

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

TRAFFIC IMPACT STUDY

PROJECT No. n 2271

Prepared By:



n Engineering Inc

9120 Leslie Street, Suite-208
Richmond Hill, Ontario L4B 3J9
T: 905-597-5937
www.nengineering.com

March 20, 2025

Table of Contents

1	Introduction	1
2	Proposed Development	1
2.1	Mosque a space for Community Gathering	2
2.2	Mosques in Canadian Cities	3
3	Scope of Work.....	4
4	Study Methodology.....	5
4.1	Pedestrian Mode Performance	5
4.2	Bicycle Mode Performance	6
4.3	Transit Mode Performance	6
4.4	Automobile Mode Performance	7
5	Existing 2024 Condition	8
5.1	Existing Street Network	8
5.2	Existing Transit Services	9
5.3	Existing Pedestrian Facilities	9
5.4	Existing Cycling Network.....	10
5.5	Existing Traffic Volume.....	10
5.6	Existing 2024 Condition Pedestrian Mode Performance	12
5.7	Existing 2024 Condition Bicycle Mode Performance	13
5.8	Existing 2024 Condition Transit Mode Performance	13
5.9	Existing 2024 Condition Intersection Capacity Analysis	14
6	Future Background Condition.....	16
6.1	Corridor Growth.....	16
6.2	Background Development	16
6.3	Future Background 2027.....	18
6.4	Future Background 2027 Condition Pedestrian Mode Performance	21
6.5	Future Background 2027 Bicycle Mode Performance	22
6.6	Future Background 2027 Transit Mode Performance	22
6.7	Future Background 2027 Condition Intersection Capacity Analysis	23
6.8	Future Background 2032.....	25
6.9	Future Background 2032 Condition Pedestrian Mode Performance	27

6.10	Future Background 2032 Bicycle Mode Performance	28
6.11	Future Background 2032 Condition Transit Mode Performance.....	28
6.12	Future Background 2032 Condition Intersection Capacity Analysis	29
6.13	Future Background 2037.....	31
6.14	Future Background 2037 Condition Pedestrian Mode Performance	33
6.15	Future Background 2037 Bicycle Mode Performance	34
6.16	Future Background 2037 Condition Transit Mode Performance.....	35
6.17	Future Background 2037 Condition Intersection Capacity Analysis	35
7	Trip Generation	37
7.1	Trip Distribution and Assignment	39
8	Future Total Condition	41
8.1	Future Total 2027.....	41
8.2	Future Total 2027 Condition Pedestrian Mode Performance	43
8.3	Future Total 2027 Bicycle Mode Performance	43
8.4	Future Total 2027 Condition Transit Mode Performance.....	44
8.5	Future Total 2027 Condition Intersection Capacity Analysis	45
8.6	Future Total 2032.....	47
8.7	Future Total 2032 Condition Pedestrian Mode Performance	49
8.8	Future Total 2032 Bicycle Mode Performance	49
8.9	Future Total 2032 Condition Transit Mode Performance.....	50
8.10	Future Total 2032 Condition Intersection Capacity Analysis	51
8.11	Future Total 2037.....	53
8.12	Future Total 2037 Condition Pedestrian Mode Performance	55
8.13	Future Total 2037 Bicycle Mode Performance	56
8.14	Future Total 2037 Condition Transit Mode Performance.....	57
8.15	Future Total 2037 Condition Intersection Capacity Analysis	57
9	Site Access Review	61
9.1	Access Spacing	61
9.2	Sight Distance Analysis.....	62
9.3	Internal Site Circulation	63
10	Parking Review	63
11	Transportation Demand Management	64

12	Summary	65
----	---------------	----

List of Figures

Figure 1 - Site Location.....	1
Figure 2- Site Plan by n Architecture Inc.	2
Figure 3- Study Area.....	4
Figure 4 - Existing 2024 Condition Peak Hour Traffic Volumes.....	11
Figure 5 - Future Background Developments Map.....	18
Figure 6 - Background Development Total Trips	19
Figure 7 - Future Background 2027 Condition Peak Hour Traffic Volumes	20
Figure 8 - Future Background 2032 Condition Peak Hour Traffic Volumes	26
Figure 9 - Future Background 2037 Condition Peak Hour Traffic Volumes	32
Figure 10 - Trips Generated by Proposed Development	40
Figure 11 - Future Total 2027 Condition Peak Hour Traffic Volumes	42
Figure 12 - Future Total 2032 Condition Peak Hour Traffic Volumes	48
Figure 13 - Future Total 2037 Condition Peak Hour Traffic Volumes	54
Figure 14 - Site Access Spacing via Google Maps.....	61
Figure 15- Visibility Triangles at the Site Entrance	63

List of Tables

Table 1 - Pedestrian Level of Service Criteria.....	5
Table 2 - Bicycle Level of Service Criteria.....	6
Table 3 - Transit Level of Service Criteria.....	7
Table 4 - Automobile HCM 6 LOS Criteria	7
Table 5 – Bus Transit Headway	9
Table 6 - Existing 2024 Condition Pedestrian Mode LOS.....	12
Table 7 - Existing 2024 Condition Bicycle Mode Level of Service	13
Table 8 - Existing 2024 Condition Transit Level of Service.....	14
Table 9 - Existing 2024 Condition Intersection Capacity Analysis.....	15
Table 10 - Future Background 2027 Condition Pedestrian Mode LOS	21
Table 11 - Future Background 2026 Bicycle Mode for AM & PM Peak Hours.....	22
Table 12 Future Background 2027 Transit Level of Service.....	22
Table 13 - Future Background 2027 Condition Intersection Capacity Analysis	24
Table 14 - Future Background 2032 Condition Pedestrian Mode LOS	27
Table 15 - Future Background 2032 Condition Bicycle Mode LOS.....	28
Table 16 Future Background 2032 Transit Level of Service.....	29
Table 17 - Future Background 2031 Condition Intersection Capacity Analysis	30
Table 18 - Future Background 2036 Condition Pedestrian Mode LOS	33
Table 19 - Future Background 2037 Condition Bicycle Mode LOS.....	34
Table 20 Future Background 2037 Transit Level of Service.....	35
Table 21 - Future Background 2036 Condition Intersection Capacity Analysis	36

Table 22 – Estimated Trips Generated by Proposed Development.....	38
Table 23 - Trip Distribution for AM & PM Peak Hours.....	39
Table 24 - Trip Assignment for AM & PM Peak Hours	39
Table 25 - Future Total 2027 Condition Pedestrian Mode LOS	43
Table 26 - Future Total 2026 Condition Bicycle Mode LOS.....	44
Table 27 Future Total 2027 Transit Level of Service	45
Table 28 - Future Total 2027 Condition Intersection Capacity Analysis	46
Table 29 - Future Total 2032 Condition Pedestrian Mode LOS	49
Table 30 - Future Total 2032 Condition Bicycle Mode LOS.....	49
Table 31 Future Total 2032 Transit Level of Service	51
Table 32 - Future Total 2031 Condition Intersection Capacity Analysis	52
Table 33 - Future Total 2037 Condition Pedestrian Mode LOS	55
Table 34 - Future Total 2037 Condition Bicycle Mode LOS.....	56
Table 35 Future Total 2037 Transit Level of Service	57
Table 36 - Future Total 2037 Condition Intersection Capacity Analysis	58
Table 37 – Comparison of Critical Movement at Different Scenarios	60
Table 39 - Sight Distance Analysis.....	62
Table 40 - TDM Checklist	64

List of Appendices

Appendix A: Approved Terms of Reference & Email Correspondence

Appendix B: Site Plan

Appendix C: Transit & Cycling Network Maps

Appendix D: Darul-Khari Mosque Activities & Functions

Appendix E: TMC Data 2024 Collected by Accu-Traffic Inc.

Appendix F: Transit Level of Service

Appendix G: Signal Timing Plan & Synchro Timing Reports

Appendix H: Automobile Synchro Analysis Reports

Appendix I: Future Background Development Excerpts

Appendix J: ITE Manual & Brampton City Worship Places Policy Excerpts

Appendix K: Vehicle Movement Diagram

Appendix L: Pavement Marking and Signage Plan

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

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
FB2026:	Future Background 2026 Condition Traffic	WBT	: Westbound through
FB2031:	Future Background 2031Condition Traffic	WBR	: Westbound right
FB2036:	Future Background 2036Condition Traffic	WBTR	: Westbound through right
FT2026:	Future Total 2026 Condition Traffic	WBLTR	: Westbound left through right
FT2031:	Future Total 2031 Condition Traffic	NBL	: Northbound left
FT2036:	Future Total 2036 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.

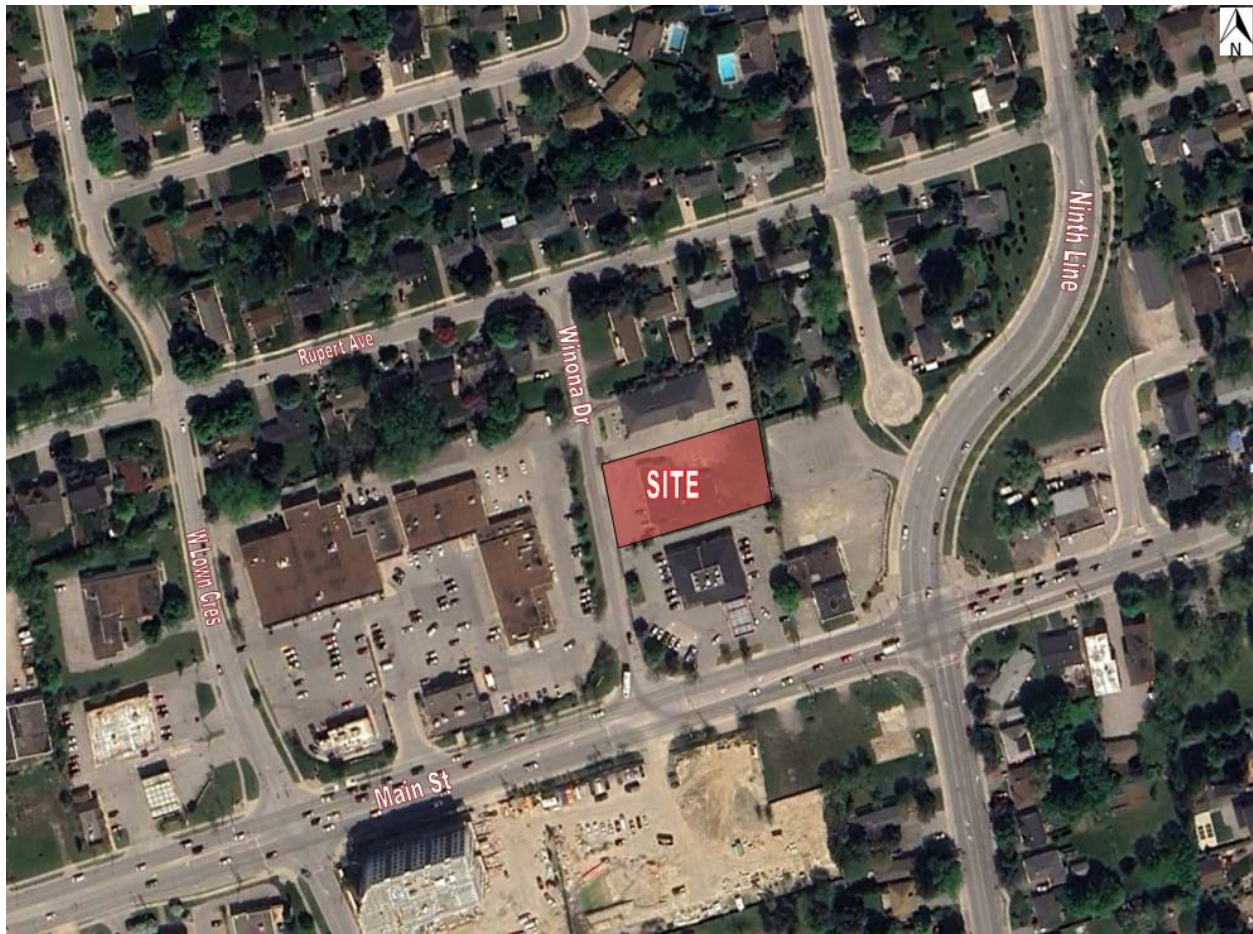


Figure 1 - Site Location

2 Proposed Development

As per the site plan provided by n Architecture Inc. (refer Appendix B), the proposed Mosque is a 3 storey building with total GFA of 2294.45 m² with the following facilities:

- Place of Worship 213.84 m²;
- Gym Area 514.37 m²
- Office 14.51 m² GFA

- Classroom, Multipurpose Hall, Senior's Lounge and other functional spaces
- 53 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.

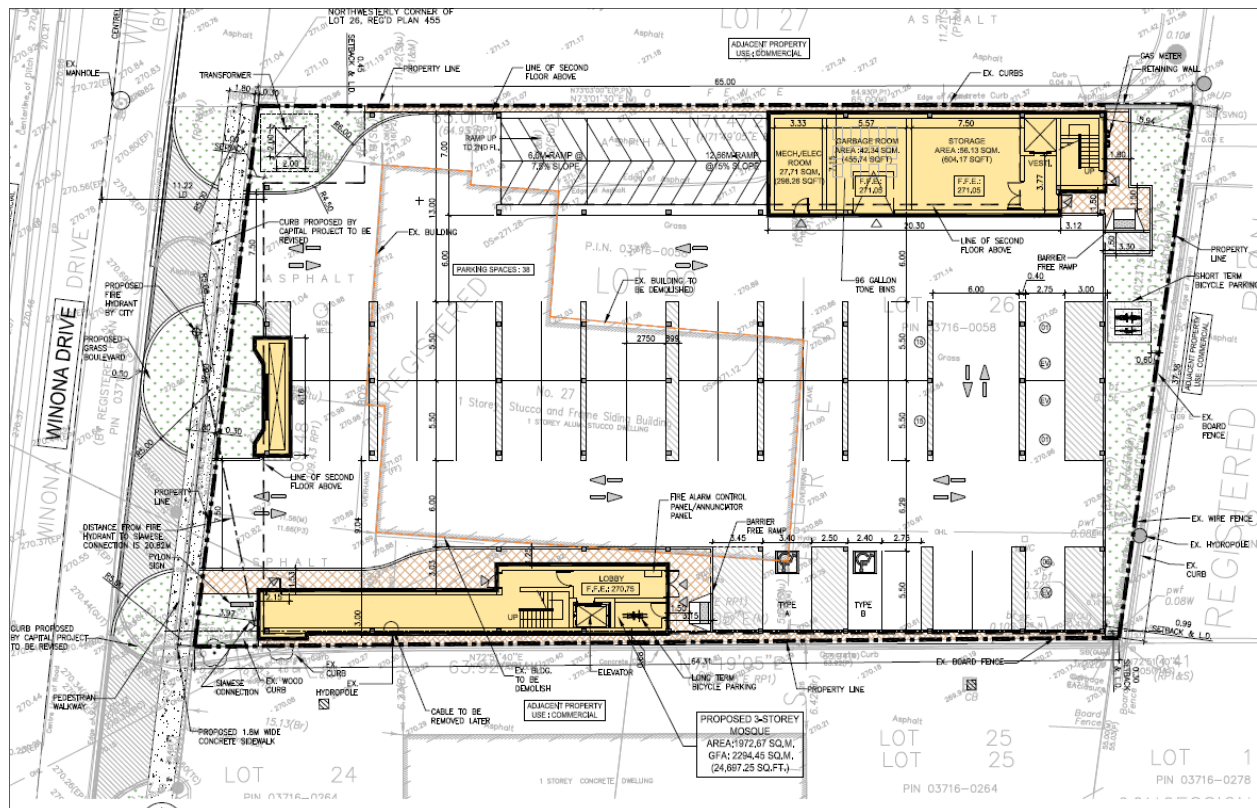


Figure 2- Site Plan by n Architecture Inc.

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 Highway Capacity Manual (HCM 6th Edition) using the Synchro (ver.11). 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 Highway Capacity Manual (HCM 6th Edition) using the Synchro (ver.11). 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 6 (HCM 6th Edition) 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 6 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 2024 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 18th January 2025 for the same peak periods to assess the traffic impact and the capacity of that intersection as well. The existing traffic volumes are shown in Figure 4 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 2024 Condition Peak Hour traffic volume data.

LEGEND

00

FRIDAY MIDDAY PEAK

(00)

FRIDAY PM PEAK

[00]

SATURDAY PM PEAK

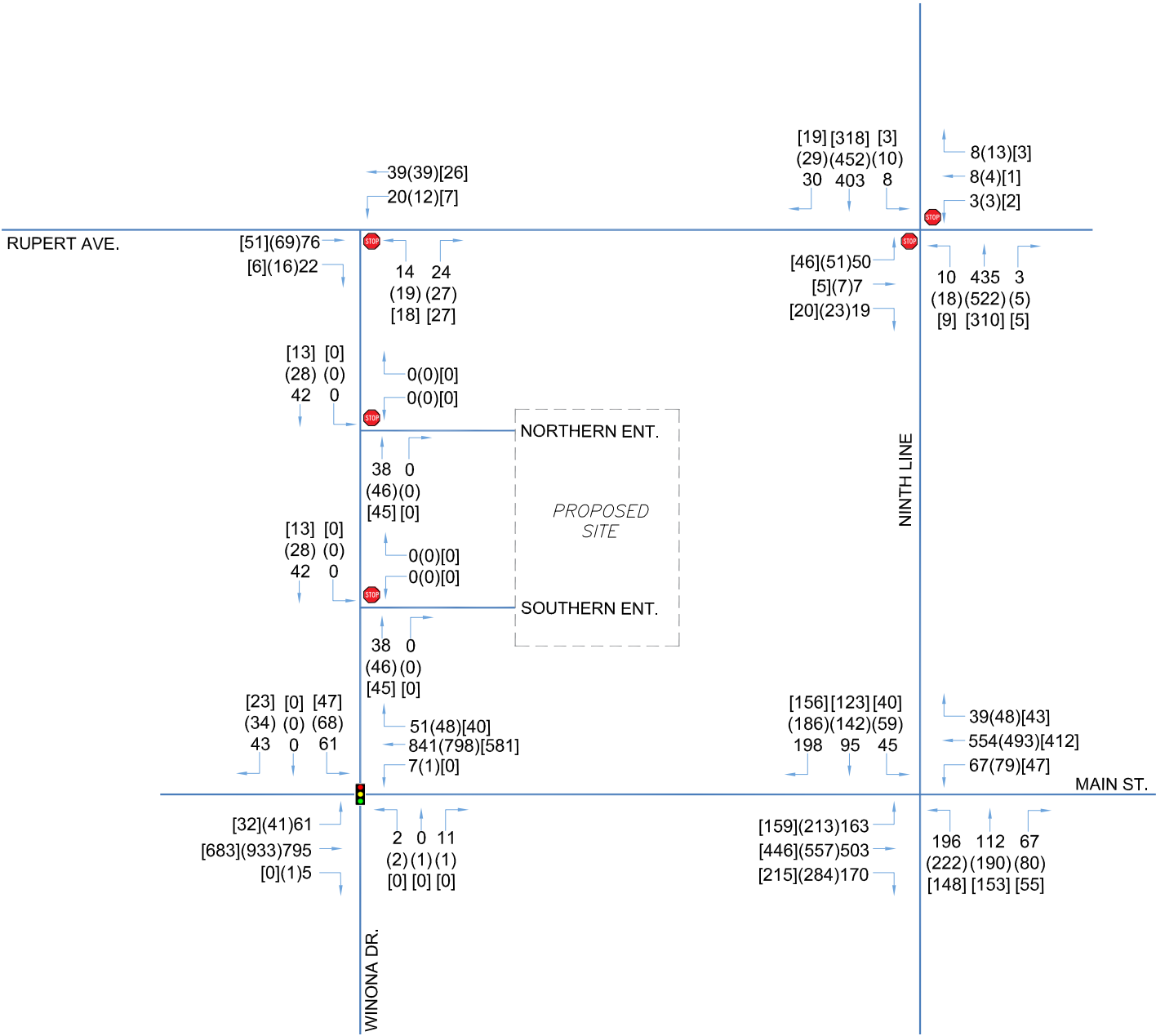
SIGNALIZED INTERSECTIONS

STOP

STOP CONTROL

UNIT:

VEH/HR



5.6 Existing 2024 Condition Pedestrian Mode Performance

The Existing 2024 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 2024 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 2024 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 2024 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 2024 Condition Transit Mode Performance

The existing 2024 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 2024 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 2024 Condition Intersection Capacity Analysis

The Synchro analysis results under the Existing 2024 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) 6 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 2024 Condition automobile Synchro analysis reports are provided in Appendix H.

Table 9 - Existing 2024 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	73.7	0.64	C	25.3	74.4	0.45	C	22.3	67.9	35.0
	EBT	0.87	D	49.5	123.5	0.84	D	41.0	122.7	0.77	D	39.4	96.7	
	EBR	0.14	C	27.9	21.3	0.22	C	24.2	43.8	0.15	C	26.5	31.5	
	WBL	0.41	C	29.4	39.2	0.43	C	25.5	32.6	0.21	C	26.6	17.7	50.0
	WBTR	0.57	C	34.6	66.7	0.45	C	28.0	60.7	0.47	C	33.4	52.0	
	NBL	0.33	B	18.4	41.2	0.46	C	22.5	53.4	0.27	B	18.1	35.2	100.0
	NBT	0.16	C	23.5	26.8	0.33	C	30.0	52.7	0.22	C	23.6	35.0	
	NBR	0.05	C	22.1	15.5	0.05	C	26.0	17.1	0.04	C	21.4	12.9	
	SBL	0.09	C	22.2	16.7	0.14	C	25.3	20.0	0.09	C	22.7	15.2	100.0
	STB	0.16	C	27.4	27.5	0.28	C	32.8	44.0	0.21	C	27.7	32.8	
	SBR	0.13	C	27.1	26.9	0.13	C	30.5	18.7	0.11	C	26.3	22.0	130.0
Winona Dr & Main St	Overall	-	A	6.7	-	-	A	6.5	-	-	A	5.0	-	
	EBL	0.16	A	4.1	18.4	0.10	A	3.6	14.4	0.06	A	2.2	9.2	30
	EBTR	0.32	A	4.1	40.3	0.37	A	4.3	62.7	0.26	A	2.7	21.7	
	WBL	0.02	A	3.0	4.7	0.00	A	2.9	-	-	-	-	-	35
	WBTR	0.36	A	4.3	45.2	0.34	A	4.2	44.5	0.23	A	2.6	32.5	
	NBLTR	0.01	D	39.4	9.1	0.02	D	39.8	5.6	-	-	-	-	
	SBLTR	0.51	D	44.2	30.1	0.51	D	44.6	31.5	0.44	D	49.9	24.4	
Southern Site Ent & Winona Dr	WBLR	0.00	A	0.0	0.0	0.00	A	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	0.01	A	2.6	2.1	0.01	A	1.8	3.3	0.01	A	1.7	3.2	
	NBLR	0.05	A	9.2	13.1	0.05	A	9.2	12.6	0.05	A	8.9	13.2	
9th Line & Rupert Ave	EBLTR	0.18	B	14.5	16.7	0.21	C	16.2	20.0	0.13	B	12.2	16.6	
	WBLTR	0.04	B	12.8	13.0	0.04	B	13.0	11.2	0.01	B	11.0	7.0	
	NBL	0.01	A	8.6	4.2	0.02	A	8.5	9.6	0.01	A	8.0	5.4	50
	SBL	0.01	A	8.3	5.5	0.01	A	8.7	6.7	0.00	A	7.9	3.0	

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 2024 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 5 below shows the locations of the future background developments in the vicinity of the subject site.

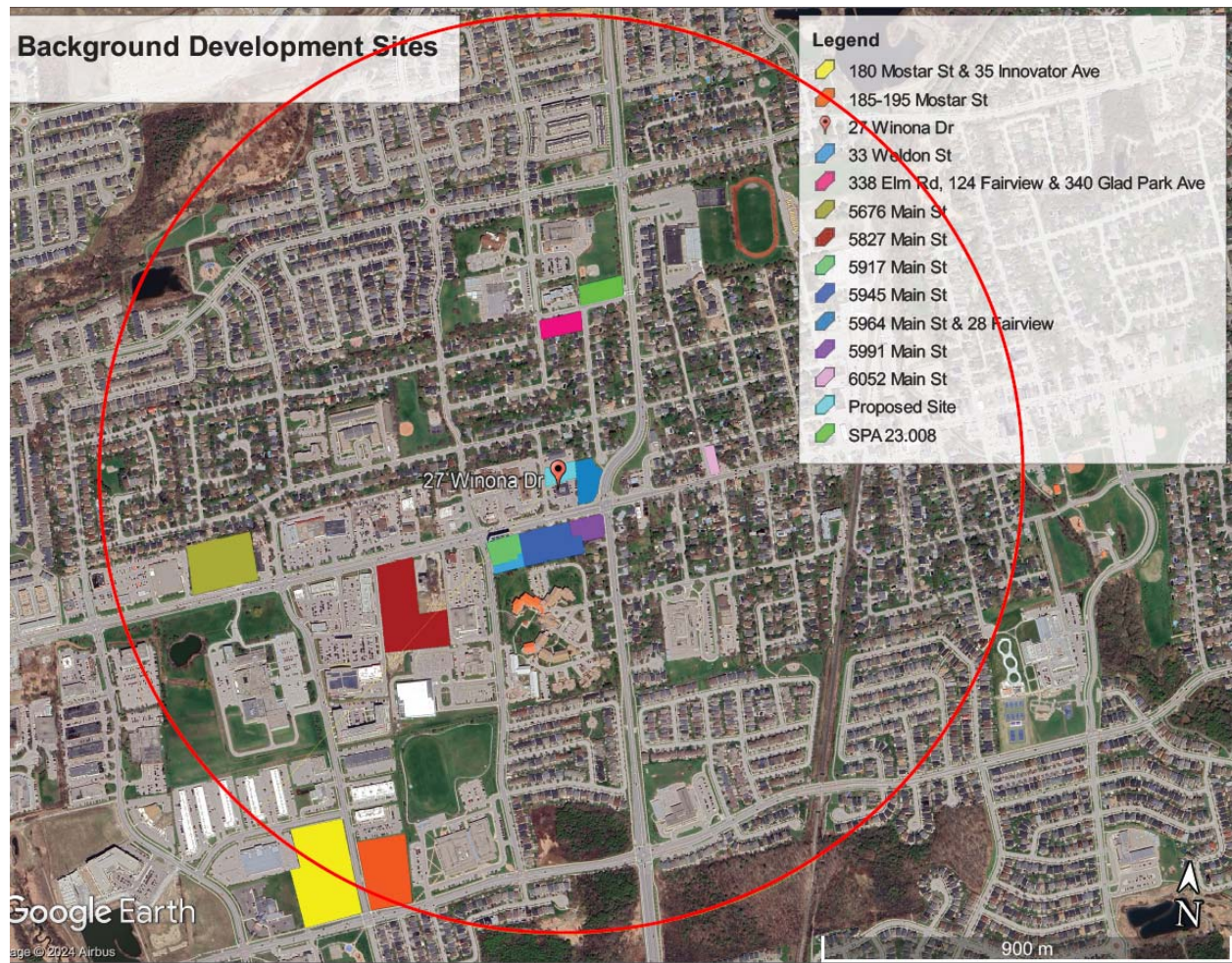


Figure 5 - Future Background Developments Map

Figure 6 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

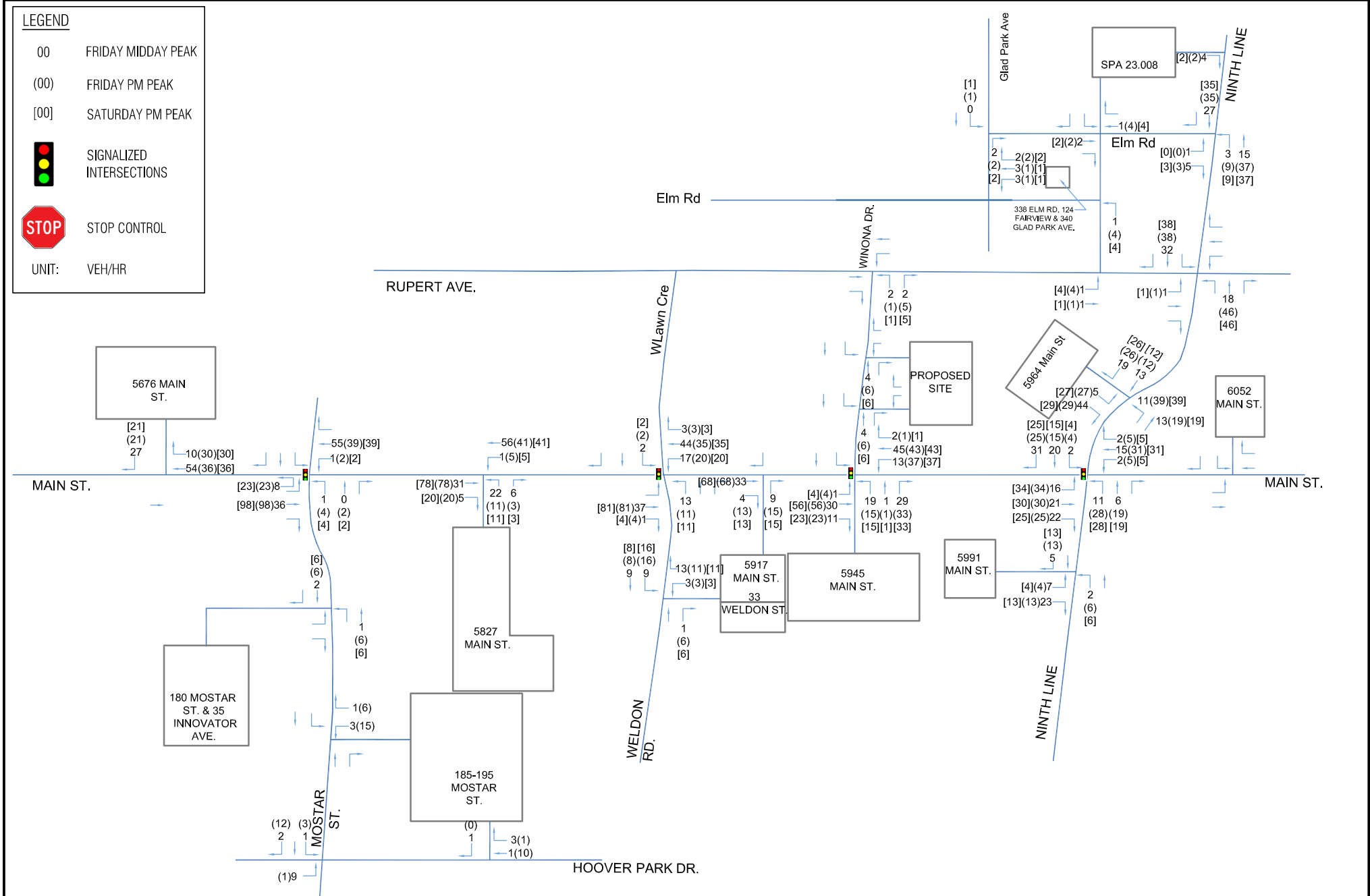


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



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:

**BACKGROUND
DEVELOPMENT TRIPS**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

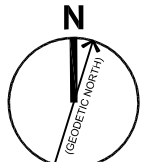
22-71

DATE: 20 JULY 2024

SCALE: NTS

DRAWING NO.:

FIG-6



PROJECT NORTH

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

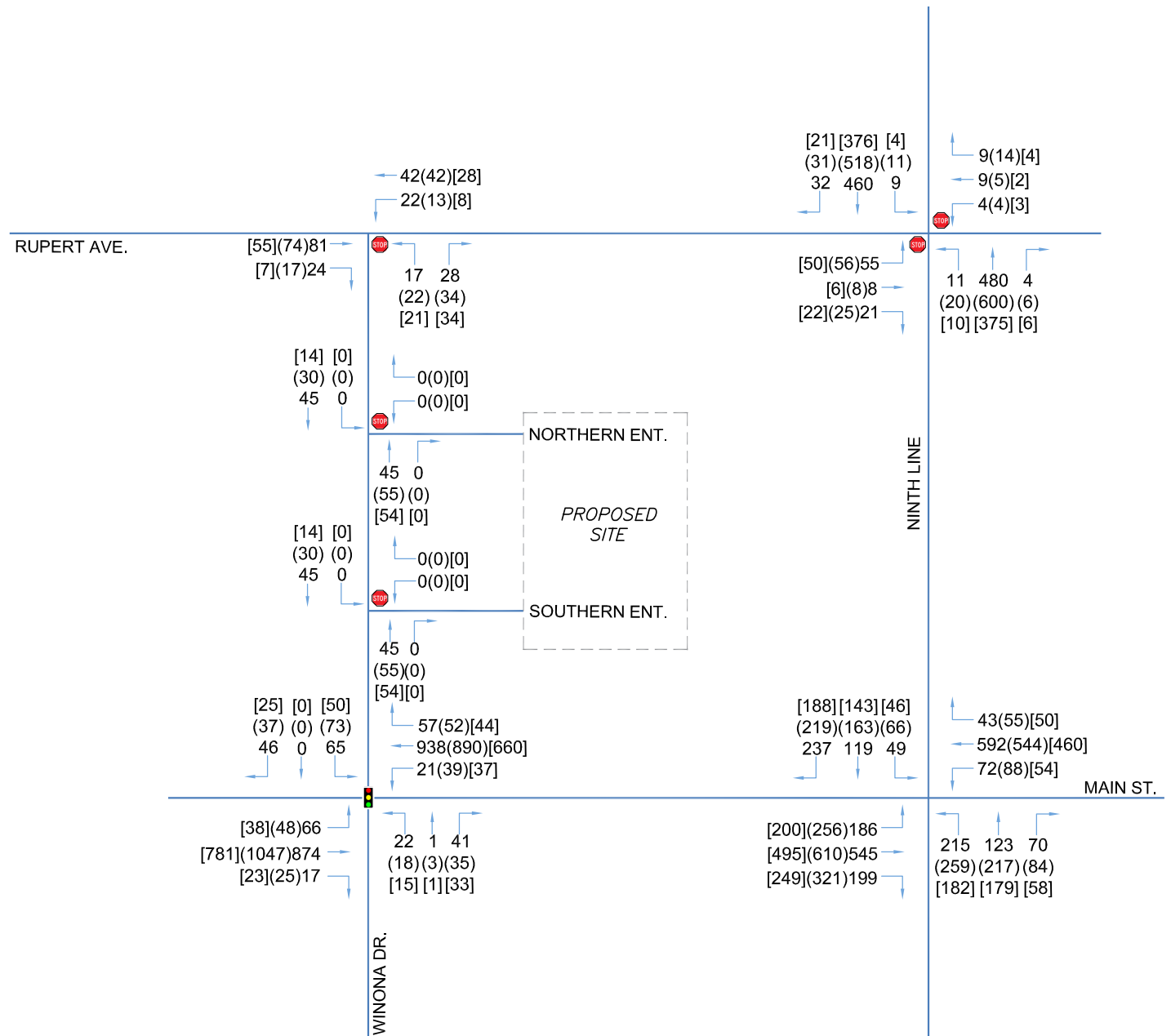


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.255.9741
E: info@nengineering.com
www.nengineering.com

PROJECT:

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

DRAWING TITLE:

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

DRAWN BY: SA

DATE: 20 JULY 2024

CHECKED BY: AZ

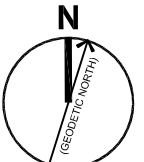
SCALE: NTS

PROJECT NO.:

DRAWING NO.:

22-71

FIG-7



PROJECT NORTH

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 2026 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) 6 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 2024 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 8.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

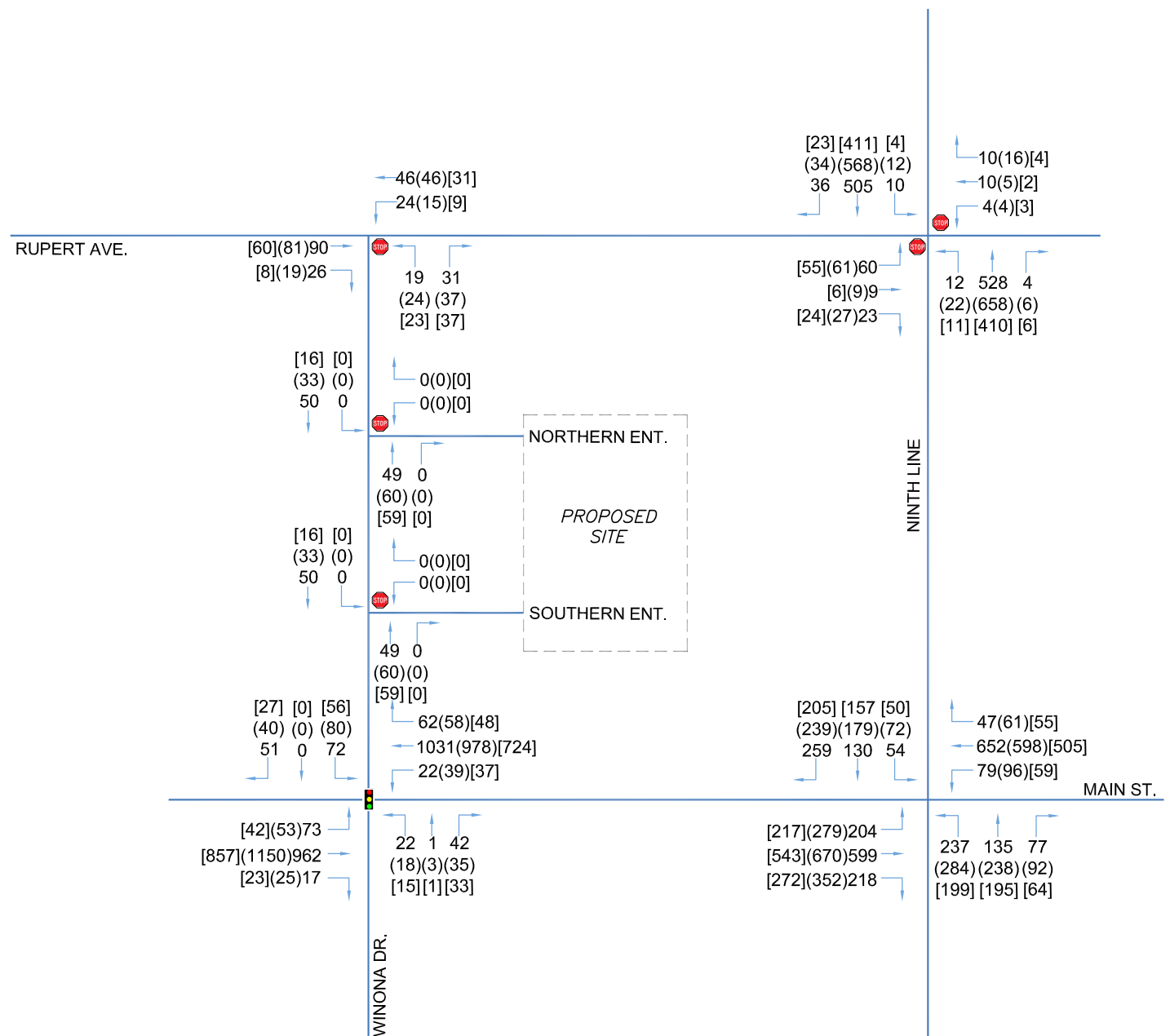


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.255.9741
E: info@nengineering.com
www.nengineering.com

PROJECT:

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

DRAWING TITLE:

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

DRAWN BY: SA

DATE: 20 JULY 2024

CHECKED BY: AZ

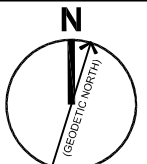
SCALE: NTS

PROJECT NO.:

22-71

DRAWING NO.:

FIG-8



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) 6 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 2031 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 9.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

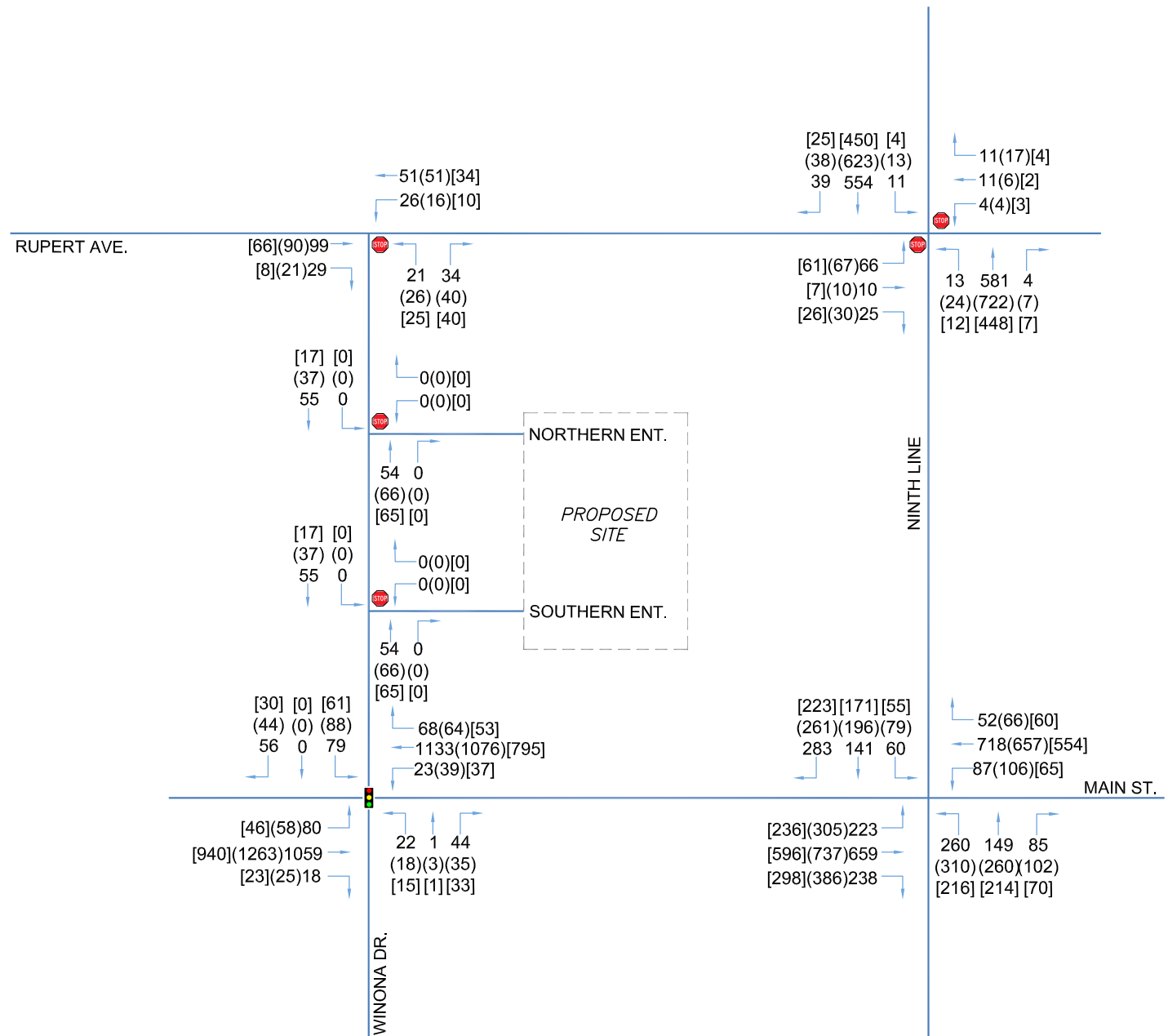


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416-255-9741
E: info@nengineering.com
www.nengineering.com

PROJECT:

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

DRAWING TITLE:

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

DRAWN BY: SA

DATE: 20 JULY 2024

CHECKED BY: AZ

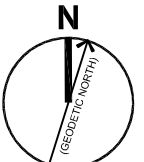
SCALE: NTS

PROJECT NO.:

DRAWING NO.:

22-71

FIG-9



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 2036 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) 6 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 2036 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 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.

