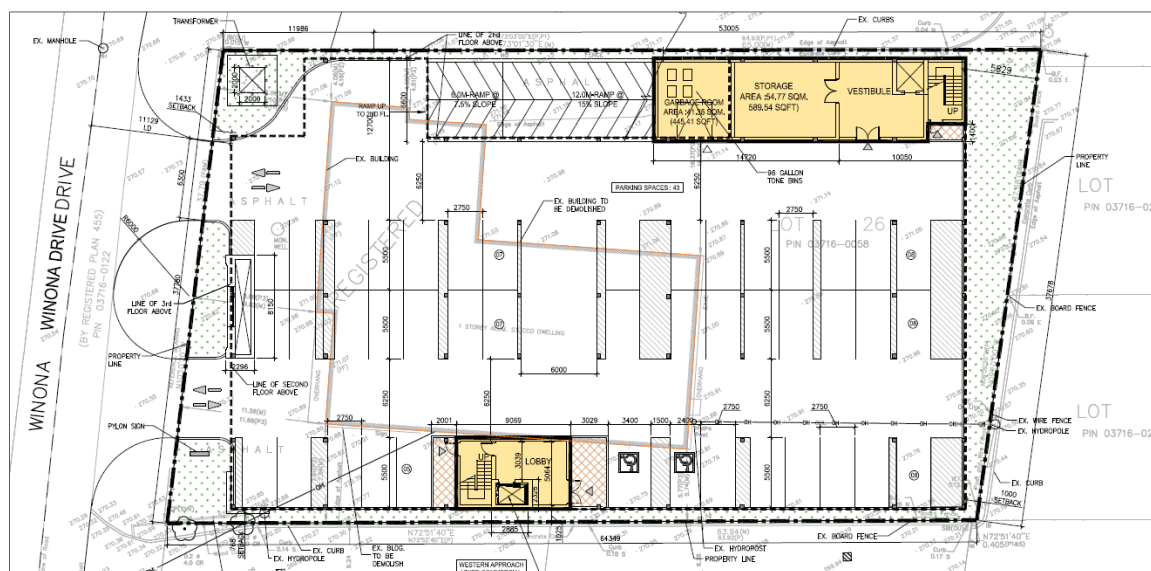


Figure 1: Preliminary Site Plan for the Proposed Development

Terms Requiring Approval

Study Intersections: The following intersections will be analyzed under this TIS for the existing condition, Full Build Out Year, Future background Condition and Future Total Conditions:

- A. Winona Dr & Main St (Signalized)
- B. Proposed Site Entrance1 & Winona Dr (Unsignalized)
- C. Proposed Site Entrance 2 & Winona Dr (Unsignalized)
- D. Winona Dr & Rupert Ave (Unsignalized)



Figure 2 - Study Area

Posted Speeds

The followings are posted speed limits on the streets in the study area:

- Main St: 50 km/hr, Arterial Road under jurisdiction of Town
- Rupert Ave : 40 km/hr, Local Street under jurisdiction of Town
- Winona Dr.: 40 km/hr, Local Street under jurisdiction of Town

Data Collection

Intersection turning movement counts will be conducted on Friday and Saturday for the peak hour of Mosque at the selected intersections.

Future Background Development

Future background analysis would include traffic volumes and the intersection's operations based on the existing traffic growth plus expected background developments within the study area which may have traffic impact on the selected intersections.

Based on the development application portal, the following development applications were found in the vicinity of proposed development:

1. 5964 Main St & 28 Fairview
2. 5991 Main St & 12238 Ninth Line
3. 5945 Main St
4. 5917 Main St
5. 33 Weldon Road 6. 5676 Main Street

Please advise if these developments or any other background development have to be included in this TIS study. If yes, it is requested to provide copy of TIS reports and details for these developments to be used for this study. **Developments within 1km radius needs to be included in background developments. Please see Development Activity map and send the request to the Town for TIS reports.**

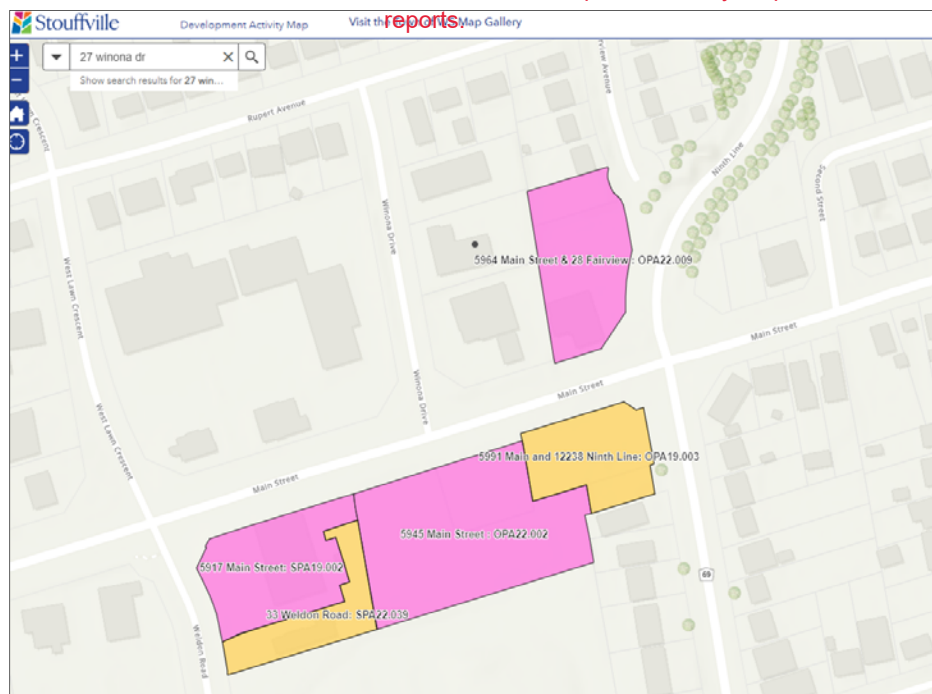


Figure 3 - Study Area

Traffic Volume Analysis

1. Horizon Years

Monitoring the development traffic will be studied for Existing 2024 condition, anticipated full build out year 2027 Condition, and Future Total 2032 Condition, five years after opening.

2. Time Periods

Traffic operations will be analyzed for Friday Mid-Day and PM peak hour and Saturday PM peak hour which is known to be busy hours for Mosques. Therefore, traffic volume data will be collected at the intersections shown in Figure 2 for the following periods:

- **Friday:** Midday from 12:00PM -3:00 PM, and PM Peak from 4:30PM-8:30 PM
- **Saturday:** PM Peak from 4:30 PM to 8:30 PM

Growth Rate

The annual growth rate factor of 2% will be applied for estimating future traffic volumes.

Trip Generation and Distribution

The following resources will be used in determining the trip generation of mosque:

1. **ITE Manual Trip Rates:** the Landuse Code 562 provides trip rates for Friday AM and PM peak hour of generator 9.54 and 23.55 respectively. These rates will be examined in the calculation of Friday trips for proposed facility
2. **¹Places of Worship Policy Review City of Brampton:** The City of Brampton has conducted research on places of worship and has provided some necessary insights that can be used in our study. the following are trip rates can be used for Friday peak hours :
The trip rate will be reviewed under full submission.

Period	Trip Rate/1000 ft ² GFA	% In	% Out
Trip Rate Based On Gross Total Mosque Floor Area			
Weekday AM Peak Hour	1.55	44%	56
Weekday Midday Peak hour	19.45	74%	26%
Weekday PM Peak Hour	3.62	52%	48%
Trip Rate Based On Designated Worship Area			
Weekday AM Peak Hour	2.93	44%	56
Weekday Midday Peak hour	44.08	74%	26%
Weekday PM Peak Hour	6.83	52%	48%

¹ <https://www.brampton.ca/en/Business/planning-development/Documents/PLD/LandUse/worship-feb15-presentation.pdf>

3. As there are no recommended trip rates available for Saturday peak hours, Vehicle occupancy rate of 2.5 for as a result of proxy site surveys presented in the Policy Review document can be used to estimate the number of trips based on the maximum capacity of worship area.
4. The highest resulting numbers of the above approaches will be used in the capacity analysis to replicate worst case scenario.
5. Trip distribution and Traffic assignment on routes will be based on existing/anticipated travel patterns and directional split percentages.

Modal Split

The modal split reduction will not be applied on the trips generated.

Capacity Analysis

Intersection's capacity will be analyzed for Existing, Future Background and Future Total conditions to understand the impact of trips generated by proposed development on the future traffic. Capacity analysis will comply with the TIS *Guidelines for York Region. For capacity analysis*, Synchro 11.0 with HCM 6th methodology will be used. SimTraffic will be used for simulation purpose to achieve 95th percentile queue length.

Internal Site Circulation

A vehicle maneuvering diagram will be provided to show that the site is able to accommodate the design vehicles properly without encroachment and safety concerns. (AutoTurn or similar software will be used). *Garbage truck and snow removal tuning templates will be required.*

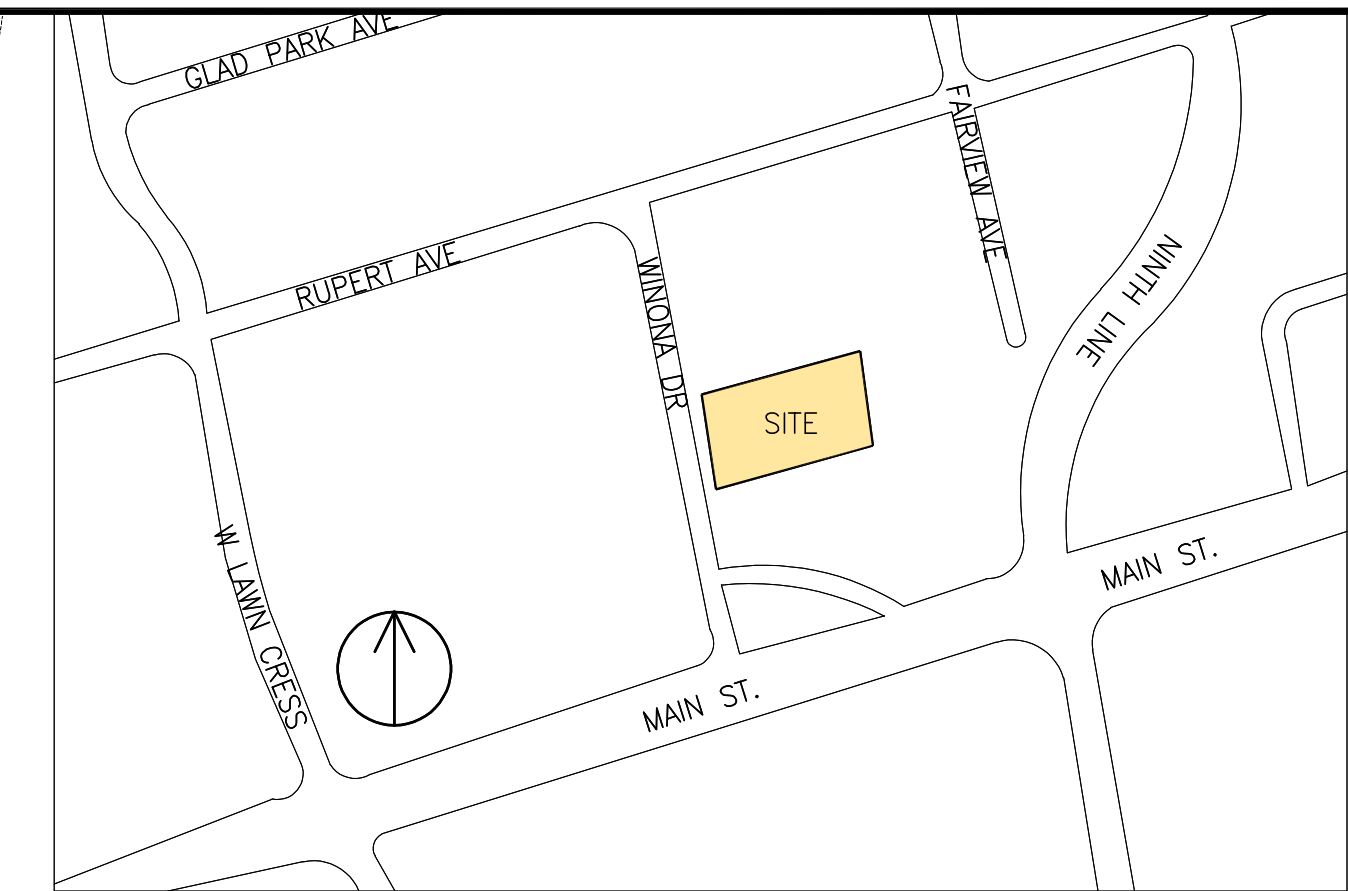
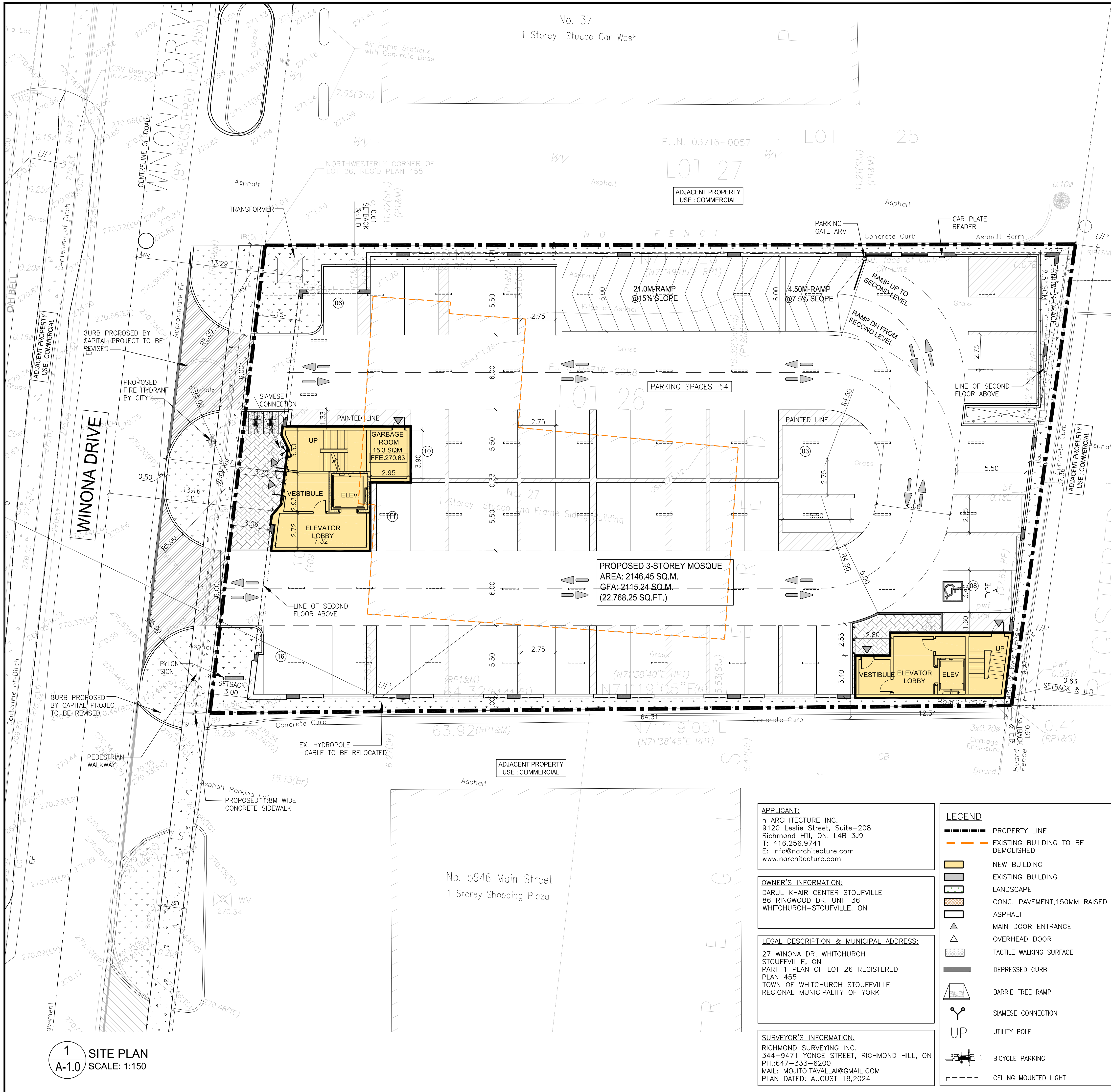
Parking Review

Parking spaces proposed in the final Site Plan will checked based on the applicable Zoning By-Law. In case of any deficiency, justification and engineering judgment would be used to check if the provided parking spaces meet the future parking demand.

-----End of Report-----

APPENDIX B

Site Plan



PROJECT STATISTICS		
ADDRESS: 27 , WINONA DR, WHITCHURCH, STOUFFVILLE, ON		
ZONING : COMMERCIAL RESIDENTIAL MIXED -WESTERN APPROACH(CM2) (BYLAW 2010-001-70 TOWN OF WHITCHURCH STOUFFVILLE,2010)		
	REQUIRED	PROPOSED
	CM-2	CM-2 (PLACE OF WORSHIP USE PERMITTED)
LOT AREA (SQ.M)	0 SQ.M. (MIN)	2408.74 SQ.M. (0.59 ACRES)
LOT FRONTAGE	0 M	37.80 M
BUILDING COVERAGE	N/A	2146.45 SQ.M (89.11%)
GFA (SQ.M)		2115.24 SQ.M
GFA (SQ.M)-EXCLUDING MECHANICAL ROOM, STAIR WELLS, ELEVATOR SHAFTS, REFUSE STORAGE ROOM		1922.20 SQ.M
LANDSCAPED AREA	MIN. 4.5M BETWEEN STREET AND PARKING AREAS OR DRIVEWAYS	3M 217.84 SQ.M(9.04%)
PAVED AREA	-	2044.58 SQ.M. (84.88%)
MAX. BUILDING HEIGHT	20M	-12.95 M -20.00M (HEIGHT OF MINARET)

BUILDING SETBACKS		
FRONT YARD (WEST)	(MIN)3 M (MAX)3 M	3 M
REAR YARD (EAST)	(MIN)0 M	0.63 M
INTERIOR SIDE YARD (NORTH)	(MIN)0 M	0.61 M
INTERIOR SIDE YARD (SOUTH)	(MIN)0 M	0.61 M

LOADING CALCULATION:		
OVER 950M ² UP TO 2115.24M ² OF GFA 4 LARGE LOADING SPACES REQUIRED (9M X 3.5M)	04	00

LONG TERM BICYCLE PARKING		
1 PER 1250 SQM OF GFA 2115.24/1250=1.69	02	03
SHORT TERM BICYCLE PARKING		
THE GREATER OF 1 SPACE PER 1000 SQM OF GFA OR 3 SPACES	03	03
BICYCLE PARKING SIZE:1.8MX0.6M_1.2M VERTICAL CLEARANCE		

PARKING CALCULATION		
MEN'S PRAYER HALL (10 SPACES/100SQ.M.)-AREA=535.82 SQ.M.	53.5	54
WOMEN'S PRAYER HALL (10 SPACES/100SQ.M.)-AREA=135.3 SQM	13.5	14
LOUNGE AREA (10 SPACES/100SQ.M.)-AREA=62.1 SQM	6.2	06
OFFICE (4 SPACES/100 SQ.M.)-AREA=41.7 SQM	1.6	02
TOTAL PARKINGS SPACES	74.8	76
ACCESSIBLE PARKING:4% OF TOTAL PARKING SPACES	03	03
PARKING SIZE:(2.75X5.5M), ACCESSIBLE PARKING SIZE: TYPE A (3.4X5.5M)_TYPE B(2.4X5.5M)		

n Architecture Inc
PRINCIPAL: NITIN MALHOTRA, ARCHITECT.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T : 4 1 6 . 2 5 6 . 9 7 4 1
E: info@narchitecture.com
www.narchitecture.com

20 NOV.2025

20th NOVEMBER 2025
ISSUED FOR ZBA#2
NOT FOR CONSTRUCTION

5.	20 NOV. 2025	ISSUED FOR ZBA#2 (DA#3)	MG
4.	18 MAR. 2025	ISSUED FOR ZBA#1 (DA#2)	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3 (DA#1)	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB
No.	Date	Version	Dwn.

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PROJECT:

**27 WINONA DR,
WHITCHURCH
STOUFFVILLE, ON
PLACE OF
WORSHIP-MOSQUE**

DRAWING TITLE:

**SITE PLAN AT
GROUND LEVEL**

DRAWN BY: JB	DATE: 12 DEC 2022
CHECKED BY: NM	SCALE: AS NOTED
PROJECT NO.:	DRAWING NO.:

22-71 A-1.0

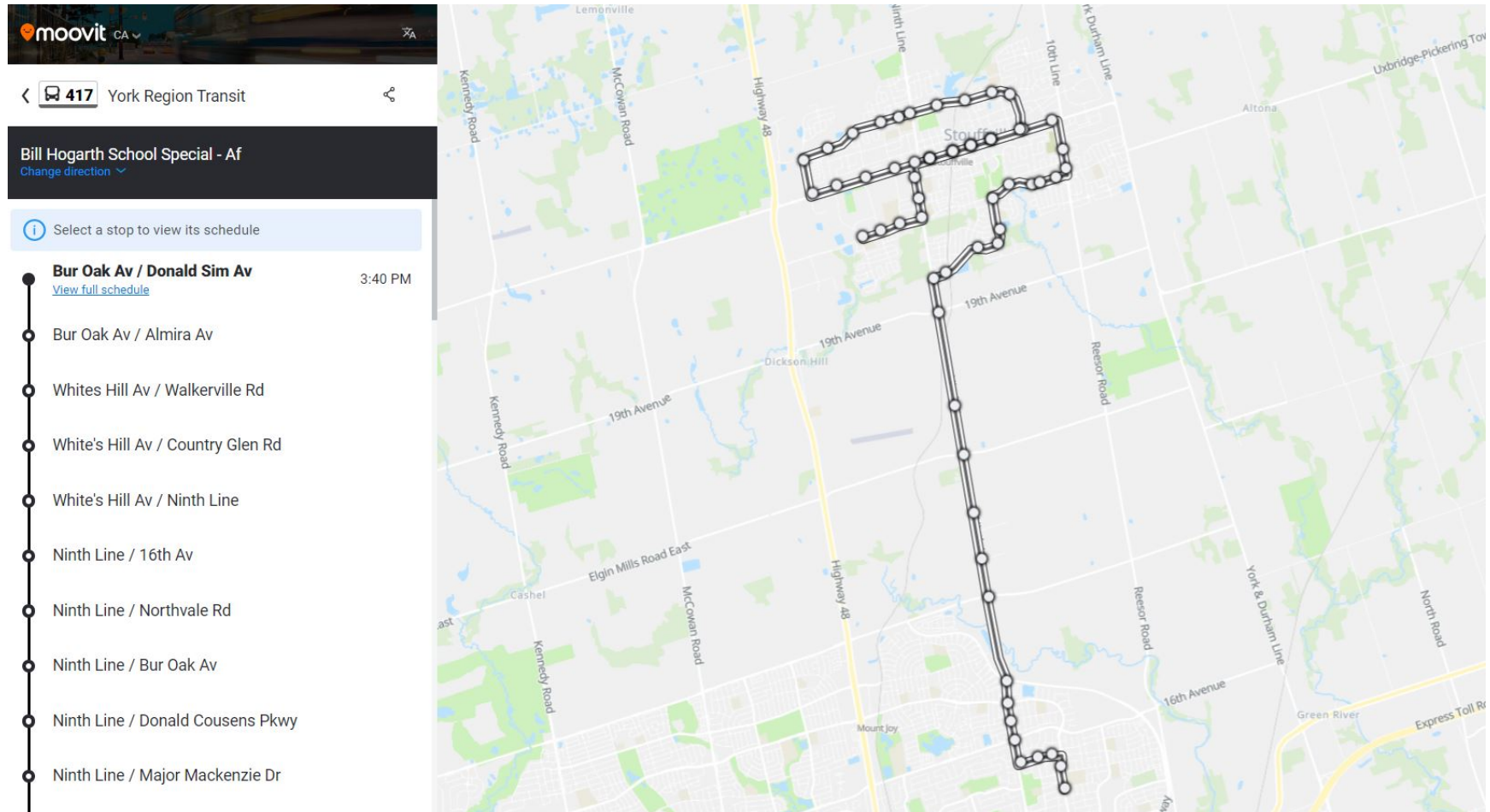
APPENDIX C

Transit & Cycling Network Maps

York Region Transit 9th Line



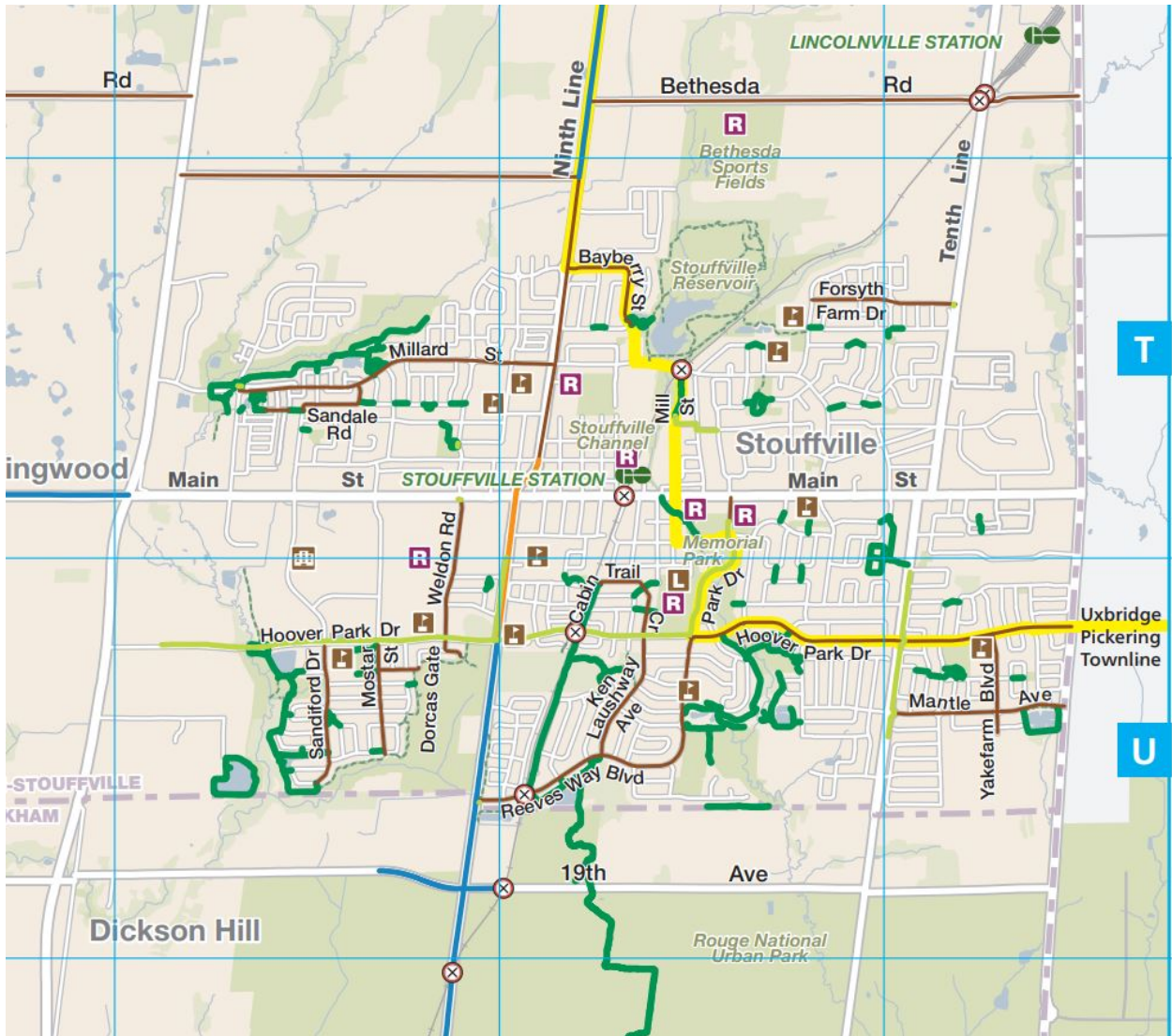
York Region Transit Line 417 Map



GO Transit Route 70 Map



York Region Cycling Map for Stouffville



APPENDIX C

Darul-Khair Mosque Functions & Information

Outline typical weekly schedule of prayer and supportive community uses (operation and programming).

Darul Khair Center, Stouffville (DKC) current location is at Unit 36, at 86 Ringwood Drive and this is the only centre where Muslims who live in Stouffville and its vicinity visit to attend prayers and other programs. Once the new Mosque will be built at 27 Winona Drive, all these programs will be shifted there, and the same programs will continue to take place at the new Mosque.

The new Mosque will be built with the donation from the community and this Mosque in addition to having a prayer area, will also have space for all ages of our congregants, a class room for religious learning for kids, sitting area with chairs for congregants to meet and greet after the prayers, a separate room for our senior congregants, a Gym for our youth, a kitchen to warm and serve catered food, office for DKC, meeting room for management and Imam office.

PRAYERS

There are five daily prayers in Islam which are called **Fajr, Dhuhr, Asr, Maghrib, and Isha**. On Fridays, the Dhuhr prayer is also known as Jumma prayer with a sermon and this weekly prayer is attended by many more congregants compared to other daily prayers. To limit the number of attendees for Friday Jumma prayers, we have been conducting two separate Jumma prayers with a time gap of about 1 hrs currently and the same will continue at the new mosque location. Each prayer has specific timings as presented in the Table-1a below and photos of prayer are included to show the number of congregants attend each prayer in the Table-1b:

Table 1a: DKC Prayer Schedule

Prayer Name	Time	No. of Attendees
Fajr (Dawn)	6.45 AM	10-15
Dhuhr (Noon)	1.00 PM	10-15
Asr (Afternoon)	3.45 PM	10-15
Maghrib (Evening)	5.00 PM	20-25
Isha (Night)	7.30 PM	20-30
Jumma-First	12.30 PM	75-100
Jumma-Second	1.45 PM	75-100

Table-1b: Photos of prayers

	
Fajr (Dawn) prayer attended by 9 congregants	Dhuhr (Noon) prayer attended by 15 congregants

	
Asr (Afternoon) payer, about 10 congregants waiting for prayer to start	Maghrib (Evening) payer attended by 15 congregants
	
Isha (Night) payer attended by 26 congregants	Jumma prayer attended by 75 congregants

PROGRAMS

There are community programs happens at DKC and the list of such programs are presented in the Table-2a below and photos of such events are presented in the table 2 b:

Table 2a: DKC Programs Schedule

Program Name	Time	No. of Attendees
Evening Quran Classes (Monday to Thursday)	5.30 PM to 7.00 PM	20-25 students
Friday Quran Tafseer Session (Every Friday)	8.00 to 9.30 PM	30-50
Sunday Quran Classes (Every Sunday)	12.00 to 2.00 PM	15-20 students
DKC Management Biweekly Meetings (alternate Tuesdays)	8.00 to 9.30 PM	8-10
DKC Students Annual Award Ceremony- currently at rented facilities July of each year	1.00 to 4.00 PM	100-120
Games for Children and Youth currently at rented facilities (Saturdays / Sundays)	2.00 to 4.00 PM	30-40
*Ramadan-Iftaar/community Dinner-currently at rented facilities Every Saturday and Sunday in Ramadan	6 to 7.00 PM	80-100
*Ramdan Night Prayers 25 days in Ramadan	8.00 to 9.30 PM	80-100

*(Ramadan happens one month each year, in 2024 it was from mid march to mid April)		
Summer Camp (July & Aug)	10.00 to 2.30 PM	25-30
Community BBQ Once a year	During daytime	80-100

Table 2b: Photos of community programs

	
Evening Quran Classes	Weekly Friday Quran Tafseer Session
	
Management Meetings (bi-weekly) on every other Tuesday evening	DKC Students Annual Award Ceremony at Royal Canadian Legion Hall, attended by DKC students and their parents
	
DKC Badminton game at Stouffville Leisure Center	DKC Basketball game at Stouffville Leisure Center
	

Ramadan-Iftaar Dinner at Royal Canadian Legion Hall	Ramadan-Iftaar Dinner at Ballantrae Community Hall
 A group of children are seated in a room with decorative Islamic-style arches. They are all holding up white certificates or diplomas, smiling. The room has large windows and a patterned wall.	 A group of people are gathered outdoors on a grassy area under a large, open-sided pavilion. Some people are standing and talking, while others are seated at tables. The scene is bright and sunny.
Summer Camp	Community BBQ at Memorial Park

Request for Additional Information from Client

Below is the comment received from the City on TIS report:

City Reviewers Comment

b) Partially addressed. The TIS provides information on the number of attendees expected at special events (i.e., Ramadan or DKC Students Annual Award Ceremony) ranging between 80-120 attendees are expected. It is our opinion that this number appears to be quite low. Please provide the number of current and projected members of the mosque and confirm that special events will never exceed 120 persons.

To adequately respond to the reviewer's comment regarding special events and projected attendance, we require more detailed information on the current operations of the mosque as well as the intended functions once the new facility is constructed. Kindly provide clarification on the following points:

Description of information required	Response by DKC
1. Special Events (Current and Future) Please outline the special events currently held at the existing mosque (e.g., religious programs, community events, educational activities). In addition, describe the anticipated functions and programs expected to be introduced once the new mosque is built.	The special events currently being held are as follows: 1. Evening Quran Classes 2. Friday Quran Tafseer Sesison (Friday Evening) 3. Management Meetings (bi-weekly) 4. Ramadan Night Prayers New Programs to add 1. Ramadan Iftar Community Dinners 2. Students Annual Award Ceremony 3. Seniors' programs
4. Attendance During Special Events or Guest Visits Are there any scholars, guest speakers, or notable	The new Mosque is for local community, and our Imam conducts all religious event. Outside scholar or guest speaker may be

individuals who are periodically invited to the mosque and who typically attract larger crowds? If so, please indicate the frequency of such events, the approximate attendance, and whether there are plans to expand or host such events more regularly at the new mosque.	invited once or twice a year during Ramadan Night Prayers. Such programs are attended by local community members only and approximate attendance can be between 100 to 120 people. Students Annual Award Ceremony are attended by the parents of students who are enrolled in Quran classes. Approximate attendees can be about 100-120 which includes parents, students and DKC staff. Senior programs will be for seniors in our local community, and such attendance can be about 20 to 30 people.
1. Ramadan Activities and Projected Attendance Events such as the 10-day condensed Tarawih or the 10-day Qiam-UL-Lail usually generate higher attendance. Please describe how these events are currently organized and managed in the existing mosque and how they are envisioned to be accommodated in the new mosque, including expected attendance levels.	At Darul Khair we don't offer 10-day condensed Tarawih or the 10-day Qiam-UL-Lail. Our current Tarawih program is throughout the 30 days of the month of Ramadan and mostly local community Muslims attends currently and this will continue in the new Mosque too. On regular basis 80-100 people attend. If we plan to celebrate the night of completing the Tarawih at the new Mosque, then there may be more people attending such event and attendees can be in the range of 100-120.
2. Additional Future Events or Considerations If there are any other planned programs, community services, or operational changes that may influence future attendance—whether daily, weekly, or during peak events—please include those details.	Currently we are conducting Eid Prayers at Markham Fair Grounds, usually 500-800 people attend the Eid prayers. If we plan to conduct Eid Prayers in the new Mosque and to manage the attendees we will have multiple Eid prayers at the new Mosque.

APPENDIX E

TMC Data Collected by Accu-Traffic Inc.

Accu-Traffic Inc.

Mid-day Peak Diagram	Specified Period From: 12:00:00 To: 15:00:00	One Hour Peak From: 12:00:00 To: 13:00:00
Municipality: Whitchurch-Stouffville Site #: 2501600001 Intersection: Main St & 9th Line TFR File #: 1 Count date: 17-Jan-25	Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **	Major Road: Main St runs W/E	

North Leg Total: 642 North Entering: 328 North Peds: 18 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>Trucks</td><td>1</td><td>1</td><td>0</td><td>2</td></tr> <tr><td>Cars</td><td>187</td><td>93</td><td>45</td><td>325</td></tr> <tr><td>Totals</td><td>188</td><td>95</td><td>45</td><td></td></tr> </table>	Buses	0	1	0	1	Trucks	1	1	0	2	Cars	187	93	45	325	Totals	188	95	45		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>1</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Cars</td><td>313</td></tr> <tr><td>Totals</td><td>314</td></tr> </table>	Buses	1	Trucks	0	Cars	313	Totals	314	East Leg Total: 1275 East Entering: 660 East Peds: 9 Peds Cross:
Buses	0	1	0	1																											
Trucks	1	1	0	2																											
Cars	187	93	45	325																											
Totals	188	95	45																												
Buses	1																														
Trucks	0																														
Cars	313																														
Totals	314																														

Buses	Trucks	Cars	Totals
1	4	933	938

Main St

Main St

Buses	Trucks	Cars	Totals
0	0	163	163
1	0	502	503
0	2	168	170
1	2	833	

9th Line

9th Line

Buses	Trucks	Cars	Totals
0	0	163	163
1	0	502	503
0	2	168	170
1	2	833	

Main St

Main St

Peds Cross: West Peds: 3 West Entering: 836 West Leg Total: 1774	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>327</td></tr> <tr><td>Trucks</td><td>4</td></tr> <tr><td>Buses</td><td>1</td></tr> <tr><td>Totals</td><td>332</td></tr> </table>	Cars	327	Trucks	4	Buses	1	Totals	332	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>196</td><td>111</td><td>67</td><td>374</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Buses</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>Totals</td><td>196</td><td>112</td><td>67</td><td></td></tr> </table>	Cars	196	111	67	374	Trucks	0	0	0	0	Buses	0	1	0	1	Totals	196	112	67		Peds Cross: South Peds: 16 South Entering: 375 South Leg Total: 707
Cars	327																														
Trucks	4																														
Buses	1																														
Totals	332																														
Cars	196	111	67	374																											
Trucks	0	0	0	0																											
Buses	0	1	0	1																											
Totals	196	112	67																												

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:30:00 To: 20:30:00	One Hour Peak From: 16:45:00 To: 17:45:00
Municipality: Whitchurch-Stouffville Site #: 2501600001 Intersection: Main St & 9th Line TFR File #: 1 Count date: 17-Jan-25	Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **	Major Road: Main St runs W/E	

North Leg Total: 838 North Entering: 387 North Peds: 15 Peds Cross:	<table style="margin: auto;"> <tr><td>Buses</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Cars</td><td>186</td><td>141</td><td>59</td><td>386</td></tr> <tr><td>Totals</td><td>186</td><td>142</td><td>59</td><td></td></tr> </table>	Buses	0	1	0	1	Trucks	0	0	0	0	Cars	186	141	59	386	Totals	186	142	59			Buses 2 Trucks 1 Cars 448 Totals 451	East Leg Total: 1316 East Entering: 620 East Peds: 4 Peds Cross:
Buses	0	1	0	1																				
Trucks	0	0	0	0																				
Cars	186	141	59	386																				
Totals	186	142	59																					

Buses	Trucks	Cars	Totals
3	0	898	901

9th Line

9th Line

9th Line

N
W E
S

Buses	Trucks	Cars	Totals
0	0	213	213
2	0	555	557
0	0	284	284
2	0	1052	

Main St

Main St

Main St

Peds Cross: West Peds: 18 West Entering: 1054 West Leg Total: 1955	<table style="margin: auto;"> <tr><td>Cars</td><td>504</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Buses</td><td>1</td></tr> <tr><td>Totals</td><td>505</td></tr> </table>	Cars	504	Trucks	0	Buses	1	Totals	505		<table style="margin: auto;"> <tr><td>Cars</td><td>222</td><td>187</td><td>80</td><td>489</td></tr> <tr><td>Trucks</td><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>Buses</td><td>0</td><td>2</td><td>0</td><td>2</td></tr> <tr><td>Totals</td><td>222</td><td>190</td><td>80</td><td></td></tr> </table>	Cars	222	187	80	489	Trucks	0	1	0	1	Buses	0	2	0	2	Totals	222	190	80		Peds Cross: South Peds: 30 South Entering: 492 South Leg Total: 997
Cars	504																															
Trucks	0																															
Buses	1																															
Totals	505																															
Cars	222	187	80	489																												
Trucks	0	1	0	1																												
Buses	0	2	0	2																												
Totals	222	190	80																													

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Whitchurch-Stouffville

Site #: 2501600001

Intersection: Main St & 9th Line

TFR File #: 1

Count date: 17-Jan-25

Weather conditions:

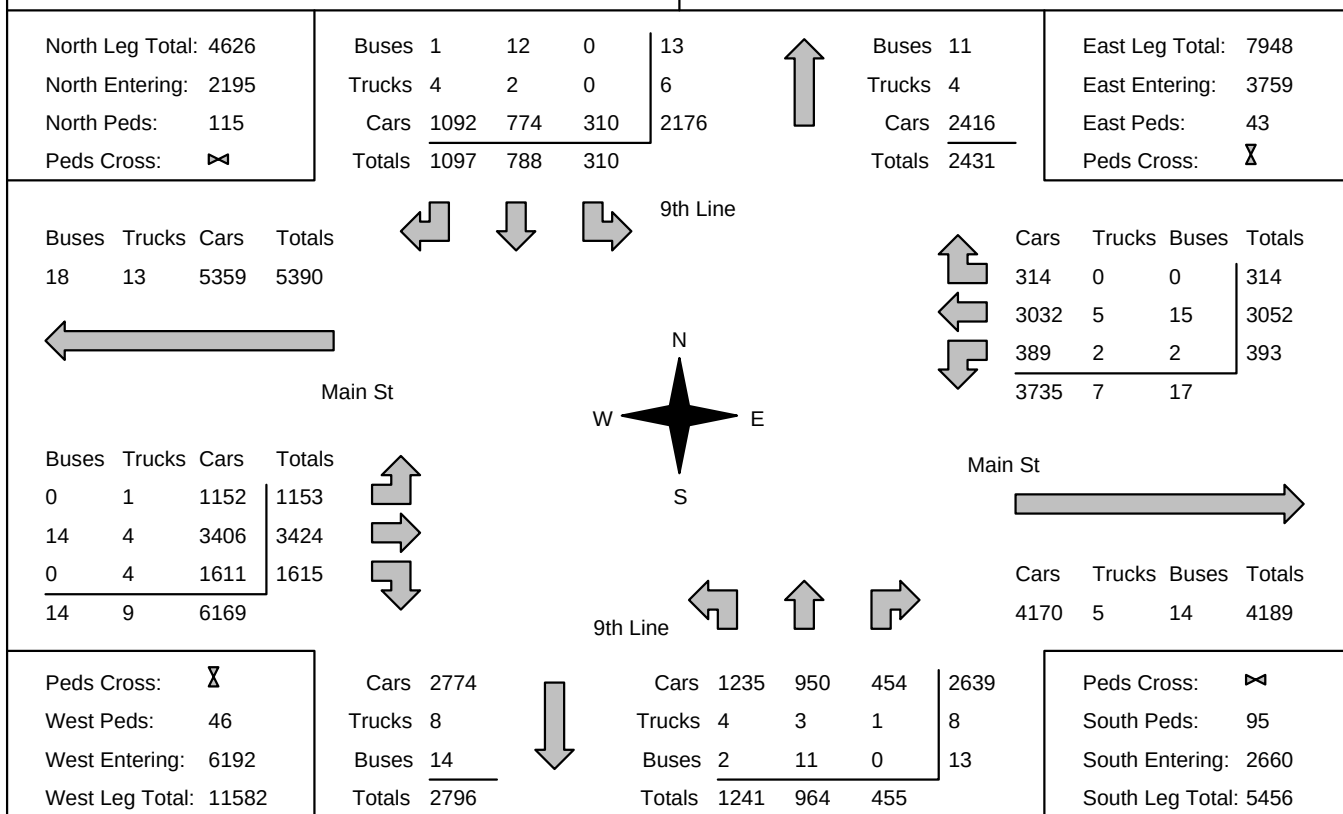
Person counted:

Person prepared:

Person checked:

**** Signalized Intersection ****

Major Road: Main St runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Main St & 9th Line					Count Date: 17-Jan-25		Municipality: Whitchurch-Stouffville					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
12:00:00	0	0	0	0	0	0	12:00:00	0	0	0	0	0
13:00:00	45	95	188	328	18	703	13:00:00	196	112	67	375	16
14:00:00	43	101	150	294	32	622	14:00:00	162	98	68	328	16
15:00:00	36	90	134	260	10	646	15:00:00	178	147	61	386	6
17:00:00	33	74	94	201	9	418	17:00:00	101	84	32	217	22
18:00:00	54	143	191	388	14	881	18:00:00	218	198	77	493	14
19:00:00	51	141	174	366	9	769	19:00:00	177	163	63	403	9
20:00:00	29	99	124	252	20	556	20:00:00	148	99	57	304	7
Totals:	291	743	1055	2089	112	4595	S Totals:	1180	901	425	2506	90
East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
12:00:00	0	0	0	0	0	0	12:00:00	0	0	0	0	0
13:00:00	67	554	39	660	9	1496	13:00:00	163	503	170	836	3
14:00:00	63	493	37	593	13	1436	14:00:00	160	470	213	843	9
15:00:00	44	438	37	519	2	1365	15:00:00	132	508	206	846	1
17:00:00	27	219	32	278	0	818	17:00:00	89	304	147	540	17
18:00:00	82	487	52	621	4	1666	18:00:00	208	546	291	1045	4
19:00:00	58	410	53	521	2	1475	19:00:00	172	502	280	954	4
20:00:00	34	333	43	410	11	1215	20:00:00	161	438	206	805	6
Totals:	375	2934	293	3602	41	9471	W Totals:	1085	3271	1513	5869	44
Calculated Values for Traffic Crossing Major Street												
Hours Ending:	12:00	13:00	14:00	15:00			17:00	18:00	19:00	20:00		
Crossing Values:	0	365	328	364			235	478	397	293		



Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Buses - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	11	11	27	27	52	52	0	0	0	0	1	1	0	0	0	0	0	0	1	1
12:30:00	22	11	47	20	91	39	0	0	0	0	1	0	0	0	0	0	0	0	12	11
12:45:00	35	13	76	29	145	54	0	0	1	1	1	0	0	0	1	1	0	0	17	5
13:00:00	45	10	93	17	187	42	0	0	1	0	1	0	0	0	1	0	0	0	18	1
13:15:00	57	12	121	28	222	35	0	0	1	0	1	0	0	0	1	0	0	0	25	7
13:30:00	61	4	145	24	256	34	0	0	1	0	1	0	0	0	2	1	0	0	30	5
13:45:00	73	12	172	27	293	37	0	0	1	0	2	1	0	0	2	0	1	1	37	7
14:00:00	88	15	193	21	335	42	0	0	1	0	2	0	0	0	2	0	1	0	50	13
14:15:00	99	11	216	23	373	38	0	0	2	1	2	0	0	0	3	1	1	0	50	0
14:30:00	109	10	240	24	394	21	0	0	2	0	2	0	0	0	3	0	1	0	53	3
14:45:00	113	4	262	22	435	41	0	0	2	0	4	2	0	0	3	0	1	0	54	1
15:00:00	124	11	280	18	467	32	0	0	2	0	4	0	0	0	4	1	1	0	60	6
15:15:00	124	0	280	0	467	0	0	0	2	0	4	0	0	0	4	0	1	0	60	0
16:30:00	124	0	280	0	467	0	0	0	2	0	4	0	0	0	4	0	1	0	60	0
16:45:00	141	17	320	40	516	49	0	0	2	0	4	0	0	0	6	2	1	0	66	6
17:00:00	157	16	352	32	561	45	0	0	2	0	4	0	0	0	6	0	1	0	69	3
17:15:00	172	15	386	34	614	53	0	0	2	0	4	0	0	0	7	1	1	0	70	1
17:30:00	186	14	423	37	653	39	0	0	2	0	4	0	0	0	7	0	1	0	77	7
17:45:00	200	14	461	38	702	49	0	0	2	0	4	0	0	0	7	0	1	0	81	4
18:00:00	211	11	493	32	752	50	0	0	2	0	4	0	0	0	8	1	1	0	83	2
18:15:00	226	15	535	42	809	57	0	0	2	0	4	0	0	0	8	0	1	0	84	1
18:30:00	239	13	567	32	855	46	0	0	2	0	4	0	0	0	8	0	1	0	86	2
18:45:00	252	13	606	39	893	38	0	0	2	0	4	0	0	0	9	1	1	0	86	0
19:00:00	262	10	633	27	926	33	0	0	2	0	4	0	0	0	9	0	1	0	92	6
19:15:00	273	11	663	30	958	32	0	0	2	0	4	0	0	0	10	1	1	0	102	10
19:30:00																				



Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Buses - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	18	18	141	141	9	9	1	1	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	30	12	278	137	21	12	1	0	1	1	0	0	0	0	1	1	0	0	3	3
12:45:00	47	17	402	124	31	10	1	0	2	1	0	0	0	0	1	0	0	0	9	6
13:00:00	66	19	550	148	39	8	1	0	3	1	0	0	0	0	1	0	0	0	9	0
13:15:00	85	19	660	110	43	4	1	0	3	0	0	0	0	0	2	1	0	0	13	4
13:30:00	99	14	805	145	56	13	1	0	3	0	0	0	0	0	3	1	0	0	14	1
13:45:00	111	12	917	112	66	10	1	0	3	0	0	0	0	0	3	0	0	0	17	3
14:00:00	129	18	1041	124	76	10	1	0	3	0	0	0	0	0	3	0	0	0	22	5
14:15:00	148	19	1155	114	84	8	1	0	4	1	0	0	0	0	4	1	0	0	22	0
14:30:00	158	10	1251	96	94	10	2	1	5	1	0	0	0	0	4	0	0	0	23	1
14:45:00	161	3	1363	112	98	4	2	0	5	0	0	0	0	0	4	0	0	0	23	0
15:00:00	172	11	1475	112	113	15	2	0	5	0	0	0	0	0	5	1	0	0	24	1
15:15:00	172	0	1475	0	113	0	2	0	5	0	0	0	0	0	5	0	0	0	24	0
16:30:00	172	0	1475	0	113	0	2	0	5	0	0	0	0	0	5	0	0	0	24	0
16:45:00	189	17	1560	85	135	22	2	0	5	0	0	0	2	2	5	0	0	0	24	0
17:00:00	197	8	1693	133	145	10	2	0	5	0	0	0	2	0	6	1	0	0	24	0
17:15:00	221	24	1802	109	156	11	2	0	5	0	0	0	2	0	7	1	0	0	26	2
17:30:00	250	29	1936	134	172	16	2	0	5	0	0	0	2	0	7	0	0	0	28	2
17:45:00	268	18	2050	114	183	11	2	0	5	0	0	0	2	0	8	1	0	0	28	0
18:00:00	279	11	2178	128	197	14	2	0	5	0	0	0	2	0	8	0	0	0	28	0
18:15:00	296	17	2267	89	208	11	2	0	5	0	0	0	2	0	9	1	0	0	28	0
18:30:00	311	15	2387	120	226	18	2	0	5	0	0	0	2	0	11	2	0	0	28	0
18:45:00	322	11	2481	94	235	9	2	0	5	0	0	0	2	0	11	0	0	0	28	0
19:00:00	337	15	2584	103	250	15	2	0	5	0	0	0	2	0	12	1	0	0	30	2
19:15:00	344	7	2661	77	263	13	2	0	5	0	0	0	2	0	13	1	0	0	40</	



Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Buses - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	48	48	25	25	14	14	0	0	0	0	0	0	0	0	0	0	0	0	3	3
12:30:00	102	54	53	28	34	20	0	0	0	0	0	0	0	0	1	1	0	0	12	9
12:45:00	151	49	72	19	48	14	0	0	0	0	0	0	0	0	1	0	0	0	14	2
13:00:00	196	45	111	39	67	19	0	0	0	0	0	0	0	0	1	0	0	0	16	2
13:15:00	226	30	134	23	83	16	0	0	0	0	1	1	0	0	2	1	0	0	16	0
13:30:00	261	35	154	20	101	18	0	0	0	0	1	0	0	0	2	0	0	0	23	7
13:45:00	315	54	185	31	117	16	0	0	0	0	1	0	0	0	2	0	0	0	25	2
14:00:00	358	43	207	22	134	17	0	0	0	0	1	0	0	0	3	1	0	0	32	7
14:15:00	404	46	235	28	143	9	0	0	0	0	1	0	0	0	3	0	0	0	33	1
14:30:00	446	42	276	41	155	12	0	0	0	0	1	0	0	0	4	1	0	0	37	4
14:45:00	485	39	320	44	174	19	0	0	1	1	1	0	0	0	5	1	0	0	37	0
15:00:00	533	48	351	31	195	21	1	1	1	0	1	0	2	2	5	0	0	0	38	1
15:15:00	533	0	351	0	195	0	1	0	1	0	1	0	2	0	5	0	0	0	38	0
16:30:00	533	0	351	0	195	0	1	0	1	0	1	0	2	0	5	0	0	0	38	0
16:45:00	584	51	392	41	208	13	2	1	2	1	1	0	2	0	5	0	0	0	44	6
17:00:00	633	49	434	42	227	19	2	0	2	0	1	0	2	0	5	0	0	0	60	16
17:15:00	688	55	479	45	245	18	2	0	3	1	1	0	2	0	6	1	0	0	70	10
17:30:00	746	58	516	37	268	23	2	0	3	0	1	0	2	0	6	0	0	0	72	2
17:45:00	806	60	579	63	288	20	2	0	3	0	1	0	2	0	7	1	0	0	74	2
18:00:00	851	45	629	50	304	16	2	0	3	0	1	0	2	0	7	0	0	0	74	0
18:15:00	902	51	680	51	319	15	3	1	3	0	1	0	2	0	7	0	0	0	74	0
18:30:00	941	39	725	45	335	16	3	0	3	0	1	0	2	0	8	1	0	0	77	3
18:45:00	982	41	762	37	353	18	4	1	3	0	1	0	2	0	8	0	0	0	78	1
19:00:00	1026	44	791	29	367	14	4	0	3	0	1	0	2	0	8	0	0	0	83	5
19:15:00	1073	47	819	28	380	13	4	0	3	0	1	0	2	0	9	1	0	0	88	5
19																				



Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Buses - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	35	35	124	124	41	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	78	43	260	136	81	40	0	0	0	0	1	1	0	0	0	0	0	0	2	2
12:45:00	117	39	380	120	130	49	0	0	0	0	1	0	0	0	1	1	0	0	3	1
13:00:00	163	46	502	122	168	38	0	0	0	0	2	1	0	0	1	0	0	0	3	0
13:15:00	204	41	620	118	216	48	0	0	1	1	2	0	0	0	1	0	0	0	6	3
13:30:00	245	41	728	108	283	67	0	0	2	1	2	0	0	0	3	2	0	0	6	0
13:45:00	285	40	847	119	337	54	0	0	2	0	2	0	0	0	3	0	0	0	7	1
14:00:00	323	38	967	120	381	44	0	0	3	1	2	0	0	0	3	0	0	0	12	5
14:15:00	357	34	1069	102	436	55	0	0	3	0	2	0	0	0	4	1	0	0	12	0
14:30:00	392	35	1213	144	482	46	0	0	4	1	2	0	0	0	4	0	0	0	13	1
14:45:00	421	29	1318	105	533	51	1	1	4	0	2	0	0	0	5	1	0	0	13	0
15:00:00	454	33	1472	154	587	54	1	0	4	0	2	0	0	0	5	0	0	0	13	0
15:15:00	454	0	1472	0	587	0	1	0	4	0	2	0	0	0	5	0	0	0	13	0
16:30:00	454	0	1472	0	587	0	1	0	4	0	2	0	0	0	5	0	0	0	13	0
16:45:00	495	41	1617	145	661	74	1	0	4	0	2	0	0	0	6	1	0	0	16	3
17:00:00	543	48	1774	157	734	73	1	0	4	0	2	0	0	0	7	1	0	0	30	14
17:15:00	602	59	1910	136	817	83	1	0	4	0	2	0	0	0	7	0	0	0	34	4
17:30:00	659	57	2043	133	882	65	1	0	4	0	2	0	0	0	8	1	0	0	34	0
17:45:00	708	49	2172	129	945	63	1	0	4	0	2	0	0	0	8	0	0	0	34	0
18:00:00	751	43	2318	146	1023	78	1	0	4	0	4	2	0	0	9	1	0	0	34	0
18:15:00	794	43	2447	129	1091	68	1	0	4	0	4	0	0	0	9	0	0	0	34	0
18:30:00	834	40	2594	147	1164	73	1	0	4	0	4	0	0	0	9	0	0	0	35	1
18:45:00	877	43	2709	115	1235	71	1	0	4	0	4	0	0	0	10	1	0	0	36	1
19:00:00	923	46	2819	110	1303	68	1	0	4	0	4	0	0	0	10	0	0	0	38	2
19:15:00	966	43	2914	95	1356	53	1	0	4	0	4	0	0	0						

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:30:00 To: 20:30:00	One Hour Peak From: 16:30:00 To: 17:30:00
Municipality: Whitchurch-Stouffville Site #: 2401600001 Intersection: Main St & 9th Line TFR File #: 1 Count date: 18-Jan-25	Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **	Major Road: Main St runs W/E	

North Leg Total: 674 North Entering: 319 North Peds: 15 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">3</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars</td> <td style="padding: 2px;">154</td> <td style="padding: 2px;">122</td> <td style="padding: 2px;">40</td> <td style="padding: 2px;">316</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals</td> <td style="padding: 2px;">156</td> <td style="padding: 2px;">123</td> <td style="padding: 2px;">40</td> <td style="padding: 2px;"></td> </tr> </table>	Buses	0	0	0	0	Trucks	2	1	0	3	Cars	154	122	40	316	Totals	156	123	40		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks</td> <td style="padding: 2px;">1</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars</td> <td style="padding: 2px;">354</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals</td> <td style="padding: 2px;">355</td> </tr> </table>	Buses	0	Trucks	1	Cars	354	Totals	355	East Leg Total: 1043 East Entering: 502 East Peds: 4 Peds Cross:
Buses	0	0	0	0																											
Trucks	2	1	0	3																											
Cars	154	122	40	316																											
Totals	156	123	40																												
Buses	0																														
Trucks	1																														
Cars	354																														
Totals	355																														

Buses	Trucks	Cars	Totals
0	5	711	716

N
 W ——— E
 S

Cars	Trucks	Buses	Totals
42	1	0	43
410	2	0	412
47	0	0	47
499	3	0	

Buses	Trucks	Cars	Totals
0	0	159	159
0	3	443	446
0	1	214	215
0	4	816	

Main St

Main St

Buses	Trucks	Cars	Totals
0	0	159	159
0	3	443	446
0	1	214	215
0	4	816	

9th Line

9th Line

Peds Cross: West Peds: 4 West Entering: 820 West Leg Total: 1536	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars</td> <td style="padding: 2px;">383</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks</td> <td style="padding: 2px;">2</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals</td> <td style="padding: 2px;">385</td> </tr> </table>	Cars	383	Trucks	2	Buses	0	Totals	385	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars</td> <td style="padding: 2px;">147</td> <td style="padding: 2px;">153</td> <td style="padding: 2px;">54</td> <td style="padding: 2px;">354</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">1</td> <td style="padding: 2px;">2</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> <td style="padding: 2px;">0</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals</td> <td style="padding: 2px;">148</td> <td style="padding: 2px;">153</td> <td style="padding: 2px;">55</td> <td style="padding: 2px;"></td> </tr> </table>	Cars	147	153	54	354	Trucks	1	0	1	2	Buses	0	0	0	0	Totals	148	153	55		Peds Cross: South Peds: 4 South Entering: 356 South Leg Total: 741
Cars	383																														
Trucks	2																														
Buses	0																														
Totals	385																														
Cars	147	153	54	354																											
Trucks	1	0	1	2																											
Buses	0	0	0	0																											
Totals	148	153	55																												

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Whitchurch-Stouffville

Site #: 2401600001

Intersection: Main St & 9th Line

TFR File #: 1

Count date: 18-Jan-25

Weather conditions:

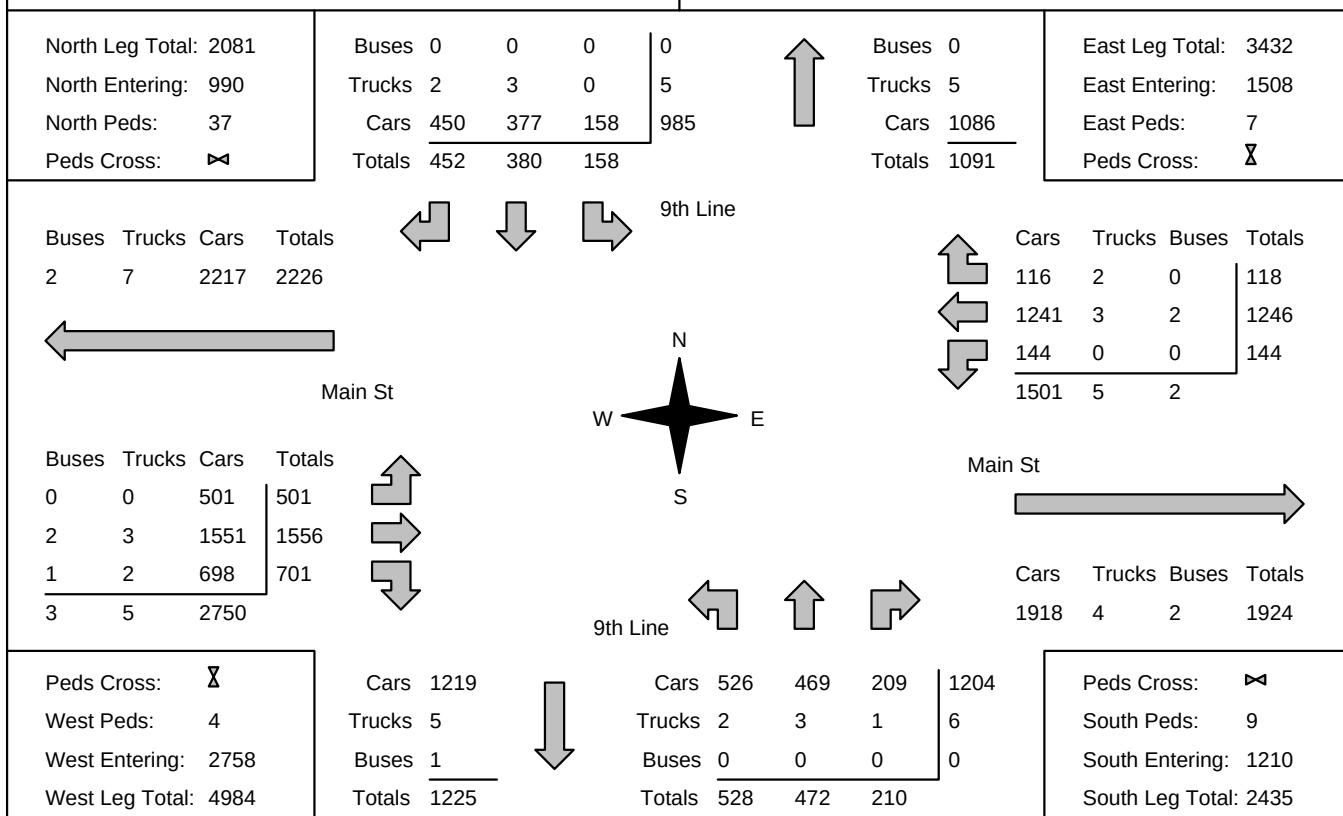
Person counted:

Person prepared:

Person checked:

**** Signalized Intersection ****

Major Road: Main St runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Main St & 9th Line					Count Date: 18-Jan-25		Municipality: Whitchurch-Stouffville					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
17:00:00	23	52	76	151	8	337	17:00:00	74	88	24	186	2
18:00:00	34	127	153	314	12	651	18:00:00	150	121	66	337	5
19:00:00	50	105	125	280	9	583	19:00:00	141	113	49	303	1
20:00:00	32	68	72	172	6	432	20:00:00	106	100	54	260	0

[illegible]

[illegible]

[illegible]

[illegible]

Accu-Traffic Inc.

