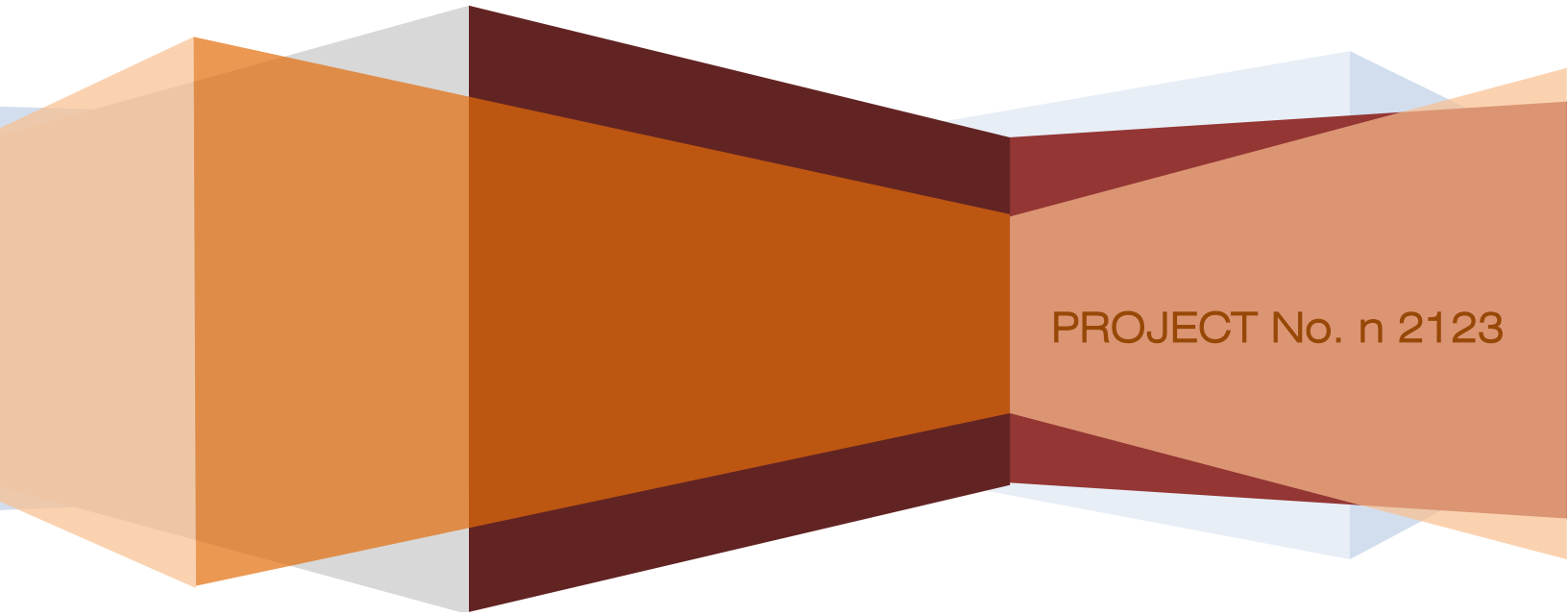
PROPOSED CONDOMINIUM

233, 249, 261 COLDWATER RD WEST,

ORILLIA, ONTARIO

TRAFFIC IMPACT STUDY



Prepared By:

n Engineering Inc

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

September 28, 2022

Table of Contents

List of Figures

List of Tables

List of Appendices

Version History

Version Number	Reason for Issue	Issue Date
01	DRAFT	2022-06-17
02	SPA I Submission	2022-09-28

Abbreviations

LOS: Level of service

NBL: Northbound left

NBT: Northbound through

SBR: Southbound through

EBL: Eastbound left

EBR: Eastbound right

SBTRL: Southbound through right left

Dr.: Drive

Ave.: Avenue

Blvd.: Boulevard

St.: Street

TMC: Turning Movement Count

Veh: Vehicle

s: second

AM: Morning hours

PM: Afternoon hours

v/c: volume to capacity ratio

City: City of Orillia

MTMP: Multi-Modal Transportation Plan

HCM: Highway Capacity Manual

ITE: Institute of Transportation Engineers

GFA: Gross Floor Area

LUC: Land-use Code

ZBL: Zoning By-Law

1 Introduction

n Engineering Inc. (n Engineering) is pleased to provide traffic consulting services in support of the proposed residential development. The subject site is at 233, 249, and 261 Coldwater Road, Orillia, Ontario. The site location is illustrated in **Figure 1**.