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)									
24692.4 ft²	23.55	43%	57%	4.22	50%	50%	4.22	50%	50%
(A) Trips	582	250	332	105	53	53	105	53	53
Based on Brampton City Policy (Trips/ Total GFA)	Average rate\$	IN	OUT	Average rate\$	IN	OUT	Average rate\$	IN	OUT
Gross Floor Area (24692.4 ft²)	19.45	74%	26%	3.62	52%	48%	3.62	52%	48%
(B) Trips	481	356	125	90	47	43	90	47	43
Based on Brampton City Policy (Trips/ Designated Worship Area)	Average rate#	IN	OUT	Average rate#	IN	OUT	Average rate #	IN	OUT
(Worship Area) 2301.7 ft²	44.08	74%	26%	6.83	52%	48%	6.83	52%	48%
(C) Trips	102	75	27	16	8	8	16	8	8
Average of A+B+C Total Site Generated Trips	388	227	161	70	36	34	70	36	34

* (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 by ITE peak hour of generated rate and GFA of the policy are very high for Friday Midday Peak hour. However, as the Muslim population in the Town of Stouffville is comparatively very low (150 families as per Darul-Khair Website), there are rare chances of full capacity demand at the near future. The parking survey of existing Darul-Khair Mosque at Stouffville indicated that the mosque has total of 110 congregants of both Friday prayers.

Furthermore, other landuses of the building such as Gym, Multi-purpose hall senior lounge and other service areas are not considered as trip generators since the main function of the mosque is to serve congregants for prayer.

Therefore, the average value of all three methods was used in the capacity analysis and is still a very conservative.

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	80	41	13	9	13	9
Westbound on Main St	61	60	8	11	9	11
Northbound on 9th Line	34	33	7	7	7	6
Southbound on 9th Line	41	22	7	6	6	7
Eastbound on Rupert Ave	9	2	1	1	1	0
Westbound on Rupert Ave	2	4	0	1	0	1
Total	227	162	36	35	36	34

The site generated trips are distributed and shown in Figure 10.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

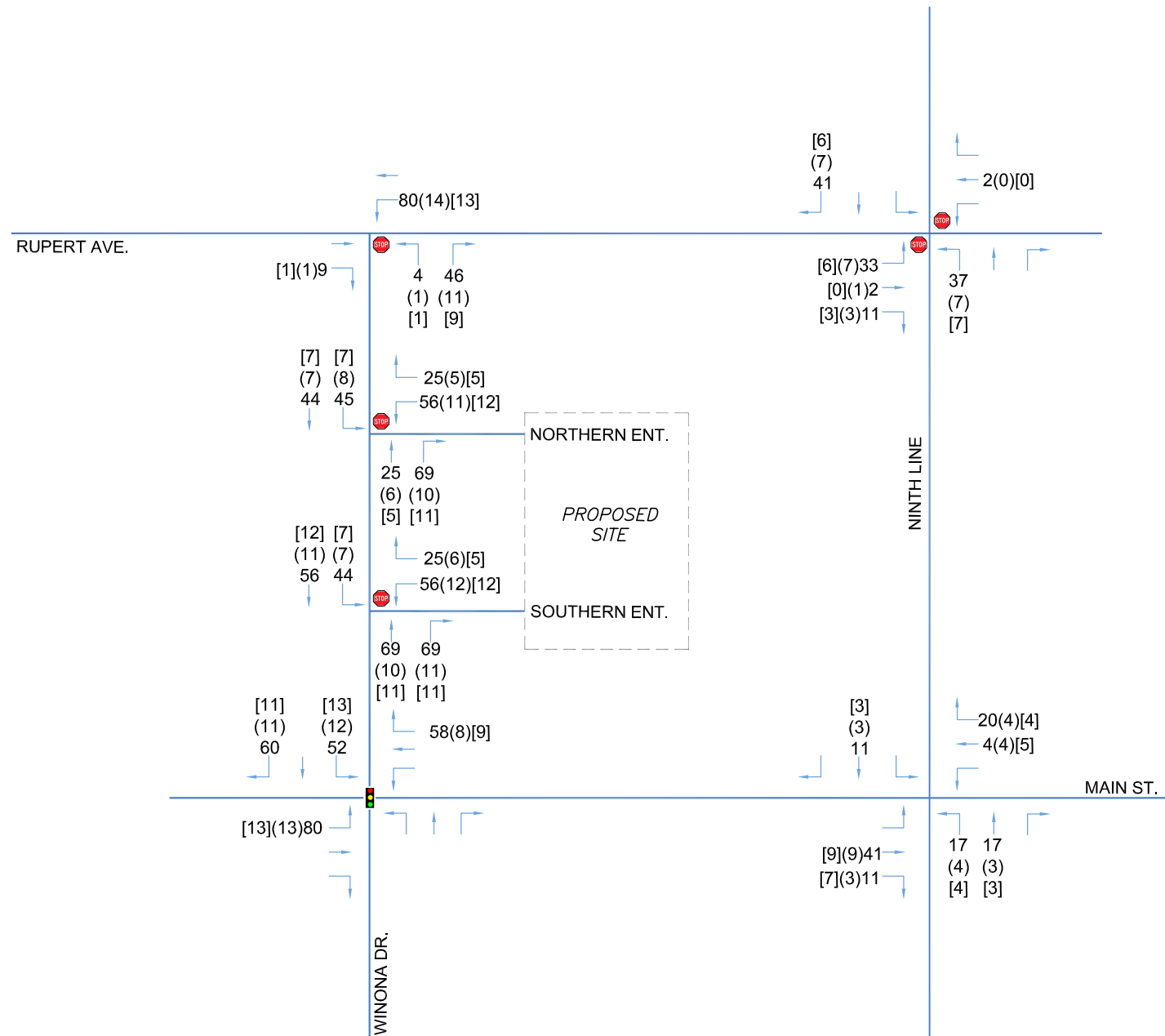


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.256.9741
E: info@nengineering.com
www.nengineering.com

PROJECT:

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

DRAWING TITLE:

**TRIPS GENERATED BY
PROPOSED DEVELOPMENT**

DRAWN BY: SA

DATE: 20 JULY 2024

CHECKED BY: AZ

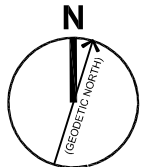
SCALE: NTS

PROJECT NO.:

DRAWING NO.:

22-71

FIG-10



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 11.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

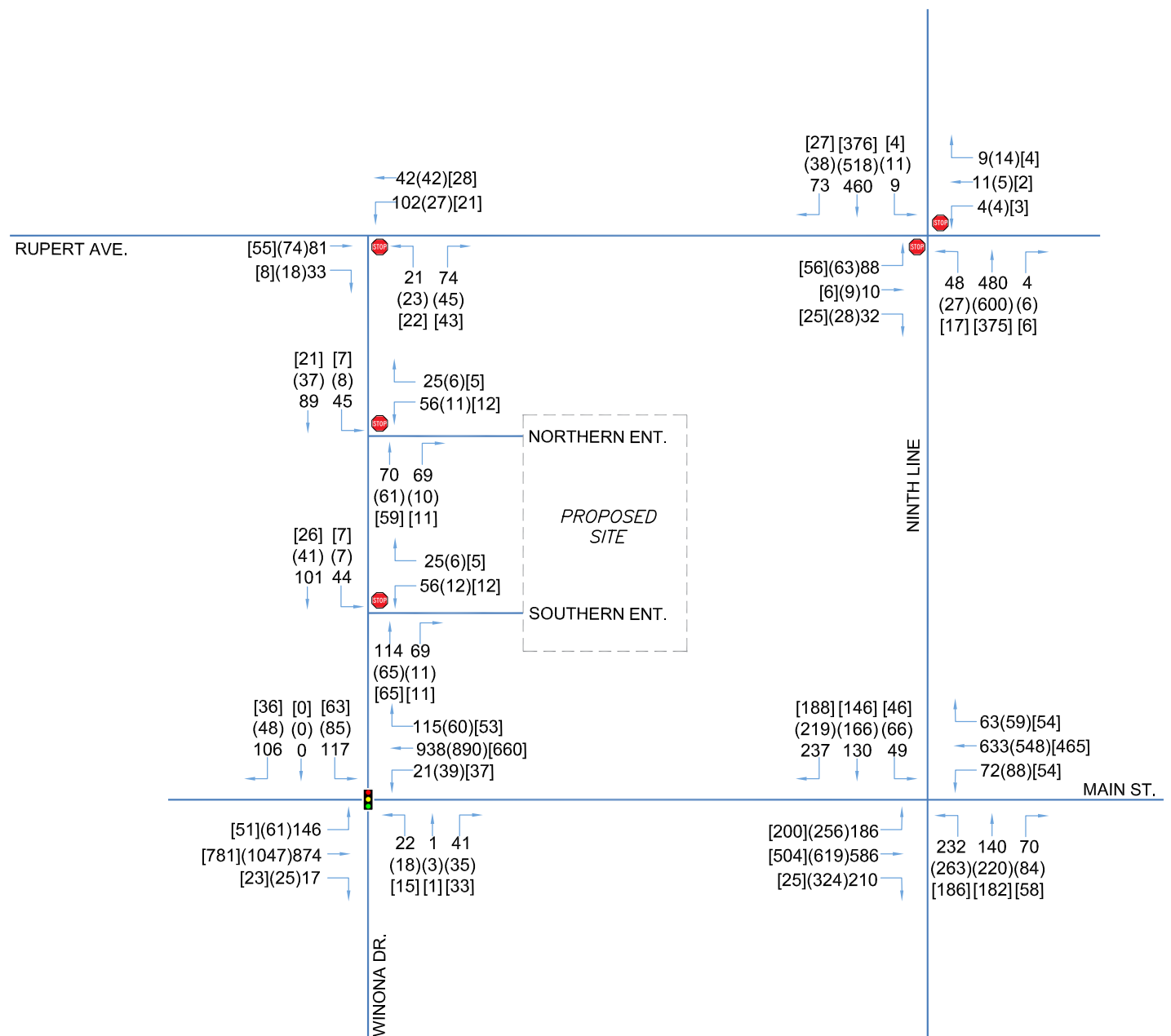


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.256.9741
E: info@nengineering.com
www.nengineering.com

PROJECT:

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

DRAWING TITLE:

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

DRAWN BY: SA

DATE: 20 JULY 2024

CHECKED BY: AZ

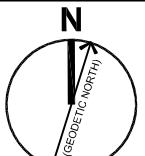
SCALE: NTS

PROJECT NO.:

22-71

DRAWING NO.:

FIG-11



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 2026 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 2026 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) 6 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	41.7			D	35.3			C	32.2		
	EBL	0.81	D	46.1	74.6	0.82	D	39.6	76.3	0.59	C	24.6	70.4	35.0
	EBT	1.01	E	77.2	128.8	0.94	D	54.6	130.6	0.85	D	45.1	127.1	
	EBR	0.21	C	28.7	32.6	0.28	C	25.6	57.3	0.02	C	25.0	30.5	
	WBL	0.50	C	32.4	49.2	0.52	C	28.2	35.2	0.29	C	27.8	21.5	50.0
	WBTR	0.67	D	36.8	82.9	0.49	C	28.3	65.7	0.53	C	34.2	59.0	
	NBL	0.42	B	19.4	49.9	0.59	C	26.1	68.5	0.36	B	19.5	46.0	100.0
	NBT	0.20	C	24.4	36.6	0.40	C	32.6	58.4	0.28	C	26.3	41.0	
	NBR	0.05	C	22.4	18.4	0.06	C	27.4	18.3	0.04	C	23.1	15.0	
	SBL	0.10	C	22.8	18.0	0.17	C	26.5	23.7	0.10	C	22.8	19.5	100.0
	STB	0.22	C	28.9	33.7	0.34	D	35.0	56.4	0.26	C	29.5	42.2	
	SBR	0.16	C	28.1	35.3	0.15	C	32.1	29.9	0.13	C	27.8	23.6	130.0
Winona Dr & Main St	Overall	-	B	13.0	-	-	A	8.50	-	-	A	7.3	-	
	EBL	0.59	B	17.5	73.0	0.18	A	5.1	63.3	0.11	A	3.5	33.7	30
	EBTR	0.40	A	7.5	108.8	0.44	A	5.6	132.6	0.32	A	4.0	39.4	
	WBL	0.07	A	5.7	18.7	0.14	A	4.7	30.0	0.09	A	3.4	16.3	35
	WBTR	0.48	A	8.2	84.8	0.39	A	5.3	65.6	0.28	A	3.8	41.2	
	NBLTR	0.12	C	34.3	23.1	0.13	D	37.7	22.8	0.12	D	41.5	21.5	
	SBLTR	0.75	D	49.4	58.6	0.60	D	44.7	36.2	0.50	D	45.6	29.5	
Southern Site Ent & Winona Dr	WBLR	0.13	B	11.1	15.7	0.02	A	9.1	10.8	0.02	A	9.1	9.7	
	SBLT	0.03	A	2.5	6.8	0.01	A	1.1	3.3	0.01	A	1.7	2.3	
Northern Site Ent & Winona Dr	WBLR	0.12	B	10.6	14.2	0.02	A	9.0	10.2	0.02	A	9.0	10.7	
	SBLT	0.03	A	2.7	8.6	0.01	A	1.4	2.8	0.01	A	1.9	2.3	
Rupert Ave & Winona Dr	WBLT	0.08	A	5.6	8.7	0.02	A	3.0	5.4	0.01	A	3.3	-	
	NBLR	0.12	A	10.0	13.5	0.08	A	9.4	11.9	0.08	A	9.1	11.6	
9th Line & Rupert Ave	EBLTR	0.38	C	20.2	22.4	0.31	C	19.8	22.8	0.19	B	13.6	17.5	
	WBLTR	0.07	B	14.7	14.3	0.06	B	14.5	13.3	0.02	B	11.9	8.9	
	NBL	0.06	A	9.2	21.9	0.03	A	8.8	11.3	0.02	A	8.2	9.9	50
	SBL	0.01	A	8.5	5.5	0.01	A	9.1	7.8	0.00	A	8.1	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 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.

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 12.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

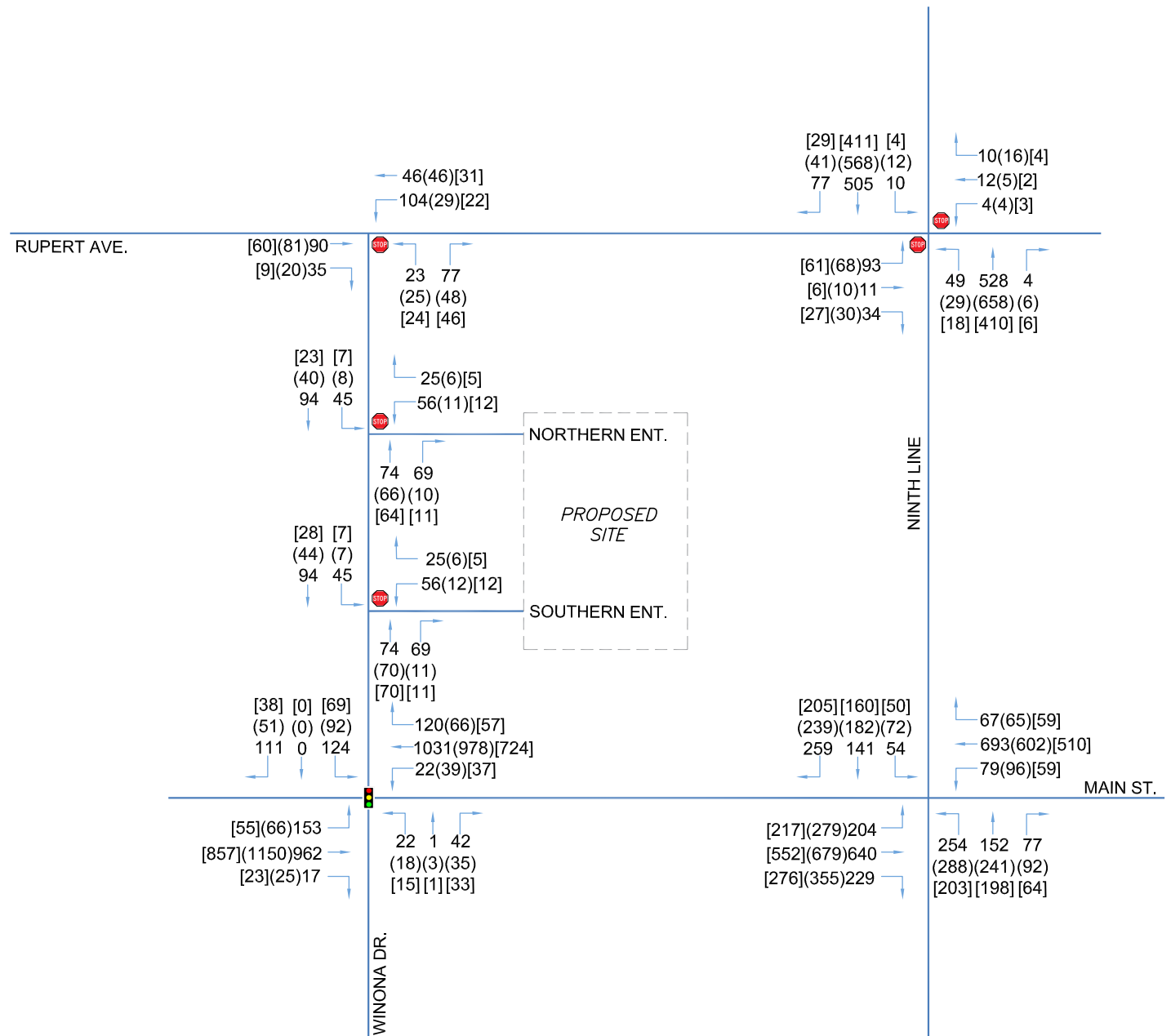


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.255.9741
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

DATE: 20 JULY 2024

CHECKED BY: AZ

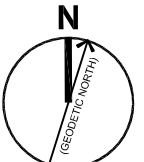
SCALE: NTS

PROJECT NO.:

DRAWING NO.:

22-71

FIG-12



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) 6 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 2031 condition Synchro capacity analysis reports are provided in Appendix H.

Table 32 - Future Total 2031 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	52.3			D	40.4			C	34.5		
	EBL	1.00	F	90.3	77.0	0.93	E	59.8	73.7	0.68	C	27.7	77.1	35.0
	EBT	1.10	F	106.7	114.8	0.98	E	64.3	126.5	0.92	D	54.4	123.4	
	EBR	0.25	C	29.3	61.1	0.33	C	25.6	54.7	0.25	C	27.4	38.0	
	WBL	0.55	C	34.3	41.5	0.58	C	31.3	49.4	0.38	C	29.3	23.8	50.0
	WBTR	0.73	D	38.8	88.0	0.52	C	28.0	72.5	0.57	C	34.9	62.4	
	NBL	0.46	B	19.8	53.5	0.70	C	32.4	75.7	0.41	C	20.3	49.5	100.0
	NBT	0.22	C	24.7	34.1	0.45	D	35.7	63.5	0.31	C	27.2	47.2	
	NBR	0.05	C	22.6	17.3	0.06	C	29.3	15.8	0.04	C	23.6	15.9	
	SBL	0.11	C	22.8	21.7	0.21	C	28.1	25.3	0.11	C	23.3	17.1	100.0
	STB	0.24	C	29.2	39.0	0.39	D	37.7	57.2	0.29	C	30.5	47.7	
	SBR	0.21	C	28.9	39.6	0.18	C	34.2	35.2	0.14	C	28.5	29.0	130.0
Winona Dr & Main St	Overall	-	B	14.4	-	-	A	9.0	-	-	A	7.5	-	
	EBL	0.73	C	29.1	71.2	0.23	A	6.00	73.5	0.13	A	3.8	40.8	30
	EBTR	0.44	A	8.3	134.2	0.48	A	6.2	176.6	0.35	A	4.4	93.7	
	WBL	0.08	A	6.2	26.0	0.16	A	5.4	80.5	0.10	A	3.6	30.1	35
	WBTR	0.53	A	9.3	100.1	0.44	A	5.8	82.0	0.31	A	4.1	54.4	
	NBLTR	0.12	C	33.8	26.8	0.13	D	37.3	24.0	0.11	D	41.1	15.6	
	SBLTR	0.76	D	50	58.1	0.62	D	45.7	48.0	0.54	D	46.3	30.9	
Southern Site Ent & Winona Dr	WBLR	0.12	B	10.7	25.8	0.02	A	9.2	10.2	0.02	A	9.1	8.9	
	SBLT	0.03	A	2.6	9.7	0.01	A	1.1	2.3	0.01	A	1.6	5.6	
Northern Site Ent & Winona Dr	WBLR	0.12	B	10.7	25.1	0.02	A	9.1	10.8	0.02	A	9.0	11.7	
	SBLT	0.03	A	2.6	20.3	0.01	A	1.3	3.2	0.01	A	1.8	2.3	
Rupert Ave & Winona Dr	WBLT	0.08	A	5.5	12.1	0.02	A	3.0	4.5	0.02	A	3.1	4.2	
	NBLR	0.13	B	10.1	17.0	0.09	A	9.5	13.5	0.08	A	9.2	12.9	
9th Line & Rupert Ave	EBLTR	0.44	C	23.3	34.8	0.38	C	23.4	30.8	0.21	B	14.5	19.0	
	WBLTR	0.08	C	15.7	14.2	0.07	C	15.5	12.3	0.02	B	12.3	7.4	
	NBL	0.06	A	9.4	19.4	0.03	A	9.0	9.4	0.02	A	8.4	9.1	50
	SBL	0.01	A	8.7	6.0	0.02	A	9.4	6.7	0.00	A	8.3	2.1	

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.

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 13.

LEGEND

00 FRIDAY MIDDAY PEAK

(00) FRIDAY PM PEAK

[00] SATURDAY PM PEAK

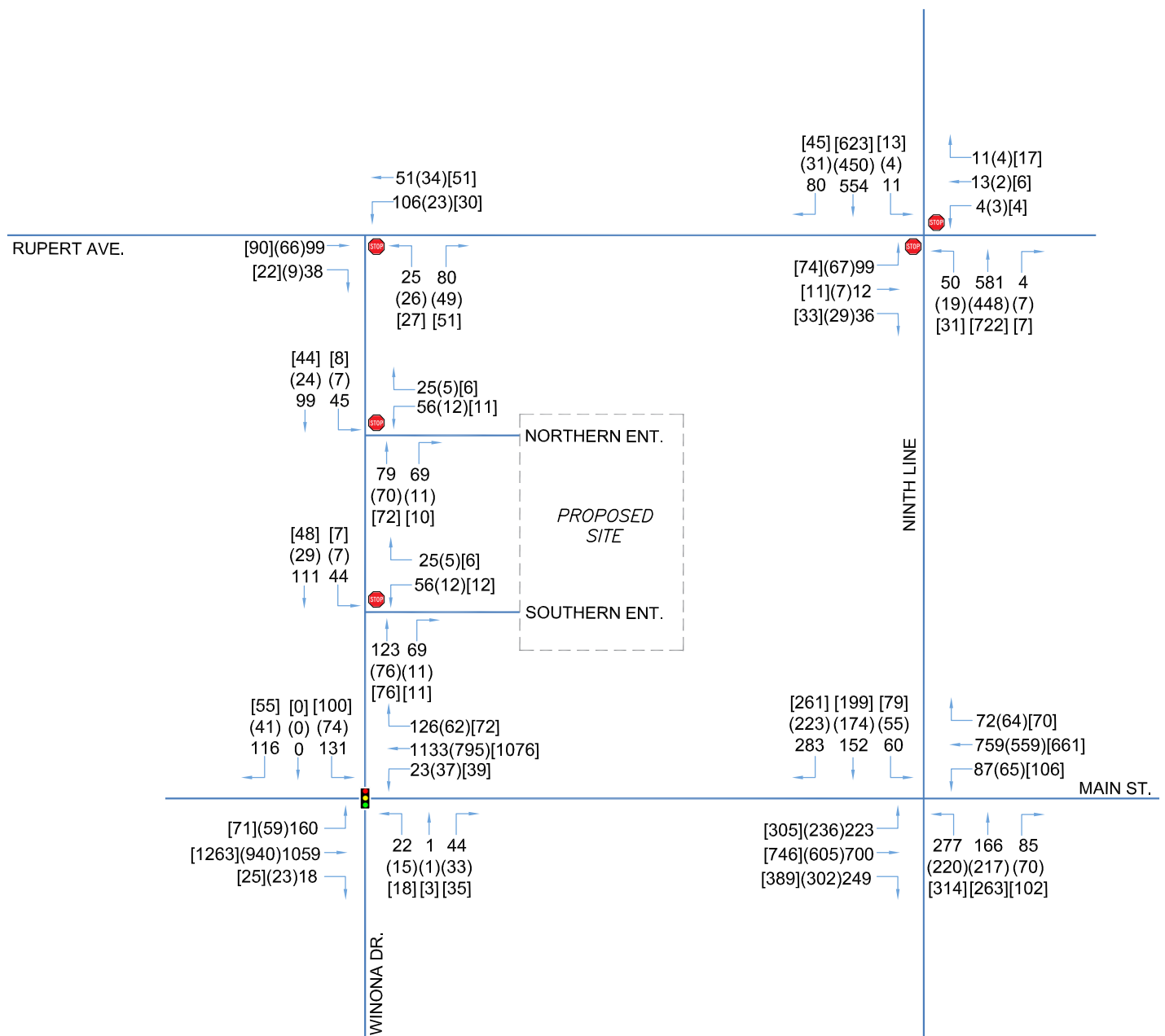


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.255.9741
E: info@nengineering.com
www.nengineering.com

PROJECT:

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

DRAWING TITLE:

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

DRAWN BY: SA

DATE: 20 JULY 2024

CHECKED BY: AZ

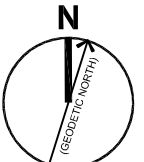
SCALE: NTS

PROJECT NO.:

22-71

DRAWING NO.:

FIG-13



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) 6 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	70.7			D	51.8			D	40.4		
	EBL	1.20	F	160.6	74.9	1.10	F	112.1	74.4	0.79	D	35.3	76.6	35.0
	EBT	1.24	F	162.0	111.5	1.07	F	90.3	120.1	1.01	E	75.8	126.1	
	EBR	0.30	C	30.9	36.3	0.39	C	26.3	68.8	0.30	C	28.2	49.0	
	WBL	0.54	C	32.4	56.7	0.64	C	34.8	33.0	0.42	C	31.0	21.9	50.0
	WBTR	0.79	D	40.9	103.4	0.56	C	28.8	72.1	0.62	D	36.2	68.2	
	NBL	0.52	C	20.7	61.8	0.79	D	39.1	74.6	0.46	C	20.8	45.2	100.0
	NBT	0.24	C	25.5	42.6	0.50	D	37.4	69.6	0.34	C	27.9	51.3	
	NBR	0.06	C	23.0	17.6	0.07	C	29.9	24.8	0.05	C	23.9	21.4	
	SBL	0.13	C	23.2	19.0	0.24	C	28.4	27.2	0.13	C	23.5	16.9	100.0
	STB	0.26	C	29.9	44.9	0.42	D	38.7	45.7	0.31	C	31.1	45.6	
	SBR	0.28	C	30.5	46.0	0.27	D	36.0	40.9	0.15	C	28.8	30.1	130.0
Winona Dr & Main St	Overall	-	B	17.1	-	-	A	9.70	-	-	A	7.8	-	
	EBL	0.93	E	64.9	102.5	0.29	A	7.6	86.7	0.15	A	4.2	59.5	30
	EBTR	0.49	A	9.3	197.4	0.54	A	7.1	202.6	0.39	A	4.7	145.5	
	WBL	0.10	A	6.9	26.7	0.20	A	6.5	40.3	0.11	A	3.9	16.7	35
	WBTR	0.59	B	10.5	111.2	0.49	A	6.6	80.9	0.34	A	4.5	60.3	
	NBLTR	0.11	C	33.4	27.1	0.12	D	36.8	22.2	0.11	D	40.7	22.5	
	SBLTR	0.78	D	50.5	57.6	0.66	D	46.8	45.6	0.57	D	47.1	34.5	
Southern Site Ent & Winona Dr	WBLR	0.13	B	11.3	15.7	0.02	A	9.2	10.7	0.02	A	9.2	11.9	
	SBLT	0.03	A	2.4	10.9	0.01	A	1.0	-	0.01	A	1.5	2.3	
Northern Site Ent & Winona Dr	WBLR	0.12	B	10.8	16.2	0.02	A	9.1	10.6	0.02	A	9.1	9.9	
	SBLT	0.03	A	2.6	9.9	0.01	A	1.2	-	0.01	A	1.8	2.3	
Rupert Ave & Winona Dr	WBLT	0.08	A	5.4	13.4	0.02	A	2.9	6.5	0.02	A	3.1	5.9	
	NBLR	0.14	B	10.3	16.1	0.10	A	9.6	11.4	0.09	A	9.3	12.2	
9th Line & Rupert Ave	EBLTR	0.51	D	28.2	41.2	0.47	D	29.1	24.6	0.25	C	15.7	17.2	
	WBLTR	0.09	C	16.8	13.0	0.09	C	17.2	12.8	0.02	B	12.8	9.6	
	NBL	0.07	A	9.7	18.0	0.04	A	9.2	12.2	0.02	A	8.5	7.5	50
	SBL	0.01	A	8.9	5.50	0.02	A	9.8	7.4	0.00	A	8.4	2.9	

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 0.93 and E exceeding 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 & Winona Dr. 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 2024	EBL	0.61	C	28.6	73.7	0.64	C	25.3	74.4	0.45	C	22.3	67.9
	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		0.81	D	46.1	74.6	0.82	D	39.6	76.3	0.59	C	24.6	70.4
	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		1.00	F	90.3	77.0	0.93	E	59.8	73.7	0.68	C	27.7	77.1
	FB2037		1.09	F	119.2	76.9	1.09	F	108.3	74.9	0.78	C	34.3	75.3
	FT 2037		1.20	F	160.6	74.9	1.10	F	112.1	74.4	0.79	D	35.3	76.6
	EX 2024	EBT	0.87	D	49.5	123.5	0.84	D	41.0	122.7	0.77	D	39.4	96.7
	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		1.01	E	77.2	128.8	0.94	D	54.6	130.6	0.85	D	45.1	127.1
	FB 2032		1.03	F	83.1	125.3	0.98	E	62.5	110.7	0.90	D	52.1	124.3
	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		1.24	F	162.0	111.5	1.07	F	90.3	120.1	1.01	E	75.8	126.1
Main St & Winona Dr	EX 2024	EBT	0.16	A	4.1	18.4	0.10	A	3.6	14.4	0.06	A	2.2	9.2
	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		0.59	B	17.5	73.0	0.18	A	5.1	63.3	0.11	A	3.5	33.7
	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		0.73	C	29.1	71.2	0.23	A	6.00	73.5	0.13	A	3.8	40.8
	FB2037		0.35	A	8.50	70.9	0.23	A	6.0	67.0	0.11	A	3.0	34.2
	FT 2037		0.93	E	64.9	102.5	0.29	A	7.6	86.7	0.15	A	4.2	59.5

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 marginally affected with the addition of traffic from the proposed development as compared to Background Development scenarios. However, no new critical movement is generated.

In order to mitigate the critical movement at the intersection of Rupert Ave & 9th Line, traffic signal control was examined based on OTM signal warrant analysis and review of signalized intersection performance based on Synchro capacity analysis in the following subsequent sections.

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 11 below shows the spacing distance of the access driveways from the nearest main intersection.



Figure 14 - 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 60 km/hr. Table 39 below outlines the sight distance analysis for the proposed site entrance.

Table 38 - 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>	60 km/h	60 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)	108.4	125.1
Measured Sight Distance	130.0	130.0
Minimum Sight Distance Satisfied	Yes	Yes
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 geometry of Winona Dr and access configuration, both entrances have clear sight distances as the road is straight and there are no trees, hydro poles, etc. that are blocking any sight lines. Therefore, the available sight distance is of sufficient length for drivers turning onto Winona Dr as expected.



Figure 15- Visibility Triangles at the Site Entrance

9.3 Internal Site Circulation

Detailed vehicle maneuvering diagrams (VMD) have been provided for the design vehicle in Appendix K. Drawings A-1.1, A-1.1a, and A-2.1 illustrates that the turning movements for design vehicles (passenger car and garbage truck) are accommodated for based on the proposed site geometry, access widths, and number of accesses.

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

10 Parking Review

As per the Town of Whitchurch-Stouffville Zoning By-law, the proposed development requires 79 parking spaces. Parking calculations in the site plan provided by n Architecture Inc., shows that 53 parking spaces are provided. Bike racks are also proposed in the site plan to promote active transportation.

A separate parking justification study has been conducted with the help of proxy site data to support the parking supply is sufficient for the future parking demand of the building. Refer the Parking Justification Study report in the submission package for further details.

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 40 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 39 - 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 storeys building including worship area, Gym offices space educational space with total GFA of 2294 m² and 53 parking spaces.

The proposed development will generate a total of inbound and outbound 388 Friday Midday peak hour trips and 70 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 40 based on the guidelines to encourage active transportation alternatives.

Based on the Town of Stouffville Zoning By-Law, the proposed development requires 79 parking spaces. The site plan has provided 53 parking spaces. Parking justification study has been conducted based on the proxy site studies to ensure the parking supply can meet the future parking demand.

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.



BLANK PAGE

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

CAUTION! This is an external email. Verify the sender's email address and carefully examine any links or attachments before clicking. If you believe this may be a phishing email, forward it to isitsafe@york.ca then delete it from your inbox. If you think you may have clicked on a phishing link, report it to the IT Service Desk, ext. 71111, and notify your supervisor immediately.

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>

*****Office Hours for Summer of 2024 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 3rd September 2024. *****

N.B: The contents of this e-mail and any attachments are confidential. It is intended for the named recipient(s) only. It may contain information that is privileged, confidential or exempt from disclosure. In any event, any privilege that exists is not waived. If you are not the intended recipient do not distribute it to another person or use it for any other purpose or make copies. Delete it and advise the sender immediately.

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

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

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

CAUTION! This is an external email. Verify the sender's email address and carefully examine any links or attachments before clicking. If you believe this may be a phishing email, forward it to jsitsafe@york.ca then delete it from your inbox. If you think you may have clicked on a phishing link, report it to the IT Service Desk, ext. 71111, and notify your supervisor immediately.

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,



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>

*****Office Hours for Summer of 2024 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 3rd September 2024. *****

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



This email and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are not the intended recipient or the person responsible for delivering the email to the intended recipient, be advised that you have received this email in error and that any use, dissemination, forwarding, printing, or copying of this email is strictly prohibited. If you have received this email in error, please immediately notify me by telephone at (905) 640-1900 ext. 2291.

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,



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>

*****Office Hours for Summer of 2024 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 3rd September 2024. *****

N.B: The contents of this e-mail and any attachments are confidential. It is intended for the named recipient(s) only. It may contain information that is privileged, confidential or exempt from disclosure. In any event, any privilege that exists is not waived. If you are not the intended recipient do not distribute it to another person or use it for any other purpose or make copies. Delete it and advise the sender immediately.

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>

*****Office Hours for Summer of 2024 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 3rd September 2024. *****

N.B: The contents of this e-mail and any attachments are confidential. It is intended for the named recipient(s) only. It may contain information that is privileged, confidential or exempt from disclosure. In any event, any privilege that exists is not waived. If you are not the intended recipient do not distribute it to another person or use it for any other purpose or make copies. Delete it and advise the sender immediately.

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>

N.B: The contents of this e-mail and any attachments are confidential. It is intended for the named recipient(s) only. It may contain information that is privileged, confidential or exempt from disclosure. In any event, any privilege that exists is not waived. If you are not the intended recipient do not distribute it to another person or use it for any other purpose or make copies. Delete it and advise the sender immediately.

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.

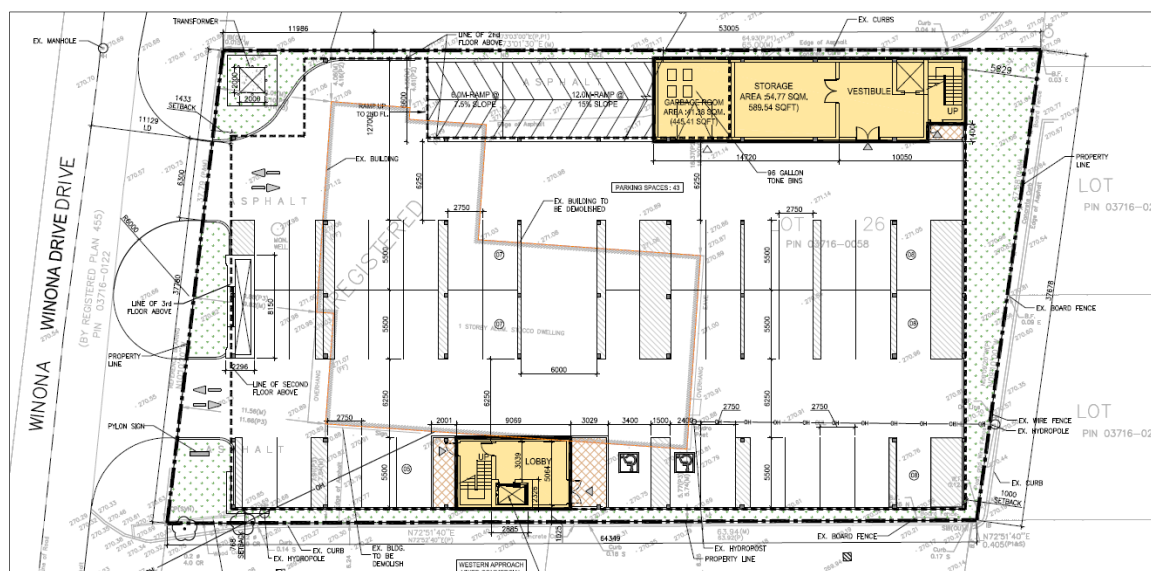


Figure 1: Preliminary Site Plan for the Proposed Development

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.**

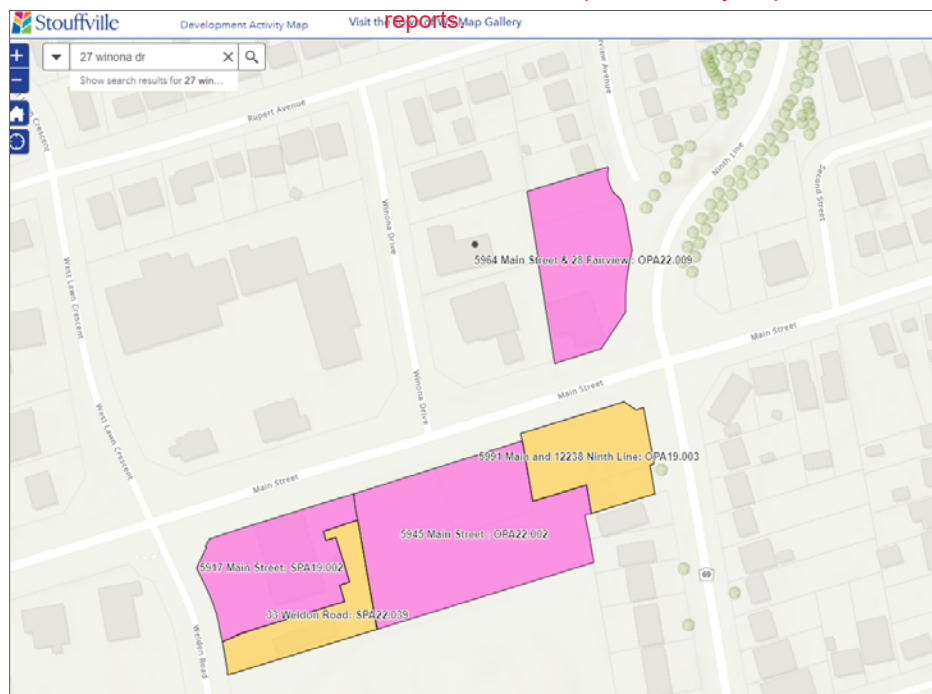


Figure 3 - Study Area

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

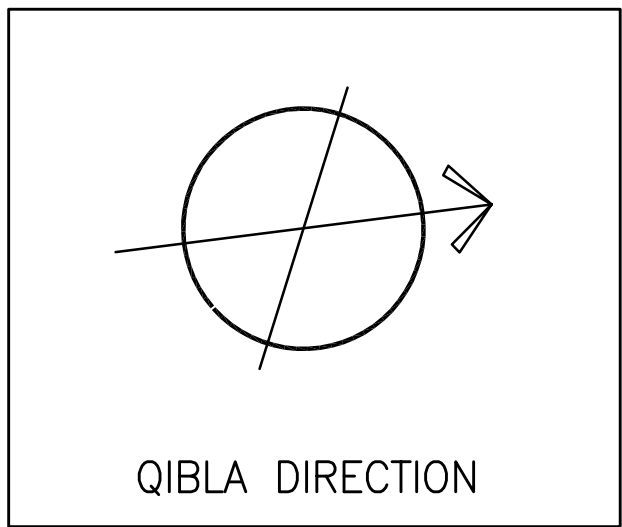
Site Plan

PARKING CALCULATION					
FUNCTION	FLOOR	RATE	AREA (SQ.M)/QTY	SPACES REQUIRED (SUB-TOTAL)	SPACES REQUIRED (BY FUNCTION)
WORSHIP AREA SPACES INCLUDE: SECOND FLOOR- WOMEN'S PRAYER HALL, MEN'S PRAYER HALL.	SECOND FLOOR	10 SPACES/ 100 SQ.M.	213.84	21 SPACES	21 SPACES
ASSEMBLY HALL SPACES INCLUDE: FIRST FLOOR- LOBBY, VESTIBULE. SECOND FLOOR- OFFICE AREA, KITCHEN, GYM, LOBBY, STAGE AREA, COAT AREA, ABLUTION AREA, THIRD FLOOR- MULTI-PURPOSE HALL, CLASS ROOM, MULTI-PURPOSE SENIOR LOUNGE, JANITOR ROOM, MEETING ROOM, IMAM ROOM, COLD STORAGE, LOBBY STORAGE, ABLUTION AREA	FIRST FLOOR	4 SPACES/ 100 SQ.M.	101.42	4 SPACES	57 SPACES
	SECOND FLOOR		702.98	28 SPACES	
	THIRD FLOOR		614.90	25 SPACE	
TOTAL PARKINGS SPACES REQUIRED					78 SPACES
TOTAL PARKINGS SPACES PROVIDED					53 SPACES
1. THE MAXIMUM OCCUPANCY IN THE BUILDING IS DURING PRAYER TIME, DURING WHICH OTHER ACTIVITIES IN THE BUILDING CEASE TO OPERATE AND ALL OCCUPANTS IN THE BUILDING CONGREGATE IN THE PRAYER AREAS. THEREFORE IN PRACTICE, THE MAXIMUM PARKING SPACES OCCUPIED WILL BE DURING FULL CAPACITY OF THE PRAYER AREAS.					