Mid-day Peak Diagram		Specified Period From: 12:00:00 To: 15:00:00	One Hour Peak From: 12:00:00 To: 13:00:00
Municipality: Whitchurch-Stouffville Site #: 2413400001 Intersection: Main St & Winona Dr TFR File #: 1 Count date: 19-Jul-24		Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Main St runs W/E	

North Leg Total: 216 North Entering: 104 North Peds: 15 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>1</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>Cars</td><td>42</td><td>0</td><td>61</td><td>103</td></tr> <tr><td>Totals</td><td>43</td><td>0</td><td>61</td><td></td></tr> </table>	Buses	0	0	0	0	Trucks	1	0	0	1	Cars	42	0	61	103	Totals	43	0	61		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>0</td></tr> <tr><td>Trucks</td><td>4</td></tr> <tr><td>Cars</td><td>108</td></tr> <tr><td>Totals</td><td>112</td></tr> </table>	Buses	0	Trucks	4	Cars	108	Totals	112	East Leg Total: 1766 East Entering: 899 East Peds: 0 Peds Cross:
Buses	0	0	0	0																											
Trucks	1	0	0	1																											
Cars	42	0	61	103																											
Totals	43	0	61																												
Buses	0																														
Trucks	4																														
Cars	108																														
Totals	112																														

Buses	Trucks	Cars	Totals
0	21	865	886

Main St

Buses	Trucks	Cars	Totals
0	1	60	61
2	14	779	795
0	5	0	5
2	20	839	

Main St

Winona Dr

driveway

Cars	Trucks	Buses	Totals
48	3	0	51
823	18	0	841
0	7	0	7
871	28	0	

Main St

Cars	Trucks	Buses	Totals
840	25	2	867

Peds Cross: West Peds: 1 West Entering: 861 West Leg Total: 1747	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>0</td></tr> <tr><td>Trucks</td><td>12</td></tr> <tr><td>Buses</td><td>0</td></tr> <tr><td>Totals</td><td>12</td></tr> </table>	Cars	0	Trucks	12	Buses	0	Totals	12	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>2</td><td>0</td><td>11</td><td>13</td></tr> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>2</td><td>0</td><td>11</td><td></td></tr> </table>	Cars	0	0	0	0	Trucks	2	0	11	13	Buses	0	0	0	0	Totals	2	0	11		Peds Cross: South Peds: 17 South Entering: 13 South Leg Total: 25
Cars	0																														
Trucks	12																														
Buses	0																														
Totals	12																														
Cars	0	0	0	0																											
Trucks	2	0	11	13																											
Buses	0	0	0	0																											
Totals	2	0	11																												

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram		Specified Period From: 16:30:00 To: 20:30:00	One Hour Peak From: 16:30:00 To: 17:30:00
Municipality: Whitchurch-Stouffville Site #: 2413400001 Intersection: Main St & Winona Dr TFR File #: 1 Count date: 19-Jul-24		Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Main St runs W/E	

North Leg Total: 192 North Entering: 102 North Peds: 21 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Cars</td><td>34</td><td>0</td><td>68</td><td>102</td></tr> <tr><td>Totals</td><td>34</td><td>0</td><td>68</td><td></td></tr> </table>	Buses	0	0	0	0	Trucks	0	0	0	0	Cars	34	0	68	102	Totals	34	0	68		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>0</td></tr> <tr><td>Trucks</td><td>2</td></tr> <tr><td>Cars</td><td>88</td></tr> <tr><td>Totals</td><td>90</td></tr> </table>	Buses	0	Trucks	2	Cars	88	Totals	90	East Leg Total: 1849 East Entering: 847 East Peds: 1 Peds Cross:
Buses	0	0	0	0																											
Trucks	0	0	0	0																											
Cars	34	0	68	102																											
Totals	34	0	68																												
Buses	0																														
Trucks	2																														
Cars	88																														
Totals	90																														

Buses	Trucks	Cars	Totals
2	2	830	834

Main St

Buses	Trucks	Cars	Totals
0	0	41	41
1	1	931	933
0	0	1	1
1	1	973	

Main St

Winona Dr

driveway

Cars	Trucks	Buses	Totals
46	2	0	48
794	2	2	798
1	0	0	1
841	4	2	

Main St

Cars	Trucks	Buses	Totals
1000	1	1	1002

Peds Cross: West Peds: 2 West Entering: 975 West Leg Total: 1809	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>2</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Buses</td><td>0</td></tr> <tr><td>Totals</td><td>2</td></tr> </table>	Cars	2	Trucks	0	Buses	0	Totals	2	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>2</td><td>1</td><td>1</td><td>4</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>2</td><td>1</td><td>1</td><td></td></tr> </table>	Cars	2	1	1	4	Trucks	0	0	0	0	Buses	0	0	0	0	Totals	2	1	1		Peds Cross: South Peds: 23 South Entering: 4 South Leg Total: 6
Cars	2																														
Trucks	0																														
Buses	0																														
Totals	2																														
Cars	2	1	1	4																											
Trucks	0	0	0	0																											
Buses	0	0	0	0																											
Totals	2	1	1																												

Comments

Accu-Traffic Inc.

Total Count Diagram

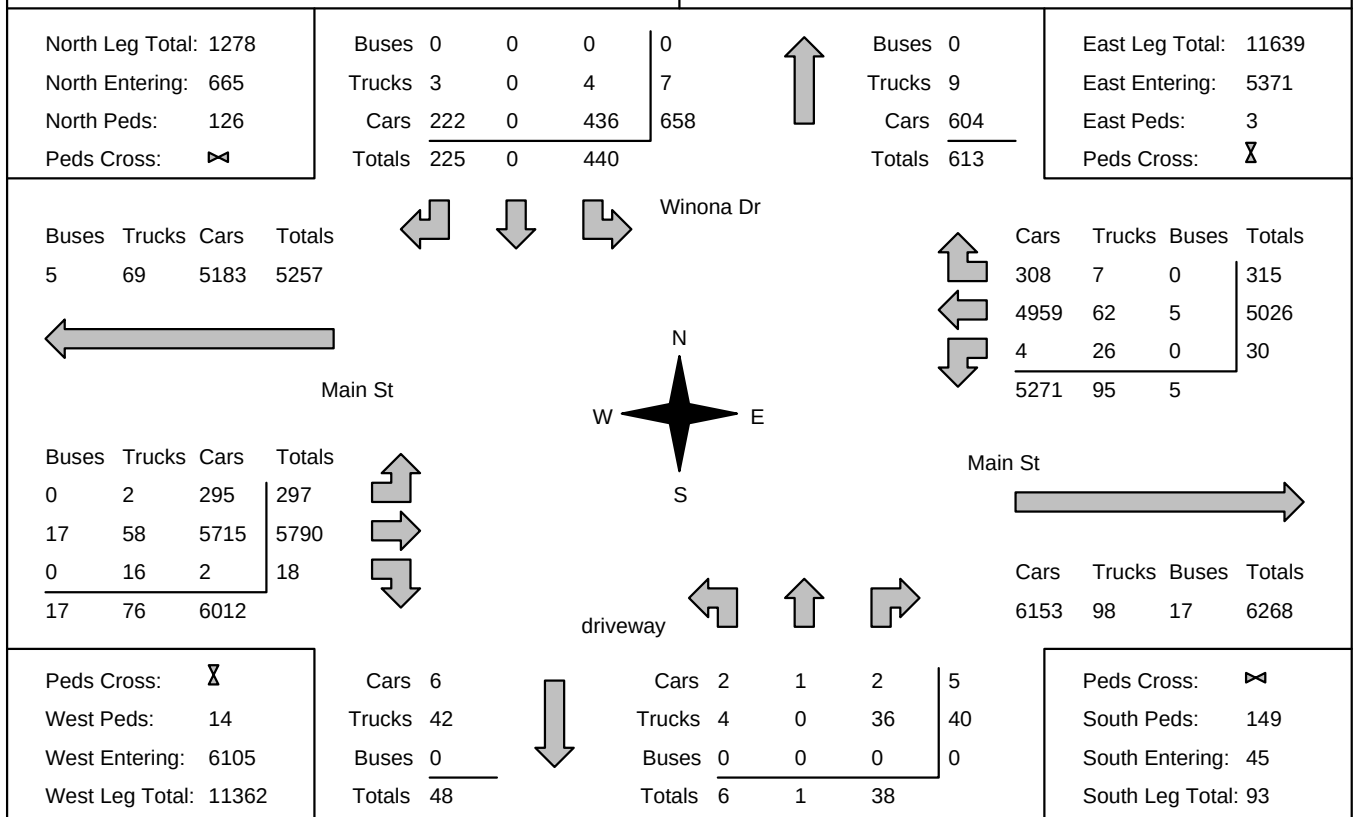
Municipality: Whitchurch-Stouffville
Site #: 2413400001
Intersection: Main St & Winona Dr
TFR File #: 1
Count date: 19-Jul-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Main St runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Main St & Winona Dr					Count Date: 19-Jul-24		Municipality: Whitchurch-Stouffville					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
12:00:00	0	0	0	0	0	0	12:00:00	0	0	0	0	0
13:00:00	61	0	43	104	15	117	13:00:00	2	0	11	13	17
14:00:00	50	0	28	78	15	91	14:00:00	2	0	11	13	20
15:00:00	61	0	32	93	16	108	15:00:00	0	0	15	15	13
17:00:00	42	0	20	62	13	63	17:00:00	1	0	0	1	14
18:00:00	73	0	25	98	17	101	18:00:00	1	1	1	3	16
19:00:00	58	0	35	93	14	93	19:00:00	0	0	0	0	31
20:00:00	69	0	32	101	20	101	20:00:00	0	0	0	0	22

Accu-Traffic Inc.

Count Date: 19-Jul-24 **Site #:** 2413400001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Buses - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	17	17	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	3	3
12:30:00	32	15	0	0	22	13	0	0	0	0	0	0	0	0	0	0	0	0	6	3
12:45:00	46	14	0	0	29	7	0	0	0	0	1	1	0	0	0	0	0	0	12	6
13:00:00	61	15	0	0	42	13	0	0	0	0	1	0	0	0	0	0	0	0	15	3
13:15:00	77	16	0	0	44	2	0	0	0	0	2	1	0	0	0	0	0	0	20	5
13:30:00	83	6	0	0	56	12	1	1	0	0	2	0	0	0	0	0	0	0	25	5
13:45:00	100	17	0	0	63	7	1	0	0	0	2	0	0	0	0	0	0	0	27	2
14:00:00	110	10	0	0	69	6	1	0	0	0	2	0	0	0	0	0	0	0	30	3
14:15:00	130	20	0	0	77	8	1	0	0	0	2	0	0	0	0	0	0	0	33	3
14:30:00	147	17	0	0	87	10	1	0	0	0	2	0	0	0	0	0	0	0	37	4
14:45:00	158	11	0	0	94	7	2	1	0	0	2	0	0	0	0	0	0	0	43	6
15:00:00	170	12	0	0	101	7	2	0	0	0	2	0	0	0	0	0	0	0	46	3
15:15:00	170	0	0	0	101	0	2	0	0	0	2	0	0	0	0	0	0	0	46	0
16:30:00	170	0	0	0	101	0	2	0	0	0	2	0	0	0	0	0	0	0	46	0
16:45:00	196	26	0	0	114	13	2	0	0	0	2	0	0	0	0	0	0	0	52	6
17:00:00	212	16	0	0	121	7	2	0	0	0	2	0	0	0	0	0	0	0	59	7
17:15:00	221	9	0	0	129	8	2	0	0	0	2	0	0	0	0	0	0	0	61	2
17:30:00	238	17	0	0	135	6	2	0	0	0	2	0	0	0	0	0	0	0	67	6
17:45:00	257	19	0	0	142	7	2	0	0	0	2	0	0	0	0	0	0	0	72	5
18:00:00	284	27	0	0	146	4	3	1	0	0	2	0	0	0	0	0	0	0	76	4
18:15:00	300	16	0	0	154	8	3	0	0	0	3	1	0	0	0	0	0	0	78	2
18:30:00	313	13	0	0	161	7	3	0	0	0	3	0	0	0	0	0	0	0	78	0
18:45:00	324	11	0	0	170	9	3	0	0	0	3	0	0	0	0	0	0	0	85	7
19:00:00	341	17	0	0	180	10	4	1	0	0	3	0	0	0	0	0	0	0	90	5
19:15:00	364	23	0	0	186	6	4	0	0	0	3	0	0	0	0	0	0	0	98	8
19:30:00	379	15	0	0	197	11	4	0	0	0	3	0	0	0	0	0	0	0	103	5
19:45:00	392	13	0	0	204	7	4	0	0	0	3	0	0	0	0	0	0	0	108	5
20:00:00	410	18	0	0	212	8	4	0	0	0	3	0	0	0	0	0	0	0	110	2
20:15:00	422	12	0	0	219	7	4	0	0	0	3	0	0	0	0	0	0	0	118	8
20:30:00	436	14	0	0	222	3	4	0	0	0	3	0	0	0	0	0	0	0	126	8
20:45:00	436	0	0	0	222	0	4	0	0	0	3	0	0	0	0	0	0	0	126	0
20:45:15	436	0	0	0	222	0	4	0	0	0	3	0	0	0	0	0	0	0	126	0



Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Buses - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	0	0	214	214	17	17	1	1	5	5	1	1	0	0	0	0	0	0	0	0
12:30:00	0	0	406	192	22	5	7	6	12	7	1	0	0	0	0	0	0	0	0	0
12:45:00	0	0	616	210	38	16	7	0	16	4	2	1	0	0	0	0	0	0	0	0
13:00:00	0	0	823	207	48	10	7	0	18	2	3	1	0	0	0	0	0	0	0	0
13:15:00	0	0	1007	184	58	10	8	1	23	5	4	1	0	0	1	1	0	0	0	0
13:30:00	0	0	1187	180	73	15	14	6	29	6	4	0	0	0	1	0	0	0	0	0
13:45:00	0	0	1381	194	78	5	14	0	32	3	4	0	0	0	1	0	0	0	0	0
14:00:00	0	0	1590	209	89	11	15	1	35	3	4	0	0	0	1	0	0	0	0	0
14:15:00	0	0	1765	175	101	12	18	3	40	5	4	0	0	0	1	0	0	0	0	0
14:30:00	3	3	1947	182	108	7	23	5	45	5	4	0	0	0	1	0	0	0	0	0
14:45:00	3	0	2149	202	121	13	25	2	52	7	5	1	0	0	1	0	0	0	0	0
15:00:00	3	0	2323	174	134	13	26	1	55	3	5	0	0	0	1	0	0	0	0	0
15:15:00	3	0	2323	0	134	0	26	0	55	0	5	0	0	0	1	0	0	0	0	0
16:30:00	3	0	2323	0	134	0	26	0	55	0	5	0	0	0	1	0	0	0	0	0
16:45:00	4	1	2508	185	142	8	26	0	55	0	6	1	0	0	2	1	0	0	1	1
17:00:00	4	0	2729	221	154	12	26	0	55	0	7	1	0	0	2	0	0	0	1	0
17:15:00	4	0	2915	186	173	19	26	0	57	2	7	0	0	0	3	1	0	0	1	0
17:30:00	4	0	3117	202	180	7	26	0	57	0	7	0	0	0	3	0	0	0	1	0
17:45:00	4	0	3302	185	193	13	26	0	58	1	7	0	0	0	3	0	0	0	1	0
18:00:00	4	0	3488	186	210	17	26	0	58	0	7	0	0	0	3	0	0	0	1	0
18:15:00	4	0	3661	173	235	25	26	0	58	0	7	0	0	0	4	1	0	0	1	0
18:30:00	4	0	3825	164	242	7	26	0	58	0	7	0	0	0	4	0	0	0	1	0
18:45:00	4	0	4004	179	252	10	26	0	61	3	7	0	0	0	4	0	0	0	1	0
19:00:00	4	0	4161	157	267	15	26	0	61	0	7	0	0	0	4	0	0	0	1	0
19:15:00	4	0	4312	151	277	10	26	0	61	0	7	0	0	0	5	1	0	0	1	0
19:30:00	4																			



Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Buses - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	3	3
12:30:00	0	0	0	0	0	0	1	0	0	0	6	5	0	0	0	0	0	0	5	2
12:45:00	0	0	0	0	0	0	1	0	0	0	9	3	0	0	0	0	0	0	8	3
13:00:00	0	0	0	0	0	0	2	1	0	0	11	2	0	0	0	0	0	0	17	9
13:15:00	0	0	0	0	0	0	2	0	0	0	13	2	0	0	0	0	0	0	23	6
13:30:00	0	0	0	0	0	0	3	1	0	0	16	3	0	0	0	0	0	0	29	6
13:45:00	0	0	0	0	0	0	4	1	0	0	20	4	0	0	0	0	0	0	33	4
14:00:00	0	0	0	0	0	0	4	0	0	0	22	2	0	0	0	0	0	0	37	4
14:15:00	0	0	0	0	0	0	4	0	0	0	25	3	0	0	0	0	0	0	41	4
14:30:00	0	0	0	0	1	1	4	0	0	0	29	4	0	0	0	0	0	0	44	3
14:45:00	0	0	0	0	1	0	4	0	0	0	32	3	0	0	0	0	0	0	45	1
15:00:00	0	0	0	0	1	0	4	0	0	0	36	4	0	0	0	0	0	0	50	5
15:15:00	0	0	0	0	1	0	4	0	0	0	36	0	0	0	0	0	0	0	50	0
16:30:00	0	0	0	0	1	0	4	0	0	0	36	0	0	0	0	0	0	0	50	0
16:45:00	1	1	0	0	1	0	4	0	0	0	36	0	0	0	0	0	0	0	56	6
17:00:00	1	0	0	0	1	0	4	0	0	0	36	0	0	0	0	0	0	0	64	8
17:15:00	2	1	1	1	1	0	4	0	0	0	36	0	0	0	0	0	0	0	69	5
17:30:00	2	0	1	0	2	1	4	0	0	0	36	0	0	0	0	0	0	0	73	4
17:45:00	2	0	1	0	2	0	4	0	0	0	36	0	0	0	0	0	0	0	78	5
18:00:00	2	0	1	0	2	0	4	0	0	0	36	0	0	0	0	0	0	0	80	2
18:15:00	2	0	1	0	2	0	4	0	0	0	36	0	0	0	0	0	0	0	84	4
18:30:00	2	0	1	0	2	0	4	0	0	0	36	0	0	0	0	0	0	0	87	3
18:45:00	2	0	1	0	2	0	4	0	0	0	36	0	0	0	0	0	0	0	100	13
19:00:00	2	0	1	0	2	0	4	0	0	0	36	0	0	0	0	0	0	0	111	11
19:15:00	2	0	1	0	2	0	4	0	0	0	36	0	0	0	0	0	0	0	121	10
19:30:00	2	0	1	0	2	0	4	0	0	0	36	0	0	0	0	0	0	0	126	5
19:45:00	2	0	1	0	2	0														



Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Buses - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	19	19	199	199	0	0	0	0	6	6	2	2	0	0	1	1	0	0	0	0
12:30:00	28	9	395	196	0	0	1	1	7	1	3	1	0	0	1	0	0	0	0	0
12:45:00	42	14	589	194	0	0	1	0	10	3	4	1	0	0	2	1	0	0	0	0
13:00:00	60	18	779	190	0	0	1	0	14	4	5	1	0	0	2	0	0	0	1	1
13:15:00	68	8	993	214	0	0	1	0	20	6	7	2	0	0	3	1	0	0	2	1
13:30:00	76	8	1195	202	0	0	1	0	25	5	8	1	0	0	3	0	0	0	4	2
13:45:00	87	11	1375	180	0	0	1	0	28	3	9	1	0	0	4	1	0	0	4	0
14:00:00	103	16	1585	210	1	1	1	0	35	7	11	2	0	0	5	1	0	0	4	0
14:15:00	112	9	1796	211	1	0	1	0	41	6	11	0	0	0	5	0	0	0	4	0
14:30:00	120	8	1984	188	1	0	1	0	45	4	12	1	0	0	5	0	0	0	5	1
14:45:00	131	11	2206	222	1	0	1	0	49	4	15	3	0	0	5	0	0	0	5	0
15:00:00	139	8	2410	204	1	0	1	0	54	5	16	1	0	0	6	1	0	0	6	1
15:15:00	139	0	2410	0	1	0	1	0	54	0	16	0	0	0	6	0	0	0	6	0
16:30:00	139	0	2410	0	1	0	1	0	54	0	16	0	0	0	6	0	0	0	6	0
16:45:00	153	14	2661	251	1	0	1	0	54	0	16	0	0	0	6	0	0	0	6	0
17:00:00	165	12	2867	206	1	0	1	0	55	1	16	0	0	0	7	1	0	0	6	0
17:15:00	167	2	3109	242	1	0	1	0	55	0	16	0	0	0	7	0	0	0	6	0
17:30:00	180	13	3341	232	2	1	1	0	55	0	16	0	0	0	7	0	0	0	8	2
17:45:00	191	11	3546	205	2	0	1	0	56	1	16	0	0	0	8	1	0	0	8	0
18:00:00	207	16	3758	212	2	0	2	1	56	0	16	0	0	0	9	1	0	0	8	0
18:15:00	211	4	3964	206	2	0	2	0	56	0	16	0	0	0	10	1	0	0	8	0
18:30:00	217	6	4189	225	2	0	2	0	57	1	16	0	0	0	11	1	0	0	8	0
18:45:00	228	11	4379	190	2	0	2	0	57	0	16	0	0	0	13	2	0	0	12	4
19:00:00	237	9	4589	210	2	0	2	0	57	0	16	0	0	0	13	0	0	0	12	0
19:15:00	247	10	4791	202	2	0	2	0	58	1	16	0	0	0	14	1	0	0	12	0
19:30:00	256																			

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:30:00 To: 20:30:00	One Hour Peak From: 16:30:00 To: 17:30:00
Municipality: Whitchurch-Stouffville Site #: 2413400001 Intersection: Main St & Winona Dr TFR File #: 1 Count date: 20-Jul-24	Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **	Major Road: Main St runs W/E	

North Leg Total: 142 North Entering: 70 North Peds: 15 Peds Cross:		East Leg Total: 1351 East Entering: 621 East Peds: 0 Peds Cross:
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Buses 0 Trucks 0 Cars 23 Totals 23		Winona Dr	Buses 0 Trucks 0 Cars 72 Totals 72
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Buses 0 Trucks 0 Cars 604 Totals 604		Main St	Cars 40 Trucks 0 Buses 0 Totals 40 581 0 621
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Buses 0 Trucks 0 Cars 32 Totals 32 1 0 714		Main St	Cars 729 Trucks 0 Buses 1 Totals 730
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Peds Cross: West Peds: 0 West Entering: 715 West Leg Total: 1319		Cars 0 Trucks 0 Buses 0 Totals 0	Cars 0 Trucks 0 Buses 0 Totals 0
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Peds Cross: South Peds: 11 South Entering: 0 South Leg Total: 0		Cars 0 Trucks 0 Buses 0 Totals 0	Cars 0 Trucks 0 Buses 0 Totals 0
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Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Main St & Winona Dr					Count Date: 20-Jul-24		Municipality: Whitchurch-Stouffville					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
17:00:00	28	0	13	41	7	41	17:00:00	0	0	0	0	8
18:00:00	44	0	22	66	11	66	18:00:00	0	0	0	0	6
19:00:00	68	0	16	84	20	84	19:00:00	0	0	0	0	22
20:00:00	57	0	17	74	15	74	20:00:00	0	0	0	0	7

[illegible]

[illegible]

[illegible]

[illegible]

Bike Volumes Friday Midday and PM Peak

[illegible]

Accu-Traffic Inc.

Mid-day Peak Diagram	Specified Period From: 12:00:00 To: 15:00:00	One Hour Peak From: 12:30:00 To: 13:30:00
Municipality: Whitchurch-Stouffville Site #: 2413400002 Intersection: Rupert Ave & Winona Dr TFR File #: 1 Count date: 19-Jul-24	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **	Major Road: Rupert Ave runs W/E	

	East Leg Total: 159 East Entering: 59 East Peds: 1 Peds Cross: 8
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<table style="width: 100%;"> <tr><td>Buses</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>0</td><td>53</td><td>53</td></tr> </table> Rupert Ave	Buses	Trucks	Cars	Totals	0	0	53	53	N S W E	<table style="width: 100%;"> <tr><td>Cars</td><td>Trucks</td><td>Buses</td><td>Totals</td></tr> <tr><td>39</td><td>0</td><td>0</td><td>39</td></tr> <tr><td>20</td><td>0</td><td>0</td><td>20</td></tr> <tr><td>59</td><td>0</td><td>0</td><td></td></tr> </table> Rupert Ave	Cars	Trucks	Buses	Totals	39	0	0	39	20	0	0	20	59	0	0	
Buses	Trucks	Cars	Totals																							
0	0	53	53																							
Cars	Trucks	Buses	Totals																							
39	0	0	39																							
20	0	0	20																							
59	0	0																								

<table style="width: 100%;"> <tr><td>Buses</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>0</td><td>76</td><td>76</td></tr> <tr><td>0</td><td>0</td><td>11</td><td>11</td></tr> <tr><td>0</td><td>0</td><td>87</td><td></td></tr> </table>	Buses	Trucks	Cars	Totals	0	0	76	76	0	0	11	11	0	0	87		Winona Dr 	<table style="width: 100%;"> <tr><td>Cars</td><td>Trucks</td><td>Buses</td><td>Totals</td></tr> <tr><td>99</td><td>1</td><td>0</td><td>100</td></tr> </table>	Cars	Trucks	Buses	Totals	99	1	0	100
Buses	Trucks	Cars	Totals																							
0	0	76	76																							
0	0	11	11																							
0	0	87																								
Cars	Trucks	Buses	Totals																							
99	1	0	100																							

Peds Cross: 8 West Peds: 0 West Entering: 87 West Leg Total: 140		<table style="width: 100%;"> <tr><td>Cars</td><td>31</td><td></td><td></td></tr> <tr><td>Trucks</td><td>0</td><td></td><td></td></tr> <tr><td>Buses</td><td>0</td><td></td><td></td></tr> <tr><td>Totals</td><td>31</td><td></td><td></td></tr> </table>	Cars	31			Trucks	0			Buses	0			Totals	31		
Cars	31																	
Trucks	0																	
Buses	0																	
Totals	31																	

<table style="width: 100%;"> <tr><td>Cars</td><td>14</td><td>23</td><td>37</td></tr> <tr><td>Trucks</td><td>0</td><td>1</td><td>1</td></tr> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>14</td><td>24</td><td></td></tr> </table>	Cars	14	23	37	Trucks	0	1	1	Buses	0	0	0	Totals	14	24			Peds Cross: 0 South Peds: 0 South Entering: 38 South Leg Total: 69
Cars	14	23	37															
Trucks	0	1	1															
Buses	0	0	0															
Totals	14	24																

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:30:00 To: 20:30:00	One Hour Peak From: 16:30:00 To: 17:30:00
Municipality: Whitchurch-Stouffville Site #: 2413400002 Intersection: Rupert Ave & Winona Dr TFR File #: 1 Count date: 19-Jul-24	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **	Major Road: Rupert Ave runs W/E	

	East Leg Total: 147 East Entering: 51 East Peds: 1 Peds Cross: 8
--	---

<table style="width: 100%;"> <tr><td>Buses</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>0</td><td>58</td><td>58</td></tr> </table> Rupert Ave	Buses	Trucks	Cars	Totals	0	0	58	58	N S W E	<table style="width: 100%;"> <tr><td>Cars</td><td>Trucks</td><td>Buses</td><td>Totals</td></tr> <tr><td>39</td><td>0</td><td>0</td><td>39</td></tr> <tr><td>12</td><td>0</td><td>0</td><td>12</td></tr> <tr><td>51</td><td>0</td><td>0</td><td></td></tr> </table> Rupert Ave	Cars	Trucks	Buses	Totals	39	0	0	39	12	0	0	12	51	0	0	
Buses	Trucks	Cars	Totals																							
0	0	58	58																							
Cars	Trucks	Buses	Totals																							
39	0	0	39																							
12	0	0	12																							
51	0	0																								

<table style="width: 100%;"> <tr><td>Buses</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>0</td><td>69</td><td>69</td></tr> <tr><td>0</td><td>0</td><td>16</td><td>16</td></tr> <tr><td>0</td><td>0</td><td>85</td><td></td></tr> </table>	Buses	Trucks	Cars	Totals	0	0	69	69	0	0	16	16	0	0	85		Winona Dr	<table style="width: 100%;"> <tr><td>Cars</td><td>Trucks</td><td>Buses</td><td>Totals</td></tr> <tr><td>96</td><td>0</td><td>0</td><td>96</td></tr> </table>	Cars	Trucks	Buses	Totals	96	0	0	96
Buses	Trucks	Cars	Totals																							
0	0	69	69																							
0	0	16	16																							
0	0	85																								
Cars	Trucks	Buses	Totals																							
96	0	0	96																							

<table style="width: 100%;"> <tr><td>Peds Cross:</td><td>8</td></tr> <tr><td>West Peds:</td><td>2</td></tr> <tr><td>West Entering:</td><td>85</td></tr> <tr><td>West Leg Total:</td><td>143</td></tr> </table>	Peds Cross:	8	West Peds:	2	West Entering:	85	West Leg Total:	143	<table style="width: 100%;"> <tr><td>Cars</td><td>28</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Buses</td><td>0</td></tr> <tr><td>Totals</td><td>28</td></tr> </table>	Cars	28	Trucks	0	Buses	0	Totals	28	<table style="width: 100%;"> <tr><td>Cars</td><td>19</td><td>27</td><td>46</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>19</td><td>27</td><td></td></tr> </table>	Cars	19	27	46	Trucks	0	0	0	Buses	0	0	0	Totals	19	27	
Peds Cross:	8																																	
West Peds:	2																																	
West Entering:	85																																	
West Leg Total:	143																																	
Cars	28																																	
Trucks	0																																	
Buses	0																																	
Totals	28																																	
Cars	19	27	46																															
Trucks	0	0	0																															
Buses	0	0	0																															
Totals	19	27																																

	Peds Cross: 1 South Peds: 1 South Entering: 46 South Leg Total: 74
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Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Whitchurch-Stouffville
Site #: 2413400002
Intersection: Rupert Ave & Winona Dr
TFR File #: 1
Count date: 19-Jul-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Rupert Ave runs W/E

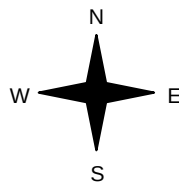
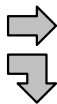
East Leg Total: 915
East Entering: 341
East Peds: 4
Peds Cross: 8

Buses	Trucks	Cars	Totals
0	0	353	353



Rupert Ave

Buses	Trucks	Cars	Totals
0	0	375	375
0	0	68	68
0	0	443	



Winona Dr

Cars	Trucks	Buses	Totals
246	0	0	246
95	0	0	95
341	0	0	



Rupert Ave



Cars	Trucks	Buses	Totals
573	1	0	574

Peds Cross: 8
West Peds: 7
West Entering: 443
West Leg Total: 796

Cars	163
Trucks	0
Buses	0
Totals	163



Cars	107	198	305
Trucks	0	1	1
Buses	0	0	0
Totals	107	199	

Peds Cross: 4
South Peds: 4
South Entering: 306
South Leg Total: 469

Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Rupert Ave & Winona Dr

Count Date: 19-Jul-24

Municipality: Whitchurch-Stouffville

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
12:00:00	0	0	0	0	0	0	12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0	41	13:00:00	18	0	23	41	0
14:00:00	0	0	0	0	0	48	14:00:00	14	0	34	48	0
15:00:00	0	0	0	0	0	58	15:00:00	18	0	40	58	1
17:00:00	0	0	0	0	0	26	17:00:00	8	0	18	26	0
18:00:00	0	0	0	0	0	47	18:00:00	25	0	22	47	1
19:00:00	0	0	0	0	0	55	19:00:00	12	0	43	55	0
20:00:00	0	0	0	0	0	16	20:00:00	9	0	7	16	2

[illegible]



Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Buses - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	8	8	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	12	4	23	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	17	5	34	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
13:00:00	25	8	43	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:15:00	29	4	53	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:30:00	32	3	62	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:45:00	33	1	70	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
14:00:00	35	2	80	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
14:15:00	38	3	88	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
14:30:00	40	2	97	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
14:45:00	45	5	103	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
15:00:00	51	6	115	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
15:15:00	51	0	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16:30:00	51	0	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16:45:00	53	2	123	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
17:00:00	53	0	129	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
17:15:00	55	2	141	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
17:30:00	63	8	154	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
17:45:00	67	4	162	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
18:00:00	69	2	169	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
18:15:00	73	4	185	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
18:30:00	77	4	192	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
18:45:00	77	0	206	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
19:00:00	78	1	212	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
19:15:00	80	2	217	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1
19:30:00	83	3	222	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
19:45:00	87	4																		



Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Buses - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	8	8	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	11	3	0	0	12	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	15	4	0	0	16	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:00:00	18	3	0	0	23	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15:00	20	2	0	0	28	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30:00	25	5	0	0	35	7	0	0	0	0	1	1	0	0	0	0	0	0	0	0
13:45:00	28	3	0	0	45	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:00:00	32	4	0	0	56	11	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:15:00	33	1	0	0	69	13	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:30:00	35	2	0	0	77	8	0	0	0	0	1	0	0	0	0	0	0	0	0	0
14:45:00	43	8	0	0	87	10	0	0	0	0	1	0	0	0	0	0	0	0	1	1
15:00:00	50	7	0	0	96	9	0	0	0	0	1	0	0	0	0	0	0	0	1	0
15:15:00	50	0	0	0	96	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
16:30:00	50	0	0	0	96	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
16:45:00	52	2	0	0	104	8	0	0	0	0	1	0	0	0	0	0	0	0	1	0
17:00:00	58	6	0	0	114	10	0	0	0	0	1	0	0	0	0	0	0	0	1	0
17:15:00	66	8	0	0	119	5	0	0	0	0	1	0	0	0	0	0	0	0	2	1
17:30:00	69	3	0	0	123	4	0	0	0	0	1	0	0	0	0	0	0	0	2	0
17:45:00	75	6	0	0	132	9	0	0	0	0	1	0	0	0	0	0	0	0	2	0
18:00:00	83	8	0	0	136	4	0	0	0	0	1	0	0	0	0	0	0	0	2	0
18:15:00	85	2	0	0	146	10	0	0	0	0	1	0	0	0	0	0	0	0	2	0
18:30:00	88	3	0	0	157	11	0	0	0	0	1	0	0	0	0	0	0	0	2	0
18:45:00	93	5	0	0	167	10	0	0	0	0	1	0	0	0	0	0	0	0	2	0
19:00:00	95	2	0	0	179	12	0	0	0	0	1	0	0	0	0	0	0	0	2	0
19:15:00	95	0	0	0	182	3	0	0	0	0	1	0	0	0	0	0	0	0	2	0
19:30:00	98	3	0	0	183	1	0	0	0	0	1	0	0	0	0	0	0	0	2	0
19:45:00	99	1	0																	

[illegible]

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:30:00 To: 20:30:00	One Hour Peak From: 16:45:00 To: 17:45:00
Municipality: Whitchurch-Stouffville Site #: 2413400002 Intersection: Rupert Ave & Winona Dr TFR File #: 1 Count date: 20-Jul-24	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **	Major Road: Rupert Ave runs W/E	

	East Leg Total: 111 East Entering: 33 East Peds: 2 Peds Cross: 8
--	---

<table style="width: 100%;"> <tr><td>Buses</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>1</td><td>43</td><td>44</td></tr> </table> Rupert Ave	Buses	Trucks	Cars	Totals	0	1	43	44	N S W E	<table style="width: 100%;"> <tr><td>Cars</td><td>Trucks</td><td>Buses</td><td>Totals</td></tr> <tr><td>25</td><td>1</td><td>0</td><td>26</td></tr> <tr><td>7</td><td>0</td><td>0</td><td>7</td></tr> <tr><td>32</td><td>1</td><td>0</td><td></td></tr> </table> Rupert Ave	Cars	Trucks	Buses	Totals	25	1	0	26	7	0	0	7	32	1	0	
Buses	Trucks	Cars	Totals																							
0	1	43	44																							
Cars	Trucks	Buses	Totals																							
25	1	0	26																							
7	0	0	7																							
32	1	0																								

<table style="width: 100%;"> <tr><td>Buses</td><td>Trucks</td><td>Cars</td><td>Totals</td></tr> <tr><td>0</td><td>0</td><td>51</td><td>51</td></tr> <tr><td>0</td><td>0</td><td>6</td><td>6</td></tr> <tr><td>0</td><td>0</td><td>57</td><td></td></tr> </table>	Buses	Trucks	Cars	Totals	0	0	51	51	0	0	6	6	0	0	57		Winona Dr 	<table style="width: 100%;"> <tr><td>Cars</td><td>Trucks</td><td>Buses</td><td>Totals</td></tr> <tr><td>78</td><td>0</td><td>0</td><td>78</td></tr> </table>	Cars	Trucks	Buses	Totals	78	0	0	78
Buses	Trucks	Cars	Totals																							
0	0	51	51																							
0	0	6	6																							
0	0	57																								
Cars	Trucks	Buses	Totals																							
78	0	0	78																							

Peds Cross: 8 West Peds: 0 West Entering: 57 West Leg Total: 101	<table style="width: 100%;"> <tr><td>Cars</td><td>13</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Buses</td><td>0</td></tr> <tr><td>Totals</td><td>13</td></tr> </table>	Cars	13	Trucks	0	Buses	0	Totals	13	<table style="width: 100%;"> <tr><td>Cars</td><td>18</td><td>27</td><td>45</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>18</td><td>27</td><td></td></tr> </table>	Cars	18	27	45	Trucks	0	0	0	Buses	0	0	0	Totals	18	27		Peds Cross: 1 South Peds: 1 South Entering: 45 South Leg Total: 58
Cars	13																										
Trucks	0																										
Buses	0																										
Totals	13																										
Cars	18	27	45																								
Trucks	0	0	0																								
Buses	0	0	0																								
Totals	18	27																									

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Whitchurch-Stouffville
Site #: 2413400002
Intersection: Rupert Ave & Winona Dr
TFR File #: 1
Count date: 20-Jul-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Rupert Ave runs W/E

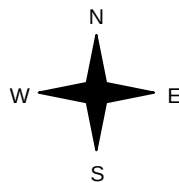
East Leg Total: 322
 East Entering: 111
 East Peds: 7
 Peds Cross: 8

Buses	Trucks	Cars	Totals
0	1	135	136



Rupert Ave

Buses	Trucks	Cars	Totals
0	0	130	130
0	0	27	27
0	0	157	



Winona Dr

Cars	Trucks	Buses	Totals
82	1	0	83
28	0	0	28
110	1	0	



Rupert Ave



Cars	Trucks	Buses	Totals
211	0	0	211



Peds Cross: 8
 West Peds: 6
 West Entering: 157
 West Leg Total: 293

Cars	55
Trucks	0
Buses	0
Totals	55



Cars	53	81	134
Trucks	0	0	0
Buses	0	0	0
Totals	53	81	

Peds Cross: 3
 South Peds: 3
 South Entering: 134
 South Leg Total: 189

Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Rupert Ave & Winona Dr					Count Date: 20-Jul-24			Municipality: Whitchurch-Stouffville				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
17:00:00	0	0	0	0	0	16	17:00:00	7	0	9	16	0
18:00:00	0	0	0	0	0	42	18:00:00	18	0	24	42	1
19:00:00	0	0	0	0	0	36	19:00:00	11	0	25	36	1
20:00:00	0	0	0	0	0	29	20:00:00	12	0	17	29	0
						</						

[illegible]

[illegible]

[illegible]

[illegible]

Bike Volumes on Friday Midday and Friday PM Peak hours								Rupert Ave & Winona Dr				
Time	North Left	East Left	South Left	West Left	North Right	East Right	South Right	West Right	North Thru	East Thru	South Thru	West Thru
12:00:00	0	0	0	0	0	0	1	0	0	0	0	0
12:15:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	0	0	0	0	0	0	0	0	0	1	0	0
13:00:00	0	0	0	0	0	0	0	0	0	0	0	0
13:15:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30:00	0	0	0	0	0	0	0	0	0	0	0	0
13:45:00	0	0	0	0	0	0	0	0	0	0	0	0
14:00:00	0	0	0	0	0	0	0	1	0	0	0	0
14:15:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30:00	0	0	0	0	0	0	0	0	0	0	0	1
14:45:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	1	0	0	0	0	0
18:00:00	0	1	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	1	0	0
18:30:00	0	0	0	0	0	0	0	0	0	1	0	0
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0
19:00:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15:00	0	0	0	0	0	0	0	0	0	0	0	1
19:30:00	0	0	0	0	0	0	0	0	0	0	0	0
19:45:00	0	0	0	0	0	0	0	0	0	0	0	1
20:00:00	0	0	0	0	0	0	0	0	0	0	0	0
20:15:00	0	0	0	0	0	0	0	0	0	0	0	0
Sum:	0	1	0	0	0	0	2	1	0	3	0	3

Bike Volumes on Saturday PM Peak Hour**Rupert Ave & Winona Dr**

Time	North Left	East Left	South Left	West Left	North Right	East Right	South Right	West Right	North Thru	East Thru	South Thru	West Thru
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	1	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	1
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0
18:45:00	0	0	0	0	0	0	1	1	0	0	0	0
19:00:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15:00	0	0	0	0	0	0	0	0	0	0	0	0
19:30:00	0	0	0	0	0	0	0	0	0	0	0	0
19:45:00	0	0	0	0	0	0	0	0	0	0	0	0
20:00:00	0	0	0	0	0	0	0	0	0	2	0	0
20:15:00	0	0	0	0	0	0	0	0	0	0	0	0
Sum:	0	0	0	0	0	0	2	1	0	2	0	1

Accu-Traffic Inc.

Mid-day Peak Diagram

Specified Period

From: 12:00:00

To: 15:00:00

One Hour Peak

From: 14:00:00

To: 15:00:00

Municipality: Whitchurch-Stouffville

Site #: 2413400003

Intersection: Ninth Line & Rupert Ave

TFR File #: 1

Count date: 19-Jul-24

Weather conditions:

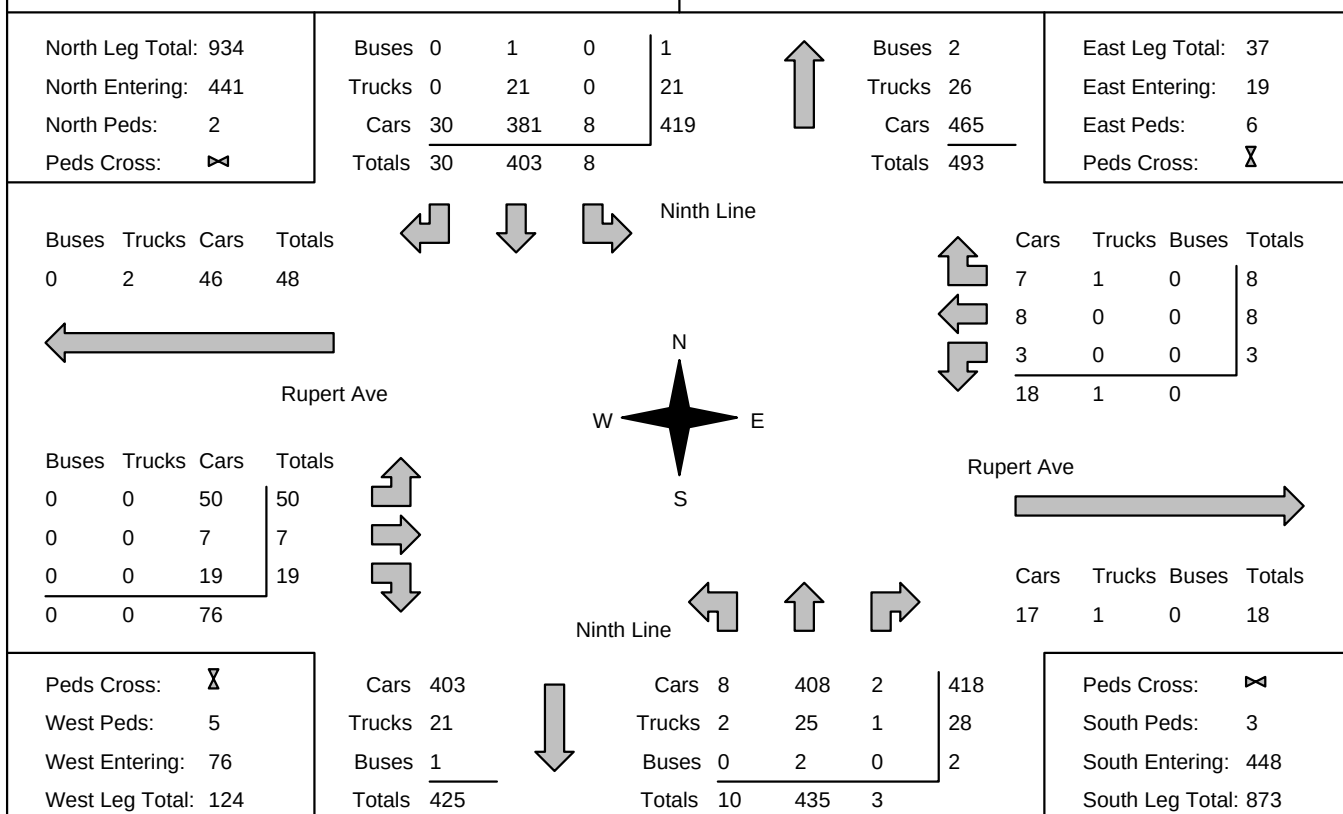
Person counted:

Person prepared:

Person checked:

** Non-Signalized Intersection **

Major Road: Ninth Line runs N/S



Comments

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:30:00 To: 20:30:00	One Hour Peak From: 16:30:00 To: 17:30:00
Municipality: Whitchurch-Stouffville Site #: 2413400003 Intersection: Ninth Line & Rupert Ave TFR File #: 1 Count date: 19-Jul-24	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **	Major Road: Ninth Line runs N/S	

North Leg Total: 1081 North Entering: 495 North Peds: 3 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 0</td> <td style="padding: 2px;">3</td> <td style="border-right: 1px solid black; padding: 2px;">0</td> <td style="padding: 2px;">3</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 0</td> <td style="padding: 2px;">1</td> <td style="border-right: 1px solid black; padding: 2px;">0</td> <td style="padding: 2px;">1</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 29</td> <td style="padding: 2px;">452</td> <td style="border-right: 1px solid black; padding: 2px;">10</td> <td style="padding: 2px;">491</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 29</td> <td style="padding: 2px;">456</td> <td style="border-right: 1px solid black; padding: 2px;">10</td> <td style="padding: 2px;"></td> </tr> </table>	Buses 0	3	0	3	Trucks 0	1	0	1	Cars 29	452	10	491	Totals 29	456	10		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px;">Buses 2</td> <td style="padding: 2px;">2</td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Trucks 4</td> <td style="padding: 2px;">4</td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Cars 580</td> <td style="padding: 2px;">580</td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;">Totals 586</td> <td style="padding: 2px;">586</td> <td style="border-right: 1px solid black; padding: 2px;"></td> <td style="padding: 2px;"></td> </tr> </table>	Buses 2	2			Trucks 4	4			Cars 580	580			Totals 586	586			East Leg Total: 42 East Entering: 20 East Peds: 6 Peds Cross:
Buses 0	3	0	3																																
Trucks 0	1	0	1																																
Cars 29	452	10	491																																
Totals 29	456	10																																	
Buses 2	2																																		
Trucks 4	4																																		
Cars 580	580																																		
Totals 586	586																																		

N
S
E
W

West Leg (Rupert Ave):

Buses 0	0	Cars 51	51
Trucks 0	0	Cars 7	7
Buses 0	0	Cars 23	23
Totals 0	0	Cars 81	

East Leg (Rupert Ave):

Cars 13	0	Buses 0	13
Cars 4	0	Buses 0	4
Cars 3	0	Buses 0	3
Totals 20	0	Buses 0	

West Leg (Ninth Line):

Cars 478	478	Trucks 1	1
Buses 3	3	Totals 482	

East Leg (Ninth Line):

Cars 18	516	5	539
Trucks 0	4	0	4
Buses 0	2	0	2
Totals 18	522	5	

Peds Cross: West Peds: 2 West Entering: 81 West Leg Total: 132	Peds Cross: South Peds: 1 South Entering: 545 South Leg Total: 1027
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Comments

Accu-Traffic Inc.