Figure 1 - Site Location

2 Proposed Development

As per the site plan, the proposed development includes a condominium building with 225 units that has a total gross floor area of 22008.67 m^2. The parking provided for the development is 265 spaces. The site is accessible via one full movement entrance on Coldwater Road. This site is surrounded by commercial and residential land use. The site plan is shown in **Figure 2**.

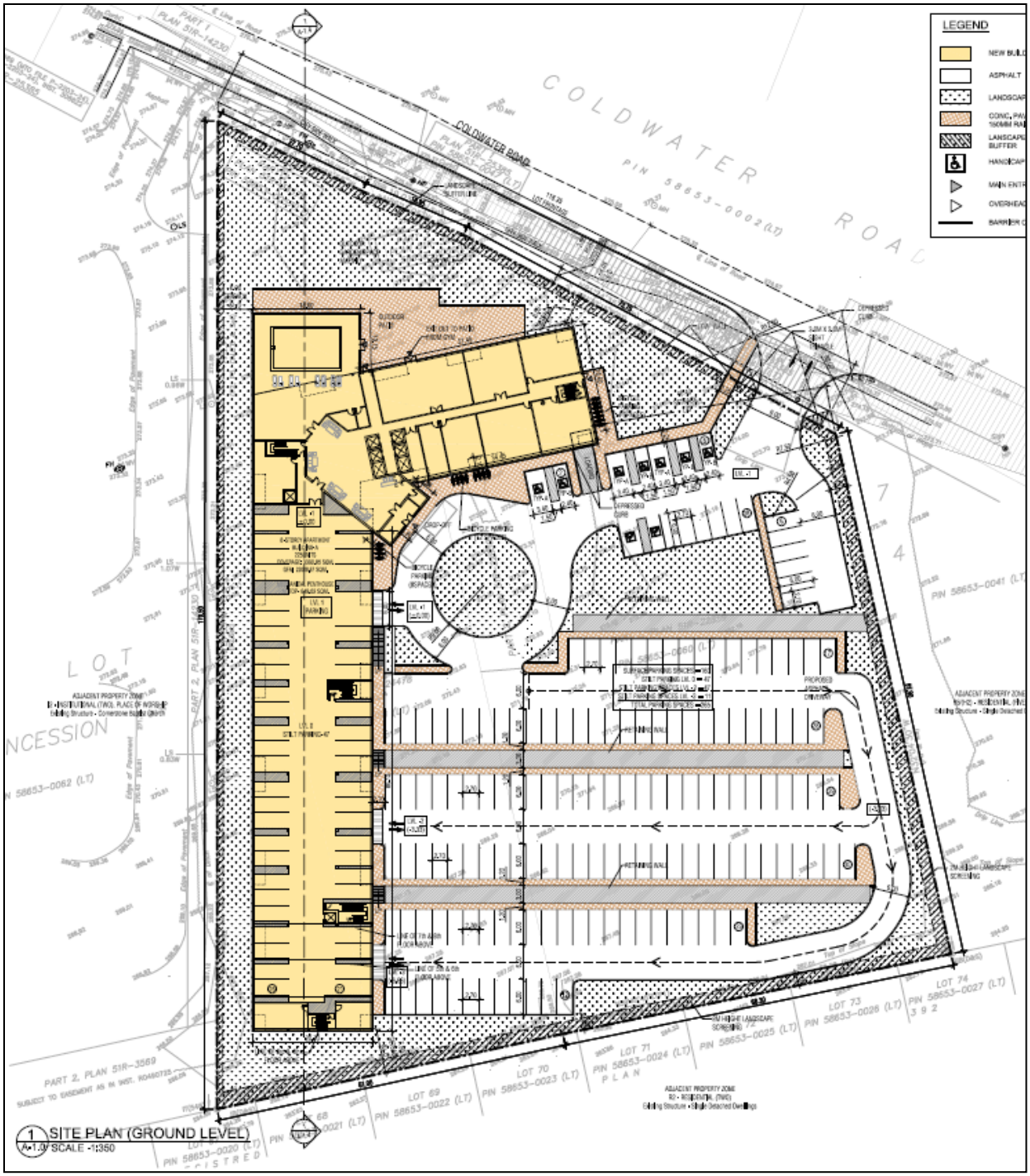


Figure 2 – Site Plan by n Architecture Inc., dated September 28th, 2022

3 Scope of Work

The study analyzes existing and future operations at the following intersections illustrated in **Figure 3**:

A. Collegiate Drive & Coldwater Road W (Signalized)
B. Coldwater Road W & Emily Street (Unsignalized)
C. Site Access to Subject Development & Coldwater Road (Unsignalized)

The time periods used for this study were at peak hours of Weekday AM and peak hours of Weekday PM. The study area and studied traffic periods were all confirmed with the staff at the City of Orillia. Refer to **Appendix A** for Email Correspondence and the approved Terms of Reference.

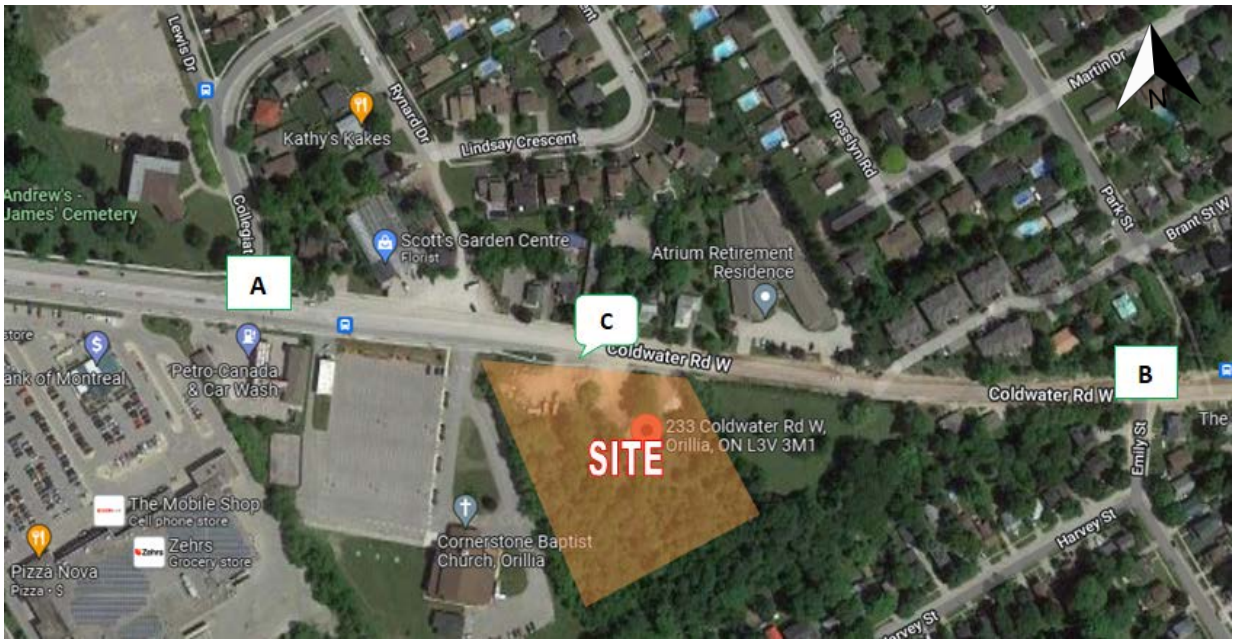


Figure 3 - Study Area

4 Study Methodology

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 1**.

Table 1 - HCM 6 LOS

LOS	Signalized Intersection Average Control Delay (s/veh)	Unsignalized Intersection Average Control Delay (s/veh)
A	≤10	≤10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

As per the *City of Orillia's Engineering Design Criteria* and discussion with the City's Engineering Staff, critical movements are highlighted in yellow for each intersection where:

- LOS is 'E' or worse (LOS as defined by delay or speed);
- v/c ratio is greater than 0.85 are considered to be critical movements;
- 95th percentile queue length exceeds the available storage.

5 Existing Conditions

This section provides a comprehensive review of the current conditions that will be used to analyze for the future conditions.