PARKING CALCULATION	REQUIRED	PROPOSED
PLACE OF WORSHIP: 10 PARKING SPACES FOR EACH 100 M² OF GFA DEVOTED TO PUBLIC USE (WORSHIP AREA) (213.84 SQM.)	21	53
TOTAL # PARKING SPACES	21	
DIFFERENCE	+32	
ACCESSIBLE PARKING : 26-100 PARKING SPACES = 4% OF TOTAL REQUIRED PARKING	01	04
DIFFERENCE	+3	
LOADING CALCULATION:		
OVER 950M² UP TO 2481.65M² OF GFA 4 LARGE LOADING SPACES REQUIRED (9M X 3.5M)	02	00
LONG TERM BICYCLE PARKING		
1 PER 1250 SQM OF GFA 2295/1250=2	02	04
SHORT TERM BICYCLE PARKING		
THE GREATER OF 1 SPACE PER 1000 SQM OF GFA OR 3 SPACES	03	03
SIZE - 1.8MX0.6M VERTICAL - 1.2M CLEARANCE		



KEY MAP
SCALE: N.T.S.



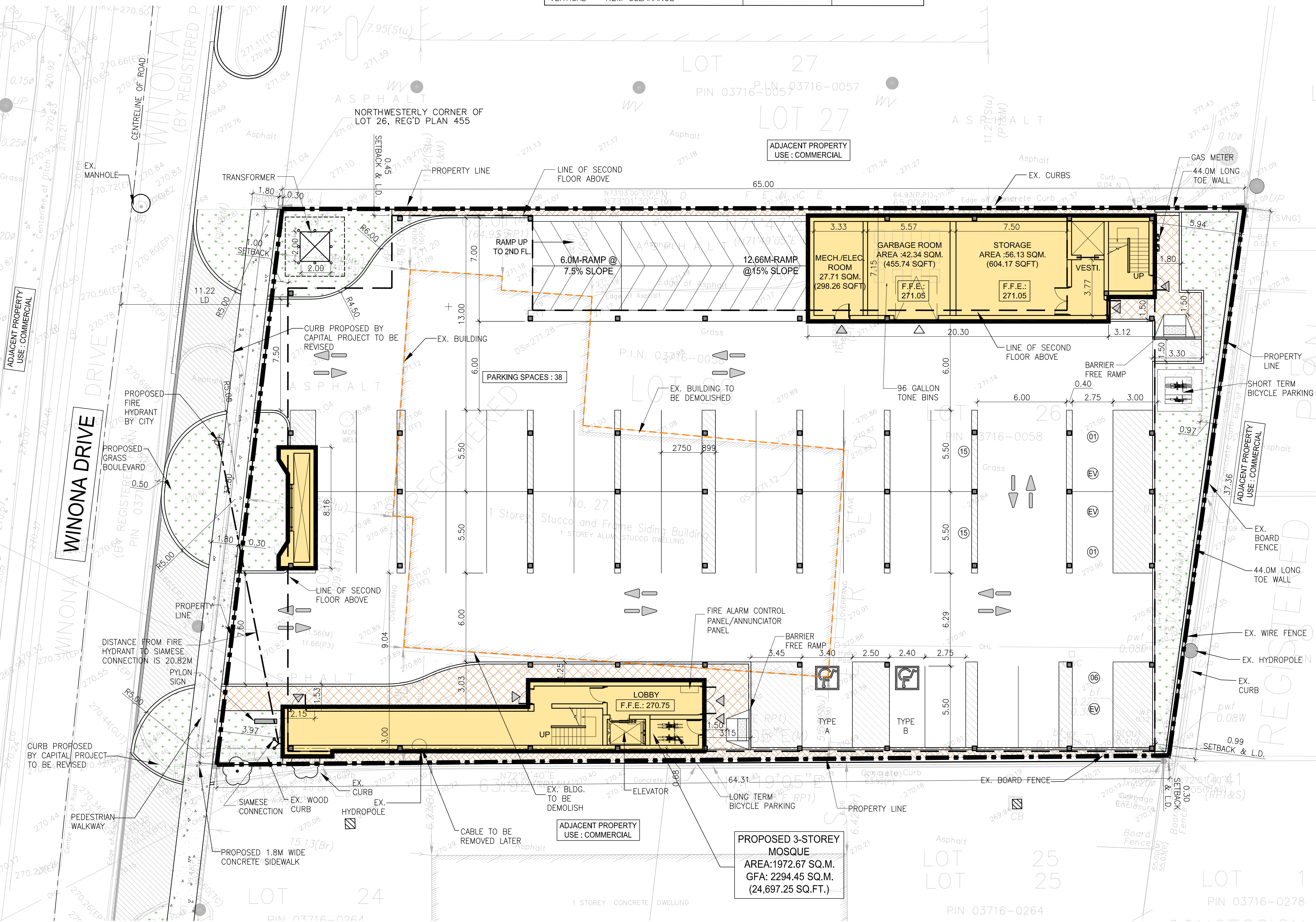
PROJECT STATISTICS		
ADDRESS: 27 , WINONA DR, WHITCHURCH, STOUFFVILLE, ON		
	REQUIRED	PROPOSED
ZONING : COMMERCIAL RESIDENTIAL MIXED -WESTERN APPROACH(CM2) (BYLAW 2010-001-70 TOWN OF WHITCHURCH STOUFFVILLE,2010)	CM-2	CM-2
LOT AREA (SQ.M)	0 SQ.M. (MIN)	2408.29 SQ.M. (0.59 ACRES)
LOT FRONTAGE	0 M	37.80 M
BUILDING COVERAGE	N/A	1972.67 SQM (81.91%)
GFA (SQ.M) (Excluding Mech./Elec. Room and Garbage Room)		2294.45 SQ.M
LANDSCAPED AREA	MIN.4.5M B/W STREET OF PARKING AREAS OR DRIVEWAYS	172.33 SQ.M (7.15%) STRIP DISTANCE VARIES MIN- 0.99 M, MAX- 6.45 M
PAVED AREA	-	1948.65 SQ.M. (80.91%)
MAX. BUILDING HEIGHT	20M	9.20M 19.05M (HEIGHT OF MINARET)

BUILDING SETBACKS		
	REQUIRED	PROPOSED
FRONT YARD (WEST)	(MIN)3 M (MAX)3 M	1.00 M
REAR YARD (EAST)	(MIN)0 M	0.99 M
INTERIOR SIDE YARD (NORTH)	(MIN)0 M	0.45 M
INTERIOR SIDE YARD (SOUTH)	(MIN)0 M	0.30 M

AREA DISTRIBUTION	
SPACES	AREA
MEN' PRAYER HALL	129.61 SQM.
WOMEN'S PRAYER HALL	84.23 SQM.
MEETING AREA	125.19 SQM.
TOTAL WORSHIP AREA	339.03 SQM.

LEGEND - PROPERTY LINE - NEW BUILDING - EXISTING BUILDING - LANDSCAPE - CONC. PAVEMENT,150MM RAISED - ASPHALT - MAIN DOOR ENTRANCE - OVERHEAD DOOR - TACTILE WALKING SURFACE	APPLICANT: n ARCHITECTURE INC. 9120 Leslie Street, Suite-208 Richmond Hill, ON. L4B 3J9 T: 416.256.9741 E: info@narchitecture.com www.narchitecture.com
LEGAL DESCRIPTION: PART 1 PLAN OF LOT 26 REGISTERED PLAN 455 TOWN OF WHITCHURCH STOUFFVILLE REGIONAL MUNICIPALITY OF YORK	OWNER'S INFO: DARUL KHAIR CENTER STOUFFVILLE 86 RINGWOOD DR. UNIT 36 WHITCHURCH-STOUFFVILLE , ON

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	
---	--



1 SITE PLAN
A-1.0 SCALE: 1:150

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

18 MAR. 2025

18th MARCH 2025
ISSUED FOR ZBA
NOT FOR CONSTRUCTION

5.	18 MAR. 2025	ISSUED FOR ZBA	ZP
4.	06 MAR. 2025	ISSUED FOR COORDINATION	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB
No.	Date	Version	Dwn.

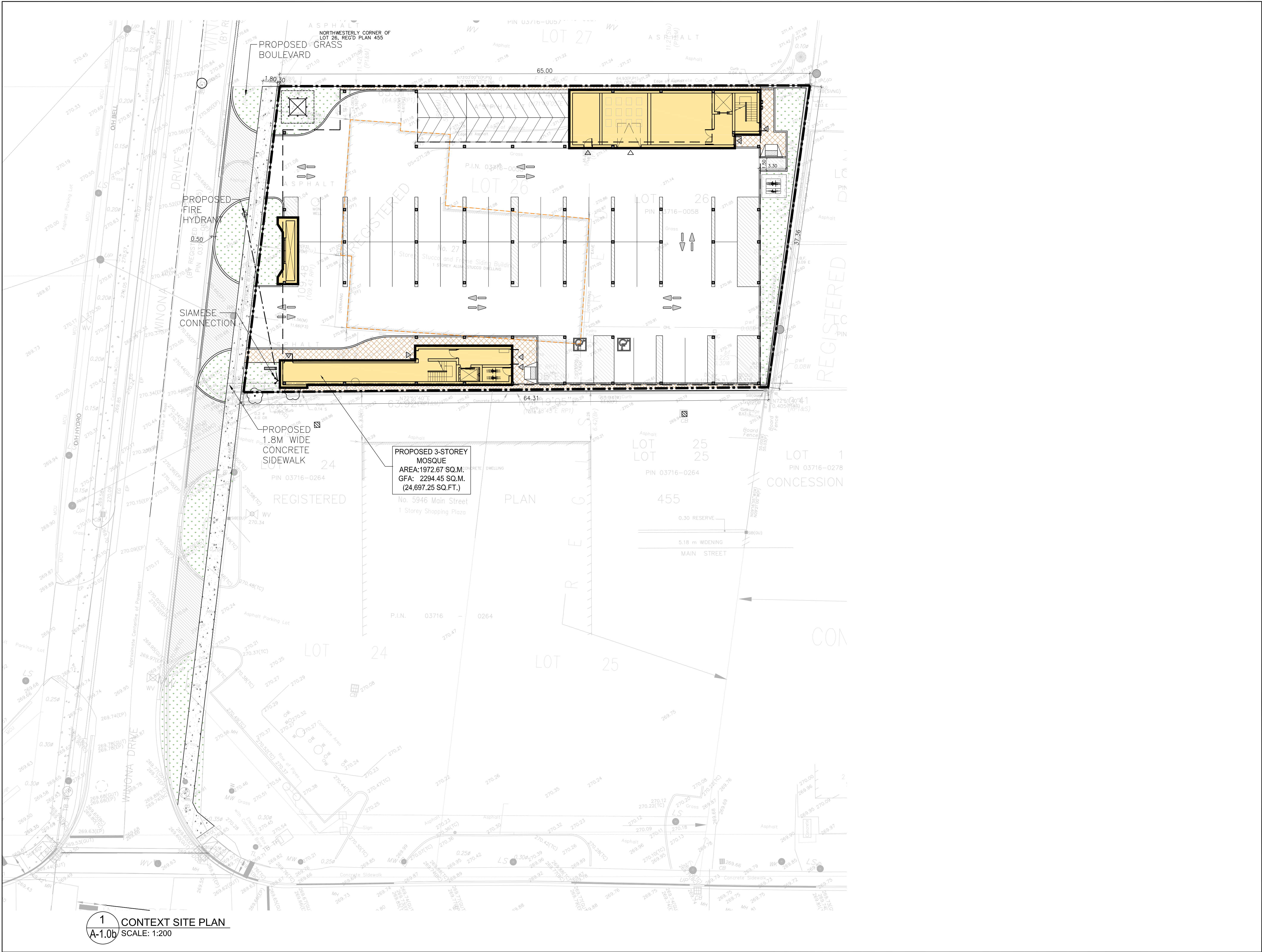
This drawing is copyright property of 'n Architecture Inc'. Not to be reproduced. Contractor must verify all job dimensions, drawings, details and specifications and report any discrepancies to the architect before proceeding with work.

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

DRAWING TITLE:
**SITE PLAN
GROUND FLOOR
LEVEL**

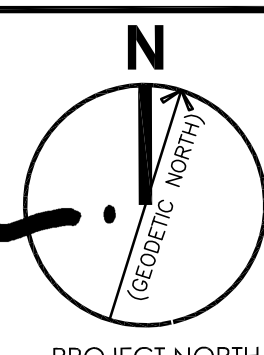
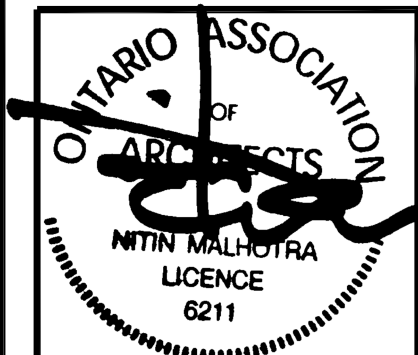
DRAWN BY: JB	DATE: 12 DEC 2022
CHECKED BY: NM	SCALE: AS NOTED
PROJECT NO.:	DRAWING NO.:

22-71 A-1.0



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



18 MAR. 2025

18th MARCH 2025
ISSUED FOR ZBA
NOT FOR CONSTRUCTION

No.	Date	Version	Dwn.
5.	18 MAR. 2025	ISSUED FOR ZBA	ZP
4.	06 MAR. 2025	ISSUED FOR COORDINATION	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB

This drawing is copyright property of 'n Architecture Inc'. Not to be reproduced. Contractor must verify all job dimensions, drawings, details and specifications and report any discrepancies to the architect before proceeding with work.

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

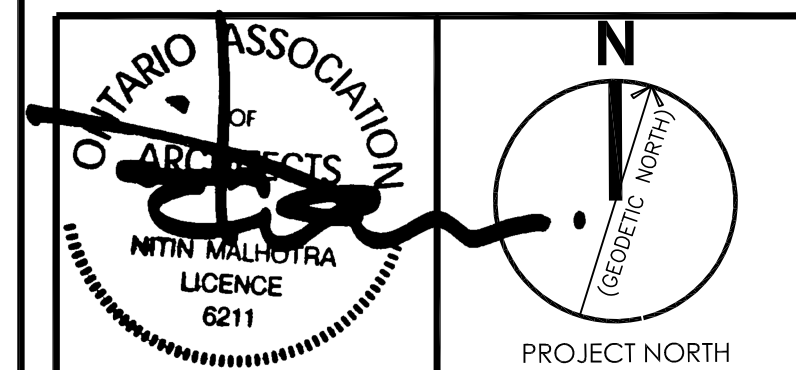
DRAWING TITLE:
**CONTEXT
SITE PLAN**

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

22-71 A-1.0b



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



18 MAR. 2025

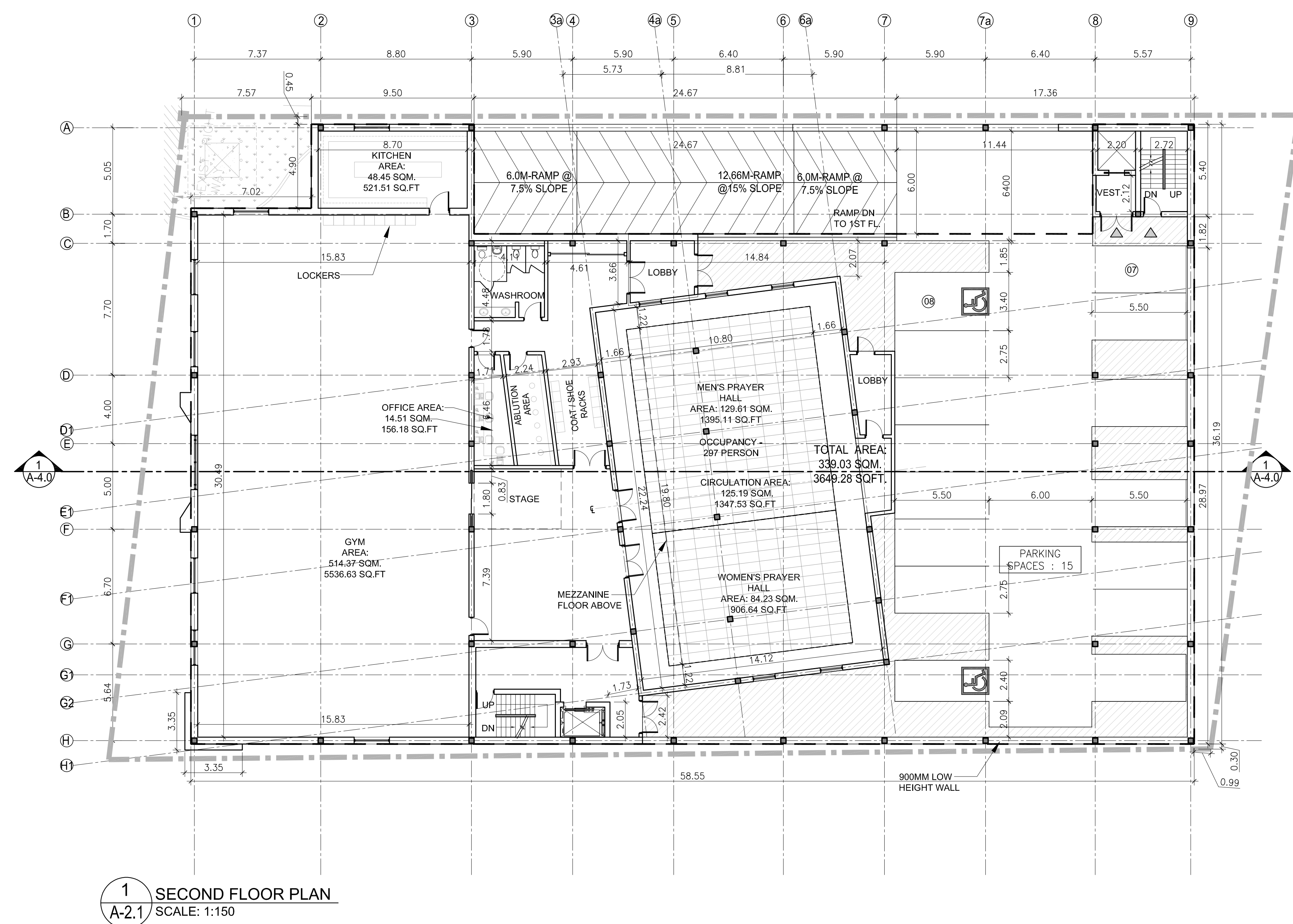
18th MARCH 2025
ISSUED FOR ZBA
NOT FOR CONSTRUCTION

5.	18 MAR. 2025	ISSUED FOR ZBA	ZP
4.	06 MAR. 2025	ISSUED FOR COORDINATION	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB
No.	Date	Version	Dwn.

This drawing is copyright property of 'n Architecture Inc.'. Not to be reproduced, Contractor must verify all job dimensions, drawings, details and specifications and report any discrepancies to the architect before proceeding with work.

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

DRAWING TITLE: SECOND FLOOR PLAN	
DRAWN BY: JB	DATE: 12 DEC 2022
CHECKED BY: NM	SCALE: AS NOTED
PROJECT NO.: 22-71	DRAWING NO.: A-2.1

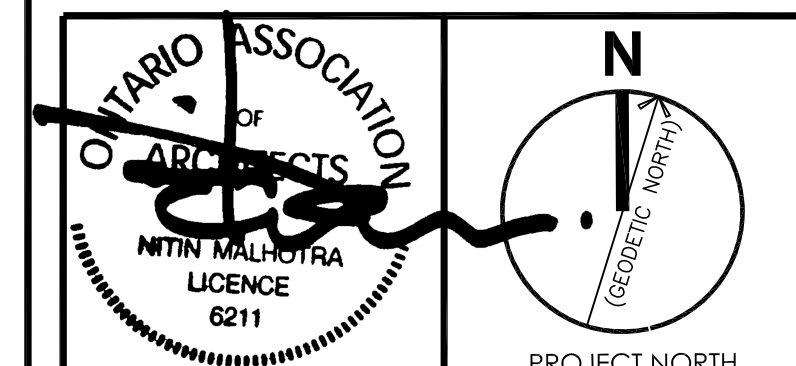


1
A-2.1 SECOND FLOOR PLAN
SCALE: 1:150



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



18 MAR. 2025

18th MARCH 2025
ISSUED FOR ZBA
NOT FOR CONSTRUCTION

No.	Date	Version	Dwn.
5.	18 MAR. 2025	ISSUED FOR ZBA	ZP
4.	06 MAR. 2025	ISSUED FOR COORDINATION	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB

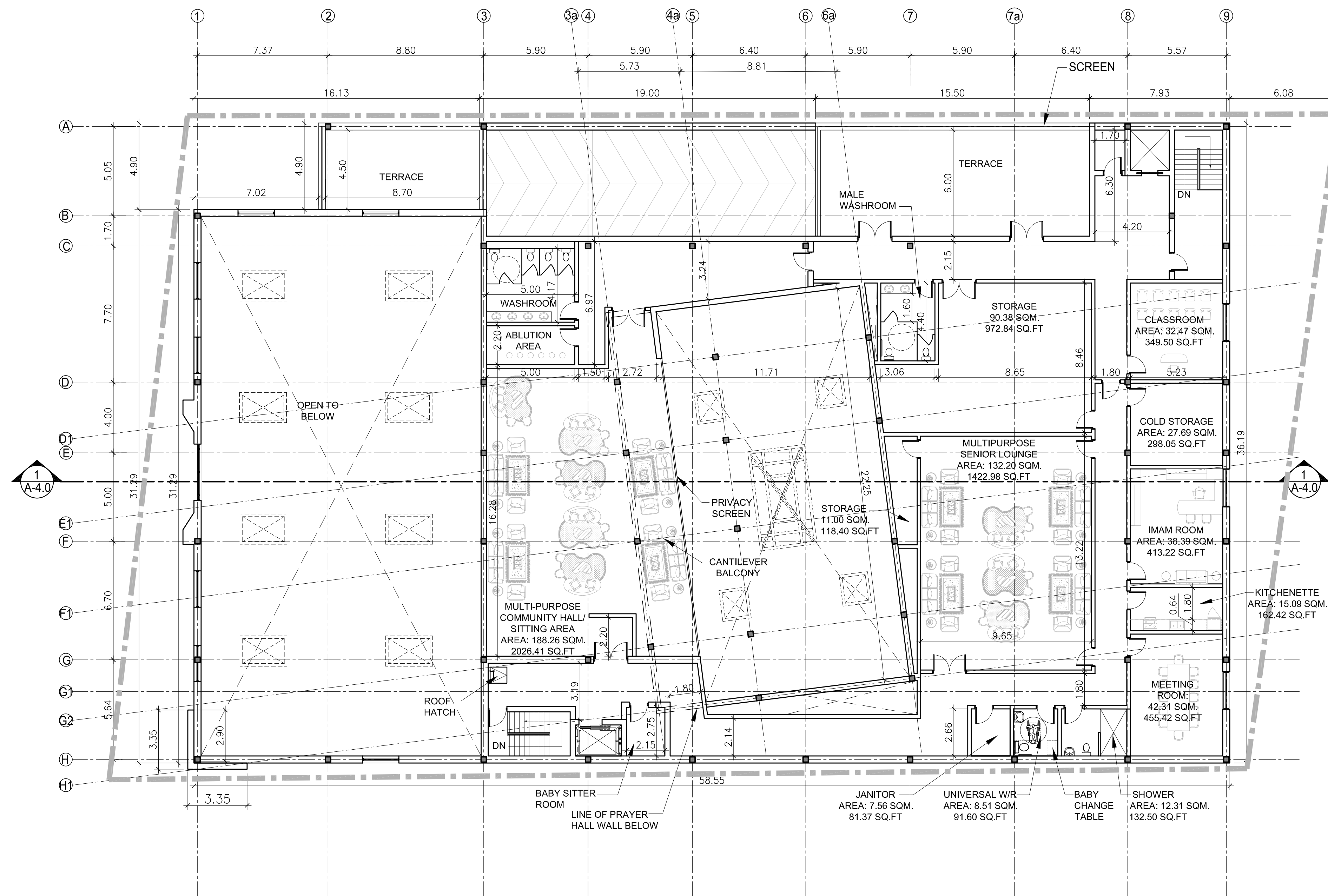
This drawing is copyright property of 'n Architecture Inc.'. Not to be reproduced. Contractor must verify all job dimensions, drawings, details and specifications and report any discrepancies to the architect before proceeding with work.

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

DRAWING TITLE:
THIRD FLOOR PLAN

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

22-71 A-2.2



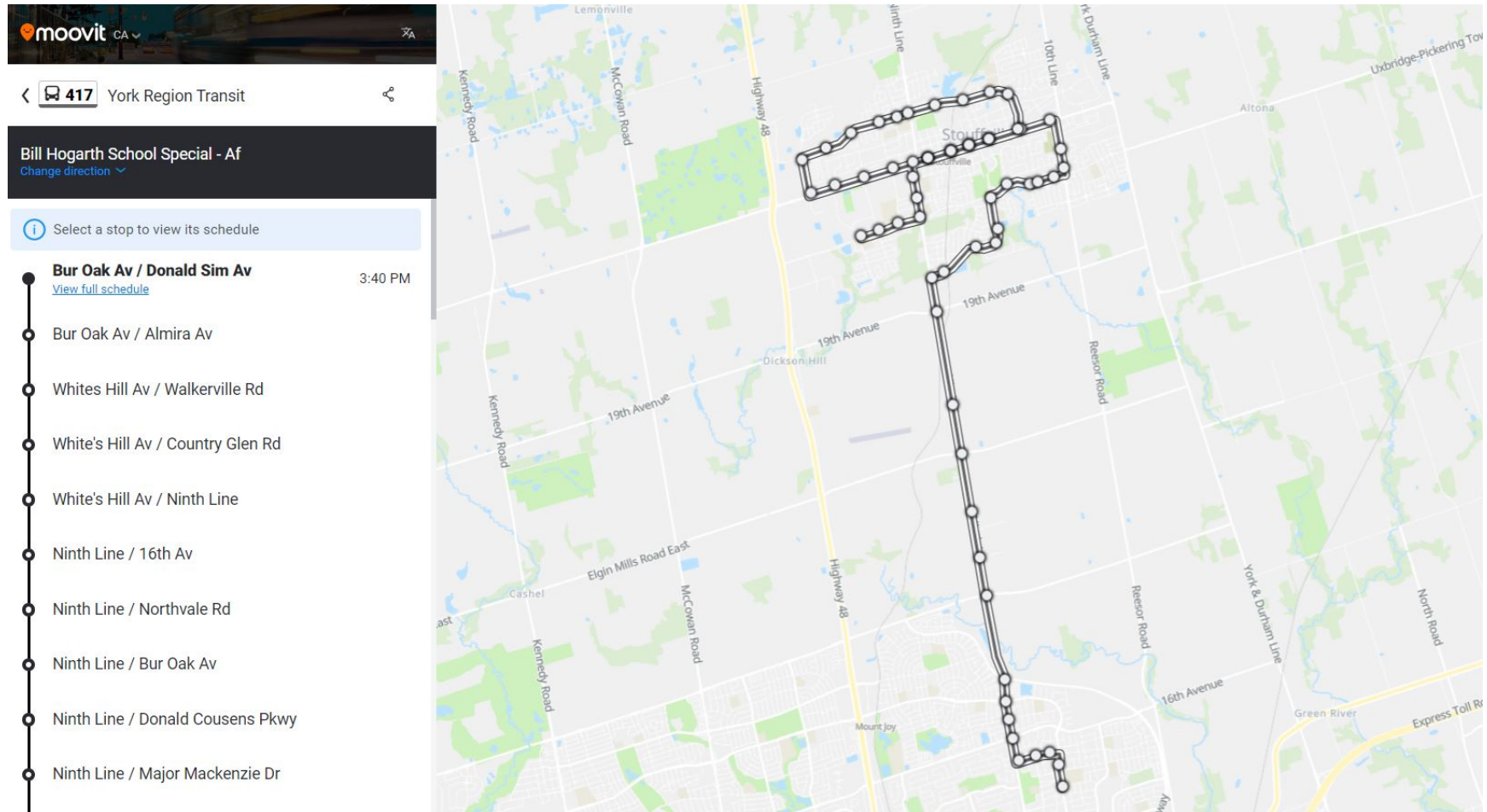
1 THIRD FLOOR PLAN
A-2.2 SCALE: 1:150

APPENDIX C

Transit & Cycling Network Maps

[illegible]

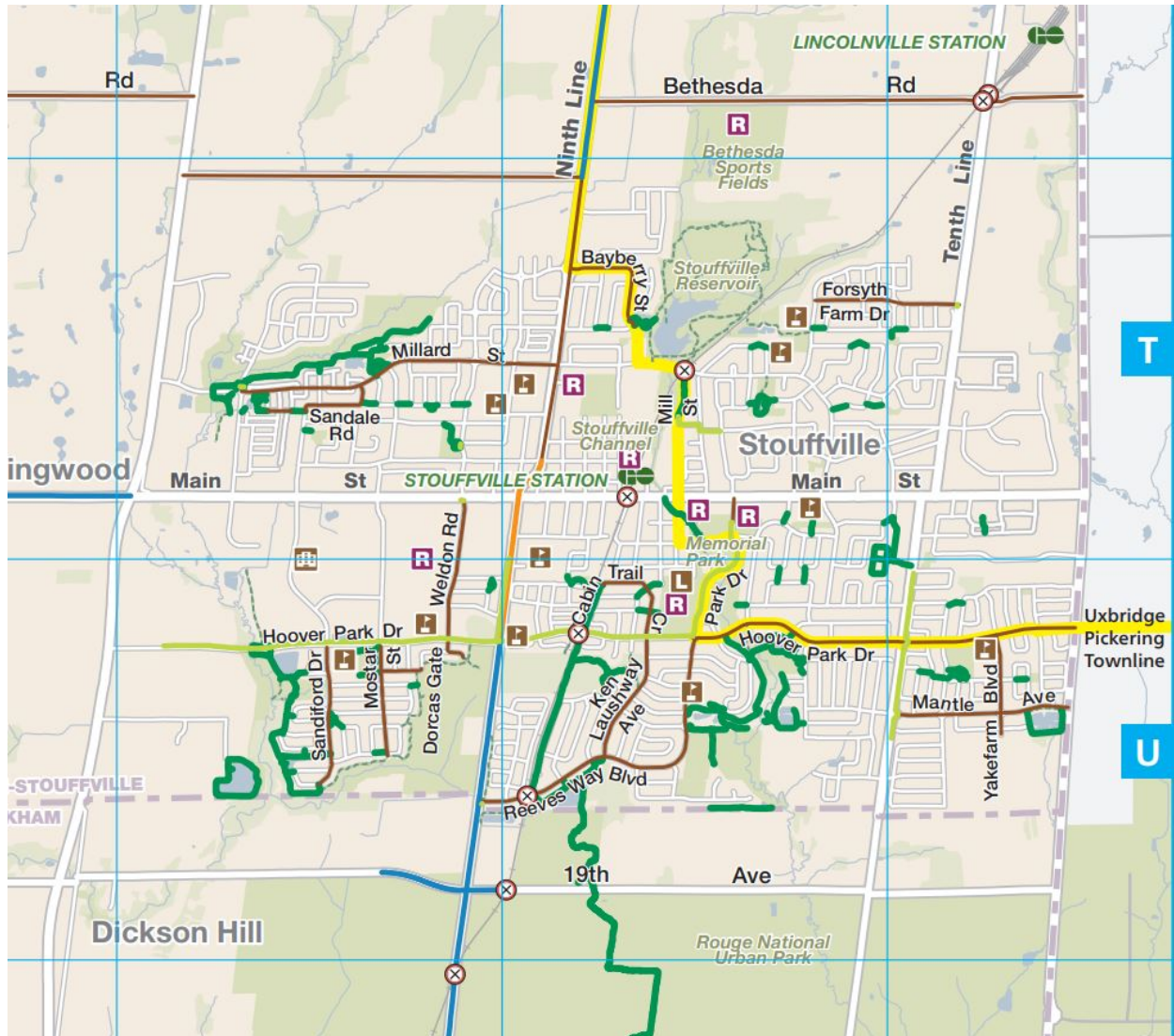
York Region Transit Line 417 Map



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 sitting in chairs, holding up certificates or awards, likely at a summer camp event.	 A group of people gathered outdoors under a large tent structure, likely at a community BBQ event.
Summer Camp	Community BBQ at Memorial Park

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="margin: auto;"> <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		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	Trucks	Cars	Totals
1	4	933	938

Main St

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

N
S
E
W

9th Line

Cars	Trucks	Buses	Totals
39	0	0	39
550	3	1	554
66	1	0	67
655	4	1	

Main St

Cars	Trucks	Buses	Totals
614	0	1	615

9th Line

Peds Cross: West Peds: 3 West Entering: 836 West Leg Total: 1774	<table style="margin: auto;"> <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	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										

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="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>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		<table style="width: 100%; border-collapse: collapse;"> <tr> <td>Buses</td><td>2</td></tr> <tr> <td>Trucks</td><td>1</td></tr> <tr> <td>Cars</td><td>448</td></tr> <tr> <td>Totals</td><td>451</td></tr> </table>	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	2																														
Trucks	1																														
Cars	448																														
Totals	451																														

Buses	Trucks	Cars	Totals
3	0	898	901

Main St

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

N
S
W
E

Cars	Trucks	Buses	Totals
48	0	0	48
490	0	3	493
79	0	0	79
617	0	3	

Main St

Cars	Trucks	Buses	Totals
694	0	2	696

Peds Cross: West Peds: 18 West Entering: 1054 West Leg Total: 1955	<table style="width: 100%; border-collapse: collapse;"> <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="width: 100%; border-collapse: collapse;"> <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:

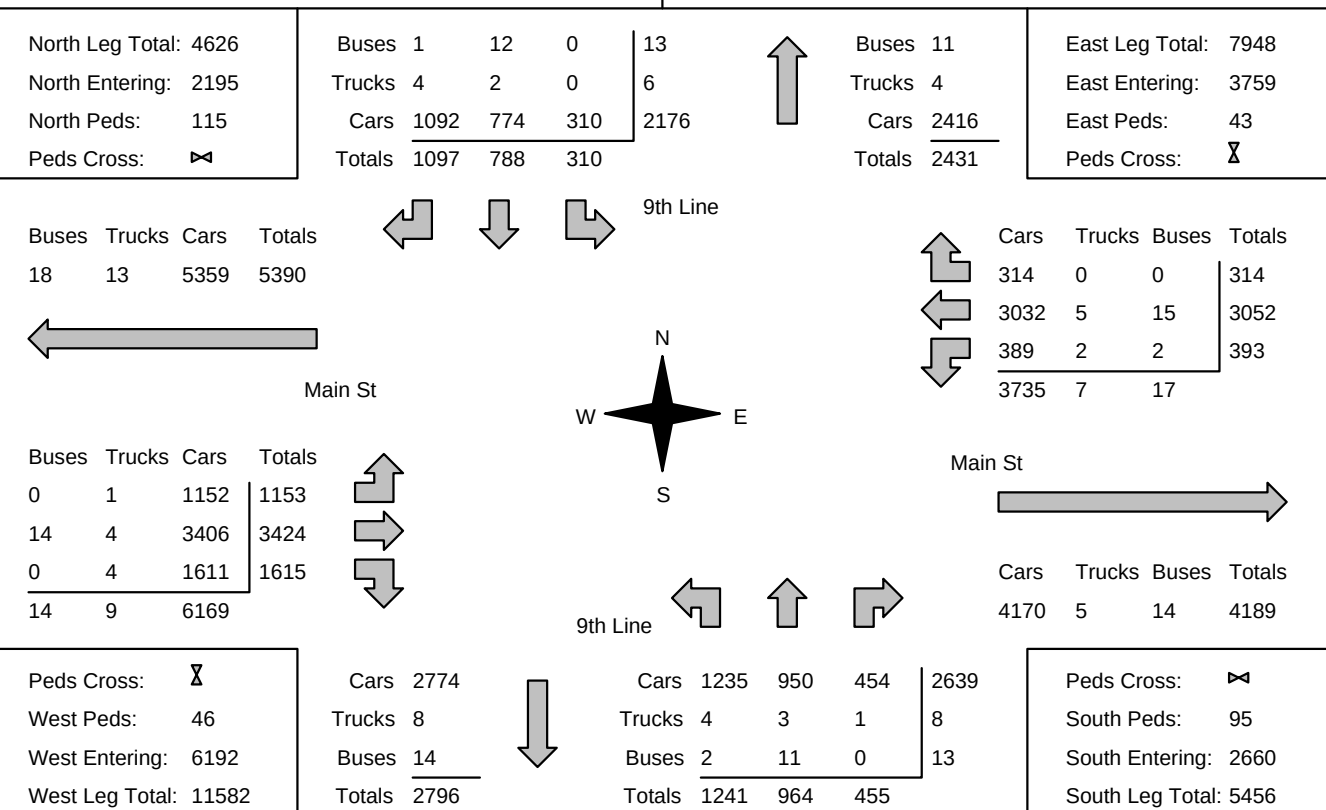
Person counted:

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



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>Buses</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>2</td><td>1</td><td>0</td><td>3</td></tr> <tr><td>Cars</td><td>154</td><td>122</td><td>40</td><td>316</td></tr> <tr><td>Totals</td><td>156</td><td>123</td><td>40</td><td></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>Buses</td><td>0</td></tr> <tr><td>Trucks</td><td>1</td></tr> <tr><td>Cars</td><td>354</td></tr> <tr><td>Totals</td><td>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

9th Line

Main St

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	

9th Line

Main St

Cars	Trucks	Buses	Totals
537	4	0	541

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

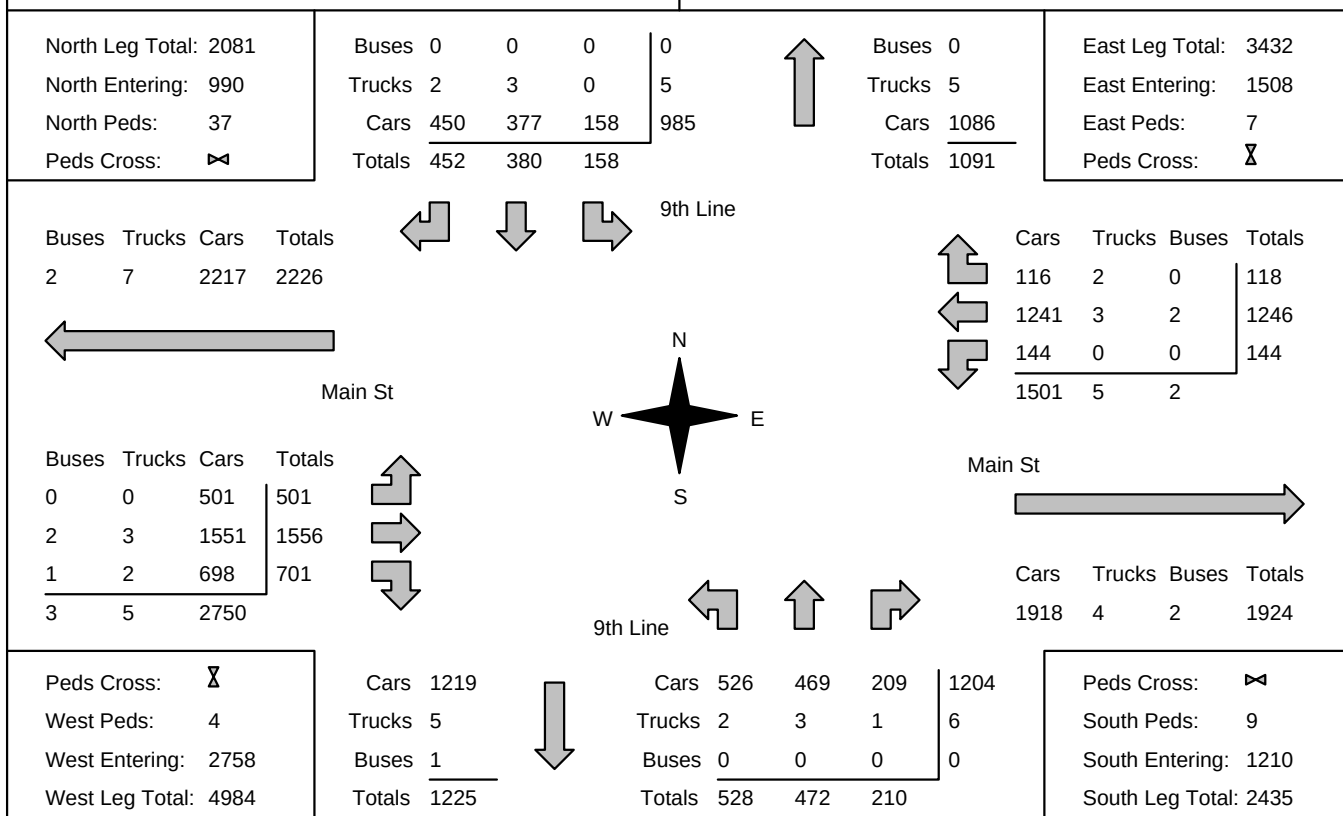
Person counted:

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:		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 0 Trucks 21 Cars 865 Totals 886 		Cars 48 Trucks 3 Buses 0 Totals 51 823 18 0 841 0 7 0 7 871 28 0	
--	--	--	--

Buses 0 Trucks 1 Cars 60 Totals 61 2 14 779 795 0 5 0 5 2 20 839		Cars 0 Trucks 12 Buses 0 Totals 12	
--	--	---	--

Peds Cross: West Peds: 1 West Entering: 861 West Leg Total: 1747		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
---	--	---	--

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

Winona Dr

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

Main St

N
S
W
E

Main St

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

driveway

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.