Total Count Diagram

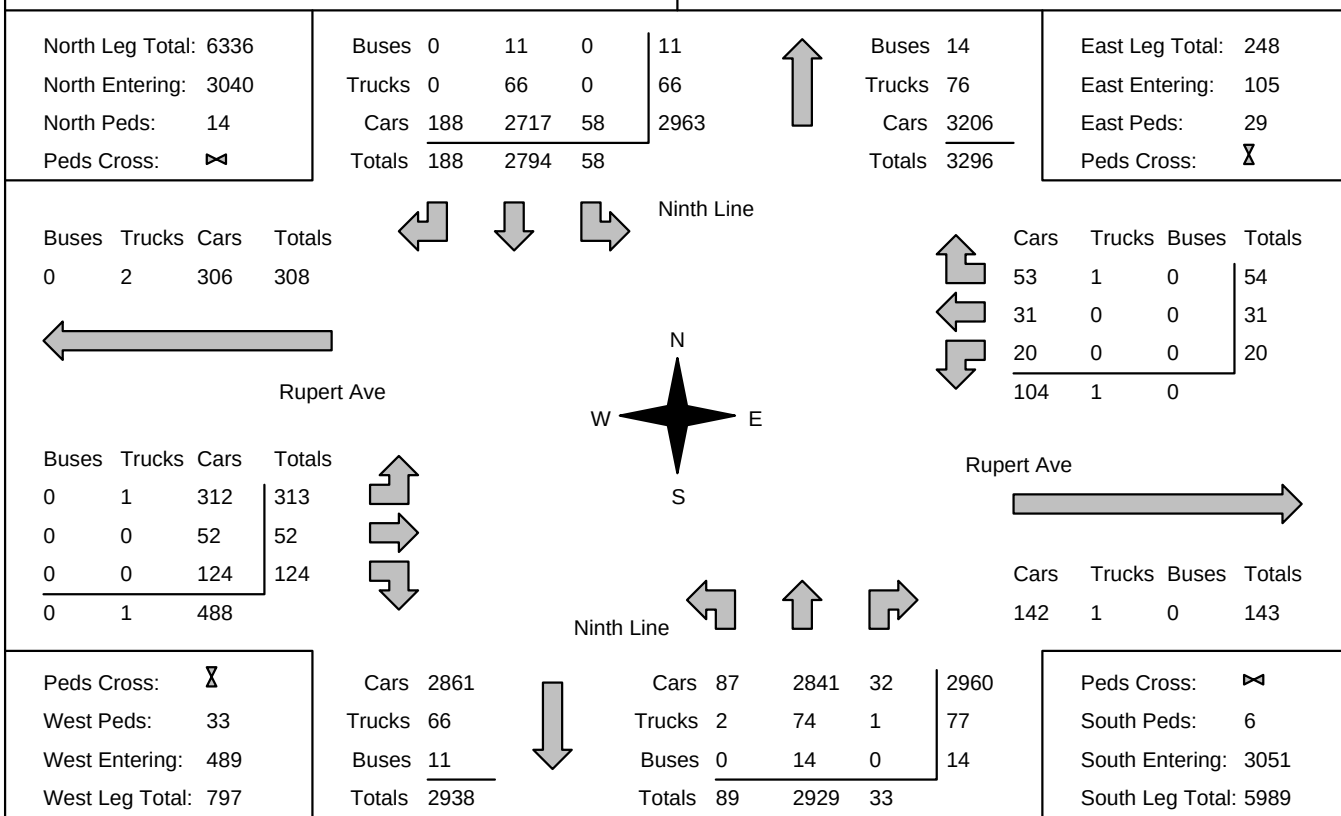
Municipality: Whitchurch-Stouffville
Site #: 2413400003
Intersection: Ninth Line & Rupert Ave
TFR File #: 1
Count date: 19-Jul-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Ninth Line runs N/S



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Ninth Line & Rupert Ave

Count Date: 19-Jul-24

Municipality: Whitchurch-Stouffville

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
12:00:00	0	0	0	0	0	0	12:00:00	0	0	0	0	0
13:00:00	5	408	41	454	2	834	13:00:00	19	356	5	380	0
14:00:00	16	402	25	443	0	848	14:00:00	6	391	8	405	0
15:00:00	8	403	30	441	2	889	15:00:00	10	435	3	448	3
17:00:00	6	218	9	233	0	500	17:00:00	8	255	4	267	1
18:00:00	9	437	30	476	3	998	18:00:00	16	503	3	522	0
19:00:00	3	404	27	434	3	892	19:00:00	16	437	5	458	2
20:00:00	8	354	21	383	4	773	20:00:00	4	383	3	390	0



Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Buses - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	1	1	115	115	8	8	0	0	6	6	0	0	0	0	0	0	0	0	0	0
12:30:00	2	1	204	89	18	10	0	0	15	9	0	0	0	0	0	0	0	0	0	0
12:45:00	3	1	300	96	28	10	0	0	17	2	0	0	0	0	1	1	0	0	0	0
13:00:00	5	2	385	85	41	13	0	0	22	5	0	0	0	0	1	0	0	0	2	2
13:15:00	10	5	504	119	48	7	0	0	27	5	0	0	0	0	1	0	0	0	2	0
13:30:00	18	8	587	83	55	7	0	0	36	9	0	0	0	0	3	2	0	0	2	0
13:45:00	20	2	662	75	61	6	0	0	39	3	0	0	0	0	3	0	0	0	2	0
14:00:00	21	1	763	101	66	5	0	0	44	5	0	0	0	0	3	0	0	0	2	0
14:15:00	23	2	851	88	71	5	0	0	48	4	0	0	0	0	3	0	0	0	2	0
14:30:00	27	4	950	99	79	8	0	0	57	9	0	0	0	0	4	1	0	0	2	0
14:45:00	27	0	1039	89	87	8	0	0	63	6	0	0	0	0	4	0	0	0	4	2
15:00:00	29	2	1144	105	96	9	0	0	65	2	0	0	0	0	4	0	0	0	4	0
15:15:00	29	0	1144	0	96	0	0	0	65	0	0	0	0	0	4	0	0	0	4	0
16:30:00	29	0	1144	0	96	0	0	0	65	0	0	0	0	0	4	0	0	0	4	0
16:45:00	33	4	1242	98	102	6	0	0	65	0	0	0	0	0	4	0	0	0	4	0
17:00:00	35	2	1362	120	105	3	0	0	65	0	0	0	0	0	4	0	0	0	4	0
17:15:00	38	3	1474	112	114	9	0	0	66	1	0	0	0	0	5	1	0	0	4	0
17:30:00	39	1	1596	122	125	11	0	0	66	0	0	0	0	0	7	2	0	0	7	3
17:45:00	42	3	1700	104	130	5	0	0	66	0	0	0	0	0	7	0	0	0	7	0
18:00:00	44	2	1795	95	135	5	0	0	66	0	0	0	0	0	7	0	0	0	7	0
18:15:00	44	0	1915	120	144	9	0	0	66	0	0	0	0	0	8	1	0	0	9	2
18:30:00	45	1	1991	76	151	7	0	0	66	0	0	0	0	0	8	0	0	0	9	0
18:45:00	46	1	2103	112	161	10	0	0	66	0	0	0	0	0	9	1	0	0	9	0
19:00:00	47	1	2197	94	162	1	0	0	66	0	0	0	0	0	9	0	0	0	10	1
19:15:00	47	0	2283	86	167	5	0	0	66	0	0	0	0	0	9	0	0	0	10	0
19:30:00	53	6	2370	87	174	7														



Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Buses - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	1	1	4	4	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30:00	1	0	4	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45:00	2	1	4	0	13	7	0	0	0	0	0	0	0	0	0	0	0	0	1	1
13:00:00	4	2	5	1	14	1	0	0	0	0	0	0	0	0	0	0	0	0	2	1
13:15:00	4	0	6	1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
13:30:00	4	0	7	1	14	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
13:45:00	4	0	8	1	16	2	0	0	0	0	0	0	0	0	0	0	0	0	4	1
14:00:00	4	0	9	1	18	2	0	0	0	0	0	0	0	0	0	0	0	0	4	0
14:15:00	4	0	11	2	18	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1
14:30:00	5	1	12	1	21	3	0	0	0	0	0	0	0	0	0	0	0	0	5	0
14:45:00	6	1	14	2	24	3	0	0	0	0	1	1	0	0	0	0	0	0	6	1
15:00:00	7	1	17	3	25	1	0	0	0	0	1	0	0	0	0	0	0	0	10	4
15:15:00	7	0	17	0	25	0	0	0	0	0	1	0	0	0	0	0	0	0	10	0
16:30:00	7	0	17	0	25	0	0	0	0	0	1	0	0	0	0	0	0	0	10	0
16:45:00	7	0	18	1	30	5	0	0	0	0	1	0	0	0	0	0	0	0	13	3
17:00:00	7	0	18	0	32	2	0	0	0	0	1	0	0	0	0	0	0	0	14	1
17:15:00	7	0	18	0	35	3	0	0	0	0	1	0	0	0	0	0	0	0	15	1
17:30:00	10	3	21	3	38	3	0	0	0	0	1	0	0	0	0	0	0	0	16	1
17:45:00	10	0	23	2	39	1	0	0	0	0	1	0	0	0	0	0	0	0	16	0
18:00:00	11	1	23	0	41	2	0	0	0	0	1	0	0	0	0	0	0	0	17	1
18:15:00	14	3	24	1	45	4	0	0	0	0	1	0	0	0	0	0	0	0	21	4
18:30:00	14	0	25	1	46	1	0	0	0	0	1	0	0	0	0	0	0	0	21	0
18:45:00	15	1	26	1	50	4	0	0	0	0	1	0	0	0	0	0	0	0	21	0
19:00:00	17	2	27	1	52	2	0	0	0	0	1	0	0	0	0	0	0	0	24	3
19:15:00	17	0	28	1	52	0	0	0	0	0	1	0	0	0	0	0	0	0	24	0
19:30:00	17	0	28	0	53	1	0	0	0	0	1	0	0	0	0	0	0	0	26	2
19:45:00	17	0	29	1																



Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Buses - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
12:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15:00	4	4	74	74	1	1	0	0	4	4	0	0	0	0	0	0	0	0	0	0
12:30:00	8	4	154	80	2	1	0	0	5	1	0	0	0	0	1	1	0	0	0	0
12:45:00	16	8	247	93	5	3	0	0	12	7	0	0	0	0	3	2	0	0	0	0
13:00:00	19	3	333	86	5	0	0	0	20	8	0	0	0	0	3	0	0	0	0	0
13:15:00	23	4	422	89	6	1	0	0	26	6	0	0	0	0	3	0	0	0	0	0
13:30:00	23	0	494	72	10	4	0	0	31	5	0	0	0	0	4	1	0	0	0	0
13:45:00	24	1	598	104	11	1	0	0	38	7	0	0	0	0	4	0	0	0	0	0
14:00:00	25	1	699	101	13	2	0	0	44	6	0	0	0	0	4	0	0	0	0	0
14:15:00	25	0	809	110	14	1	0	0	48	4	0	0	0	0	5	1	0	0	0	0
14:30:00	27	2	900	91	14	0	0	0	53	5	0	0	0	0	6	1	0	0	0	0
14:45:00	30	3	991	91	15	1	2	2	61	8	1	1	0	0	6	0	0	0	2	2
15:00:00	33	3	1107	116	15	0	2	0	69	8	1	0	0	0	6	0	0	0	3	1
15:15:00	33	0	1107	0	15	0	2	0	69	0	1	0	0	0	6	0	0	0	3	0
16:30:00	33	0	1107	0	15	0	2	0	69	0	1	0	0	0	6	0	0	0	3	0
16:45:00	37	4	1242	135	19	4	2	0	71	2	1	0	0	0	6	0	0	0	3	0
17:00:00	41	4	1359	117	19	0	2	0	71	0	1	0	0	0	7	1	0	0	4	1
17:15:00	45	4	1495	136	20	1	2	0	73	2	1	0	0	0	7	0	0	0	4	0
17:30:00	51	6	1623	128	20	0	2	0	73	0	1	0	0	0	8	1	0	0	4	0
17:45:00	55	4	1734	111	20	0	2	0	73	0	1	0	0	0	8	0	0	0	4	0
18:00:00	57	2	1857	123	22	2	2	0	73	0	1	0	0	0	10	2	0	0	4	0
18:15:00	65	8	1960	103	22	0	2	0	73	0	1	0	0	0	11	1	0	0	4	0
18:30:00	67	2	2068	108	24	2	2	0	73	0	1	0	0	0	11	0	0	0	6	2
18:45:00	68	1	2191	123	27	3	2	0	74	1	1	0	0	0	12	1	0	0	6	0
19:00:00	73	5	2291	100	27	0	2	0	74	0	1	0	0	0	12	0	0	0	6	0
19:15:00	75	2	2389	98	30	3	2	0	74	0	1	0	0	0	13	1	0	0	6	0
19:30:00	76	1	2493	104	30	0	2	0												

[illegible]

Accu-Traffic Inc.

Afternoon Peak Diagram		Specified Period From: 16:30:00 To: 20:30:00	One Hour Peak From: 16:45:00 To: 17:45:00
Municipality: Whitchurch-Stouffville Site #: 2413400003 Intersection: Ninth Line & Rupert Ave TFR File #: 1 Count date: 20-Jul-24		Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **		Major Road: Ninth Line runs N/S	

North Leg Total: 699 North Entering: 340 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Cars</td><td>19</td><td>318</td><td>3</td><td>340</td></tr> <tr><td>Totals</td><td>19</td><td>318</td><td>3</td><td></td></tr> </table>	Buses	0	0	0	0	Trucks	0	0	0	0	Cars	19	318	3	340	Totals	19	318	3			<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>1</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Cars</td><td>358</td></tr> <tr><td>Totals</td><td>359</td></tr> </table>	Buses	1	Trucks	0	Cars	358	Totals	359	East Leg Total: 19 East Entering: 6 East Peds: 3 Peds Cross:
Buses	0	0	0	0																												
Trucks	0	0	0	0																												
Cars	19	318	3	340																												
Totals	19	318	3																													
Buses	1																															
Trucks	0																															
Cars	358																															
Totals	359																															

Buses	Trucks	Cars	Totals
0	0	29	29

Rupert Ave

Ninth Line

Ninth Line

Buses	Trucks	Cars	Totals
0	0	46	46
0	0	5	5
0	0	20	20
0	0	71	

Rupert Ave

Cars	Trucks	Buses	Totals
3	0	0	3
1	0	0	1
2	0	0	2
6	0	0	

Cars	Trucks	Cars	Totals
0	0	46	46
0	0	5	5
0	0	20	20
0	0	71	

Ninth Line

Ninth Line

Cars	Trucks	Cars	Totals
9	0	309	323
0	0	0	0
0	1	0	1
9	1	5	

Ninth Line

Cars	Trucks	Buses	Totals
13	0	0	13

Comments

Accu-Traffic Inc.

Total Count Diagram

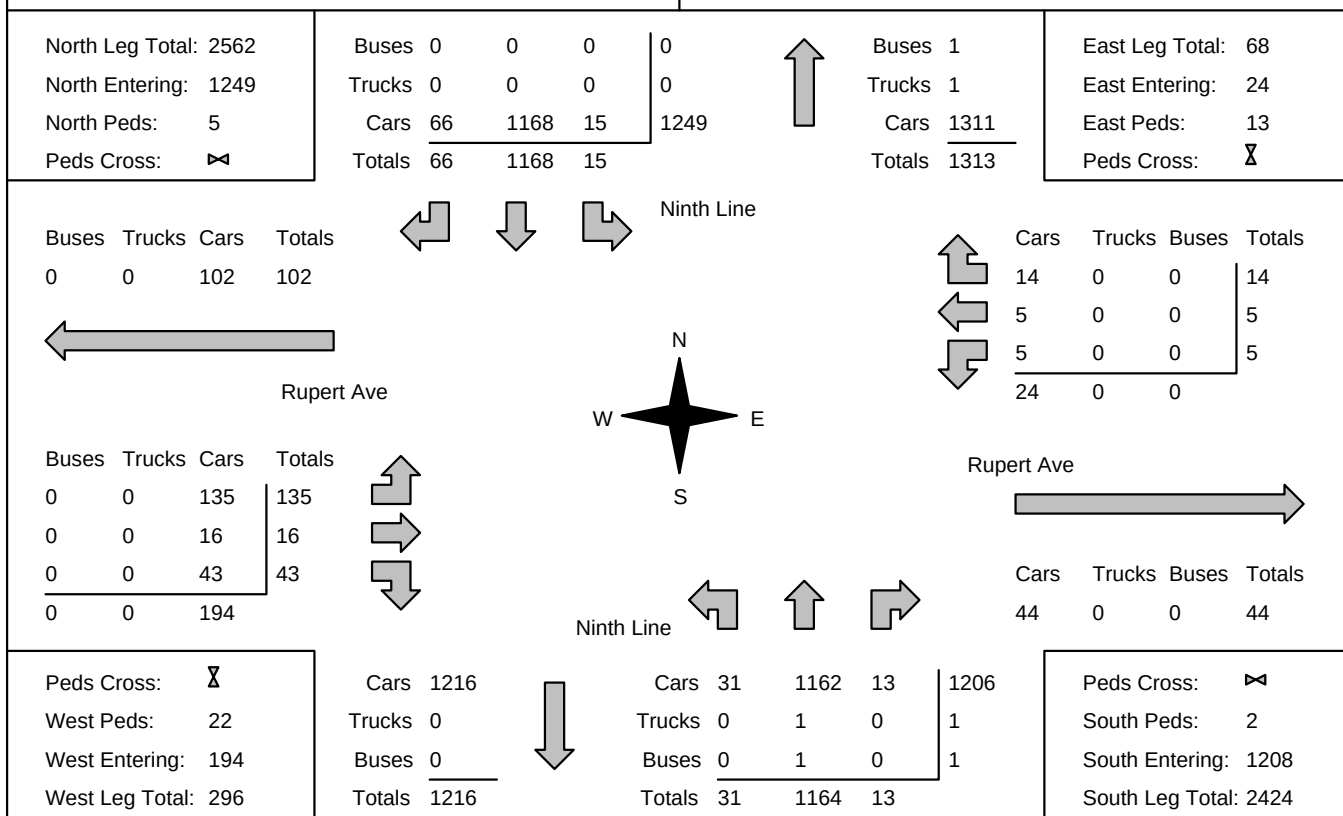
Municipality: Whitchurch-Stouffville
Site #: 2413400003
Intersection: Ninth Line & Rupert Ave
TFR File #: 1
Count date: 20-Jul-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Ninth Line runs N/S



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Ninth Line & Rupert Ave					Count Date: 20-Jul-24		Municipality: Whitchurch-Stouffville					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
17:00:00	1	145	10	156	0	347	17:00:00	4	185	2	191	0
18:00:00	4	333	21	358	2	654	18:00:00	10	282	4	296	1
19:00:00	5	319	19	343	0	641	19:00:00	9	283	6	298	0
20:00:00	5	263	12	280	2	570	20:00:00	3	286	1	290	0
									</			

[illegible]

[illegible]

[illegible]

[illegible]

Bike Volumes on Rupert Ave & 9th Line

Time	North Left	East Left	South Left	West Left	North Right	East Right	South Right	West Right	North Thru	East Thru	South Thru	West Thru
12:00:00	0	0	0	1	0	0	0	0	1	0	0	1
12:15:00	0	0	0	0	0	0	0	0	0	0	1	0
12:30:00	0	0	0	0	0	0	0	0	2	0	1	0
12:45:00	0	0	0	0	0	0	0	0	0	0	1	0
13:00:00	0	0	0	0	0	0	0	0	0	0	0	0
13:15:00	0	0	0	0	0	0	0	0	1	0	0	0
13:30:00	0	0	0	0	0	0	0	0	1	0	0	0
13:45:00	0	0	0	0	0	0	0	0	1	0	0	0
14:00:00	0	0	0	0	0	0	0	0	0	0	0	0
14:15:00	0	1	0	0	0	0	0	0	0	0	0	0
14:30:00	0	0	0	0	0	0	0	0	0	0	1	0
14:45:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	1	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	3	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	1	0	0	0
17:45:00	0	0	0	0	1	0	0	0	2	0	2	1
18:00:00	0	0	0	0	0	0	0	0	0	1	0	0
18:15:00	0	0	0	0	1	0	0	0	3	0	0	0
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0
18:45:00	0	0	0	0	0	0	0	0	1	0	0	0
19:00:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15:00	0	0	0	0	0	0	0	0	0	0	0	0
19:30:00	0	0	0	0	0	0	0	0	0	0	2	0
19:45:00	0	0	0	0	0	0	0	0	0	0	0	0
20:00:00	0	0	0	0	0	0	0	0	0	0	0	1
20:15:00	0	0	0	0	0	0	0	0	0	0	0	0
Sum:	0	1	0	1	2	0	0	0	13	1	12	3

Bike Volumes on Saturday PM Peak Hour

Winona Dr & 9th Line

Time	North Left	East Left	South Left	West Left	North Right	East Right	South Right	West Right	North Thru	East Thru	South Thru	West Thru
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	1	0
17:00:00	0	0	0	0	0	0	0	0	1	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	1
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	1	0	0	0
18:30:00	0	0	0	0	0	0	0	0	1	0	0	0
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0
19:00:00	0	0	0	0	0	0	0	0	0	0	0	0
19:15:00	0	0	0	0	0	0	0	0	0	0	0	0
19:30:00	0	0	0	0	0	0	0	0	1	0	3	0
19:45:00	0	0	0	0	0	0	0	0	3	0	0	0
20:00:00	0	0	0	0	0	0	0	0	0	2	0	0
20:15:00	0	0	0	0	0	0	0	0	0	0	0	0
Sum:	0	0	0	0	0	0	0	0	7	2	4	1

APPENDIX F

Transit Level Of Service Analysis

Level of Service Analysis for Transit Performance

Existing 2025 Condition:

EX 2025 LOS derived values

Approach			***Transit Service Quality				***Approach (LOS)					
Intersection	Direction	Description	*Access To Transit (m)	**Transit Headway (Minutes)			Delay (sec/veh)			V/C Ratio		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	230	>30	>30	>30	27.9	24.2	26.5	0.14	0.22	0.15
	Westbound		230	>30	>30	>30	34.6	28.0	33.4	0.57	0.45	0.47
	Northbound	9th Line	230	>30	>30	>30	22.1	26.0	21.4	0.05	0.05	0.04
	Southbound		230	>30	>30	>30	27.1	30.5	26.3	0.13	0.13	0.11
Main St & Winona Dr	Eastbound	Main St	230	>30	>30	>30	4.2	4.4	2.7	0.33	0.38	0.26
	Westbound		230	>30	>30	>30	4.4	4.3	2.6	0.36	0.35	0.24
9th Line & Rupert Ave	Northbound	9th Line	320	>30	>30	>30	8.6	8.5	8.0	0.01	0.02	0.01
	Southbound		320	>30	>30	>30	8.3	8.7	7.9	0.01	0.01	0.00

*Distance calculated from Google image

**Service frequency information obtained from bus schedules available on York Region YRT.ca and Go Transit websites

***values of Intersection Capacity Analysis from Synchro Reports

EX 2025 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	C	C	C	A	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

Future Background 2027 Condition:**FB 2027 derived LOS derived Values**

Approach			***Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	*Access To Transit (m)	**Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	230	>30	>30	>30	28.4	25.6	26.8	0.18	0.28	0.20
	Westbound		230	>30	>30	>30	35.3	28.3	34.0	0.61	0.49	0.52
	Northbound	9th Line	230	>30	>30	>30	22.4	27.1	23.2	0.05	0.06	0.04
	Southbound		230	>30	>30	>30	28.0	31.8	27.7	0.16	0.15	0.13
Main St & Winona Dr	Eastbound	Main St	230	>30	>30	>30	4.6	5.0	3.1	0.36	0.43	0.31
	Westbound		230	>30	>30	>30	4.9	4.7	2.9	0.41	0.38	0.27
9th Line & Rupert Ave	Northbound	9th Line	320	>30	>30	>30	8.8	8.7	8.2	0.01	0.02	0.01
	Southbound		320	>30	>30	>30	8.5	9.1	8.1	0.01	0.01	0.00

*Distance calculated from Google image

**Service frequency information obtained from bus schedules available on York Region YRT.ca and Go Transit websites

***values of Intersection Capacity Analysis from Synchro Reports

FB 2027 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	C	B	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

Future Background 2032 Condition:**FB 2032 derived LOS derived Values**

Approach			***Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	*Access To Transit (m)	**Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	230	>30	>30	>30	28.9	25.6	27.4	0.22	0.33	0.24
	Westbound	Main St	230	>30	>30	>30	36.9	28.1	34.8	0.67	0.51	0.56
	Northbound	9th Line	230	>30	>30	>30	22.6	29.0	23.6	0.05	0.06	0.04
	Southbound	9th Line	230	>30	>30	>30	28.6	33.9	28.4	0.2	0.17	0.14
Main St & Winona Dr	Eastbound	Main St	230	>30	>30	>30	5.1	5.6	3.3	0.40	0.48	0.34
	Westbound	Main St	230	>30	>30	>30	5.4	5.2	3.1	0.45	0.43	0.29
9th Line & Rupert Ave	Northbound	9th Line	320	>30	>30	>30	9.0	8.9	8.3	0.01	0.03	0.01
	Southbound	9th Line	320	>30	>30	>30	8.7	9.4	8.3	0.01	0.02	0.00

*Distance calculated from Google image

**Service frequency information obtained from bus schedules available on York Region YRT.ca and Go Transit websites

***values of Intersection Capacity Analysis from Synchro Reports

FB 2032 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	C	B	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

Future Background 2037 Condition:**FB 2037 derived LOS derived Values**

Approach			***Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	*Access To Transit (m)	**Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	230	>30	>30	>30	30.5	26.2	28.1	0.27	0.38	0.29
	Westbound	Main St	230	>30	>30	>30	38.7	28.7	36.0	0.73	0.56	0.61
	Northbound	9th Line	230	>30	>30	>30	23.0	29.9	23.9	0.06	0.07	0.05
	Southbound	9th Line	230	>30	>30	>30	30.3	36	28.8	0.27	0.27	0.15
Main St & Winona Dr	Eastbound	Main St	230	>30	>30	>30	5.7	6.4	3.6	0.45	0.53	0.37
	Westbound	Main St	230	>30	>30	>30	6.2	5.9	3.4	0.51	0.47	0.33
9th Line & Rupert Ave	Northbound	9th Line	320	>30	>30	>30	9.3	9.2	8.4	0.02	0.03	0.01
	Southbound	9th Line	320	>30	>30	>30	8.9	9.8	8.4	0.01	0.02	0.00

*Distance calculated from Google image

**Service frequency information obtained from bus schedules available on York Region YRT.ca and Go Transit websites

***values of Intersection Capacity Analysis from Synchro Reports

FB 2037 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	D	C	A	B
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	D	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

Future Total 2027 Condition:**FT 2027 Derived Values**

Approach			***Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	*Access To Transit (m)	**Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	230	>30	>30	>30	30.5	26.2	28.1	0.27	0.38	0.29
	Westbound		230	>30	>30	>30	38.7	28.7	36.0	0.73	0.56	0.61
	Northbound	9th Line	230	>30	>30	>30	23.0	29.9	23.9	0.06	0.07	0.05
	Southbound		230	>30	>30	>30	30.3	36	28.8	0.27	0.27	0.15
Main St & Winona Dr	Eastbound	Main St	230	>30	>30	>30	5.7	6.4	3.6	0.45	0.53	0.37
	Westbound		230	>30	>30	>30	6.2	5.9	3.4	0.51	0.47	0.33
9th Line & Rupert Ave	Northbound	9th Line	320	>30	>30	>30	9.3	9.2	8.4	0.02	0.03	0.01
	Southbound		320	>30	>30	>30	8.9	9.8	8.4	0.01	0.02	0.00

*Distance calculated from Google image

**Service frequency information obtained from bus schedules available on York Region YRT.ca and Go Transit websites

***values of Intersection Capacity Analysis from Synchro Reports

FT 2027 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	C	B	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

Future Total 2032 Condition:**FT 2032 Derived Values**

Approach			***Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	*Access To Transit (m)	**Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	230	>30	>30	>30	29.3	25.6	27.4	0.25	0.33	0.25
	Westbound		230	>30	>30	>30	38.8	28.0	34.9	0.73	0.52	0.57
	Northbound	9th Line	230	>30	>30	>30	22.6	29.3	23.6	0.05	0.06	0.04
	Southbound		230	>30	>30	>30	28.9	34.2	28.5	0.21	0.18	0.14
Main St & Winona Dr	Eastbound	Main St	230	>30	>30	>30	8.3	6.2	4.4	0.44	0.48	0.35
	Westbound		230	>30	>30	>30	9.3	5.8	4.1	0.53	0.44	0.31
9th Line & Rupert Ave	Northbound	9th Line	320	>30	>30	>30	9.4	9.0	8.4	0.06	0.03	0.02
	Southbound		320	>30	>30	>30	8.7	9.4	8.3	0.01	0.02	0.00

*Distance calculated from Google image

**Service frequency information obtained from bus schedules available on York Region YRT.ca and Go Transit websites

***values of Intersection Capacity Analysis from Synchro Reports

FT 2032 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	C	C	A	A
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	C	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	A	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

Future Total 2037 Condition:**FT 2037 Derived Values**

Approach			***Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	*Access To Transit (m)	**Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	230	>30	>30	>30	30.9	26.3	28.2	0.30	0.39	0.30
	Westbound		230	>30	>30	>30	40.9	28.8	36.2	0.79	0.56	0.62
	Northbound	9th Line	230	>30	>30	>30	23.0	29.9	23.9	0.06	0.07	0.05
	Southbound		230	>30	>30	>30	30.5	36.0	28.8	0.28	0.27	0.15
Main St & Winona Dr	Eastbound	Main St	230	>30	>30	>30	9.3	7.1	4.7	0.49	0.54	0.39
	Westbound		230	>30	>30	>30	10.5	6.6	4.5	0.59	0.49	0.34
9th Line & Rupert Ave	Northbound	9th Line	320	>30	>30	>30	9.7	9.2	8.5	0.07	0.04	0.02
	Southbound		320	>30	>30	>30	8.9	9.8	8.4	0.01	0.02	0.00

*Distance calculated from Google image

**Service frequency information obtained from bus schedules available on York Region YRT.ca and Go Transit websites

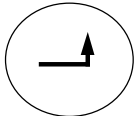
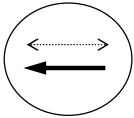
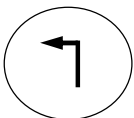
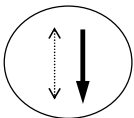
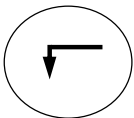
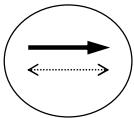
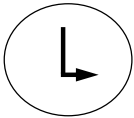
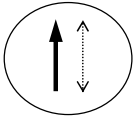
***values of Intersection Capacity Analysis from Synchro Reports

FT 2037 Transit Level of Service

Approach			Transit Service Quality				Intersection Approach (LOS)					
Intersection	Direction	Description	Access To Transit (m)	Transit Headway LOS			Delay LOS			V/C LOS		
				FRI Mid	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM	FRI Midday	FRI PM	SAT PM
9th Line & Main St	Eastbound	Main St	B	F	F	F	C	C	C	A	A	A
	Westbound		B	F	F	F	D	C	D	C	A	B
	Northbound	9th Line	B	F	F	F	C	C	C	A	A	A
	Southbound		B	F	F	F	C	D	C	A	A	A
Main St & Winona Dr	Eastbound	Main St	B	F	F	F	A	A	A	A	A	A
	Westbound		B	F	F	F	B	A	A	A	A	A
9th Line & Rupert Ave	Northbound	9th Line	B	F	F	F	A	A	A	A	A	A
	Southbound		B	F	F	F	A	A	A	A	A	A

APPENDIX G

Signal Timing Plan & Synchro Signal Timing Report

LOCATION: Main St & Ninth Line (YR 69)		MUNICIPALITY: Town of Whitchurch-Stouffville			N ↑	
CTCS: 543		COMPUTER SYSTEM: Centrac				
MODE/COMMENT: SA with APS		CONTROLLER/CABINET TYPE: Cobalt				
PREPARED/CHECKED BY: MA		CONFLICT FLASH: Red & Red				
PREPARATION DATE: January 20, 2025		DESIGN WALK SPEED: 1.0 m/s (FDW based on full crossing at 1.2 m/s)				
IMPLEMENTATION DATE: January 20, 2025		CHANNEL/DROP:				
NEMA Phase (York)		AM 6:00-15:00 M-F 6:00-19:00 Sat & Sun	PM 15:00-20:00 M-F	Free 20:00-06:00 M-F 19:00-6:00 Sat & Sun	Phase Mode (Fixed/Demanded/Callable)	Remarks
	Local Plan	Pattern 1	Pattern 2	Pattern 99		
	System Plan	Plan 1	Plan 2	Plan 99		
1. E/B Left Turn Arrow 	WLK FDW MIN 7 EXT 5 MAX1 7 MAX2 0 AMB 3 ALR 1 SPLIT				Callable/Extendable by Setback Loop	Pedestrian Minimums: EWWK = 7 sec., EWFD = 24 sec. NSWK = 7 sec., NSFD = 22 sec. Emergency vehicle pre-emption 3: Serve EWG/EWDW min 20 secs and up to 100 secs if there are continuous emergency calls in EW direction.
2. Westbound 	WLK 7 FDW 24 MIN 31 EXT 0 MAX1 31 MAX2 0 AMB 4.5 ALR 2.5 SPLIT				Fixed	Emergency vehicle pre-emption 4: Serve NSG/NSDW min 20 secs and up to 100 secs if there are continuous emergency calls in NS direction. NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NSG is served. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum green split during coordinated operation or serves MAX1 during Free operation. If a pedestrian call is received, the pedestrian minimum will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
3. N/B Left Turn Arrow 	WLK FDW MIN 7 EXT 5 MAX1 7 MAX2 0 AMB 3 ALR 1 SPLIT				Callable/Extendable by Setback Loop	
4. Southbound 	WLK 7 FDW 22 MIN 10 EXT 5 MAX1 30 MAX2 0 AMB 4.0 ALR 3.0 SPLIT				Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	During coordinated operation, the signal constantly cycles through main street FDW to improve response time to side street vehicle and pedestrian demand. During free plan, signal rests in EWWK and does not cycle through EWFD unless there is side street vehicle or pedestrian demand.
5. W/B Left Turn Arrow 	WLK FDW MIN 7 EXT 5 MAX1 7 MAX2 0 AMB 3 ALR 1 SPLIT				Callable/Extendable by Setback Loop	EWFD reverts to EWWK if there is no side street demand at the end of the EWFD. APS Extended Push Activation = 3 sec When activated, NS APS and EW APS on for 7 seconds.
6. Eastbound 	WLK 7 FDW 24 MIN 31 EXT 0 MAX1 31 MAX2 0 AMB 4.5 ALR 2.5 SPLIT				Fixed	Signal Timing Adjustments •Increased Veh Ext Time to 5s along all phases. •Implemented new Coord plan# 2, pm peak. •Readjust splits and offsets accordingly. •Readjust Time Base Schedules along all coord plans.
7. SB Left Turn Arrow 	WLK FDW MIN 7 EXT 5 MAX1 7 MAX2 0 AMB 3 ALR 1 SPLIT				Callable/Extendable by Setback Loop	LEGEND: SA - Semi-Actuated signal WLK - Walk time FDW - Flashing Don't Walk time MIN - Minimum green time EXT - Extension time MAX1 - Maximum green time 1 MAX2 - Maximum green time 2 AMB - Amber ALR - All Red CL - Cycle Length OF - Offset VP - Vehicle Permissive NSWK - North/South Walk EWWK - East/West Walk NSG - North/South Green EWG - East/West Green NSFD - North/South Flashing Don't Walk EWFD - East/West Flashing Don't Walk TSP - Transit Priority APS - Audible Pedestrian Signal
8. Northbound 	WLK 7 FDW 22 MIN 10 EXT 5 MAX1 30 MAX2 0 AMB 4 ALR 3.0 SPLIT				Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
	CL OF VP	120 0 24	120 0 24	0 (FREE) 0 (FREE) 0 (FREE)		

NOTES:

Timings
1: Ninth Line & Main St /Main St

EX 2025 FRI MIDDAY
11-26-2025

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	163	503	170	67	554	196	112	67	45	95	198
Future Volume (vph)	163	503	170	67	554	196	112	67	45	95	198
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	31.0	31.0	7.0	31.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.5	38.0	38.0	12.0	38.0	11.5	34.0	34.0	11.5	34.0	34.0
Total Split (s)	12.0	46.0	46.0	12.0	46.0	17.0	45.0	45.0	17.0	45.0	45.0
Total Split (%)	10.0%	38.3%	38.3%	10.0%	38.3%	14.2%	37.5%	37.5%	14.2%	37.5%	37.5%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	48.5	39.2	39.2	47.1	36.5	57.3	47.0	47.0	48.7	40.1	40.1
Actuated g/C Ratio	0.42	0.34	0.34	0.40	0.31	0.49	0.40	0.40	0.42	0.34	0.34
v/c Ratio	0.59	0.86	0.29	0.35	0.58	0.33	0.16	0.10	0.09	0.16	0.31
Control Delay	30.1	51.8	7.3	24.0	35.8	19.3	25.0	1.9	17.1	28.5	5.0
Queue Delay	0.0	51.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	102.8	7.3	24.0	35.8	19.3	25.0	1.9	17.1	28.5	5.0
LOS	C	F	A	C	D	B	C	A	B	C	A
Approach Delay		69.2			34.6		17.9			13.2	
Approach LOS		E			C		B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 116.8

Natural Cycle: 100

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 41.6

Intersection LOS: D

Intersection Capacity Utilization 65.7%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Ninth Line & Main St /Main St

			
Ø1	Ø2	Ø3	Ø4
17 s	45 s	12 s	46 s
			
Ø5	Ø6	Ø7	Ø8
17 s	45 s	12 s	46 s

Timings
1: Ninth Line & Main St /Main St

EX 2025 FRI PM Peak
11-26-2025

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	213	557	284	79	493	222	190	80	59	142	186
Future Volume (vph)	213	557	284	79	493	222	190	80	59	142	186
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	31.0	31.0	7.0	31.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.5	38.0	38.0	12.0	38.0	11.5	36.0	36.0	11.5	34.0	34.0
Total Split (s)	12.0	55.0	55.0	12.0	55.0	16.0	37.0	37.0	16.0	37.0	37.0
Total Split (%)	10.0%	45.8%	45.8%	10.0%	45.8%	13.3%	30.8%	30.8%	13.3%	30.8%	30.8%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	52.5	43.2	43.2	51.2	40.5	48.3	38.1	38.1	41.3	32.1	32.1
Actuated g/C Ratio	0.47	0.38	0.38	0.46	0.36	0.43	0.34	0.34	0.37	0.29	0.29
v/c Ratio	0.62	0.83	0.39	0.37	0.46	0.46	0.33	0.14	0.13	0.29	0.33
Control Delay	25.2	43.1	5.5	19.4	28.1	25.6	32.5	4.0	21.6	34.7	6.3
Queue Delay	0.0	24.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	67.7	5.8	19.4	28.1	25.6	32.5	4.0	21.6	34.7	6.3
LOS	C	E	A	B	C	C	C	A	C	C	A
Approach Delay		42.4			27.0		24.8			19.1	
Approach LOS		D			C		C			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 112.5

Natural Cycle: 100

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 31.7

Intersection LOS: C

Intersection Capacity Utilization 74.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Ninth Line & Main St /Main St

 Ø1	 Ø2	 Ø3	 Ø4
16 s	37 s	12 s	55 s
 Ø5	 Ø6	 Ø7	 Ø8
16 s	37 s	12 s	55 s

Timings
1: Ninth Line & Main St /Main St

EX 2025 SAT PM Peak
11-26-2025

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	159	446	215	47	412	148	153	55	40	123	156
Future Volume (vph)	159	446	215	47	412	148	153	55	40	123	156
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	31.0	31.0	7.0	31.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.5	38.0	38.0	12.0	38.0	11.5	34.0	34.0	11.5	34.0	34.0
Total Split (s)	16.0	46.0	46.0	16.0	46.0	16.0	42.0	42.0	16.0	42.0	42.0
Total Split (%)	13.3%	38.3%	38.3%	13.3%	38.3%	13.3%	35.0%	35.0%	13.3%	35.0%	35.0%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	50.5	38.5	38.5	43.4	32.8	52.8	45.1	45.1	45.5	37.0	37.0
Actuated g/C Ratio	0.45	0.34	0.34	0.39	0.29	0.47	0.40	0.40	0.41	0.33	0.33
v/c Ratio	0.43	0.75	0.33	0.18	0.47	0.27	0.22	0.09	0.08	0.22	0.26
Control Delay	22.0	42.0	4.9	19.1	33.6	18.9	25.1	0.7	17.4	29.1	5.5
Queue Delay	0.0	10.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	52.7	5.1	19.1	33.6	18.9	25.1	0.7	17.4	29.1	5.5
LOS	C	D	A	B	C	B	C	A	B	C	A
Approach Delay		34.2			32.3		18.7			16.1	
Approach LOS		C			C		B			B	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 111.8

Natural Cycle: 100

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 28.1

Intersection LOS: C

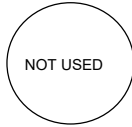
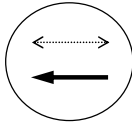
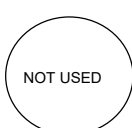
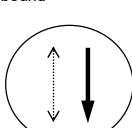
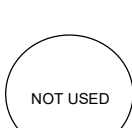
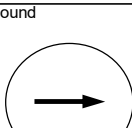
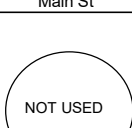
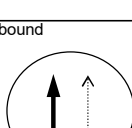
Intersection Capacity Utilization 67.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Ninth Line & Main St /Main St

			
Ø1	Ø2	Ø3	Ø4
16 s	42 s	16 s	46 s
			
Ø5	Ø6	Ø7	Ø8
16 s	42 s	16 s	46 s

LOCATION: Main St & Winoa (Town of Stouffville) CTCS: 871 MODE/COMMENT: SA with APS PREPARED/CHECKED BY: MA PREPARATION DATE: March 25, 2024 IMPLEMENTATION DATE: July 22, 2024		MUNICIPALITY: Town of Whitchurch-Stouffville COMPUTER SYSTEM: Centrac CONTROLLER/CABINET TYPE: Econolite EOS CONFLICT FLASH: Red & Red DESIGN WALK SPEED: 1.0 m/s (FDW based on full crossing at 1.0 m/s) CHANNEL/DROP:					
NEMA Phase (York)		AM	PM	OFF	Free	Phase Mode (Fixed/Demanded/Callable)	Remarks
		6:30-9:30 M-F	15:00-20:00 M-F	9:30-15:00 20:00-22:00 M-F 7:00-20:00 Sat & Sun	22:00-6:30 M-F 20:00-7:00 Sat & Sun		
	Local Plan System Plan	Pattern 1 Plan 1	Pattern 2 Plan 2	Pattern 3 Plan 3	Pattern 99 Plan 99		
	WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT						Pedestrian Minimums: EWWK = 7 sec., EWFD = 20 sec. NSWK = 7 sec., NSFD = 21 sec. Emergency vehicle pre-emption 3: Serve EWG/EWDW min 20 secs and up to 100 secs if there are continuous emergency calls in EW direction. Emergency vehicle pre-emption 4: Serve NSG/NSDW min 20 secs and up to 100 secs if there are continuous emergency calls in NS direction.
2. Westbound  Main St	WLK 7 FDW 20 MIN 19 EXT 0 MAX1 19 MAX2 0 AMB 4.0 ALR 2.0 SPLIT					Fixed	NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NSG is served. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum green split during coordinated operation or serves MAX1 during Free operation. If a pedestrian call is received, the pedestrian minimum will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG. During coordinated operation, the signal constantly cycles through main street FDW to improve response time to side street vehicle and pedestrian demand.
	WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT						During free plan, signal rests in EWWK and does not cycle through EWFD unless there is side street vehicle or pedestrian demand. EWFD reverts to EWWK if there is no side street demand at the end of the EWFD. APS Extended Push Activation = 3 sec When activated, APS is on for 7 seconds.
4. Southbound  W Lawn Cres	WLK 7 FDW 21 MIN 10 EXT 3 MAX1 20 MAX2 0 AMB 4.0 ALR 2.0 SPLIT					Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	Signal Timing Adjustments: • Controller upgrade to Econolite- EOS firmware. • Implement new Coord Plans 1, 2, & 3, during AM, PM, & Off-Peak hours.
	WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT						
6. Eastbound  Main St	WLK FDW 19 MIN 19 EXT 0 MAX1 19 MAX2 0 AMB 4.0 ALR 2.0 SPLIT					Fixed	LEGEND: SA - Semi-Actuated signal WLK - Walk time FDW - Flashing Don't Walk time MIN - Minimum green time EXT - Extension time MAX1 - Maximum green time 1 MAX2 - Maximum green time 2 AMB - Amber ALR - All Red CL - Cycle Length OF - Offset VP - Vehicle Permissive NSWK - North/South Walk EWWK - East/West Walk NSG - North/South Green EWG - East/West Green NSFD - North/South Flashing Don't Walk EWFD - East/West Flashing Don't Walk TSP - Transit Priority APS - Audible Pedestrian Signal RLC - Red Light Camera
	WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT						
8. Northbound  Weldon Rd	WLK 7 FDW 21 MIN 10 EXT 3 MAX1 20 MAX2 0 AMB 4.0 ALR 2.0 SPLIT					Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
	CL OF VP	120 93 20	120 104 20	120 0 20	0 (FREE) 0 (FREE) 0 (FREE)		

NOTES:

Timings

2: Driveway/Winona Dr & Main St/Main St

EX 2025 FRI MIDDAY

11-26-2025

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	63	811	8	858	3	0	63	0
Future Volume (vph)	63	811	8	858	3	0	63	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	D.Pm	NA
Protected Phases		6		2		8		4
Permitted Phases	6		2		8		8	
Detector Phase	6	6	2	2	8	8	8	4
Switch Phase								
Minimum Initial (s)	19.0	19.0	19.0	19.0	10.0	10.0	10.0	10.0
Minimum Split (s)	76.0	76.0	76.0	76.0	34.0	34.0	34.0	34.0
Total Split (s)	76.0	76.0	76.0	76.0	44.0	44.0	44.0	44.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0		6.0		6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Efect Green (s)	76.8	76.8	76.8	76.8		12.2		12.2
Actuated g/C Ratio	0.76	0.76	0.76	0.76		0.12		0.12
v/c Ratio	0.17	0.33	0.02	0.37		0.07		0.59
Control Delay	5.1	4.5	3.9	4.7		8.7		41.6
Queue Delay	0.0	0.0	0.0	0.7		0.0		0.0
Total Delay	5.1	4.5	3.9	5.4		8.7		41.6
LOS	A	A	A	A		A		D
Approach Delay		4.5		5.3		8.7		41.6
Approach LOS		A		A		A		D
Intersection Summary								
Cycle Length: 120								
Actuated Cycle Length: 101								
Natural Cycle: 110								
Control Type: Semi Act-Uncoord								
Maximum v/c Ratio: 0.59								
Intersection Signal Delay: 7.0					Intersection LOS: A			
Intersection Capacity Utilization 69.1%					ICU Level of Service C			
Analysis Period (min) 15								

Splits and Phases: 2: Driveway/Winona Dr & Main St/Main St



Timings

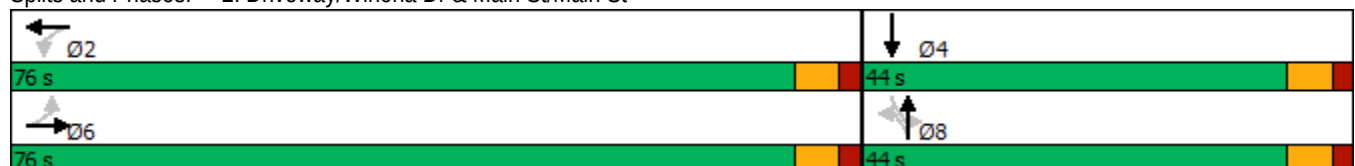
2: Driveway/Winona Dr & Main St/Main St

EX 2025 FRI PM Peak

11-26-2025

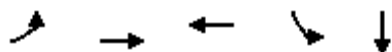
								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	42	952	2	814	3	2	70	0
Future Volume (vph)	42	952	2	814	3	2	70	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	D.Pm	NA
Protected Phases		6		2		8		4
Permitted Phases	6		2		8		8	
Detector Phase	6	6	2	2	8	8	8	4
Switch Phase								
Minimum Initial (s)	19.0	19.0	19.0	19.0	10.0	10.0	10.0	10.0
Minimum Split (s)	40.0	40.0	40.0	40.0	34.0	34.0	34.0	34.0
Total Split (s)	76.0	76.0	76.0	76.0	44.0	44.0	44.0	44.0
Total Split (%)	63.3%	63.3%	63.3%	63.3%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0		6.0		6.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	None	None	None	None
Act Effct Green (s)	77.6	77.6	77.6	77.6		12.2		12.2
Actuated g/C Ratio	0.76	0.76	0.76	0.76		0.12		0.12
v/c Ratio	0.11	0.38	0.01	0.35		0.04		0.58
Control Delay	4.5	4.8	4.0	4.5		31.8		43.0
Queue Delay	0.0	0.0	0.0	0.6		0.0		0.0
Total Delay	4.5	4.8	4.0	5.2		31.8		43.0
LOS	A	A	A	A		C		D
Approach Delay		4.7		5.2		31.8		43.0
Approach LOS		A		A		C		D
Intersection Summary								
Cycle Length: 120								
Actuated Cycle Length: 101.9								
Natural Cycle: 75								
Control Type: Semi Act-Uncoord								
Maximum v/c Ratio: 0.58								
Intersection Signal Delay: 7.0					Intersection LOS: A			
Intersection Capacity Utilization 54.4%					ICU Level of Service A			
Analysis Period (min) 15								

Splits and Phases: 2: Driveway/Winona Dr & Main St/Main St



Timings 2: Driveway/Winona Dr & Main St/Main St

EX 2025 SAT PM Peak
11-26-2025

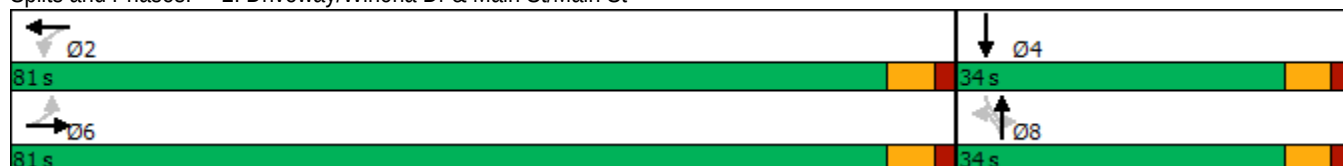


Lane Group	EBL	EBT	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	33	697	593	48	0
Future Volume (vph)	33	697	593	48	0
Turn Type	Perm	NA	NA	D.Pm	NA
Protected Phases		6	2		4
Permitted Phases	6			8	
Detector Phase	6	6	2	8	4
Switch Phase					
Minimum Initial (s)	19.0	19.0	19.0	10.0	10.0
Minimum Split (s)	81.0	81.0	81.0	34.0	34.0
Total Split (s)	81.0	81.0	81.0	34.0	34.0
Total Split (%)	70.4%	70.4%	70.4%	29.6%	29.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0		6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	None	None
Act Effect Green (s)	88.4	88.4	88.4		10.9
Actuated g/C Ratio	0.83	0.83	0.83		0.10
v/c Ratio	0.06	0.26	0.23		0.45
Control Delay	3.1	3.0	2.9		39.5
Queue Delay	0.0	0.0	0.3		0.0
Total Delay	3.1	3.0	3.2		39.5
LOS	A	A	A		D
Approach Delay		3.0	3.2		39.5
Approach LOS		A	A		D

Intersection Summary

Cycle Length: 115
Actuated Cycle Length: 106.4
Natural Cycle: 115
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.45
Intersection Signal Delay: 4.9
Intersection LOS: A
Intersection Capacity Utilization 45.8%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: Driveway/Winona Dr & Main St/Main St



APPENDIX H

Automobile Synchro Analysis Reports

HCM Signalized Intersection Capacity Analysis

1: Ninth Line & Main St /Main St

EX 2025 FRI MIDDAY

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	503	170	67	554	39	196	112	67	45	95	198
Future Volume (vph)	163	503	170	67	554	39	196	112	67	45	95	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1599	1787	3542		1805	1881	1615	1805	1881	1599
Flt Permitted	0.26	1.00	1.00	0.14	1.00		0.63	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	503	1900	1599	270	3542		1195	1881	1615	1289	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	177	547	185	73	602	42	213	122	73	49	103	215
RTOR Reduction (vph)	0	0	110	0	4	0	0	0	44	0	0	141
Lane Group Flow (vph)	177	547	75	73	640	0	213	122	29	49	103	74
Heavy Vehicles (%)	0%	0%	1%	1%	1%	0%	0%	1%	0%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	47.2	39.2	39.2	43.4	37.3		57.1	47.0	47.0	47.0	40.9	40.9
Effective Green, g (s)	47.2	39.2	39.2	43.4	37.3		57.1	47.0	47.0	47.0	40.9	40.9
Actuated g/C Ratio	0.40	0.33	0.33	0.37	0.32		0.48	0.40	0.40	0.40	0.35	0.35
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	288	629	529	177	1115		639	746	641	538	649	552
v/s Ratio Prot	c0.04	c0.29		0.02	0.18		c0.03	0.06		0.00	0.05	
v/s Ratio Perm	0.20		0.05	0.13			c0.13		0.02	0.03		0.05
v/c Ratio	0.61	0.87	0.14	0.41	0.57		0.33	0.16	0.05	0.09	0.16	0.13
Uniform Delay, d1	24.8	37.2	27.8	27.8	33.9		18.1	23.0	21.9	22.1	26.8	26.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	12.3	0.1	1.6	0.7		0.3	0.5	0.1	0.1	0.5	0.5
Delay (s)	28.6	49.5	27.9	29.4	34.6		18.4	23.5	22.1	22.2	27.4	27.1
Level of Service	C	D	C	C	C		B	C	C	C	C	C
Approach Delay (s)		41.0			34.1			20.6			26.5	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			33.3			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			118.4			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			65.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	106.2	22.2	31.8	69.3	60.3	35.0	32.4	12.4	12.2	22.8	22.8
Average Queue (m)	39.4	90.9	13.3	13.8	54.1	43.4	24.3	15.7	6.2	5.6	13.3	14.2
95th Queue (m)	71.6	123.3	23.0	38.5	75.3	68.5	40.2	35.4	15.6	13.8	25.7	25.5
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		11										
Queuing Penalty (veh)		49										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	11	44			10							
Queuing Penalty (veh)	55	72			7							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

EX 2025 FRI MIDDAY
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	811	6	8	858	53	3	0	12	63	0	44
Future Volume (vph)	63	811	6	8	858	53	3	0	12	63	0	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.89			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	3536		1805	3500			1659			1709	
Flt Permitted	0.27	1.00		0.31	1.00			0.95			0.81	
Satd. Flow (perm)	511	3536		588	3500			1585			1425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	882	7	9	933	58	3	0	13	68	0	48
RTOR Reduction (vph)	0	0	0	0	2	0	0	14	0	0	27	0
Lane Group Flow (vph)	68	889	0	9	989	0	0	2	0	0	89	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	1%	0%	1%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	76.8	76.8		76.8	76.8			12.2			12.2	
Effective Green, g (s)	76.8	76.8		76.8	76.8			12.2			12.2	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.12			0.12	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	388	2688		447	2661			191			172	
v/s Ratio Prot		0.25			c0.28							
v/s Ratio Perm	0.13			0.02				0.00			c0.06	
v/c Ratio	0.18	0.33		0.02	0.37			0.01			0.52	
Uniform Delay, d1	3.3	3.9		2.9	4.0			39.1			41.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.0	0.3		0.1	0.4			0.0			2.6	
Delay (s)	4.3	4.2		3.0	4.4			39.1			44.2	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.2			4.4			39.1			44.2	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			6.8			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			101.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			69.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	22.1	69.1	48.7	5.5	39.3	41.0	8.4	27.8
Average Queue (m)	12.0	45.8	21.0	1.7	19.0	20.2	3.5	17.1
95th Queue (m)	36.2	104.8	73.1	7.6	45.6	45.7	10.8	31.4
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		0						
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	0	16			2			
Queuing Penalty (veh)	1	10			0			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

EX 2025 FRI Midday
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	40	0	0	44
Future Volume (Veh/h)	0	0	40	0	0	44
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	43	0	0	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	91	43			43	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	91	43			43	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	914	1033			1579	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	43	48			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1579			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

EX 2025 FRI MIDDAY
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	40	0	0	44
Future Volume (Veh/h)	0	0	40	0	0	44
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	43	0	0	48
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	91	43			43	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	91	43			43	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	914	1033			1579	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	43	48			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1579			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

EX 2025 FRI MIDDAY
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	78	23	21	40	15	25
Future Volume (Veh/h)	78	23	21	40	15	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	85	25	23	43	16	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			110			98
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			110			98
tC, single (s)			4.1			6.2
tC, 2 stage (s)						
tF (s)			2.2			3.3
p0 queue free %			98			97
cM capacity (veh/h)			1493			953
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	110	66	43			
Volume Left	0	23	16			
Volume Right	25	0	27			
cSH	1700	1493	887			
Volume to Capacity	0.06	0.02	0.05			
Queue Length 95th (m)	0.0	0.4	1.2			
Control Delay (s)	0.0	2.7	9.3			
Lane LOS			A			
Approach Delay (s)	0.0	2.7	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			19.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	1.8	10.0
Average Queue (m)	0.4	6.7
95th Queue (m)	3.3	13.5
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

EX 2025 FRI Midday
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	8	20	4	9	9	11	444	4	9	412	31
Future Volume (Veh/h)	51	8	20	4	9	9	11	444	4	9	412	31
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	9	22	4	10	10	12	483	4	10	448	34
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh									2			
Upstream signal (m)	240											
pX, platoon unblocked	0.94	0.94		0.94	0.94	0.94				0.94		
vC, conflicting volume	1007	996	465	1004	1011	485	482			487		
vC1, stage 1 conf vol	485	485		509	509							
vC2, stage 2 conf vol	522	511		494	502							
vCu, unblocked vol	974	962	465	970	978	417	482			419		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.2		
p0 queue free %	87	98	96	99	98	98	99			99		
cM capacity (veh/h)	416	426	602	413	422	576	993			1079		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	86	24	12	487	10	482						
Volume Left	55	4	12	0	10	0						
Volume Right	22	10	0	4	0	34						
cSH	453	473	993	1700	1079	1700						
Volume to Capacity	0.19	0.05	0.01	0.29	0.01	0.28						
Queue Length 95th (m)	5.5	1.3	0.3	0.0	0.2	0.0						
Control Delay (s)	14.8	13.0	8.7	0.0	8.4	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	14.8	13.0	0.2		0.2							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			41.4%	ICU Level of Service				A				
Analysis Period (min)			15									

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	17.3	11.1	5.7	1.7
Average Queue (m)	10.7	4.8	1.7	0.3
95th Queue (m)	18.5	13.3	8.6	3.1
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