5.1 Existing Street Network

Coldwater Road West is located north of the site area and runs east to west. This is a two-way major arterial road under the jurisdiction of the City with designated left turn lanes as drivers approach intersections. There are sidewalks on both sides of the road within the study area. There is also a two way left turn median within the study area for vehicles to turn into existing development driveways. This road has a posted speed of 60 km/h in the study area.

Collegiate Road is located east of the site area and runs north to west. This road is a two-way local road and has one lane in each direction. It connects to a residential neighborhood and has a sidewalk on both sides of the street. This road connects to a community safety zone and has a posted speed of 40 km/h in the study area.

Emily Street is located east of the site area and runs north to south. This is a two-lane local road and has one lane in each direction. It connects to a residential neighborhood and has a sidewalk on both sides of the street. This road connects to Coldwater Road with a "T-legged" unsignalized intersection. The assumed speed of this road is 40km/h.

5.2 Pedestrian Conditions

The site area has an existing city sidewalk that allows pedestrians to travel from existing development to nearby commercial properties. The proposed development will include a proposed sidewalk (2.1 m width) that extends from the northeast corner of the building to the existing public sidewalk on Coldwater Road W. Refer to the Site Plan A-1.0 for a visual.

5.3 Existing Cycling Network

There are existing bike lanes along Coldwater Road West for travel in the east and west direction. Refer to **Appendix B** for the Existing Cycling Network map from the MTMP.

5.4 Existing Transit Plan

There are 4 transit stops within the vicinity of the study area. The West Ridge via Coldwater Rd and West Ridge via Old Barrie Road transit routes provide transit services on Coldwater Rd. These transit services are provided daily, times differ based on which day it is.

The County of Simcoe also provides inter-municipal routes called Linx. Route 3 connects Orillia to Barrie and Route 6 connects Orillia to Midland. Refer to **Appendix B** for the Existing Planned Transit Route Network map and Linx Transit System Map from the MTMP.

5.5 Multi-Modal Transportation

The City of Orillia's detailed MTMP report, dated November 2019, discusses the current transportation modes use in the city and how they would like to reduce the reliance on automobile traffic and sway residents to use active transportation such as walking, biking and transit.

The MTMP analysis states that most of Orillia's residential development is low density, the city has limited cycling facilities, and the transit routing is indirect. The proposed development at 233, 249, and 261 Coldwater Road is a mid-rise building that looks forward to support the recommendation in the MTMP. The proposed development provides sidewalk connections for pedestrians, and bike racks with 30 bicycle parking. With the proposed development being within 1 kilometer of the nearest shopping centre on Coldwater Rd, and 500 meters away from the nearest high school and middle school means there will be an increase in active transportation.

Coldwater Road connects to Hwy 11/Hwy 12 which provide travel routes to Barrie and Simcoe. The proposed site location is in between the freeways and Downtown Orillia. With the forecasted trip distribution patterns for 2036 AM showing a majority percentage of trips will