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



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					



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:	<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>23</td><td>0</td><td>47</td><td>70</td></tr> <tr><td>Totals</td><td>23</td><td>0</td><td>47</td><td></td></tr> </table>	Buses	0	0	0	0	Trucks	0	0	0	0	Cars	23	0	47	70	Totals	23	0	47		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Cars</td><td>72</td></tr> <tr><td>Totals</td><td>72</td></tr> </table>	Buses	0	Trucks	0	Cars	72	Totals	72	East Leg Total: 1351 East Entering: 621 East Peds: 0 Peds Cross:
Buses	0	0	0	0																											
Trucks	0	0	0	0																											
Cars	23	0	47	70																											
Totals	23	0	47																												
Buses	0																														
Trucks	0																														
Cars	72																														
Totals	72																														

Buses	Trucks	Cars	Totals
0	0	604	604

Winona Dr

Cars	Trucks	Buses	Totals
40	0	0	40
581	0	0	581
0	0	0	0
621	0	0	

Buses	Trucks	Cars	Totals
0	0	32	32
1	0	682	683
0	0	0	0
1	0	714	

Main St

Cars	Trucks	Buses	Totals
729	0	1	730

Peds Cross:
 West Peds: 0
 West Entering: 715
 West Leg Total: 1319

driveway

Cars	0	0	0	0
Trucks	0	0	0	0
Buses	0	0	0	0
Totals	0	0	0	0

Peds Cross:
 South Peds: 11
 South Entering: 0
 South Leg Total: 0

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]

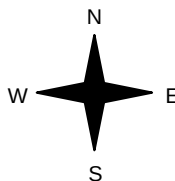
Bike Volumes Friday Midday and PM Peak

[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
--	---

<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		<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></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Buses</td><td>0</td></tr> <tr><td>Totals</td><td>31</td></tr> </table>	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: 8 South Peds: 0 South Entering: 38 South Leg Total: 69
Cars	31																										
Trucks	0																										
Buses	0																										
Totals	31																										
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																							

Peds Cross: 8 West Peds: 2 West Entering: 85 West Leg Total: 143		<table style="width: 100%;"> <tr><td>Cars</td><td>28</td><td></td></tr> <tr><td>Trucks</td><td>0</td><td></td></tr> <tr><td>Buses</td><td>0</td><td></td></tr> <tr><td>Totals</td><td>28</td><td></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: 1 South Peds: 1 South Entering: 46 South Leg Total: 74
Cars	28																															
Trucks	0																															
Buses	0																															
Totals	28																															
Cars	19	27	46																													
Trucks	0	0	0																													
Buses	0	0	0																													
Totals	19	27																														

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

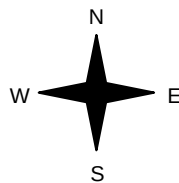
East Leg Total: 915
 East Entering: 341
 East Peds: 4
 Peds Cross: 8

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																		

Accu-Traffic Inc.

Count Date: 19-Jul-24 Site #: 2413400002

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

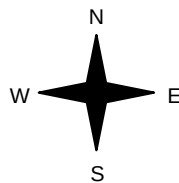
East Leg Total: 322
 East Entering: 111
 East Peds: 7
 Peds Cross: 8

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:

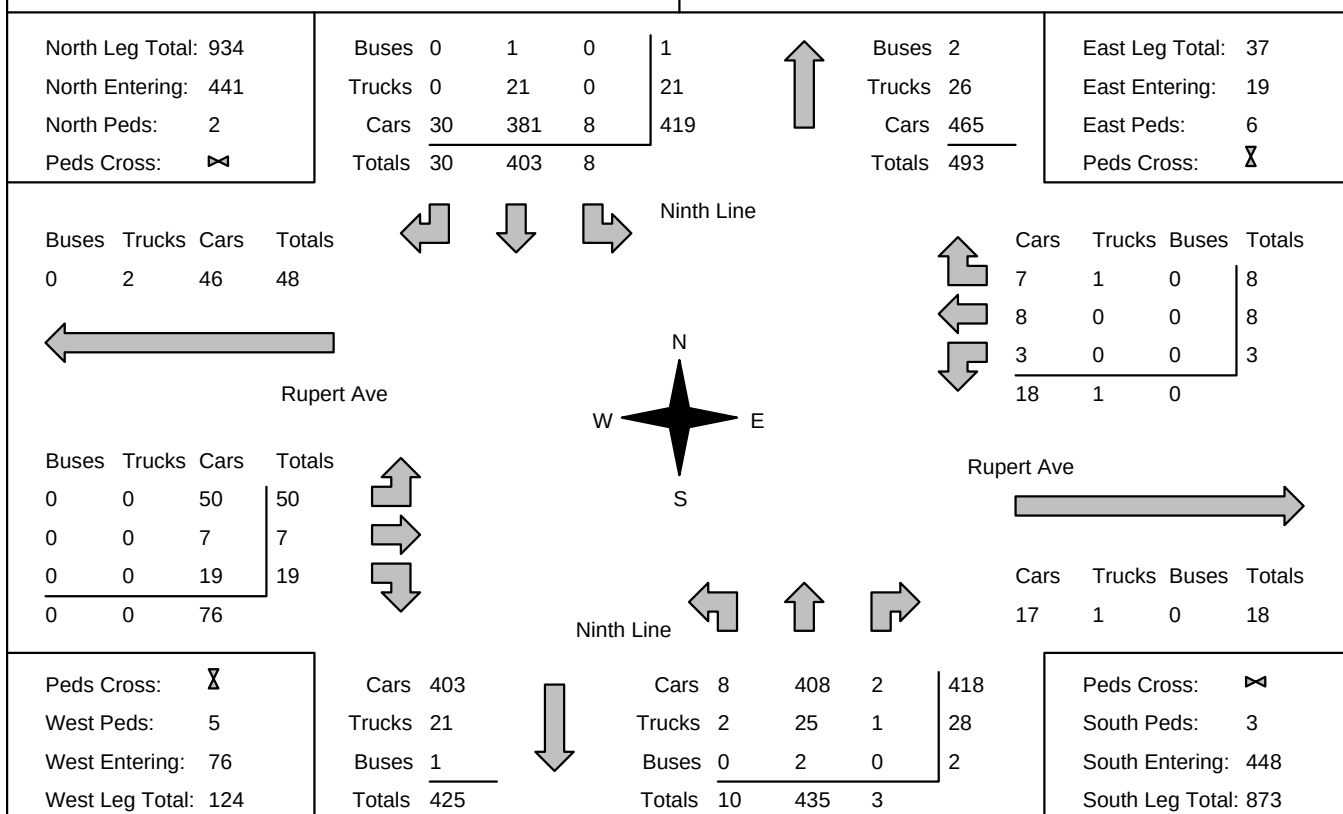
Person counted:

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																																		

Buses	Trucks	Cars	Totals
0	0	51	51

N
S
W
E

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

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

N
S
W
E

Cars	Trucks	Buses	Totals
22	0	0	22

Peds Cross:
 West Peds: 2
 West Entering: 81
 West Leg Total: 132

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

Peds Cross:
 South Peds: 1
 South Entering: 545
 South Leg Total: 1027

Comments

Accu-Traffic Inc.

Total Count Diagram

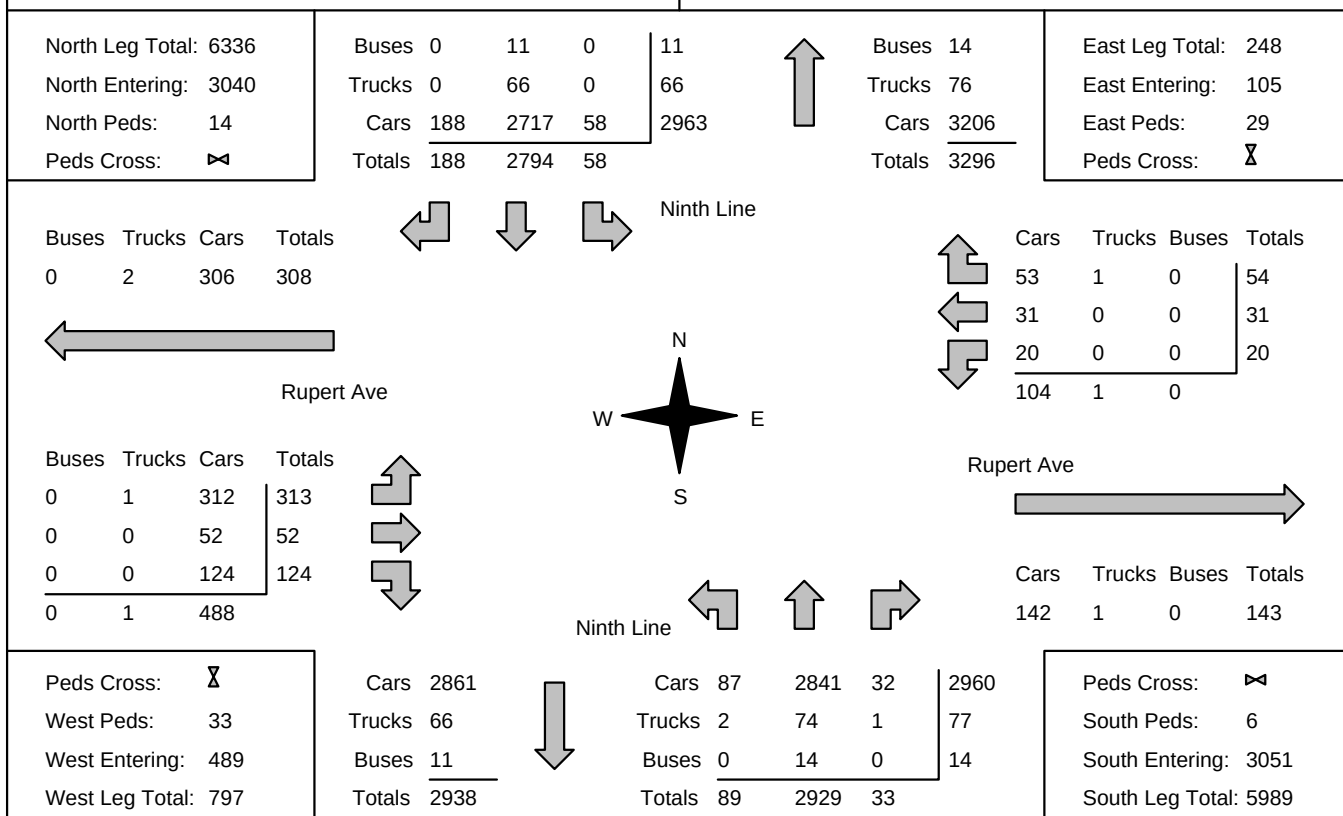
Municipality: Whitchurch-Stouffville
Site #: 2413400003
Intersection: Ninth Line & Rupert Ave
TFR File #: 1
Count date: 19-Jul-24

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

Ninth Line

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

N

S

Rupert Ave

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

Ninth Line

Rupert Ave

Cars	Trucks	Buses	Totals
13	0	0	13

Peds Cross: West Peds: 6 West Entering: 71 West Leg Total: 100	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>340</td></tr> <tr><td>Trucks</td><td>0</td></tr> <tr><td>Buses</td><td>0</td></tr> <tr><td>Totals</td><td>340</td></tr> </table>	Cars	340	Trucks	0	Buses	0	Totals	340		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>9</td><td>309</td><td>5</td><td>323</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>9</td><td>310</td><td>5</td><td></td></tr> </table>	Cars	9	309	5	323	Trucks	0	0	0	0	Buses	0	1	0	1	Totals	9	310	5		Peds Cross: South Peds: 1 South Entering: 324 South Leg Total: 664
Cars	340																															
Trucks	0																															
Buses	0																															
Totals	340																															
Cars	9	309	5	323																												
Trucks	0	0	0	0																												
Buses	0	1	0	1																												
Totals	9	310	5																													

Comments

Accu-Traffic Inc.

Total Count Diagram

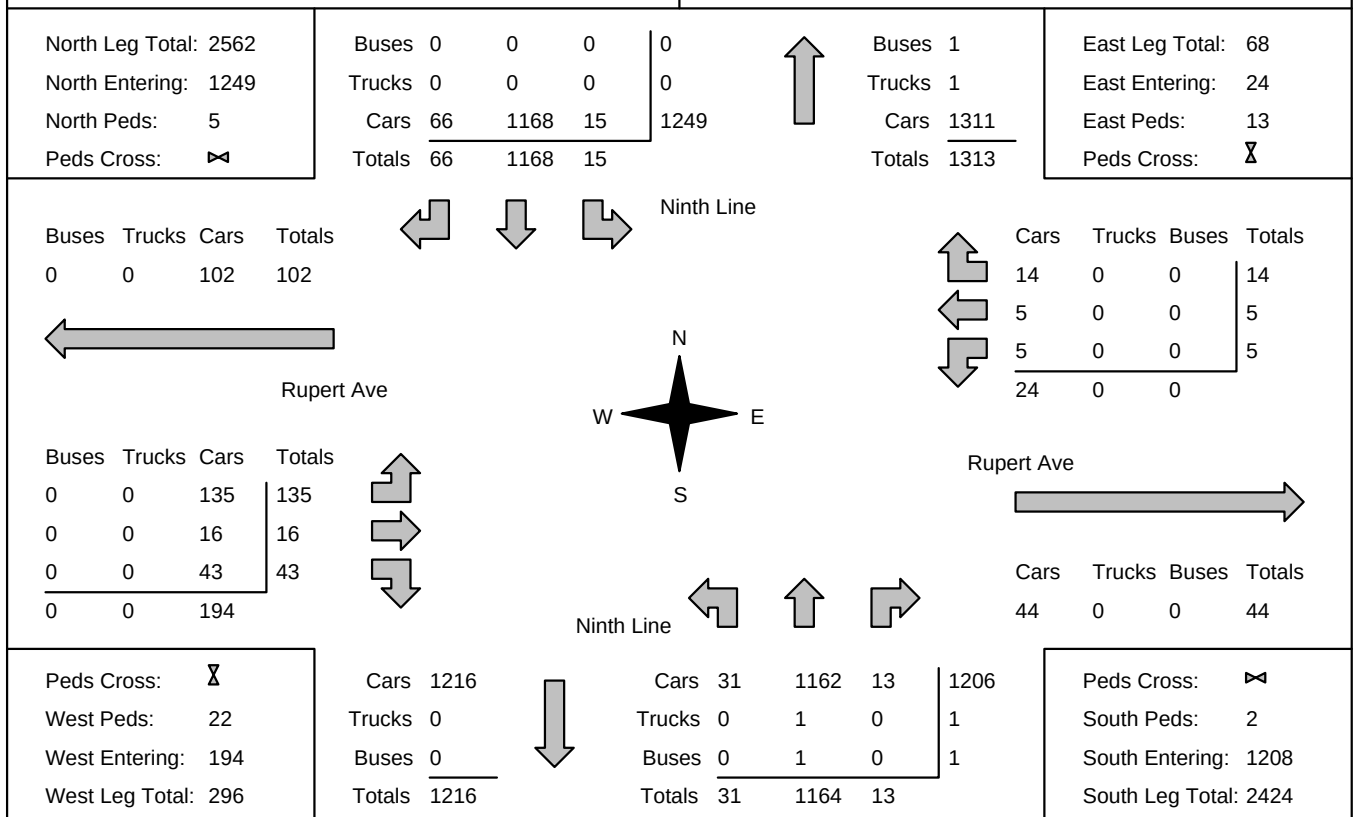
Municipality: Whitchurch-Stouffville
Site #: 2413400003
Intersection: Ninth Line & Rupert Ave
TFR File #: 1
Count date: 20-Jul-24

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 2024 Condition:

EX 2024 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	4.1	4.3	2.7	0.32	0.37	0.26
	Westbound		230	>30	>30	>30	4.3	4.2	2.6	0.36	0.34	0.23
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 2024 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

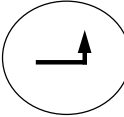
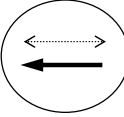
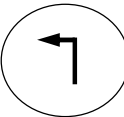
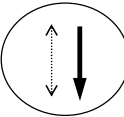
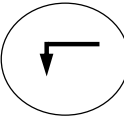
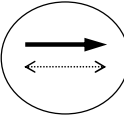
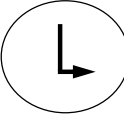
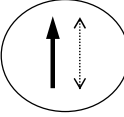
***values of Intersection Capacity Analysis from Synchro Reports

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) CTCS: 543 MODE/COMMENT: SA with APS PREPARED/CHECKED BY: MA PREPARATION DATE: January 20, 2025 IMPLEMENTATION DATE: January 20, 2025		MUNICIPALITY: Town of Whitchurch-Stouffville COMPUTER SYSTEM: Centrac CONTROLLER/CABINET TYPE: Cobalt CONFLICT FLASH: Red & Red DESIGN WALK SPEED: 1.0 m/s (FDW based on full crossing at 1.2 m/s) 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 System Plan	Pattern 1 Plan 1	Pattern 2 Plan 2	Pattern 99 Plan 99		
1. E/B Left Turn Arrow 	WLK 7 FDW 7 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 7 FDW 7 MIN 7 EXT 5 MAX1 7 MAX2 0 AMB 3 ALR 1 SPLIT				Callable/Extendable by Setback Loop	During coordinated operation, the signal constantly cycles through main street FDW to improve response time to side street vehicle and pedestrian demand.
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 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 7 FDW 7 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 7 FDW 7 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 2024 FRI MIDDAY
03-20-2025

											
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	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)	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 2024 FRI PM Peak
03-20-2025

											
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	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	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 2024 SAT PM Peak
03-20-2025

											
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	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)	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

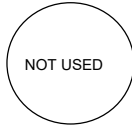
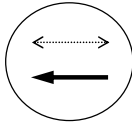
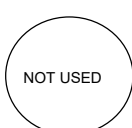
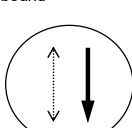
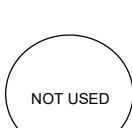
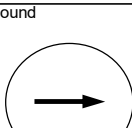
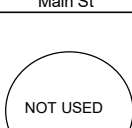
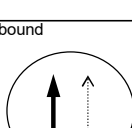
Intersection Capacity Utilization 67.8%

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 2024 FRI MIDDAY

03-20-2025

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	61	795	7	841	2	0	61	0
Future Volume (vph)	61	795	7	841	2	0	61	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)	77.2	77.2	77.2	77.2		12.0		12.0
Actuated g/C Ratio	0.76	0.76	0.76	0.76		0.12		0.12
v/c Ratio	0.17	0.32	0.02	0.36		0.07		0.58
Control Delay	4.9	4.4	3.7	4.6		7.1		41.1
Queue Delay	0.0	0.0	0.0	0.6		0.0		0.0
Total Delay	4.9	4.4	3.7	5.2		7.1		41.1
LOS	A	A	A	A		A		D
Approach Delay		4.4		5.2		7.1		41.1
Approach LOS		A		A		A		D
Intersection Summary								
Cycle Length: 120								
Actuated Cycle Length: 101.3								
Natural Cycle: 110								
Control Type: Semi Act-Uncoord								
Maximum v/c Ratio: 0.58								
Intersection Signal Delay: 6.8					Intersection LOS: A			
Intersection Capacity Utilization 68.4%					ICU Level of Service C			
Analysis Period (min) 15								

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

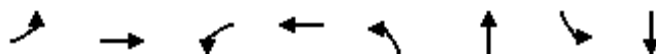


Timings

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

EX 2024 FRI PM Peak

03-20-2025



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↰↱	↰	↰↱		↰↱		↰↱
Traffic Volume (vph)	41	933	1	798	2	1	68	0
Future Volume (vph)	41	933	1	798	2	1	68	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 Effect Green (s)	78.0	78.0	78.0	78.0		12.1		12.1
Actuated g/C Ratio	0.76	0.76	0.76	0.76		0.12		0.12
v/c Ratio	0.10	0.37	0.00	0.34		0.02		0.57
Control Delay	4.3	4.6	4.0	4.4		33.0		42.6
Queue Delay	0.0	0.0	0.0	0.6		0.0		0.0
Total Delay	4.3	4.6	4.0	5.0		33.0		42.6
LOS	A	A	A	A		C		D
Approach Delay		4.6		5.0		33.0		42.6
Approach LOS		A		A		C		D

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 102.1

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 6.9

Intersection LOS: A

Intersection Capacity Utilization 52.4%

ICU Level of Service A

Analysis Period (min) 15

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

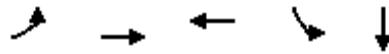


Timings

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

EX 2024 SAT PM Peak

03-20-2025



Lane Group	EBL	EBT	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	32	683	581	47	0
Future Volume (vph)	32	683	581	47	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)	88.5	88.5	88.5		10.8
Actuated g/C Ratio	0.83	0.83	0.83		0.10
v/c Ratio	0.06	0.25	0.23		0.44
Control Delay	3.0	3.0	2.8		39.0
Queue Delay	0.0	0.0	0.3		0.0
Total Delay	3.0	3.0	3.2		39.0
LOS	A	A	A		D
Approach Delay		3.0	3.2		39.0
Approach LOS		A	A		D

Intersection Summary

Cycle Length: 115

Actuated Cycle Length: 106.5

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 4.9

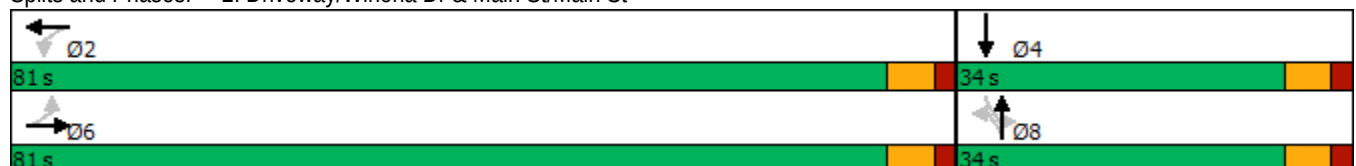
Intersection LOS: A

Intersection Capacity Utilization 44.9%

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 2024 FRI MIDDAY

03-18-2025

												
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	105.7	19.1	33.8	75.2	58.3	37.6	23.1	12.4	14.1	24.2	23.4
Average Queue (m)	42.2	93.5	13.0	15.3	58.5	42.2	23.5	12.4	6.8	7.3	13.9	15.3
95th Queue (m)	73.7	123.5	21.3	39.2	84.2	66.7	41.2	26.8	15.5	16.7	27.5	26.9
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 (%)	10	44			13							
Queuing Penalty (veh)	51	71			9							

HCM Signalized Intersection Capacity Analysis

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

EX 2024 FRI MIDDAY

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	795	5	7	841	51	2	0	11	61	0	43
Future Volume (vph)	61	795	5	7	841	51	2	0	11	61	0	43
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			0.88			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	3537		1805	3501			1652			1708	
Flt Permitted	0.28	1.00		0.32	1.00			0.95			0.81	
Satd. Flow (perm)	526	3537		603	3501			1587			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)	66	864	5	8	914	55	2	0	12	66	0	47
RTOR Reduction (vph)	0	0	0	0	2	0	0	12	0	0	27	0
Lane Group Flow (vph)	66	869	0	8	967	0	0	2	0	0	86	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)	77.2	77.2		77.2	77.2			12.0			12.0	
Effective Green, g (s)	77.2	77.2		77.2	77.2			12.0			12.0	
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)	401	2698		459	2670			188			169	
v/s Ratio Prot		0.25			c0.28							
v/s Ratio Perm	0.13			0.01				0.00			c0.06	
v/c Ratio	0.16	0.32		0.02	0.36			0.01			0.51	
Uniform Delay, d1	3.3	3.8		2.9	3.9			39.4			41.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.9	0.3		0.1	0.4			0.0			2.4	
Delay (s)	4.1	4.1		3.0	4.3			39.4			44.2	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.1			4.3			39.4			44.2	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			6.7			HCM 2000 Level of Service				A		
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			101.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			68.4%			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)	15.6	62.6	24.6	2.4	35.7	36.8	6.0	26.2
Average Queue (m)	9.5	36.8	11.7	0.8	19.2	20.4	2.6	16.7
95th Queue (m)	18.4	76.3	40.3	4.7	42.2	45.2	9.1	30.1
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 (%)	0	9			1			
Queuing Penalty (veh)	0	6			0			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

EX 2024 FRI MIDDAY
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	38	0	0	42
Future Volume (Veh/h)	0	0	38	0	0	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)	0	0	41	0	0	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	87	41			41	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	87	41			41	
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)	919	1036			1581	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	41	46			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1581			
Volume to Capacity	0.00	0.02	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 2024 FRI Midday
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	38	0	0	42
Future Volume (Veh/h)	0	0	38	0	0	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)	0	0	41	0	0	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)			107			
pX, platoon unblocked						
vC, conflicting volume	87	41			41	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	87	41			41	
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)	919	1036			1581	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	41	46			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1581			
Volume to Capacity	0.00	0.02	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 2024 FRI Midday
03-18-2025

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Volume (veh/h)	76	22	20	39	14	24
Future Volume (Veh/h)	76	22	20	39	14	24
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)	83	24	22	42	15	26
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			107		181	95
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			107		181	95
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)			1497		801	956
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	107	64	41			
Volume Left	0	22	15			
Volume Right	24	0	26			
cSH	1700	1497	893			
Volume to Capacity	0.06	0.01	0.05			
Queue Length 95th (m)	0.0	0.4	1.2			
Control Delay (s)	0.0	2.6	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.6	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization			19.8%	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)	0.8	9.4
Average Queue (m)	0.2	6.4
95th Queue (m)	2.1	13.1
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 2024 FRI Midday
03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	7	19	3	8	8	10	435	3	8	403	30
Future Volume (Veh/h)	50	7	19	3	8	8	10	435	3	8	403	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)	54	8	21	3	9	9	11	473	3	9	438	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	0.94	0.94		0.94	0.94	0.94				0.94		
vC, conflicting volume	981	970	454	978	986	474	471			476		
vC1, stage 1 conf vol	472	472		496	496							
vC2, stage 2 conf vol	508	498		481	489							
vCu, unblocked vol	946	935	454	942	951	405	471			407		
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	97	99	98	98	99			99		
cM capacity (veh/h)	427	435	610	424	430	585	1003			1089		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	83	21	11	476	9	471						
Volume Left	54	3	11	0	9	0						
Volume Right	21	9	0	3	0	33						
cSH	463	484	1003	1700	1089	1700						
Volume to Capacity	0.18	0.04	0.01	0.28	0.01	0.28						
Queue Length 95th (m)	5.2	1.1	0.3	0.0	0.2	0.0						
Control Delay (s)	14.5	12.8	8.6	0.0	8.3	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	14.5	12.8	0.2		0.2							
Approach LOS	B	B										
Intersection Summary												
Average Delay	1.5											
Intersection Capacity Utilization	40.7%			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)	14.4	10.3	2.8	3.4
Average Queue (m)	9.2	5.0	0.6	1.0
95th Queue (m)	16.7	13.0	4.2	5.5
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

EX 2024 FRI PM Peak

1: Ninth Line & Main St /Main St

03-18-2025

												
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)	59.9	105.0	36.5	26.4	57.7	55.1	48.7	46.0	14.2	17.6	38.1	16.9
Average Queue (m)	42.3	84.8	23.7	15.0	40.3	32.0	30.6	27.5	8.2	9.7	24.3	10.3
95th Queue (m)	74.4	122.7	43.8	32.6	64.8	60.7	53.4	52.7	17.1	20.0	44.0	18.7
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		7										
Queuing Penalty (veh)		37										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	5	38		0	3							
Queuing Penalty (veh)	28	80		0	3							

HCM Signalized Intersection Capacity Analysis

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

EX 2024 FRI PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	933	1	1	798	48	2	1	1	68	0	34
Future Volume (vph)	41	933	1	1	798	48	2	1	1	68	0	34
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			0.97			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3609		1805	3538			1791			1756	
Flt Permitted	0.30	1.00		0.27	1.00			0.87			0.80	
Satd. Flow (perm)	569	3609		508	3538			1588			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)	45	1014	1	1	867	52	2	1	1	74	0	37
RTOR Reduction (vph)	0	0	0	0	2	0	0	1	0	0	24	0
Lane Group Flow (vph)	45	1015	0	1	917	0	0	3	0	0	87	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)	78.0	78.0		78.0	78.0			12.1			12.1	
Effective Green, g (s)	78.0	78.0		78.0	78.0			12.1			12.1	
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)	434	2757		388	2702			188			171	
v/s Ratio Prot		c0.28			0.26							
v/s Ratio Perm	0.08			0.00				0.00			c0.06	
v/c Ratio	0.10	0.37		0.00	0.34			0.02			0.51	
Uniform Delay, d1	3.1	4.0		2.8	3.8			39.7			42.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	0.4		0.0	0.3			0.0			2.4	
Delay (s)	3.6	4.3		2.9	4.2			39.8			44.6	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.3			4.2			39.8			44.6	
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)			102.1			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			52.4%			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	NB	SB
Directions Served	L	T	TR	T	TR	LTR	LTR
Maximum Queue (m)	11.4	56.4	36.5	34.0	37.5	4.3	26.5
Average Queue (m)	7.4	35.6	18.4	18.5	21.6	1.0	16.4
95th Queue (m)	14.4	83.6	62.7	41.7	44.5	5.6	31.5
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						
Storage Blk Time (%)		9		1			
Queuing Penalty (veh)		4		0			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

EX 2024 FRI PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	46	0	0	28
Future Volume (Veh/h)	0	0	46	0	0	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)	0	0	50	0	0	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	80	50			50	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	80	50			50	
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)	922	1018			1557	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	50	30			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1557			
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 2024 FRI PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	46	0	0	28
Future Volume (Veh/h)	0	0	46	0	0	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)	0	0	50	0	0	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	80	50			50	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	80	50			50	
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)	927	1024			1570	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	50	30			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1570			
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 2024 FRI PM Peak

03-18-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	69	16	12	39	19	27
Future Volume (Veh/h)	69	16	12	39	19	27
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)	75	17	13	42	21	29
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			92		152	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			92		152	84
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)			1515		838	981
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	92	55	50			
Volume Left	0	13	21			
Volume Right	17	0	29			
cSH	1700	1515	915			
Volume to Capacity	0.05	0.01	0.05			
Queue Length 95th (m)	0.0	0.2	1.4			
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			2.8			
Intersection Capacity Utilization			19.4%	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	8.8
Average Queue (m)	0.4	6.7
95th Queue (m)	3.3	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

EX 2024 FRI PM Peak
03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	7	23	3	4	13	18	522	5	10	452	29
Future Volume (Veh/h)	51	7	23	3	4	13	18	522	5	10	452	29
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	8	25	3	4	14	20	567	5	11	491	32
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	1152	1141	507	1152	1154	570	523			572		
vC1, stage 1 conf vol	529	529		610	610							
vC2, stage 2 conf vol	623	612		542	545							
vCu, unblocked vol	1095	1082	507	1094	1097	416	523			419		
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	96	99	99	97	98			99		
cM capacity (veh/h)	368	379	570	363	375	550	1054			988		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	88	21	20	572	11	523						
Volume Left	55	3	20	0	11	0						
Volume Right	25	14	0	5	0	32						
cSH	410	473	1054	1700	988	1700						
Volume to Capacity	0.21	0.04	0.02	0.34	0.01	0.31						
Queue Length 95th (m)	6.4	1.1	0.5	0.0	0.3	0.0						
Control Delay (s)	16.2	13.0	8.5	0.0	8.7	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	16.2	13.0	0.3		0.2							
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.6											
Intersection Capacity Utilization	45.7%			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)	17.3	8.7	8.3	3.4
Average Queue (m)	11.1	3.7	2.7	1.5
95th Queue (m)	20.0	11.2	9.6	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

1: Ninth Line & Main St /Main St

EX 2024 SAT PM Peak

03-18-2025

												
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)	59.8	92.0	26.5	15.2	52.5	44.0	27.2	30.9	10.8	11.7	29.0	19.5
Average Queue (m)	35.1	58.5	16.6	8.8	41.3	30.4	19.0	20.0	5.6	6.5	18.1	11.2
95th Queue (m)	67.9	96.7	31.5	17.7	59.8	52.0	35.2	35.0	12.9	15.2	32.8	22.0
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		1										
Queuing Penalty (veh)		2										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	3	26			2							
Queuing Penalty (veh)	12	41			1							

HCM Signalized Intersection Capacity Analysis

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

EX 2024 SAT PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	683	0	0	581	40	0	0	0	47	0	23
Future Volume (vph)	32	683	0	0	581	40	0	0	0	47	0	23
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						0.96	
Flt Protected	0.95	1.00			1.00						0.97	
Satd. Flow (prot)	1805	3574			3576						1757	
Flt Permitted	0.40	1.00			1.00						0.80	
Satd. Flow (perm)	751	3574			3576						1449	
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)	35	742	0	0	632	43	0	0	0	51	0	25
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	26	0
Lane Group Flow (vph)	35	742	0	0	673	0	0	0	0	0	50	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)	87.2	87.2			87.2						8.6	
Effective Green, g (s)	87.2	87.2			87.2						8.6	
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)	607	2891			2892						115	
v/s Ratio Prot		c0.21			0.19							
v/s Ratio Perm	0.05										c0.03	
v/c Ratio	0.06	0.26			0.23						0.44	
Uniform Delay, d1	2.1	2.5			2.4						47.3	
Progression Factor	1.00	1.00			1.00						1.00	
Incremental Delay, d2	0.2	0.2			0.2						2.6	
Delay (s)	2.2	2.7			2.6						49.9	
Level of Service	A	A			A						D	
Approach Delay (s)		2.7			2.6			0.0			49.9	
Approach LOS		A			A			A			D	
Intersection Summary												
HCM 2000 Control Delay			5.0		HCM 2000 Level of Service				A			
HCM 2000 Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			107.8		Sum of lost time (s)			12.0				
Intersection Capacity Utilization			44.9%		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)	7.3	35.2	18.0	25.6	28.8	21.9
Average Queue (m)	2.9	19.9	7.1	11.4	13.6	12.2
95th Queue (m)	9.2	39.7	21.7	29.4	32.5	24.4
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 (%)		2		0		
Queuing Penalty (veh)		1		0		

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

EX 2024 SAT PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	45	0	0	13
Future Volume (Veh/h)	0	0	45	0	0	13
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	14
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	63	49			49	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	63	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)	943	1020			1558	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	49	14			
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

EX 2024 SAT PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	45	0	0	13
Future Volume (Veh/h)	0	0	45	0	0	13
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	14
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	63	49			49	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	63	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)	948	1025			1571	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	49	14			
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

EX 2024 SAT PM Peak
03-18-2025

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶↷	
Traffic Volume (veh/h)	51	6	7	26	18	27
Future Volume (Veh/h)	51	6	7	26	18	27
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)	55	7	8	28	20	29
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	62			102	58	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62			102	58	
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)	1554			896	1013	
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	62	36	49			
Volume Left	0	8	20			
Volume Right	7	0	29			
cSH	1700	1554	962			
Volume to Capacity	0.04	0.01	0.05			
Queue Length 95th (m)	0.0	0.1	1.3			
Control Delay (s)	0.0	1.7	8.9			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.7	8.9			
Approach LOS			A			
Intersection Summary						
Average Delay	3.4					
Intersection Capacity Utilization	17.4%			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	10.1
Average Queue (m)	0.4	5.9
95th Queue (m)	3.2	13.2
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 2024 SAT PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	5	20	2	1	3	9	310	5	3	318	19
Future Volume (Veh/h)	46	5	20	2	1	3	9	310	5	3	318	19
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)	50	5	22	2	1	3	10	337	5	3	346	21
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	723	724	356	736	732	340	367			342		
vC1, stage 1 conf vol	362	362		360	360							
vC2, stage 2 conf vol	360	362		376	373							
vCu, unblocked vol	673	675	356	687	684	266	367			268		
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 %	91	99	97	100	100	100	99			100		
cM capacity (veh/h)	544	523	692	522	517	731	1203			1229		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	77	6	10	342	3	367						
Volume Left	50	2	10	0	3	0						
Volume Right	22	3	0	5	0	21						
cSH	578	608	1203	1700	1229	1700						
Volume to Capacity	0.13	0.01	0.01	0.20	0.00	0.22						
Queue Length 95th (m)	3.7	0.2	0.2	0.0	0.1	0.0						
Control Delay (s)	12.2	11.0	8.0	0.0	7.9	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	12.2	11.0	0.2		0.1							
Approach LOS	B	B										
Intersection Summary												
Average Delay	1.4											
Intersection Capacity Utilization	32.0%			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)	13.2	6.1	2.7	1.6
Average Queue (m)	8.7	1.5	0.9	0.3
95th Queue (m)	16.6	7.0	5.4	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

FB 2027 FRI Midday

03-18-2025

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)	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

03-18-2025

												
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

						
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

03-18-2025

												
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			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	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

03-18-2025

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

03-18-2025

												
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

						
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

03-18-2025

												
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			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)	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

03-18-2025

												
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

03-18-2025

												
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 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			102.8									
Intersection Capacity Utilization			50.1%									
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

												
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			
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)	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

1: Ninth Line & Main St /Main St

FB 2032 FRI MIDDAY

03-18-2025

												
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
03-18-2025

												
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

												
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

03-18-2025

												
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
03-18-2025

												
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

												
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

03-18-2025

												
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

03-18-2025

												
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

	→	↘	↙	←	↖	↗
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
03-18-2025

												
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

03-18-2025

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)	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
03-18-2025

												
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

												
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			
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)	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

03-18-2025

												
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
03-18-2025

												
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

												
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			
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)	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

FB 2037 SAT PM Peak

1: Ninth Line & Main St /Main St

03-18-2025

												
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

03-18-2025

												
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
03-18-2025

						
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
03-18-2025

						
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
03-18-2025

						
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	
Analysis Period (min)			15		A	

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

03-18-2025

												
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

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	586	210	72	633	63	232	140	70	49	130	237
Future Volume (vph)	186	586	210	72	633	63	232	140	70	49	130	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	3529		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)	382	1900	1599	198	3529		1106	1881	1615	1255	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	637	228	78	688	68	252	152	76	53	141	258
RTOR Reduction (vph)	0	0	117	0	6	0	0	0	46	0	0	170
Lane Group Flow (vph)	202	637	111	78	750	0	252	152	30	53	141	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		57.5	47.3	47.3	47.0	40.8	40.8
Effective Green, g (s)	47.9	39.9	39.9	44.3	38.1		57.5	47.3	47.3	47.0	40.8	40.8
Actuated g/C Ratio	0.40	0.33	0.33	0.37	0.32		0.48	0.40	0.40	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)	248	633	533	155	1124		605	743	638	521	641	545
v/s Ratio Prot	c0.05	c0.34		0.03	0.21		c0.04	0.08		0.01	0.07	
v/s Ratio Perm	0.27		0.07	0.16			c0.16		0.02	0.03		0.06
v/c Ratio	0.81	1.01	0.21	0.50	0.67		0.42	0.20	0.05	0.10	0.22	0.16
Uniform Delay, d1	27.9	39.9	28.5	29.9	35.3		18.9	23.8	22.3	22.7	28.1	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	18.2	37.3	0.2	2.6	1.5		0.5	0.6	0.1	0.1	0.8	0.6
Delay (s)	46.1	77.2	28.7	32.4	36.8		19.4	24.4	22.4	22.8	28.9	28.1
Level of Service	D	E	C	C	D		B	C	C	C	C	C
Approach Delay (s)		61.0			36.4			21.4			27.7	
Approach LOS		E			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			41.7			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			119.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			74.5%			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	108.0	29.8	43.1	87.3	73.3	44.7	33.1	15.5	16.0	29.9	32.1
Average Queue (m)	45.9	100.2	17.1	16.8	65.3	56.0	28.8	17.3	7.8	8.6	17.9	18.1
95th Queue (m)	74.6	128.8	32.6	49.2	93.5	82.9	49.9	36.6	18.4	18.0	33.7	35.3
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		18										
Queuing Penalty (veh)		92										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	17	46			16							
Queuing Penalty (veh)	102	86			11							