EX 2025 FRI PM Peak

11-24-2025

1: Ninth Line & Main St /Main St

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	557	284	79	493	48	222	190	80	59	142	186
Future Volume (vph)	213	557	284	79	493	48	222	190	80	59	142	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1615	1805	3530		1805	1863	1615	1805	1881	1615
Flt Permitted	0.33	1.00	1.00	0.15	1.00		0.54	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	628	1900	1615	288	3530		1029	1863	1615	1194	1881	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	232	605	309	86	536	52	241	207	87	64	154	202
RTOR Reduction (vph)	0	0	174	0	6	0	0	0	58	0	0	144
Lane Group Flow (vph)	232	605	135	86	582	0	241	207	29	64	154	58
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	51.3	43.3	43.3	47.5	41.4		48.8	38.1	38.1	39.7	33.0	33.0
Effective Green, g (s)	51.3	43.3	43.3	47.5	41.4		48.8	38.1	38.1	39.7	33.0	33.0
Actuated g/C Ratio	0.45	0.38	0.38	0.42	0.36		0.43	0.33	0.33	0.35	0.29	0.29
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	364	720	612	200	1279		519	621	538	450	543	466
v/s Ratio Prot	c0.04	c0.32		0.02	0.16		c0.05	0.11		0.01	0.08	
v/s Ratio Perm	0.24		0.08	0.16			c0.15		0.02	0.04		0.04
v/c Ratio	0.64	0.84	0.22	0.43	0.45		0.46	0.33	0.05	0.14	0.28	0.13
Uniform Delay, d1	21.6	32.3	24.0	24.0	27.8		21.8	28.5	25.8	25.2	31.4	30.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6	8.7	0.2	1.5	0.3		0.7	1.4	0.2	0.1	1.3	0.6
Delay (s)	25.3	41.0	24.2	25.5	28.0		22.5	30.0	26.0	25.3	32.8	30.5
Level of Service	C	D	C	C	C		C	C	C	C	C	C
Approach Delay (s)		33.3			27.7			26.0			30.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.1			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			114.2			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			74.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	104.0	39.1	19.9	57.9	49.8	46.1	44.0	11.6	19.3	35.0	17.8
Average Queue (m)	42.2	82.1	22.4	12.6	44.0	32.7	33.3	27.5	6.3	10.5	21.9	11.6
95th Queue (m)	73.6	121.1	45.4	23.5	63.9	57.1	55.1	48.8	14.2	21.6	43.0	19.6
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		6										
Queuing Penalty (veh)		29										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	12	39			4							
Queuing Penalty (veh)	68	83			3							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

EX 2025 FRI PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	952	2	2	814	49	3	2	2	70	0	35
Future Volume (vph)	42	952	2	2	814	49	3	2	2	70	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.96			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3609		1805	3538			1788			1756	
Flt Permitted	0.29	1.00		0.26	1.00			0.89			0.80	
Satd. Flow (perm)	556	3609		494	3538			1632			1444	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	1035	2	2	885	53	3	2	2	76	0	38
RTOR Reduction (vph)	0	0	0	0	2	0	0	2	0	0	24	0
Lane Group Flow (vph)	46	1037	0	2	936	0	0	5	0	0	90	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	77.6	77.6		77.6	77.6			12.2			12.2	
Effective Green, g (s)	77.6	77.6		77.6	77.6			12.2			12.2	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.12			0.12	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	423	2751		376	2696			195			173	
v/s Ratio Prot		c0.29			0.26							
v/s Ratio Perm	0.08			0.00				0.00			c0.06	
v/c Ratio	0.11	0.38		0.01	0.35			0.03			0.52	
Uniform Delay, d1	3.1	4.0		2.9	3.9			39.6			42.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.4		0.0	0.4			0.1			2.8	
Delay (s)	3.7	4.4		2.9	4.3			39.6			44.9	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.4			4.3			39.6			44.9	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			6.6			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			101.8			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			54.4%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	17.2	67.3	40.8	0.8	41.1	44.2	6.0	23.8
Average Queue (m)	7.6	38.5	18.2	0.2	18.1	21.4	1.5	14.8
95th Queue (m)	26.3	91.5	63.7	2.1	45.9	49.0	7.0	26.4
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		0						
Queuing Penalty (veh)		0						
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		9			1			
Queuing Penalty (veh)		4			0			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

EX 2025 FRI PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	48	0	0	30
Future Volume (Veh/h)	0	0	48	0	0	30
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	52	0	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	85	52			52	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	85	52			52	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	916	1016			1554	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	52	33			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1554			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

EX 2025 FRI PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	48	0	0	30
Future Volume (Veh/h)	0	0	48	0	0	30
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	52	0	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	85	52			52	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	85	52			52	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	921	1021			1567	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	52	33			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1567			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

EX 2025 FRI PM Peak
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	71	17	13	40	20	28
Future Volume (Veh/h)	71	17	13	40	20	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	18	14	43	22	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			95		157	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			95		157	86
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	97
cM capacity (veh/h)			1512		831	978
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	95	57	52			
Volume Left	0	14	22			
Volume Right	18	0	30			
cSH	1700	1512	910			
Volume to Capacity	0.06	0.01	0.06			
Queue Length 95th (m)	0.0	0.2	1.5			
Control Delay (s)	0.0	1.9	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.9	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			2.9			
Intersection Capacity Utilization			19.5%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	0.9	8.6
Average Queue (m)	0.4	5.9
95th Queue (m)	3.2	12.3
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

EX 2025 FRI PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	8	24	4	5	14	19	533	6	11	462	30
Future Volume (Veh/h)	53	8	24	4	5	14	19	533	6	11	462	30
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	9	26	4	5	15	21	579	7	12	502	33
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						TWLTL					
Median storage veh							2					
Upstream signal (m)	240											
pX, platoon unblocked	0.86	0.86		0.86	0.86	0.86				0.86		
vC, conflicting volume	1181	1170	518	1181	1184	582	535			586		
vC1, stage 1 conf vol	542	542		624	624							
vC2, stage 2 conf vol	638	628		556	559							
vCu, unblocked vol	1128	1116	518	1128	1131	431	535			435		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	98	95	99	99	97	98			99		
cM capacity (veh/h)	357	370	561	352	366	539	1043			974		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	93	24	21	586	12	535						
Volume Left	58	4	21	0	12	0						
Volume Right	26	15	0	7	0	33						
cSH	399	454	1043	1700	974	1700						
Volume to Capacity	0.23	0.05	0.02	0.34	0.01	0.31						
Queue Length 95th (m)	7.1	1.3	0.5	0.0	0.3	0.0						
Control Delay (s)	16.8	13.4	8.5	0.0	8.7	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	16.8	13.4	0.3		0.2							
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.7											
Intersection Capacity Utilization	46.6%			ICU Level of Service					A			
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	18.2	8.1	9.7	4.2
Average Queue (m)	12.1	4.5	2.5	0.8
95th Queue (m)	20.5	11.7	9.5	5.0
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

1: Ninth Line & Main St /Main St

EX 2025 SAT PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	446	215	47	412	43	148	153	55	40	123	156
Future Volume (vph)	159	446	215	47	412	43	148	153	55	40	123	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1881	1615	1805	3552		1787	1900	1583	1805	1881	1599
Flt Permitted	0.34	1.00	1.00	0.25	1.00		0.59	1.00	1.00	0.65	1.00	1.00
Satd. Flow (perm)	641	1881	1615	483	3552		1113	1900	1583	1239	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	173	485	234	51	448	47	161	166	60	43	134	170
RTOR Reduction (vph)	0	0	155	0	7	0	0	0	36	0	0	112
Lane Group Flow (vph)	173	485	79	51	488	0	161	166	24	43	134	58
Heavy Vehicles (%)	0%	1%	0%	0%	0%	2%	1%	0%	2%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	48.7	38.5	38.5	39.8	33.6		53.6	45.1	45.1	43.2	38.7	38.7
Effective Green, g (s)	48.7	38.5	38.5	39.8	33.6		53.6	45.1	45.1	43.2	38.7	38.7
Actuated g/C Ratio	0.43	0.34	0.34	0.35	0.29		0.47	0.39	0.39	0.38	0.34	0.34
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	386	633	543	239	1044		586	749	624	490	636	541
v/s Ratio Prot	c0.04	c0.26		0.01	0.14		c0.03	0.09		0.00	0.07	
v/s Ratio Perm	0.15		0.05	0.06			c0.10		0.01	0.03		0.04
v/c Ratio	0.45	0.77	0.15	0.21	0.47		0.27	0.22	0.04	0.09	0.21	0.11
Uniform Delay, d1	21.4	33.9	26.4	26.2	33.0		17.8	23.0	21.3	22.7	26.9	25.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	5.5	0.1	0.4	0.3		0.3	0.7	0.1	0.1	0.8	0.4
Delay (s)	22.3	39.4	26.5	26.6	33.4		18.1	23.6	21.4	22.7	27.7	26.3
Level of Service	C	D	C	C	C		B	C	C	C	C	C
Approach Delay (s)		32.7			32.7			21.0			26.4	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.6			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			114.3			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			67.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	58.3	91.1	23.0	15.8	53.3	43.4	29.2	31.6	9.1	10.8	32.8	18.1
Average Queue (m)	36.2	63.8	15.6	8.7	38.9	27.2	19.1	21.4	5.0	4.4	18.5	11.3
95th Queue (m)	68.8	105.1	26.0	18.4	58.8	50.4	34.4	36.2	12.0	12.8	34.2	20.3
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		1										
Queuing Penalty (veh)		3										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	2	27			2							
Queuing Penalty (veh)	11	42			1							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

EX 2025 SAT PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	697	0	0	593	41	0	0	0	48	0	24
Future Volume (vph)	33	697	0	0	593	41	0	0	0	48	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0						6.0	
Lane Util. Factor	1.00	0.95			0.95						1.00	
Frt	1.00	1.00			0.99						0.95	
Flt Protected	0.95	1.00			1.00						0.97	
Satd. Flow (prot)	1805	3574			3575						1756	
Flt Permitted	0.39	1.00			1.00						0.80	
Satd. Flow (perm)	740	3574			3575						1450	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	758	0	0	645	45	0	0	0	52	0	26
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	26	0
Lane Group Flow (vph)	36	758	0	0	688	0	0	0	0	0	52	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA					D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	87.1	87.1			87.1						8.7	
Effective Green, g (s)	87.1	87.1			87.1						8.7	
Actuated g/C Ratio	0.81	0.81			0.81						0.08	
Clearance Time (s)	6.0	6.0			6.0						6.0	
Vehicle Extension (s)	3.0	3.0			3.0						3.0	
Lane Grp Cap (vph)	597	2887			2888						117	
v/s Ratio Prot		c0.21			0.19							
v/s Ratio Perm	0.05										c0.04	
v/c Ratio	0.06	0.26			0.24						0.45	
Uniform Delay, d1	2.1	2.5			2.5						47.3	
Progression Factor	1.00	1.00			1.00						1.00	
Incremental Delay, d2	0.2	0.2			0.2						2.7	
Delay (s)	2.3	2.7			2.7						50.0	
Level of Service	A	A			A						D	
Approach Delay (s)		2.7			2.7			0.0			50.0	
Approach LOS		A			A			A			D	
Intersection Summary												
HCM 2000 Control Delay			5.1			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			107.8			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			45.8%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	TR	T	TR	LTR
Maximum Queue (m)	7.5	34.5	16.8	31.5	30.5	19.5
Average Queue (m)	3.0	16.5	6.7	13.0	13.5	11.8
95th Queue (m)	9.5	38.0	18.6	37.5	35.9	23.3
Link Distance (m)		147.1	147.1	104.5	104.5	56.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	30.0					
Storage Blk Time (%)		1		1		
Queuing Penalty (veh)		0		0		

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

EX 2025 SAT PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	47	0	0	15
Future Volume (Veh/h)	0	0	47	0	0	15
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	51	0	0	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	67	51			51	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	67	51			51	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	938	1017			1555	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	51	16			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1555			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

EX 2025 SAT PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	47	0	0	15
Future Volume (Veh/h)	0	0	47	0	0	15
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	51	0	0	16
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	67	51			51	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	67	51			51	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	943	1023			1568	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	51	16			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1568			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

EX 2025 SAT PM Peak
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	53	7	8	27	19	28
Future Volume (Veh/h)	53	7	8	27	19	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	58	8	9	29	21	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			66		109	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			66		109	62
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	97
cM capacity (veh/h)			1549		888	1009
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	66	38	51			
Volume Left	0	9	21			
Volume Right	8	0	30			
cSH	1700	1549	955			
Volume to Capacity	0.04	0.01	0.05			
Queue Length 95th (m)	0.0	0.1	1.4			
Control Delay (s)	0.0	1.8	9.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.8	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			18.4%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	1.8	8.6
Average Queue (m)	0.4	5.7
95th Queue (m)	3.2	12.1
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

EX 2025 SAT PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	6	21	3	2	4	10	317	6	4	325	20
Future Volume (Veh/h)	47	6	21	3	2	4	10	317	6	4	325	20
Sign Control	Stop				Stop				Free		Free	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	7	23	3	2	4	11	345	7	4	353	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type									None	TWLTL		
Median storage veh										2		
Upstream signal (m)									240			
pX, platoon unblocked	0.93	0.93		0.93	0.93	0.93				0.93		
vC, conflicting volume	744	746	364	758	754	348	375			352		
vC1, stage 1 conf vol	372	372		370	370							
vC2, stage 2 conf vol	372	374		388	383							
vCu, unblocked vol	689	692	364	704	700	265	375			269		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	99	97	99	100	99	99			100		
cM capacity (veh/h)	533	514	685	511	509	726	1195			1218		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	81	9	11	352	4	375						
Volume Left	51	3	11	0	4	0						
Volume Right	23	4	0	7	0	22						
cSH	567	588	1195	1700	1218	1700						
Volume to Capacity	0.14	0.02	0.01	0.21	0.00	0.22						
Queue Length 95th (m)	4.0	0.4	0.2	0.0	0.1	0.0						
Control Delay (s)	12.4	11.2	8.0	0.0	8.0	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	12.4	11.2	0.2		0.1							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			32.6%	ICU Level of Service				A				
Analysis Period (min)			15									

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB
Directions Served	LTR	LTR	L
Maximum Queue (m)	15.1	9.5	1.8
Average Queue (m)	10.1	3.8	0.5
95th Queue (m)	16.2	11.4	4.1
Link Distance (m)	219.8	78.5	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			50.0
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Signalized Intersection Capacity Analysis

FB 2027 FRI Midday

1: Ninth Line & Main St /Main St

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	545	199	72	592	43	215	123	70	49	119	237
Future Volume (vph)	186	545	199	72	592	43	215	123	70	49	119	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1599	1787	3540		1805	1881	1615	1805	1881	1599
Flt Permitted	0.24	1.00	1.00	0.10	1.00		0.60	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	455	1900	1599	198	3540		1137	1881	1615	1275	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	202	592	216	78	643	47	234	134	76	53	129	258
RTOR Reduction (vph)	0	0	119	0	5	0	0	0	46	0	0	170
Lane Group Flow (vph)	202	592	97	78	685	0	234	134	30	53	129	88
Heavy Vehicles (%)	0%	0%	1%	1%	1%	0%	0%	1%	0%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	47.9	39.9	39.9	44.3	38.1		57.4	47.2	47.2	47.1	40.9	40.9
Effective Green, g (s)	47.9	39.9	39.9	44.3	38.1		57.4	47.2	47.2	47.1	40.9	40.9
Actuated g/C Ratio	0.40	0.33	0.33	0.37	0.32		0.48	0.39	0.39	0.39	0.34	0.34
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	272	634	533	155	1128		616	742	637	530	643	547
v/s Ratio Prot	c0.05	c0.31		0.03	0.19		c0.04	0.07		0.01	0.07	
v/s Ratio Perm	0.25		0.06	0.16			c0.14		0.02	0.03		0.06
v/c Ratio	0.74	0.93	0.18	0.50	0.61		0.38	0.18	0.05	0.10	0.20	0.16
Uniform Delay, d1	27.0	38.5	28.2	28.9	34.4		18.7	23.6	22.3	22.6	27.8	27.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.4	20.9	0.2	2.6	0.9		0.4	0.5	0.1	0.1	0.7	0.6
Delay (s)	37.5	59.4	28.4	31.5	35.3		19.1	24.1	22.4	22.7	28.5	28.0
Level of Service	D	E	C	C	D		B	C	C	C	C	C
Approach Delay (s)		48.4			34.9			21.2			27.5	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			119.5			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			73.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	109.5	41.5	20.3	69.7	67.1	39.8	22.0	12.9	12.2	26.8	25.5
Average Queue (m)	40.8	101.8	21.5	12.6	58.6	49.4	27.0	12.1	5.4	5.8	16.0	16.0
95th Queue (m)	72.3	123.3	58.4	25.4	75.0	71.2	45.0	25.4	14.3	14.6	30.8	27.7
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		21	1									
Queuing Penalty (veh)		101	3									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	11	49			13							
Queuing Penalty (veh)	62	90			10							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FB 2027 FRI Midday

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	874	17	21	938	57	22	1	41	65	0	46
Future Volume (vph)	66	874	17	21	938	57	22	1	41	65	0	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	3531		1805	3501			1689			1709	
Flt Permitted	0.25	1.00		0.28	1.00			0.85			0.83	
Satd. Flow (perm)	456	3531		534	3501			1468			1452	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	72	950	18	23	1020	62	24	1	45	71	0	50
RTOR Reduction (vph)	0	1	0	0	2	0	0	39	0	0	27	0
Lane Group Flow (vph)	72	967	0	23	1080	0	0	31	0	0	94	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	1%	0%	1%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	73.9	73.9		73.9	73.9			12.5			12.5	
Effective Green, g (s)	73.9	73.9		73.9	73.9			12.5			12.5	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.13			0.13	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	342	2651		401	2629			186			184	
v/s Ratio Prot		0.27			c0.31							
v/s Ratio Perm	0.16			0.04				0.02			c0.06	
v/c Ratio	0.21	0.36		0.06	0.41			0.17			0.51	
Uniform Delay, d1	3.6	4.2		3.2	4.4			38.3			40.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.4	0.4		0.3	0.5			0.4			2.4	
Delay (s)	5.0	4.6		3.5	4.9			38.7			42.5	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.6			4.9			38.7			42.5	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			7.7			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			98.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			69.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	39.4	101.6	62.8	8.0	45.9	49.6	19.6	27.9
Average Queue (m)	14.9	63.8	28.3	3.6	27.8	30.7	11.8	17.8
95th Queue (m)	51.4	138.9	99.3	10.4	52.2	57.5	23.3	32.2
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		6	2				1	
Queuing Penalty (veh)		0	0				0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		24			3			
Queuing Penalty (veh)		16			1			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FB 2027 FRI Midday
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	45	0	0	45
Future Volume (Veh/h)	0	0	45	0	0	45
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	49	0	0	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	98	49			49	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98	49			49	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	906	1025			1571	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	49	49			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1571			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FB 2027 FRI Midday
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	45	0	0	45
Future Volume (Veh/h)	0	0	45	0	0	45
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	49	0	0	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	98	49			49	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98	49			49	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	906	1025			1571	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	49	49			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1571			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FB 2027 FRI Midday
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	81	24	22	42	17	28
Future Volume (Veh/h)	81	24	22	42	17	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	26	24	46	18	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			114		195	101
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			114		195	101
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		98	97
cM capacity (veh/h)			1488		785	949
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	114	70	48			
Volume Left	0	24	18			
Volume Right	26	0	30			
cSH	1700	1488	880			
Volume to Capacity	0.07	0.02	0.05			
Queue Length 95th (m)	0.0	0.4	1.4			
Control Delay (s)	0.0	2.6	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.6	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization			20.1%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	3.7	9.1
Average Queue (m)	0.7	6.3
95th Queue (m)	4.8	12.6
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FB 2027 FRI Midday
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	8	21	4	9	9	11	480	4	9	460	32
Future Volume (Veh/h)	55	8	21	4	9	9	11	480	4	9	460	32
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	9	23	4	10	10	12	522	4	10	500	35
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh									2			
Upstream signal (m)	240											
pX, platoon unblocked	0.91	0.91		0.91	0.91	0.91				0.91		
vC, conflicting volume	1098	1088	518	1096	1103	524	535			526		
vC1, stage 1 conf vol	538	538		548	548							
vC2, stage 2 conf vol	561	550		548	555							
vCu, unblocked vol	1060	1048	518	1057	1065	431	535			434		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.2		
p0 queue free %	85	98	96	99	97	98	99			99		
cM capacity (veh/h)	387	400	562	382	395	551	948			1038		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	92	24	12	526	10	535						
Volume Left	60	4	12	0	10	0						
Volume Right	23	10	0	4	0	35						
cSH	421	445	948	1700	1038	1700						
Volume to Capacity	0.22	0.05	0.01	0.31	0.01	0.31						
Queue Length 95th (m)	6.6	1.4	0.3	0.0	0.2	0.0						
Control Delay (s)	15.9	13.5	8.8	0.0	8.5	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	15.9	13.5	0.2		0.2							
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.7											
Intersection Capacity Utilization	44.2%			ICU Level of Service					A			
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	16.8	10.9	5.5	3.4
Average Queue (m)	11.1	5.4	1.1	0.7
95th Queue (m)	19.3	14.0	6.0	4.5
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

FB 2027 FRI PM Peak

11-24-2025

1: Ninth Line & Main St /Main St

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	610	321	88	544	55	259	217	84	66	163	219
Future Volume (vph)	256	610	321	88	544	55	259	217	84	66	163	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1615	1805	3528		1805	1863	1615	1805	1881	1615
Flt Permitted	0.31	1.00	1.00	0.09	1.00		0.50	1.00	1.00	0.58	1.00	1.00
Satd. Flow (perm)	584	1900	1615	176	3528		959	1863	1615	1098	1881	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	278	663	349	96	591	60	282	236	91	72	177	238
RTOR Reduction (vph)	0	0	181	0	7	0	0	0	61	0	0	170
Lane Group Flow (vph)	278	663	168	96	644	0	282	236	30	72	177	68
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	51.6	43.6	43.6	51.0	43.3		49.0	38.0	38.0	40.0	33.0	33.0
Effective Green, g (s)	51.6	43.6	43.6	51.0	43.3		49.0	38.0	38.0	40.0	33.0	33.0
Actuated g/C Ratio	0.44	0.37	0.37	0.44	0.37		0.42	0.33	0.33	0.34	0.28	0.28
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	343	712	605	185	1313		491	608	527	420	533	458
v/s Ratio Prot	c0.06	c0.35		0.03	0.18		c0.06	0.13		0.01	0.09	
v/s Ratio Perm	0.30		0.10	0.19			c0.18		0.02	0.05		0.04
v/c Ratio	0.81	0.93	0.28	0.52	0.49		0.57	0.39	0.06	0.17	0.33	0.15
Uniform Delay, d1	25.6	34.9	25.4	25.3	28.0		23.7	30.2	26.9	26.1	32.9	31.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.5	18.9	0.3	2.4	0.3		1.6	1.9	0.2	0.2	1.7	0.7
Delay (s)	39.1	53.8	25.6	27.7	28.3		25.3	32.1	27.1	26.3	34.6	31.8
Level of Service	D	D	C	C	C		C	C	C	C	C	C
Approach Delay (s)		43.0			28.2			28.2			32.0	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			34.9			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			116.3			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			79.6%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.9	109.0	38.3	27.0	63.6	56.0	53.0	52.4	19.3	17.4	40.8	24.0
Average Queue (m)	55.5	101.5	24.1	17.7	48.2	40.2	37.7	34.5	10.1	11.3	27.4	15.7
95th Queue (m)	72.0	123.2	41.8	30.5	72.2	65.5	62.0	56.9	21.3	21.6	45.5	27.4
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		18										
Queuing Penalty (veh)		103										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	31	42			8		0					
Queuing Penalty (veh)	192	106			7		0					

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FB 2027 FRI PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	1047	25	39	890	52	18	3	35	73	0	37
Future Volume (vph)	48	1047	25	39	890	52	18	3	35	73	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.92			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3597		1805	3539			1712			1756	
Flt Permitted	0.26	1.00		0.22	1.00			0.88			0.80	
Satd. Flow (perm)	499	3597		420	3539			1525			1450	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	1138	27	42	967	57	20	3	38	79	0	40
RTOR Reduction (vph)	0	1	0	0	2	0	0	33	0	0	24	0
Lane Group Flow (vph)	52	1164	0	42	1022	0	0	28	0	0	95	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	74.1	74.1		74.1	74.1			12.6			12.6	
Effective Green, g (s)	74.1	74.1		74.1	74.1			12.6			12.6	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.13			0.13	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	374	2700		315	2656			194			185	
v/s Ratio Prot		c0.32			0.29							
v/s Ratio Perm	0.10			0.10				0.02			c0.07	
v/c Ratio	0.14	0.43		0.13	0.38			0.14			0.52	
Uniform Delay, d1	3.4	4.5		3.4	4.3			38.3			40.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.8	0.5		0.9	0.4			0.3			2.4	
Delay (s)	4.2	5.0		4.3	4.7			38.6			42.6	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		5.0			4.7			38.6			42.6	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			7.5			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			98.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			62.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	66.4	127.4	99.7	18.0	57.0	60.7	17.0	31.0
Average Queue (m)	22.2	89.9	56.0	9.1	32.0	34.8	8.7	19.3
95th Queue (m)	69.8	167.9	151.2	23.8	63.4	66.7	19.0	35.3
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		14	4				0	
Queuing Penalty (veh)		0	0				0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		32			5			
Queuing Penalty (veh)		15			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FB 2027 FRI PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	55	0	0	30
Future Volume (Veh/h)	0	0	55	0	0	30
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	60	0	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	93	60			60	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	93	60			60	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	907	1005			1544	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	60	33			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1544			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FB 2027 FRI PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	55	0	0	30
Future Volume (Veh/h)	0	0	55	0	0	30
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	60	0	0	33
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	93	60			60	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	93	60			60	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	912	1011			1556	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	60	33			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1556			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FB 2027 FRI PM Peak
11-24-2025

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Volume (veh/h)	74	17	13	42	22	34
Future Volume (Veh/h)	74	17	13	42	22	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	18	14	46	24	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			98		163	89
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			98		163	89
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	96
cM capacity (veh/h)			1508		825	975
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	98	60	61			
Volume Left	0	14	24			
Volume Right	18	0	37			
cSH	1700	1508	910			
Volume to Capacity	0.06	0.01	0.07			
Queue Length 95th (m)	0.0	0.2	1.7			
Control Delay (s)	0.0	1.8	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.8	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			19.6%		ICU Level of Service	
Analysis Period (min)			15		A	

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	0.9	11.4
Average Queue (m)	0.2	8.1
95th Queue (m)	2.3	14.1
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FB 2027 FRI PM Peak
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	8	25	4	5	14	20	600	6	11	518	31
Future Volume (Veh/h)	56	8	25	4	5	14	20	600	6	11	518	31
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	61	9	27	4	5	15	22	652	7	12	563	34
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			TWLTL		
Median storage veh										2		
Upstream signal (m)							240					
pX, platoon unblocked	0.81	0.81		0.81	0.81	0.81				0.81		
vC, conflicting volume	1318	1307	580	1318	1320	656	597			659		
vC1, stage 1 conf vol	604	604		700	700							
vC2, stage 2 conf vol	714	703		618	621							
vCu, unblocked vol	1275	1262	580	1276	1279	460	597			464		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	97	95	99	98	97	98			99		
cM capacity (veh/h)	316	333	518	312	329	492	989			899		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	97	24	22	659	12	597						
Volume Left	61	4	22	0	12	0						
Volume Right	27	15	0	7	0	34						
cSH	357	410	989	1700	899	1700						
Volume to Capacity	0.27	0.06	0.02	0.39	0.01	0.35						
Queue Length 95th (m)	8.7	1.5	0.5	0.0	0.3	0.0						
Control Delay (s)	18.8	14.3	8.7	0.0	9.1	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	18.8	14.3	0.3		0.2							
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.8											
Intersection Capacity Utilization	50.3%			ICU Level of Service			A					
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (m)	19.3	9.6	7.1	0.7	4.2
Average Queue (m)	10.8	4.6	2.5	0.1	1.3
95th Queue (m)	22.4	12.2	9.7	1.7	6.1
Link Distance (m)	219.8	78.5		216.3	115.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

HCM Signalized Intersection Capacity Analysis

FB 2027 SAT PM Peak

1: Ninth Line & Main St /Main St

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	495	249	54	460	50	182	179	58	46	143	188
Future Volume (vph)	200	495	249	54	460	50	182	179	58	46	143	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1881	1615	1805	3550		1787	1900	1583	1805	1881	1599
Flt Permitted	0.30	1.00	1.00	0.20	1.00		0.56	1.00	1.00	0.64	1.00	1.00
Satd. Flow (perm)	567	1881	1615	371	3550		1052	1900	1583	1207	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	538	271	59	500	54	198	195	63	50	155	204
RTOR Reduction (vph)	0	0	161	0	7	0	0	0	39	0	0	137
Lane Group Flow (vph)	217	538	110	59	547	0	198	195	24	50	155	67
Heavy Vehicles (%)	0%	1%	0%	0%	0%	2%	1%	0%	2%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	50.2	39.8	39.8	40.9	34.5		53.3	43.1	43.1	44.1	37.9	37.9
Effective Green, g (s)	50.2	39.8	39.8	40.9	34.5		53.3	43.1	43.1	44.1	37.9	37.9
Actuated g/C Ratio	0.43	0.34	0.34	0.35	0.30		0.46	0.37	0.37	0.38	0.33	0.33
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	371	648	556	210	1060		558	709	590	492	617	524
v/s Ratio Prot	c0.06	c0.29		0.02	0.15		c0.04	0.10		0.01	0.08	
v/s Ratio Perm	0.19		0.07	0.08			c0.13		0.01	0.03		0.04
v/c Ratio	0.58	0.83	0.20	0.28	0.52		0.35	0.28	0.04	0.10	0.25	0.13
Uniform Delay, d1	21.9	34.7	26.6	26.8	33.6		19.0	25.3	23.0	22.7	28.4	27.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	8.9	0.2	0.7	0.4		0.4	1.0	0.1	0.1	1.0	0.5
Delay (s)	24.3	43.6	26.8	27.5	34.0		19.4	26.2	23.2	22.8	29.4	27.7
Level of Service	C	D	C	C	C		B	C	C	C	C	C
Approach Delay (s)		35.1			33.4			22.9			27.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			115.5			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			72.0%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	106.7	38.1	19.4	59.4	47.4	34.8	36.7	11.9	13.2	32.4	23.4
Average Queue (m)	42.6	76.6	19.8	11.1	43.1	32.3	23.5	24.4	6.8	7.3	20.3	14.7
95th Queue (m)	73.1	125.7	45.0	23.8	63.7	54.7	37.3	45.5	14.9	15.5	35.9	26.8
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		5	0									
Queuing Penalty (veh)		23	1									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	7	32		0	3							
Queuing Penalty (veh)	37	64		0	2							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FB 2027 SAT PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	781	23	37	660	44	15	1	33	50	0	25
Future Volume (vph)	38	781	23	37	660	44	15	1	33	50	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1805	3560		1805	3576			1700			1756	
Flt Permitted	0.36	1.00		0.32	1.00			0.90			0.80	
Satd. Flow (perm)	687	3560		608	3576			1547			1451	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	849	25	40	717	48	16	1	36	54	0	27
RTOR Reduction (vph)	0	1	0	0	2	0	0	33	0	0	26	0
Lane Group Flow (vph)	41	873	0	40	763	0	0	20	0	0	55	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	82.0	82.0		82.0	82.0			8.8			8.8	
Effective Green, g (s)	82.0	82.0		82.0	82.0			8.8			8.8	
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.09			0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	547	2839		484	2852			132			124	
v/s Ratio Prot		c0.25			0.21							
v/s Ratio Perm	0.06			0.07				0.01			c0.04	
v/c Ratio	0.07	0.31		0.08	0.27			0.15			0.45	
Uniform Delay, d1	2.2	2.8		2.3	2.7			43.5			44.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	0.3		0.3	0.2			0.5			2.6	
Delay (s)	2.5	3.1		2.6	2.9			44.1			47.2	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		3.0			2.9			44.1			47.2	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			6.1			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			102.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			50.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	9.5	59.9	22.3	12.4	29.7	33.7	13.4	29.7
Average Queue (m)	4.7	33.0	11.3	6.7	18.4	20.4	8.3	17.4
95th Queue (m)	12.0	72.0	25.5	15.4	36.9	40.6	16.6	32.7
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		7			1			
Queuing Penalty (veh)		3			0			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FB 2027 SAT PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	54	0	0	14
Future Volume (Veh/h)	0	0	54	0	0	14
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	59	0	0	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	74	59			59	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	74	59			59	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	930	1007			1545	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	59	15			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1545			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FB 2027 SAT PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	54	0	0	14
Future Volume (Veh/h)	0	0	54	0	0	14
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	59	0	0	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	74	59			59	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	74	59			59	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	935	1012			1558	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	59	15			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1558			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FB 2027 SAT PM Peak
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	55	7	8	28	21	34
Future Volume (Veh/h)	55	7	8	28	21	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	8	9	30	23	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			68		112	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			68		112	64
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	96
cM capacity (veh/h)			1546		884	1006
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	68	39	60			
Volume Left	0	9	23			
Volume Right	8	0	37			
cSH	1700	1546	956			
Volume to Capacity	0.04	0.01	0.06			
Queue Length 95th (m)	0.0	0.1	1.6			
Control Delay (s)	0.0	1.7	9.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.7	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			18.4%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	0.9	9.5
Average Queue (m)	0.2	7.4
95th Queue (m)	2.3	12.6
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FB 2027 SAT PM Peak
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	6	22	3	2	4	10	375	6	4	376	21
Future Volume (Veh/h)	50	6	22	3	2	4	10	375	6	4	376	21
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	7	24	3	2	4	11	408	7	4	409	23
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			TWLTL		
Median storage veh										2		
Upstream signal (m)							240					
pX, platoon unblocked	0.89	0.89		0.89	0.89	0.89				0.89		
vC, conflicting volume	864	866	420	878	874	412	432			415		
vC1, stage 1 conf vol	428	428		434	434							
vC2, stage 2 conf vol	435	437		444	440							
vCu, unblocked vol	787	790	420	804	799	281	432			285		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	99	96	99	100	99	99			100		
cM capacity (veh/h)	486	473	637	464	468	681	1138			1151		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	85	9	11	415	4	432						
Volume Left	54	3	11	0	4	0						
Volume Right	24	4	0	7	0	23						
cSH	520	542	1138	1700	1151	1700						
Volume to Capacity	0.16	0.02	0.01	0.24	0.00	0.25						
Queue Length 95th (m)	4.6	0.4	0.2	0.0	0.1	0.0						
Control Delay (s)	13.3	11.8	8.2	0.0	8.1	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	13.3	11.8	0.2		0.1							
Approach LOS	B	B										
Intersection Summary												
Average Delay	1.4											
Intersection Capacity Utilization	35.8%			ICU Level of Service			A					
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	11.7	3.1	2.8	2.5
Average Queue (m)	8.9	1.1	0.7	0.5
95th Queue (m)	14.3	5.8	4.9	3.8
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

FB 2032 FRI MIDDAY

1: Ninth Line & Main St /Main St

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	599	218	79	652	47	237	135	77	54	130	259
Future Volume (vph)	204	599	218	79	652	47	237	135	77	54	130	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1599	1787	3541		1805	1881	1615	1805	1881	1599
Flt Permitted	0.20	1.00	1.00	0.10	1.00		0.58	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	377	1900	1599	198	3541		1107	1881	1615	1260	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	651	237	86	709	51	258	147	84	59	141	282
RTOR Reduction (vph)	0	0	119	0	4	0	0	0	51	0	0	175
Lane Group Flow (vph)	222	651	118	86	756	0	258	147	33	59	141	107
Heavy Vehicles (%)	0%	0%	1%	1%	1%	0%	0%	1%	0%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	47.9	39.9	39.9	44.3	38.1		57.6	47.2	47.2	47.3	40.9	40.9
Effective Green, g (s)	47.9	39.9	39.9	44.3	38.1		57.6	47.2	47.2	47.3	40.9	40.9
Actuated g/C Ratio	0.40	0.33	0.33	0.37	0.32		0.48	0.39	0.39	0.40	0.34	0.34
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	246	633	533	155	1127		606	741	636	527	642	546
v/s Ratio Prot	c0.06	c0.34		0.03	0.21		c0.05	0.08		0.01	0.07	
v/s Ratio Perm	0.30		0.07	0.18			c0.16		0.02	0.04		0.07
v/c Ratio	0.90	1.03	0.22	0.55	0.67		0.43	0.20	0.05	0.11	0.22	0.20
Uniform Delay, d1	30.2	39.9	28.7	30.0	35.4		19.0	23.8	22.4	22.6	28.0	27.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.6	43.2	0.2	4.3	1.6		0.5	0.6	0.2	0.1	0.8	0.8
Delay (s)	62.8	83.1	28.9	34.3	36.9		19.4	24.4	22.6	22.7	28.8	28.6
Level of Service	E	F	C	C	D		B	C	C	C	C	C
Approach Delay (s)		67.5			36.7			21.5			27.9	
Approach LOS		E			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			44.4			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			119.7			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			75.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	109.5	33.8	35.4	79.3	75.0	45.0	36.9	14.4	15.2	34.4	36.6
Average Queue (m)	47.2	103.0	20.7	17.4	64.5	58.2	30.3	19.1	8.0	8.3	19.9	22.1
95th Queue (m)	73.9	125.3	51.4	41.2	93.7	89.3	50.5	39.1	16.8	17.3	37.8	42.7
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		26	1									
Queuing Penalty (veh)		142	4									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	21	50			18							
Queuing Penalty (veh)	124	101			14							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FB 2032 FRI MIDDAY

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	962	17	22	1031	62	22	1	42	72	0	51
Future Volume (vph)	73	962	17	22	1031	62	22	1	42	72	0	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	3531		1805	3502			1688			1709	
Flt Permitted	0.21	1.00		0.25	1.00			0.85			0.82	
Satd. Flow (perm)	398	3531		474	3502			1467			1447	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	79	1046	18	24	1121	67	24	1	46	78	0	55
RTOR Reduction (vph)	0	1	0	0	2	0	0	40	0	0	27	0
Lane Group Flow (vph)	79	1063	0	24	1186	0	0	31	0	0	106	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	1%	0%	1%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	73.6	73.6		73.6	73.6			13.2			13.2	
Effective Green, g (s)	73.6	73.6		73.6	73.6			13.2			13.2	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.13			0.13	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	296	2630		353	2608			195			193	
v/s Ratio Prot		0.30			c0.34							
v/s Ratio Perm	0.20			0.05				0.02			c0.07	
v/c Ratio	0.27	0.40		0.07	0.45			0.16			0.55	
Uniform Delay, d1	4.0	4.6		3.4	4.9			37.9			40.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.2	0.5		0.4	0.6			0.4			3.2	
Delay (s)	6.2	5.1		3.8	5.4			38.3			43.2	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		5.1			5.4			38.3			43.2	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			8.2			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			98.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			73.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	48.7	132.8	111.0	21.3	70.5	70.0	21.8	29.6
Average Queue (m)	20.8	93.5	67.6	6.7	43.0	45.3	12.9	22.0
95th Queue (m)	64.2	178.6	170.3	27.4	83.7	82.1	24.9	34.2
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		16	7		0	0	2	
Queuing Penalty (veh)		0	0		0	0	0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	0	38			7			
Queuing Penalty (veh)	0	28			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FB 2032 FRI Midday
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	49	0	0	50
Future Volume (Veh/h)	0	0	49	0	0	50
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	53	0	0	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	107	53			53	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	107	53			53	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	895	1020			1566	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	53	54			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1566			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FB 2032 FRI Midday
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	49	0	0	50
Future Volume (Veh/h)	0	0	49	0	0	50
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	53	0	0	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	107	53			53	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	107	53			53	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	895	1020			1566	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	53	54			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1566			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FB 2032 FRI Midday
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	90	26	24	46	19	31
Future Volume (Veh/h)	90	26	24	46	19	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	28	26	50	21	34
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			126		214	112
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			126		214	112
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		97	96
cM capacity (veh/h)			1473		765	936
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	126	76	55			
Volume Left	0	26	21			
Volume Right	28	0	34			
cSH	1700	1473	862			
Volume to Capacity	0.07	0.02	0.06			
Queue Length 95th (m)	0.0	0.4	1.6			
Control Delay (s)	0.0	2.7	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.7	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			20.4%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	5.4	10.6
Average Queue (m)	1.4	7.3
95th Queue (m)	6.7	13.6
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FB 2032 FRI Midday
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	9	23	4	10	10	12	528	4	10	505	36
Future Volume (Veh/h)	60	9	23	4	10	10	12	528	4	10	505	36
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	10	25	4	11	11	13	574	4	11	549	39
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh									2			
Upstream signal (m)	240											
pX, platoon unblocked	0.89	0.89		0.89	0.89	0.89				0.89		
vC, conflicting volume	1207	1194	568	1203	1212	576	588			578		
vC1, stage 1 conf vol	590	590		602	602							
vC2, stage 2 conf vol	616	604		601	610							
vCu, unblocked vol	1172	1158	568	1168	1178	466	588			468		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.2		
p0 queue free %	82	97	95	99	97	98	99			99		
cM capacity (veh/h)	352	369	526	347	365	515	904			986		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	100	26	13	578	11	588						
Volume Left	65	4	13	0	11	0						
Volume Right	25	11	0	4	0	39						
cSH	386	412	904	1700	986	1700						
Volume to Capacity	0.26	0.06	0.01	0.34	0.01	0.35						
Queue Length 95th (m)	8.2	1.6	0.3	0.0	0.3	0.0						
Control Delay (s)	17.6	14.3	9.0	0.0	8.7	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	17.6	14.3	0.2		0.2							
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.8											
Intersection Capacity Utilization	47.3%			ICU Level of Service					A			
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	18.2	10.6	6.2	4.9
Average Queue (m)	12.0	6.0	1.4	1.0
95th Queue (m)	20.6	14.9	6.8	5.4
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

FB 2032 FRI PM Peak

1: Ninth Line & Main St /Main St

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	670	352	96	598	61	284	238	92	72	179	239
Future Volume (vph)	279	670	352	96	598	61	284	238	92	72	179	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1615	1805	3528		1805	1863	1615	1805	1881	1615
Flt Permitted	0.28	1.00	1.00	0.09	1.00		0.47	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	530	1900	1615	162	3528		894	1863	1615	992	1881	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	303	728	383	104	650	66	309	259	100	78	195	260
RTOR Reduction (vph)	0	0	175	0	7	0	0	0	69	0	0	184
Lane Group Flow (vph)	303	728	208	104	709	0	309	259	31	78	195	76
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	55.0	47.0	47.0	54.6	46.8		48.8	37.4	37.4	40.2	32.8	32.8
Effective Green, g (s)	55.0	47.0	47.0	54.6	46.8		48.8	37.4	37.4	40.2	32.8	32.8
Actuated g/C Ratio	0.46	0.39	0.39	0.46	0.39		0.41	0.31	0.31	0.34	0.27	0.27
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	329	746	634	181	1380		456	582	505	383	515	442
v/s Ratio Prot	c0.06	c0.38		0.04	0.20		c0.07	0.14		0.01	0.10	
v/s Ratio Perm	0.36		0.13	0.22			c0.21		0.02	0.06		0.05
v/c Ratio	0.92	0.98	0.33	0.57	0.51		0.68	0.45	0.06	0.20	0.38	0.17
Uniform Delay, d1	27.9	35.7	25.3	26.7	27.7		27.3	32.8	28.8	27.6	35.1	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.1	26.8	0.3	4.4	0.3		4.0	2.5	0.2	0.3	2.1	0.8
Delay (s)	58.0	62.5	25.6	31.0	28.1		31.2	35.3	29.0	27.9	37.3	33.9
Level of Service	E	E	C	C	C		C	D	C	C	D	C
Approach Delay (s)		51.6			28.4			32.5			34.3	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			39.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			119.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			83.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	109.6	62.2	25.9	72.6	62.7	62.9	56.4	15.0	25.1	49.8	26.7
Average Queue (m)	53.4	107.6	33.2	16.2	54.0	41.8	46.0	39.2	9.4	14.5	32.7	17.9
95th Queue (m)	74.9	110.7	64.6	28.7	79.3	71.2	72.3	62.7	17.8	27.9	55.1	29.6
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		26										
Queuing Penalty (veh)		164										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	37	45			10							
Queuing Penalty (veh)	248	124			9							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FB 2032 FRI PM Peak
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	1150	25	39	978	58	18	3	35	80	0	40
Future Volume (vph)	53	1150	25	39	978	58	18	3	35	80	0	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.92			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3599		1805	3538			1712			1756	
Flt Permitted	0.23	1.00		0.19	1.00			0.88			0.79	
Satd. Flow (perm)	439	3599		362	3538			1523			1443	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	1250	27	42	1063	63	20	3	38	87	0	43
RTOR Reduction (vph)	0	1	0	0	2	0	0	33	0	0	23	0
Lane Group Flow (vph)	58	1276	0	42	1124	0	0	28	0	0	107	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	73.8	73.8		73.8	73.8			13.2			13.2	
Effective Green, g (s)	73.8	73.8		73.8	73.8			13.2			13.2	
Actuated g/C Ratio	0.75	0.75		0.75	0.75			0.13			0.13	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	327	2682		269	2637			203			192	
v/s Ratio Prot		c0.35			0.32							
v/s Ratio Perm	0.13			0.12				0.02			c0.07	
v/c Ratio	0.18	0.48		0.16	0.43			0.14			0.56	
Uniform Delay, d1	3.7	5.0		3.6	4.7			37.9			40.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.2	0.6		1.2	0.5			0.3			3.5	
Delay (s)	4.9	5.6		4.9	5.2			38.2			43.6	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		5.5			5.2			38.2			43.6	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			8.0			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			99.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	66.2	145.4	139.7	23.3	58.1	62.9	19.4	29.0
Average Queue (m)	21.6	115.5	92.1	10.1	36.2	39.4	10.3	20.7
95th Queue (m)	72.9	182.5	190.3	27.2	68.6	72.2	21.4	35.9
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		26	12				0	
Queuing Penalty (veh)		0	0				0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	0	47		0	6			
Queuing Penalty (veh)	0	25		0	2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FB 2032 FRI PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	60	0	0	33
Future Volume (Veh/h)	0	0	60	0	0	33
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	65	0	0	36
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	101	65			65	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	101	65			65	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	898	999			1537	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	65	36			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1537			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		6.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FB 2032 FRI PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	60	0	0	33
Future Volume (Veh/h)	0	0	60	0	0	33
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	65	0	0	36
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	101	65			65	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	101	65			65	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	902	1005			1550	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	65	36			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1550			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		6.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FB 2032 FRI PM Peak
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	81	19	15	46	24	37
Future Volume (Veh/h)	81	19	15	46	24	37
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	21	16	50	26	40
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			109		180	98
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			109		180	98
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	96
cM capacity (veh/h)			1494		805	963
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	109	66	66			
Volume Left	0	16	26			
Volume Right	21	0	40			
cSH	1700	1494	894			
Volume to Capacity	0.06	0.01	0.07			
Queue Length 95th (m)	0.0	0.3	1.9			
Control Delay (s)	0.0	1.9	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.9	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			20.2%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	NB
Directions Served	LR
Maximum Queue (m)	10.2
Average Queue (m)	7.9
95th Queue (m)	13.0
Link Distance (m)	65.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FB 2032 FRI PM Peak
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	9	27	4	5	16	22	658	6	12	568	34
Future Volume (Veh/h)	61	9	27	4	5	16	22	658	6	12	568	34
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	66	10	29	4	5	17	24	715	7	13	617	37
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh									2			
Upstream signal (m)	240											
pX, platoon unblocked	0.78	0.78		0.78	0.78	0.78				0.78		
vC, conflicting volume	1444	1432	636	1444	1446	718	654			722		
vC1, stage 1 conf vol	662	662		766	766							
vC2, stage 2 conf vol	782	770		677	680							
vCu, unblocked vol	1429	1413	636	1428	1432	504	654			509		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	97	94	99	98	96	97			98		
cM capacity (veh/h)	280	300	482	277	297	449	943			837		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	105	26	24	722	13	654						
Volume Left	66	4	24	0	13	0						
Volume Right	29	17	0	7	0	37						
cSH	319	376	943	1700	837	1700						
Volume to Capacity	0.33	0.07	0.03	0.42	0.02	0.38						
Queue Length 95th (m)	11.2	1.8	0.6	0.0	0.4	0.0						
Control Delay (s)	21.7	15.3	8.9	0.0	9.4	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	21.7	15.3	0.3		0.2							
Approach LOS	C	C										
Intersection Summary												
Average Delay	2.0											
Intersection Capacity Utilization	53.8%			ICU Level of Service			A					
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	22.5	10.2	8.0	4.2
Average Queue (m)	13.0	5.6	2.7	1.6
95th Queue (m)	23.9	13.5	10.0	6.9
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

1: Ninth Line & Main St /Main St

FB 2032 SAT PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	543	272	59	505	55	199	195	64	50	157	205
Future Volume (vph)	217	543	272	59	505	55	199	195	64	50	157	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1881	1615	1805	3550		1787	1900	1583	1805	1881	1599
Flt Permitted	0.26	1.00	1.00	0.13	1.00		0.54	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	503	1881	1615	247	3550		1009	1900	1583	1188	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	236	590	296	64	549	60	216	212	70	54	171	223
RTOR Reduction (vph)	0	0	160	0	7	0	0	0	44	0	0	151
Lane Group Flow (vph)	236	590	136	64	602	0	216	212	26	54	171	72
Heavy Vehicles (%)	0%	1%	0%	0%	0%	2%	1%	0%	2%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	51.1	40.5	40.5	41.9	35.3		53.5	43.2	43.2	44.2	37.9	37.9
Effective Green, g (s)	51.1	40.5	40.5	41.9	35.3		53.5	43.2	43.2	44.2	37.9	37.9
Actuated g/C Ratio	0.44	0.35	0.35	0.36	0.30		0.46	0.37	0.37	0.38	0.33	0.33
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	352	653	560	176	1074		540	703	586	483	611	519
v/s Ratio Prot	c0.07	c0.31		0.02	0.17		c0.04	0.11		0.01	0.09	
v/s Ratio Perm	0.23		0.08	0.11			c0.14		0.02	0.04		0.05
v/c Ratio	0.67	0.90	0.24	0.36	0.56		0.40	0.30	0.04	0.11	0.28	0.14
Uniform Delay, d1	22.5	36.2	27.1	27.7	34.1		19.7	26.0	23.5	23.2	29.2	27.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	15.9	0.2	1.3	0.7		0.5	1.1	0.1	0.1	1.1	0.6
Delay (s)	27.4	52.1	27.4	29.0	34.8		20.2	27.1	23.6	23.3	30.4	28.4
Level of Service	C	D	C	C	C		C	C	C	C	C	C
Approach Delay (s)		40.4			34.3			23.6			28.5	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			33.9			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			116.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			73.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	55.8	105.8	29.4	19.4	61.8	52.1	38.8	42.9	12.6	15.7	34.8	23.7
Average Queue (m)	46.6	83.9	17.8	11.6	49.8	37.7	25.0	25.3	7.6	8.4	22.2	15.9
95th Queue (m)	72.8	124.3	32.8	22.6	68.1	59.7	40.2	46.1	15.6	19.4	39.5	27.4
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		6										
Queuing Penalty (veh)		28										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	9	37			7							
Queuing Penalty (veh)	51	81			4							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FB 2032 SAT PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	857	23	37	724	48	15	1	33	56	0	27
Future Volume (vph)	42	857	23	37	724	48	15	1	33	56	0	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1805	3561		1805	3576			1700			1758	
Flt Permitted	0.33	1.00		0.29	1.00			0.89			0.79	
Satd. Flow (perm)	632	3561		553	3576			1535			1437	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	932	25	40	787	52	16	1	36	61	0	29
RTOR Reduction (vph)	0	1	0	0	2	0	0	33	0	0	25	0
Lane Group Flow (vph)	46	956	0	40	837	0	0	20	0	0	65	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	81.4	81.4		81.4	81.4			9.2			9.2	
Effective Green, g (s)	81.4	81.4		81.4	81.4			9.2			9.2	
Actuated g/C Ratio	0.79	0.79		0.79	0.79			0.09			0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	501	2825		438	2837			137			128	
v/s Ratio Prot		c0.27			0.23							
v/s Ratio Perm	0.07			0.07				0.01			c0.04	
v/c Ratio	0.09	0.34		0.09	0.29			0.15			0.50	
Uniform Delay, d1	2.4	3.0		2.4	2.9			43.1			44.5	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.4	0.3		0.4	0.3			0.5			3.1	
Delay (s)	2.7	3.3		2.8	3.1			43.6			47.6	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		3.3			3.1			43.6			47.6	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			6.2			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			102.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			54.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	11.8	60.9	22.4	12.0	32.4	34.7	13.0	25.2
Average Queue (m)	6.1	34.6	11.2	6.5	16.2	20.9	8.3	15.0
95th Queue (m)	14.5	67.8	25.5	14.8	40.3	43.5	15.2	30.2
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		8			1			
Queuing Penalty (veh)		3			1			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FB 2032 SAT PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	59	0	0	16
Future Volume (Veh/h)	0	0	59	0	0	16
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	64	0	0	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	81	64			64	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	81	64			64	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	921	1000			1538	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	64	17			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1538			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		6.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FB 2032 SAT PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	59	0	0	16
Future Volume (Veh/h)	0	0	59	0	0	16
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	64	0	0	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	81	64			64	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	81	64			64	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	926	1006			1551	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	64	17			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1551			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FB 2032 SAT PM Peak
11-24-2025

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↗	
Traffic Volume (veh/h)	60	8	9	31	23	37
Future Volume (Veh/h)	60	8	9	31	23	37
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	9	10	34	25	40
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			74		124	70
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			74		124	70
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	96
cM capacity (veh/h)			1538		871	999
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	74	44	65			
Volume Left	0	10	25			
Volume Right	9	0	40			
cSH	1700	1538	945			
Volume to Capacity	0.04	0.01	0.07			
Queue Length 95th (m)	0.0	0.2	1.8			
Control Delay (s)	0.0	1.7	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.7	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay		3.6				
Intersection Capacity Utilization		19.0%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	1.8	10.1
Average Queue (m)	0.4	8.3
95th Queue (m)	3.3	12.0
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FB 2032 SAT PM Peak
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	6	24	3	2	4	11	410	6	4	411	23
Future Volume (Veh/h)	55	6	24	3	2	4	11	410	6	4	411	23
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	7	26	3	2	4	12	446	7	4	447	25
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh									2			
Upstream signal (m)	240											
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	942	944	460	958	954	450	472			453		
vC1, stage 1 conf vol	468	468		474	474							
vC2, stage 2 conf vol	475	477		484	480							
vCu, unblocked vol	861	863	460	878	873	295	472			299		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	98	96	99	100	99	99			100		
cM capacity (veh/h)	456	447	606	433	441	653	1100			1110		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	93	9	12	453	4	472						
Volume Left	60	3	12	0	4	0						
Volume Right	26	4	0	7	0	25						
cSH	489	512	1100	1700	1110	1700						
Volume to Capacity	0.19	0.02	0.01	0.27	0.00	0.28						
Queue Length 95th (m)	5.6	0.4	0.3	0.0	0.1	0.0						
Control Delay (s)	14.1	12.2	8.3	0.0	8.3	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	14.1	12.2	0.2		0.1							
Approach LOS	B	B										
Intersection Summary												
Average Delay	1.5											
Intersection Capacity Utilization	38.6%			ICU Level of Service					A			
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	16.8	8.0	4.5	1.7
Average Queue (m)	11.9	2.8	1.6	0.5
95th Queue (m)	18.2	9.5	7.3	3.8
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