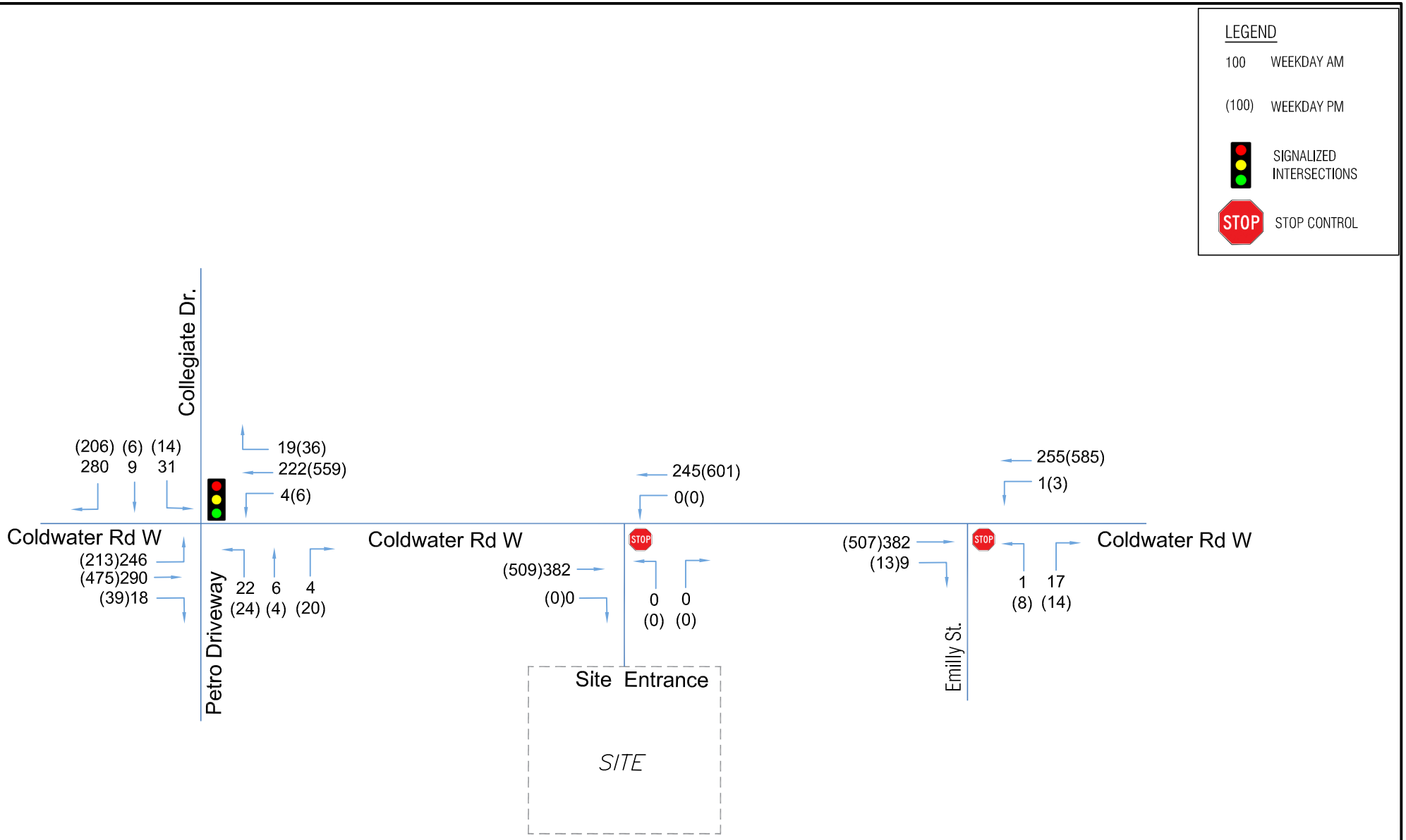
travel to and from internally in Orillia, Simcoe, and Barrie, the location of the site makes it easy for people to use transit, biking routes, or sharing rides (i.e. use of Uber).

The site plan and location of the proposed development are in accordance with the MTMP for the City of Orillia to create a transportation network that safely integrates all modes of transportation for internal and external travel.

5.6 Existing Traffic Volume

Turning movement counts at the identified intersections were collected by Accu – Traffic Inc. on Wednesday April 13th, 2022 from 7:00 – 10:00, and Wednesday April 13th, 2022 from 15:00 – 18:00. Refer to **Appendix C** for the TMC volumes.

The existing traffic volumes are shown in **Figure 4** and are utilized in the Intersection Capacity Analysis for the Existing Weekday AM & Weekday PM Peak Hours.



n Engineering Inc
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.258.9741
E: info@narchitecture.com
www.narchitecture.com

PROJECT:

CONDOMINIUM
233,249,261
COLDWATER ROAD, WEST,
ORILIA

DRAWING TITLE:

EXISTING 2022

DRAWN BY: GJ	DATE: 20 APRIL 2022
CHECKED BY: AZ	SCALE: NTS
PROJECT NO.: **21-23**	DRAWING NO.: **FIG-4**

N
(GEODETIC NORTH)
PROJECT NORTH

5.7 Intersection Capacity Analysis - Existing Condition (2022)

The Synchro analysis results under the existing conditions are summarized in **Table 2** and **Table 3** 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 the *City of Orillia Engineering Design Criteria*. The signal timing plans were obtained from the Transportation Department at the City of Orillia at the intersection of Coldwater Rd & Collegiate Dr. The signal timing reports from Synchro and signal timing plans are both provided in **Appendix D**. The detailed existing condition Synchro reports are provided in **Appendix E**.