HCM Signalized Intersection Capacity Analysis

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

FT 2027 FRI MIDDAY

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	874	17	21	938	115	22	1	41	117	0	106
Future Volume (vph)	146	874	17	21	938	115	22	1	41	117	0	106
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			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	3531		1805	3466			1689			1699	
Flt Permitted	0.21	1.00		0.27	1.00			0.84			0.82	
Satd. Flow (perm)	395	3531		509	3466			1436			1430	
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)	159	950	18	23	1020	125	24	1	45	127	0	115
RTOR Reduction (vph)	0	1	0	0	6	0	0	36	0	0	32	0
Lane Group Flow (vph)	159	967	0	23	1139	0	0	34	0	0	210	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)	70.9	70.9		70.9	70.9			20.3			20.3	
Effective Green, g (s)	70.9	70.9		70.9	70.9			20.3			20.3	
Actuated g/C Ratio	0.69	0.69		0.69	0.69			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)	271	2425		349	2381			282			281	
v/s Ratio Prot		0.27			0.33							
v/s Ratio Perm	c0.40			0.05				0.02			c0.15	
v/c Ratio	0.59	0.40		0.07	0.48			0.12			0.75	
Uniform Delay, d1	8.5	7.0		5.3	7.5			34.1			39.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	9.0	0.5		0.4	0.7			0.2			10.3	
Delay (s)	17.5	7.5		5.7	8.2			34.3			49.4	
Level of Service	B	A		A	A			C			D	
Approach Delay (s)		8.9			8.2			34.3			49.4	
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			0.62									
Actuated Cycle Length (s)			103.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			80.1%			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)	61.4	106.2	61.3	12.7	75.9	74.3	20.6	53.2
Average Queue (m)	29.6	67.9	33.3	4.2	41.4	42.4	11.4	38.6
95th Queue (m)	73.0	136.7	108.8	18.7	87.5	84.8	23.1	58.6
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		7	2		0	0	1	1
Queuing Penalty (veh)		0	0		0	0	0	2
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	2	27			7			
Queuing Penalty (veh)	7	39			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2027 FRI Midday
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	56	25	114	69	44	101
Future Volume (Veh/h)	56	25	114	69	44	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)	61	27	124	75	48	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)			81			
pX, platoon unblocked						
vC, conflicting volume	368	162			199	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	368	162			199	
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	97			97	
cM capacity (veh/h)	614	889			1385	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	88	199	158			
Volume Left	61	0	48			
Volume Right	27	75	0			
cSH	679	1700	1385			
Volume to Capacity	0.13	0.12	0.03			
Queue Length 95th (m)	3.6	0.0	0.9			
Control Delay (s)	11.1	0.0	2.5			
Lane LOS	B		A			
Approach Delay (s)	11.1	0.0	2.5			
Approach LOS	B					
Intersection Summary						
Average Delay			3.1			
Intersection Capacity Utilization			32.6%	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)	14.6	5.4
Average Queue (m)	10.5	1.4
95th Queue (m)	15.7	6.8
Link Distance (m)	45.0	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
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	56	25	70	69	45	89
Future Volume (Veh/h)	56	25	70	69	45	89
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)	61	27	76	75	49	97
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	308	114			151	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	308	114			151	
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	97			97	
cM capacity (veh/h)	665	945			1442	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	88	151	146			
Volume Left	61	0	49			
Volume Right	27	75	0			
cSH	731	1700	1442			
Volume to Capacity	0.12	0.09	0.03			
Queue Length 95th (m)	3.3	0.0	0.8			
Control Delay (s)	10.6	0.0	2.7			
Lane LOS	B		A			
Approach Delay (s)	10.6	0.0	2.7			
Approach LOS	B					
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			29.7%	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)	11.6	6.7
Average Queue (m)	8.2	1.8
95th Queue (m)	14.2	8.6
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 FRI Midday
03-18-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	81	33	102	42	21	74
Future Volume (Veh/h)	81	33	102	42	21	74
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	36	111	46	23	80
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			124		374	106
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			124		374	106
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	92
cM capacity (veh/h)			1475		584	943
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	124	157	103			
Volume Left	0	111	23			
Volume Right	36	0	80			
cSH	1700	1475	829			
Volume to Capacity	0.07	0.08	0.12			
Queue Length 95th (m)	0.0	1.9	3.4			
Control Delay (s)	0.0	5.6	10.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	5.6	10.0			
Approach LOS			A			
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			26.9%	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)	7.4	10.9
Average Queue (m)	2.3	8.9
95th Queue (m)	8.7	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

FT 2027 FRI Midday
03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	10	32	4	11	9	48	480	4	9	460	73
Future Volume (Veh/h)	88	10	32	4	11	9	48	480	4	9	460	73
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)	96	11	35	4	12	10	52	522	4	10	500	79
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	1202	1190	540	1188	1227	524	579			526		
vC1, stage 1 conf vol	560	560		628	628							
vC2, stage 2 conf vol	642	630		560	599							
vCu, unblocked vol	1175	1162	540	1161	1203	438	579			440		
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 %	72	97	94	99	96	98	94			99		
cM capacity (veh/h)	341	360	546	327	340	550	912			1039		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	142	26	52	526	10	579						
Volume Left	96	4	52	0	10	0						
Volume Right	35	10	0	4	0	79						
cSH	378	396	912	1700	1039	1700						
Volume to Capacity	0.38	0.07	0.06	0.31	0.01	0.34						
Queue Length 95th (m)	13.7	1.7	1.4	0.0	0.2	0.0						
Control Delay (s)	20.2	14.7	9.2	0.0	8.5	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	20.2	14.7	0.8		0.1							
Approach LOS	C	B										
Intersection Summary												
Average Delay	2.9											
Intersection Capacity Utilization	56.0%			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)	19.4	11.4	18.7	4.2
Average Queue (m)	13.1	6.1	8.2	1.0
95th Queue (m)	22.4	14.3	21.9	5.5
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 2027 FRI PM Peak

1: Ninth Line & Main St /Main St

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	256	619	324	88	548	59	263	220	84	66	166	219
Future Volume (vph)	256	619	324	88	548	59	263	220	84	66	166	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	3526		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)	576	1900	1615	173	3526		948	1863	1615	1082	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	673	352	96	596	64	286	239	91	72	180	238
RTOR Reduction (vph)	0	0	179	0	7	0	0	0	61	0	0	171
Lane Group Flow (vph)	278	673	173	96	653	0	286	239	30	72	180	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)	52.2	44.2	44.2	51.6	43.9		49.0	37.9	37.9	40.1	33.0	33.0
Effective Green, g (s)	52.2	44.2	44.2	51.6	43.9		49.0	37.9	37.9	40.1	33.0	33.0
Actuated g/C Ratio	0.45	0.38	0.38	0.44	0.38		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)	341	718	610	183	1324		485	604	523	415	530	455
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	0.28	0.52	0.49		0.59	0.40	0.06	0.17	0.34	0.15
Uniform Delay, d1	25.7	35.0	25.3	25.4	28.0		24.2	30.6	27.2	26.3	33.3	31.4
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	13.9	19.6	0.3	2.7	0.3		1.8	1.9	0.2	0.2	1.7	0.7
Delay (s)	39.6	54.6	25.6	28.2	28.3		26.1	32.6	27.4	26.5	35.0	32.1
Level of Service	D	D	C	C	C		C	C	C	C	D	C
Approach Delay (s)		43.6			28.3			28.8			32.4	
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)			116.9			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			80.0%			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)	59.9	110.0	50.7	27.9	65.5	58.0	57.9	49.9	16.0	19.8	49.3	25.0
Average Queue (m)	49.6	95.4	26.8	17.0	50.6	43.6	42.3	34.3	9.2	11.6	31.5	16.9
95th Queue (m)	76.3	130.6	57.3	35.2	73.8	65.7	68.5	58.4	18.3	23.7	56.4	29.9
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		16	0									
Queuing Penalty (veh)		95	2									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	20	40			9							
Queuing Penalty (veh)	121	103			8							

HCM Signalized Intersection Capacity Analysis

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

FT 2027 FRI PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	1047	25	39	890	60	18	3	35	85	0	48
Future Volume (vph)	61	1047	25	39	890	60	18	3	35	85	0	48
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	3534			1712			1751	
Flt Permitted	0.26	1.00		0.22	1.00			0.87			0.80	
Satd. Flow (perm)	490	3597		415	3534			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)	66	1138	27	42	967	65	20	3	38	92	0	52
RTOR Reduction (vph)	0	1	0	0	3	0	0	33	0	0	23	0
Lane Group Flow (vph)	66	1164	0	42	1029	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			14.1			14.1	
Effective Green, g (s)	73.5	73.5		73.5	73.5			14.1			14.1	
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)	361	2654		306	2607			214			203	
v/s Ratio Prot		c0.32			0.29							
v/s Ratio Perm	0.13			0.10				0.02			c0.08	
v/c Ratio	0.18	0.44		0.14	0.39			0.13			0.60	
Uniform Delay, d1	4.0	5.1		3.8	4.8			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	0.4			0.3			4.6	
Delay (s)	5.1	5.6		4.7	5.3			37.7			44.7	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		5.6			5.3			37.7			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)			99.6			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)	51.8	112.1	90.4	25.6	54.3	56.7	20.2	31.4
Average Queue (m)	18.8	71.5	49.3	9.7	30.5	33.0	11.3	20.0
95th Queue (m)	63.3	150.9	132.6	30.0	64.1	65.6	22.8	36.2
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		5	1				1	
Queuing Penalty (veh)		0	0				0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		27			5			
Queuing Penalty (veh)		16			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2027 FRI PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	6	65	11	7	41
Future Volume (Veh/h)	12	6	65	11	7	41
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	12	8	45
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	77			83	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	138	77			83	
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)	851	984			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	83	53			
Volume Left	13	0	8			
Volume Right	7	12	0			
cSH	893	1700	1514			
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	1.1			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.1			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			18.1%	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)	8.7	1.8
Average Queue (m)	3.3	0.4
95th Queue (m)	10.8	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
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	6	61	10	8	37
Future Volume (Veh/h)	11	6	61	10	8	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)	12	7	66	11	9	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	130	72			77	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130	72			77	
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)	864	996			1535	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	19	77	49			
Volume Left	12	0	9			
Volume Right	7	11	0			
cSH	909	1700	1535			
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	1.4			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	1.4			
Approach LOS	A					
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		18.8%		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	0.9
Average Queue (m)	3.3	0.3
95th Queue (m)	10.2	2.8
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 FRI PM Peak
03-18-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	74	18	27	42	23	45
Future Volume (Veh/h)	74	18	27	42	23	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)	80	20	29	46	25	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			100		194	90
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			100		194	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		784	973
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	100	75	74			
Volume Left	0	29	25			
Volume Right	20	0	49			
cSH	1700	1505	900			
Volume to Capacity	0.06	0.02	0.08			
Queue Length 95th (m)	0.0	0.5	2.1			
Control Delay (s)	0.0	3.0	9.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.0	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization		21.1%	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)	4.6	9.4
Average Queue (m)	0.9	8.2
95th Queue (m)	5.4	11.9
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 PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	9	28	4	5	14	27	600	6	11	518	38
Future Volume (Veh/h)	63	9	28	4	5	14	27	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)	68	10	30	4	5	15	29	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	1335	1324	584	1336	1342	656	604			659		
vC1, stage 1 conf vol	608	608		714	714							
vC2, stage 2 conf vol	728	717		622	628							
vCu, unblocked vol	1297	1284	584	1298	1305	461	604			465		
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 %	78	97	94	99	98	97	97			99		
cM capacity (veh/h)	309	326	516	302	320	491	984			899		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	108	24	29	659	12	604						
Volume Left	68	4	29	0	12	0						
Volume Right	30	15	0	7	0	41						
cSH	350	404	984	1700	899	1700						
Volume to Capacity	0.31	0.06	0.03	0.39	0.01	0.36						
Queue Length 95th (m)	10.3	1.5	0.7	0.0	0.3	0.0						
Control Delay (s)	19.8	14.5	8.8	0.0	9.1	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	19.8	14.5	0.4		0.2							
Approach LOS	C	B										
Intersection Summary												
Average Delay	2.0											
Intersection Capacity Utilization	50.9%			ICU Level of Service			A					
Analysis Period (min)	15											

Intersection: 6: Ninth Line & Rupert Ave

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	20.7	10.0	9.8	0.7	6.7	0.5
Average Queue (m)	13.2	5.2	3.7	0.1	2.0	0.1
95th Queue (m)	22.8	13.3	11.3	1.7	7.8	1.4
Link Distance (m)	219.8	78.5		216.3	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 SAT PM Peak

1: Ninth Line & Main St /Main St

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	504	25	54	465	54	186	182	58	46	146	188
Future Volume (vph)	200	504	25	54	465	54	186	182	58	46	146	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	3546		1787	1900	1583	1805	1881	1599
Flt Permitted	0.29	1.00	1.00	0.18	1.00		0.55	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	554	1881	1615	345	3546		1042	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	548	27	59	505	59	202	198	63	50	159	204
RTOR Reduction (vph)	0	0	18	0	8	0	0	0	39	0	0	137
Lane Group Flow (vph)	217	548	9	59	556	0	202	198	24	50	159	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		53.4	43.2	43.2	44.1	37.9	37.9
Effective Green, g (s)	50.2	39.8	39.8	40.9	34.5		53.4	43.2	43.2	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)	367	647	556	202	1058		555	710	591	491	616	524
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		0.01	0.09			c0.13		0.01	0.03		0.04
v/c Ratio	0.59	0.85	0.02	0.29	0.53		0.36	0.28	0.04	0.10	0.26	0.13
Uniform Delay, d1	22.0	35.1	25.0	27.0	33.7		19.1	25.3	23.0	22.7	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	2.5	10.0	0.0	0.8	0.5		0.4	1.0	0.1	0.1	1.0	0.5
Delay (s)	24.6	45.1	25.0	27.8	34.2		19.5	26.3	23.1	22.8	29.5	27.8
Level of Service	C	D	C	C	C		B	C	C	C	C	C
Approach Delay (s)		38.8			33.6			22.9			27.8	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			32.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			115.6			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)	59.7	107.4	17.7	17.6	54.8	49.5	39.4	36.0	13.0	16.2	39.1	20.6
Average Queue (m)	37.2	85.8	6.1	10.6	41.7	33.8	27.8	22.9	6.7	9.0	26.1	12.8
95th Queue (m)	70.4	127.1	30.5	21.5	62.9	59.0	46.0	41.0	15.0	19.5	42.2	23.6
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		9	0									
Queuing Penalty (veh)		38	2									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	7	40			5							
Queuing Penalty (veh)	34	79			3							

HCM Signalized Intersection Capacity Analysis

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

FT 2027 SAT PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	781	23	37	660	53	15	1	33	63	0	36
Future Volume (vph)	51	781	23	37	660	53	15	1	33	63	0	36
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	3569			1700			1751	
Flt Permitted	0.35	1.00		0.32	1.00			0.89			0.78	
Satd. Flow (perm)	671	3560		599	3569			1538			1403	
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)	55	849	25	40	717	58	16	1	36	68	0	39
RTOR Reduction (vph)	0	1	0	0	3	0	0	32	0	0	25	0
Lane Group Flow (vph)	55	873	0	40	772	0	0	21	0	0	82	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)	515	2733		460	2740			179			164	
v/s Ratio Prot		c0.25			0.22							
v/s Ratio Perm	0.08			0.07				0.01			c0.06	
v/c Ratio	0.11	0.32		0.09	0.28			0.12			0.50	
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			2.4	
Delay (s)	3.5	4.0		3.4	3.8			41.5			45.6	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.0			3.8			41.5			45.6	
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			63.4%			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)	25.5	71.4	31.0	13.3	32.1	37.2	17.1	24.9
Average Queue (m)	8.8	40.9	8.5	7.4	15.8	19.3	9.1	14.5
95th Queue (m)	33.7	87.2	39.4	16.3	37.2	41.2	21.5	29.5
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		0					1	
Queuing Penalty (veh)		0					0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		11			1			
Queuing Penalty (veh)		6			0			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2027 SAT PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	5	65	11	7	26
Future Volume (Veh/h)	12	5	65	11	7	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)	13	5	71	12	8	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	121	77			83	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	121	77			83	
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	984			1514	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	83	36			
Volume Left	13	0	8			
Volume Right	5	12	0			
cSH	899	1700	1514			
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	1.7			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.7			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
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)	7.8	0.9
Average Queue (m)	2.9	0.2
95th Queue (m)	9.7	2.3
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 SAT PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	5	59	11	7	21
Future Volume (Veh/h)	12	5	59	11	7	21
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	5	64	12	8	23
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	109	70			76	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	109	70			76	
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)	888	998			1536	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	76	31			
Volume Left	13	0	8			
Volume Right	5	12	0			
cSH	916	1700	1536			
Volume to Capacity	0.02	0.04	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		17.2%		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)	8.7	0.9
Average Queue (m)	3.6	0.2
95th Queue (m)	10.7	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
03-18-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	55	8	21	28	22	43
Future Volume (Veh/h)	55	8	21	28	22	43
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	23	30	24	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)						
pX, platoon unblocked						
vC, conflicting volume			69		140	64
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			69		140	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		844	1005
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	69	53	71			
Volume Left	0	23	24			
Volume Right	9	0	47			
cSH	1700	1545	945			
Volume to Capacity	0.04	0.01	0.08			
Queue Length 95th (m)	0.0	0.4	1.9			
Control Delay (s)	0.0	3.3	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.3	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			19.8%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 5: Winona Dr & Rupert Ave

Movement	NB
Directions Served	LR
Maximum Queue (m)	9.5
Average Queue (m)	8.2
95th Queue (m)	11.6
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

FT 2027 SAT PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	6	25	3	2	4	17	375	6	4	376	27
Future Volume (Veh/h)	56	6	25	3	2	4	17	375	6	4	376	27
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)	61	7	27	3	2	4	18	408	7	4	409	29
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	880	882	424	895	894	412	438			415		
vC1, stage 1 conf vol	432	432		448	448							
vC2, stage 2 conf vol	449	451		448	446							
vCu, unblocked vol	809	811	424	825	823	285	438			289		
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	98			100		
cM capacity (veh/h)	477	465	635	452	457	680	1133			1151		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	95	9	18	415	4	438						
Volume Left	61	3	18	0	4	0						
Volume Right	27	4	0	7	0	29						
cSH	512	533	1133	1700	1151	1700						
Volume to Capacity	0.19	0.02	0.02	0.24	0.00	0.26						
Queue Length 95th (m)	5.4	0.4	0.4	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	37.2%			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)	16.1	6.1	8.0	2.5
Average Queue (m)	10.5	2.4	2.8	0.7
95th Queue (m)	17.5	8.9	9.9	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

1: Ninth Line & Main St /Main St

FT 2032 FRI MIDDAY

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	204	640	229	79	693	67	254	152	77	54	141	259
Future Volume (vph)	204	640	229	79	693	67	254	152	77	54	141	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	3530		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)	309	1900	1599	198	3530		1077	1881	1615	1240	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	696	249	86	753	73	276	165	84	59	153	282
RTOR Reduction (vph)	0	0	117	0	6	0	0	0	51	0	0	166
Lane Group Flow (vph)	222	696	132	86	820	0	276	165	33	59	153	116
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	47.3	47.3	47.3	40.9	40.9
Effective Green, g (s)	47.9	39.9	39.9	44.3	38.1		57.7	47.3	47.3	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	0.39	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)	223	632	532	155	1122		596	742	637	519	642	545
v/s Ratio Prot	c0.07	c0.37		0.03	0.23		c0.05	0.09		0.01	0.08	
v/s Ratio Perm	0.33		0.08	0.18			c0.17		0.02	0.04		0.07
v/c Ratio	1.00	1.10	0.25	0.55	0.73		0.46	0.22	0.05	0.11	0.24	0.21
Uniform Delay, d1	31.6	40.0	29.1	30.1	36.3		19.2	24.0	22.4	22.7	28.3	28.0
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	58.6	66.7	0.2	4.3	2.5		0.6	0.7	0.2	0.1	0.9	0.9
Delay (s)	90.3	106.7	29.3	34.3	38.8		19.8	24.7	22.6	22.8	29.2	28.9
Level of Service	F	F	C	C	D		B	C	C	C	C	C
Approach Delay (s)		87.0			38.4			21.8			28.3	
Approach LOS		F			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			52.3			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			78.6%			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	109.1	45.0	32.2	93.2	80.3	49.7	31.1	14.8	20.3	33.6	37.4
Average Queue (m)	48.3	105.8	25.3	15.5	73.3	63.1	32.4	19.1	7.8	9.6	20.5	21.0
95th Queue (m)	77.0	114.8	61.1	41.5	98.9	88.0	53.5	34.1	17.3	21.7	39.0	39.6
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		28	1									
Queuing Penalty (veh)		158	5									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	15	51			23							
Queuing Penalty (veh)	96	105			18							

HCM Signalized Intersection Capacity Analysis

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

FT 2032 FRI MIDDAY
03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	962	17	22	1031	120	22	1	42	124	0	111
Future Volume (vph)	153	962	17	22	1031	120	22	1	42	124	0	111
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			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	3531		1805	3470			1688			1699	
Flt Permitted	0.18	1.00		0.23	1.00			0.84			0.82	
Satd. Flow (perm)	337	3531		445	3470			1440			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)	166	1046	18	24	1121	130	24	1	46	135	0	121
RTOR Reduction (vph)	0	1	0	0	6	0	0	36	0	0	31	0
Lane Group Flow (vph)	166	1063	0	24	1245	0	0	35	0	0	225	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)	70.7	70.7		70.7	70.7			21.6			21.6	
Effective Green, g (s)	70.7	70.7		70.7	70.7			21.6			21.6	
Actuated g/C Ratio	0.68	0.68		0.68	0.68			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)	228	2393		301	2352			298			295	
v/s Ratio Prot		0.30			0.36							
v/s Ratio Perm	c0.49			0.05				0.02			c0.16	
v/c Ratio	0.73	0.44		0.08	0.53			0.12			0.76	
Uniform Delay, d1	10.7	7.7		5.7	8.4			33.6			38.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	18.4	0.6		0.5	0.9			0.2			11.1	
Delay (s)	29.1	8.3		6.2	9.3			33.8			50.0	
Level of Service	C	A		A	A			C			D	
Approach Delay (s)		11.1			9.2			33.8			50.0	
Approach LOS		B			A			C			D	
Intersection Summary												
HCM 2000 Control Delay			14.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			104.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			83.5%			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)	61.1	116.9	91.6	19.8	82.3	84.9	22.2	48.4
Average Queue (m)	31.5	82.1	51.4	6.6	51.0	54.0	13.7	40.2
95th Queue (m)	71.2	148.6	134.2	26.0	100.0	100.1	26.8	58.1
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		9	3		0	0	4	9
Queuing Penalty (veh)		0	0		1	1	0	14
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	6	35			10			
Queuing Penalty (veh)	30	53			2			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2032 FRI Midday
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	56	25	74	69	45	94
Future Volume (Veh/h)	56	25	74	69	45	94
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)	61	27	80	75	49	102
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	318	118			155	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	318	118			155	
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	97			97	
cM capacity (veh/h)	657	940			1438	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	88	155	151			
Volume Left	61	0	49			
Volume Right	27	75	0			
cSH	724	1700	1438			
Volume to Capacity	0.12	0.09	0.03			
Queue Length 95th (m)	3.3	0.0	0.8			
Control Delay (s)	10.7	0.0	2.6			
Lane LOS	B		A			
Approach Delay (s)	10.7	0.0	2.6			
Approach LOS	B					
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			30.2%	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)	17.4	0.7	6.4
Average Queue (m)	11.1	0.1	2.7
95th Queue (m)	25.8	1.7	9.7
Link Distance (m)	45.0	56.1	9.1
Upstream Blk Time (%)	2		8
Queuing Penalty (veh)	0		12
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
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	56	25	74	69	45	94
Future Volume (Veh/h)	56	25	74	69	45	94
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)	61	27	80	75	49	102
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	318	118			155	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	318	118			155	
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	97			97	
cM capacity (veh/h)	657	940			1438	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	88	155	151			
Volume Left	61	0	49			
Volume Right	27	75	0			
cSH	724	1700	1438			
Volume to Capacity	0.12	0.09	0.03			
Queue Length 95th (m)	3.3	0.0	0.8			
Control Delay (s)	10.7	0.0	2.6			
Lane LOS	B		A			
Approach Delay (s)	10.7	0.0	2.6			
Approach LOS	B					
Intersection Summary						
Average Delay			3.4			
Intersection Capacity Utilization			30.2%	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)	14.8	5.1	12.3
Average Queue (m)	10.5	1.0	4.3
95th Queue (m)	25.1	5.6	20.3
Link Distance (m)	41.9	9.1	65.8
Upstream Blk Time (%)	1	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2032 FRI Midday
03-18-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	90	35	104	46	23	77
Future Volume (Veh/h)	90	35	104	46	23	77
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	38	113	50	25	84
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			136	393		117
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			136	393		117
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		91
cM capacity (veh/h)			1461	568		930
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	136	163	109			
Volume Left	0	113	25			
Volume Right	38	0	84			
cSH	1700	1461	811			
Volume to Capacity	0.08	0.08	0.13			
Queue Length 95th (m)	0.0	2.0	3.7			
Control Delay (s)	0.0	5.5	10.1			
Lane LOS			A B			
Approach Delay (s)	0.0	5.5	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			31.1%	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)	11.0	15.9
Average Queue (m)	3.6	9.9
95th Queue (m)	12.1	17.0
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

FT 2032 FRI Midday
03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	11	34	4	12	10	49	528	4	10	505	77
Future Volume (Veh/h)	93	11	34	4	12	10	49	528	4	10	505	77
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)	101	12	37	4	13	11	53	574	4	11	549	84
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	1310	1297	591	1296	1337	576	633			578		
vC1, stage 1 conf vol	613	613		682	682							
vC2, stage 2 conf vol	698	684		614	655							
vCu, unblocked vol	1289	1274	591	1273	1319	471	633			473		
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 %	67	96	93	99	96	98	94			99		
cM capacity (veh/h)	309	332	511	295	312	514	869			987		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	150	28	53	578	11	633						
Volume Left	101	4	53	0	11	0						
Volume Right	37	11	0	4	0	84						
cSH	345	366	869	1700	987	1700						
Volume to Capacity	0.44	0.08	0.06	0.34	0.01	0.37						
Queue Length 95th (m)	17.0	2.0	1.6	0.0	0.3	0.0						
Control Delay (s)	23.3	15.7	9.4	0.0	8.7	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	23.3	15.7	0.8		0.1							
Approach LOS	C	C										
Intersection Summary												
Average Delay	3.1											
Intersection Capacity Utilization	59.1%			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)	31.1	12.2	17.1	3.3	2.5
Average Queue (m)	19.7	5.0	7.1	1.2	0.6
95th Queue (m)	34.8	14.2	19.4	6.0	4.4
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 2032 FRI PM Peak

1: Ninth Line & Main St /Main St

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	679	355	96	602	65	288	241	92	72	182	239
Future Volume (vph)	279	679	355	96	602	65	288	241	92	72	182	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	3525		1805	1863	1615	1805	1881	1615
Flt Permitted	0.27	1.00	1.00	0.08	1.00		0.46	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	522	1900	1615	161	3525		883	1863	1615	980	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	738	386	104	654	71	313	262	100	78	198	260
RTOR Reduction (vph)	0	0	174	0	7	0	0	0	69	0	0	182
Lane Group Flow (vph)	303	738	212	104	718	0	313	262	31	78	198	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)	55.5	47.5	47.5	55.1	47.3		48.8	37.4	37.4	40.2	32.8	32.8
Effective Green, g (s)	55.5	47.5	47.5	55.1	47.3		48.8	37.4	37.4	40.2	32.8	32.8
Actuated g/C Ratio	0.46	0.40	0.40	0.46	0.39		0.41	0.31	0.31	0.33	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	751	638	180	1388		450	580	502	378	513	441
v/s Ratio Prot	c0.06	c0.39		0.04	0.20		c0.07	0.14		0.01	0.11	
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		0.70	0.45	0.06	0.21	0.39	0.18
Uniform Delay, d1	28.1	35.9	25.3	26.9	27.7		27.8	33.1	29.0	27.9	35.5	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	28.4	0.3	4.4	0.3		4.6	2.5	0.2	0.3	2.2	0.9
Delay (s)	59.8	64.3	25.6	31.3	28.0		32.4	35.7	29.3	28.1	37.7	34.2
Level of Service	E	E	C	C	C		C	D	C	C	D	C
Approach Delay (s)		52.8			28.5			33.2			34.6	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			40.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			120.1			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			83.8%			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	50.8	43.3	74.6	64.2	66.9	59.6	12.9	20.9	49.3	29.3
Average Queue (m)	51.5	102.2	30.3	20.7	54.7	46.0	50.3	39.4	8.3	12.6	31.8	20.9
95th Queue (m)	73.7	126.5	54.7	49.4	83.1	72.5	75.7	63.5	15.8	25.3	57.2	35.2
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		23										
Queuing Penalty (veh)		147										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	31	42		0	12							
Queuing Penalty (veh)	211	117		0	12							

HCM Signalized Intersection Capacity Analysis

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

FT 2032 FRI PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	1150	25	39	978	66	18	3	35	92	0	51
Future Volume (vph)	66	1150	25	39	978	66	18	3	35	92	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			0.92			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1805	3599		1805	3534			1712			1752	
Flt Permitted	0.23	1.00		0.19	1.00			0.87			0.79	
Satd. Flow (perm)	428	3599		356	3534			1518			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)	72	1250	27	42	1063	72	20	3	38	100	0	55
RTOR Reduction (vph)	0	1	0	0	3	0	0	32	0	0	23	0
Lane Group Flow (vph)	72	1276	0	42	1132	0	0	29	0	0	132	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)	73.4	73.4		73.4	73.4			14.9			14.9	
Effective Green, g (s)	73.4	73.4		73.4	73.4			14.9			14.9	
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)	313	2633		260	2586			225			212	
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	0.48		0.16	0.44			0.13			0.62	
Uniform Delay, d1	4.3	5.6		4.1	5.3			37.1			40.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.7	0.6		1.3	0.5			0.3			5.6	
Delay (s)	6.0	6.2		5.4	5.8			37.3			45.7	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		6.2			5.8			37.3			45.7	
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			78.3%			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)	61.1	132.6	118.6	17.3	66.0	67.3	21.3	37.1
Average Queue (m)	24.4	105.3	80.2	7.8	41.1	44.4	11.9	27.0
95th Queue (m)	73.5	187.8	176.6	22.8	80.5	82.0	24.0	48.0
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		18	7		0	0	2	1
Queuing Penalty (veh)		0	0		2	1	0	1
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		43			7			
Queuing Penalty (veh)		28			3			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2032 FRI PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	6	70	11	7	44
Future Volume (Veh/h)	12	6	70	11	7	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)	13	7	76	12	8	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	146	82			88	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	146	82			88	
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)	842	978			1508	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	88	56			
Volume Left	13	0	8			
Volume Right	7	12	0			
cSH	885	1700	1508			
Volume to Capacity	0.02	0.05	0.01			
Queue Length 95th (m)	0.6	0.0	0.1			
Control Delay (s)	9.2	0.0	1.1			
Lane LOS	A		A			
Approach Delay (s)	9.2	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: 3: Winona Dr & Southern Site Entrance

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.7	0.9
Average Queue (m)	3.3	0.2
95th Queue (m)	10.2	2.3
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
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	6	66	10	8	40
Future Volume (Veh/h)	11	6	66	10	8	40
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)	12	7	72	11	9	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)			107			
pX, platoon unblocked						
vC, conflicting volume	138	78			83	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	138	78			83	
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)	854	989			1527	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	19	83	52			
Volume Left	12	0	9			
Volume Right	7	11	0			
cSH	899	1700	1527			
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	1.3			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.3			
Approach LOS	A					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			18.9%	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	1.8
Average Queue (m)	3.8	0.4
95th Queue (m)	10.8	3.2
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
03-18-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	81	20	29	46	25	48
Future Volume (Veh/h)	81	20	29	46	25	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)	88	22	32	50	27	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			110		213	99
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			110		213	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	95
cM capacity (veh/h)			1493		763	962
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	110	82	79			
Volume Left	0	32	27			
Volume Right	22	0	52			
cSH	1700	1493	883			
Volume to Capacity	0.06	0.02	0.09			
Queue Length 95th (m)	0.0	0.5	2.4			
Control Delay (s)	0.0	3.0	9.5			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.0	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			21.7%	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)	3.4	10.7
Average Queue (m)	0.7	8.4
95th Queue (m)	4.5	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

FT 2032 FRI PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	10	30	4	5	16	29	658	6	12	568	41
Future Volume (Veh/h)	68	10	30	4	5	16	29	658	6	12	568	41
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)	74	11	33	4	5	17	32	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	0.79	0.79		0.79	0.79	0.79				0.79		
vC, conflicting volume	1464	1452	640	1464	1470	718	662			722		
vC1, stage 1 conf vol	666	666		782	782							
vC2, stage 2 conf vol	798	786		682	688							
vCu, unblocked vol	1454	1438	640	1454	1462	505	662			510		
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	96	93	98	98	96	97			98		
cM capacity (veh/h)	272	293	479	266	288	449	936			837		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	118	26	32	722	13	662						
Volume Left	74	4	32	0	13	0						
Volume Right	33	17	0	7	0	45						
cSH	312	370	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)	23.4	15.5	9.0	0.0	9.4	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	23.4	15.5	0.4		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)	27.2	8.9	8.0	5.8
Average Queue (m)	17.2	5.3	2.4	1.5
95th Queue (m)	30.8	12.3	9.4	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

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	217	552	276	59	510	59	203	198	64	50	160	205
Future Volume (vph)	217	552	276	59	510	59	203	198	64	50	160	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	3547		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)	492	1881	1615	223	3547		1001	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	600	300	64	554	64	221	215	70	54	174	223
RTOR Reduction (vph)	0	0	159	0	8	0	0	0	44	0	0	151
Lane Group Flow (vph)	236	600	141	64	610	0	221	215	26	54	174	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	44.1	37.8	37.8
Effective Green, g (s)	51.1	40.5	40.5	41.9	35.3		53.5	43.2	43.2	44.1	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)	348	653	560	169	1073		538	703	586	481	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	0.11	0.29	0.14
Uniform Delay, d1	22.5	36.5	27.2	27.9	34.2		19.8	26.1	23.5	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	5.2	17.9	0.2	1.4	0.7		0.5	1.1	0.1	0.1	1.2	0.6
Delay (s)	27.7	54.4	27.4	29.3	34.9		20.3	27.2	23.6	23.3	30.5	28.5
Level of Service	C	D	C	C	C		C	C	C	C	C	C
Approach Delay (s)		41.7			34.4			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			74.2%			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	108.1	35.5	21.4	66.5	54.6	44.4	44.8	13.2	14.5	41.2	26.3
Average Queue (m)	51.4	97.0	20.6	11.5	49.7	38.6	31.3	25.3	7.2	8.2	26.7	15.9
95th Queue (m)	77.1	123.4	38.0	23.8	72.1	62.4	49.5	47.2	15.9	17.1	47.7	29.0
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		16										
Queuing Penalty (veh)		79										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	14	44			8							
Queuing Penalty (veh)	75	96			5							

HCM Signalized Intersection Capacity Analysis

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

FT 2032 SAT PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	857	23	37	724	57	15	1	33	69	0	38
Future Volume (vph)	55	857	23	37	724	57	15	1	33	69	0	38
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	3570			1700			1753	
Flt Permitted	0.32	1.00		0.29	1.00			0.89			0.77	
Satd. Flow (perm)	615	3561		543	3570			1537			1398	
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)	60	932	25	40	787	62	16	1	36	75	0	41
RTOR Reduction (vph)	0	1	0	0	3	0	0	32	0	0	25	0
Lane Group Flow (vph)	60	956	0	40	846	0	0	21	0	0	91	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			12.7			12.7	
Effective Green, g (s)	79.6	79.6		79.6	79.6			12.7			12.7	
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)	469	2717		414	2724			187			170	
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	3.2	4.0		3.2	3.8			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			3.2	
Delay (s)	3.8	4.4		3.6	4.1			41.1			46.3	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.3			4.1			41.1			46.3	
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			0.38									
Actuated Cycle Length (s)			104.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.2%			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)	25.5	94.0	59.8	24.3	43.1	45.8	13.1	27.7
Average Queue (m)	11.2	62.6	29.3	10.0	22.0	25.0	7.8	18.0
95th Queue (m)	40.8	131.7	93.7	30.1	52.0	54.4	15.6	30.9
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		1	0					
Queuing Penalty (veh)		0	0					
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		23			3			
Queuing Penalty (veh)		12			1			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2032 SAT PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	5	70	11	7	28
Future Volume (Veh/h)	12	5	70	11	7	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)	13	5	76	12	8	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	128	82			88	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	128	82			88	
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)	862	978			1508	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	88	38			
Volume Left	13	0	8			
Volume Right	5	12	0			
cSH	891	1700	1508			
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	1.6			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.6			
Approach LOS	A					
Intersection Summary						
Average Delay		1.6				
Intersection Capacity Utilization		17.5%		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	2.2
Average Queue (m)	2.4	0.4
95th Queue (m)	8.9	5.6
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
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	5	64	11	7	23
Future Volume (Veh/h)	12	5	64	11	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	5	70	12	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	117	76			82	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	117	76			82	
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)	879	991			1528	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	82	33			
Volume Left	13	0	8			
Volume Right	5	12	0			
cSH	908	1700	1528			
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	1.8			
Lane LOS	A		A			
Approach Delay (s)	9.0	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	SB
Directions Served	LR	LT
Maximum Queue (m)	9.1	0.9
Average Queue (m)	3.8	0.2
95th Queue (m)	11.7	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
03-18-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	60	9	22	31	24	46
Future Volume (Veh/h)	60	9	22	31	24	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)	65	10	24	34	26	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			75	152		70
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			75	152		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 %			98	97		95
cM capacity (veh/h)			1537	831		998
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	75	58	76			
Volume Left	0	24	26			
Volume Right	10	0	50			
cSH	1700	1537	934			
Volume to Capacity	0.04	0.02	0.08			
Queue Length 95th (m)	0.0	0.4	2.1			
Control Delay (s)	0.0	3.1	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.1	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			4.2			
Intersection Capacity Utilization			20.3%	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)	1.8	10.1
Average Queue (m)	0.6	8.0
95th Queue (m)	4.2	12.9
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 2032 SAT PM Peak
03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	6	27	3	2	4	18	410	6	4	411	29
Future Volume (Veh/h)	61	6	27	3	2	4	18	410	6	4	411	29
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	7	29	3	2	4	20	446	7	4	447	32
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	962	964	463	977	976	450	479				453	
vC1, stage 1 conf vol	471	471		490	490							
vC2, stage 2 conf vol	491	493		488	487							
vCu, unblocked vol	884	887	463	901	901	298	479				302	
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)	446	438	603	420	430	652	1094				1110	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	102	9	20	453	4	479						
Volume Left	66	3	20	0	4	0						
Volume Right	29	4	0	7	0	32						
cSH	481	502	1094	1700	1110	1700						
Volume to Capacity	0.21	0.02	0.02	0.27	0.00	0.28						
Queue Length 95th (m)	6.3	0.4	0.4	0.0	0.1	0.0						
Control Delay (s)	14.5	12.3	8.4	0.0	8.3	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	14.5	12.3	0.4		0.1							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			39.9%	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	5.3	8.2	0.8
Average Queue (m)	11.3	1.7	2.5	0.2
95th Queue (m)	19.0	7.4	9.1	2.1
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

FT 2037 FRI Midday

1: Ninth Line & Main St /Main St

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	700	249	87	759	72	277	166	85	60	152	283
Future Volume (vph)	223	700	249	87	759	72	277	166	85	60	152	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	3531		1805	1881	1615	1805	1881	1599
Flt Permitted	0.13	1.00	1.00	0.10	1.00		0.55	1.00	1.00	0.64	1.00	1.00
Satd. Flow (perm)	253	1900	1599	194	3531		1045	1881	1615	1223	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	761	271	95	825	78	301	180	92	65	165	308
RTOR Reduction (vph)	0	0	118	0	6	0	0	0	56	0	0	155
Lane Group Flow (vph)	242	761	153	95	897	0	301	180	36	65	165	153
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)	201	614	517	177	1136		582	736	632	512	636	540
v/s Ratio Prot	c0.08	c0.40		0.03	0.25		c0.06	0.10		0.01	0.09	
v/s Ratio Perm	0.39		0.10	0.17			c0.19		0.02	0.04		0.10
v/c Ratio	1.20	1.24	0.30	0.54	0.79		0.52	0.24	0.06	0.13	0.26	0.28
Uniform Delay, d1	31.3	40.8	30.5	29.3	37.2		19.9	24.7	22.8	23.0	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	129.3	121.2	0.3	3.1	3.7		0.8	0.8	0.2	0.1	1.0	1.3
Delay (s)	160.6	162.0	30.9	32.4	40.9		20.7	25.5	23.0	23.2	29.9	30.5
Level of Service	F	F	C	C	D		C	C	C	C	C	C
Approach Delay (s)		133.9			40.1			22.6			29.4	
Approach LOS		F			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			70.7			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			83.0%			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	109.9	32.3	52.0	102.4	95.0	55.1	38.4	16.8	16.8	38.6	42.6
Average Queue (m)	50.8	107.4	22.1	23.5	81.3	73.3	33.8	22.9	7.9	10.0	23.2	24.0
95th Queue (m)	74.9	111.5	36.3	56.7	113.0	103.4	61.8	42.6	17.6	19.0	44.9	46.0
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		31										
Queuing Penalty (veh)		192										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	28	50			27							
Queuing Penalty (veh)	192	112			24							

HCM Signalized Intersection Capacity Analysis

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

FT 2037 FRI Midday

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	1059	18	23	1133	126	22	1	44	131	0	116
Future Volume (vph)	160	1059	18	23	1133	126	22	1	44	131	0	116
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			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1770	3531		1805	3472			1687			1699	
Flt Permitted	0.15	1.00		0.20	1.00			0.84			0.82	
Satd. Flow (perm)	279	3531		381	3472			1444			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)	174	1151	20	25	1232	137	24	1	48	142	0	126
RTOR Reduction (vph)	0	1	0	0	6	0	0	38	0	0	31	0
Lane Group Flow (vph)	174	1170	0	25	1363	0	0	35	0	0	237	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)	70.5	70.5		70.5	70.5			22.6			22.6	
Effective Green, g (s)	70.5	70.5		70.5	70.5			22.6			22.6	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.22			0.22	
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)	187	2368		255	2328			310			306	
v/s Ratio Prot		0.33			0.39							
v/s Ratio Perm	c0.62			0.07				0.02			c0.17	
v/c Ratio	0.93	0.49		0.10	0.59			0.11			0.78	
Uniform Delay, d1	15.2	8.5		6.1	9.4			33.2			38.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	49.7	0.7		0.8	1.1			0.2			11.6	
Delay (s)	64.9	9.3		6.9	10.5			33.4			50.5	
Level of Service	E	A		A	B			C			D	
Approach Delay (s)		16.5			10.4			33.4			50.5	
Approach LOS		B			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			17.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			105.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			87.2%			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)	79.9	152.2	148.6	21.1	98.5	97.1	24.0	50.1
Average Queue (m)	53.1	117.5	96.9	7.1	66.7	67.7	13.7	38.9
95th Queue (m)	102.5	192.3	197.4	26.7	109.0	111.2	27.1	57.6
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		38	13		0	1	0	2
Queuing Penalty (veh)		0	0		3	3	0	3
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	5	54			15			
Queuing Penalty (veh)	27	86			4			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2037 FRI Midday
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	56	25	123	69	44	111
Future Volume (Veh/h)	56	25	123	69	44	111
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)	61	27	134	75	48	121
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	388	172			209	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	388	172			209	
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	97			97	
cM capacity (veh/h)	597	877			1374	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	88	209	169			
Volume Left	61	0	48			
Volume Right	27	75	0			
cSH	662	1700	1374			
Volume to Capacity	0.13	0.12	0.03			
Queue Length 95th (m)	3.7	0.0	0.9			
Control Delay (s)	11.3	0.0	2.4			
Lane LOS	B		A			
Approach Delay (s)	11.3	0.0	2.4			
Approach LOS	B					
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			33.6%	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)	13.8	0.9	7.3
Average Queue (m)	9.4	0.2	3.6
95th Queue (m)	15.7	2.3	10.9
Link Distance (m)	45.0	56.1	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 2037 FRI Midday
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	56	25	79	69	45	99
Future Volume (Veh/h)	56	25	79	69	45	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)	61	27	86	75	49	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)			107			
pX, platoon unblocked						
vC, conflicting volume	330	124			161	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	330	124			161	
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	97			97	
cM capacity (veh/h)	646	933			1430	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	88	161	157			
Volume Left	61	0	49			
Volume Right	27	75	0			
cSH	713	1700	1430			
Volume to Capacity	0.12	0.09	0.03			
Queue Length 95th (m)	3.4	0.0	0.9			
Control Delay (s)	10.8	0.0	2.6			
Lane LOS	B		A			
Approach Delay (s)	10.8	0.0	2.6			
Approach LOS	B					
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			30.7%	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)	13.1	0.9	7.8
Average Queue (m)	10.1	0.2	2.2
95th Queue (m)	16.2	2.2	9.9
Link Distance (m)	41.9	9.1	65.8
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