FB 2037 FRI MIDDAY

1: Ninth Line & Main St /Main St

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	659	238	87	718	52	260	149	85	60	141	283
Future Volume (vph)	223	659	238	87	718	52	260	149	85	60	141	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1599	1787	3540		1805	1881	1615	1805	1881	1599
Flt Permitted	0.17	1.00	1.00	0.10	1.00		0.57	1.00	1.00	0.65	1.00	1.00
Satd. Flow (perm)	317	1900	1599	194	3540		1074	1881	1615	1243	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	242	716	259	95	780	57	283	162	92	65	153	308
RTOR Reduction (vph)	0	0	120	0	5	0	0	0	56	0	0	163
Lane Group Flow (vph)	242	716	139	95	832	0	283	162	36	65	153	145
Heavy Vehicles (%)	0%	0%	1%	1%	1%	0%	0%	1%	0%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	47.0	39.0	39.0	46.6	38.8		57.8	47.2	47.2	47.4	40.8	40.8
Effective Green, g (s)	47.0	39.0	39.0	46.6	38.8		57.8	47.2	47.2	47.4	40.8	40.8
Actuated g/C Ratio	0.39	0.32	0.32	0.39	0.32		0.48	0.39	0.39	0.39	0.34	0.34
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	222	614	517	177	1138		593	736	632	519	636	540
v/s Ratio Prot	c0.07	c0.38		0.03	0.24		c0.05	0.09		0.01	0.08	
v/s Ratio Perm	0.35		0.09	0.17			c0.18		0.02	0.04		0.09
v/c Ratio	1.09	1.17	0.27	0.54	0.73		0.48	0.22	0.06	0.13	0.24	0.27
Uniform Delay, d1	32.7	40.8	30.2	29.3	36.3		19.6	24.4	22.8	23.0	28.7	29.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	86.5	91.6	0.3	3.1	2.5		0.6	0.7	0.2	0.1	0.9	1.2
Delay (s)	119.2	132.4	30.5	32.4	38.7		20.2	25.1	23.0	23.2	29.6	30.3
Level of Service	F	F	C	C	D		C	C	C	C	C	C
Approach Delay (s)		108.1			38.1			22.2			29.2	
Approach LOS		F			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			60.5			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			120.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			79.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	109.6	39.6	49.7	92.6	81.4	53.4	30.6	17.4	18.4	37.4	39.3
Average Queue (m)	50.8	106.6	24.2	22.6	73.4	61.3	33.2	18.3	8.9	9.6	21.5	24.9
95th Queue (m)	76.9	115.5	50.8	61.9	101.6	86.8	59.4	36.0	19.7	19.4	40.2	44.4
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		34	0									
Queuing Penalty (veh)		199	1									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	35	52			24							
Queuing Penalty (veh)	231	116			21							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FB 2037 FRI MIDDAY
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	1059	18	23	1133	68	22	1	44	79	0	56
Future Volume (vph)	80	1059	18	23	1133	68	22	1	44	79	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	3531		1805	3501			1687			1708	
Flt Permitted	0.18	1.00		0.22	1.00			0.86			0.82	
Satd. Flow (perm)	338	3531		411	3501			1469			1440	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	1151	20	25	1232	74	24	1	48	86	0	61
RTOR Reduction (vph)	0	1	0	0	2	0	0	41	0	0	27	0
Lane Group Flow (vph)	87	1170	0	25	1304	0	0	32	0	0	120	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	1%	0%	1%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	73.3	73.3		73.3	73.3			14.2			14.2	
Effective Green, g (s)	73.3	73.3		73.3	73.3			14.2			14.2	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.14			0.14	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	248	2601		302	2579			209			205	
v/s Ratio Prot		0.33			c0.37							
v/s Ratio Perm	0.26			0.06				0.02			c0.08	
v/c Ratio	0.35	0.45		0.08	0.51			0.15			0.59	
Uniform Delay, d1	4.7	5.2		3.7	5.5			37.4			39.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	3.9	0.6		0.5	0.7			0.3			4.3	
Delay (s)	8.5	5.7		4.2	6.2			37.7			44.2	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		5.9			6.2			37.7			44.2	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			8.9			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			99.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			77.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	61.5	145.6	136.4	12.5	86.8	87.1	25.8	37.1
Average Queue (m)	24.0	113.9	94.7	5.3	53.4	54.4	15.4	23.1
95th Queue (m)	70.9	186.8	190.4	14.6	98.2	95.4	29.0	40.8
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		31	10		0		2	
Queuing Penalty (veh)		0	0		0		0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	0	51			10			
Queuing Penalty (veh)	1	41			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FB 2037 FRI Midday
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	54	0	0	55
Future Volume (Veh/h)	0	0	54	0	0	55
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	59	0	0	60
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	119	59			59	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	119	59			59	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	882	1012			1558	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	59	60			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1558			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FB 2037 FRI Midday
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	54	0	0	55
Future Volume (Veh/h)	0	0	54	0	0	55
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	59	0	0	60
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	119	59			59	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	119	59			59	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	882	1012			1558	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	59	60			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1558			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FB 2037 FRI Midday
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	99	29	26	51	21	34
Future Volume (Veh/h)	99	29	26	51	21	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	32	28	55	23	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			140		235	124
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			140		235	124
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		97	96
cM capacity (veh/h)			1456		743	921
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	140	83	60			
Volume Left	0	28	23			
Volume Right	32	0	37			
cSH	1700	1456	844			
Volume to Capacity	0.08	0.02	0.07			
Queue Length 95th (m)	0.0	0.5	1.8			
Control Delay (s)	0.0	2.6	9.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.6	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			24.4%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	0.6	1.8	10.0
Average Queue (m)	0.1	0.7	6.8
95th Queue (m)	1.5	4.8	13.3
Link Distance (m)	106.0	219.8	65.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FB 2037 FRI Midday
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	10	25	4	11	11	13	581	4	11	554	39
Future Volume (Veh/h)	66	10	25	4	11	11	13	581	4	11	554	39
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	11	27	4	12	12	14	632	4	12	602	42
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						TWLTL					
Median storage veh							2					
Upstream signal (m)	240											
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	1325	1311	623	1320	1330	634	644			636		
vC1, stage 1 conf vol	647	647		662	662							
vC2, stage 2 conf vol	678	664		658	668							
vCu, unblocked vol	1299	1283	623	1294	1305	505	644			507		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.2		
p0 queue free %	77	97	94	99	96	97	98			99		
cM capacity (veh/h)	317	338	490	313	334	477	861			929		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	110	28	14	636	12	644						
Volume Left	72	4	14	0	12	0						
Volume Right	27	12	0	4	0	42						
cSH	350	379	861	1700	929	1700						
Volume to Capacity	0.31	0.07	0.02	0.37	0.01	0.38						
Queue Length 95th (m)	10.5	1.9	0.4	0.0	0.3	0.0						
Control Delay (s)	19.9	15.3	9.3	0.0	8.9	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	19.9	15.3	0.2		0.2							
Approach LOS	C	C										
Intersection Summary												
Average Delay	2.0											
Intersection Capacity Utilization	50.6%			ICU Level of Service					A			
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (m)	20.8	12.4	8.1	2.6	0.5
Average Queue (m)	12.6	5.2	2.5	0.8	0.1
95th Queue (m)	22.2	14.9	11.5	4.9	1.4
Link Distance (m)	219.8	78.5		115.7	115.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

HCM Signalized Intersection Capacity Analysis

FB 2037 FRI PM Peak

1: Ninth Line & Main St /Main St

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	737	386	106	657	66	310	260	102	79	196	261
Future Volume (vph)	305	737	386	106	657	66	310	260	102	79	196	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1615	1805	3528		1805	1863	1615	1805	1881	1615
Flt Permitted	0.24	1.00	1.00	0.08	1.00		0.44	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	464	1900	1615	159	3528		839	1863	1615	896	1881	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	801	420	115	714	72	337	283	111	86	213	284
RTOR Reduction (vph)	0	0	173	0	7	0	0	0	77	0	0	166
Lane Group Flow (vph)	332	801	247	115	779	0	337	283	34	86	213	118
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	56.0	48.0	48.0	55.6	47.8		48.8	37.0	37.0	40.6	32.8	32.8
Effective Green, g (s)	56.0	48.0	48.0	55.6	47.8		48.8	37.0	37.0	40.6	32.8	32.8
Actuated g/C Ratio	0.46	0.40	0.40	0.46	0.40		0.40	0.31	0.31	0.34	0.27	0.27
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	304	756	642	179	1398		435	571	495	360	511	439
v/s Ratio Prot	c0.07	0.42		0.04	0.22		c0.08	0.15		0.02	0.11	
v/s Ratio Perm	c0.43		0.15	0.25			c0.24		0.02	0.06		0.07
v/c Ratio	1.09	1.06	0.38	0.64	0.56		0.77	0.50	0.07	0.24	0.42	0.27
Uniform Delay, d1	29.8	36.3	25.8	27.2	28.2		29.7	34.2	29.6	28.0	36.0	34.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	78.5	49.6	0.4	7.7	0.5		8.4	3.1	0.3	0.3	2.5	1.5
Delay (s)	108.3	85.9	26.2	34.8	28.7		38.0	37.2	29.9	28.4	38.5	36.0
Level of Service	F	F	C	C	C		D	D	C	C	D	D
Approach Delay (s)		74.6			29.5			36.5			35.8	
Approach LOS		E			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			50.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			120.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			88.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.9	110.0	59.2	38.9	76.9	70.3	67.1	59.8	16.7	16.8	40.1	37.1
Average Queue (m)	57.0	105.6	34.5	20.0	60.2	49.0	47.1	39.3	10.8	11.1	28.7	24.4
95th Queue (m)	74.9	123.5	72.8	45.4	84.3	76.7	70.2	69.0	22.5	19.3	46.7	43.8
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		29	1									
Queuing Penalty (veh)		203	3									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	22	47		0	15							
Queuing Penalty (veh)	165	142		0	16							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FB 2037 FRI PM Peak
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	1263	25	39	1076	64	18	3	35	88	0	44
Future Volume (vph)	58	1263	25	39	1076	64	18	3	35	88	0	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.92			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3600		1805	3538			1712			1756	
Flt Permitted	0.20	1.00		0.16	1.00			0.87			0.79	
Satd. Flow (perm)	377	3600		304	3538			1522			1434	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	1373	27	42	1170	70	20	3	38	96	0	48
RTOR Reduction (vph)	0	1	0	0	2	0	0	33	0	0	23	0
Lane Group Flow (vph)	63	1399	0	42	1238	0	0	28	0	0	121	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	73.5	73.5		73.5	73.5			14.2			14.2	
Effective Green, g (s)	73.5	73.5		73.5	73.5			14.2			14.2	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.14			0.14	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	277	2653		224	2608			216			204	
v/s Ratio Prot		c0.39			0.35							
v/s Ratio Perm	0.17			0.14				0.02			c0.08	
v/c Ratio	0.23	0.53		0.19	0.47			0.13			0.59	
Uniform Delay, d1	4.1	5.6		4.0	5.3			37.4			40.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.9	0.8		1.8	0.6			0.3			4.6	
Delay (s)	6.0	6.4		5.8	5.9			37.6			44.6	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		6.4			5.9			37.6			44.6	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			8.7									
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			99.7									
Intersection Capacity Utilization			72.4%									
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	47.2	146.6	141.8	12.7	66.5	73.4	20.2	33.9
Average Queue (m)	19.4	125.9	110.4	6.8	37.9	41.0	12.0	24.3
95th Queue (m)	67.0	190.9	198.5	17.4	76.2	79.4	25.0	40.4
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		34	17			0	4	
Queuing Penalty (veh)		0	0			0	0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		51			6			
Queuing Penalty (veh)		29			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FB 2037 FRI PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	66	0	0	37
Future Volume (Veh/h)	0	0	66	0	0	37
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	72	0	0	40
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	112	72			72	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	112	72			72	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	885	990			1528	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	72	40			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1528			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FB 2037 FRI PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	66	0	0	37
Future Volume (Veh/h)	0	0	66	0	0	37
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	72	0	0	40
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	112	72			72	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	112	72			72	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	890	996			1541	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	72	40			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1541			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FB 2037 FRI PM Peak
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	90	21	16	51	26	40
Future Volume (Veh/h)	90	21	16	51	26	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	23	17	55	28	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			121		198	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			121		198	110
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		96	95
cM capacity (veh/h)			1479		786	950
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	121	72	71			
Volume Left	0	17	28			
Volume Right	23	0	43			
cSH	1700	1479	877			
Volume to Capacity	0.07	0.01	0.08			
Queue Length 95th (m)	0.0	0.3	2.1			
Control Delay (s)	0.0	1.8	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.8	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			20.8%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	0.9	9.3
Average Queue (m)	0.2	7.6
95th Queue (m)	2.2	12.4
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FB 2037 FRI PM Peak
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	10	30	4	6	17	24	722	7	13	623	38
Future Volume (Veh/h)	67	10	30	4	6	17	24	722	7	13	623	38
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	73	11	33	4	7	18	26	785	8	14	677	41
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						TWLTL					
Median storage veh							2					
Upstream signal (m)	240											
pX, platoon unblocked	0.75	0.75		0.75	0.75	0.75				0.75		
vC, conflicting volume	1584	1570	698	1584	1587	789	718			793		
vC1, stage 1 conf vol	726	726		841	841							
vC2, stage 2 conf vol	858	845		744	746							
vCu, unblocked vol	1611	1593	698	1612	1615	557	718			562		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	70	96	93	98	97	96	97			98		
cM capacity (veh/h)	243	267	444	241	265	402	892			768		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	117	29	26	793	14	718						
Volume Left	73	4	26	0	14	0						
Volume Right	33	18	0	8	0	41						
cSH	281	330	892	1700	768	1700						
Volume to Capacity	0.42	0.09	0.03	0.47	0.02	0.42						
Queue Length 95th (m)	15.6	2.3	0.7	0.0	0.4	0.0						
Control Delay (s)	26.7	16.9	9.2	0.0	9.8	0.0						
Lane LOS	D	C	A		A							
Approach Delay (s)	26.7	16.9	0.3		0.2							
Approach LOS	D	C										
Intersection Summary												
Average Delay	2.3											
Intersection Capacity Utilization	57.8%			ICU Level of Service			B					
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	25.8	10.2	8.9	5.8
Average Queue (m)	16.0	4.0	2.8	1.3
95th Queue (m)	28.5	12.3	10.0	6.4
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

1: Ninth Line & Main St /Main St

FB 2037 SAT PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	596	298	65	554	60	216	214	70	55	171	223
Future Volume (vph)	236	596	298	65	554	60	216	214	70	55	171	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1881	1615	1805	3550		1787	1900	1583	1805	1881	1599
Flt Permitted	0.23	1.00	1.00	0.11	1.00		0.52	1.00	1.00	0.60	1.00	1.00
Satd. Flow (perm)	435	1881	1615	214	3550		971	1900	1583	1144	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	257	648	324	71	602	65	235	233	76	60	186	242
RTOR Reduction (vph)	0	0	159	0	7	0	0	0	48	0	0	164
Lane Group Flow (vph)	257	648	165	71	660	0	235	233	28	60	186	78
Heavy Vehicles (%)	0%	1%	0%	0%	0%	2%	1%	0%	2%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	51.4	40.6	40.6	42.3	35.5		53.7	43.2	43.2	44.4	37.9	37.9
Effective Green, g (s)	51.4	40.6	40.6	42.3	35.5		53.7	43.2	43.2	44.4	37.9	37.9
Actuated g/C Ratio	0.44	0.35	0.35	0.36	0.30		0.46	0.37	0.37	0.38	0.32	0.32
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	330	652	559	169	1076		527	700	583	470	608	517
v/s Ratio Prot	c0.08	c0.34		0.02	0.19		c0.04	0.12		0.01	0.10	
v/s Ratio Perm	0.26		0.10	0.13			c0.16		0.02	0.04		0.05
v/c Ratio	0.78	0.99	0.29	0.42	0.61		0.45	0.33	0.05	0.13	0.31	0.15
Uniform Delay, d1	23.3	38.1	27.8	29.1	34.9		20.1	26.6	23.7	23.3	29.7	28.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.0	33.5	0.3	1.7	1.0		0.6	1.3	0.2	0.1	1.3	0.6
Delay (s)	34.3	71.6	28.1	30.8	36.0		20.7	27.9	23.9	23.5	31.0	28.8
Level of Service	C	E	C	C	D		C	C	C	C	C	C
Approach Delay (s)		52.4			35.5			24.2			29.0	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			39.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			117.1			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			76.5%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	109.5	43.6	18.8	75.8	62.9	44.1	42.3	15.2	17.4	37.6	30.1
Average Queue (m)	50.0	98.0	23.8	11.5	55.2	44.5	28.2	28.3	7.8	9.4	25.2	19.6
95th Queue (m)	75.3	127.1	51.4	21.6	80.6	67.5	50.8	48.8	17.9	19.5	41.4	32.8
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		19	0									
Queuing Penalty (veh)		97	1									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	20	46			9							
Queuing Penalty (veh)	116	108			6							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FB 2037 SAT PM Peak

11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	940	23	37	795	53	15	1	33	61	0	30
Future Volume (vph)	46	940	23	37	795	53	15	1	33	61	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1805	3562		1805	3576			1700			1756	
Flt Permitted	0.30	1.00		0.26	1.00			0.88			0.78	
Satd. Flow (perm)	574	3562		497	3576			1523			1424	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	1022	25	40	864	58	16	1	36	66	0	33
RTOR Reduction (vph)	0	1	0	0	3	0	0	33	0	0	25	0
Lane Group Flow (vph)	50	1046	0	40	919	0	0	20	0	0	74	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	80.8	80.8		80.8	80.8			9.6			9.6	
Effective Green, g (s)	80.8	80.8		80.8	80.8			9.6			9.6	
Actuated g/C Ratio	0.79	0.79		0.79	0.79			0.09			0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	452	2810		392	2821			142			133	
v/s Ratio Prot		c0.29			0.26							
v/s Ratio Perm	0.09			0.08				0.01			c0.05	
v/c Ratio	0.11	0.37		0.10	0.33			0.14			0.55	
Uniform Delay, d1	2.5	3.2		2.5	3.1			42.6			44.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.4		0.5	0.3			0.5			4.9	
Delay (s)	3.0	3.6		3.0	3.4			43.1			49.3	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		3.6			3.4			43.1			49.3	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			6.5			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			102.4			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			58.7%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	25.2	103.3	74.8	12.6	43.4	42.7	16.5	27.2
Average Queue (m)	9.2	71.6	41.2	6.3	21.2	21.7	10.0	16.5
95th Queue (m)	34.2	146.8	116.9	15.3	48.5	45.3	18.9	33.8
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		3	0					
Queuing Penalty (veh)		0	0					
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		27			2			
Queuing Penalty (veh)		12			1			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FB 2037 SAT PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	65	0	0	17
Future Volume (Veh/h)	0	0	65	0	0	17
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	71	0	0	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	89	71			71	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89	71			71	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	912	991			1529	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	71	18			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1529			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FB 2037 SAT PM Peak
11-24-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	65	0	0	17
Future Volume (Veh/h)	0	0	65	0	0	17
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	71	0	0	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	89	71			71	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89	71			71	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	917	997			1542	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	71	18			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1542			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FB 2037 SAT PM Peak
11-24-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	66	8	10	34	25	40
Future Volume (Veh/h)	66	8	10	34	25	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	9	11	37	27	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			81		136	76
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			81		136	76
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	96
cM capacity (veh/h)			1529		857	990
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	81	48	70			
Volume Left	0	11	27			
Volume Right	9	0	43			
cSH	1700	1529	934			
Volume to Capacity	0.05	0.01	0.07			
Queue Length 95th (m)	0.0	0.2	1.9			
Control Delay (s)	0.0	1.7	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.7	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization		19.5%	ICU Level of Service		A	
Analysis Period (min)		15				

Intersection: 5: Winona Dr & Rupert Ave

Movement	NB
Directions Served	LR
Maximum Queue (m)	10.0
Average Queue (m)	8.1
95th Queue (m)	12.5
Link Distance (m)	65.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FB 2037 SAT PM Peak
11-24-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	7	26	3	2	4	12	448	7	4	450	25
Future Volume (Veh/h)	61	7	26	3	2	4	12	448	7	4	450	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	66	8	28	3	2	4	13	487	8	4	489	27
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh											2	
Upstream signal (m)								240				
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	1028	1032	502	1046	1041	491	516			495		
vC1, stage 1 conf vol	510	510		517	517							
vC2, stage 2 conf vol	518	521		529	524							
vCu, unblocked vol	944	947	502	964	958	310	516			314		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	84	98	95	99	100	99	99			100		
cM capacity (veh/h)	425	420	573	400	414	623	1060			1066		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	102	9	13	495	4	516						
Volume Left	66	3	13	0	4	0						
Volume Right	28	4	0	8	0	27						
cSH	457	480	1060	1700	1066	1700						
Volume to Capacity	0.22	0.02	0.01	0.29	0.00	0.30						
Queue Length 95th (m)	6.8	0.5	0.3	0.0	0.1	0.0						
Control Delay (s)	15.1	12.6	8.4	0.0	8.4	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	15.1	12.6	0.2		0.1							
Approach LOS	C	B										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			41.7%	ICU Level of Service					A			
Analysis Period (min)			15									

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	16.7	6.1	5.4	2.5
Average Queue (m)	11.5	1.7	1.3	0.7
95th Queue (m)	19.8	7.4	6.3	4.3
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

FT 2027 FRI MIDDAY

1: Ninth Line & Main St /Main St

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	575	216	72	642	65	236	143	70	62	125	237
Future Volume (vph)	186	575	216	72	642	65	236	143	70	62	125	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1599	1787	3528		1805	1881	1615	1805	1881	1599
Flt Permitted	0.19	1.00	1.00	0.10	1.00		0.59	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	368	1900	1599	198	3528		1119	1881	1615	1251	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	202	625	235	78	698	71	257	155	76	67	136	258
RTOR Reduction (vph)	0	0	123	0	6	0	0	0	46	0	0	170
Lane Group Flow (vph)	202	625	112	78	763	0	257	155	30	67	136	88
Heavy Vehicles (%)	0%	0%	1%	1%	1%	0%	0%	1%	0%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	47.9	39.9	39.9	44.3	38.1		57.6	47.0	47.0	47.5	40.9	40.9
Effective Green, g (s)	47.9	39.9	39.9	44.3	38.1		57.6	47.0	47.0	47.5	40.9	40.9
Actuated g/C Ratio	0.40	0.33	0.33	0.37	0.32		0.48	0.39	0.39	0.40	0.34	0.34
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	243	633	533	155	1122		611	738	634	526	642	546
v/s Ratio Prot	c0.06	c0.33		0.03	0.22		c0.04	0.08		0.01	0.07	
v/s Ratio Perm	0.28		0.07	0.16			c0.16		0.02	0.04		0.06
v/c Ratio	0.83	0.99	0.21	0.50	0.68		0.42	0.21	0.05	0.13	0.21	0.16
Uniform Delay, d1	28.2	39.6	28.6	29.8	35.5		18.9	24.1	22.5	22.6	28.0	27.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.8	32.2	0.2	2.6	1.7		0.5	0.6	0.1	0.1	0.8	0.6
Delay (s)	49.0	71.9	28.8	32.3	37.2		19.4	24.7	22.6	22.7	28.7	28.1
Level of Service	D	E	C	C	D		B	C	C	C	C	C
Approach Delay (s)		58.0			36.7			21.6			27.5	
Approach LOS		E			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			40.6			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			119.7			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			74.2%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.9	108.6	27.2	21.8	78.3	72.8	43.6	31.6	15.4	16.6	32.5	32.0
Average Queue (m)	43.4	98.0	17.7	12.4	64.4	55.6	28.0	17.6	7.4	8.9	19.3	18.5
95th Queue (m)	73.9	123.6	31.7	25.6	89.0	84.1	48.1	37.9	16.9	19.3	38.0	34.9
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		20										
Queuing Penalty (veh)		103										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	12	46			17							
Queuing Penalty (veh)	69	85			12							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2027 FRI MIDDAY

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	874	17	21	938	128	22	1	41	112	0	108
Future Volume (vph)	159	874	17	21	938	128	22	1	41	112	0	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.91			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1770	3531		1805	3459			1689			1696	
Flt Permitted	0.21	1.00		0.27	1.00			0.83			0.82	
Satd. Flow (perm)	389	3531		510	3459			1431			1435	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	173	950	18	23	1020	139	24	1	45	122	0	117
RTOR Reduction (vph)	0	1	0	0	7	0	0	36	0	0	34	0
Lane Group Flow (vph)	173	967	0	23	1152	0	0	34	0	0	205	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	1%	0%	1%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	71.0	71.0		71.0	71.0			19.9			19.9	
Effective Green, g (s)	71.0	71.0		71.0	71.0			19.9			19.9	
Actuated g/C Ratio	0.69	0.69		0.69	0.69			0.19			0.19	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	268	2436		351	2386			276			277	
v/s Ratio Prot		0.27			0.33							
v/s Ratio Perm	c0.44			0.05				0.02			c0.14	
v/c Ratio	0.65	0.40		0.07	0.48			0.12			0.74	
Uniform Delay, d1	8.9	6.8		5.2	7.4			34.3			39.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	11.4	0.5		0.4	0.7			0.2			10.2	
Delay (s)	20.3	7.3		5.5	8.1			34.5			49.2	
Level of Service	C	A		A	A			C			D	
Approach Delay (s)		9.3			8.1			34.5			49.2	
Approach LOS		A			A			C			D	
Intersection Summary												
HCM 2000 Control Delay			13.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			102.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			80.3%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	61.3	106.7	84.1	19.6	77.3	76.0	22.8	45.7
Average Queue (m)	34.4	76.7	48.0	5.9	44.0	45.9	12.8	34.5
95th Queue (m)	81.5	158.6	134.1	25.5	86.0	85.9	24.6	53.4
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		10	3				1	1
Queuing Penalty (veh)		0	0				0	1
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	8	30			9			
Queuing Penalty (veh)	36	47			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2027 FRI Midday
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	55	30	127	82	51	99
Future Volume (Veh/h)	55	30	127	82	51	99
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	33	138	89	55	108
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked	1.00	1.00			1.00	
vC, conflicting volume	400	182			227	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	397	178			223	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	96			96	
cM capacity (veh/h)	585	867			1354	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	93	227	163			
Volume Left	60	0	55			
Volume Right	33	89	0			
cSH	662	1700	1354			
Volume to Capacity	0.14	0.13	0.04			
Queue Length 95th (m)	3.9	0.0	1.0			
Control Delay (s)	11.3	0.0	2.8			
Lane LOS	B		A			
Approach Delay (s)	11.3	0.0	2.8			
Approach LOS	B					
Intersection Summary						
Average Delay		3.1				
Intersection Capacity Utilization		34.6%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	11.6	1.3	6.4
Average Queue (m)	9.2	0.3	1.8
95th Queue (m)	14.6	2.3	7.8
Link Distance (m)	45.0	56.1	9.1
Upstream Blk Time (%)			1
Queuing Penalty (veh)			1
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FT 2027 FRI Midday
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	54	30	75	82	52	96
Future Volume (Veh/h)	54	30	75	82	52	96
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	33	82	89	57	104
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	344	126			171	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	344	126			171	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	96			96	
cM capacity (veh/h)	630	929			1418	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	92	171	161			
Volume Left	59	0	57			
Volume Right	33	89	0			
cSH	712	1700	1418			
Volume to Capacity	0.13	0.10	0.04			
Queue Length 95th (m)	3.5	0.0	1.0			
Control Delay (s)	10.8	0.0	2.9			
Lane LOS	B		A			
Approach Delay (s)	10.8	0.0	2.9			
Approach LOS	B					
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			31.7%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 4: Winona Dr & Northern Site Entrance

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	12.8	0.8	8.9
Average Queue (m)	9.1	0.2	2.5
95th Queue (m)	14.5	2.1	9.7
Link Distance (m)	41.9	9.1	65.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2027 FRI Midday
11-25-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	81	35	114	42	21	84
Future Volume (Veh/h)	81	35	114	42	21	84
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	38	124	46	23	91
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			126		401	107
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			126		401	107
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		96	90
cM capacity (veh/h)			1473		558	942
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	126	170	114			
Volume Left	0	124	23			
Volume Right	38	0	91			
cSH	1700	1473	827			
Volume to Capacity	0.07	0.08	0.14			
Queue Length 95th (m)	0.0	2.2	3.8			
Control Delay (s)	0.0	5.8	10.0			
Lane LOS		A	B			
Approach Delay (s)	0.0	5.8	10.0			
Approach LOS			B			
Intersection Summary						
Average Delay		5.2				
Intersection Capacity Utilization		28.2%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	8.3	15.8
Average Queue (m)	3.2	10.2
95th Queue (m)	10.2	17.9
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FT 2027 FRI Midday
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	10	40	4	11	9	53	480	4	9	460	80
Future Volume (Veh/h)	90	10	40	4	11	9	53	480	4	9	460	80
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	11	43	4	12	10	58	522	4	10	500	87
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh									2			
Upstream signal (m)	240											
pX, platoon unblocked	0.92	0.92		0.92	0.92	0.92				0.92		
vC, conflicting volume	1218	1206	544	1208	1247	524	587			526		
vC1, stage 1 conf vol	564	564		640	640							
vC2, stage 2 conf vol	654	642		568	607							
vCu, unblocked vol	1193	1180	544	1183	1225	438	587			441		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.2		
p0 queue free %	71	97	92	99	96	98	94			99		
cM capacity (veh/h)	334	354	543	314	332	550	905			1039		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	152	26	58	526	10	587						
Volume Left	98	4	58	0	10	0						
Volume Right	43	10	0	4	0	87						
cSH	377	388	905	1700	1039	1700						
Volume to Capacity	0.40	0.07	0.06	0.31	0.01	0.35						
Queue Length 95th (m)	15.2	1.7	1.6	0.0	0.2	0.0						
Control Delay (s)	20.9	15.0	9.2	0.0	8.5	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	20.9	15.0	0.9		0.1							
Approach LOS	C	B										
Intersection Summary												
Average Delay	3.1											
Intersection Capacity Utilization	57.0%			ICU Level of Service				B				
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (m)	26.4	10.1	15.6	1.7	0.6
Average Queue (m)	16.7	5.0	5.8	0.7	0.1
95th Queue (m)	32.2	12.7	17.6	4.4	1.4
Link Distance (m)	219.8	78.5		115.7	115.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

HCM Signalized Intersection Capacity Analysis

FT 2027 FRI PM Peak

1: Ninth Line & Main St /Main St

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	617	326	88	551	57	263	220	84	68	165	219
Future Volume (vph)	256	617	326	88	551	57	263	220	84	68	165	219
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1615	1805	3527		1805	1863	1615	1805	1881	1615
Flt Permitted	0.30	1.00	1.00	0.09	1.00		0.50	1.00	1.00	0.57	1.00	1.00
Satd. Flow (perm)	574	1900	1615	174	3527		952	1863	1615	1083	1881	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	278	671	354	96	599	62	286	239	91	74	179	238
RTOR Reduction (vph)	0	0	181	0	7	0	0	0	61	0	0	171
Lane Group Flow (vph)	278	671	173	96	654	0	286	239	30	74	179	67
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	52.0	44.0	44.0	51.4	43.7		49.0	37.9	37.9	40.1	33.0	33.0
Effective Green, g (s)	52.0	44.0	44.0	51.4	43.7		49.0	37.9	37.9	40.1	33.0	33.0
Actuated g/C Ratio	0.45	0.38	0.38	0.44	0.37		0.42	0.32	0.32	0.34	0.28	0.28
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	340	716	608	184	1320		487	605	524	416	531	456
v/s Ratio Prot	c0.06	c0.35		0.03	0.19		c0.06	0.13		0.01	0.10	
v/s Ratio Perm	0.31		0.11	0.20			c0.19		0.02	0.05		0.04
v/c Ratio	0.82	0.94	0.29	0.52	0.50		0.59	0.40	0.06	0.18	0.34	0.15
Uniform Delay, d1	25.7	35.0	25.4	25.4	28.0		24.1	30.5	27.1	26.2	33.2	31.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.1	19.6	0.3	2.7	0.3		1.8	1.9	0.2	0.2	1.7	0.7
Delay (s)	39.8	54.7	25.6	28.1	28.3		25.9	32.4	27.3	26.4	34.9	32.0
Level of Service	D	D	C	C	C		C	C	C	C	C	C
Approach Delay (s)		43.6			28.3			28.6			32.2	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			35.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			116.7			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			79.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	109.1	41.8	25.8	64.4	56.7	60.6	49.8	15.6	19.0	47.4	25.8
Average Queue (m)	51.2	93.6	25.0	16.8	48.7	40.1	40.9	31.9	8.9	11.7	30.2	17.4
95th Queue (m)	73.7	130.7	48.0	29.2	72.2	64.3	66.9	59.8	18.2	23.7	53.4	28.9
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		13										
Queuing Penalty (veh)		77										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	18	40			8							
Queuing Penalty (veh)	111	102			7							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2027 FRI PM Peak

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	1047	25	39	890	63	18	3	35	85	0	49
Future Volume (vph)	62	1047	25	39	890	63	18	3	35	85	0	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.92			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3597		1805	3532			1712			1751	
Flt Permitted	0.26	1.00		0.22	1.00			0.87			0.80	
Satd. Flow (perm)	487	3597		415	3532			1517			1439	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	1138	27	42	967	68	20	3	38	92	0	53
RTOR Reduction (vph)	0	1	0	0	3	0	0	33	0	0	23	0
Lane Group Flow (vph)	67	1164	0	42	1032	0	0	28	0	0	122	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	73.5	73.5		73.5	73.5			14.2			14.2	
Effective Green, g (s)	73.5	73.5		73.5	73.5			14.2			14.2	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.14			0.14	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	359	2651		305	2603			216			204	
v/s Ratio Prot		c0.32			0.29							
v/s Ratio Perm	0.14			0.10				0.02			c0.08	
v/c Ratio	0.19	0.44		0.14	0.40			0.13			0.60	
Uniform Delay, d1	4.0	5.1		3.8	4.9			37.4			40.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.1	0.5		0.9	0.5			0.3			4.6	
Delay (s)	5.1	5.6		4.8	5.3			37.6			44.7	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		5.6			5.3			37.6			44.7	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			8.5			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			99.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			74.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	37.1	95.4	60.4	20.1	59.6	58.7	16.3	30.8
Average Queue (m)	18.0	61.8	33.0	9.2	29.6	31.2	9.3	20.0
95th Queue (m)	56.6	126.8	97.4	25.6	67.6	66.0	21.2	36.9
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		4	0				1	
Queuing Penalty (veh)		0	0				0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	0	22			4			
Queuing Penalty (veh)	0	14			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2027 FRI PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	6	67	13	6	42
Future Volume (Veh/h)	12	6	67	13	6	42
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	7	73	14	7	46
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	140	80			87	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	140	80			87	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	849	980			1509	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	87	53			
Volume Left	13	0	7			
Volume Right	7	14	0			
cSH	891	1700	1509			
Volume to Capacity	0.02	0.05	0.00			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.1	0.0	1.0			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			17.3%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.7	1.8
Average Queue (m)	3.4	0.4
95th Queue (m)	10.2	3.3
Link Distance (m)	45.0	9.1
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FT 2027 FRI PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	7	61	12	7	36
Future Volume (Veh/h)	12	7	61	12	7	36
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	8	66	13	8	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	128	72			79	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	128	72			79	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	867	995			1532	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	21	79	47			
Volume Left	13	0	8			
Volume Right	8	13	0			
cSH	912	1700	1532			
Volume to Capacity	0.02	0.05	0.01			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.0	0.0	1.3			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	1.3			
Approach LOS	A					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			17.9%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 4: Winona Dr & Northern Site Entrance

Movement	WB
Directions Served	LR
Maximum Queue (m)	8.6
Average Queue (m)	4.1
95th Queue (m)	11.3
Link Distance (m)	41.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2027 FRI PM Peak
11-25-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	74	18	25	42	23	46
Future Volume (Veh/h)	74	18	25	42	23	46
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	20	27	46	25	50
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	100			190	90	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100			190	90	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	98			97	95	
cM capacity (veh/h)	1505			789	973	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	100	73	75			
Volume Left	0	27	25			
Volume Right	20	0	50			
cSH	1700	1505	903			
Volume to Capacity	0.06	0.02	0.08			
Queue Length 95th (m)	0.0	0.4	2.2			
Control Delay (s)	0.0	2.8	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.8	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay	3.7					
Intersection Capacity Utilization	21.0%			ICU Level of Service	A	
Analysis Period (min)	15					

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	0.9	9.5
Average Queue (m)	0.2	8.3
95th Queue (m)	2.2	11.6
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FT 2027 FRI PM Peak
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	8	29	4	5	14	25	600	6	11	518	38
Future Volume (Veh/h)	64	8	29	4	5	14	25	600	6	11	518	38
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	9	32	4	5	15	27	652	7	12	563	41
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh									2			
Upstream signal (m)	240											
pX, platoon unblocked	0.81	0.81		0.81	0.81	0.81				0.81		
vC, conflicting volume	1331	1320	584	1333	1338	656	604			659		
vC1, stage 1 conf vol	608	608		710	710							
vC2, stage 2 conf vol	724	713		624	628							
vCu, unblocked vol	1292	1279	584	1294	1300	460	604			464		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	97	94	99	98	97	97			99		
cM capacity (veh/h)	311	328	516	303	322	492	984			899		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	111	24	27	659	12	604						
Volume Left	70	4	27	0	12	0						
Volume Right	32	15	0	7	0	41						
cSH	353	405	984	1700	899	1700						
Volume to Capacity	0.31	0.06	0.03	0.39	0.01	0.36						
Queue Length 95th (m)	10.6	1.5	0.7	0.0	0.3	0.0						
Control Delay (s)	19.8	14.4	8.8	0.0	9.1	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	19.8	14.4	0.3		0.2							
Approach LOS	C	B										
Intersection Summary												
Average Delay	2.0											
Intersection Capacity Utilization	51.0%			ICU Level of Service				A				
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	18.6	8.6	9.1	4.2
Average Queue (m)	13.4	4.6	2.7	1.2
95th Queue (m)	22.4	12.1	9.6	6.0
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

FT 2027 SAT PM Peak

1: Ninth Line & Main St /Main St

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	503	254	54	468	52	186	182	58	48	145	188
Future Volume (vph)	200	503	254	54	468	52	186	182	58	48	145	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1881	1615	1805	3548		1787	1900	1583	1805	1881	1599
Flt Permitted	0.29	1.00	1.00	0.18	1.00		0.56	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	552	1881	1615	348	3548		1044	1900	1583	1203	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	547	276	59	509	57	202	198	63	52	158	204
RTOR Reduction (vph)	0	0	162	0	8	0	0	0	39	0	0	137
Lane Group Flow (vph)	217	547	114	59	558	0	202	198	24	52	158	67
Heavy Vehicles (%)	0%	1%	0%	0%	0%	2%	1%	0%	2%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	50.2	39.8	39.8	40.9	34.5		53.3	43.1	43.1	44.0	37.8	37.8
Effective Green, g (s)	50.2	39.8	39.8	40.9	34.5		53.3	43.1	43.1	44.0	37.8	37.8
Actuated g/C Ratio	0.43	0.34	0.34	0.35	0.30		0.46	0.37	0.37	0.38	0.33	0.33
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	366	648	556	203	1059		555	709	590	490	615	523
v/s Ratio Prot	c0.06	c0.29		0.02	0.16		c0.04	0.10		0.01	0.08	
v/s Ratio Perm	0.20		0.07	0.09			c0.13		0.01	0.03		0.04
v/c Ratio	0.59	0.84	0.21	0.29	0.53		0.36	0.28	0.04	0.11	0.26	0.13
Uniform Delay, d1	22.0	35.0	26.7	26.9	33.7		19.1	25.3	23.0	22.8	28.5	27.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	9.8	0.2	0.8	0.5		0.4	1.0	0.1	0.1	1.0	0.5
Delay (s)	24.6	44.8	26.9	27.7	34.2		19.5	26.3	23.2	22.9	29.5	27.8
Level of Service	C	D	C	C	C		B	C	C	C	C	C
Approach Delay (s)		35.8			33.6			22.9			27.8	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.6			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			115.5			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			72.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	106.8	31.6	22.9	62.3	50.0	43.7	34.3	12.1	16.2	34.2	21.8
Average Queue (m)	43.3	86.1	18.1	11.2	47.3	33.4	30.8	23.7	7.3	9.3	22.8	12.9
95th Queue (m)	74.5	122.2	34.3	29.9	67.8	58.6	51.1	39.8	15.2	19.8	37.8	23.3
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		6										
Queuing Penalty (veh)		28										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	7	40			7							
Queuing Penalty (veh)	33	80			4							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2027 SAT PM Peak

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	781	23	37	660	56	15	1	33	63	0	37
Future Volume (vph)	52	781	23	37	660	56	15	1	33	63	0	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1805	3560		1805	3568			1700			1750	
Flt Permitted	0.35	1.00		0.32	1.00			0.89			0.78	
Satd. Flow (perm)	669	3560		599	3568			1537			1404	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	849	25	40	717	61	16	1	36	68	0	40
RTOR Reduction (vph)	0	1	0	0	4	0	0	32	0	0	25	0
Lane Group Flow (vph)	57	873	0	40	774	0	0	21	0	0	83	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	80.1	80.1		80.1	80.1			12.2			12.2	
Effective Green, g (s)	80.1	80.1		80.1	80.1			12.2			12.2	
Actuated g/C Ratio	0.77	0.77		0.77	0.77			0.12			0.12	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	513	2733		460	2740			179			164	
v/s Ratio Prot		c0.25			0.22							
v/s Ratio Perm	0.09			0.07				0.01			c0.06	
v/c Ratio	0.11	0.32		0.09	0.28			0.12			0.51	
Uniform Delay, d1	3.1	3.7		3.0	3.6			41.2			43.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.4	0.3		0.4	0.3			0.3			2.5	
Delay (s)	3.5	4.0		3.4	3.8			41.5			45.7	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.0			3.8			41.5			45.7	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			7.3			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			104.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			64.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	15.1	51.8	23.7	13.1	38.7	40.8	14.5	24.3
Average Queue (m)	7.2	33.5	12.7	6.7	19.8	23.2	8.5	14.5
95th Queue (m)	19.6	66.1	35.1	15.5	44.7	47.5	17.7	28.8
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)							0	
Queuing Penalty (veh)							0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	0	9			2			
Queuing Penalty (veh)	0	5			1			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2027 SAT PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	6	67	13	6	26
Future Volume (Veh/h)	13	6	67	13	6	26
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	7	73	14	7	28
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	122	80			87	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	122	80			87	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	869	980			1509	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	21	87	35			
Volume Left	14	0	7			
Volume Right	7	14	0			
cSH	903	1700	1509			
Volume to Capacity	0.02	0.05	0.00			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.1	0.0	1.5			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.5			
Approach LOS	A					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			16.5%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB
Directions Served	LR
Maximum Queue (m)	8.5
Average Queue (m)	2.7
95th Queue (m)	9.7
Link Distance (m)	45.0
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FT 2027 SAT PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	6	60	13	7	20
Future Volume (Veh/h)	12	6	60	13	7	20
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	7	65	14	8	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	110	72			79	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	110	72			79	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	887	996			1532	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	79	30			
Volume Left	13	0	8			
Volume Right	7	14	0			
cSH	922	1700	1532			
Volume to Capacity	0.02	0.05	0.01			
Queue Length 95th (m)	0.5	0.0	0.1			
Control Delay (s)	9.0	0.0	2.0			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	2.0			
Approach LOS	A					
Intersection Summary						
Average Delay		1.9				
Intersection Capacity Utilization		17.2%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 4: Winona Dr & Northern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.6	0.9
Average Queue (m)	4.1	0.2
95th Queue (m)	11.3	2.3
Link Distance (m)	41.9	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2027 SAT PM Peak
11-25-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	55	8	20	28	22	45
Future Volume (Veh/h)	55	8	20	28	22	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	9	22	30	24	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			69		138	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			69		138	64
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		97	95
cM capacity (veh/h)			1545		847	1005
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	69	52	73			
Volume Left	0	22	24			
Volume Right	9	0	49			
cSH	1700	1545	947			
Volume to Capacity	0.04	0.01	0.08			
Queue Length 95th (m)	0.0	0.3	2.0			
Control Delay (s)	0.0	3.2	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.2	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			19.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	1.9	10.1
Average Queue (m)	0.6	8.1
95th Queue (m)	4.2	12.7
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FT 2027 SAT PM Peak

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	6	26	3	2	4	15	375	6	4	376	28
Future Volume (Veh/h)	57	6	26	3	2	4	15	375	6	4	376	28
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	7	28	3	2	4	16	408	7	4	409	30
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			TWLTL		
Median storage veh										2		
Upstream signal (m)							240					
pX, platoon unblocked	0.89	0.89		0.89	0.89	0.89				0.89		
vC, conflicting volume	877	879	424	892	890	412	439				415	
vC1, stage 1 conf vol	432	432		444	444							
vC2, stage 2 conf vol	445	447		448	447							
vCu, unblocked vol	804	806	424	821	819	284	439				288	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	87	99	96	99	100	99	99				100	
cM capacity (veh/h)	479	467	634	453	459	680	1132				1151	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	97	9	16	415	4	439						
Volume Left	62	3	16	0	4	0						
Volume Right	28	4	0	7	0	30						
cSH	515	534	1132	1700	1151	1700						
Volume to Capacity	0.19	0.02	0.01	0.24	0.00	0.26						
Queue Length 95th (m)	5.5	0.4	0.3	0.0	0.1	0.0						
Control Delay (s)	13.6	11.9	8.2	0.0	8.1	0.0						
Lane LOS	B	B	A	A								
Approach Delay (s)	13.6	11.9	0.3	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay	1.6											
Intersection Capacity Utilization	37.4%			ICU Level of Service					A			
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	15.7	8.7	3.6	1.7
Average Queue (m)	10.9	3.4	0.7	0.3
95th Queue (m)	18.6	10.3	4.8	3.1
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

1: Ninth Line & Main St /Main St

FT 2032 FRI Midday

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	629	235	79	702	69	258	155	77	67	136	259
Future Volume (vph)	204	629	235	79	702	69	258	155	77	67	136	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1599	1787	3529		1805	1881	1615	1805	1881	1599
Flt Permitted	0.16	1.00	1.00	0.10	1.00		0.57	1.00	1.00	0.65	1.00	1.00
Satd. Flow (perm)	298	1900	1599	198	3529		1089	1881	1615	1237	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	222	684	255	86	763	75	280	168	84	73	148	282
RTOR Reduction (vph)	0	0	121	0	6	0	0	0	51	0	0	165
Lane Group Flow (vph)	222	684	134	86	832	0	280	168	33	73	148	117
Heavy Vehicles (%)	0%	0%	1%	1%	1%	0%	0%	1%	0%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	47.9	39.9	39.9	44.3	38.1		57.7	46.9	46.9	47.6	40.8	40.8
Effective Green, g (s)	47.9	39.9	39.9	44.3	38.1		57.7	46.9	46.9	47.6	40.8	40.8
Actuated g/C Ratio	0.40	0.33	0.33	0.37	0.32		0.48	0.39	0.39	0.40	0.34	0.34
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	219	632	532	155	1122		601	736	632	523	640	544
v/s Ratio Prot	c0.07	c0.36		0.03	0.24		c0.05	0.09		0.01	0.08	
v/s Ratio Perm	0.34		0.08	0.18			c0.17		0.02	0.05		0.07
v/c Ratio	1.01	1.08	0.25	0.55	0.74		0.47	0.23	0.05	0.14	0.23	0.22
Uniform Delay, d1	31.5	40.0	29.1	30.1	36.5		19.2	24.4	22.6	22.7	28.3	28.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	64.4	60.1	0.2	4.3	2.7		0.6	0.7	0.2	0.1	0.8	0.9
Delay (s)	95.9	100.1	29.3	34.3	39.1		19.8	25.1	22.8	22.8	29.1	29.0
Level of Service	F	F	C	C	D		B	C	C	C	C	C
Approach Delay (s)		83.7			38.7			22.0			28.1	
Approach LOS		F			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			50.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			119.8			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			78.2%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.9	109.7	35.0	50.0	87.2	80.6	45.8	30.4	16.0	20.2	35.7	31.8
Average Queue (m)	47.1	107.5	20.8	22.1	73.5	65.6	30.7	17.8	8.3	11.3	23.4	20.5
95th Queue (m)	74.2	111.5	45.0	59.2	97.9	92.3	53.0	36.3	17.9	22.7	42.9	35.2
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		34	0									
Queuing Penalty (veh)		191	2									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	24	53			24							
Queuing Penalty (veh)	152	109			19							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2032 FRI MIDDAY
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	962	17	22	1031	133	22	1	42	119	0	113
Future Volume (vph)	166	962	17	22	1031	133	22	1	42	119	0	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.91			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1770	3531		1805	3463			1688			1697	
Flt Permitted	0.18	1.00		0.24	1.00			0.84			0.82	
Satd. Flow (perm)	332	3531		447	3463			1434			1432	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	180	1046	18	24	1121	145	24	1	46	129	0	123
RTOR Reduction (vph)	0	1	0	0	6	0	0	37	0	0	34	0
Lane Group Flow (vph)	180	1063	0	24	1260	0	0	34	0	0	218	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	1%	0%	1%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	70.8	70.8		70.8	70.8			21.0			21.0	
Effective Green, g (s)	70.8	70.8		70.8	70.8			21.0			21.0	
Actuated g/C Ratio	0.68	0.68		0.68	0.68			0.20			0.20	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	226	2408		304	2362			290			289	
v/s Ratio Prot		0.30			0.36							
v/s Ratio Perm	c0.54			0.05				0.02			c0.15	
v/c Ratio	0.80	0.44		0.08	0.53			0.12			0.76	
Uniform Delay, d1	11.5	7.5		5.5	8.2			33.8			39.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	24.6	0.6		0.5	0.9			0.2			10.7	
Delay (s)	36.1	8.1		6.1	9.1			34.0			49.7	
Level of Service	D	A		A	A			C			D	
Approach Delay (s)		12.1			9.1			34.0			49.7	
Approach LOS		B			A			C			D	
Intersection Summary												
HCM 2000 Control Delay			14.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			103.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			83.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	72.6	143.6	134.5	22.0	86.9	84.8	20.2	49.6
Average Queue (m)	48.5	109.6	89.1	8.6	61.5	63.1	12.5	38.4
95th Queue (m)	96.6	184.0	182.7	34.5	103.7	101.1	23.1	55.8
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		25	9		0	0	0	1
Queuing Penalty (veh)		0	0		0	0	0	2
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	9	51			12			
Queuing Penalty (veh)	43	85			3			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2032 FRI MIDDAY
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	55	30	131	82	51	104
Future Volume (Veh/h)	55	30	131	82	51	104
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	33	142	89	55	113
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked	1.00	1.00			1.00	
vC, conflicting volume	410	186			231	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	405	181			226	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	96			96	
cM capacity (veh/h)	579	863			1349	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	93	231	168			
Volume Left	60	0	55			
Volume Right	33	89	0			
cSH	655	1700	1349			
Volume to Capacity	0.14	0.14	0.04			
Queue Length 95th (m)	3.9	0.0	1.0			
Control Delay (s)	11.4	0.0	2.8			
Lane LOS	B		A			
Approach Delay (s)	11.4	0.0	2.8			
Approach LOS	B					
Intersection Summary						
Average Delay		3.1				
Intersection Capacity Utilization		35.1%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	15.2	8.3
Average Queue (m)	10.2	2.6
95th Queue (m)	17.2	9.3
Link Distance (m)	45.0	9.1
Upstream Blk Time (%)		2
Queuing Penalty (veh)		3
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FT 2032 FRI Midday
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	54	30	79	82	52	101
Future Volume (Veh/h)	54	30	79	82	52	101
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	33	86	89	57	110
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	354	130			175	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354	130			175	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	96			96	
cM capacity (veh/h)	621	924			1414	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	92	175	167			
Volume Left	59	0	57			
Volume Right	33	89	0			
cSH	704	1700	1414			
Volume to Capacity	0.13	0.10	0.04			
Queue Length 95th (m)	3.6	0.0	1.0			
Control Delay (s)	10.9	0.0	2.8			
Lane LOS	B		A			
Approach Delay (s)	10.9	0.0	2.8			
Approach LOS	B					
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			32.2%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 4: Winona Dr & Northern Site Entrance

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	12.8	0.9	9.1
Average Queue (m)	9.1	0.2	3.2
95th Queue (m)	15.5	2.3	11.3
Link Distance (m)	41.9	9.1	65.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2032 FRI Midday
11-25-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	90	37	116	46	23	87
Future Volume (Veh/h)	90	37	116	46	23	87
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	40	126	50	25	95
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			138		420	118
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			138		420	118
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		95	90
cM capacity (veh/h)			1458		542	928
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	138	176	120			
Volume Left	0	126	25			
Volume Right	40	0	95			
cSH	1700	1458	809			
Volume to Capacity	0.08	0.09	0.15			
Queue Length 95th (m)	0.0	2.3	4.2			
Control Delay (s)	0.0	5.7	10.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	5.7	10.2			
Approach LOS			B			
Intersection Summary						
Average Delay		5.1				
Intersection Capacity Utilization		32.5%	ICU Level of Service	A		
Analysis Period (min)		15				

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	7.3	14.8
Average Queue (m)	2.4	9.7
95th Queue (m)	8.9	15.7
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FT 2032 FRI Midday
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	11	42	4	12	10	54	528	4	10	505	84
Future Volume (Veh/h)	95	11	42	4	12	10	54	528	4	10	505	84
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	12	46	4	13	11	59	574	4	11	549	91
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh												2
Upstream signal (m)	240											
pX, platoon unblocked	0.90	0.90		0.90	0.90	0.90				0.90		
vC, conflicting volume	1326	1312	594	1317	1356	576	640			578		
vC1, stage 1 conf vol	616	616		694	694							
vC2, stage 2 conf vol	710	696		623	662							
vCu, unblocked vol	1306	1291	594	1296	1340	471	640			474		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.2		
p0 queue free %	66	96	91	99	96	98	93			99		
cM capacity (veh/h)	303	326	508	282	305	514	864			987		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	161	28	59	578	11	640						
Volume Left	103	4	59	0	11	0						
Volume Right	46	11	0	4	0	91						
cSH	345	358	864	1700	987	1700						
Volume to Capacity	0.47	0.08	0.07	0.34	0.01	0.38						
Queue Length 95th (m)	19.1	2.0	1.8	0.0	0.3	0.0						
Control Delay (s)	24.3	15.9	9.5	0.0	8.7	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	24.3	15.9	0.9		0.1							
Approach LOS	C	C										
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			60.1%	ICU Level of Service				B				
Analysis Period (min)			15									

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (m)	35.4	13.4	17.3	5.7	1.7
Average Queue (m)	19.5	6.8	9.1	1.6	0.3
95th Queue (m)	37.0	16.0	19.9	7.0	2.5
Link Distance (m)	219.8	78.5		115.7	115.7
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

HCM Signalized Intersection Capacity Analysis

FT 2032 FRI PM Peak

1: Ninth Line & Main St /Main St

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	677	357	96	605	63	288	241	92	74	181	239
Future Volume (vph)	279	677	357	96	605	63	288	241	92	74	181	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1615	1805	3527		1805	1863	1615	1805	1881	1615
Flt Permitted	0.27	1.00	1.00	0.08	1.00		0.47	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	521	1900	1615	161	3527		886	1863	1615	976	1881	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	303	736	388	104	658	68	313	262	100	80	197	260
RTOR Reduction (vph)	0	0	175	0	7	0	0	0	69	0	0	182
Lane Group Flow (vph)	303	736	213	104	719	0	313	262	31	80	197	78
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	55.4	47.4	47.4	55.0	47.2		48.8	37.3	37.3	40.3	32.8	32.8
Effective Green, g (s)	55.4	47.4	47.4	55.0	47.2		48.8	37.3	37.3	40.3	32.8	32.8
Actuated g/C Ratio	0.46	0.39	0.39	0.46	0.39		0.41	0.31	0.31	0.34	0.27	0.27
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	326	750	637	180	1387		452	579	501	379	514	441
v/s Ratio Prot	c0.06	c0.39		0.04	0.20		c0.07	0.14		0.01	0.10	
v/s Ratio Perm	0.37		0.13	0.23			c0.21		0.02	0.06		0.05
v/c Ratio	0.93	0.98	0.33	0.58	0.52		0.69	0.45	0.06	0.21	0.38	0.18
Uniform Delay, d1	28.1	35.9	25.3	26.9	27.7		27.7	33.2	29.1	27.8	35.4	33.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	31.7	28.1	0.3	4.4	0.3		4.5	2.5	0.2	0.3	2.2	0.9
Delay (s)	59.8	64.0	25.6	31.3	28.1		32.3	35.7	29.3	28.1	37.5	34.2
Level of Service	E	E	C	C	C		C	D	C	C	D	C
Approach Delay (s)		52.7			28.5			33.2			34.5	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			40.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			83.6%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.9	110.2	46.6	40.6	77.6	71.9	65.5	52.9	13.9	24.8	40.6	27.7
Average Queue (m)	52.5	105.9	29.7	21.1	55.3	48.5	47.9	37.7	9.2	14.1	28.4	18.6
95th Queue (m)	74.2	118.9	53.2	48.6	83.1	78.9	72.6	64.3	16.6	29.5	46.5	31.3
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		25										
Queuing Penalty (veh)		162										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	30	43		0	12			0				
Queuing Penalty (veh)	205	121		0	12			1				