Table 2 - Existing Conditions 2022 Signalized Intersection Capacity Analysis

Signalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)	
Coldwater Rd W & Collegiate Dr/ Petro Driveway	Overall	-	**C**	21.0	-	-	**C**	21.4	-	
	EBL	0.41	B	18.6	47.6	0.44	C	23.5	48.0	62.0
	EBTR	0.17	A	8.1	56.6	0.28	A	8.8	55.4	
	WBL	0.01	C	22.1	2.1	0.03	C	24.4	6.8	55.0
	WBTR	0.26	C	22.2	29.4	0.64	C	29.8	53.6	
	NBLTR	0.16	C	23.9	15.7	0.16	C	21.3	17.0	
	SBL	0.07	C	20.3	16.4	0.03	B	19.8	10.1	50.0
	SBTR	0.75	D	37.1	37.0	0.52	C	26.9	31.1	

Table 3 - Existing 2022 Conditions Unsignalized Intersection Capacity Analysis

Unsignalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour			
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)
Site Entrance & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	-
	WBL	-	A	0	0	-	A	0	0
	NBL	-	A	0	-	-	A	0	-
Emily St & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	-
	WBTL	0.001	A	8.2	0	0.003	A	8.6	0
	NBLR	0.032	B	11.1	0.1	0.054	B	13.6	0.2

As per the overall analysis, the signalized intersection is expected to operate with a LOS level C for both Weekday AM and PM peak hours with residual capacity at all movements for existing conditions.

The SBTR movement for the signalized intersection is of an acceptable LOS level D for AM peak hours. The v/c ratio and control delay for this shared turning movement is below the city's threshold values. The 95th percentile queue is less than the storage length. Therefore, no recommendations are required for this condition. The SBTR movement will be closely monitored for future conditions.

All movements for the unsignalized intersections are performing at a good LOS of level B or better for both AM and PM peak hours.

6 Future Background Conditions

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

6.1 Corridor Growth

The City did not have any historical turning movement data for the intersections in the site area to determine a growth factor. n Engineering Inc. decided to hire Accu – Traffic Inc. to acquire most recent traffic counts at the specified intersections.

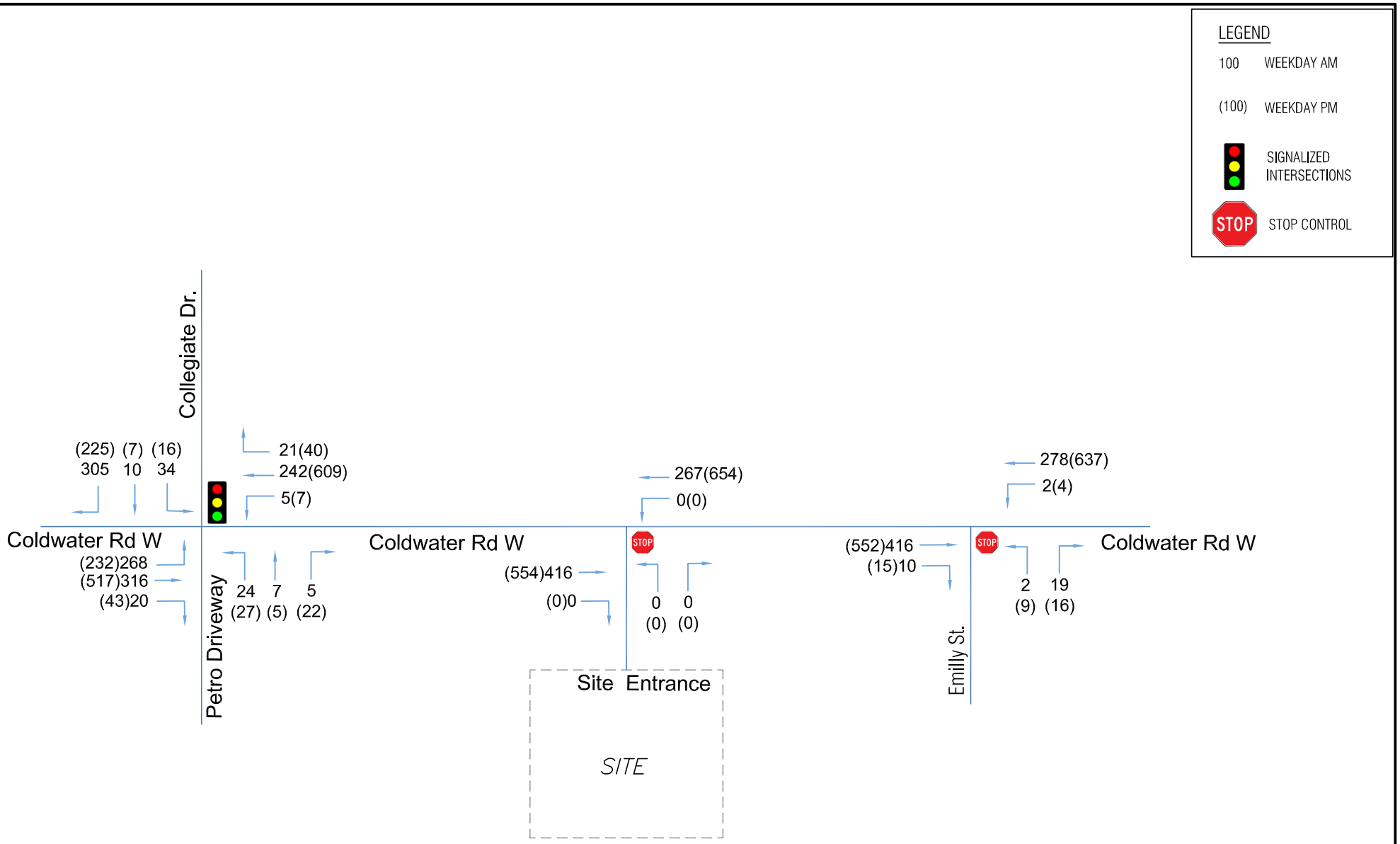
The Municipal Comprehensive Review (MCR) Land Needs Assessment to 2051 provides an average 1.7% annual growth factor for the high growth scenario population growth for the City. Refer to **Appendix F** for the MCR Report excerpts. This will be used for calculating future volumes. Furthermore, the Future Background conditions consider traffic operations for a five-year and ten-year horizon period (year 2027 and 2032) from the date of the TIS.