HCM Unsignalized Intersection Capacity Analysis

5: Winona Dr & Rupert Ave

FT 2037 FRI Midday
03-18-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	99	38	106	51	25	80
Future Volume (Veh/h)	99	38	106	51	25	80
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	41	115	55	27	87
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			149		414	128
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			149		414	128
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		95	91
cM capacity (veh/h)			1445		551	916
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	149	170	114			
Volume Left	0	115	27			
Volume Right	41	0	87			
cSH	1700	1445	792			
Volume to Capacity	0.09	0.08	0.14			
Queue Length 95th (m)	0.0	2.1	4.0			
Control Delay (s)	0.0	5.4	10.3			
Lane LOS		A	B			
Approach Delay (s)	0.0	5.4	10.3			
Approach LOS			B			
Intersection Summary						
Average Delay			4.8			
Intersection Capacity Utilization			32.4%	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)	9.5	14.7
Average Queue (m)	4.3	9.7
95th Queue (m)	13.4	16.1
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

FT 2037 FRI Midday
03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	12	36	4	13	11	50	581	4	11	554	80
Future Volume (Veh/h)	99	12	36	4	13	11	50	581	4	11	554	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)	108	13	39	4	14	12	54	632	4	12	602	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	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	1428	1414	646	1414	1455	634	689			636		
vC1, stage 1 conf vol	670	670		742	742							
vC2, stage 2 conf vol	759	744		672	713							
vCu, unblocked vol	1418	1401	646	1401	1449	509	689			511		
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 %	61	96	92	98	95	97	93			99		
cM capacity (veh/h)	277	303	476	263	285	476	827			930		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	160	30	54	636	12	689						
Volume Left	108	4	54	0	12	0						
Volume Right	39	12	0	4	0	87						
cSH	311	335	827	1700	930	1700						
Volume to Capacity	0.51	0.09	0.07	0.37	0.01	0.41						
Queue Length 95th (m)	22.2	2.3	1.7	0.0	0.3	0.0						
Control Delay (s)	28.2	16.8	9.7	0.0	8.9	0.0						
Lane LOS	D	C	A		A							
Approach Delay (s)	28.2	16.8	0.8		0.2							
Approach LOS	D	C										
Intersection Summary												
Average Delay				3.6								
Intersection Capacity Utilization				62.3%	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)	31.1	9.5	14.1	4.2	0.8
Average Queue (m)	19.1	5.3	7.3	1.0	0.2
95th Queue (m)	41.2	13.0	18.0	5.5	2.0
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 2037 FRI PM Peak

1: Ninth Line & Main St /Main St

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	305	746	389	106	661	70	314	263	102	79	199	261
Future Volume (vph)	305	746	389	106	661	70	314	263	102	79	199	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	3526		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)	456	1900	1615	159	3526		831	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	811	423	115	718	76	341	286	111	86	216	284
RTOR Reduction (vph)	0	0	173	0	7	0	0	0	77	0	0	165
Lane Group Flow (vph)	332	811	250	115	787	0	341	286	34	86	216	119
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)	301	756	642	179	1397		433	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		0.15	0.25			c0.24		0.02	0.07		0.07
v/c Ratio	1.10	1.07	0.39	0.64	0.56		0.79	0.50	0.07	0.24	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	82.4	54.0	0.4	7.7	0.5		9.2	3.1	0.3	0.4	2.6	1.5
Delay (s)	112.1	90.3	26.3	34.8	28.8		39.1	37.4	29.9	28.4	38.7	36.0
Level of Service	F	F	C	C	C		D	D	C	C	D	D
Approach Delay (s)		77.6			29.6			37.0			35.9	
Approach LOS		E			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			51.8			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			89.7%			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)	59.9	110.1	61.2	29.0	71.1	65.4	69.7	61.3	20.6	21.7	41.3	36.1
Average Queue (m)	52.6	106.9	32.9	19.3	53.5	45.8	49.0	42.1	13.4	13.5	29.6	23.5
95th Queue (m)	74.4	120.1	68.8	33.0	76.1	72.1	74.6	69.6	24.8	27.2	45.7	40.9
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		33	0									
Queuing Penalty (veh)		231	3									
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	31	47			11							
Queuing Penalty (veh)	228	143			12							

HCM Signalized Intersection Capacity Analysis

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

FT 2037 FRI PM Peak

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	1263	25	39	1076	72	18	3	35	100	0	55
Future Volume (vph)	71	1263	25	39	1076	72	18	3	35	100	0	55
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	3534			1712			1752	
Flt Permitted	0.19	1.00		0.16	1.00			0.87			0.79	
Satd. Flow (perm)	367	3600		298	3534			1516			1426	
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)	77	1373	27	42	1170	78	20	3	38	109	0	60
RTOR Reduction (vph)	0	1	0	0	3	0	0	32	0	0	23	0
Lane Group Flow (vph)	77	1399	0	42	1245	0	0	29	0	0	146	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)	265	2608		215	2560			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	0.29	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			6.8	
Delay (s)	7.6	7.1		6.5	6.6			36.8			46.8	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		7.1			6.6			36.8			46.8	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM 2000 Control Delay			9.7			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			82.1%			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)	65.7	151.7	151.6	38.9	68.2	67.8	18.2	39.4
Average Queue (m)	30.1	139.6	132.0	12.5	42.4	45.3	10.2	26.3
95th Queue (m)	86.7	191.6	202.6	40.3	82.5	80.9	22.2	45.6
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		56	22				1	0
Queuing Penalty (veh)		0	0				0	0
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)	0	57			7			
Queuing Penalty (veh)	0	41			3			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2037 FRI PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	6	76	11	7	48
Future Volume (Veh/h)	12	6	76	11	7	48
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	83	12	8	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)			81			
pX, platoon unblocked						
vC, conflicting volume	157	89			95	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	157	89			95	
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)	830	969			1499	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	95	60			
Volume Left	13	0	8			
Volume Right	7	12	0			
cSH	874	1700	1499			
Volume to Capacity	0.02	0.06	0.01			
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			18.4%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection: 3: Winona Dr & Southern Site Entrance

Movement	WB
Directions Served	LR
Maximum Queue (m)	7.9
Average Queue (m)	3.6
95th Queue (m)	10.7
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 2037 FRI PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	11	6	72	10	8	44
Future Volume (Veh/h)	11	6	72	10	8	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)	12	7	78	11	9	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	150	84			89	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	150	84			89	
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)	842	981			1519	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	19	89	57			
Volume Left	12	0	9			
Volume Right	7	11	0			
cSH	889	1700	1519			
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	1.2			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	1.2			
Approach LOS	A					
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			19.1%	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)	3.6
95th Queue (m)	10.6
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
03-18-2025

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Volume (veh/h)	90	22	30	51	27	51
Future Volume (Veh/h)	90	22	30	51	27	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)	98	24	33	55	29	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			122		231	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			122		231	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		745	949
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	122	88	84			
Volume Left	0	33	29			
Volume Right	24	0	55			
cSH	1700	1478	867			
Volume to Capacity	0.07	0.02	0.10			
Queue Length 95th (m)	0.0	0.5	2.6			
Control Delay (s)	0.0	2.9	9.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	2.9	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)	1.3	8.0
95th Queue (m)	6.5	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

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	11	33	4	6	17	31	722	7	13	623	45
Future Volume (Veh/h)	74	11	33	4	6	17	31	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)	80	12	36	4	7	18	34	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	1604	1590	702	1604	1611	789	726			793		
vC1, stage 1 conf vol	730	730		857	857							
vC2, stage 2 conf vol	874	861		747	754							
vCu, unblocked vol	1638	1620	702	1638	1647	558	726			563		
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 %	66	95	92	98	97	96	96			98		
cM capacity (veh/h)	236	260	442	231	256	402	886			769		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	128	29	34	793	14	726						
Volume Left	80	4	34	0	14	0						
Volume Right	36	18	0	8	0	49						
cSH	274	325	886	1700	769	1700						
Volume to Capacity	0.47	0.09	0.04	0.47	0.02	0.43						
Queue Length 95th (m)	18.6	2.3	1.0	0.0	0.4	0.0						
Control Delay (s)	29.1	17.2	9.2	0.0	9.8	0.0						
Lane LOS	D	C	A		A							
Approach Delay (s)	29.1	17.2	0.4		0.2							
Approach LOS	D	C										
Intersection Summary												
Average Delay	2.7											
Intersection Capacity Utilization	58.4%			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)	23.4	9.9	9.2	6.7
Average Queue (m)	14.7	5.1	4.8	1.8
95th Queue (m)	24.6	12.8	12.2	7.4
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

FT 2037 SAT PM Peak

1: Ninth Line & Main St /Main St

03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	605	302	65	559	64	220	217	70	55	174	223
Future Volume (vph)	236	605	302	65	559	64	220	217	70	55	174	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	0.98		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	3547		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	3547		964	1900	1583	1136	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	658	328	71	608	70	239	236	76	60	189	242
RTOR Reduction (vph)	0	0	159	0	8	0	0	0	48	0	0	164
Lane Group Flow (vph)	257	658	169	71	670	0	239	236	28	60	189	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)	326	652	559	169	1075		525	700	583	467	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	26.6	23.7	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	37.5	0.3	1.7	1.1		0.6	1.3	0.2	0.1	1.3	0.6
Delay (s)	35.3	75.8	28.2	31.0	36.2		20.8	27.9	23.9	23.5	31.1	28.8
Level of Service	D	E	C	C	D		C	C	C	C	C	C
Approach Delay (s)		54.9			35.7			24.3			29.0	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			40.4			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	106.4	46.0	19.0	65.2	59.4	38.4	44.1	16.4	12.8	41.7	25.3
Average Queue (m)	49.0	96.5	25.9	12.1	52.7	44.0	28.0	29.3	9.6	8.9	25.9	18.0
95th Queue (m)	76.6	126.1	49.0	21.9	72.9	68.2	45.2	51.3	21.4	16.9	45.6	30.1
Link Distance (m)		104.5	104.5		171.6	171.6		187.5	187.5		216.3	
Upstream Blk Time (%)		17										
Queuing Penalty (veh)		89										
Storage Bay Dist (m)	35.0			50.0			100.0			100.0		130.0
Storage Blk Time (%)	15	44			10							
Queuing Penalty (veh)	90	105			6							

HCM Signalized Intersection Capacity Analysis

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

FT 2037 SAT PM Peak
03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	940	23	37	795	62	15	1	33	74	0	41
Future Volume (vph)	59	940	23	37	795	62	15	1	33	74	0	41
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	3571			1700			1752	
Flt Permitted	0.29	1.00		0.26	1.00			0.89			0.77	
Satd. Flow (perm)	558	3562		486	3571			1534			1400	
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)	64	1022	25	40	864	67	16	1	36	80	0	45
RTOR Reduction (vph)	0	1	0	0	3	0	0	31	0	0	24	0
Lane Group Flow (vph)	64	1046	0	40	928	0	0	22	0	0	101	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			13.2			13.2	
Effective Green, g (s)	79.2	79.2		79.2	79.2			13.2			13.2	
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)	423	2702		368	2709			193			177	
v/s Ratio Prot		c0.29			0.26							
v/s Ratio Perm	0.11			0.08				0.01			c0.07	
v/c Ratio	0.15	0.39		0.11	0.34			0.11			0.57	
Uniform Delay, d1	3.4	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			4.1	
Delay (s)	4.2	4.7		3.9	4.5			40.7			47.1	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		4.7			4.4			40.7			47.1	
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)			104.4			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)	39.5	97.0	85.3	13.8	53.9	53.3	18.4	30.3
Average Queue (m)	17.1	75.7	51.3	7.6	27.1	28.4	9.6	21.7
95th Queue (m)	59.5	165.8	145.5	16.7	60.0	60.3	22.5	34.5
Link Distance (m)		147.1	147.1		104.5	104.5	27.7	56.1
Upstream Blk Time (%)		12	6				1	
Queuing Penalty (veh)		0	0				0	
Storage Bay Dist (m)	30.0			35.0				
Storage Blk Time (%)		31			3			
Queuing Penalty (veh)		18			1			

HCM Unsignalized Intersection Capacity Analysis

3: Winona Dr & Southern Site Entrance

FT 2037 SAT PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	5	76	11	7	29
Future Volume (Veh/h)	12	5	76	11	7	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)	13	5	83	12	8	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	137	89			95	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	137	89			95	
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)	852	969			1499	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	95	40			
Volume Left	13	0	8			
Volume Right	5	12	0			
cSH	881	1700	1499			
Volume to Capacity	0.02	0.06	0.01			
Queue Length 95th (m)	0.5	0.0	0.1			
Control Delay (s)	9.2	0.0	1.5			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	1.5			
Approach LOS	A					
Intersection Summary						
Average Delay			1.5			
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)	8.6	0.9
Average Queue (m)	4.3	0.2
95th Queue (m)	11.9	2.3
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 2037 SAT PM Peak
03-18-2025

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	5	70	11	7	24
Future Volume (Veh/h)	12	5	70	11	7	24
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	5	76	12	8	26
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	124	82			88	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124	82			88	
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)	871	983			1520	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	18	88	34			
Volume Left	13	0	8			
Volume Right	5	12	0			
cSH	900	1700	1520			
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			1.6			
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)	6.9	0.9
Average Queue (m)	3.1	0.2
95th Queue (m)	9.9	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 2037 SAT PM Peak
03-18-2025

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	66	9	23	34	26	49
Future Volume (Veh/h)	66	9	23	34	26	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)	72	10	25	37	28	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			82		164	77
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			82		164	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	95
cM capacity (veh/h)			1528		818	990
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	82	62	81			
Volume Left	0	25	28			
Volume Right	10	0	53			
cSH	1700	1528	923			
Volume to Capacity	0.05	0.02	0.09			
Queue Length 95th (m)	0.0	0.4	2.3			
Control Delay (s)	0.0	3.1	9.3			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.1	9.3			
Approach LOS			A			
Intersection Summary						
Average Delay			4.2			
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)	4.6	9.3
Average Queue (m)	1.1	7.7
95th Queue (m)	5.9	12.2
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
03-18-2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	7	29	3	2	4	19	448	7	4	450	31
Future Volume (Veh/h)	67	7	29	3	2	4	19	448	7	4	450	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)	73	8	32	3	2	4	21	487	8	4	489	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	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	1048	1051	506	1066	1064	491	523			495		
vC1, stage 1 conf vol	514	514		533	533							
vC2, stage 2 conf vol	534	537		533	531							
vCu, unblocked vol	968	972	506	989	987	313	523			317		
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)	416	411	570	387	402	622	1054			1066		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	113	9	21	495	4	523						
Volume Left	73	3	21	0	4	0						
Volume Right	32	4	0	8	0	34						
cSH	450	470	1054	1700	1066	1700						
Volume to Capacity	0.25	0.02	0.02	0.29	0.00	0.31						
Queue Length 95th (m)	7.9	0.5	0.5	0.0	0.1	0.0						
Control Delay (s)	15.7	12.8	8.5	0.0	8.4	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	15.7	12.8	0.3		0.1							
Approach LOS	C	B										
Intersection Summary												
Average Delay	1.8											
Intersection Capacity Utilization	43.0%			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)	15.6	7.0	4.5	1.6
Average Queue (m)	10.2	2.9	1.7	0.3
95th Queue (m)	17.2	9.6	7.5	2.9
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)				

APPENDIX I

Background Development Trips Diagrams & Background Development TIS Excerpts

LEGEND

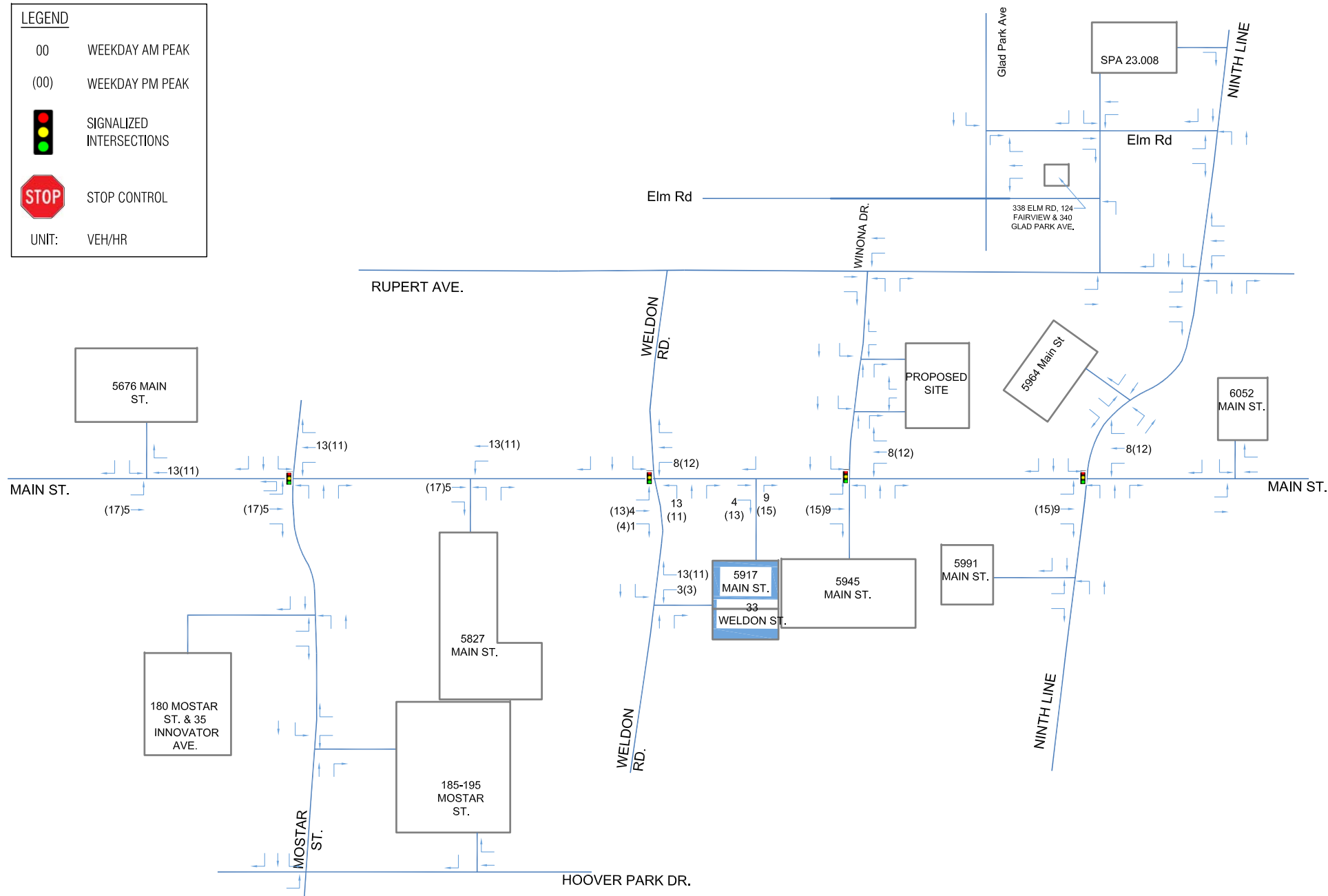
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



n Engineering Inc
9120 Leslie Street, Suite 208
Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
E: info@nengineering.com
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.:

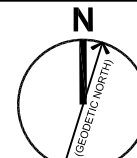
22-71

DATE: 20 JULY 2024

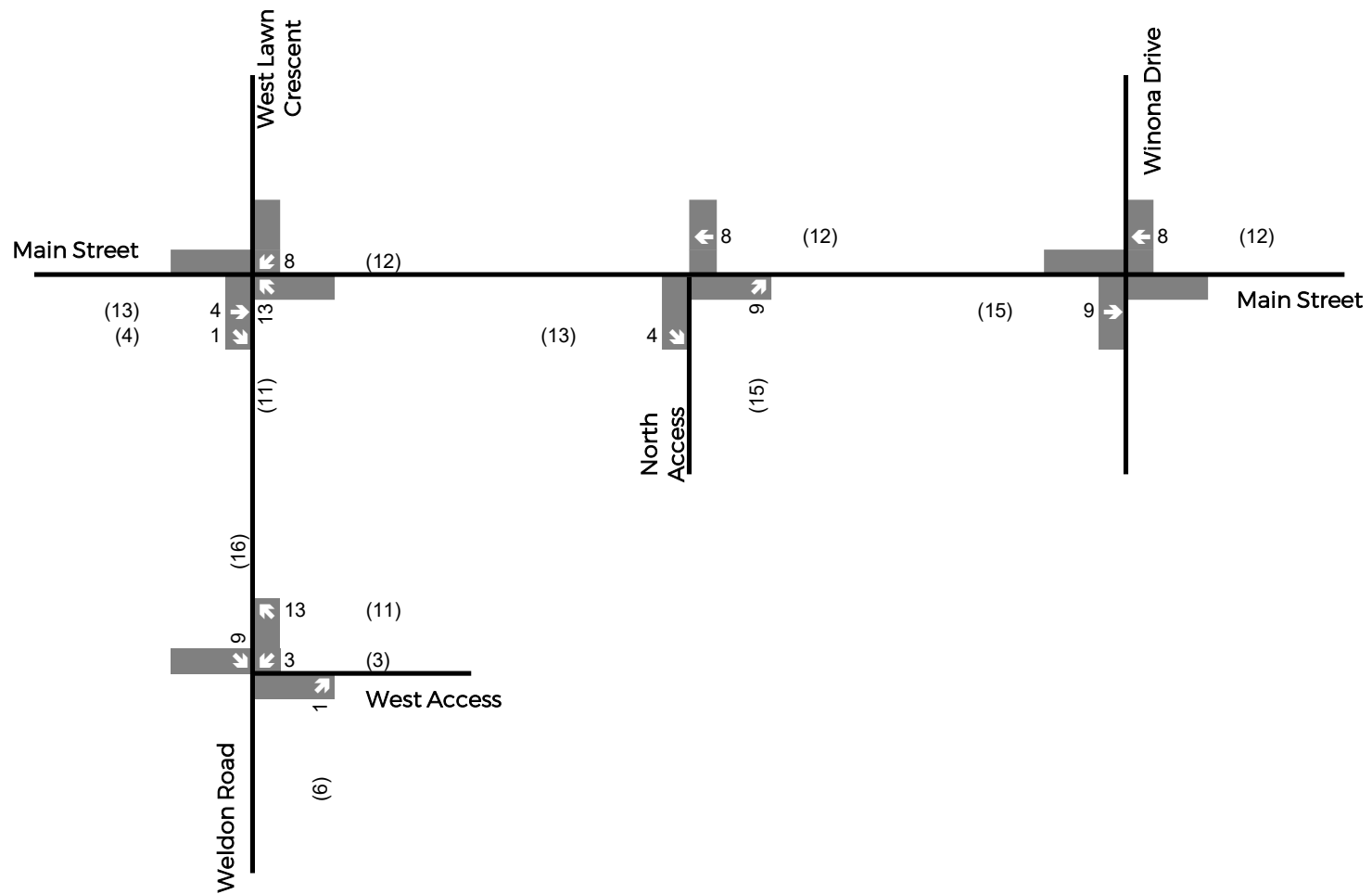
SCALE: NTS

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

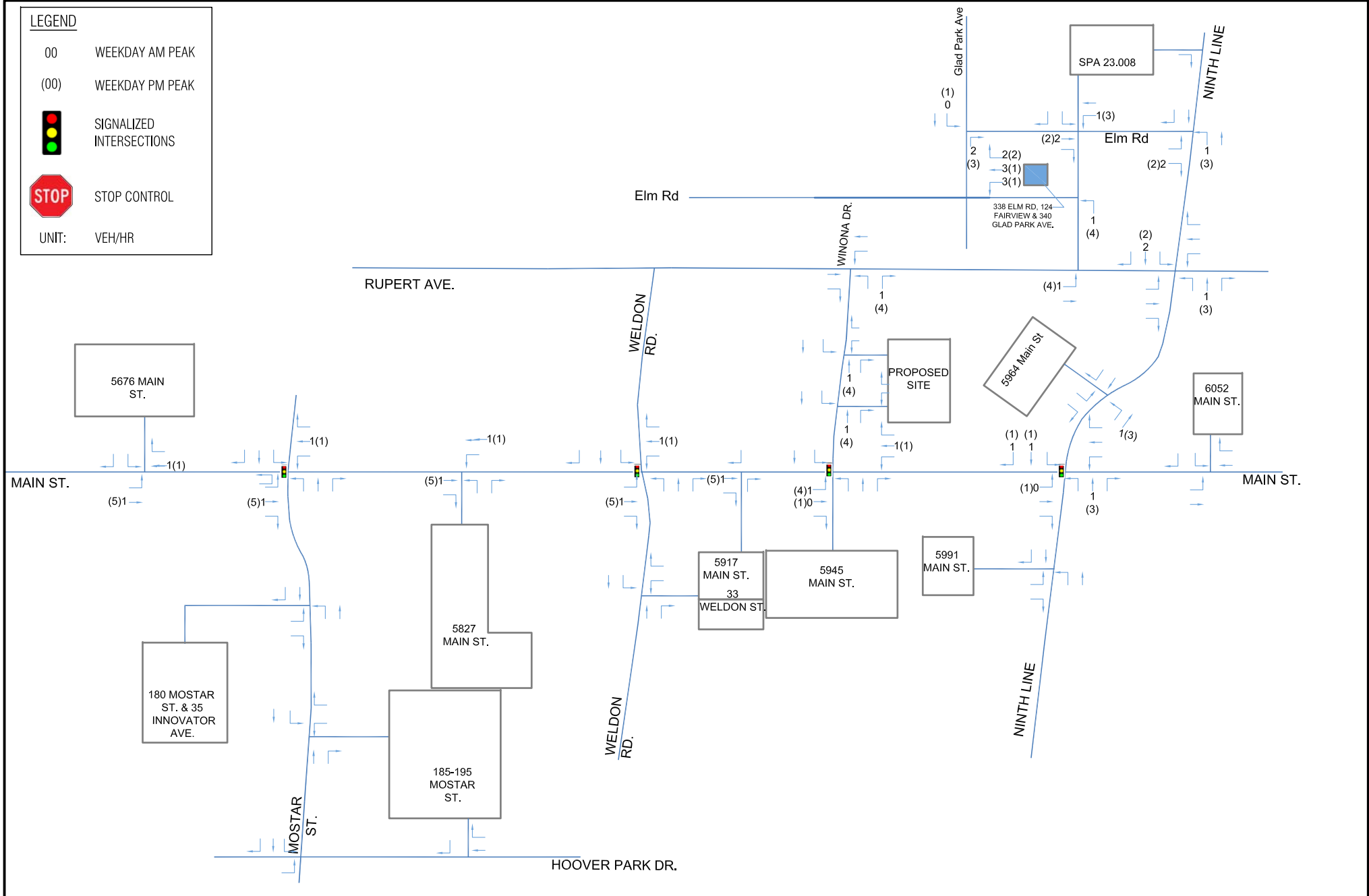
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



n Engineering Inc
9120 Leslie Street, Suite 208
Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
E: info@nengineering.com
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.:

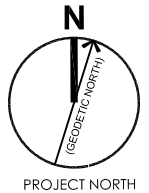
22-71

DATE: 20 JULY 2024

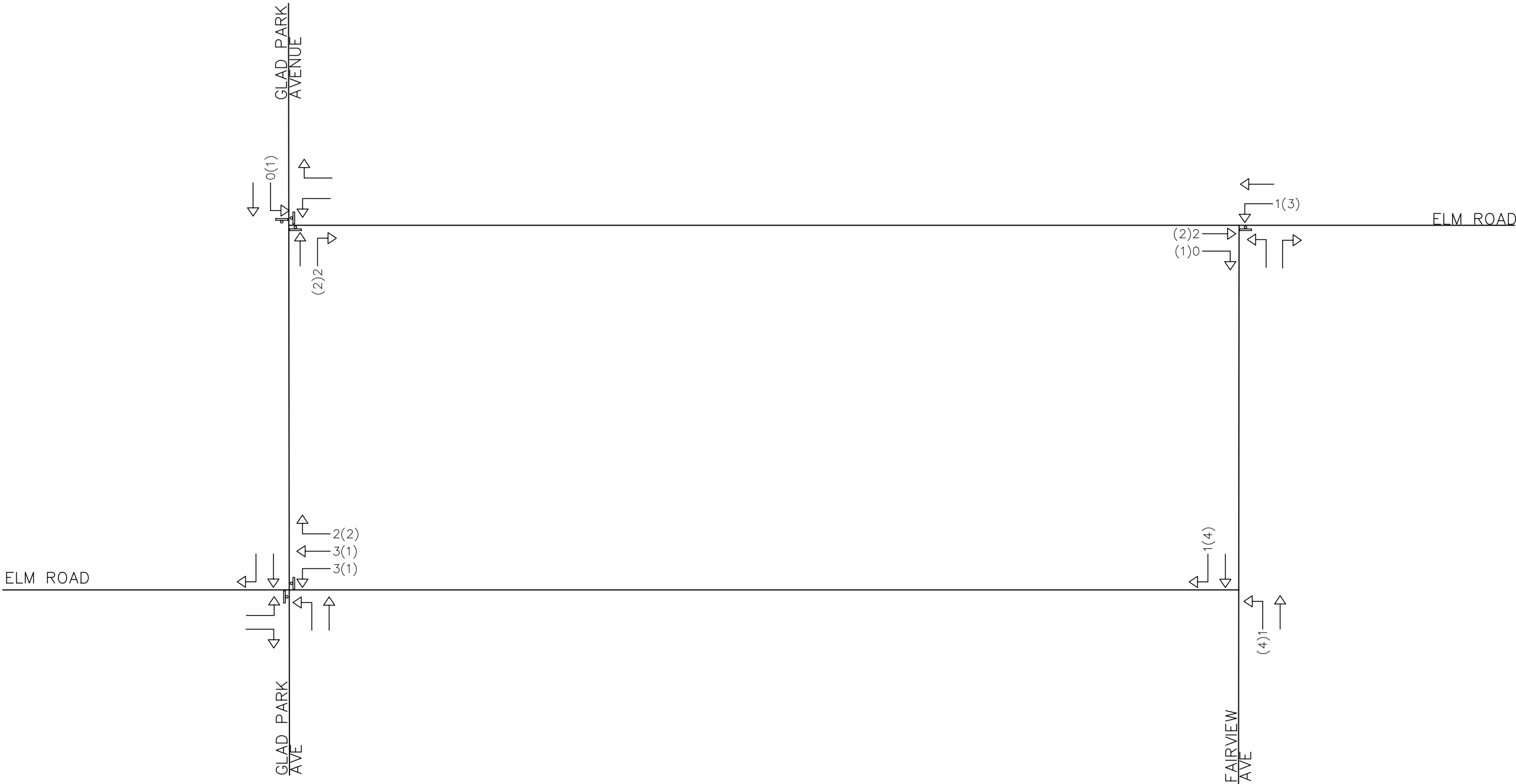
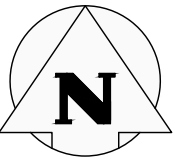
SCALE: NTS

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

CROZIER
CONSULTING ENGINEERS

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

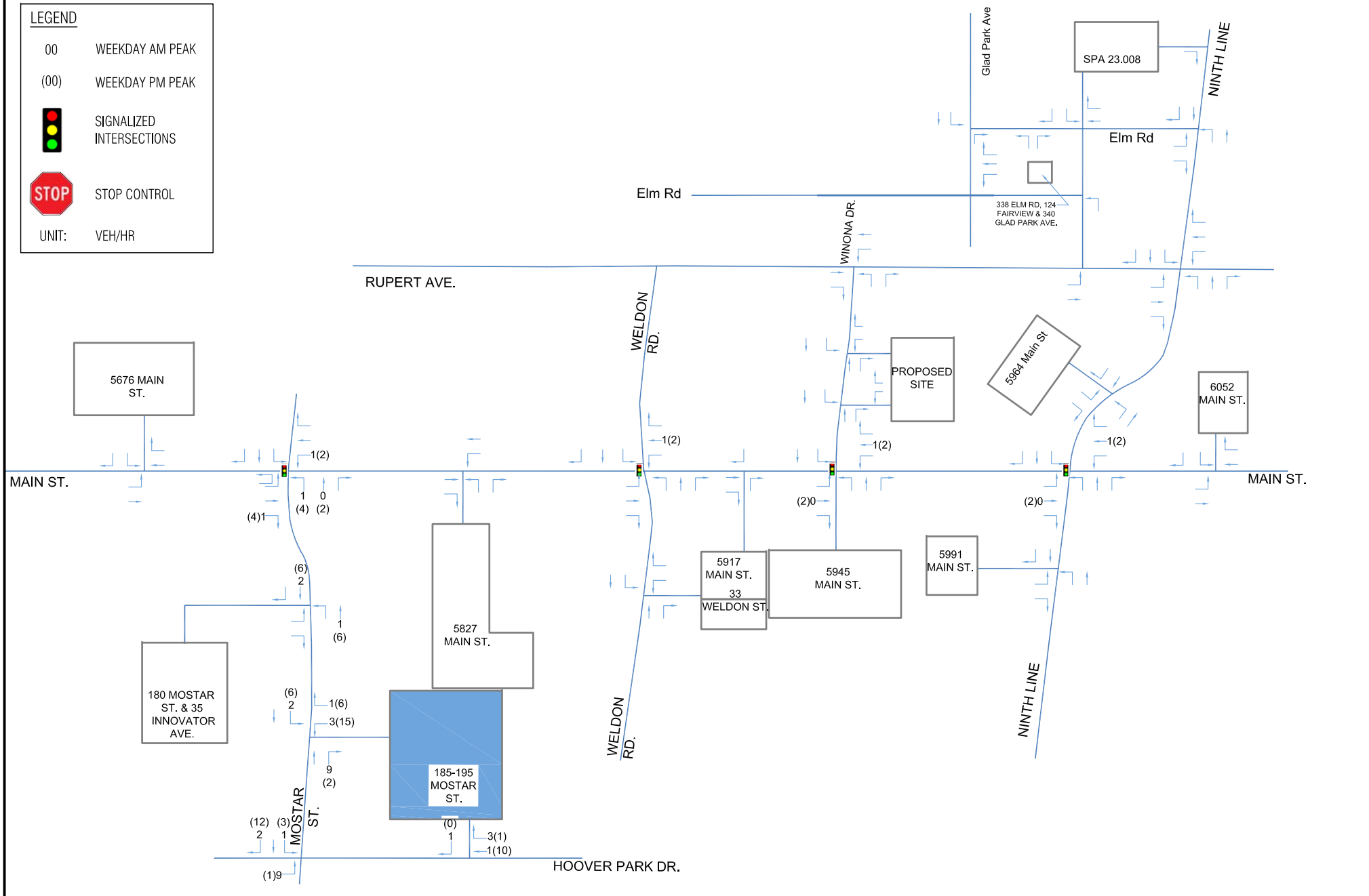
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
E: info@nengineering.com
www.nengineering.com

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.:

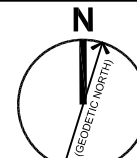
22-71

DATE: 20 JULY 2024

SCALE: NTS

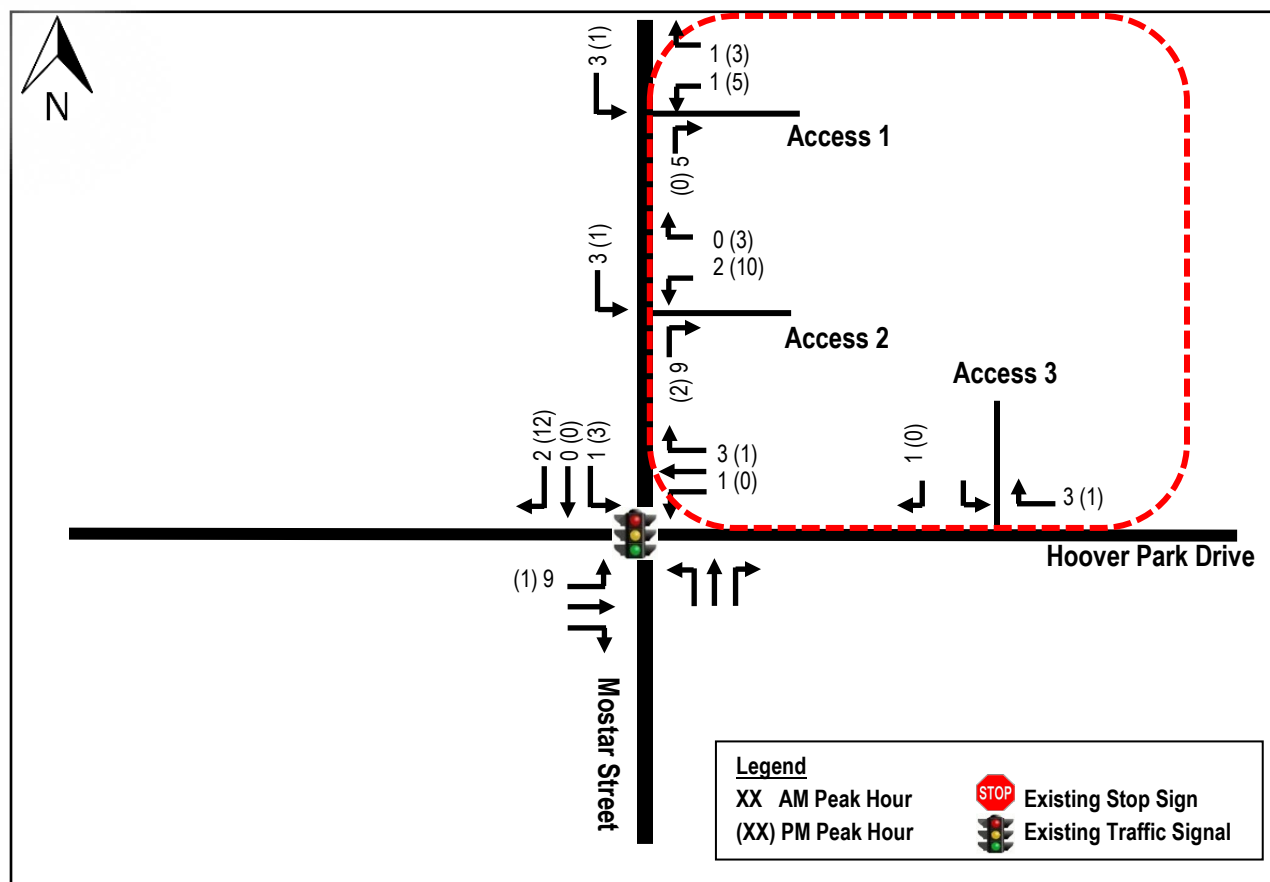
DRAWING NO.:

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

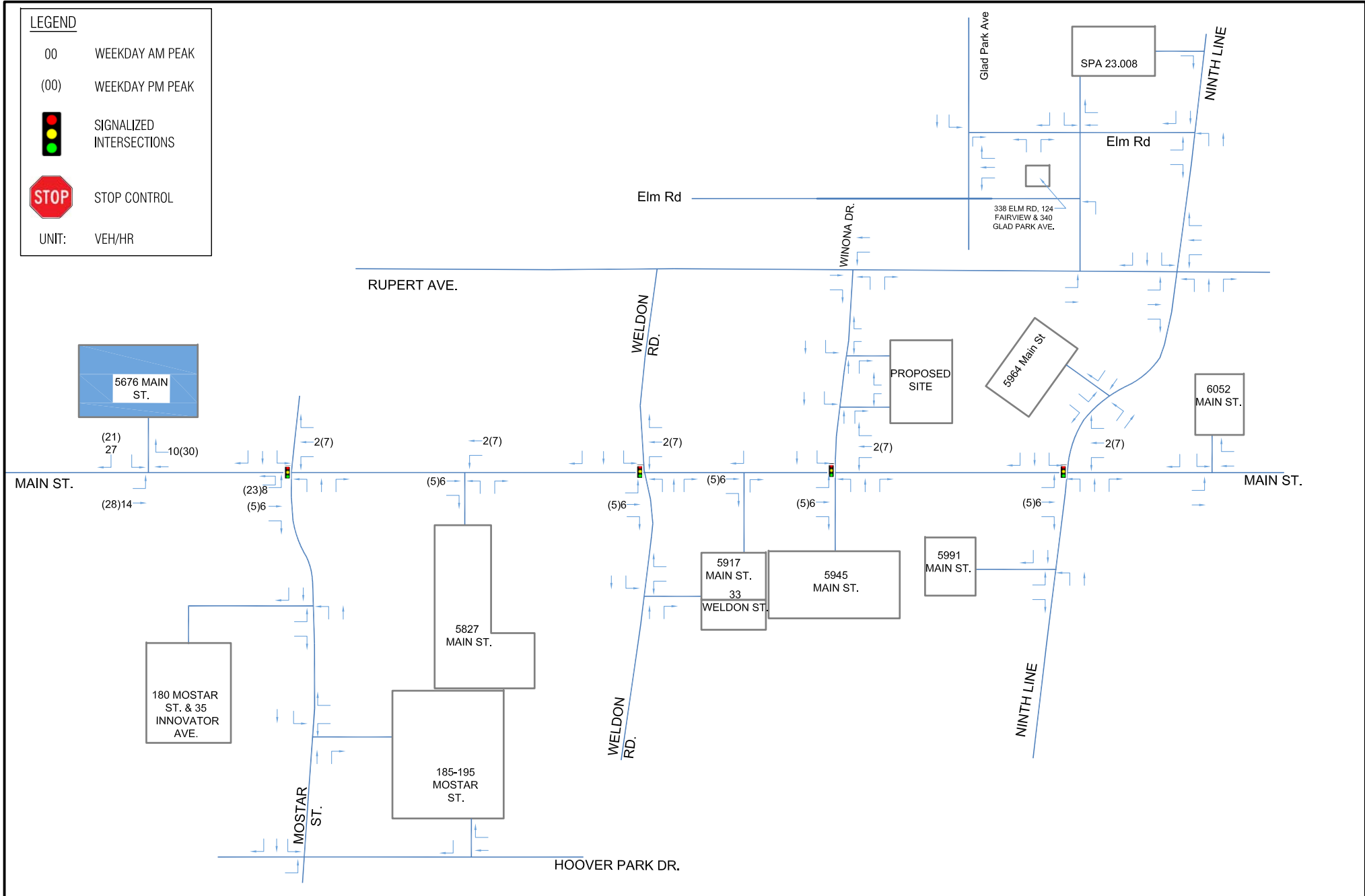
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



n Engineering Inc
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
E: info@nengineering.com
www.nengineering.com