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2032 FRI PM Peak

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	1150	25	39	978	69	18	3	35	92	0	52
Future Volume (vph)	67	1150	25	39	978	69	18	3	35	92	0	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.92			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3599		1805	3532			1712			1751	
Flt Permitted	0.22	1.00		0.19	1.00			0.87			0.79	
Satd. Flow (perm)	426	3599		356	3532			1516			1433	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	73	1250	27	42	1063	75	20	3	38	100	0	57
RTOR Reduction (vph)	0	1	0	0	3	0	0	32	0	0	23	0
Lane Group Flow (vph)	73	1276	0	42	1135	0	0	29	0	0	134	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	73.3	73.3		73.3	73.3			15.0			15.0	
Effective Green, g (s)	73.3	73.3		73.3	73.3			15.0			15.0	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.15			0.15	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	311	2630		260	2581			226			214	
v/s Ratio Prot		c0.35			0.32							
v/s Ratio Perm	0.17			0.12				0.02			c0.09	
v/c Ratio	0.23	0.49		0.16	0.44			0.13			0.63	
Uniform Delay, d1	4.4	5.6		4.1	5.4			37.0			40.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.8	0.6		1.3	0.5			0.3			5.6	
Delay (s)	6.2	6.3		5.4	5.9			37.2			45.6	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		6.3			5.9			37.2			45.6	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			9.0			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			100.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			78.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	48.5	150.3	136.5	26.9	65.6	67.6	20.6	32.6
Average Queue (m)	21.2	109.1	83.8	9.3	37.9	41.0	9.4	22.8
95th Queue (m)	67.3	186.6	187.7	32.1	77.1	80.4	23.2	40.3
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		23	7			0	1	0
Queuing Penalty (veh)		0	0			0	0	0
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	0	45			6			
Queuing Penalty (veh)	0	30			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2032 FRI PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	6	72	13	6	45
Future Volume (Veh/h)	12	6	72	13	6	45
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	7	78	14	7	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	148	85			92	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148	85			92	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	840	974			1503	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	92	56			
Volume Left	13	0	7			
Volume Right	7	14	0			
cSH	883	1700	1503			
Volume to Capacity	0.02	0.05	0.00			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.2	0.0	1.0			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	1.0			
Approach LOS	A					
Intersection Summary						
Average Delay		1.4				
Intersection Capacity Utilization		17.4%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.7	1.8
Average Queue (m)	3.8	0.4
95th Queue (m)	10.7	3.3
Link Distance (m)	45.0	9.1
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FT 2032 FRI PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	7	66	12	7	39
Future Volume (Veh/h)	12	7	66	12	7	39
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	8	72	13	8	42
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	136	78			85	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	136	78			85	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	857	988			1524	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	21	85	50			
Volume Left	13	0	8			
Volume Right	8	13	0			
cSH	903	1700	1524			
Volume to Capacity	0.02	0.05	0.01			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.1	0.0	1.2			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.2			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			18.0%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 4: Winona Dr & Northern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	7.8	2.7
Average Queue (m)	4.3	0.5
95th Queue (m)	11.4	4.0
Link Distance (m)	41.9	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2032 FRI PM Peak
11-25-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	81	20	27	46	25	49
Future Volume (Veh/h)	81	20	27	46	25	49
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	22	29	50	27	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			110		207	99
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			110		207	99
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	94
cM capacity (veh/h)			1493		771	962
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	110	79	80			
Volume Left	0	29	27			
Volume Right	22	0	53			
cSH	1700	1493	888			
Volume to Capacity	0.06	0.02	0.09			
Queue Length 95th (m)	0.0	0.5	2.4			
Control Delay (s)	0.0	2.8	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.8	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			21.6%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	4.3	11.8
Average Queue (m)	1.0	8.8
95th Queue (m)	6.4	13.4
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FT 2032 FRI PM Peak
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	9	31	4	5	16	27	658	6	12	568	41
Future Volume (Veh/h)	69	9	31	4	5	16	27	658	6	12	568	41
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	10	34	4	5	17	29	715	7	13	617	45
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			TWLTL		
Median storage veh										2		
Upstream signal (m)							240					
pX, platoon unblocked	0.78	0.78		0.78	0.78	0.78				0.78		
vC, conflicting volume	1458	1446	640	1458	1464	718	662			722		
vC1, stage 1 conf vol	666	666		776	776							
vC2, stage 2 conf vol	792	780		682	688							
vCu, unblocked vol	1446	1431	640	1447	1455	504	662			508		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	73	97	93	99	98	96	97			98		
cM capacity (veh/h)	275	296	479	269	291	449	936			837		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	119	26	29	722	13	662						
Volume Left	75	4	29	0	13	0						
Volume Right	34	17	0	7	0	45						
cSH	315	372	936	1700	837	1700						
Volume to Capacity	0.38	0.07	0.03	0.42	0.02	0.39						
Queue Length 95th (m)	13.6	1.8	0.8	0.0	0.4	0.0						
Control Delay (s)	23.2	15.4	9.0	0.0	9.4	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	23.2	15.4	0.3		0.2							
Approach LOS	C	C										
Intersection Summary												
Average Delay	2.3											
Intersection Capacity Utilization	54.5%			ICU Level of Service			A					
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	23.9	10.2	7.3	5.0
Average Queue (m)	15.4	6.0	2.8	1.5
95th Queue (m)	28.4	13.3	9.5	6.7
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

FT 2032 SAT PM Peak

1: Ninth Line & Main St /Main St

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	551	277	59	513	57	203	198	64	52	159	205
Future Volume (vph)	217	551	277	59	513	57	203	198	64	52	159	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1881	1615	1805	3549		1787	1900	1583	1805	1881	1599
Flt Permitted	0.26	1.00	1.00	0.12	1.00		0.53	1.00	1.00	0.62	1.00	1.00
Satd. Flow (perm)	490	1881	1615	225	3549		1004	1900	1583	1185	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	236	599	301	64	558	62	221	215	70	57	173	223
RTOR Reduction (vph)	0	0	161	0	7	0	0	0	44	0	0	151
Lane Group Flow (vph)	236	599	140	64	613	0	221	215	26	57	173	72
Heavy Vehicles (%)	0%	1%	0%	0%	0%	2%	1%	0%	2%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	51.1	40.5	40.5	41.9	35.3		53.5	43.1	43.1	44.2	37.8	37.8
Effective Green, g (s)	51.1	40.5	40.5	41.9	35.3		53.5	43.1	43.1	44.2	37.8	37.8
Actuated g/C Ratio	0.44	0.35	0.35	0.36	0.30		0.46	0.37	0.37	0.38	0.32	0.32
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	347	653	560	170	1074		539	702	585	483	609	518
v/s Ratio Prot	c0.07	c0.32		0.02	0.17		c0.04	0.11		0.01	0.09	
v/s Ratio Perm	0.23		0.09	0.11			c0.15		0.02	0.04		0.05
v/c Ratio	0.68	0.92	0.25	0.38	0.57		0.41	0.31	0.04	0.12	0.28	0.14
Uniform Delay, d1	22.5	36.4	27.2	27.9	34.3		19.8	26.1	23.6	23.2	29.3	27.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	17.7	0.2	1.4	0.7		0.5	1.1	0.1	0.1	1.2	0.6
Delay (s)	27.9	54.2	27.4	29.3	35.0		20.3	27.3	23.7	23.3	30.5	28.5
Level of Service	C	D	C	C	D		C	C	C	C	C	C
Approach Delay (s)		41.6			34.5			23.7			28.6	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			34.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			116.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			74.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.9	109.0	33.7	18.8	63.6	58.6	48.7	39.4	13.5	14.7	39.1	24.9
Average Queue (m)	50.2	97.0	21.6	12.7	48.6	39.3	30.1	24.7	7.3	8.5	26.5	15.5
95th Queue (m)	75.5	121.6	35.4	23.0	68.1	65.1	53.4	44.9	15.8	19.6	43.5	28.2
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		14										
Queuing Penalty (veh)		67										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	9	44			7							
Queuing Penalty (veh)	51	95			4							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2032 SAT PM Peak

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	857	23	37	724	60	15	1	33	69	0	39
Future Volume (vph)	56	857	23	37	724	60	15	1	33	69	0	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1805	3561		1805	3569			1700			1752	
Flt Permitted	0.32	1.00		0.29	1.00			0.89			0.77	
Satd. Flow (perm)	613	3561		542	3569			1537			1399	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	932	25	40	787	65	16	1	36	75	0	42
RTOR Reduction (vph)	0	1	0	0	4	0	0	32	0	0	25	0
Lane Group Flow (vph)	61	956	0	40	848	0	0	21	0	0	92	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	79.6	79.6		79.6	79.6			12.8			12.8	
Effective Green, g (s)	79.6	79.6		79.6	79.6			12.8			12.8	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.12			0.12	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	467	2715		413	2721			188			171	
v/s Ratio Prot		c0.27			0.24							
v/s Ratio Perm	0.10			0.07				0.01			c0.07	
v/c Ratio	0.13	0.35		0.10	0.31			0.11			0.54	
Uniform Delay, d1	3.3	4.0		3.2	3.9			40.8			43.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.6	0.4		0.5	0.3			0.3			3.5	
Delay (s)	3.8	4.4		3.6	4.2			41.0			46.5	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.4			4.1			41.0			46.5	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			7.6			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			104.4			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	26.0	76.9	38.2	13.5	42.4	46.9	15.7	28.9
Average Queue (m)	10.0	49.0	16.2	6.6	23.6	25.5	8.5	19.0
95th Queue (m)	34.4	100.0	48.3	15.2	47.9	52.9	18.3	35.7
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		0					0	
Queuing Penalty (veh)		0					0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		19			2			
Queuing Penalty (veh)		11			1			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2032 SAT PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	6	72	13	6	28
Future Volume (Veh/h)	13	6	72	13	6	28
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	7	78	14	7	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	129	85			92	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	129	85			92	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	861	974			1503	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	21	92	37			
Volume Left	14	0	7			
Volume Right	7	14	0			
cSH	896	1700	1503			
Volume to Capacity	0.02	0.05	0.00			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.1	0.0	1.4			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.4			
Approach LOS	A					
Intersection Summary						
Average Delay		1.6				
Intersection Capacity Utilization		16.6%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.7	1.8
Average Queue (m)	3.6	0.4
95th Queue (m)	10.6	3.3
Link Distance (m)	45.0	9.1
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FT 2032 SAT PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	6	65	13	7	22
Future Volume (Veh/h)	12	6	65	13	7	22
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	7	71	14	8	24
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	118	78			85	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	118	78			85	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	878	988			1524	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	85	32			
Volume Left	13	0	8			
Volume Right	7	14	0			
cSH	914	1700	1524			
Volume to Capacity	0.02	0.05	0.01			
Queue Length 95th (m)	0.5	0.0	0.1			
Control Delay (s)	9.0	0.0	1.9			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	1.9			
Approach LOS	A					
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			17.3%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 4: Winona Dr & Northern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.4	0.9
Average Queue (m)	3.9	0.2
95th Queue (m)	11.3	2.3
Link Distance (m)	41.9	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2032 SAT PM Peak
11-25-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	60	9	21	31	24	48
Future Volume (Veh/h)	60	9	21	31	24	48
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	10	23	34	26	52
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			75	150	70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			75	150	70	
tC, single (s)			4.1	6.4	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			99	97	95	
cM capacity (veh/h)			1537	834	998	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	75	57	78			
Volume Left	0	23	26			
Volume Right	10	0	52			
cSH	1700	1537	937			
Volume to Capacity	0.04	0.01	0.08			
Queue Length 95th (m)	0.0	0.4	2.2			
Control Delay (s)	0.0	3.0	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.0	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization			20.4%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	2.7	10.8
Average Queue (m)	0.5	8.3
95th Queue (m)	4.1	13.8
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FT 2032 SAT PM Peak
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	6	28	3	2	4	16	410	6	4	411	30
Future Volume (Veh/h)	62	6	28	3	2	4	16	410	6	4	411	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	7	30	3	2	4	17	446	7	4	447	33
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			TWLTL		
Median storage veh										2		
Upstream signal (m)							240					
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	956	958	464	972	972	450	480				453	
vC1, stage 1 conf vol	472	472		484	484							
vC2, stage 2 conf vol	485	487		488	488							
vCu, unblocked vol	877	879	464	895	894	296	480				300	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	85	98	95	99	100	99	98				100	
cM capacity (veh/h)	450	441	603	423	433	653	1093				1110	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	104	9	17	453	4	480						
Volume Left	67	3	17	0	4	0						
Volume Right	30	4	0	7	0	33						
cSH	484	504	1093	1700	1110	1700						
Volume to Capacity	0.21	0.02	0.02	0.27	0.00	0.28						
Queue Length 95th (m)	6.5	0.4	0.4	0.0	0.1	0.0						
Control Delay (s)	14.5	12.3	8.3	0.0	8.3	0.0						
Lane LOS	B	B	A	A								
Approach Delay (s)	14.5	12.3	0.3	0.1								
Approach LOS	B	B										
Intersection Summary												
Average Delay	1.7											
Intersection Capacity Utilization	40.1%			ICU Level of Service					A			
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	16.8	7.1	7.3	0.8
Average Queue (m)	11.5	2.1	1.8	0.3
95th Queue (m)	19.3	8.3	7.8	3.0
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

FT 2037 FRI Midday

1: Ninth Line & Main St /Main St

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	689	255	87	768	74	281	169	85	73	147	283
Future Volume (vph)	223	689	255	87	768	74	281	169	85	73	147	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1599	1787	3530		1805	1881	1615	1805	1881	1599
Flt Permitted	0.13	1.00	1.00	0.10	1.00		0.56	1.00	1.00	0.64	1.00	1.00
Satd. Flow (perm)	242	1900	1599	194	3530		1057	1881	1615	1219	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	242	749	277	95	835	80	305	184	92	79	160	308
RTOR Reduction (vph)	0	0	122	0	6	0	0	0	56	0	0	154
Lane Group Flow (vph)	242	749	155	95	909	0	305	184	36	79	160	154
Heavy Vehicles (%)	0%	0%	1%	1%	1%	0%	0%	1%	0%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	47.0	39.0	39.0	46.6	38.8		57.8	46.7	46.7	47.9	40.8	40.8
Effective Green, g (s)	47.0	39.0	39.0	46.6	38.8		57.8	46.7	46.7	47.9	40.8	40.8
Actuated g/C Ratio	0.39	0.32	0.32	0.39	0.32		0.48	0.39	0.39	0.40	0.34	0.34
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	197	614	517	177	1135		587	728	625	518	636	540
v/s Ratio Prot	c0.08	0.39		0.03	0.26		c0.06	0.10		0.01	0.09	
v/s Ratio Perm	c0.40		0.10	0.17			c0.19		0.02	0.05		0.10
v/c Ratio	1.23	1.22	0.30	0.54	0.80		0.52	0.25	0.06	0.15	0.25	0.28
Uniform Delay, d1	31.0	40.8	30.6	29.3	37.4		19.9	25.1	23.2	22.9	28.9	29.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	139.1	113.2	0.3	3.1	4.1		0.8	0.8	0.2	0.1	0.9	1.3
Delay (s)	170.1	154.0	30.9	32.4	41.5		20.7	25.9	23.3	23.1	29.8	30.5
Level of Service	F	F	C	C	D		C	C	C	C	C	C
Approach Delay (s)		130.2			40.7			22.8			29.2	
Approach LOS		F			D			C			C	
Intersection Summary												
HCM 2000 Control Delay	69.1			HCM 2000 Level of Service					E			
HCM 2000 Volume to Capacity ratio	0.87											
Actuated Cycle Length (s)	120.6			Sum of lost time (s)					20.0			
Intersection Capacity Utilization	82.7%			ICU Level of Service					E			
Analysis Period (min)	15											
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	109.6	50.6	47.1	100.1	93.0	50.9	33.5	14.5	16.0	37.0	40.1
Average Queue (m)	49.9	107.4	27.0	24.1	79.9	72.8	34.7	19.7	7.8	9.4	22.1	22.8
95th Queue (m)	76.1	112.5	65.9	62.8	111.3	103.7	59.0	40.2	16.3	19.0	42.2	42.9
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		36	1									
Queuing Penalty (veh)		219	4									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	21	50		0	30							
Queuing Penalty (veh)	144	112		0	26							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2037 FRI Midday

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	1059	18	23	1133	139	22	1	44	126	0	118
Future Volume (vph)	173	1059	18	23	1133	139	22	1	44	126	0	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.91			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	3531		1805	3466			1687			1697	
Flt Permitted	0.15	1.00		0.20	1.00			0.84			0.82	
Satd. Flow (perm)	275	3531		382	3466			1440			1429	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	1151	20	25	1232	151	24	1	48	137	0	128
RTOR Reduction (vph)	0	1	0	0	6	0	0	38	0	0	32	0
Lane Group Flow (vph)	188	1170	0	25	1377	0	0	35	0	0	233	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	1%	0%	1%	2%	0%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	70.6	70.6		70.6	70.6			22.2			22.2	
Effective Green, g (s)	70.6	70.6		70.6	70.6			22.2			22.2	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.21			0.21	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	185	2378		257	2334			305			302	
v/s Ratio Prot		0.33			0.40							
v/s Ratio Perm	c0.68			0.07				0.02			c0.16	
v/c Ratio	1.02	0.49		0.10	0.59			0.12			0.77	
Uniform Delay, d1	17.1	8.3		6.0	9.3			33.4			38.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	70.5	0.7		0.8	1.1			0.2			11.5	
Delay (s)	87.6	9.1		6.7	10.4			33.5			50.4	
Level of Service	F	A		A	B			C			D	
Approach Delay (s)		19.9			10.3			33.5			50.4	
Approach LOS		B			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			18.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			104.8			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			87.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	74.0	153.6	141.7	22.5	96.9	100.6	23.2	51.8
Average Queue (m)	48.2	130.9	110.2	6.8	63.8	68.8	12.9	40.9
95th Queue (m)	99.2	191.2	200.6	26.8	111.4	114.2	27.0	57.4
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		42	15		1	1	2	5
Queuing Penalty (veh)		0	0		3	5	0	8
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	11	56			13			
Queuing Penalty (veh)	57	96			3			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2037 FRI Midday
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	55	30	136	82	51	109
Future Volume (Veh/h)	55	30	136	82	51	109
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	33	148	89	55	118
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked	0.99	0.99			0.99	
vC, conflicting volume	420	192			237	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	414	184			229	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	96			96	
cM capacity (veh/h)	571	858			1342	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	93	237	173			
Volume Left	60	0	55			
Volume Right	33	89	0			
cSH	648	1700	1342			
Volume to Capacity	0.14	0.14	0.04			
Queue Length 95th (m)	4.0	0.0	1.0			
Control Delay (s)	11.5	0.0	2.7			
Lane LOS	B		A			
Approach Delay (s)	11.5	0.0	2.7			
Approach LOS	B					
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			35.6%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	16.3	0.7	8.3
Average Queue (m)	10.4	0.1	4.3
95th Queue (m)	19.6	1.6	11.7
Link Distance (m)	45.0	56.1	9.1
Upstream Blk Time (%)			3
Queuing Penalty (veh)			5
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FT 2037 FRI Midday
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	54	30	84	82	52	106
Future Volume (Veh/h)	54	30	84	82	52	106
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	59	33	91	89	57	115
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	364	136			180	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	364	136			180	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	96			96	
cM capacity (veh/h)	613	919			1408	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	92	180	172			
Volume Left	59	0	57			
Volume Right	33	89	0			
cSH	696	1700	1408			
Volume to Capacity	0.13	0.11	0.04			
Queue Length 95th (m)	3.6	0.0	1.0			
Control Delay (s)	11.0	0.0	2.8			
Lane LOS	B		A			
Approach Delay (s)	11.0	0.0	2.8			
Approach LOS	B					
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			32.7%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 4: Winona Dr & Northern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	13.3	10.8
Average Queue (m)	9.4	3.5
95th Queue (m)	14.8	12.4
Link Distance (m)	41.9	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2037 FRI Midday
11-25-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	99	40	118	51	25	90
Future Volume (Veh/h)	99	40	118	51	25	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	43	128	55	27	98
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			151		440	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			151		440	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		95	89
cM capacity (veh/h)			1442		527	915
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	151	183	125			
Volume Left	0	128	27			
Volume Right	43	0	98			
cSH	1700	1442	789			
Volume to Capacity	0.09	0.09	0.16			
Queue Length 95th (m)	0.0	2.3	4.5			
Control Delay (s)	0.0	5.6	10.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	5.6	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay			5.1			
Intersection Capacity Utilization			33.8%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	7.4	13.9
Average Queue (m)	4.2	10.1
95th Queue (m)	11.7	15.5
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FT 2037 FRI Midday
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	12	44	4	13	11	55	581	4	11	554	87
Future Volume (Veh/h)	101	12	44	4	13	11	55	581	4	11	554	87
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	110	13	48	4	14	12	60	632	4	12	602	95
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh									2			
Upstream signal (m)	240											
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	1444	1430	650	1434	1475	634	697			636		
vC1, stage 1 conf vol	674	674		754	754							
vC2, stage 2 conf vol	771	756		680	721							
vCu, unblocked vol	1436	1419	650	1425	1471	508	697			510		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.2		
p0 queue free %	59	96	90	98	95	97	93			99		
cM capacity (veh/h)	271	297	473	251	277	476	821			930		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	171	30	60	636	12	697						
Volume Left	110	4	60	0	12	0						
Volume Right	48	12	0	4	0	95						
cSH	310	327	821	1700	930	1700						
Volume to Capacity	0.55	0.09	0.07	0.37	0.01	0.41						
Queue Length 95th (m)	25.0	2.4	1.9	0.0	0.3	0.0						
Control Delay (s)	29.9	17.1	9.7	0.0	8.9	0.0						
Lane LOS	D	C	A		A							
Approach Delay (s)	29.9	17.1	0.8		0.2							
Approach LOS	D	C										
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			63.4%	ICU Level of Service				B				
Analysis Period (min)			15									

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (m)	32.7	12.6	17.4	2.5	12.5
Average Queue (m)	20.2	6.1	8.1	0.7	2.6
95th Queue (m)	37.0	15.4	20.5	4.4	30.2
Link Distance (m)	219.8	78.5		115.7	115.7
Upstream Blk Time (%)					0
Queuing Penalty (veh)					0
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

HCM Signalized Intersection Capacity Analysis

FT 2037 FRI PM Peak

1: Ninth Line & Main St /Main St

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	744	391	106	664	68	314	263	102	81	198	261
Future Volume (vph)	305	744	391	106	664	68	314	263	102	81	198	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1615	1805	3528		1805	1863	1615	1805	1881	1615
Flt Permitted	0.24	1.00	1.00	0.08	1.00		0.44	1.00	1.00	0.47	1.00	1.00
Satd. Flow (perm)	454	1900	1615	159	3528		834	1863	1615	887	1881	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	809	425	115	722	74	341	286	111	88	215	284
RTOR Reduction (vph)	0	0	174	0	7	0	0	0	77	0	0	164
Lane Group Flow (vph)	332	809	251	115	789	0	341	286	34	88	215	120
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	56.0	48.0	48.0	55.6	47.8		48.8	37.0	37.0	40.6	32.8	32.8
Effective Green, g (s)	56.0	48.0	48.0	55.6	47.8		48.8	37.0	37.0	40.6	32.8	32.8
Actuated g/C Ratio	0.46	0.40	0.40	0.46	0.40		0.40	0.31	0.31	0.34	0.27	0.27
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	300	756	642	179	1398		434	571	495	357	511	439
v/s Ratio Prot	c0.07	0.43		0.04	0.22		c0.08	0.15		0.02	0.11	
v/s Ratio Perm	c0.44		0.16	0.25			c0.24		0.02	0.07		0.07
v/c Ratio	1.11	1.07	0.39	0.64	0.56		0.79	0.50	0.07	0.25	0.42	0.27
Uniform Delay, d1	29.7	36.3	25.9	27.2	28.3		29.9	34.2	29.6	28.1	36.1	34.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	83.7	53.1	0.4	7.7	0.5		9.1	3.1	0.3	0.4	2.5	1.5
Delay (s)	113.4	89.4	26.3	34.8	28.8		39.0	37.4	29.9	28.5	38.6	36.1
Level of Service	F	F	C	C	C		D	D	C	C	D	D
Approach Delay (s)		77.4			29.6			37.0			35.9	
Approach LOS		E			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			51.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			120.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			89.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.9	109.6	57.2	36.5	72.9	64.3	68.2	54.6	17.3	22.6	53.8	37.0
Average Queue (m)	52.9	106.2	32.0	22.7	55.7	48.0	50.9	40.6	10.3	14.2	34.1	23.2
95th Queue (m)	72.0	119.6	63.3	45.8	81.1	74.6	83.1	72.1	19.9	26.1	61.6	42.8
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		32	0									
Queuing Penalty (veh)		224	1									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	37	48		0	13		1	0				
Queuing Penalty (veh)	279	145		0	14		1	0				

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2037 FRI PM Peak

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	1263	25	39	1076	75	18	3	35	100	0	56
Future Volume (vph)	72	1263	25	39	1076	75	18	3	35	100	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.92			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3600		1805	3532			1712			1752	
Flt Permitted	0.19	1.00		0.16	1.00			0.87			0.79	
Satd. Flow (perm)	365	3600		298	3532			1515			1427	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	1373	27	42	1170	82	20	3	38	109	0	61
RTOR Reduction (vph)	0	1	0	0	3	0	0	32	0	0	23	0
Lane Group Flow (vph)	78	1399	0	42	1249	0	0	29	0	0	147	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	73.1	73.1		73.1	73.1			15.8			15.8	
Effective Green, g (s)	73.1	73.1		73.1	73.1			15.8			15.8	
Actuated g/C Ratio	0.72	0.72		0.72	0.72			0.16			0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	264	2608		215	2558			237			223	
v/s Ratio Prot		c0.39			0.35							
v/s Ratio Perm	0.21			0.14				0.02			c0.10	
v/c Ratio	0.30	0.54		0.20	0.49			0.12			0.66	
Uniform Delay, d1	4.9	6.3		4.5	5.9			36.6			40.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.8	0.8		2.0	0.7			0.2			7.1	
Delay (s)	7.7	7.1		6.5	6.6			36.8			47.2	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		7.1			6.6			36.8			47.2	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			9.8			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			100.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			82.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	67.3	151.7	151.6	25.1	64.8	66.3	20.8	41.9
Average Queue (m)	29.6	140.6	130.2	10.3	41.5	44.1	12.5	30.3
95th Queue (m)	84.5	191.2	199.7	29.9	79.3	78.1	24.8	49.4
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		56	19		0	0	2	1
Queuing Penalty (veh)		0	0		0	0	0	1
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		57			7			
Queuing Penalty (veh)		41			3			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2037 FRI PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	6	78	13	6	49
Future Volume (Veh/h)	12	6	78	13	6	49
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	7	85	14	7	53
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	159	92			99	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	159	92			99	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	828	965			1494	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	99	60			
Volume Left	13	0	7			
Volume Right	7	14	0			
cSH	872	1700	1494			
Volume to Capacity	0.02	0.06	0.00			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.2	0.0	0.9			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	0.9			
Approach LOS	A					
Intersection Summary						
Average Delay		1.3				
Intersection Capacity Utilization		17.6%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	7.8	1.8
Average Queue (m)	3.7	0.4
95th Queue (m)	10.6	3.2
Link Distance (m)	45.0	9.1
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FT 2037 FRI PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	7	72	12	7	43
Future Volume (Veh/h)	12	7	72	12	7	43
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	8	78	13	8	47
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	148	84			91	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	148	84			91	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	845	980			1517	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	21	91	55			
Volume Left	13	0	8			
Volume Right	8	13	0			
cSH	892	1700	1517			
Volume to Capacity	0.02	0.05	0.01			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.1	0.0	1.1			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.1			
Approach LOS	A					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			18.2%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 4: Winona Dr & Northern Site Entrance

Movement	WB
Directions Served	LR
Maximum Queue (m)	8.7
Average Queue (m)	5.1
95th Queue (m)	12.1
Link Distance (m)	41.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2037 FRI PM Peak
11-25-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	90	22	28	51	27	52
Future Volume (Veh/h)	90	22	28	51	27	52
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	98	24	30	55	29	57
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			122		225	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			122		225	110
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	94
cM capacity (veh/h)			1478		752	949
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	122	85	86			
Volume Left	0	30	29			
Volume Right	24	0	57			
cSH	1700	1478	872			
Volume to Capacity	0.07	0.02	0.10			
Queue Length 95th (m)	0.0	0.5	2.6			
Control Delay (s)	0.0	2.7	9.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.7	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			22.3%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	5.4	8.8
Average Queue (m)	1.6	8.0
95th Queue (m)	7.4	11.4
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FT 2037 FRI PM Peak
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	10	34	4	6	17	29	722	7	13	623	45
Future Volume (Veh/h)	75	10	34	4	6	17	29	722	7	13	623	45
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	11	37	4	7	18	32	785	8	14	677	49
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			TWLTL		
Median storage veh										2		
Upstream signal (m)							240					
pX, platoon unblocked	0.75	0.75		0.75	0.75	0.75				0.75		
vC, conflicting volume	1600	1586	702	1600	1607	789	726			793		
vC1, stage 1 conf vol	730	730		853	853							
vC2, stage 2 conf vol	870	857		748	754							
vCu, unblocked vol	1633	1615	702	1633	1642	557	726			562		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	65	96	92	98	97	96	96			98		
cM capacity (veh/h)	237	262	442	233	258	402	886			768		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	130	29	32	793	14	726						
Volume Left	82	4	32	0	14	0						
Volume Right	37	18	0	8	0	49						
cSH	276	326	886	1700	768	1700						
Volume to Capacity	0.47	0.09	0.04	0.47	0.02	0.43						
Queue Length 95th (m)	18.9	2.3	0.9	0.0	0.4	0.0						
Control Delay (s)	29.2	17.1	9.2	0.0	9.8	0.0						
Lane LOS	D	C	A		A							
Approach Delay (s)	29.2	17.1	0.4		0.2							
Approach LOS	D	C										
Intersection Summary												
Average Delay	2.7											
Intersection Capacity Utilization	58.5%			ICU Level of Service			B					
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	26.1	9.2	8.3	5.8
Average Queue (m)	16.8	4.5	3.3	1.8
95th Queue (m)	29.6	12.2	10.4	7.5
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

HCM Signalized Intersection Capacity Analysis

FT 2037 SAT PM Peak

1: Ninth Line & Main St /Main St

11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	604	303	65	562	62	220	217	70	57	173	223
Future Volume (vph)	236	604	303	65	562	62	220	217	70	57	173	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1881	1615	1805	3549		1787	1900	1583	1805	1881	1599
Flt Permitted	0.22	1.00	1.00	0.11	1.00		0.51	1.00	1.00	0.60	1.00	1.00
Satd. Flow (perm)	423	1881	1615	214	3549		966	1900	1583	1133	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	257	657	329	71	611	67	239	236	76	62	188	242
RTOR Reduction (vph)	0	0	160	0	7	0	0	0	48	0	0	164
Lane Group Flow (vph)	257	657	169	71	671	0	239	236	28	62	188	78
Heavy Vehicles (%)	0%	1%	0%	0%	0%	2%	1%	0%	2%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	51.4	40.6	40.6	42.3	35.5		53.7	43.1	43.1	44.5	37.9	37.9
Effective Green, g (s)	51.4	40.6	40.6	42.3	35.5		53.7	43.1	43.1	44.5	37.9	37.9
Actuated g/C Ratio	0.44	0.35	0.35	0.36	0.30		0.46	0.37	0.37	0.38	0.32	0.32
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	326	652	559	169	1075		525	699	582	468	608	517
v/s Ratio Prot	c0.08	c0.35		0.02	0.19		c0.05	0.12		0.01	0.10	
v/s Ratio Perm	0.27		0.10	0.13			c0.16		0.02	0.04		0.05
v/c Ratio	0.79	1.01	0.30	0.42	0.62		0.46	0.34	0.05	0.13	0.31	0.15
Uniform Delay, d1	23.4	38.2	27.9	29.3	35.1		20.2	26.7	23.8	23.3	29.8	28.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.9	37.1	0.3	1.7	1.1		0.6	1.3	0.2	0.1	1.3	0.6
Delay (s)	35.3	75.4	28.2	31.0	36.2		20.8	28.0	24.0	23.4	31.1	28.8
Level of Service	D	E	C	C	D		C	C	C	C	C	C
Approach Delay (s)		54.6			35.7			24.3			29.0	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			40.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			117.1			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			76.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	109.4	43.6	23.5	68.2	60.9	40.7	43.3	14.6	16.1	35.3	27.6
Average Queue (m)	47.7	104.1	24.4	11.6	53.8	44.3	29.3	27.6	6.9	9.2	24.8	16.4
95th Queue (m)	75.7	122.5	51.1	30.7	76.0	71.5	49.9	48.8	17.4	19.7	43.6	32.1
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		22	0									
Queuing Penalty (veh)		116	1									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	21	47			12							
Queuing Penalty (veh)	126	110			8							

HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2037 SAT PM Peak
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	940	23	37	795	65	15	1	33	74	0	42
Future Volume (vph)	60	940	23	37	795	65	15	1	33	74	0	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1805	3562		1805	3569			1700			1751	
Flt Permitted	0.29	1.00		0.26	1.00			0.89			0.78	
Satd. Flow (perm)	555	3562		486	3569			1534			1401	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1022	25	40	864	71	16	1	36	80	0	46
RTOR Reduction (vph)	0	1	0	0	4	0	0	31	0	0	24	0
Lane Group Flow (vph)	65	1046	0	40	931	0	0	22	0	0	102	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	79.2	79.2		79.2	79.2			13.3			13.3	
Effective Green, g (s)	79.2	79.2		79.2	79.2			13.3			13.3	
Actuated g/C Ratio	0.76	0.76		0.76	0.76			0.13			0.13	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	420	2699		368	2704			195			178	
v/s Ratio Prot		c0.29			0.26							
v/s Ratio Perm	0.12			0.08				0.01			c0.07	
v/c Ratio	0.15	0.39		0.11	0.34			0.11			0.57	
Uniform Delay, d1	3.5	4.3		3.3	4.1			40.4			42.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.8	0.4		0.6	0.3			0.3			4.4	
Delay (s)	4.3	4.8		3.9	4.5			40.6			47.3	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.7			4.5			40.6			47.3	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			7.8			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			104.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			70.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	50.0	114.0	82.4	17.8	39.6	44.0	17.4	31.1
Average Queue (m)	23.0	79.1	38.1	7.9	22.1	25.0	8.6	19.2
95th Queue (m)	67.5	144.4	110.5	23.3	46.0	49.8	19.5	36.6
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		2	1				1	0
Queuing Penalty (veh)		0	0				0	0
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		30			2			
Queuing Penalty (veh)		18			1			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2037 SAT PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	13	6	78	13	6	29
Future Volume (Veh/h)	13	6	78	13	6	29
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	7	85	14	7	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			81			
pX, platoon unblocked						
vC, conflicting volume	138	92			99	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	138	92			99	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	99			100	
cM capacity (veh/h)	851	965			1494	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	21	99	39			
Volume Left	14	0	7			
Volume Right	7	14	0			
cSH	886	1700	1494			
Volume to Capacity	0.02	0.06	0.00			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.2	0.0	1.4			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	1.4			
Approach LOS	A					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			16.7%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB
Directions Served	LR
Maximum Queue (m)	7.8
Average Queue (m)	3.4
95th Queue (m)	10.3
Link Distance (m)	45.0
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

HCM Unsignalized Intersection Capacity Analysis

4: Winona Dr & Northern Site Entrance

FT 2037 SAT PM Peak
11-25-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	6	71	13	7	23
Future Volume (Veh/h)	12	6	71	13	7	23
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	7	77	14	8	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)			107			
pX, platoon unblocked						
vC, conflicting volume	125	84			91	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	125	84			91	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	870	981			1517	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	91	33			
Volume Left	13	0	8			
Volume Right	7	14	0			
cSH	906	1700	1517			
Volume to Capacity	0.02	0.05	0.01			
Queue Length 95th (m)	0.5	0.0	0.1			
Control Delay (s)	9.1	0.0	1.8			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.8			
Approach LOS	A					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			17.3%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 4: Winona Dr & Northern Site Entrance

Movement	WB
Directions Served	LR
Maximum Queue (m)	7.8
Average Queue (m)	3.9
95th Queue (m)	11.0
Link Distance (m)	41.9
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2037 SAT PM Peak
11-25-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	66	9	22	34	26	51
Future Volume (Veh/h)	66	9	22	34	26	51
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	10	24	37	28	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			82		162	77
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			82		162	77
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		97	94
cM capacity (veh/h)			1528		820	990
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	82	61	83			
Volume Left	0	24	28			
Volume Right	10	0	55			
cSH	1700	1528	925			
Volume to Capacity	0.05	0.02	0.09			
Queue Length 95th (m)	0.0	0.4	2.4			
Control Delay (s)	0.0	3.0	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.0	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay		4.2				
Intersection Capacity Utilization		20.9%		ICU Level of Service		A
Analysis Period (min)		15				

Intersection: 5: Winona Dr & Rupert Ave

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (m)	2.7	12.1
Average Queue (m)	0.7	8.7
95th Queue (m)	4.7	13.8
Link Distance (m)	219.8	65.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

HCM Unsignalized Intersection Capacity Analysis

6: Ninth Line & Rupert Ave

FT 2037 SAT PM Peak
11-25-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	7	30	3	2	4	17	448	7	4	450	32
Future Volume (Veh/h)	68	7	30	3	2	4	17	448	7	4	450	32
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	8	33	3	2	4	18	487	8	4	489	35
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								TWLTL			
Median storage veh									2			
Upstream signal (m)	240											
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	1042	1046	506	1061	1059	491	524			495		
vC1, stage 1 conf vol	514	514		527	527							
vC2, stage 2 conf vol	528	531		534	532							
vCu, unblocked vol	961	964	506	982	980	310	524			315		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	82	98	94	99	100	99	98			100		
cM capacity (veh/h)	419	414	570	390	405	623	1053			1066		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	115	9	18	495	4	524						
Volume Left	74	3	18	0	4	0						
Volume Right	33	4	0	8	0	35						
cSH	453	472	1053	1700	1066	1700						
Volume to Capacity	0.25	0.02	0.02	0.29	0.00	0.31						
Queue Length 95th (m)	8.0	0.5	0.4	0.0	0.1	0.0						
Control Delay (s)	15.6	12.8	8.5	0.0	8.4	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	15.6	12.8	0.3		0.1							
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.8											
Intersection Capacity Utilization	43.3%			ICU Level of Service					A			
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	17.4	6.2	5.4	2.5
Average Queue (m)	11.1	2.3	1.4	0.5
95th Queue (m)	18.8	8.6	6.8	3.8
Link Distance (m)	219.8	78.5		115.7
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)				
Queuing Penalty (veh)				

APPENDIX I

Background Development Trips Diagrams & Background Development TIS Excerpts

LEGEND

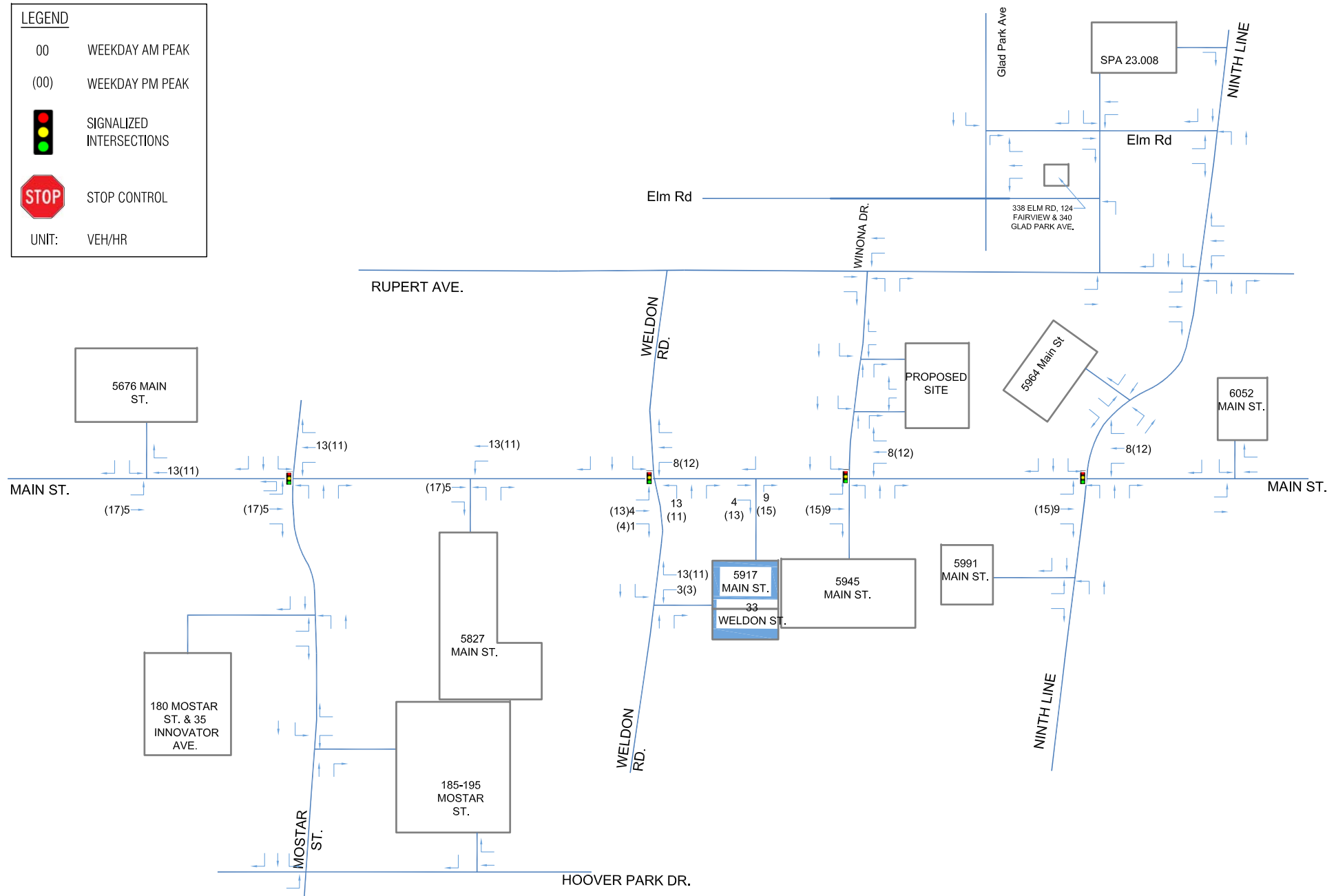
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



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Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
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www.nengineering.com

PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**5917 MAIN ST. & 33
WELDON AVE.
(BACKGROUND
DEVELOPMENT TRIPS)**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

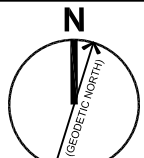
22-71

DATE: 20 JULY 2024

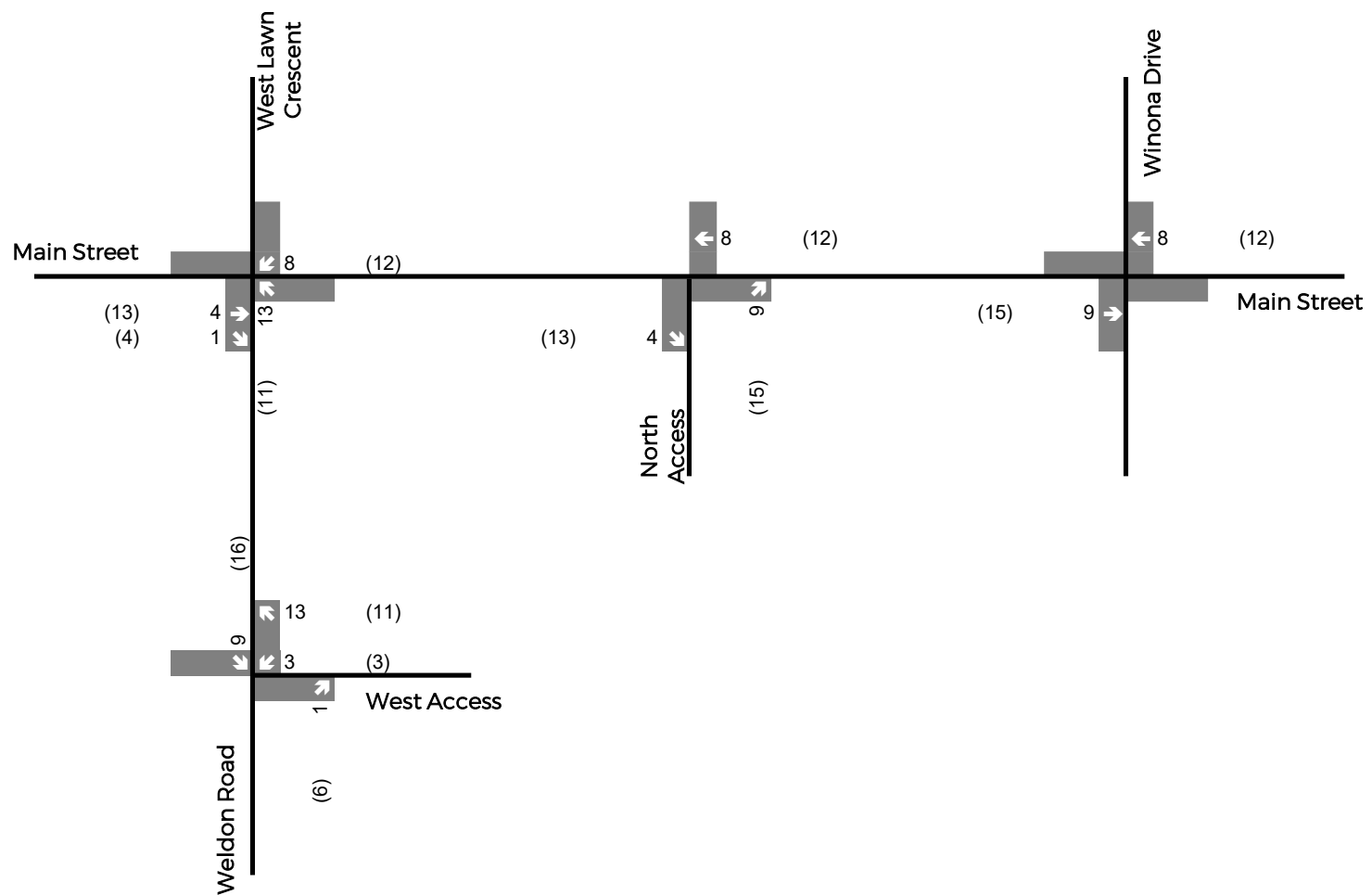
SCALE: NTS

DRAWING NO.:

FIG-B1



PROJECT NORTH



Legend

xx A.M. Peak Hour Traffic Volumes

(xx) P.M. Peak Hour Traffic Volumes

Figure 4.1

Site Generated Trips

LEGEND

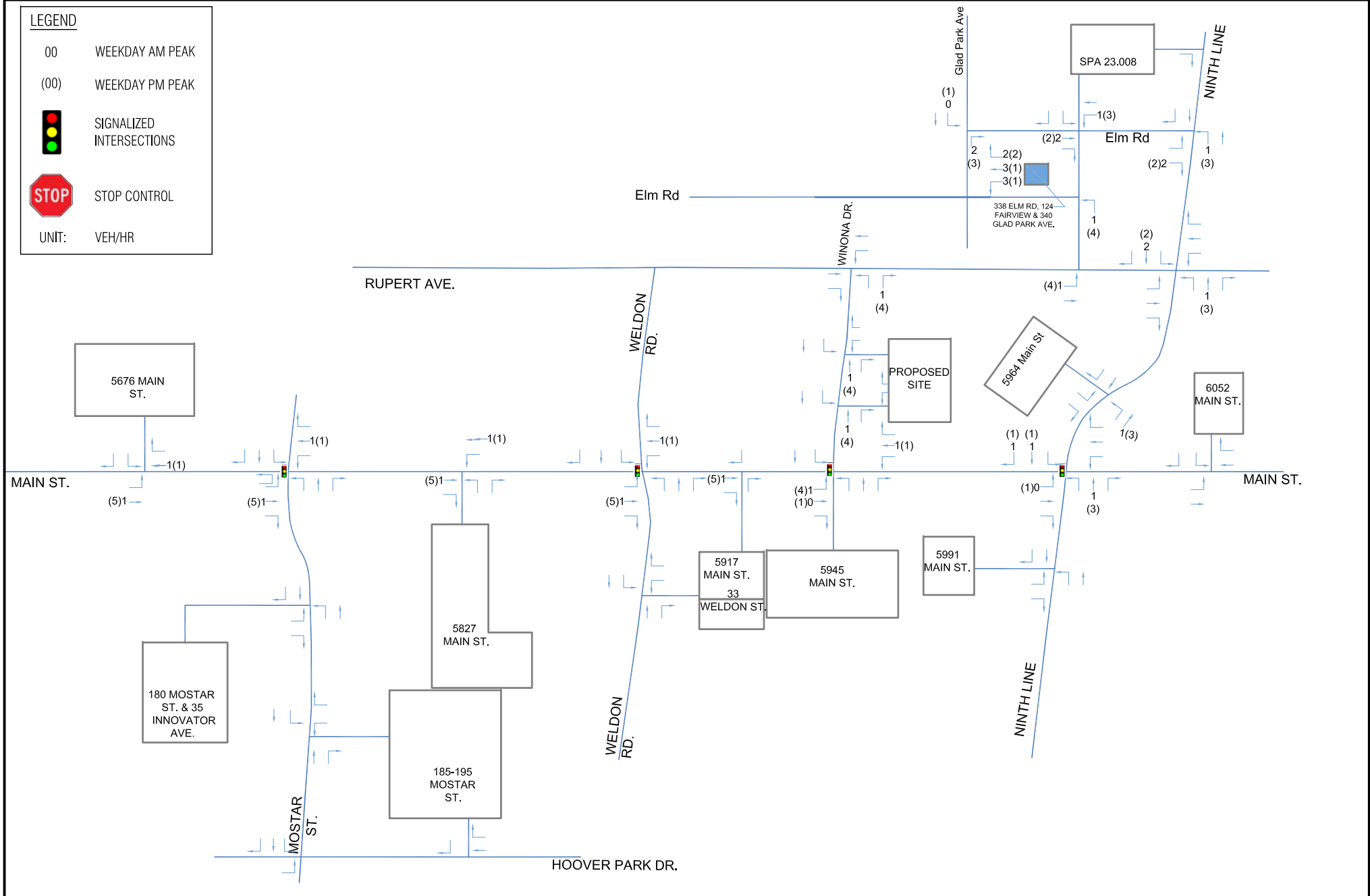
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



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www.nengineering.com

PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**124 FAIRVIEW AVE, 338 & 340
GLAD PARK AVE.
(BACKGROUND
DEVELOPMENT TRIPS)**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

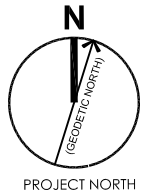
22-71

DATE: 20 JULY 2024

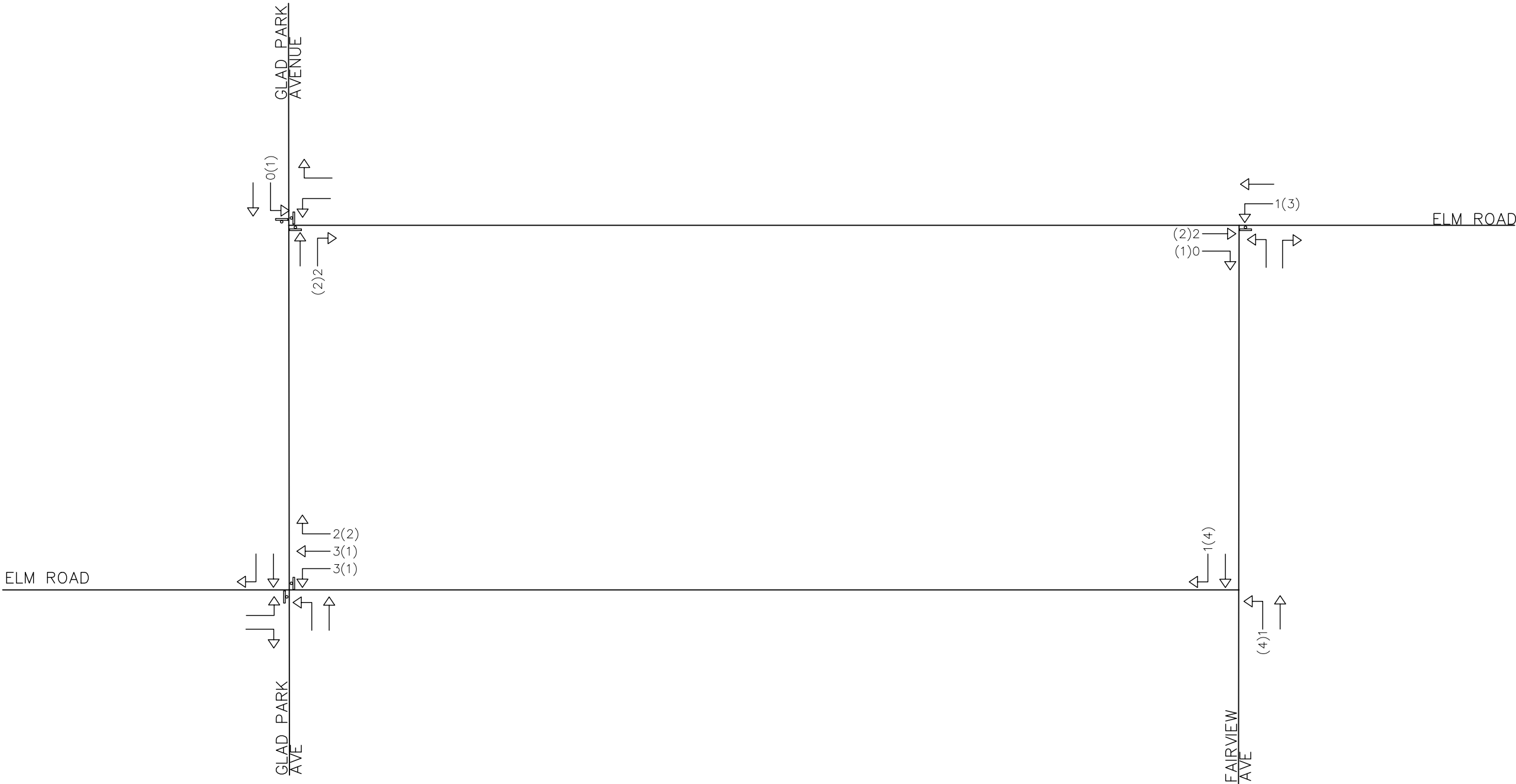
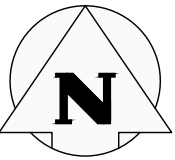
SCALE: NTS

DRAWING NO.:

FIG-B2



NOTE:
THIS FIGURE IS SCHEMATIC ONLY
AND IS NOT TO BE SCALED.



LEGEND:

 SIGNAL CONTROL

 STOP CONTROL

 YEILD CONTROL

 ROUND ABOUT

 WEEKDAY AM(PM)
TRAFFIC VOLUMES

124 FAIRVIW AVENUE & 338 & 340 GLAD
PARK AVENUE

TRIP ASSIGNMENT



211 YONGE STREET
SUITE 600
TORONTO, ON M5B 1M4
416-477-3392 T
WWW.CFCROZIER.CA

Drawn	I.A.	Design	I.A.	Project No.	2416-6617
Date	2023/03/16	Check	M.I.	Scale	N.T.S
				Dwg.	FIG 8

LEGEND

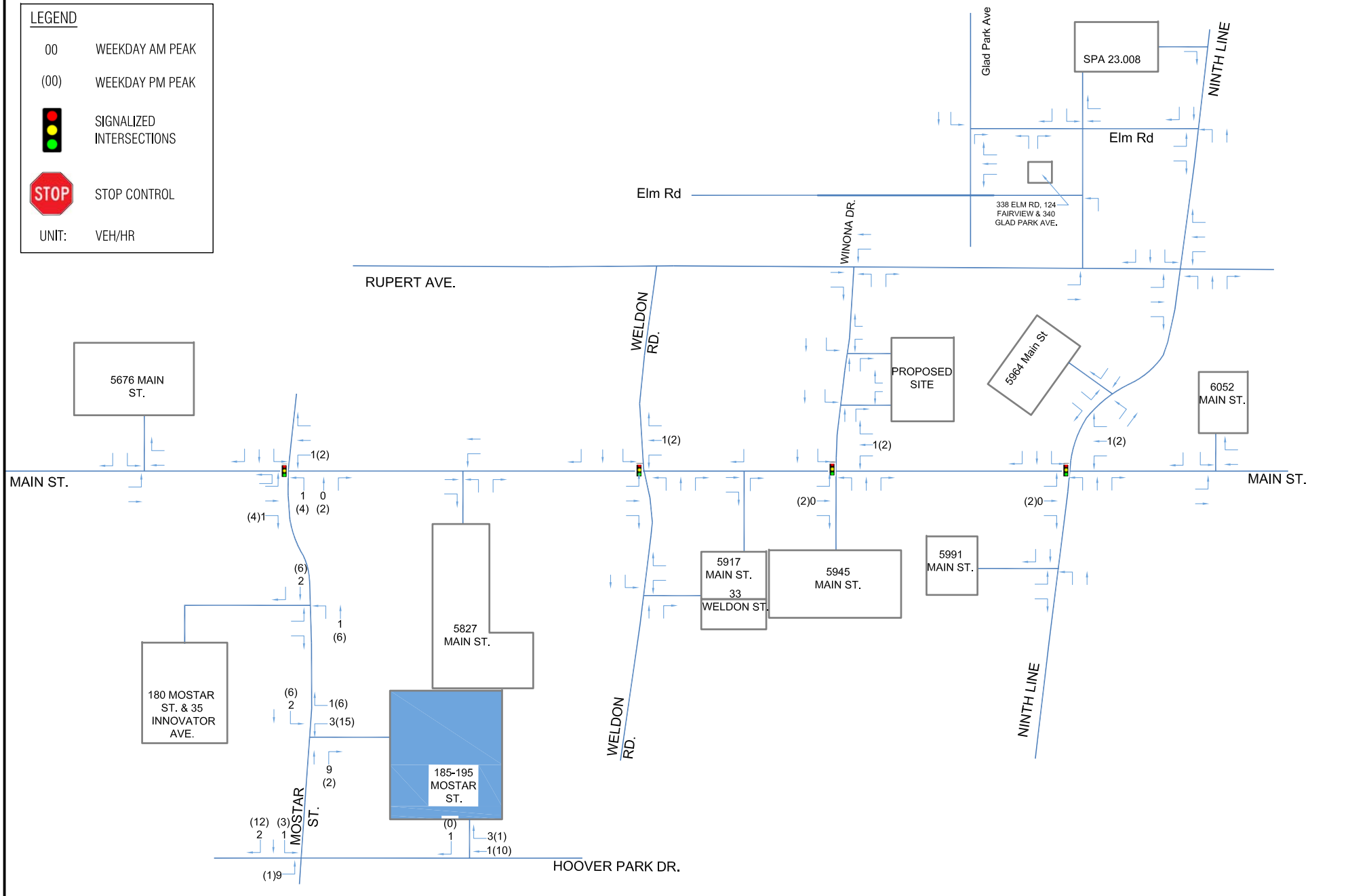
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**185-195 MOSTAR ST.
(BACKGROUND
DEVELOPMENT TRIPS)**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

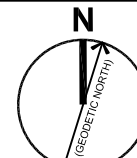
22-71

DATE: 20 JULY 2024

SCALE: NTS

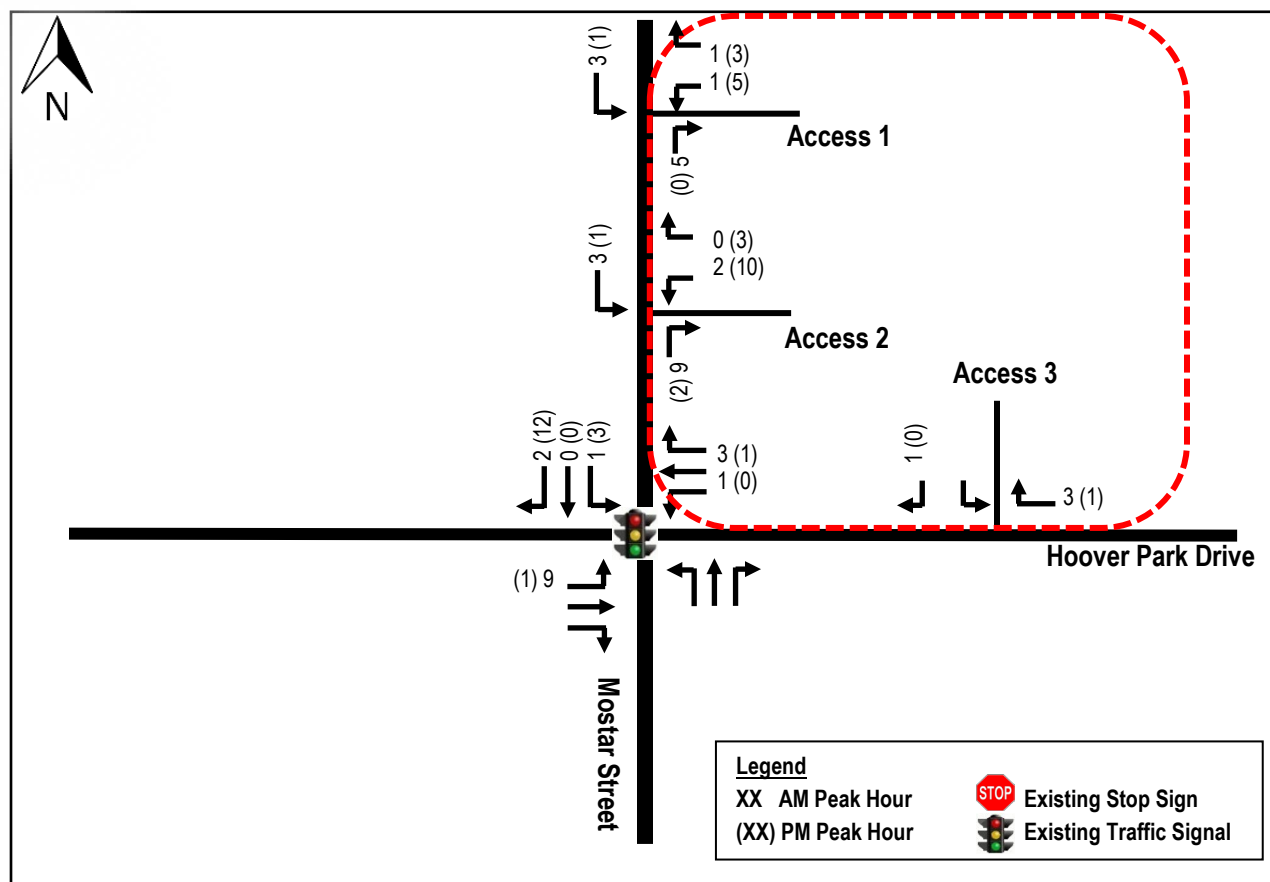
DRAWING NO.:

FIG-B3



PROJECT NORTH

Figure 8 – Site Traffic Volumes



5.0 FUTURE TOTAL TRAFFIC CONDITIONS

5.1. Future Total Traffic Assessment for Auto Mode

The future total traffic volumes for 2030 horizon are provided in **Figures 9**. These traffic volumes were analyzed using Synchro Version 11 software. The detailed calculations are provided in **Appendix F** and summarized in **Table 7**.