6.2 Background Development

The staffs at City of Orillia have informed n Engineering Inc. that there are no future developments in the area. Refer to **Appendix A** for the email correspondence and approved Terms of Reference describing these details.

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. The Future Background TMC diagram is shown in **Figure 5.**



n Engineering Inc
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.258.9741
E: info@narchitecture.com
www.narchitecture.com

PROJECT:

CONDOMINIUM
233,249,261
COLDWATER ROAD, WEST,
ORILIA

DRAWING TITLE:

FB2027

DRAWN BY: GJ	DATE: 20 APRIL 2022
CHECKED BY: AZ	SCALE: NTS
PROJECT NO.: **21-23**	DRAWING NO.: **FIG-5**

N
(GEODETIC NORTH)
PROJECT NORTH

6.4 Intersection Capacity Analysis – Future Background Condition (2027)

The Future Background 2027 Intersection Capacity analysis for the Weekday AM and PM Peak Hours are summarized in **Table 4** and **Table 5** for 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 the *City of Orillia Engineering Design Criteria*. The signal timing plans were obtained from the Transportation Department at the City of Orillia. The signal timing reports from Synchro and signal timing plans are both provided in **Appendix D**. The detailed future background condition Synchro reports are provided in **Appendix E**.

Table 4 - Future Background 2027 Signalized Intersection Capacity Analysis

Signalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)	
Coldwater Rd W & Collegiate Dr/ Petro Driveway	Overall	-	**C**	26.4	-	-	**C**	22.6	-	
	EBL	0.45	B	19.6	44.4	0.49	C	24.3	52.6	62.0
	EBTR	0.18	A	8.2	43.2	0.30	A	8.9	63.6	
	WBL	0.02	C	22.4	3.5	0.03	C	25.0	17.7	55.0
	WBTR	0.29	C	22.6	29.3	0.70	C	32.0	50.7	
	NBLTR	0.27	C	28.6	12.4	0.19	C	21.9	48.1	
	SBL	0.08	C	20.4	16.4	0.04	B	19.9	9.3	50.0
	SBTR	0.91	E	55.1	46.0	0.57	C	28.2	30.3	

Table 5 - Future Background 2027 Unsignalized Intersection Capacity Analysis

Unsignalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour			
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)
Site Entrance & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	-
	WBL	-	A	0	0	-	A	0	0
	NBL	-	A	0	-	-	A	0	-
Emily St & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	-
	WBTL	0.002	A	8.3	0	0.005	A	8.8	0
	NBLR	0.04	B	11.6	0.1	0.066	B	14.4	0.2

As per the overall analysis, the signalized intersection continues to operate with a LOS level C for both Weekday AM and PM peak hours with residual capacity at all movements for existing conditions.