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.:

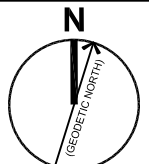
22-71

DATE: 20 JULY 2024

SCALE: NTS

DRAWING NO.:

FIG-B4



PROJECT NORTH

LEGEND

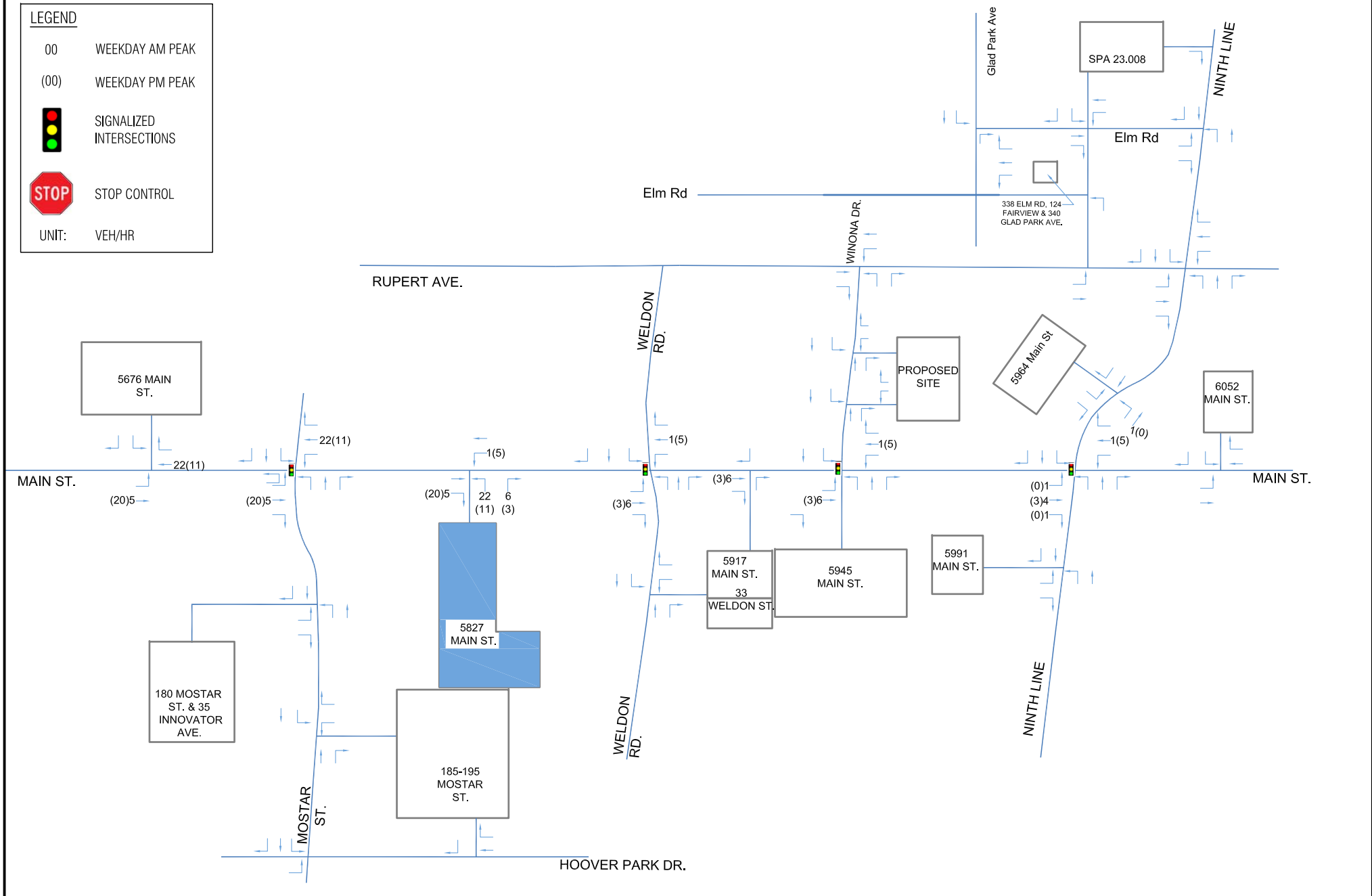
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
E: info@nengineering.com
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.:

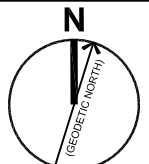
22-71

DATE: 20 JULY 2024

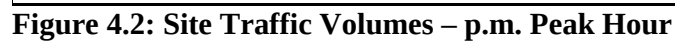
SCALE: NTS

DRAWING NO.:

FIG-B5



PROJECT NORTH



LEGEND

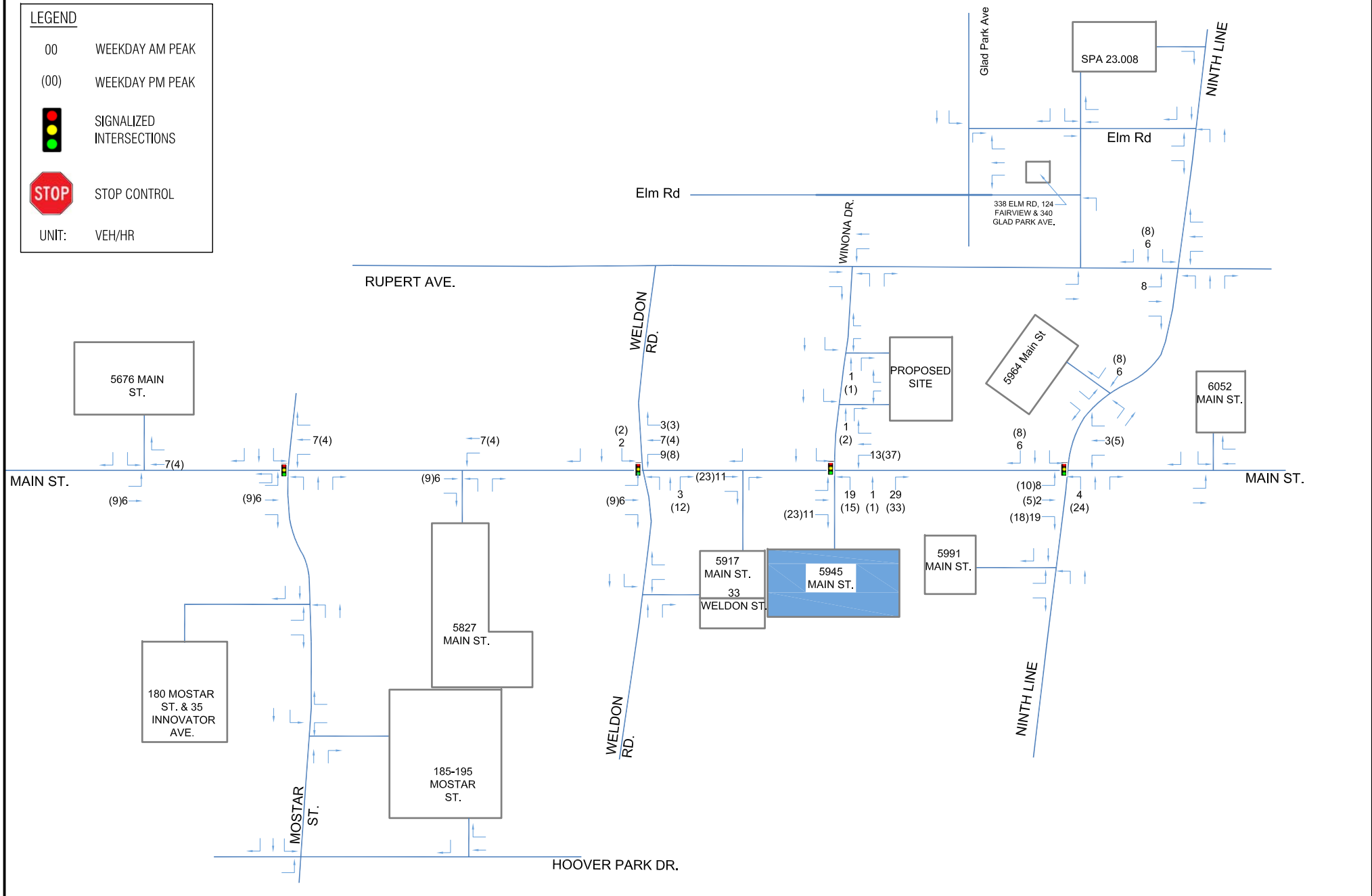
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite 208
Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
E: info@nengineering.com
www.nengineering.com

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.:

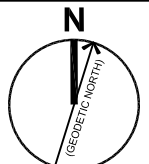
22-71

DATE: 20 JULY 2024

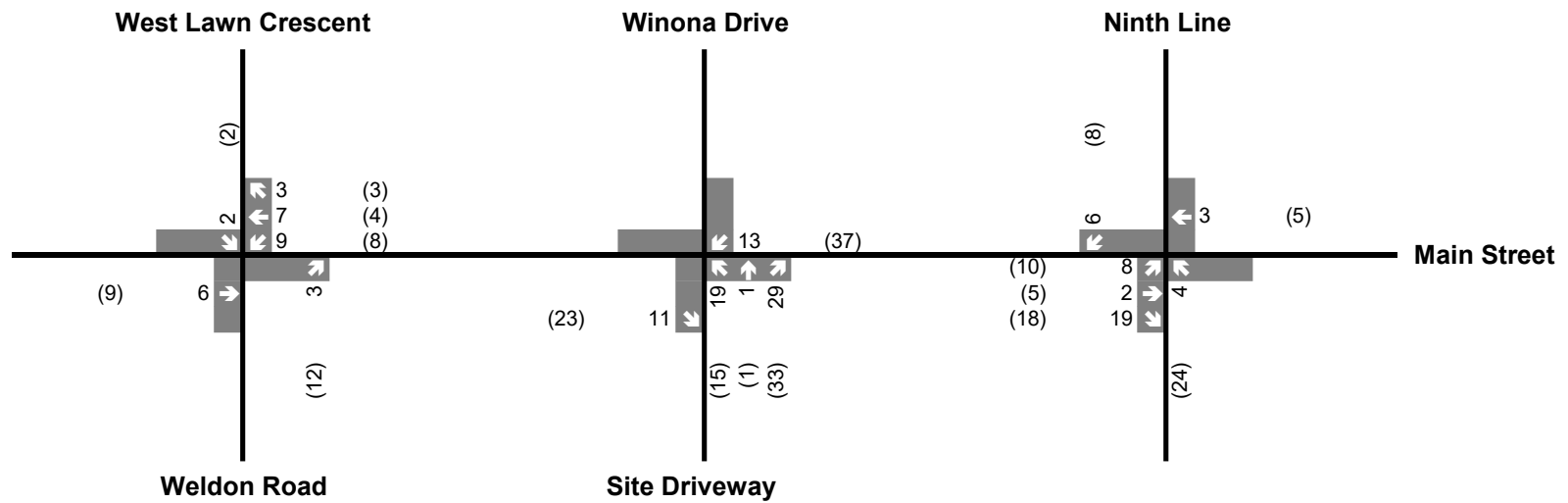
SCALE: NTS

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

LEGEND

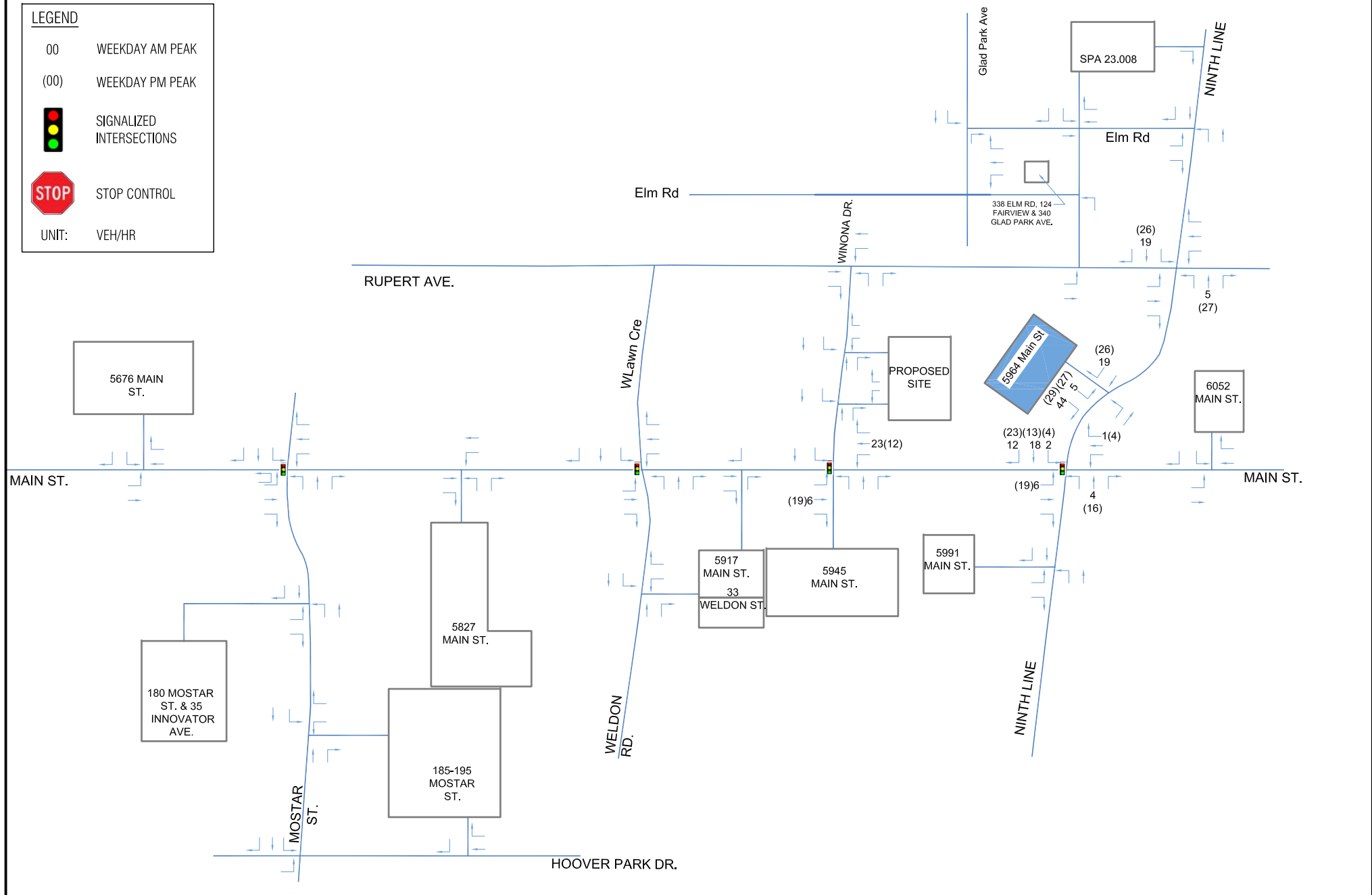
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



n Engineering Inc
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
E: info@nengineering.com
www.nengineering.com

PROJECT:

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

DRAWING TITLE:

**5964 MAIN ST.
(BACKGROUND
DEVELOPMENT TRIPS)**

DRAWN BY: SA

CHECKED BY: AZ

PROJECT NO.:

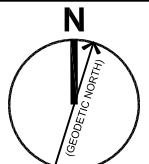
22-71

DATE: 20 JULY 2024

SCALE: NTS

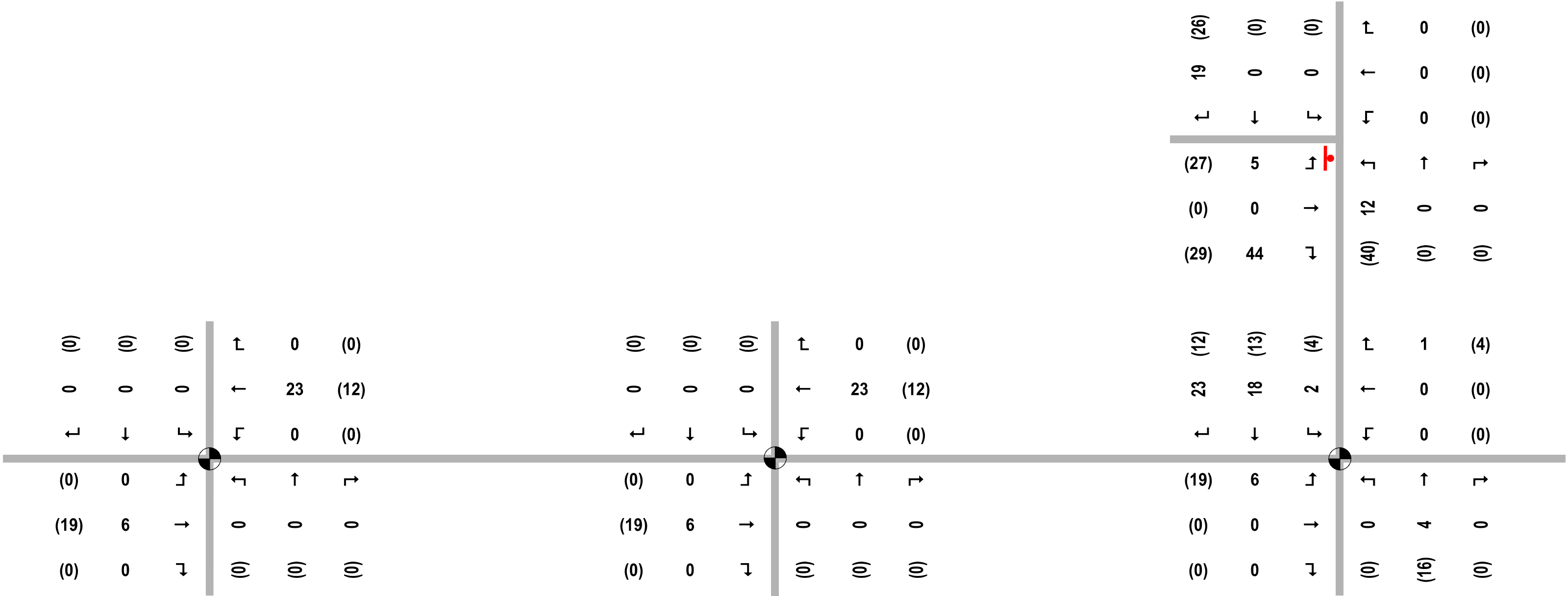
DRAWING NO.:

FIG-B7



PROJECT NORTH

Figure 3-1: Site Traffic Volumes



LEGEND

Subject Site xx AM Peak Hour (xx) PM Peak Hour Existing Stop Sign Existing Traffic Signals

LEGEND

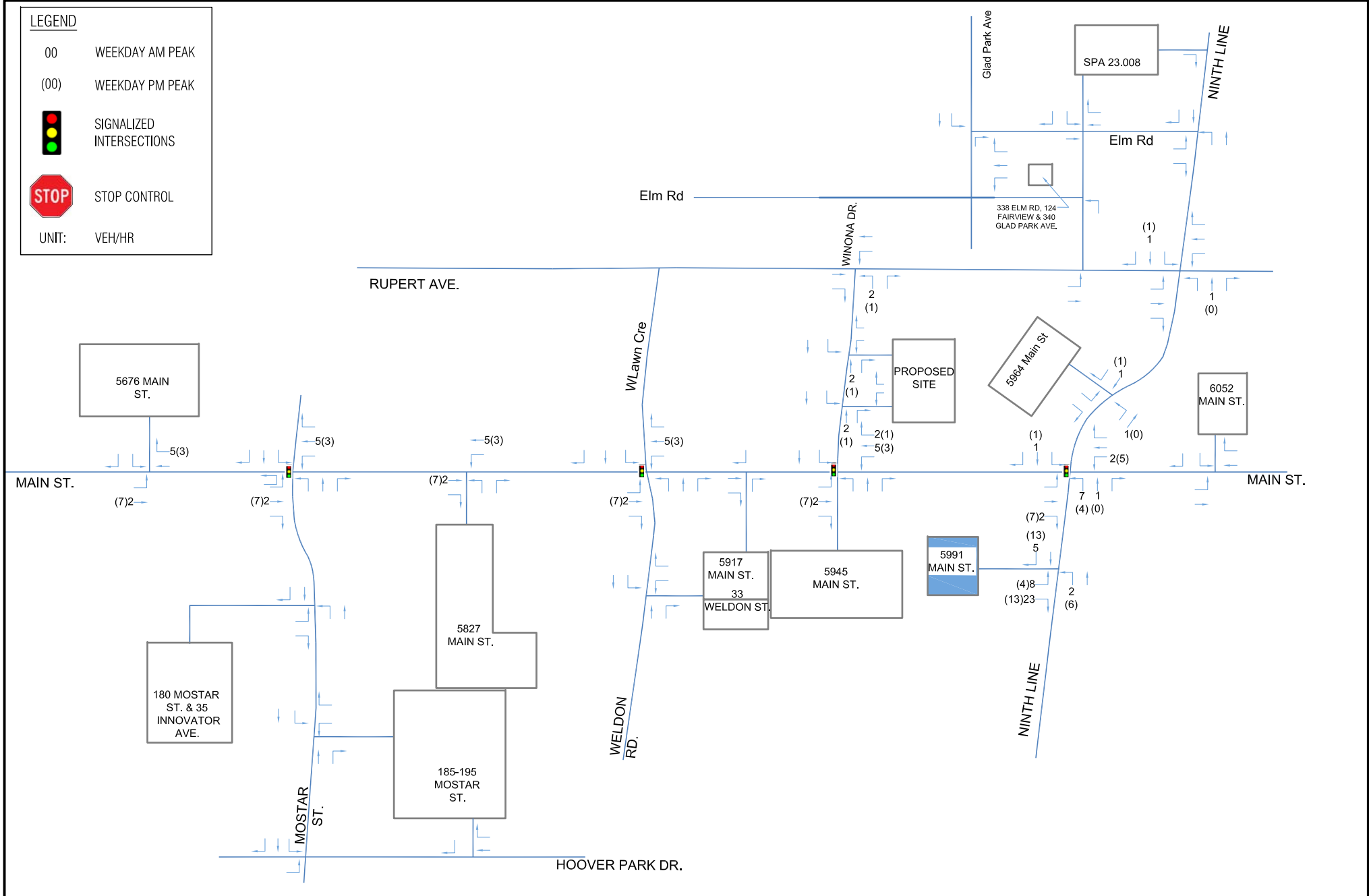
00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

 SIGNALIZED INTERSECTIONS

 STOP CONTROL

UNIT: VEH/HR



n Engineering Inc
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
E: info@nengineering.com
www.nengineering.com

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

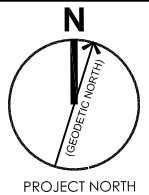
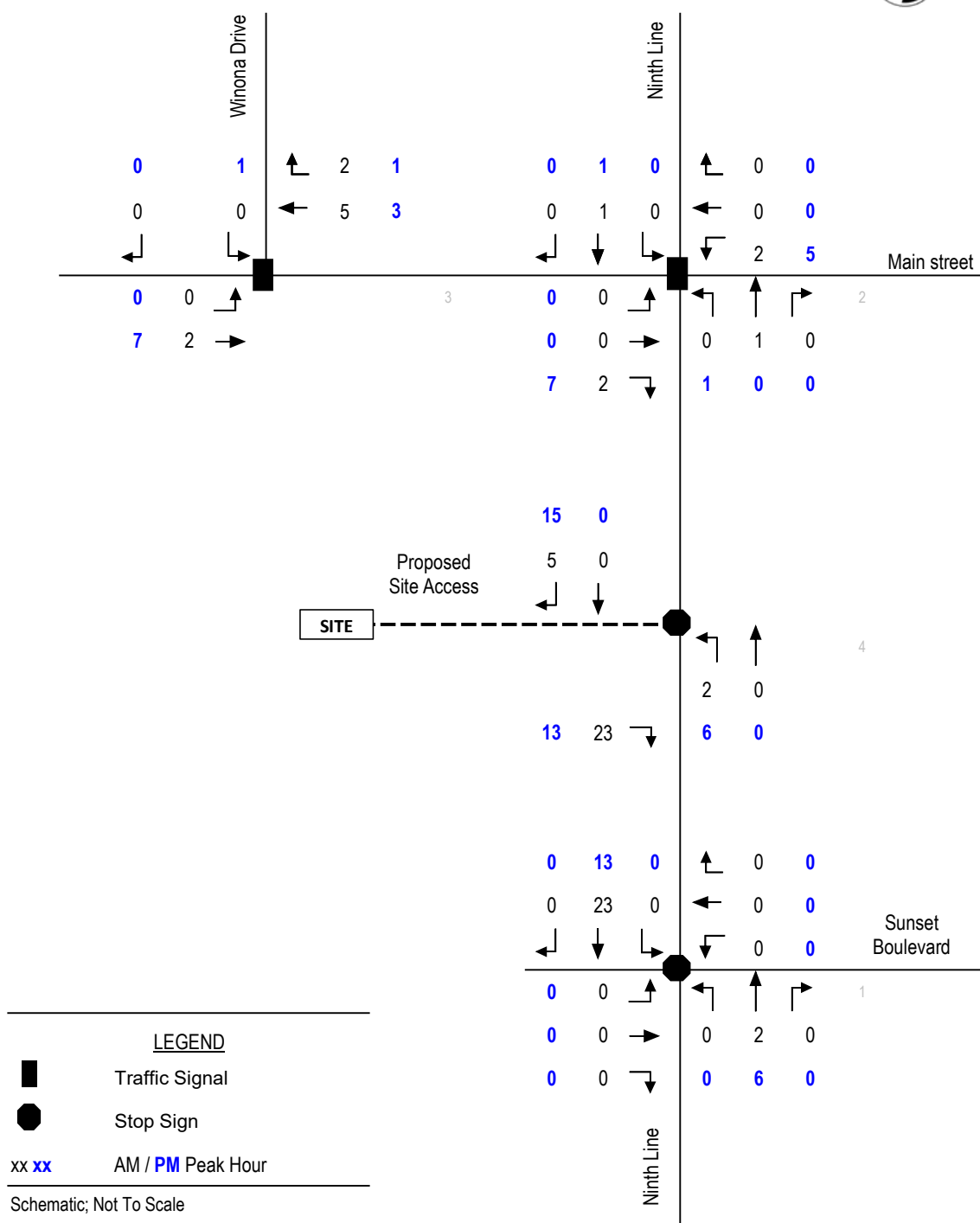


Figure 7: Site Traffic Assignment, Weekday AM and PM Peak Hours



LEGEND

00 WEEKDAY AM PEAK

(00) WEEKDAY PM PEAK

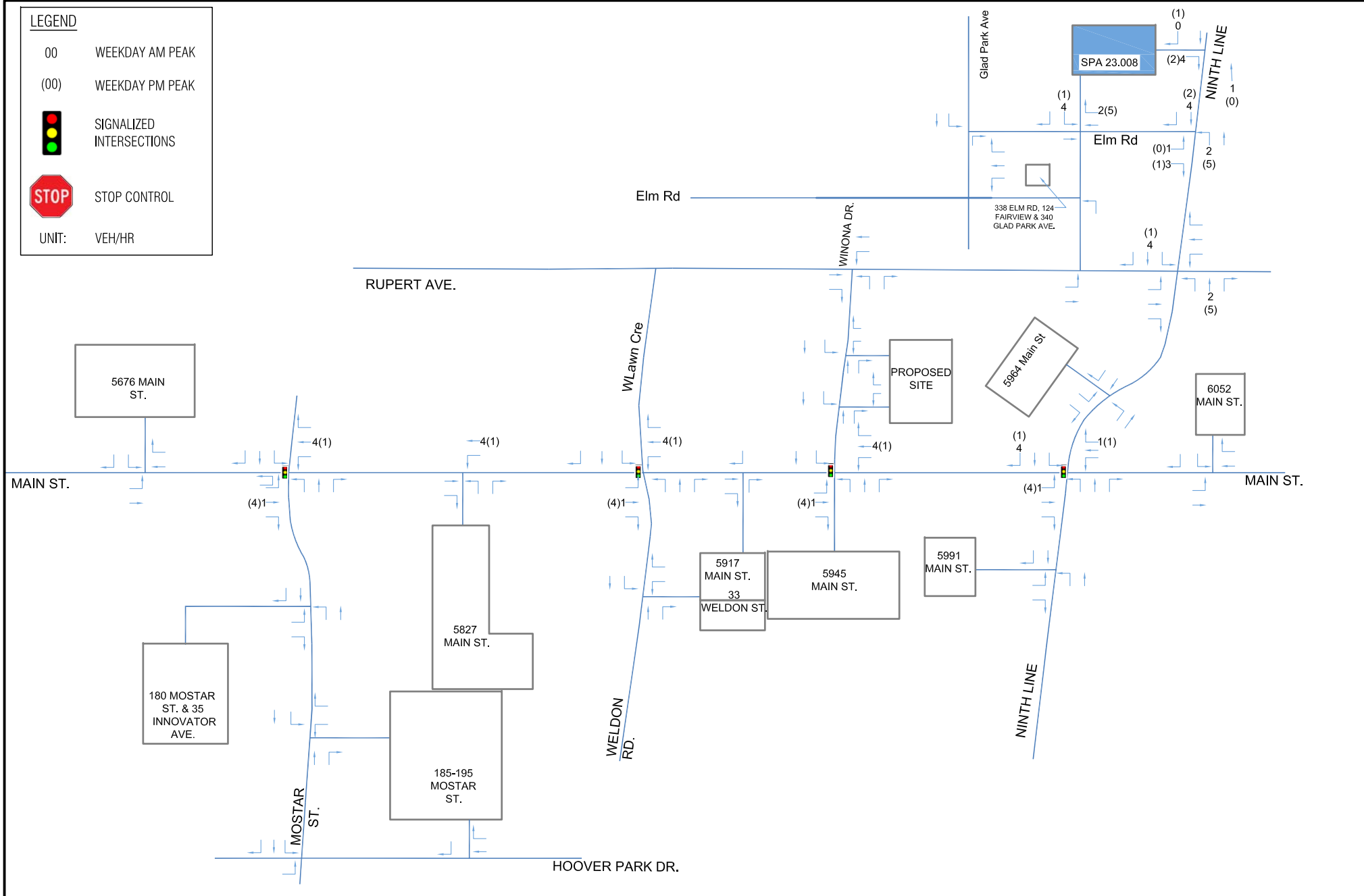


SIGNALIZED
INTERSECTIONS



STOP CONTROL

UNIT: VEH/HR



n Engineering Inc.
9120 Leslie Street, Suite 208
Richmond Hill, Ontario, L4B 3J9
T: 416-256-9741
E: info@nengineering.com
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.:

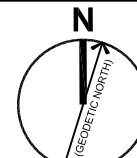
22-71

DATE: 20 JULY 2024

SCALE: NTS

DRAWING NO.:

FIG-B9



PROJECT NORTH

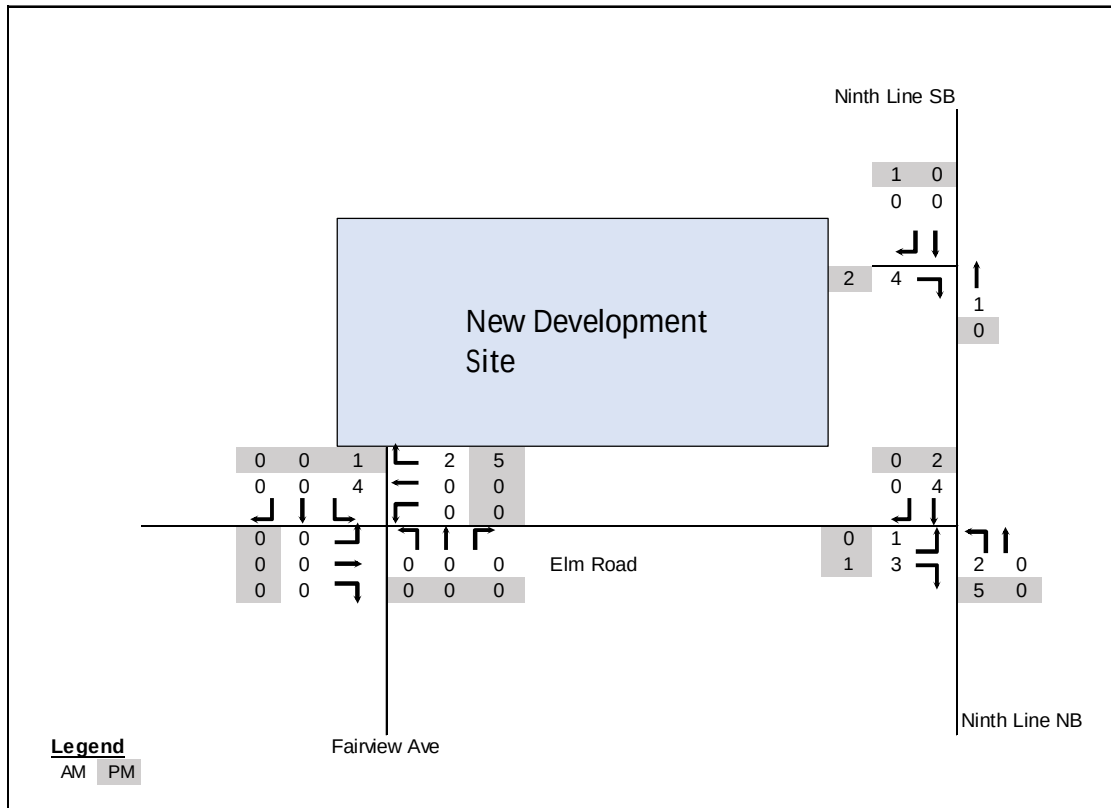


Figure 4-2: Development Generated Site Traffic

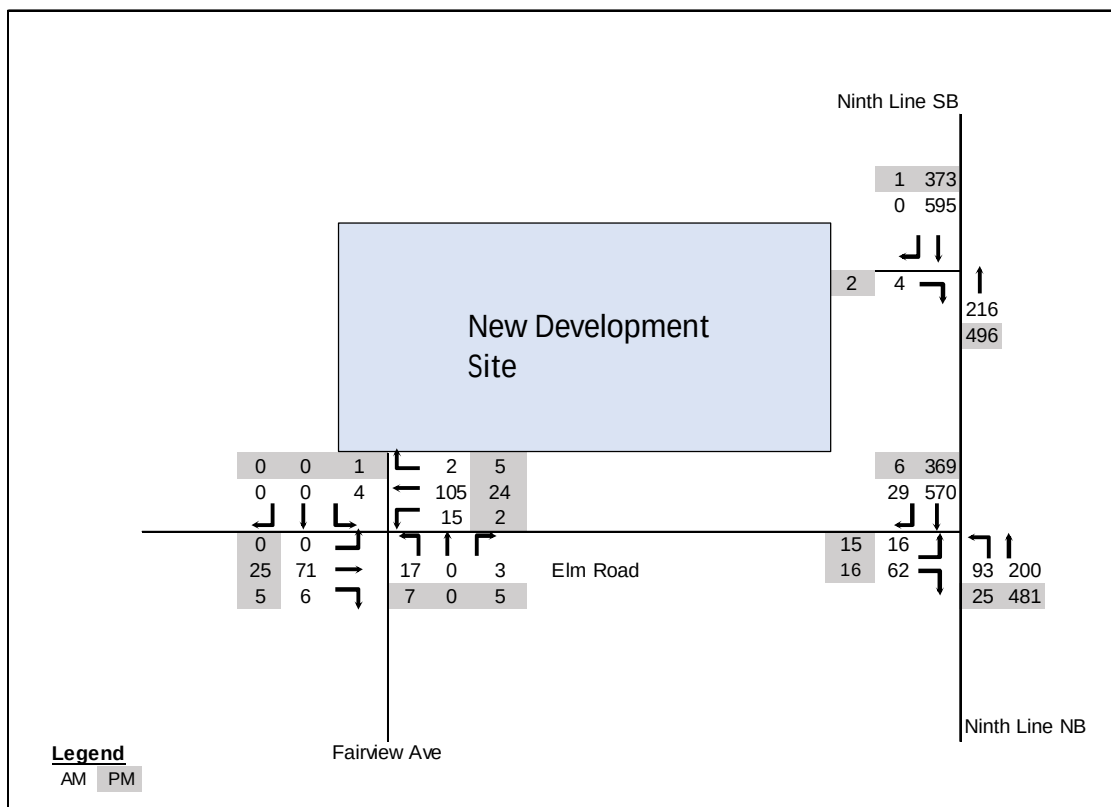


Figure 4-3: Future Total Scenario (Existing plus Development Traffic)

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

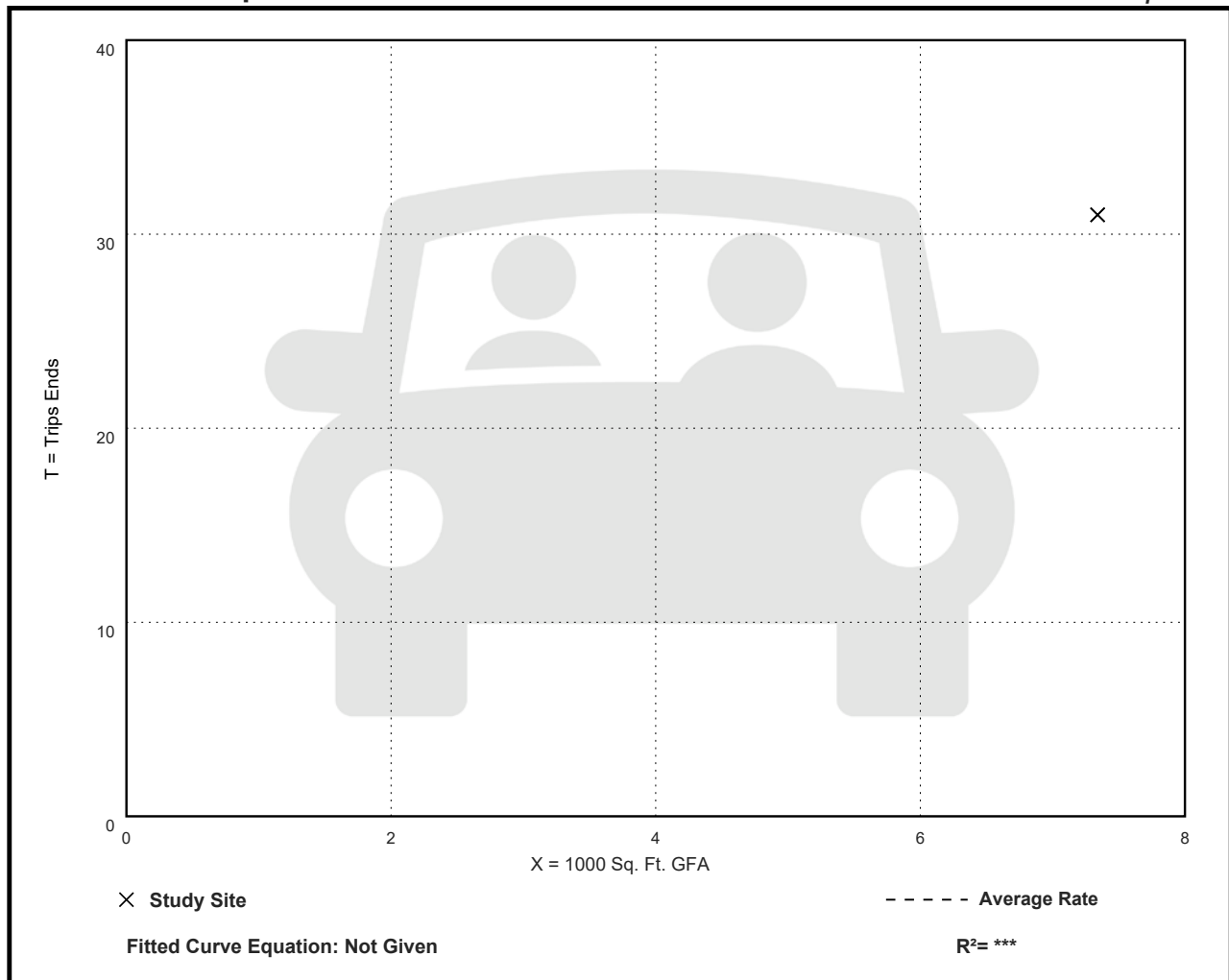
Directional Distribution: Not Available

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

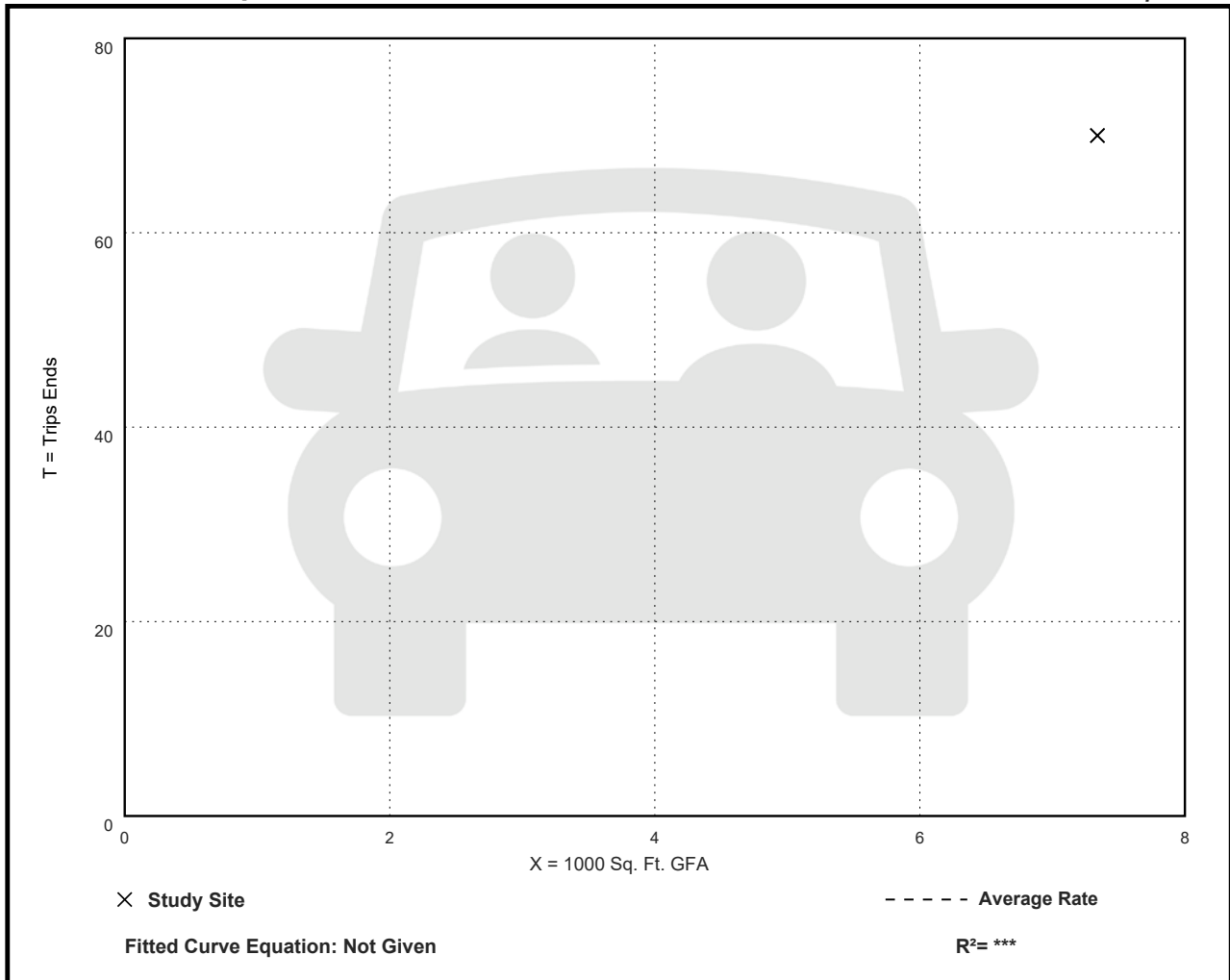
Directional Distribution: 67% entering, 33% exiting