LEGEND

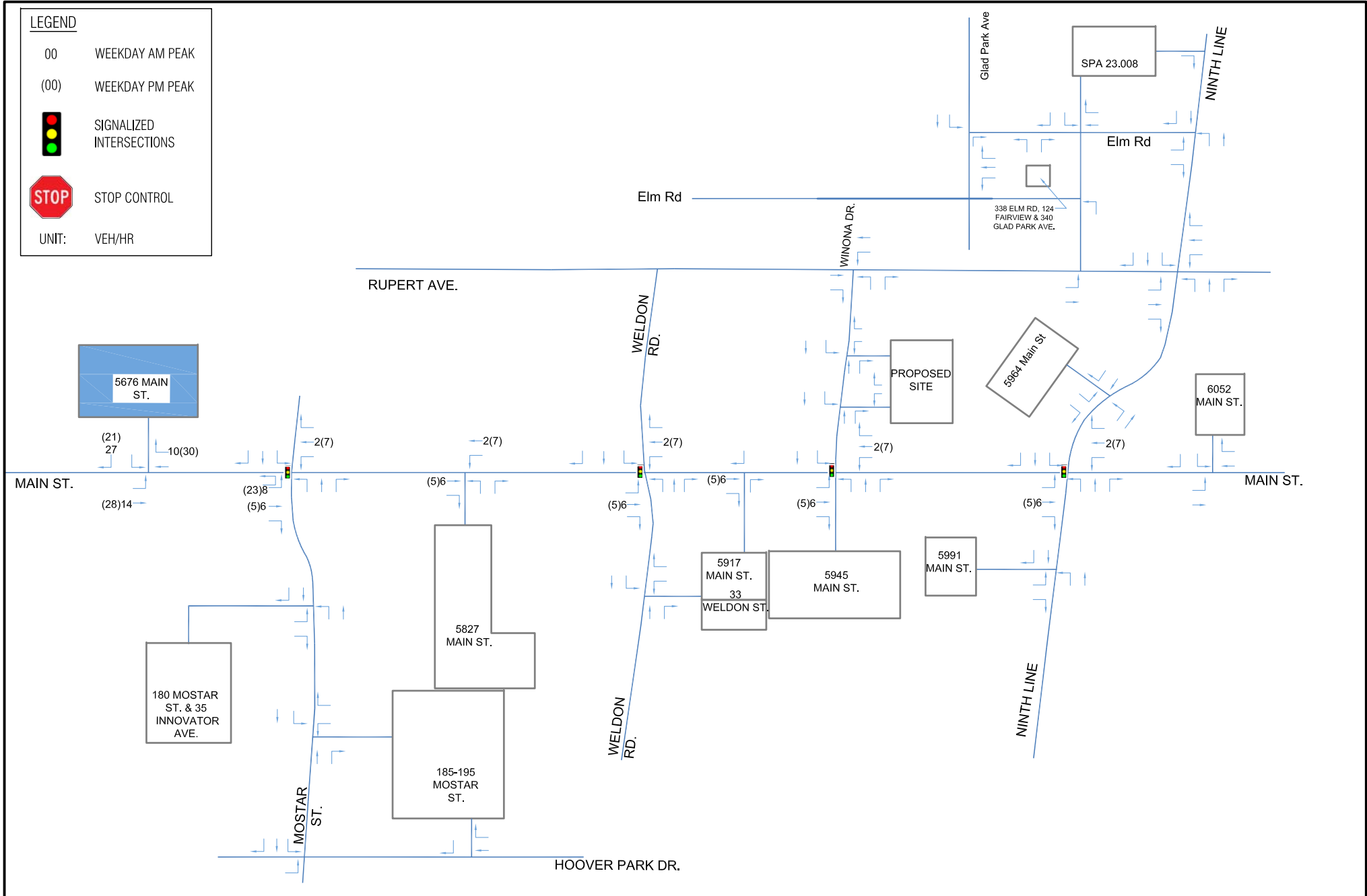
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**5676 MAIN ST.
(BACKGROUND
DEVELOPMENT TRIPS)**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

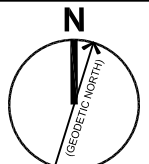
22-71

DATE: 20 JULY 2024

SCALE: NTS

DRAWING NO.:

FIG-B4



PROJECT NORTH

LEGEND

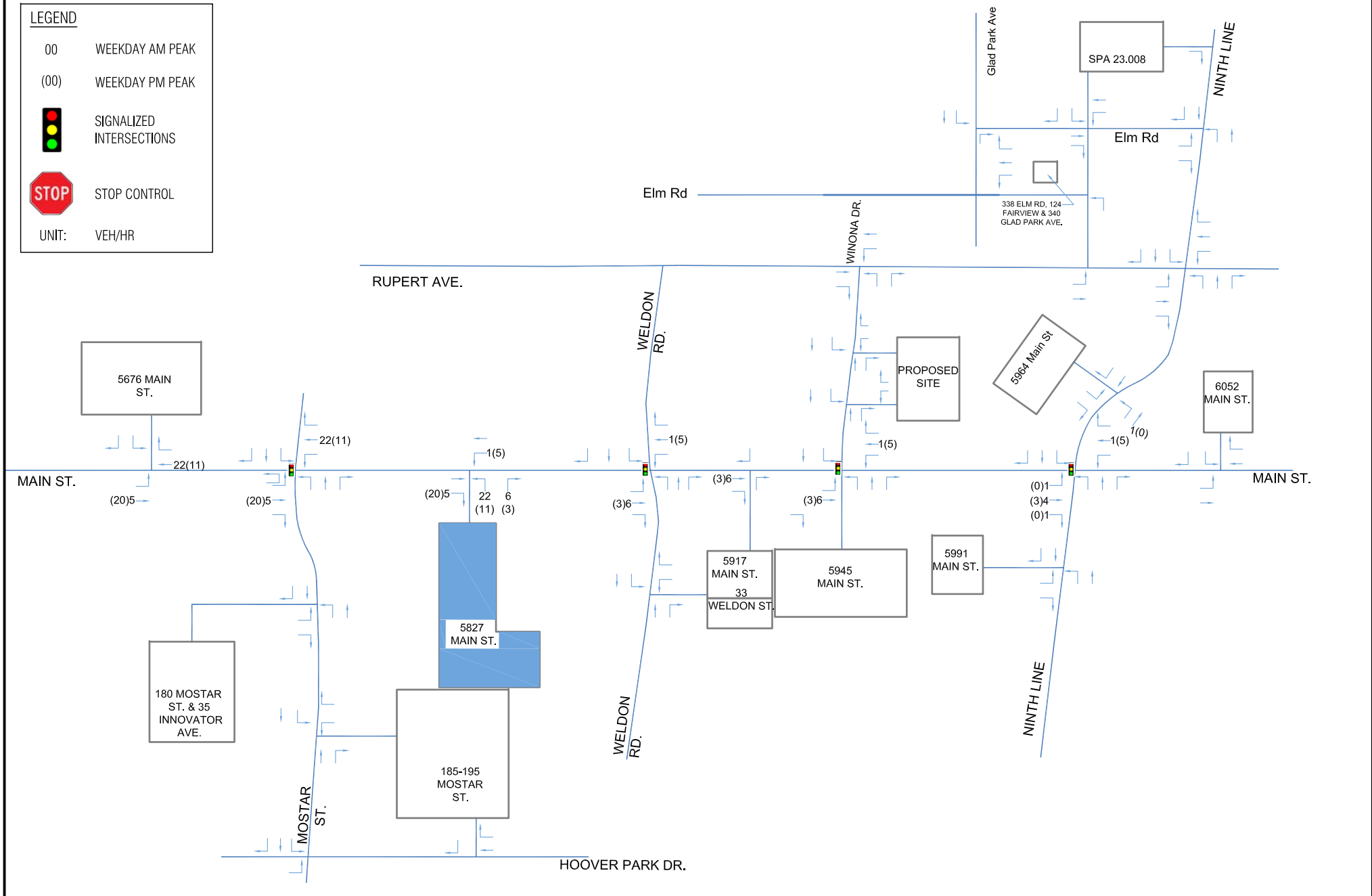
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



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www.nengineering.com

PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**5827 MAIN ST.
(BACKGROUND
DEVELOPMENT TRIPS)**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

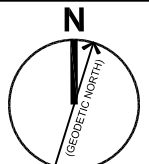
22-71

DATE: 20 JULY 2024

SCALE: NTS

DRAWING NO.:

FIG-B5



PROJECT NORTH

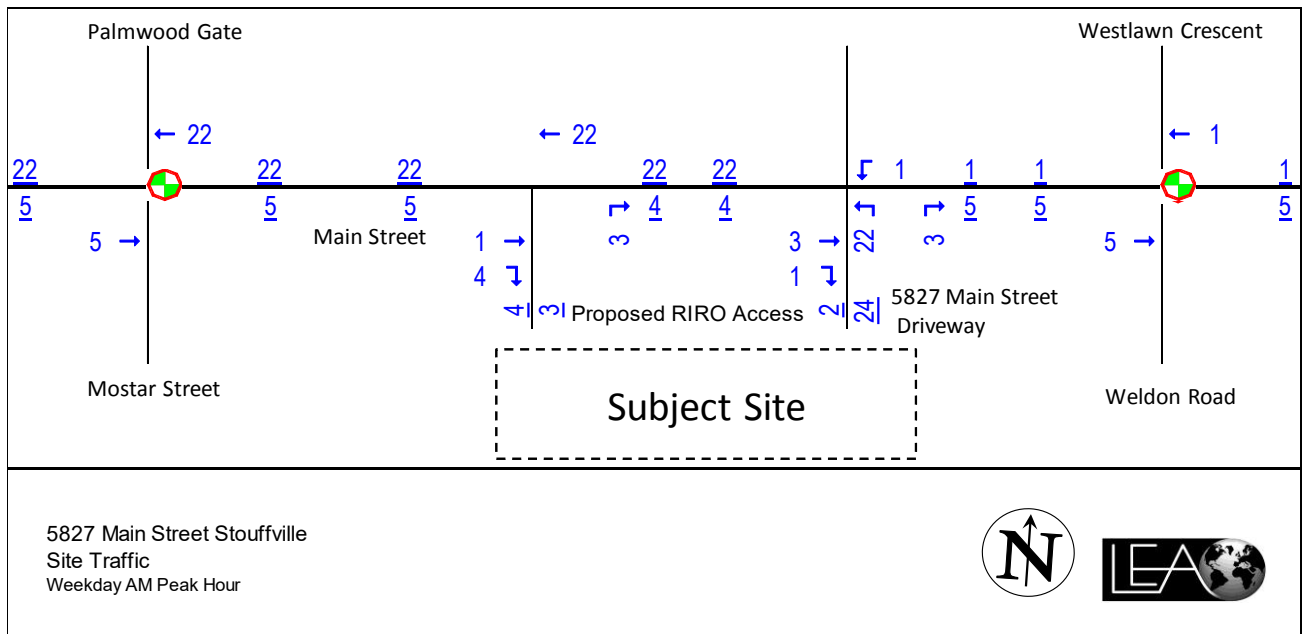


Figure 4.1: Site Traffic Volumes – a.m. Peak Hour

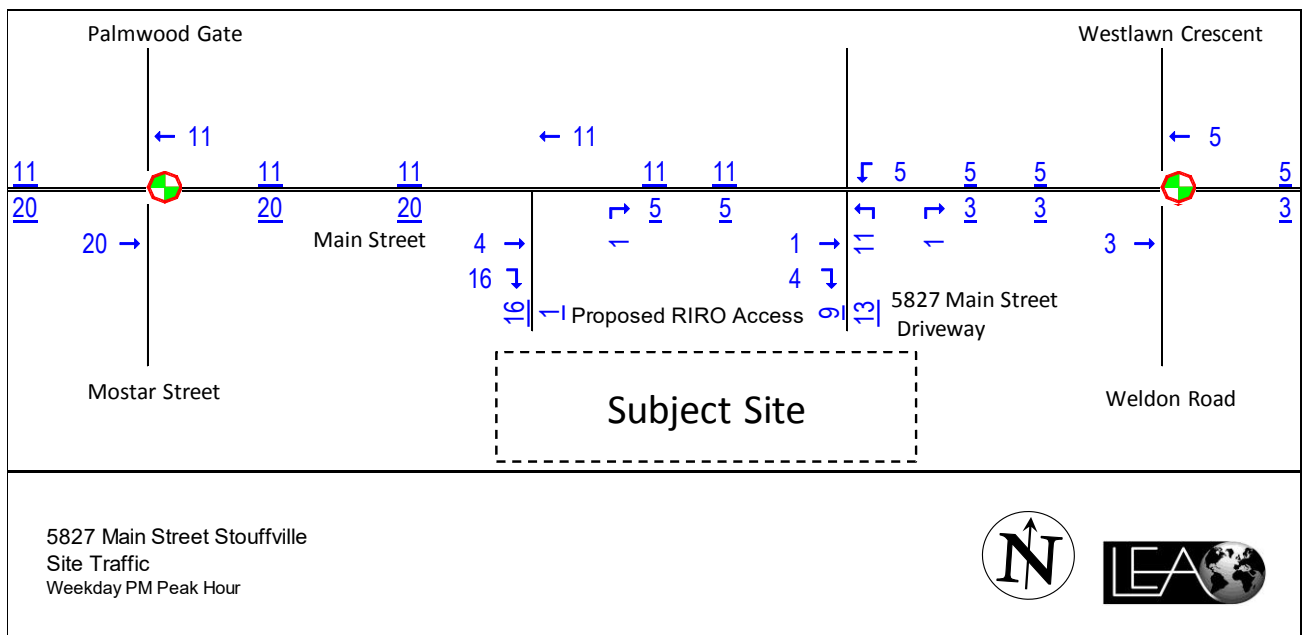


Figure 4.2: Site Traffic Volumes – p.m. Peak Hour

LEGEND

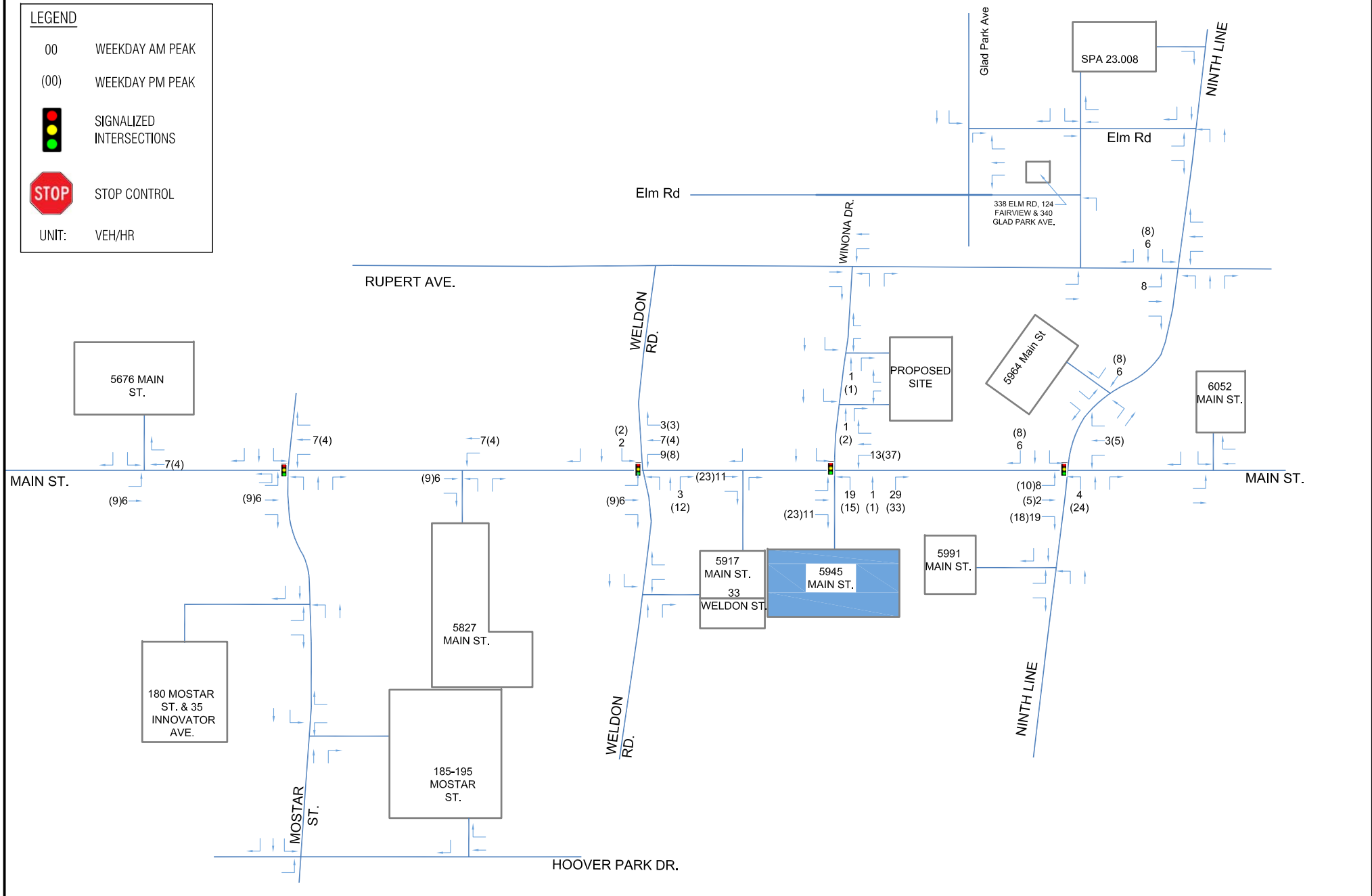
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**5945 MAIN ST.
(BACKGROUND
DEVELOPMENT TRIPS)**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

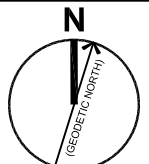
22-71

DATE: 20 JULY 2024

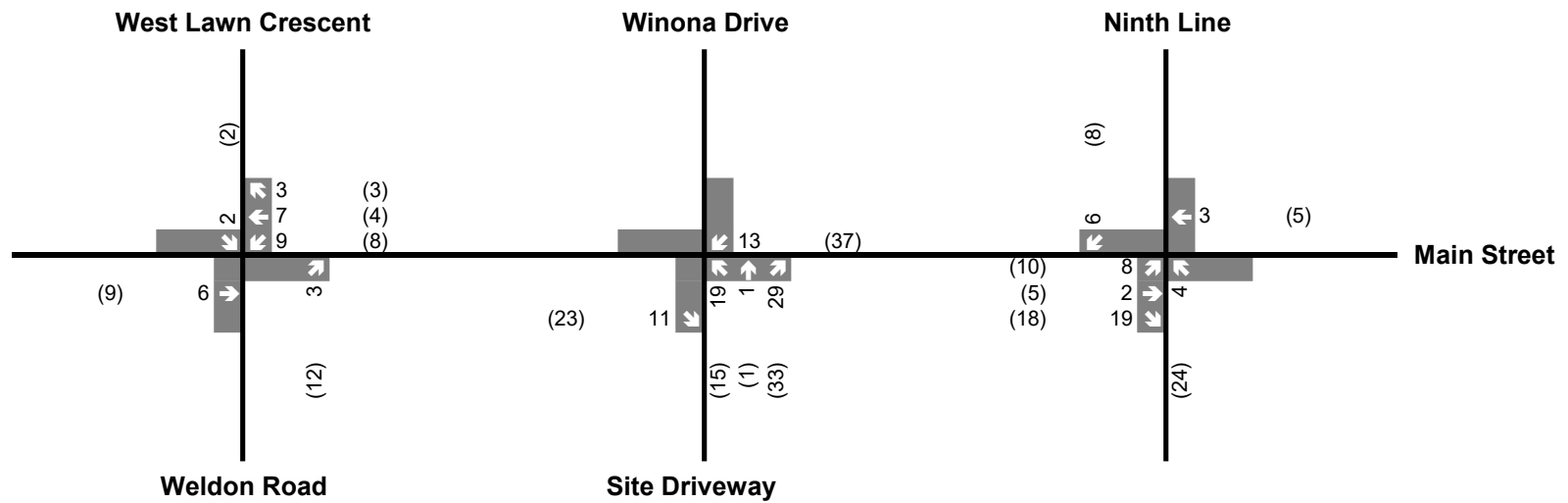
SCALE: NTS

DRAWING NO.:

FIG-B6



PROJECT NORTH



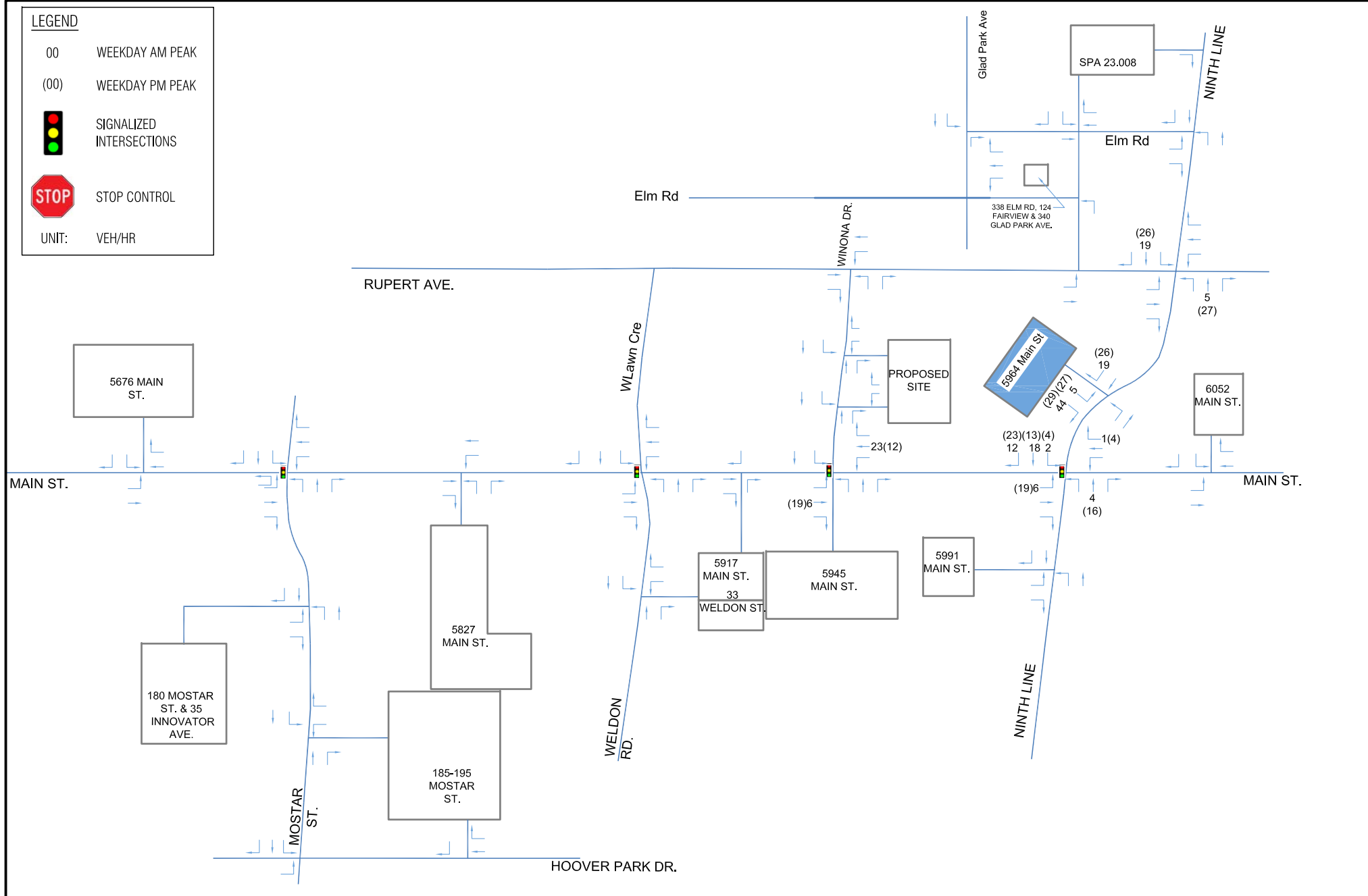
Legend

xx A.M. Peak Hour Traffic Volumes
 (xx) P.M. Peak Hour Traffic Volumes

Figure 4.1

Site Generated Traffic Volumes

00	WEEKDAY AM PEAK
(00)	WEEKDAY PM PEAK
	SIGNALIZED INTERSECTIONS
	STOP CONTROL
UNIT:	VEH/HR



PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON

**5964 MAIN ST.
(BACKGROUND
DEVELOPMENT TRIPS)**

22-71

FIG-B7

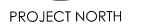
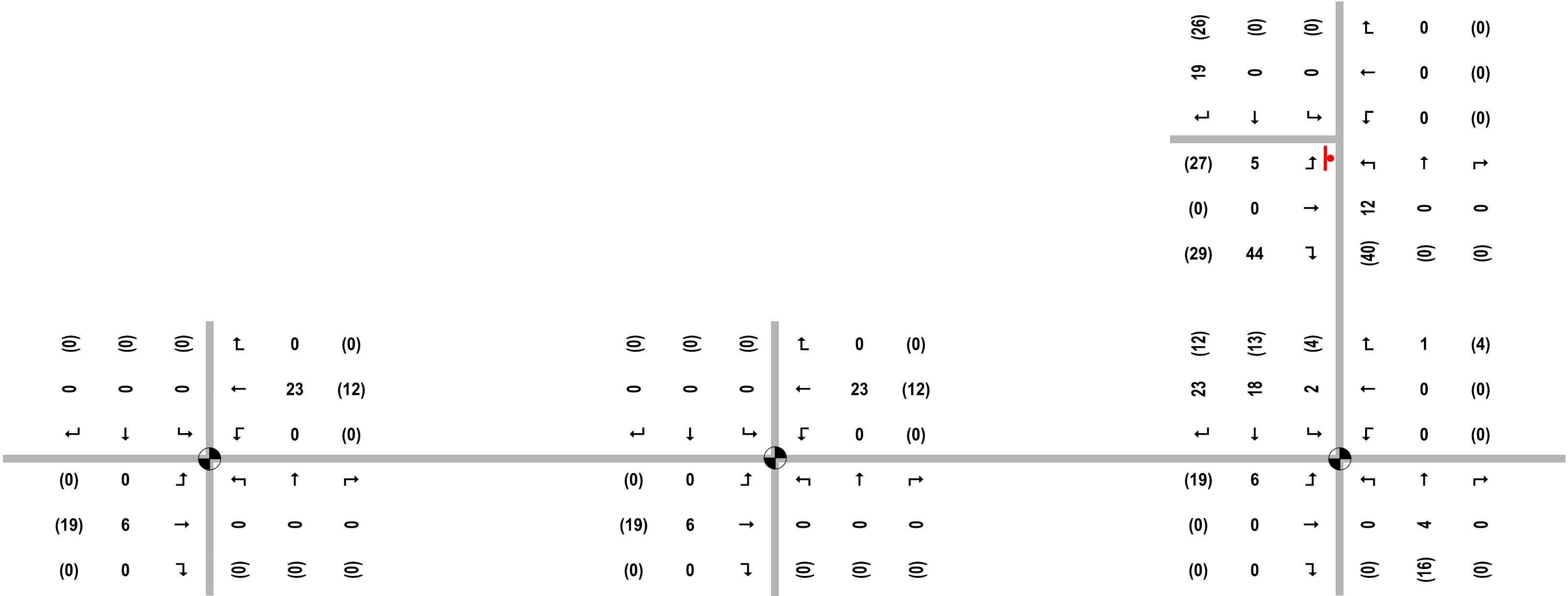


Figure 3-1: Site Traffic Volumes



LEGEND

Subject Site xx AM Peak Hour (xx) PM Peak Hour Existing Stop Sign Existing Traffic Signals

LEGEND

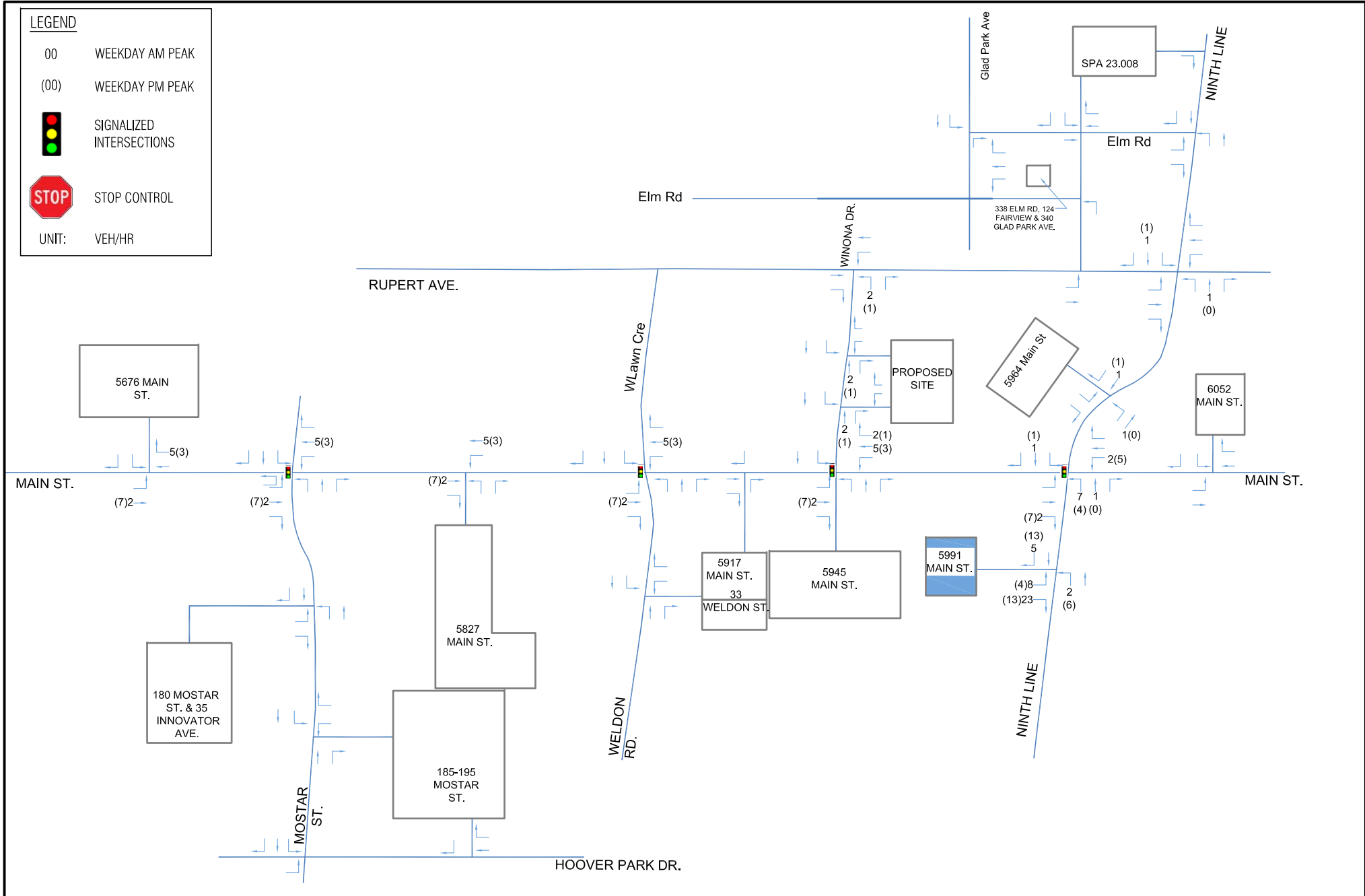
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



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PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**5991 MAIN ST.
(BACKGROUND
DEVELOPMENT TRIPS)**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

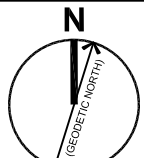
22-71

DATE: 20 JULY 2024

SCALE: NTS

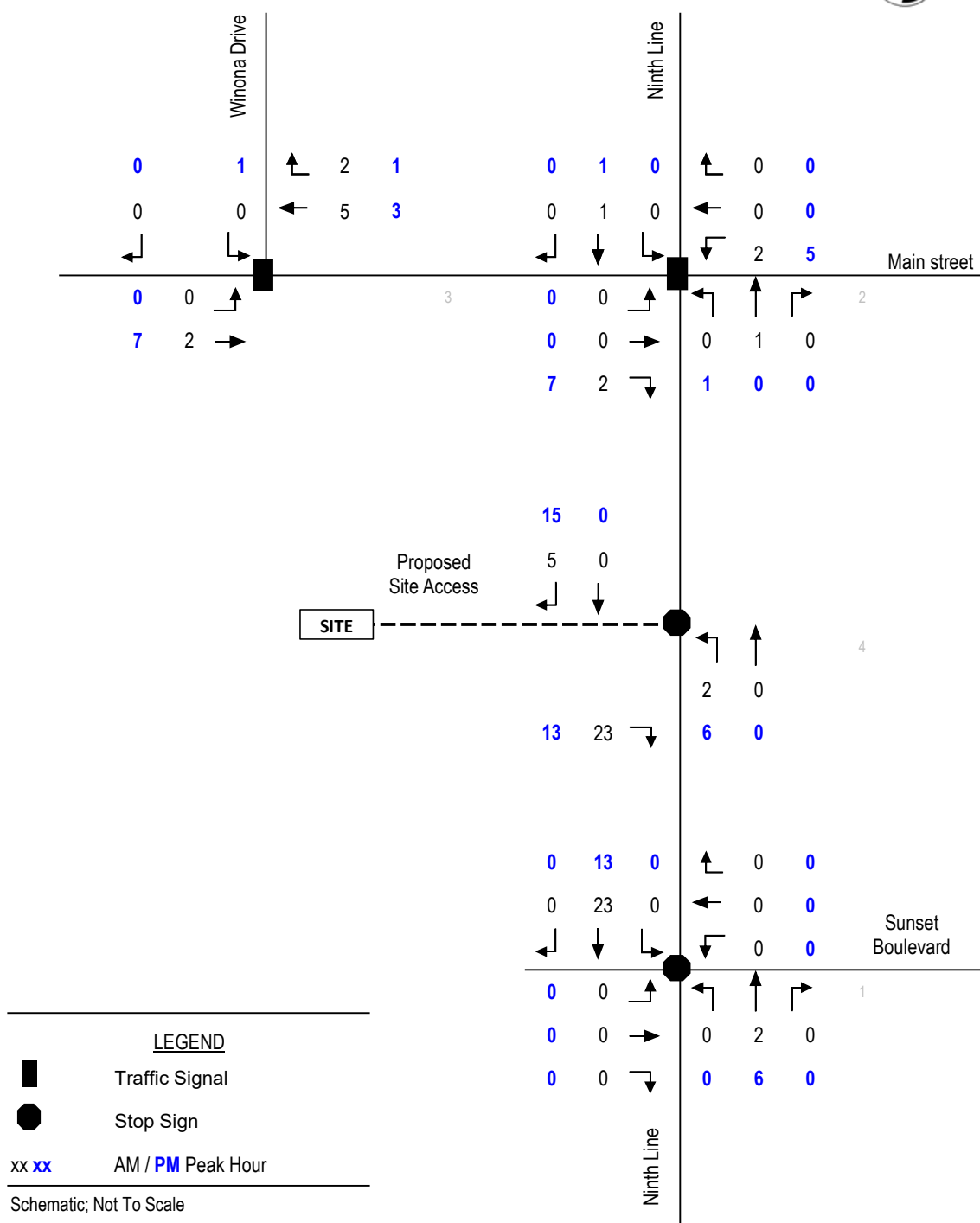
DRAWING NO.:

FIG-B8



PROJECT NORTH

Figure 7: Site Traffic Assignment, Weekday AM and PM Peak Hours



LEGEND

00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

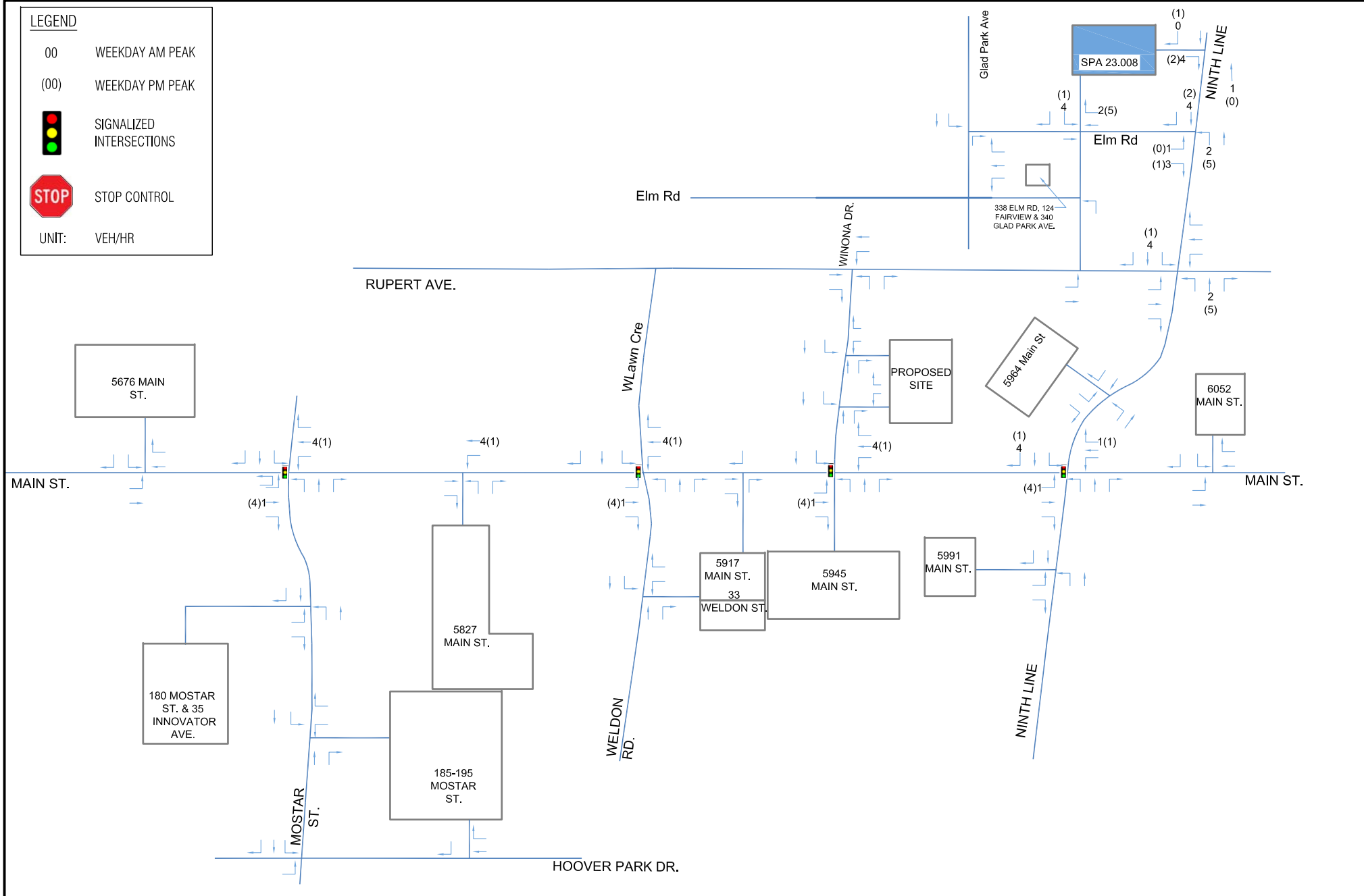


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



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www.nengineering.com

PROJECT:

**PROPOSED DEVELOPMENT
AT 27 WINONA DR,
STOUFFVILLE, ON**

DRAWING TITLE:

**NW OF ELM ROAD & NINTH LINE
(BACKGROUND DEVELOPMENT
TRIPS)**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

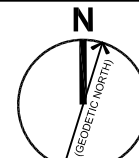
22-71

DATE: 20 JULY 2024

SCALE: NTS

DRAWING NO.:

FIG-B9



PROJECT NORTH

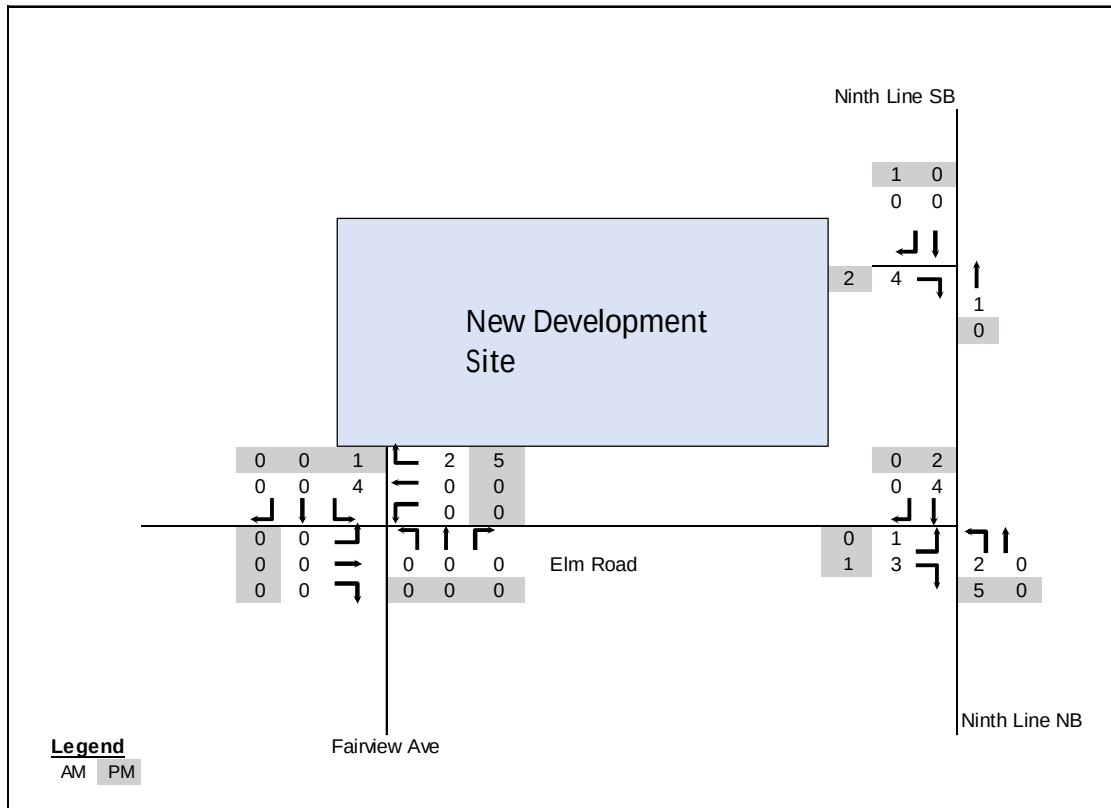


Figure 4-2: Development Generated Site Traffic

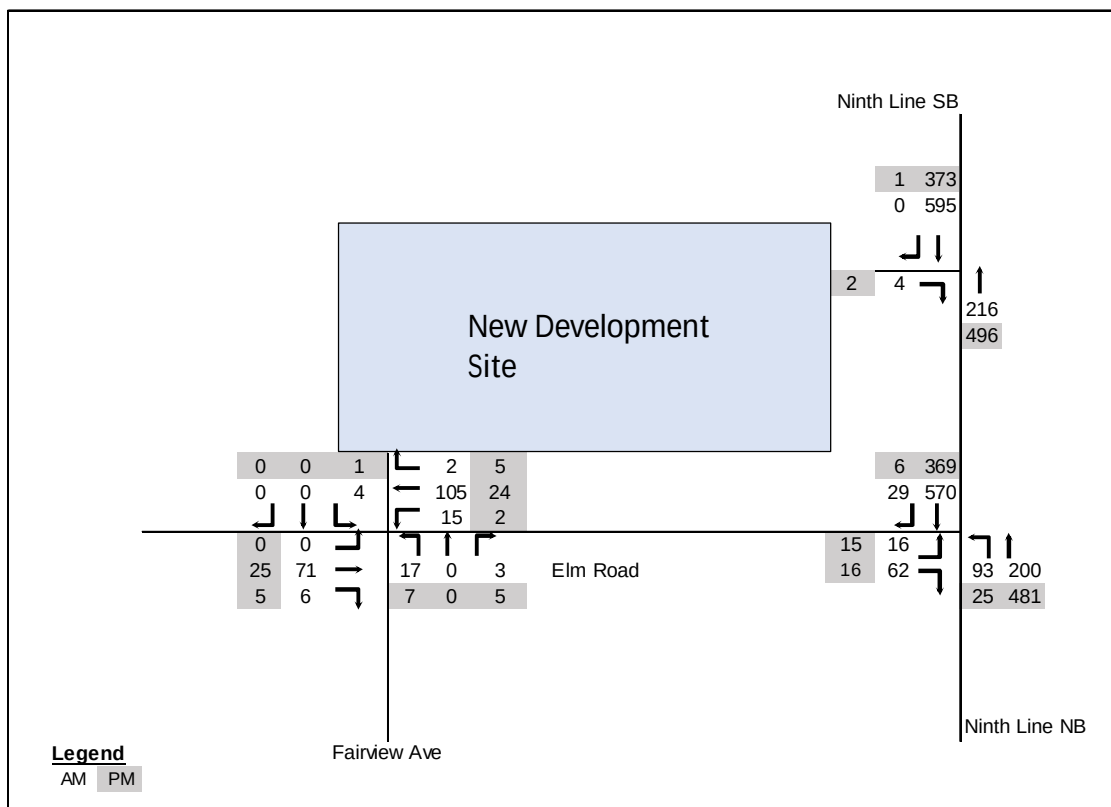


Figure 4-3: Future Total Scenario (Existing plus Development Traffic)

APPENDIX J

ITE Manual & Brampton City Worship Places Policy Excerpts

Land Use: 562

Mosque

Description

A mosque is a building in which public worship services are held. Church (Land Use 560) and synagogue (Land Use 561) are related uses.

Additional Data

Worship services are typically held on Fridays.

The sites were surveyed in the 2000s and 2010s in Ontario (CAN).

Source Numbers

730, 1009

Mosque (562)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Friday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. 1000 Sq. Ft. GFA: 7

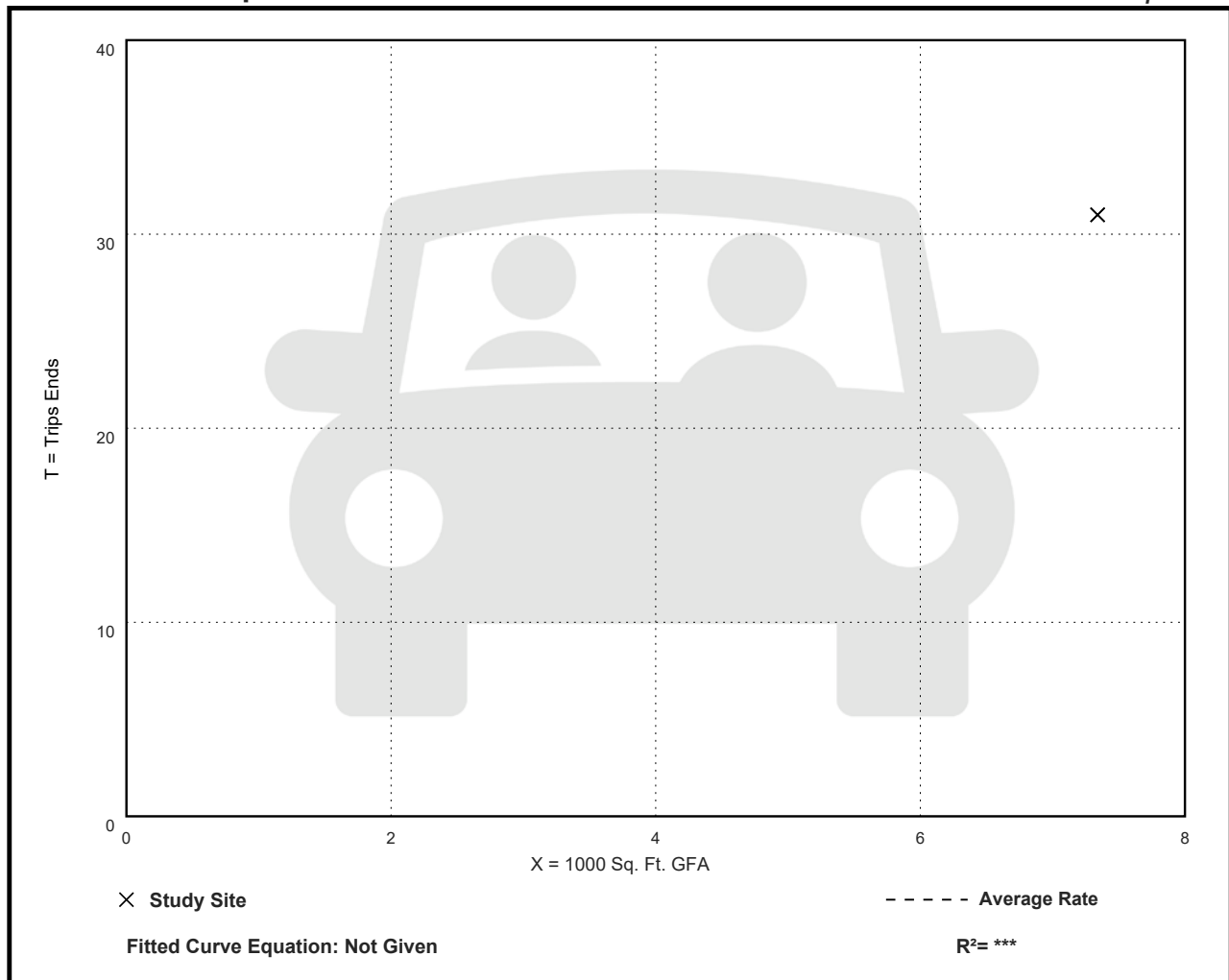
Directional Distribution: Not Available

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.22	4.22 - 4.22	***

Data Plot and Equation

Caution – Small Sample Size



Mosque (562)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Friday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. 1000 Sq. Ft. GFA: 7

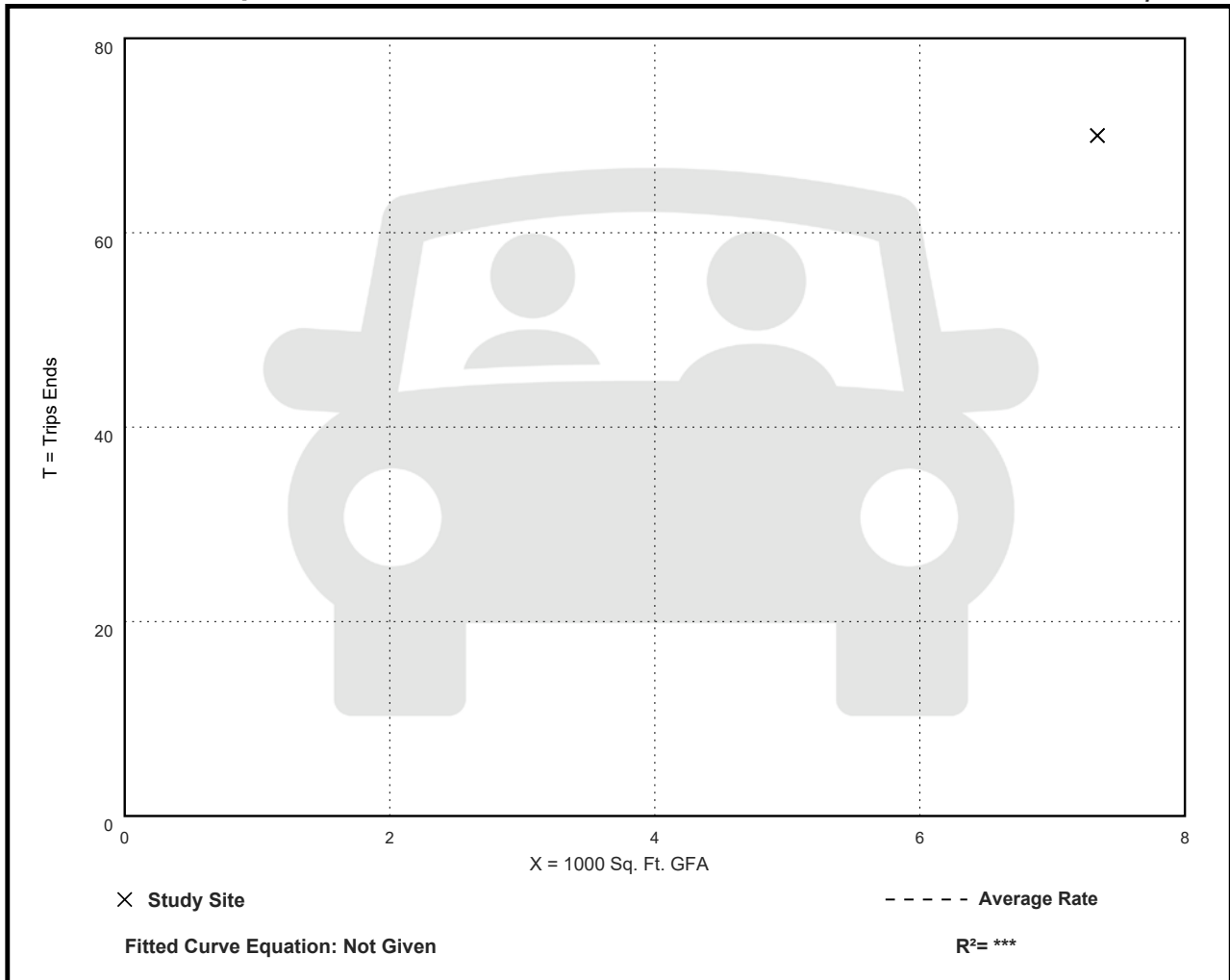
Directional Distribution: 67% entering, 33% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.54	9.54 - 9.54	***

Data Plot and Equation

Caution – Small Sample Size



Mosque (562)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Friday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 2

Avg. 1000 Sq. Ft. GFA: 6

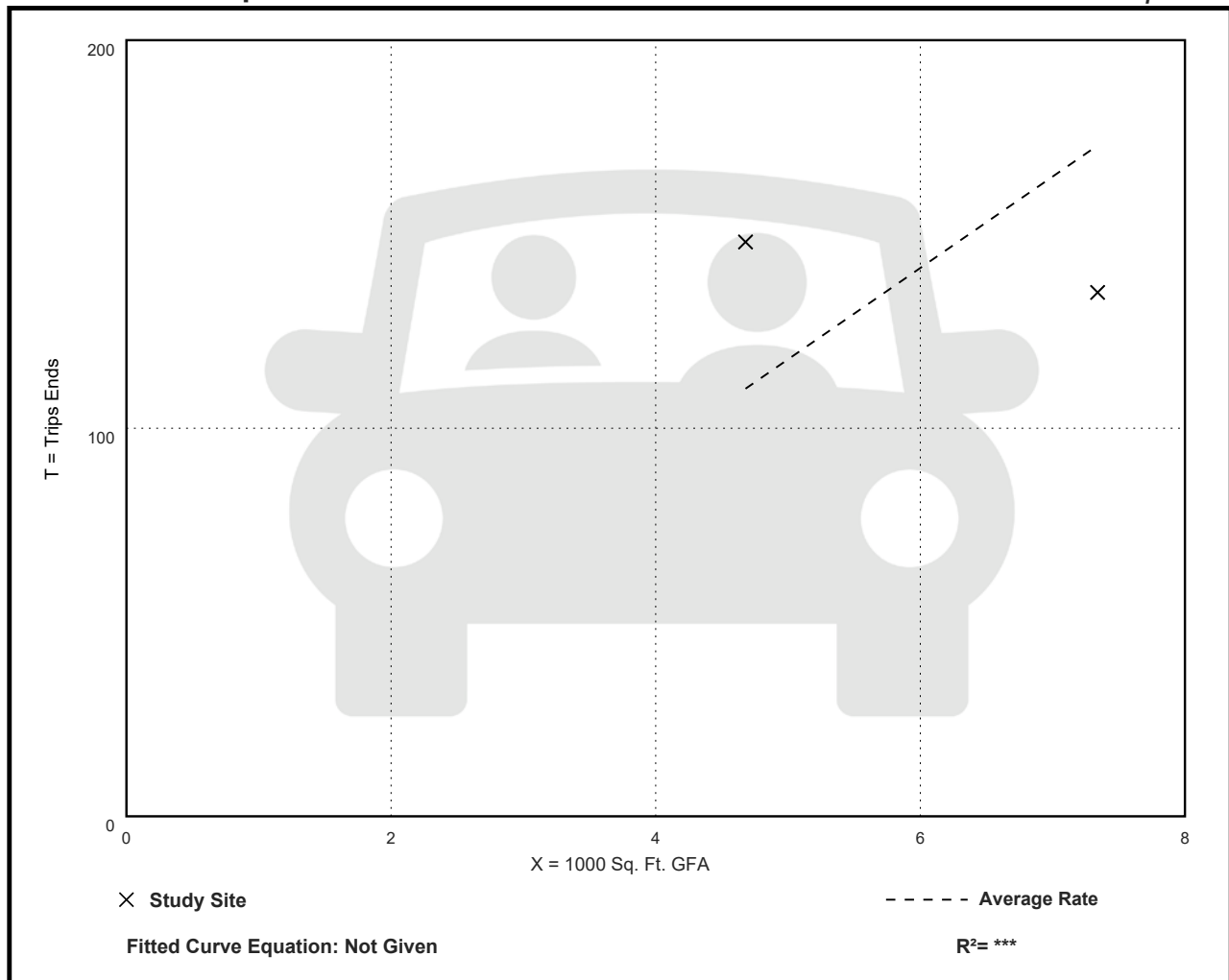
Directional Distribution: 43% entering, 57% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
23.55	18.39 - 31.63	***

Data Plot and Equation

Caution – Small Sample Size



Weekday Seats = N/A

Weekday Adj. Street Peak Hour = 1.32 per family member

Sunday Congregation = 1160

Sunday Seats = N/A

Sunday Adj. Street Peak Hour = 0.406 per family member

Sunday Pre-Service Trip Rate = 0.255 per family member

Sunday Post-Service Trip Rate = 0.406 per family member

Table A3.7 Scarborough Gospel Temple Trip Generation

		In	Out	Total	In%	Out%
PM Peak Hour	veh / h	80	39	119	67%	33%
Adj. Street Peak Hour	veh/ h	68	403	471	14%	86%
Sunday Pre-Service Peak Hour	veh / h	240	56	296	81%	19%
Sunday Post-Service Peak Hour	veh / h	68	403	471	14%	86%

The following trip generation rates were derived from the April 2006 Paradigm Transportation Solutions Limited Traffic Study entitled: *Ahmadiyya Muslim Mosque (Huronario Street, Brampton) Traffic Impact Study*. As part of the traffic study requirements, three proxy sites were surveyed to determine the transportation characteristics associated with Muslim Mosques. The trip generation rates have been based upon both the gross floor area and designated worship area.

Average Trip Generation Rate for Muslim Mosque Place of Worship

(Weekday AM and PM Peak)

GFA = 11,600 (1,078) Designated Worship Area = 6,150 (571)

(Weekday Midday Peak)

GFA = 11,399 (1059) Designated Worship Area = 5,029 (467)

Table A3.8 Mosque Trip Generation

	Trip Rate per 1,000 s.f. GFA	Trip Rate per 100 s.m. GFA	In%	Out%
Weekday AM Peak Hour*	1.55	1.67	44%	56%
Weekday Midday Peak Hour	19.45	20.93	74%	26%
Weekday PM Peak Hour*	3.62	3.90	52%	48%
	Trip Rate per 1,000 s.f. WAGFA	Trip Rate per 100 s.m. WAGFA	In%	Out%
Weekday AM Peak Hour*	2.93	3.15	44%	56%
Weekday Midday Peak Hour	44.08	47.47	74%	26%
Weekday PM Peak Hour*	6.83	7.36	52%	48%

Source: Adapted from Paradigm Transportation Solutions Limited Traffic Study for Ahmadiyya Muslim Mosque.

* Average is only based upon two sites due to available data.

APPENDIX K

Synchro Capacity Analysis Reports for (Optimized Signal Timing Adjustment)

Timings

FT 2037 FRI Midday (Optimized STP)

1: Ninth Line & Main St /Main St

11-26-2025

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	223	689	255	87	768	281	169	85	73	147	283
Future Volume (vph)	223	689	255	87	768	281	169	85	73	147	283
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	31.0	31.0	7.0	31.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.5	38.0	38.0	12.0	38.0	11.5	34.0	34.0	11.5	34.0	34.0
Total Split (s)	27.0	81.0	81.0	12.0	66.0	23.0	45.0	45.0	12.0	34.0	34.0
Total Split (%)	18.0%	54.0%	54.0%	8.0%	44.0%	15.3%	30.0%	30.0%	8.0%	22.7%	22.7%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	72.0	57.2	57.2	60.8	49.9	52.5	42.3	42.3	38.4	29.6	29.6
Actuated g/C Ratio	0.54	0.43	0.43	0.46	0.38	0.40	0.32	0.32	0.29	0.22	0.22
v/c Ratio	0.73	0.91	0.35	0.58	0.69	0.63	0.31	0.16	0.20	0.38	0.53
Control Delay	31.2	51.9	8.4	35.0	37.4	38.7	39.9	4.0	30.9	50.2	9.7
Queue Delay	0.2	14.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	66.3	8.8	35.0	37.4	38.7	39.9	4.0	30.9	50.2	9.7
LOS	C	E	A	D	D	D	D	A	C	D	A
Approach Delay		47.1			37.2		33.6			24.6	
Approach LOS		D			D		C			C	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 132.7

Natural Cycle: 100

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.91

Intersection Signal Delay: 38.2

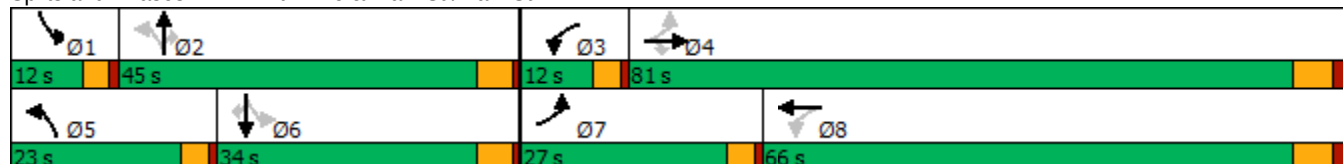
Intersection LOS: D

Intersection Capacity Utilization 82.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Ninth Line & Main St /Main St



HCM Signalized Intersection Capacity Analysis

FT 2037 FRI Midday (Optimized STP)

1: Ninth Line & Main St /Main St

11-26-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	689	255	87	768	74	281	169	85	73	147	283
Future Volume (vph)	223	689	255	87	768	74	281	169	85	73	147	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1599	1787	3530		1805	1881	1615	1805	1881	1599
Flt Permitted	0.15	1.00	1.00	0.08	1.00		0.48	1.00	1.00	0.64	1.00	1.00
Satd. Flow (perm)	291	1900	1599	151	3530		918	1881	1615	1219	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	242	749	277	95	835	80	305	184	92	79	160	308
RTOR Reduction (vph)	0	0	110	0	5	0	0	0	63	0	0	229
Lane Group Flow (vph)	242	749	167	95	910	0	305	184	29	79	160	79
Heavy Vehicles (%)	0%	0%	1%	1%	1%	0%	0%	1%	0%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	69.0	57.2	57.2	57.7	49.9		52.3	42.2	42.2	36.5	30.4	30.4
Effective Green, g (s)	69.0	57.2	57.2	57.7	49.9		52.3	42.2	42.2	36.5	30.4	30.4
Actuated g/C Ratio	0.52	0.43	0.43	0.43	0.37		0.39	0.32	0.32	0.27	0.23	0.23
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	322	815	686	161	1321		479	595	511	360	428	364
v/s Ratio Prot	c0.09	c0.39		0.03	0.26		c0.09	0.10		0.01	0.09	
v/s Ratio Perm	0.30		0.10	0.22			c0.16		0.02	0.05		0.05
v/c Ratio	0.75	0.92	0.24	0.59	0.69		0.64	0.31	0.06	0.22	0.37	0.22
Uniform Delay, d1	22.7	35.9	24.3	29.5	35.2		30.0	34.5	31.7	36.8	43.4	41.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.5	15.2	0.2	5.7	1.5		2.8	1.3	0.2	0.3	2.5	1.4
Delay (s)	32.2	51.0	24.4	35.2	36.7		32.8	35.9	31.9	37.1	45.9	43.1
Level of Service	C	D	C	D	D		C	D	C	D	D	D
Approach Delay (s)		41.6			36.5			33.6			43.1	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			39.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			133.3			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			82.7%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	56.8	109.4	44.8	38.3	99.7	87.7	71.0	44.9	18.4	23.5	42.7	43.5
Average Queue (m)	44.4	103.0	25.2	21.0	76.2	66.7	47.0	29.2	9.4	12.9	28.5	24.3
95th Queue (m)	72.8	121.9	54.8	48.2	108.2	95.1	83.1	51.4	19.7	27.9	49.3	45.0
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		18	0									
Queuing Penalty (veh)		112	2									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	11	39			25		0					
Queuing Penalty (veh)	77	88			22		0					

Timings

FT 2037 FRI PM Peak (Optimized STP)

1: Ninth Line & Main St /Main St

11-26-2025

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	305	744	391	106	664	314	263	102	81	198	261
Future Volume (vph)	305	744	391	106	664	314	263	102	81	198	261
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	31.0	31.0	7.0	31.0	7.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	11.5	38.0	38.0	12.0	38.0	11.5	36.0	36.0	11.5	34.0	34.0
Total Split (s)	38.0	81.0	81.0	12.0	55.0	23.0	45.0	45.0	12.0	34.0	34.0
Total Split (%)	25.3%	54.0%	54.0%	8.0%	36.7%	15.3%	30.0%	30.0%	8.0%	22.7%	22.7%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	78.7	63.9	63.9	61.3	50.5	53.3	40.5	40.5	38.0	29.2	29.2
Actuated g/C Ratio	0.56	0.46	0.46	0.44	0.36	0.38	0.29	0.29	0.27	0.21	0.21
v/c Ratio	0.78	0.93	0.48	0.73	0.62	0.83	0.53	0.20	0.28	0.55	0.51
Control Delay	31.8	54.3	10.0	53.9	39.6	54.1	48.2	7.2	34.5	57.8	8.8
Queue Delay	0.4	50.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	104.8	11.2	53.9	39.6	54.1	48.2	7.2	34.5	57.8	8.8
LOS	C	F	B	D	D	D	D	A	C	E	A
Approach Delay		64.0			41.4		44.8			30.6	
Approach LOS		E			D		D			C	

Intersection Summary

Cycle Length: 150

Actuated Cycle Length: 140.1

Natural Cycle: 110

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 49.7

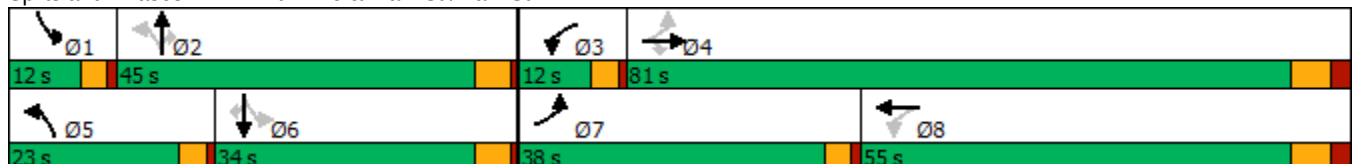
Intersection LOS: D

Intersection Capacity Utilization 89.5%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 1: Ninth Line & Main St /Main St



HCM Signalized Intersection Capacity Analysis

1: Ninth Line & Main St /Main St

FT 2037 FRI PM Peak (Optimized STP)

11-26-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	744	391	106	664	68	314	263	102	81	198	261
Future Volume (vph)	305	744	391	106	664	68	314	263	102	81	198	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1615	1805	3528		1805	1863	1615	1805	1881	1615
Flt Permitted	0.20	1.00	1.00	0.08	1.00		0.36	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	371	1900	1615	150	3528		684	1863	1615	1016	1881	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	332	809	425	115	722	74	341	286	111	88	215	284
RTOR Reduction (vph)	0	0	149	0	5	0	0	0	79	0	0	225
Lane Group Flow (vph)	332	809	276	115	791	0	341	286	32	88	215	59
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	75.7	63.9	63.9	58.3	50.5		52.3	40.5	40.5	37.0	29.2	29.2
Effective Green, g (s)	75.7	63.9	63.9	58.3	50.5		52.3	40.5	40.5	37.0	29.2	29.2
Actuated g/C Ratio	0.54	0.46	0.46	0.42	0.36		0.37	0.29	0.29	0.26	0.21	0.21
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	417	867	737	154	1272		408	538	467	312	392	336
v/s Ratio Prot	c0.12	c0.43		0.04	0.22		c0.11	0.15		0.02	0.11	
v/s Ratio Perm	0.31		0.17	0.27			c0.20		0.02	0.06		0.04
v/c Ratio	0.80	0.93	0.37	0.75	0.62		0.84	0.53	0.07	0.28	0.55	0.18
Uniform Delay, d1	22.2	36.0	24.9	32.6	36.9		35.7	41.8	36.1	39.9	49.5	45.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.1	16.6	0.3	17.8	1.0		13.8	3.7	0.3	0.5	5.4	1.1
Delay (s)	32.4	52.6	25.3	50.4	37.8		49.5	45.5	36.4	40.4	54.9	46.7
Level of Service	C	D	C	D	D		D	D	D	D	D	D
Approach Delay (s)		40.9			39.4			46.0			48.7	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			42.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			89.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	109.7	50.1	52.6	82.0	80.2	86.9	76.5	25.5	24.0	56.6	33.0
Average Queue (m)	51.9	105.2	31.8	27.7	64.1	59.5	61.7	52.3	14.9	14.8	43.1	21.3
95th Queue (m)	70.2	121.9	56.9	60.7	90.8	89.8	105.8	87.0	30.2	28.2	73.7	39.4
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		25										
Queuing Penalty (veh)		174										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	29	42		1	19		1	0				
Queuing Penalty (veh)	216	128		3	20		3	1				

Timings

FT 2037 SAT PM Peak (Optimized STP)

1: Ninth Line & Main St /Main St

11-26-2025

											
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	236	604	303	65	562	220	217	70	57	173	223
Future Volume (vph)	236	604	303	65	562	220	217	70	57	173	223
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8		2		2	6		6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	31.0	31.0	7.0	31.0	7.0	5.0	5.0	7.0	10.0	10.0
Minimum Split (s)	11.5	38.0	38.0	12.0	38.0	11.5	34.0	34.0	11.5	34.0	34.0
Total Split (s)	22.0	58.0	58.0	12.0	48.0	15.0	38.0	38.0	12.0	35.0	35.0
Total Split (%)	18.3%	48.3%	48.3%	10.0%	40.0%	12.5%	31.7%	31.7%	10.0%	29.2%	29.2%
Yellow Time (s)	3.0	4.5	4.5	3.0	4.5	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	2.5	2.5	1.0	2.5	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	7.0	7.0	4.0	7.0	4.0	5.0	5.0	4.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)	58.9	46.8	46.8	48.0	37.4	45.6	35.9	35.9	38.7	30.1	30.1
Actuated g/C Ratio	0.52	0.41	0.41	0.42	0.33	0.40	0.32	0.32	0.34	0.27	0.27
v/c Ratio	0.62	0.84	0.39	0.31	0.57	0.53	0.39	0.13	0.15	0.38	0.40
Control Delay	21.8	42.1	5.5	17.6	33.0	29.7	35.1	0.4	23.8	37.9	6.6
Queue Delay	0.9	47.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	89.2	6.0	17.6	33.0	29.7	35.1	0.4	23.8	37.9	6.6
LOS	C	F	A	B	C	C	D	A	C	D	A
Approach Delay		53.4			31.5		28.0			20.8	
Approach LOS		D			C		C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 113.1

Natural Cycle: 100

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 38.1

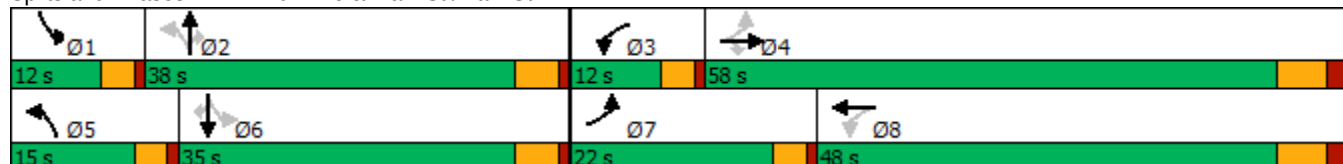
Intersection LOS: D

Intersection Capacity Utilization 76.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 1: Ninth Line & Main St /Main St



HCM Signalized Intersection Capacity Analysis

FT 2037 SAT PM Peak (Optimized STP)

1: Ninth Line & Main St /Main St

11-26-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	604	303	65	562	62	220	217	70	57	173	223
Future Volume (vph)	236	604	303	65	562	62	220	217	70	57	173	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1881	1615	1805	3549		1787	1900	1583	1805	1881	1599
Flt Permitted	0.25	1.00	1.00	0.16	1.00		0.48	1.00	1.00	0.57	1.00	1.00
Satd. Flow (perm)	467	1881	1615	304	3549		900	1900	1583	1091	1881	1599
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	257	657	329	71	611	67	239	236	76	62	188	242
RTOR Reduction (vph)	0	0	170	0	7	0	0	0	52	0	0	177
Lane Group Flow (vph)	257	657	159	71	671	0	239	236	24	62	188	65
Heavy Vehicles (%)	0%	1%	0%	0%	0%	2%	1%	0%	2%	0%	1%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	56.8	46.8	46.8	44.3	38.3		45.9	35.9	35.9	36.9	30.9	30.9
Effective Green, g (s)	56.8	46.8	46.8	44.3	38.3		45.9	35.9	35.9	36.9	30.9	30.9
Actuated g/C Ratio	0.50	0.41	0.41	0.39	0.33		0.40	0.31	0.31	0.32	0.27	0.27
Clearance Time (s)	4.0	7.0	7.0	4.0	7.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	400	767	658	195	1185		445	594	495	388	506	430
v/s Ratio Prot	c0.08	c0.35		0.02	0.19		c0.05	0.12		0.01	0.10	
v/s Ratio Perm	0.24		0.10	0.12			c0.16		0.02	0.04		0.04
v/c Ratio	0.64	0.86	0.24	0.36	0.57		0.54	0.40	0.05	0.16	0.37	0.15
Uniform Delay, d1	18.7	30.9	22.3	25.1	31.4		24.2	30.9	27.5	27.3	34.0	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	9.3	0.2	1.2	0.6		1.3	2.0	0.2	0.2	2.1	0.7
Delay (s)	22.2	40.2	22.5	26.3	32.0		25.5	32.9	27.7	27.5	36.1	32.7
Level of Service	C	D	C	C	C		C	C	C	C	D	C
Approach Delay (s)		31.8			31.5			29.0			33.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.4			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			114.7			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			76.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 1: Ninth Line & Main St /Main St

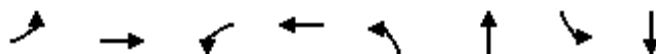
Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR	L	T	R	L	T	R
Maximum Queue (m)	59.8	108.0	32.2	19.2	66.4	57.4	47.9	38.4	15.4	17.4	36.2	25.7
Average Queue (m)	46.0	90.2	21.3	11.0	51.7	42.4	30.7	25.8	7.7	9.6	23.9	15.8
95th Queue (m)	73.6	125.6	36.9	22.0	72.0	67.6	52.1	45.8	17.1	19.7	42.8	28.5
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		12										
Queuing Penalty (veh)		65										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	8	41			8							
Queuing Penalty (veh)	51	96			5							

Timings

FT 2037 FRI Midday (Optimized STP)

2: Driveway/Winona Dr & Main St/Main St

11-26-2025



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↑	←	↑↑		↑↓		↑↓
Traffic Volume (vph)	173	1059	23	1133	22	1	126	0
Future Volume (vph)	173	1059	23	1133	22	1	126	0
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	1	6		2		8		4
Permitted Phases	6		2		8		4	
Detector Phase	1	6	2	2	8	8	4	4
Switch Phase								
Minimum Initial (s)	5.0	19.0	19.0	19.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	76.0	65.0	65.0	34.0	34.0	34.0	34.0
Total Split (s)	11.0	76.0	65.0	65.0	34.0	34.0	34.0	34.0
Total Split (%)	10.0%	69.1%	59.1%	59.1%	30.9%	30.9%	30.9%	30.9%
Yellow Time (s)	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	6.0	6.0	6.0		6.0		6.0
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	Max	Max	Max	None	None	None	None
Act Effect Green (s)	71.8	70.3	59.2	59.2		19.1		19.1
Actuated g/C Ratio	0.71	0.69	0.58	0.58		0.19		0.19
v/c Ratio	0.76	0.48	0.09	0.68		0.24		0.81
Control Delay	30.2	8.7	12.5	17.5		16.9		46.5
Queue Delay	0.0	0.0	0.0	13.4		0.0		0.0
Total Delay	30.2	8.7	12.5	30.9		16.9		46.5
LOS	C	A	B	C		B		D
Approach Delay		11.7		30.6		16.9		46.5
Approach LOS		B		C		B		D

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 101.4

Natural Cycle: 110

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 23.3

Intersection LOS: C

Intersection Capacity Utilization 81.6%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Driveway/Winona Dr & Main St/Main St



HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2037 FRI Midday (Optimized STP)

11-26-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	1059	18	23	1133	139	22	1	44	126	0	118
Future Volume (vph)	173	1059	18	23	1133	139	22	1	44	126	0	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.98			0.91			0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	3531		1805	3466			1687			1697	
Flt Permitted	0.11	1.00		0.24	1.00			0.83			0.82	
Satd. Flow (perm)	210	3531		459	3466			1417			1436	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	1151	20	25	1232	151	24	1	48	137	0	128
RTOR Reduction (vph)	0	1	0	0	7	0	0	39	0	0	60	0
Lane Group Flow (vph)	188	1170	0	25	1376	0	0	34	0	0	205	0
Heavy Vehicles (%)	2%	2%	0%	0%	2%	6%	1%	0%	1%	2%	0%	2%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	70.3	70.3		59.3	59.3			19.0			19.0	
Effective Green, g (s)	70.3	70.3		59.3	59.3			19.0			19.0	
Actuated g/C Ratio	0.69	0.69		0.59	0.59			0.19			0.19	
Clearance Time (s)	4.5	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	245	2450		268	2028			265			269	
v/s Ratio Prot	c0.05	0.33			0.40							
v/s Ratio Perm	c0.48			0.05				0.02			c0.14	
v/c Ratio	0.77	0.48		0.09	0.68			0.13			0.76	
Uniform Delay, d1	12.8	7.1		9.2	14.4			34.3			39.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	13.4	0.7		0.7	1.8			0.2			12.0	
Delay (s)	26.2	7.8		9.9	16.3			34.5			51.0	
Level of Service	C	A		A	B			C			D	
Approach Delay (s)		10.3			16.2			34.5			51.0	
Approach LOS		B			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			17.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			101.3			Sum of lost time (s)			16.5			
Intersection Capacity Utilization			81.6%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

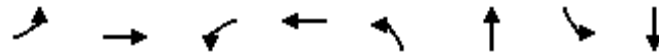
Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	64.0	123.9	97.1	15.1	96.9	97.1	21.8	52.6
Average Queue (m)	37.2	90.2	53.3	6.2	63.5	67.5	14.0	40.1
95th Queue (m)	82.7	164.0	139.4	18.9	111.5	107.3	27.5	61.7
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		8	2		1	0	3	6
Queuing Penalty (veh)		0	0		4	2	0	9
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	5	33		0	17			
Queuing Penalty (veh)	24	57		2	4			

Timings

FT 2037 FRI PM Peak (Optimized STP)

2: Driveway/Winona Dr & Main St/Main St

11-26-2025



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	72	1263	39	1076	18	3	100	0
Future Volume (vph)	72	1263	39	1076	18	3	100	0
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	D.Pm	NA
Protected Phases	1	6		2		8		4
Permitted Phases	6		2		8		8	
Detector Phase	1	6	2	2	8	8	8	4
Switch Phase								
Minimum Initial (s)	5.0	19.0	19.0	19.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	40.0	40.0	40.0	34.0	34.0	34.0	34.0
Total Split (s)	12.0	74.0	62.0	62.0	36.0	36.0	36.0	36.0
Total Split (%)	10.9%	67.3%	56.4%	56.4%	32.7%	32.7%	32.7%	32.7%
Yellow Time (s)	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	6.0	6.0	6.0		6.0		6.0
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	Max	Max	Max	None	None	None	None
Act Effect Green (s)	72.4	70.9	61.7	61.7		13.3		13.3
Actuated g/C Ratio	0.75	0.74	0.64	0.64		0.14		0.14
v/c Ratio	0.24	0.53	0.19	0.55		0.26		0.65
Control Delay	5.4	6.7	12.0	11.8		20.0		33.4
Queue Delay	0.0	0.0	0.0	1.3		0.0		0.0
Total Delay	5.4	6.7	12.0	13.2		20.0		33.4
LOS	A	A	B	B		B		C
Approach Delay		6.7		13.1		20.0		33.4
Approach LOS		A		B		B		C

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 96.2

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 11.2

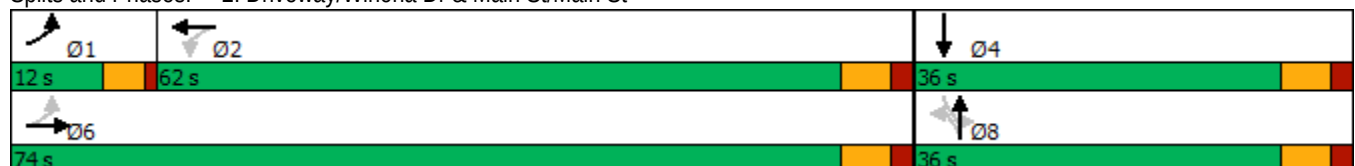
Intersection LOS: B

Intersection Capacity Utilization 82.2%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: Driveway/Winona Dr & Main St/Main St



HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2037 FRI PM Peak (Optimized STP)

11-26-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	1263	25	39	1076	75	18	3	35	100	0	56
Future Volume (vph)	72	1263	25	39	1076	75	18	3	35	100	0	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.92			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3600		1805	3532			1712			1752	
Flt Permitted	0.16	1.00		0.19	1.00			0.86			0.79	
Satd. Flow (perm)	303	3600		356	3532			1497			1428	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	1373	27	42	1170	82	20	3	38	109	0	61
RTOR Reduction (vph)	0	1	0	0	3	0	0	33	0	0	64	0
Lane Group Flow (vph)	78	1399	0	42	1249	0	0	28	0	0	106	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	4%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	71.7	71.7		61.7	61.7			13.3			13.3	
Effective Green, g (s)	71.7	71.7		61.7	61.7			13.3			13.3	
Actuated g/C Ratio	0.74	0.74		0.64	0.64			0.14			0.14	
Clearance Time (s)	4.5	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	309	2661		226	2246			205			195	
v/s Ratio Prot	0.01	c0.39			c0.35							
v/s Ratio Perm	0.17			0.12				0.02			c0.07	
v/c Ratio	0.25	0.53		0.19	0.56			0.14			0.54	
Uniform Delay, d1	5.7	5.4		7.3	9.9			36.8			39.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.4	0.7		1.8	1.0			0.3			3.1	
Delay (s)	6.1	6.1		9.1	10.9			37.1			42.1	
Level of Service	A	A		A	B			D			D	
Approach Delay (s)		6.1			10.9			37.1			42.1	
Approach LOS		A			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			10.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			97.0			Sum of lost time (s)			16.5			
Intersection Capacity Utilization			82.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

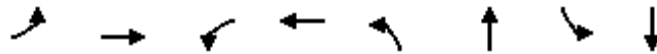
Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	66.6	149.3	143.0	21.0	65.2	65.5	20.0	35.6
Average Queue (m)	23.2	124.1	98.6	8.7	41.7	45.9	11.3	25.8
95th Queue (m)	73.5	187.9	196.9	31.1	72.6	75.1	25.3	41.9
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		34	9				2	
Queuing Penalty (veh)		0	0				0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		47			9			
Queuing Penalty (veh)		34			3			

Timings

FT 2037 SAT PM Peak (Optimized STP)

2: Driveway/Winona Dr & Main St/Main St

11-26-2025



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	60	940	37	795	15	1	74	0
Future Volume (vph)	60	940	37	795	15	1	74	0
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	D.Pm	NA
Protected Phases	1	6		2		8		4
Permitted Phases	6		2		8		8	
Detector Phase	1	6	2	2	8	8	8	4
Switch Phase								
Minimum Initial (s)	5.0	19.0	19.0	19.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	81.0	81.0	81.0	34.0	34.0	34.0	34.0
Total Split (s)	10.0	91.0	81.0	81.0	34.0	34.0	34.0	34.0
Total Split (%)	8.0%	72.8%	64.8%	64.8%	27.2%	27.2%	27.2%	27.2%
Yellow Time (s)	3.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.5	6.0	6.0	6.0		6.0		6.0
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	Max	Max	Max	None	None	None	None
Act Effect Green (s)	89.1	87.6	79.4	79.4		12.0		12.0
Actuated g/C Ratio	0.80	0.78	0.71	0.71		0.11		0.11
v/c Ratio	0.14	0.37	0.11	0.37		0.27		0.58
Control Delay	3.4	4.3	7.2	7.3		24.0		34.5
Queue Delay	0.0	0.0	0.0	0.8		0.0		0.0
Total Delay	3.4	4.3	7.2	8.0		24.0		34.5
LOS	A	A	A	A		C		C
Approach Delay		4.2		8.0		24.0		34.5
Approach LOS		A		A		C		C

Intersection Summary

Cycle Length: 125

Actuated Cycle Length: 111.6

Natural Cycle: 125

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 8.0

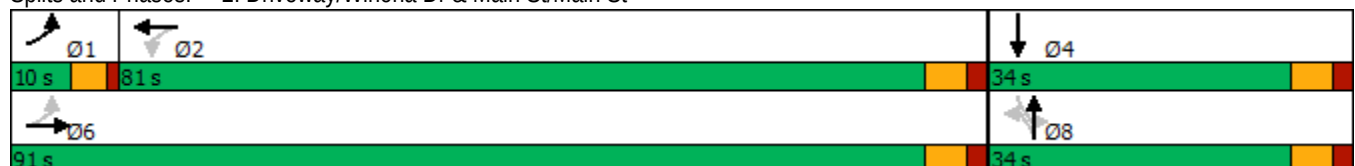
Intersection LOS: A

Intersection Capacity Utilization 70.4%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Driveway/Winona Dr & Main St/Main St



HCM Signalized Intersection Capacity Analysis

2: Driveway/Winona Dr & Main St/Main St

FT 2037 SAT PM Peak (Optimized STP)

11-26-2025

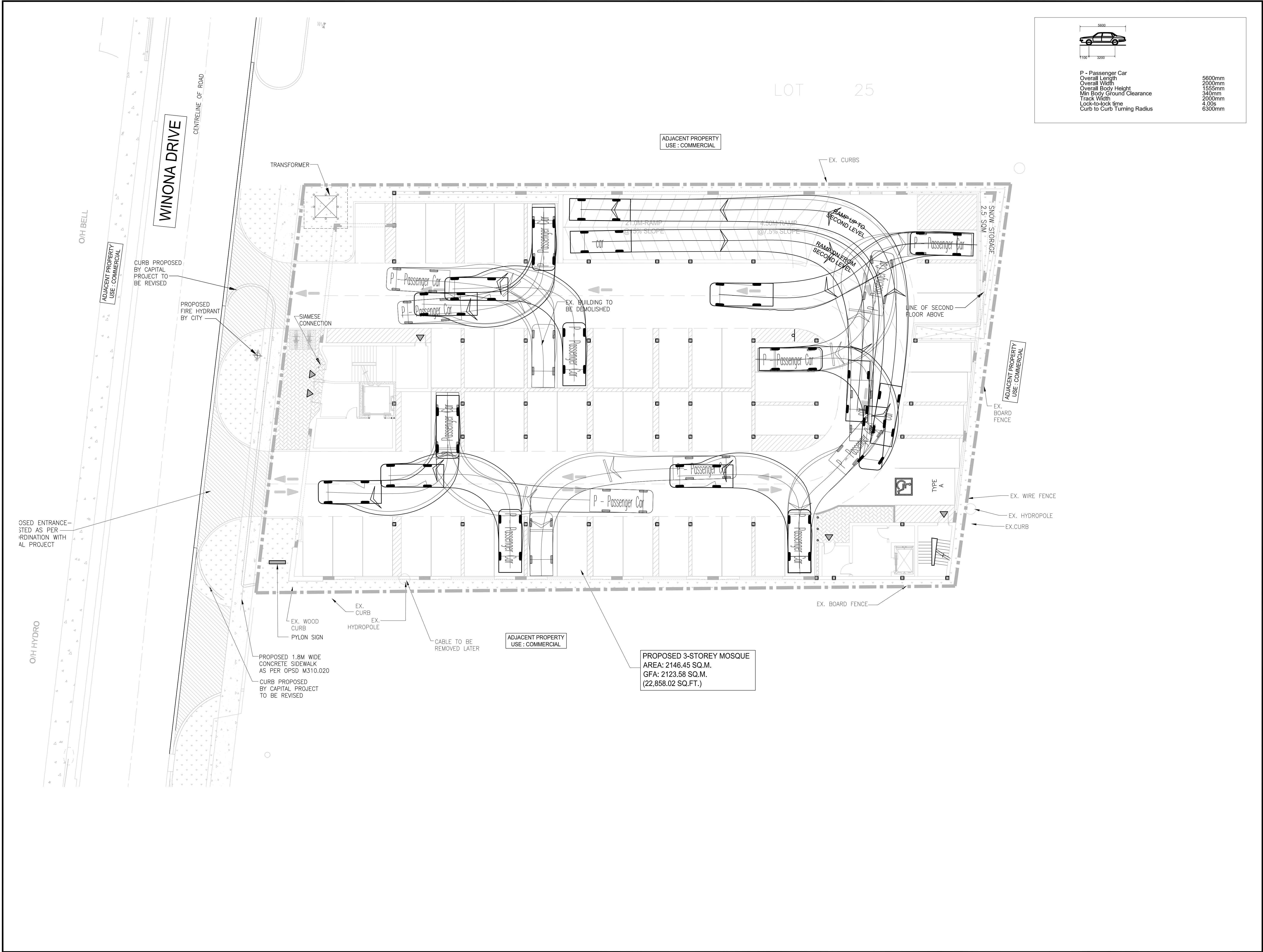
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	940	23	37	795	65	15	1	33	74	0	42
Future Volume (vph)	60	940	23	37	795	65	15	1	33	74	0	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0		6.0	6.0			6.0			6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.91			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1805	3562		1805	3569			1700			1751	
Flt Permitted	0.27	1.00		0.27	1.00			0.87			0.82	
Satd. Flow (perm)	505	3562		520	3569			1507			1476	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	1022	25	40	864	71	16	1	36	80	0	46
RTOR Reduction (vph)	0	1	0	0	4	0	0	32	0	0	58	0
Lane Group Flow (vph)	65	1046	0	40	931	0	0	21	0	0	68	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		D.Pm	NA	
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2			8			8		
Actuated Green, G (s)	88.4	88.4		79.4	79.4			12.0			12.0	
Effective Green, g (s)	88.4	88.4		79.4	79.4			12.0			12.0	
Actuated g/C Ratio	0.79	0.79		0.71	0.71			0.11			0.11	
Clearance Time (s)	4.5	6.0		6.0	6.0			6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	449	2801		367	2521			160			157	
v/s Ratio Prot	0.01	c0.29			0.26							
v/s Ratio Perm	0.11			0.08				0.01			c0.05	
v/c Ratio	0.14	0.37		0.11	0.37			0.13			0.43	
Uniform Delay, d1	3.3	3.6		5.2	6.6			45.5			47.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.4		0.6	0.4			0.4			1.9	
Delay (s)	3.4	4.0		5.8	7.0			45.8			48.9	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.0			6.9			45.8			48.9	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			8.7			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			112.4			Sum of lost time (s)			16.5			
Intersection Capacity Utilization			70.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection: 2: Driveway/Winona Dr & Main St/Main St

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (m)	38.1	87.1	53.1	17.4	37.1	37.1	19.4	34.9
Average Queue (m)	15.9	52.9	23.1	8.1	20.0	24.1	10.5	22.4
95th Queue (m)	55.1	112.9	70.5	23.4	46.1	45.9	22.1	42.5
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)							0	0
Queuing Penalty (veh)							0	0
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		16			1			
Queuing Penalty (veh)		9			1			

APPENDIX L

Vehicle Movement Diagrams



P - Passenger Car
Overall Length 5600mm
Overall Width 2000mm
Overall Body Height 1555mm
Min Body Ground Clearance 340mm
Track Width 2000mm
Lock-to-lock time 4.00s
Curb to Curb Turning Radius 6300mm

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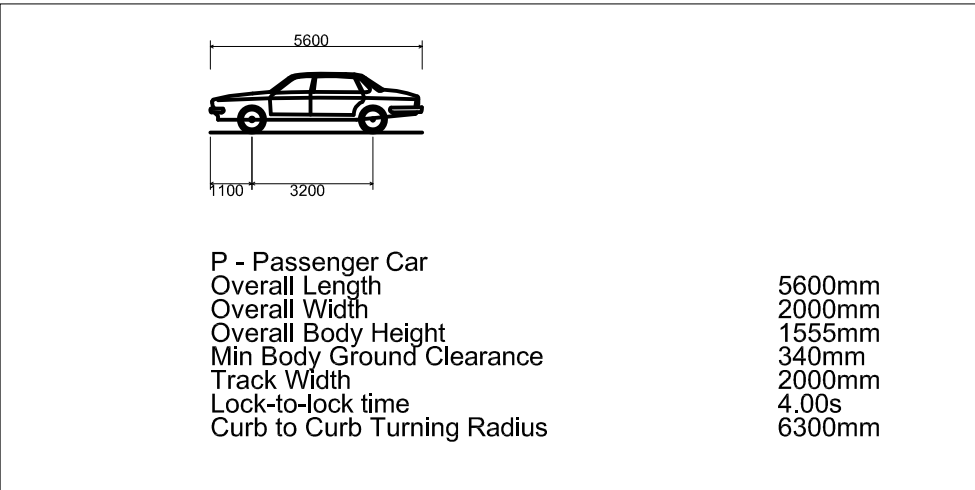
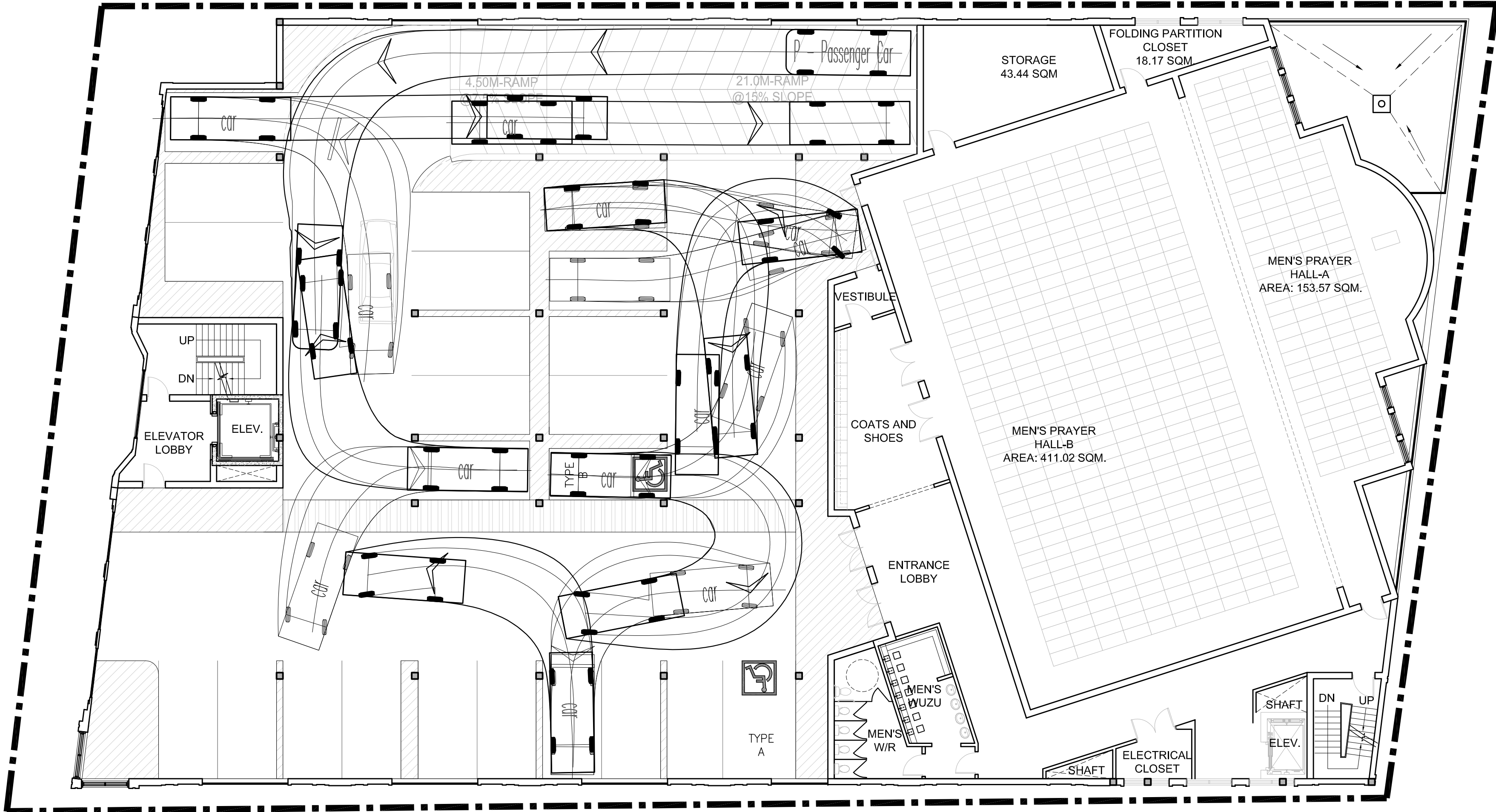
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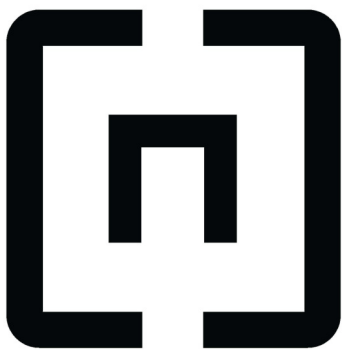
**CAR MOVEMENT PLAN
(1st FLOOR)**

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CHECKED BY: AZ	SCALE: 1:150
PROJECT NO.:	DRAWING NO.:

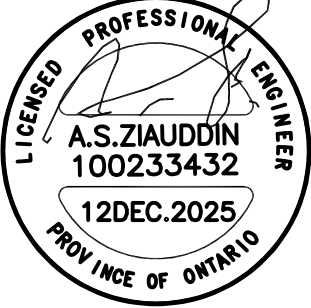
22-71

TR-03

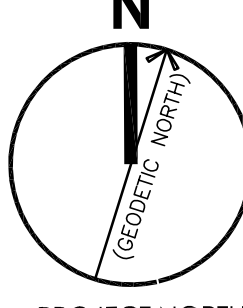




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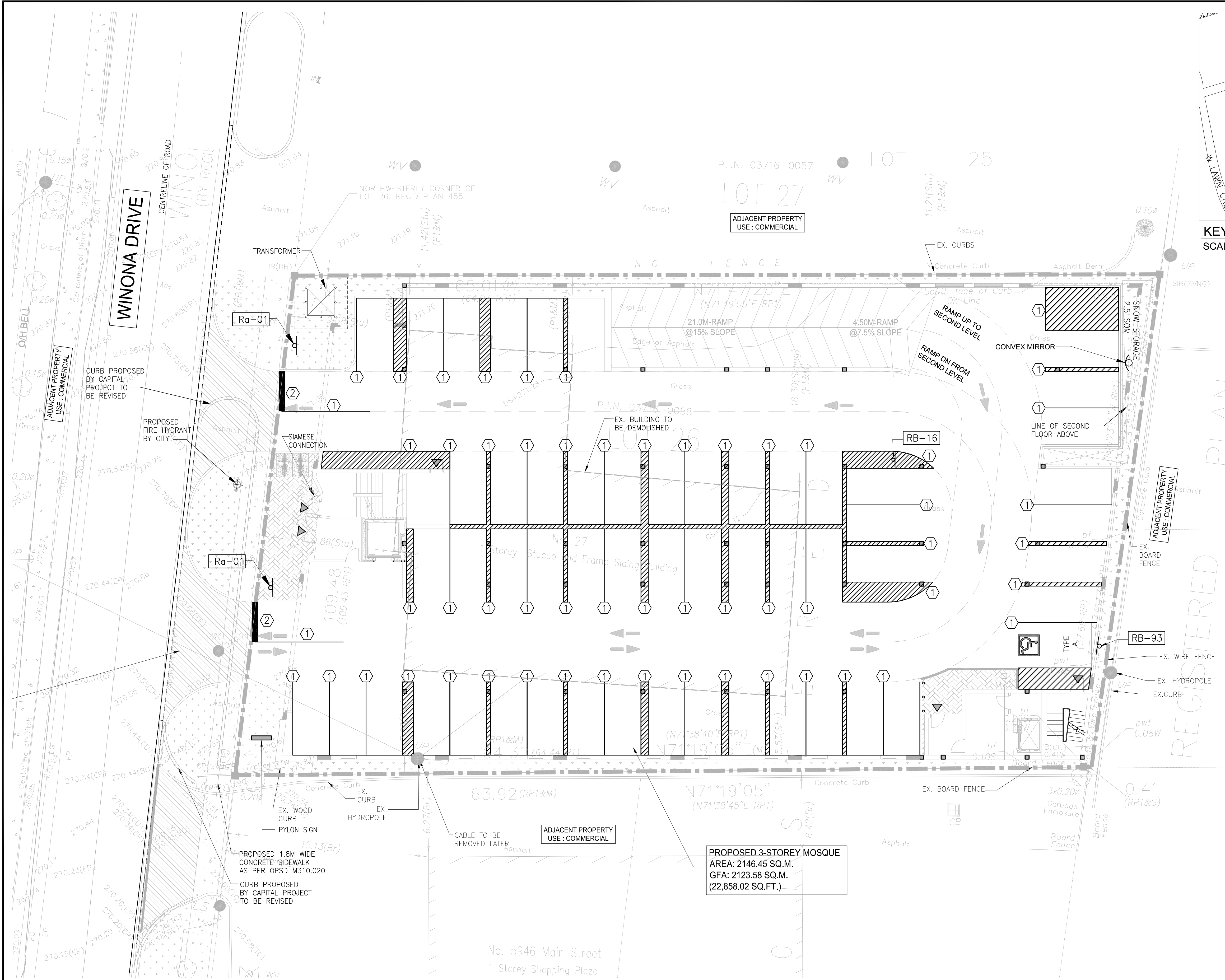
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**CAR MOVEMENT PLAN
(2nd FLOOR)**

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PROJECT NO.:	DRAWING NO.:

22-71 TR-04

APPENDIX L

Pavement Marking & Signage Plan



SIGNAGE LEGEND:

SYMBOL	SIGN	PROPOSED QUANTITY
	Ra-1 STOP SIGN 600X600MM	02
	Rb-93 ACCESSIBLE PARKING PERMIT SIGN 300X450MM	01
	Rb-16 NO U TURN SIGN 600X600MM	01

PAVEMENT MARKING LEGEND:

	HANDICAPPED PARKING PAVEMENT MARKING	02
	SOLID YELLOW LINE	10 cm
	SOLID WHITE STOP BAR	45 cm

NOTE: ALL PAVEMENT MARKING AND SIGNAGE INSTALLATION SHOULD ACCORDING TO ONTARIO TRAFFIC MANUAL.

LEGEND

- PROPERTY LINE
- NEW BUILDING
- EXISTING BUILDING
- LANDSCAPE
- CONC. PAVEMENT, 150MM RAISED
- ASPHALT
- MAIN DOOR ENTRANCE
- OVERHEAD DOOR
- TACTILE WALKING SURFACE

APPLICANT:

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Richmond Hill, ON. L4B 3J9
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E: info@narchitecture.com
www.narchitecture.com

LEGAL DESCRIPTION:

PART PLAN OF LOT 26 REGISTERED
PLAN 455
TOWN OF WHITCHURCH STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

SURVEY INFORMATION:

RICHMOND SURVEYING INC.
344-9471 YONGE STREET, RICHMOND
HILL, ON
PH.: 647-333-6200
MAIL: MOJITO.TAVALLAI@GMAIL.COM
PLAN DATED: AUGUST 18, 2024

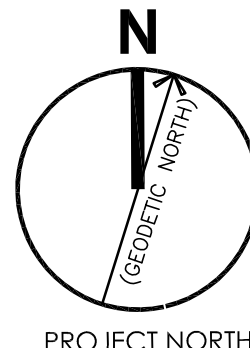
OWNER'S INFO:

DARUL KHAIR CENTER STOUFFVILLE
86 RINGWOOD DR. UNIT 36
WHITCHURCH-STOUFFVILLE, ON



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& SIGNAGE PLAN

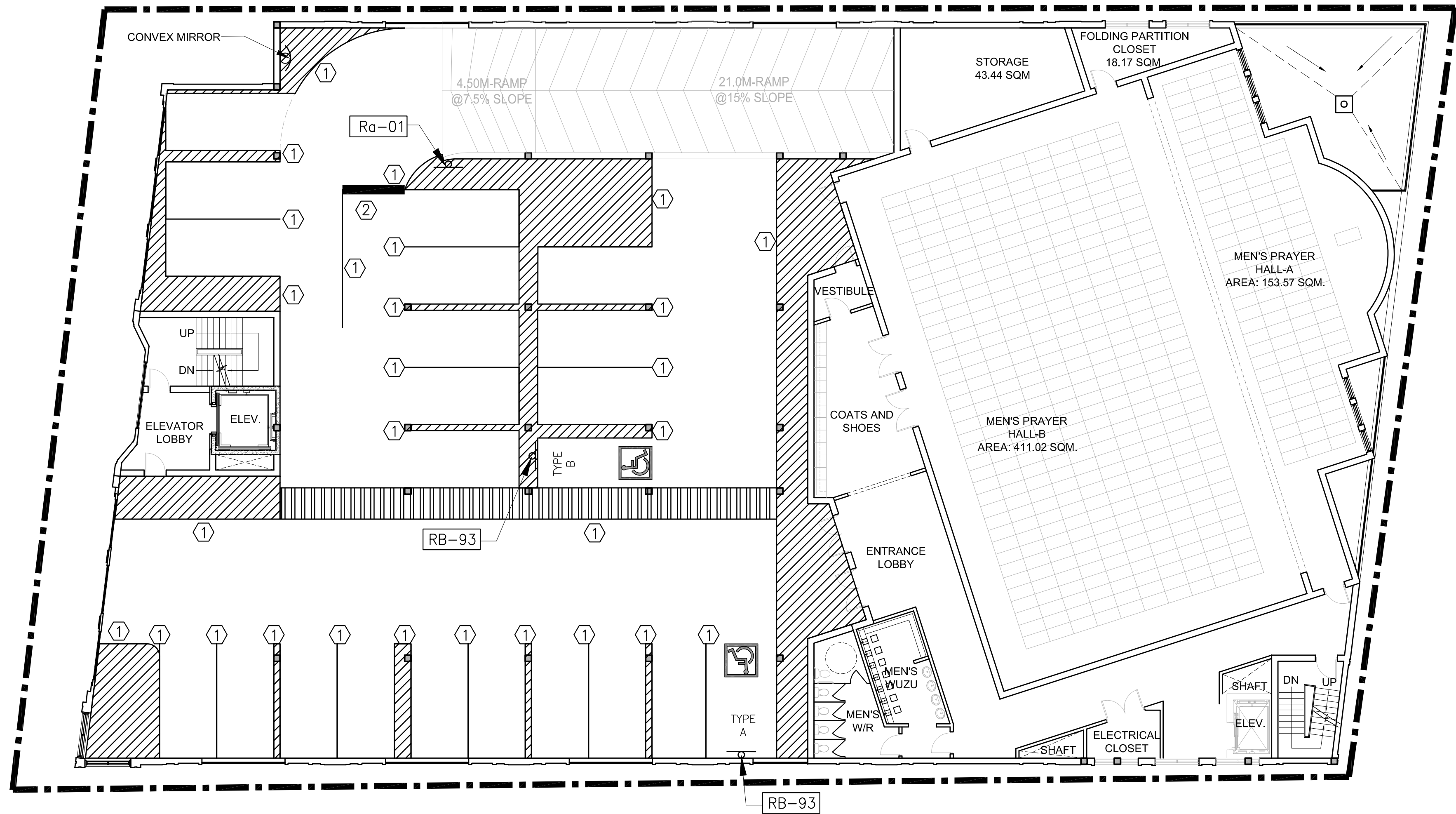
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KEY MAP
SCALE: N.T.S.

SIGNAGE LEGEND:

SYMBOL	SIGN	PROPOSED QUANTITY
	Ra-1 STOP SIGN 600X600MM	01
	Rb-93 ACCESSIBLE PARKING PERMIT SIGN 300X450MM	02

PAVEMENT MARKING LEGEND:

	HANDICAPPED PARKING PAVEMENT MARKING	02
	SOLID YELLOW LINE	10 cm
	SOLID WHITE STOP BAR	45 cm

NOTE: ALL PAVEMENT MARKING AND SIGNAGE INSTALLATION SHOULD ACCORDING TO ONTARIO TRAFFIC MANUAL.

LEGEND	
	PROPERTY LINE
	NEW BUILDING
	EXISTING BUILDING
	LANDSCAPE
	CONC. PAVEMENT, 150MM RAISED
	ASPHALT
	MAIN DOOR ENTRANCE
	OVERHEAD DOOR
	TACTILE WALKING SURFACE

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PLAN DATED: AUGUST 18, 2024

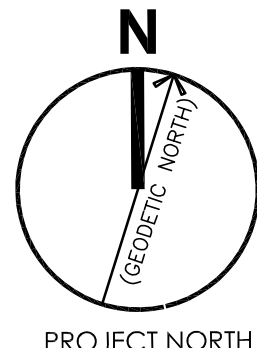
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