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

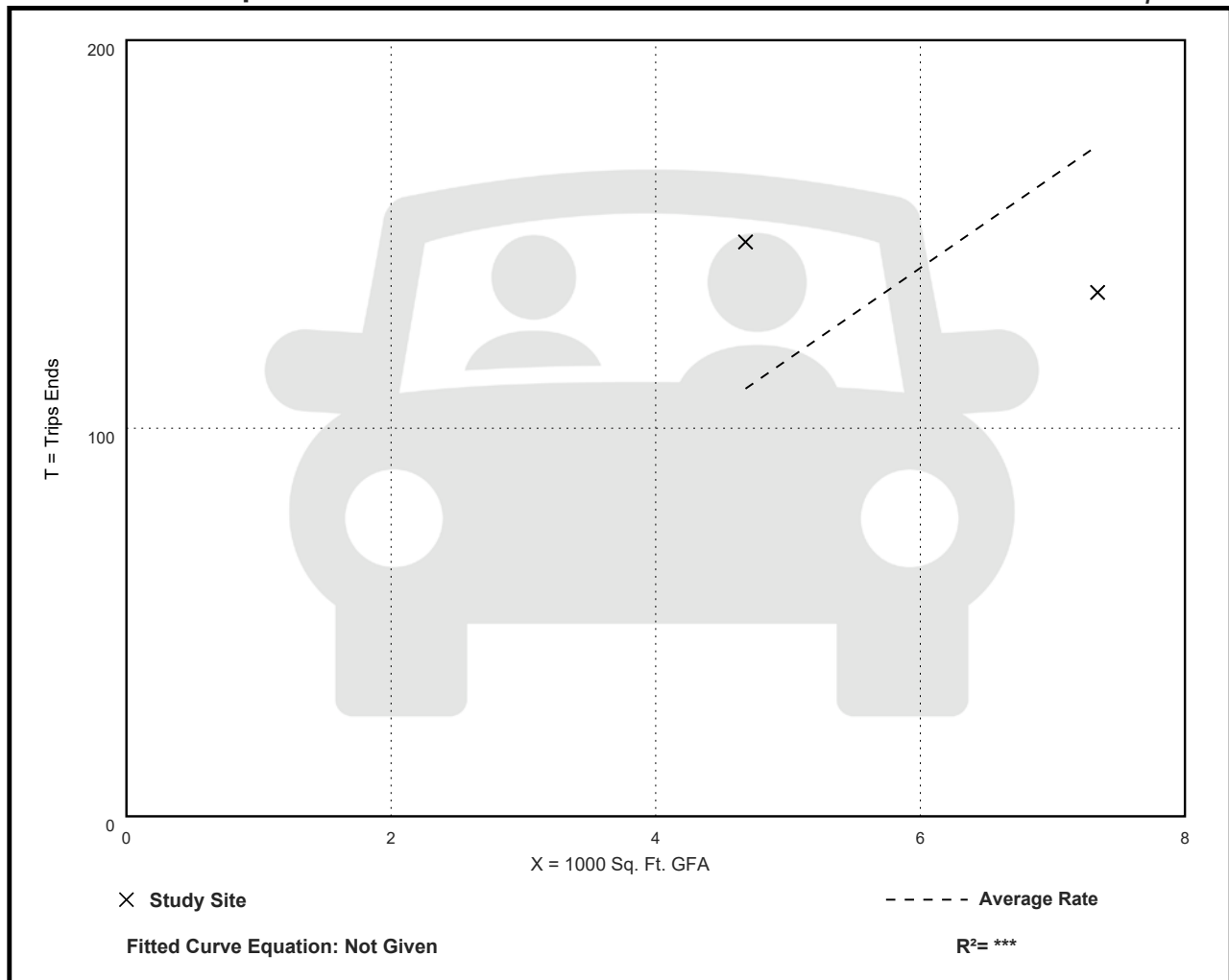
Directional Distribution: 43% entering, 57% exiting

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

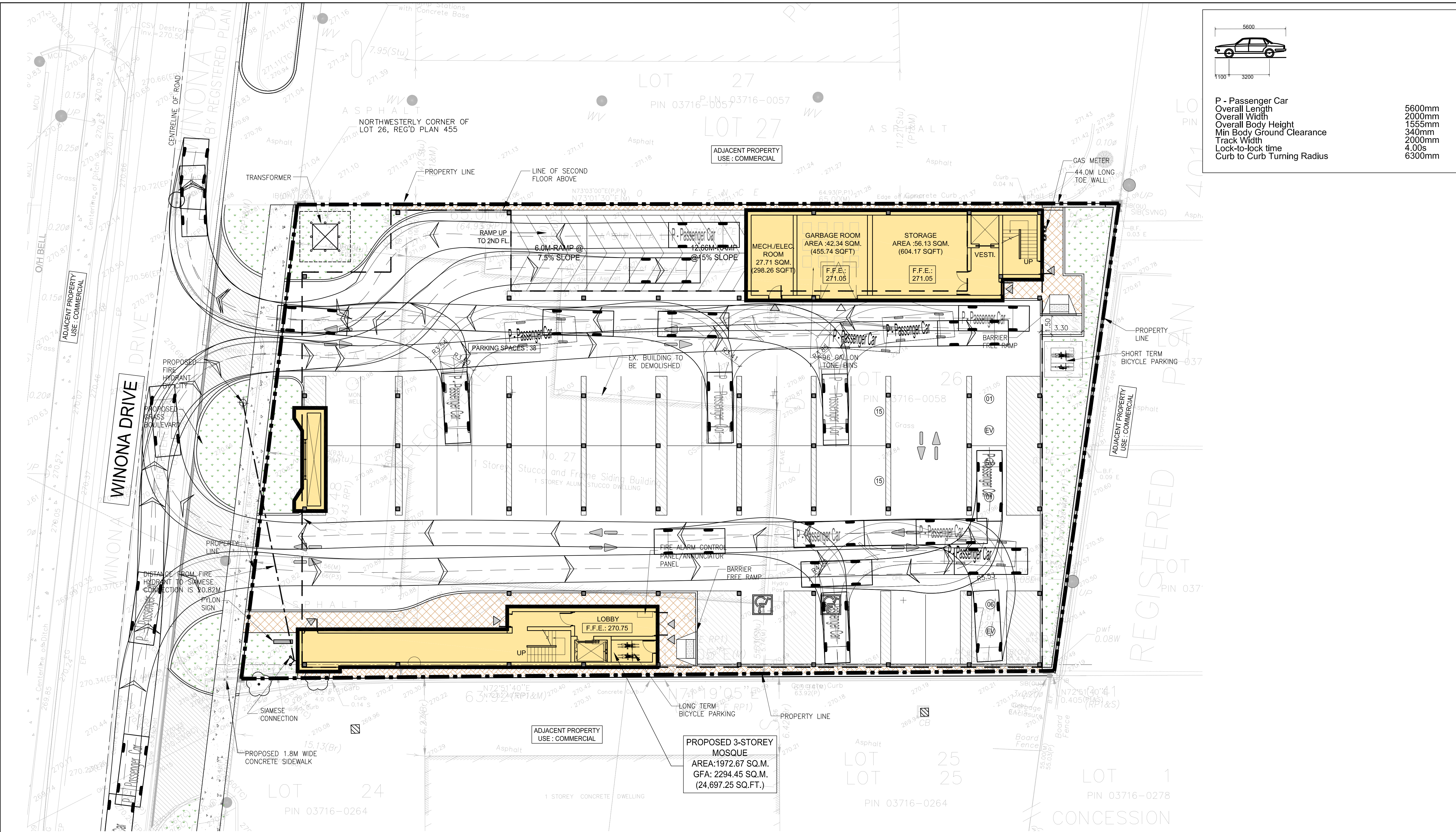
	Trip Rate per 1,000 s.f. GFA	Trip Rate per 100 s.m. GFA	In%	Out%
Weekday AM Peak Hour*	1.55	1.67	44%	56%
Weekday Midday Peak Hour	19.45	20.93	74%	26%
Weekday PM Peak Hour*	3.62	3.90	52%	48%
	Trip Rate per 1,000 s.f. WAGFA	Trip Rate per 100 s.m. WAGFA	In%	Out%
Weekday AM Peak Hour*	2.93	3.15	44%	56%
Weekday Midday Peak Hour	44.08	47.47	74%	26%
Weekday PM Peak Hour*	6.83	7.36	52%	48%

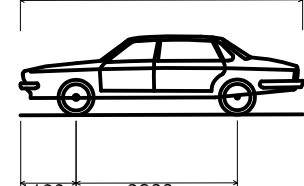
Source: Adapted from Paradigm Transportation Solutions Limited Traffic Study for Ahmadiyya Muslim Mosque.

* Average is only based upon two sites due to available data.

APPENDIX K

Vehicle Movement Diagrams





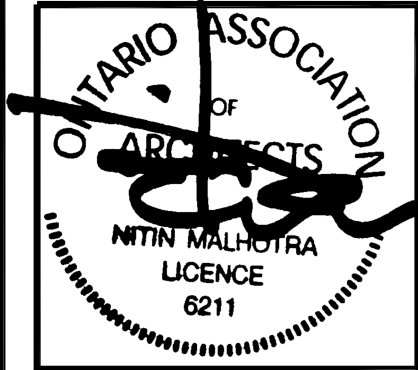
P - Passenger Car
Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock-to-lock time
Curb to Curb Turning Radius

5600mm
2000mm
1555mm
340mm
2000mm
4.00s
6300mm

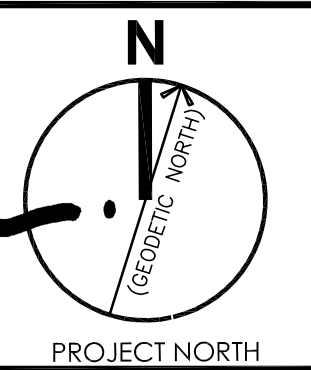
1
A-1.1 CAR TURNING MOVEMENT PLAN
SCALE: 1:150



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



18 MAR. 2025



PROJECT NORTH

18M MARCH 2025
ISSUED FOR ZBA
NOT FOR CONSTRUCTION

5.	18 MAR. 2025	ISSUED FOR ZBA	ZP
4.	06 MAR. 2025	ISSUED FOR COORDINATION	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB
No.	Date	Version	Dwn.

This drawing is copyright property of 'n Architecture Inc'. Not to be reproduced. Contractor must verify all job dimensions, drawings, details and specifications and report any discrepancies to the architect before proceeding with work.

PROJECT:

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

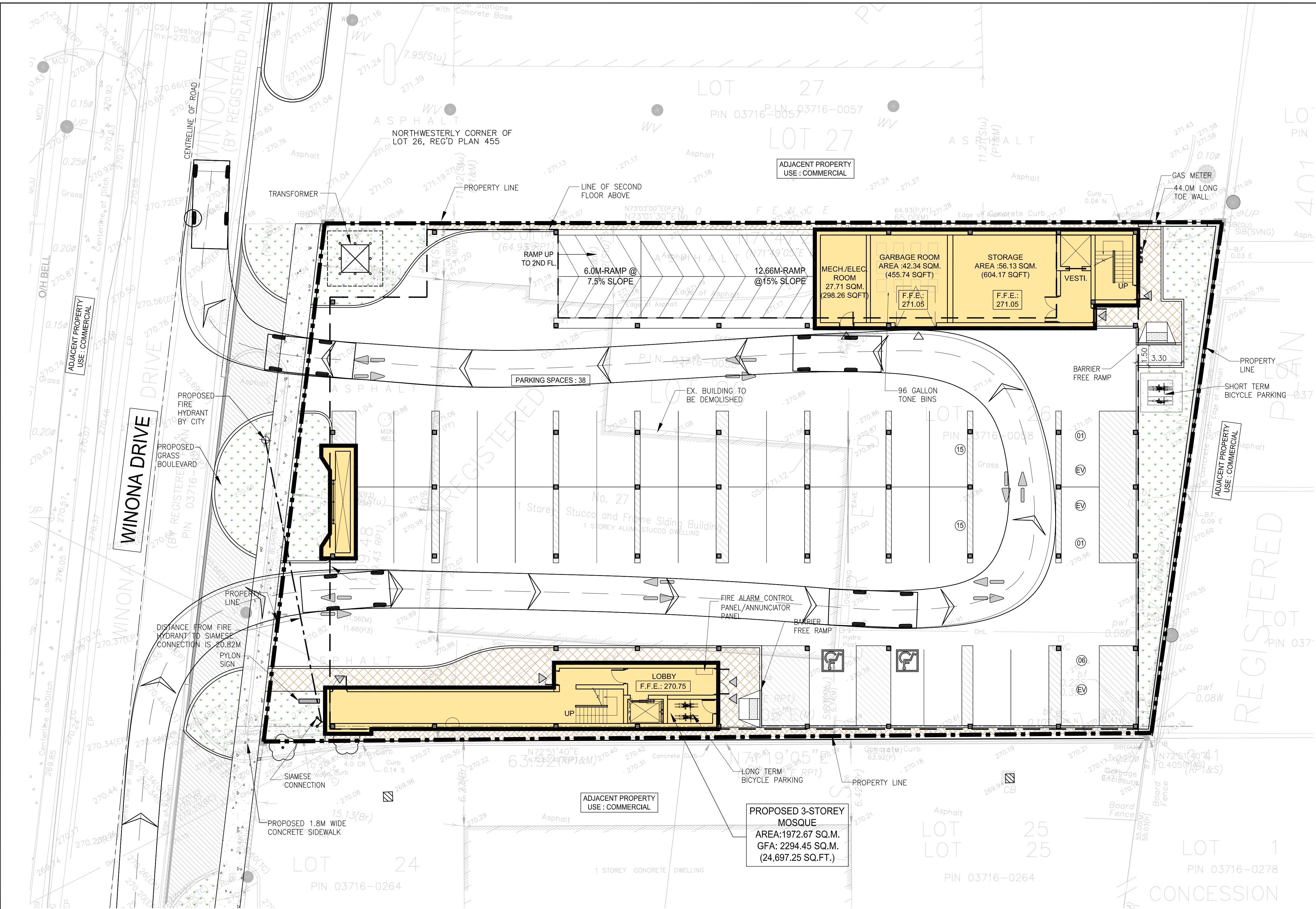
DRAWING TITLE:

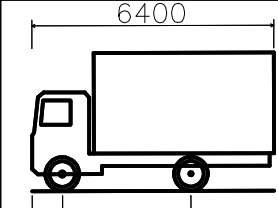
**CAR TURNING
MOVEMENT PLAN**

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

22-71

A-1.1





6400
800 3400

LSU - Light Single Unit Truck

Overall Length 6400mm

Overall Width 2600mm

Overall Body Height 3650mm

Min. Body Ground Clearance 445mm

Track Width 2600mm

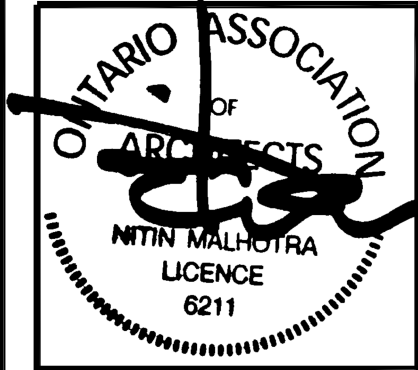
Lock-to-lock time 4.00s

Curb to Curb Turning Radius 6300mm

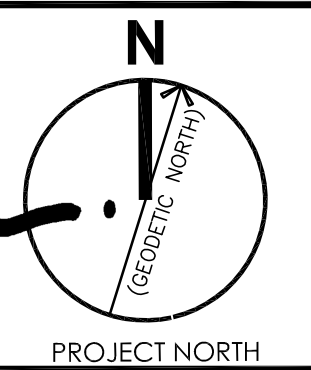
1 GARBAGE TRUCK TURNING MOVEMENT PLAN
A-1.1a SCALE: 1:150



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



18 MAR. 2025



PROJECT NORTH

18th MARCH 2025
ISSUED FOR ZBA
NOT FOR CONSTRUCTION

5.	18 MAR. 2025	ISSUED FOR ZBA	ZP
4.	06 MAR. 2025	ISSUED FOR COORDINATION	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB
No.	Date	Version	Dwn.

This drawing is copyright property of 'n Architecture Inc'. Not to be reproduced. Contractor must verify all job dimensions, drawings, details and specifications and report any discrepancies to the architect before proceeding with work.

PROJECT:

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

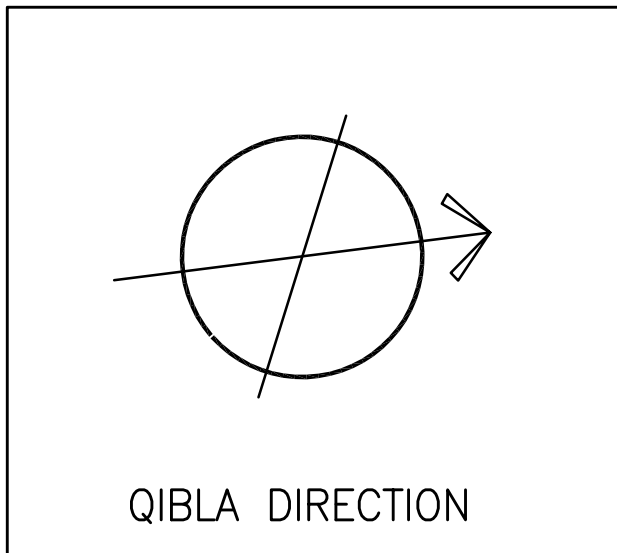
DRAWING TITLE:

**GARBAGE TRUCK
TURNING
MOVEMENT PLAN**

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

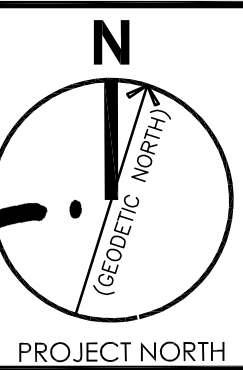
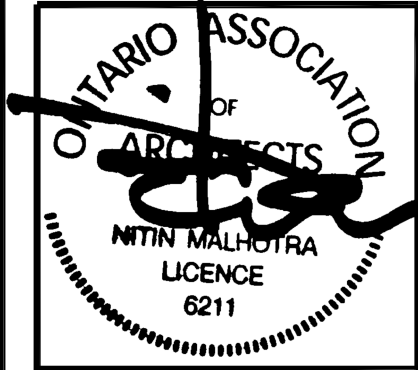
22-71

A-1.1a



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



18 MAR. 2025

18th MARCH 2025
ISSUED FOR ZBA
NOT FOR CONSTRUCTION

No.	Date	Version	Dwn.
5.	18 MAR. 2025	ISSUED FOR ZBA	ZP
4.	06 MAR. 2025	ISSUED FOR COORDINATION	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB
No.	Date	Version	Dwn.

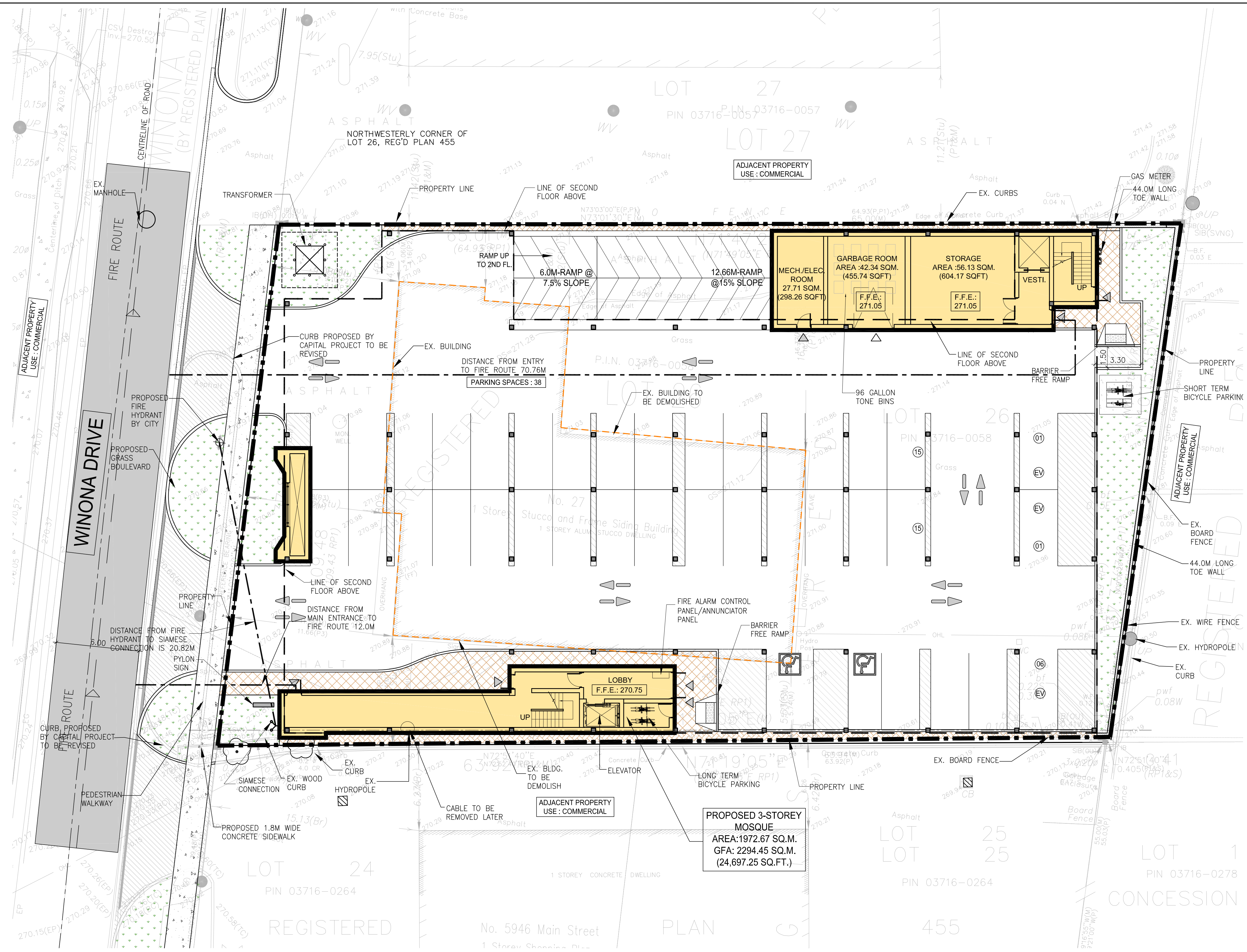
This drawing is copyright property of 'n Architecture Inc'. Not to be reproduced. Contractor must verify all job dimensions, drawings, details and specifications and report any discrepancies to the architect before proceeding with work.

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

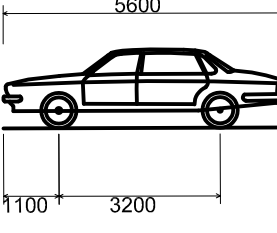
DRAWING TITLE:
**SITE PLAN
FIRE ROUTE
PLAN**

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

22-71 A-1.2

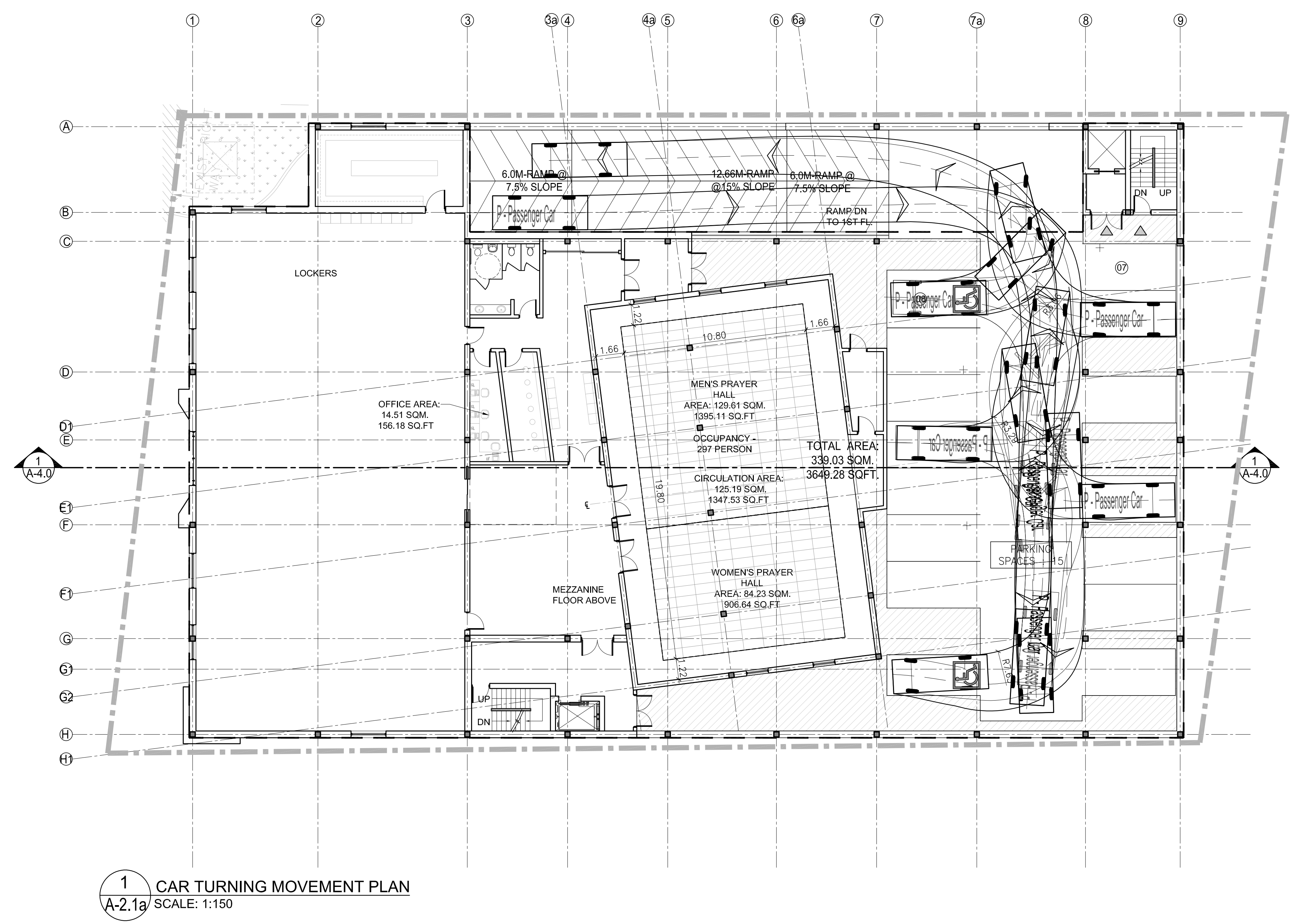


1 FIRE ROUTE PLAN
A-1.2 SCALE: 1:150



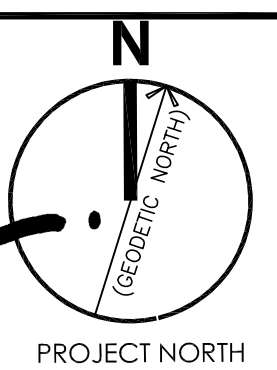
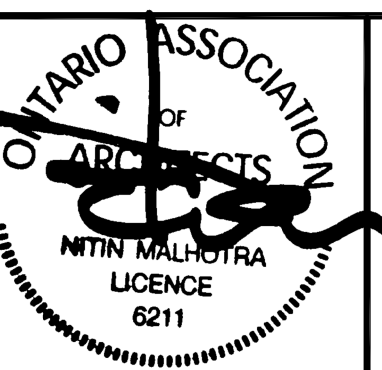
5600
1100 3200

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





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



PROJECT NORTH

18 MAR. 2025

18th MARCH 2025
ISSUED FOR ZBA
NOT FOR CONSTRUCTION

5.	18 MAR. 2025	ISSUED FOR ZBA	ZP
4.	06 MAR. 2025	ISSUED FOR COORDINATION	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB
No.	Date	Version	Dwn.

This drawing is copyright property of 'n Architecture Inc'. Not to be reproduced. Contractor must verify all job dimensions, drawings, details and specifications and report any discrepancies to the architect before proceeding with work.

PROJECT:

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

DRAWING TITLE:

**SECOND FLOOR
CAR TURNING
MOVEMENT PLAN**

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

22-71

A-2.1a

5600



11003200

P - Passenger Car

Overall Length

Overall Width

Overall Body Height

Min Body Ground Clearance

Track Width

Lock-to-lock time

Curb to Curb Turning Radius

5600mm

2000mm

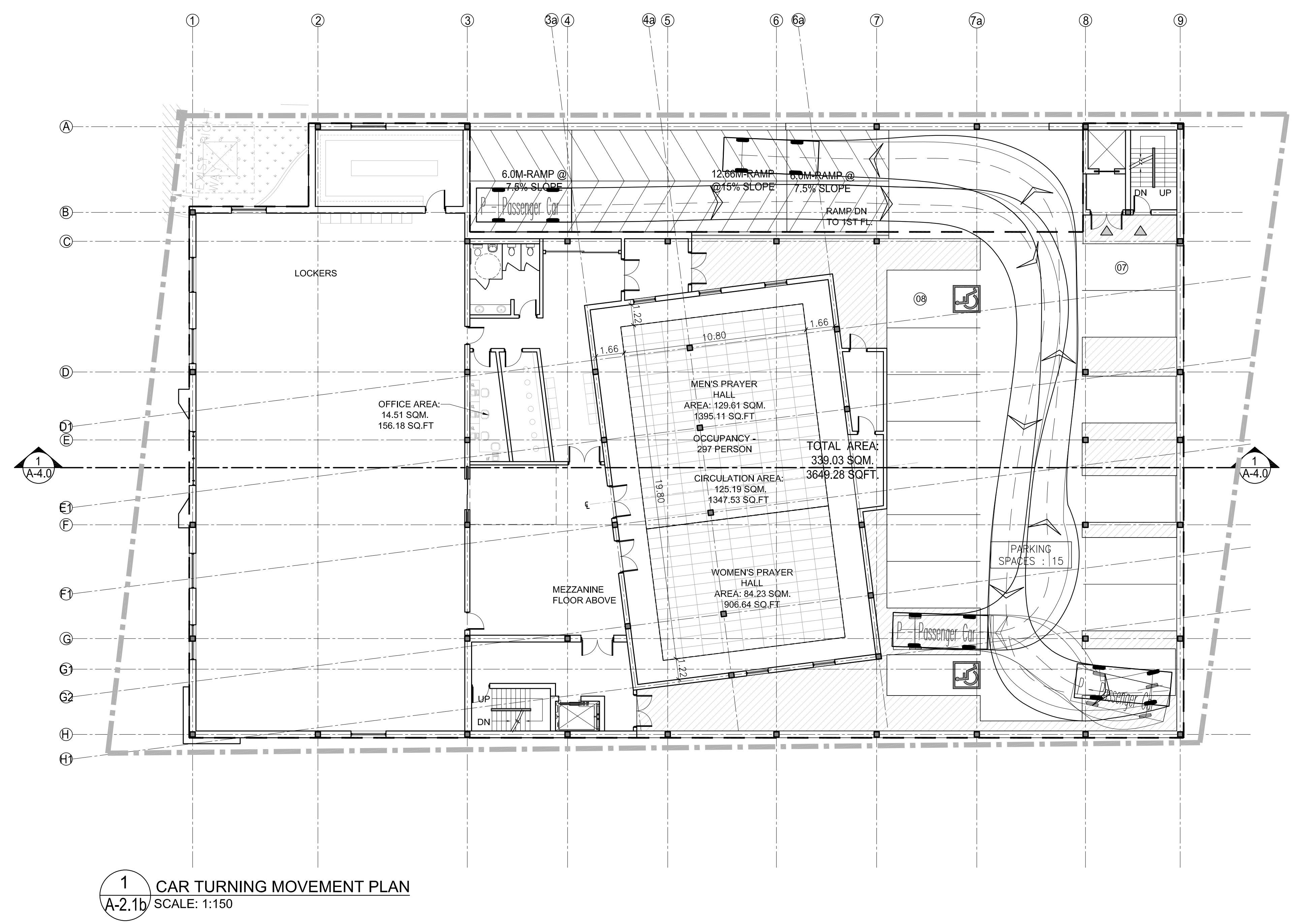
1555mm

340mm

2000mm

4.00s

6300mm





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

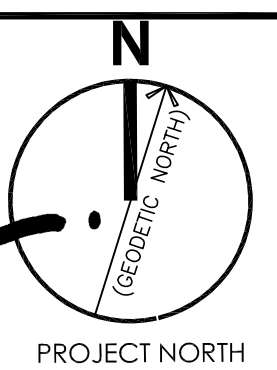
www.narchitecture.com



ONTARIO ASSOCIATION of ARCHITECTS

NITIN MALHOTRA

LICENCE 6211



PROJECT NORTH

18 MAR. 2025

18th MARCH 2025

ISSUED FOR ZBA

NOT FOR CONSTRUCTION

5.	18 MAR. 2025	ISSUED FOR ZBA	ZP
4.	06 MAR. 2025	ISSUED FOR COORDINATION	ZP
3.	05 NOV. 2024	ISSUED FOR PRE-CON #3	ZP
2.	24 APR. 2024	ISSUED FOR PRE-CON #2	JB
1.	13 JUN. 2023	ISSUED FOR PRE-CON	JB
No.	Date	Version	Dwn.

This drawing is copyright property of 'n Architecture Inc'. Not to be reproduced. Contractor must verify all job dimensions, drawings, details and specifications and report any discrepancies to the architect before proceeding with work.

PROJECT:

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

DRAWING TITLE:

2nd FLOOR
CAR TURNING
MOVEMENT PLAN

DRAWN BY: JB

DATE: 12 DEC 2022

CHECKED BY: NM

SCALE: AS NOTED

PROJECT NO.:

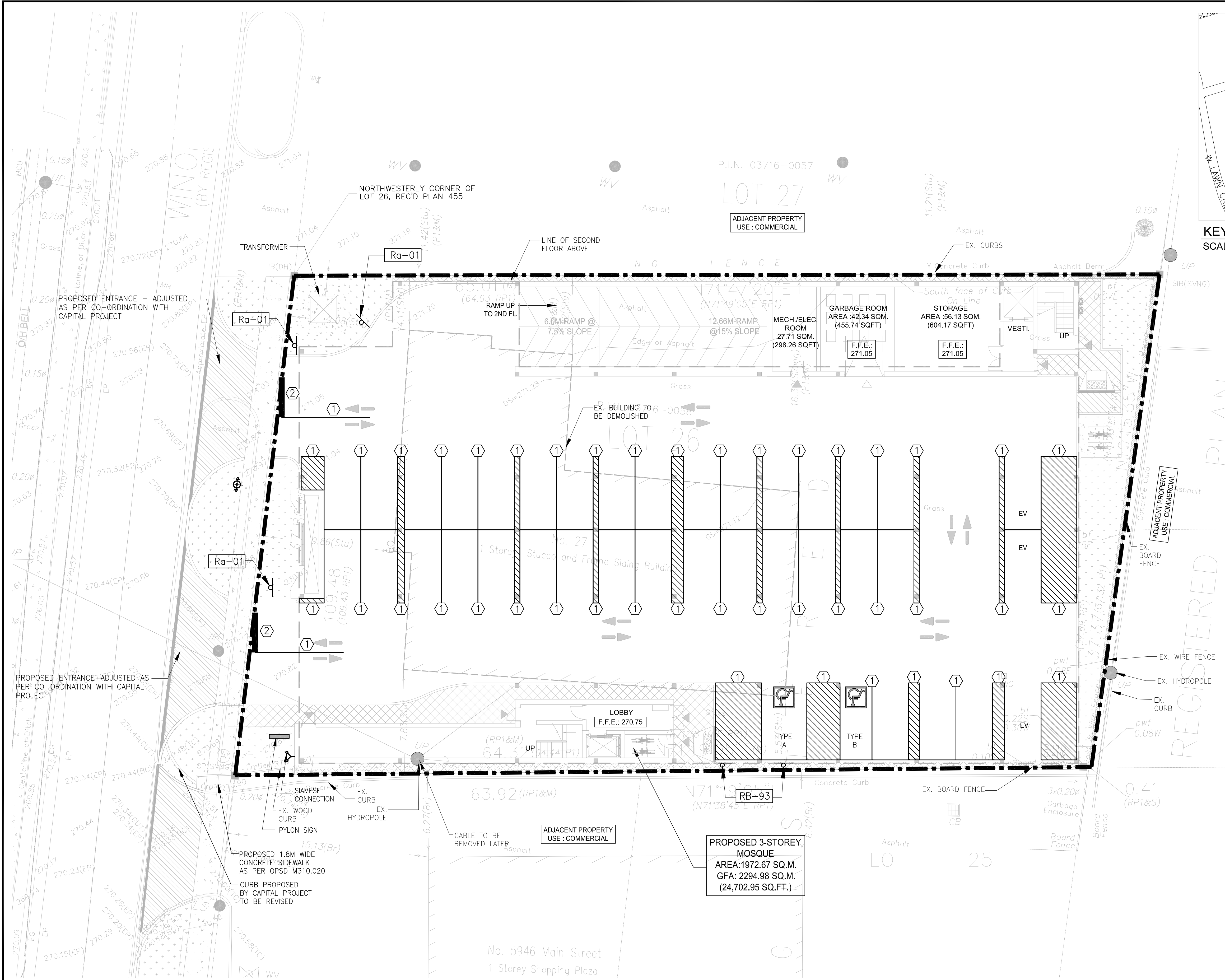
22-71

DRAWING NO.:

A-2.1b

APPENDIX L

Pavement Marking & Signage Plan



KEY MAP
SCALE: N.T.S.

SIGNAGE LEGEND:

SYMBOL	SIGN	PROPOSED QUANTITY
	Ra-1 STOP SIGN 600X600MM	02
	Rb-93 ACCESSIBLE PARKING PERMIT SIGN 300X450MM	02

PAVEMENT MARKING LEGEND:

	HANDICAPPED PARKING PAVEMENT MARKING	02
①	SOLID YELLOW LINE	10 cm
②	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:

n ARCHITECTURE INC.
9120 Leslie Street,
Suite-208
Richmond Hill, ON. L4B 3J9
T: 416.256.9741
E: info@narchitecture.com
www.narchitecture.com

LEGAL DESCRIPTION:

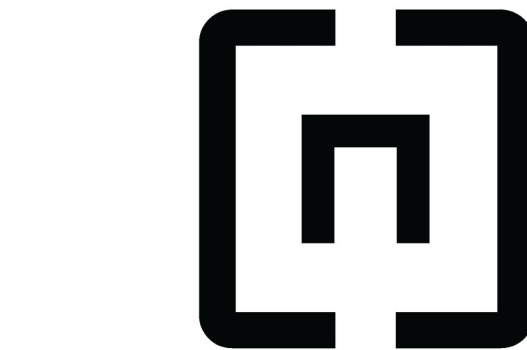
PART PLAN OF LOT 26 REGISTERED
PLAN 455
TOWN OF WHITCHURCH STOUFFVILLE
REGIONAL MUNICIPALITY OF YORK

SURVEY INFORMATION:

RICHMOND SURVEYING INC.
344-9471 YONGE STREET, RICHMOND
HILL, ON
PH.: 647-333-6200
MAIL: MOUITO.TAVALLAI@GMAIL.COM
PLAN DATED: AUGUST 18, 2024

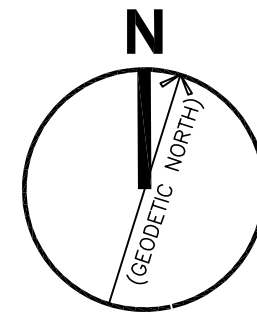
OWNER'S INFO:

DARUL KHAIR CENTER STOUFFVILLE
86 RINGWOOD DR. UNIT 36
WHITCHURCH-STOUFFVILLE, ON



n Engineering Inc

9120 Leslie Street, Suite-208
Richmond Hill, Ontario. L4B 3J9
T : 4 1 6 . 2 5 6 . 9 7 4 1
E : info@nengineering.com
www.nengineering.com



02.	20 MAR. 2025	ISSUED FOR ZBA	SA
01.	05 NOV. 2024	ISSUED FOR PRE-CON #3	SA
No.	Date	Version	Dwn.

This drawing is copyright property of
'n Engineering Inc'. Not to be reproduced.
Contractor must verify all job dimensions,
drawings, details and specifications and report
any discrepancies to the engineer before
proceeding with work.

PROJECT:

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

DRAWING TITLE:

PAVEMENT MARKING
& SIGNAGE PLAN

DRAWN BY: SA DATE: 27 AUGUST 2024

CHECKED BY: AZ SCALE: 1:150

PROJECT NO.: DRAWING NO.:

22-71 TR-01

BLANK PAGE