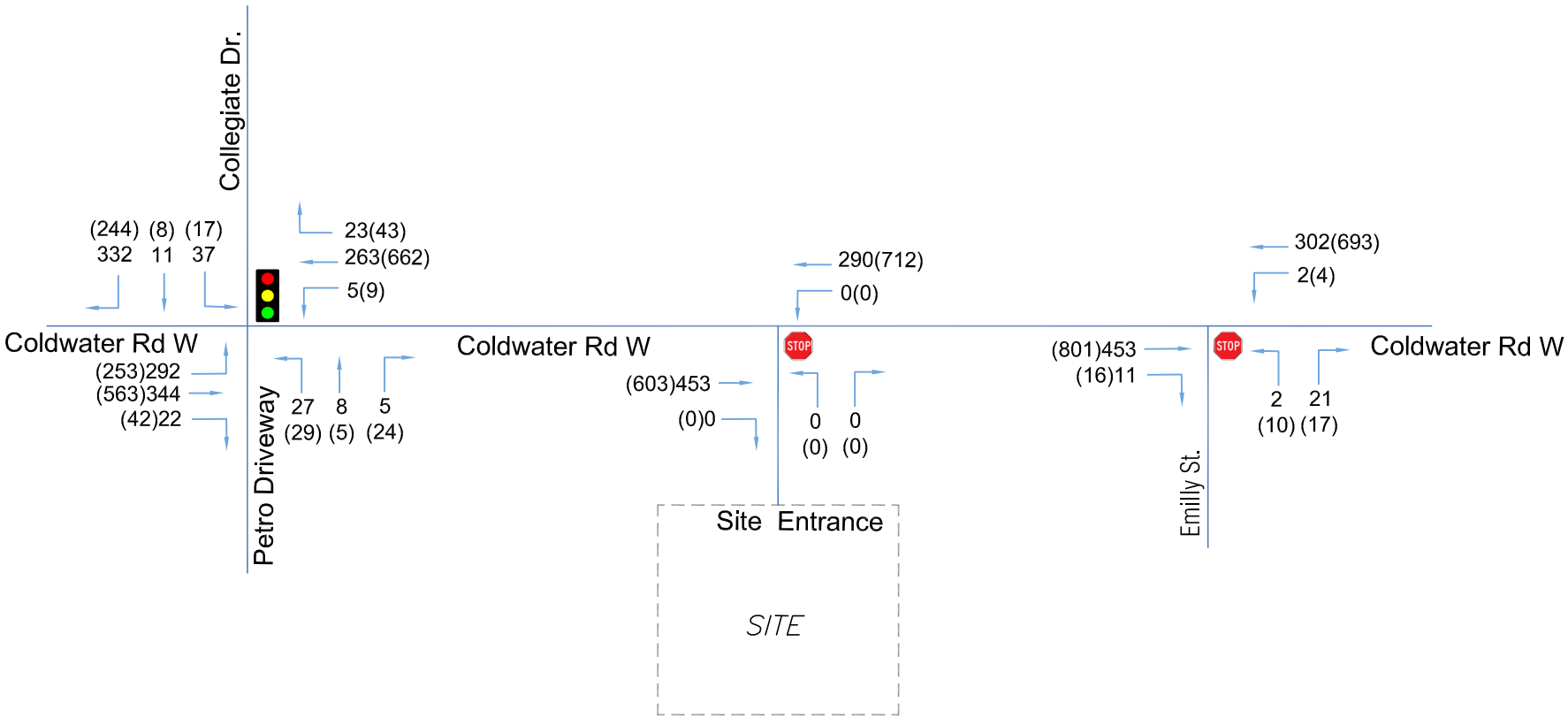
The SBTR movement becomes a critical movement for the signalized intersection. The 1.7% annual inflation rate has increased the traffic volumes that negatively affects traffic in the site area.

The SBTR critical movement for the signalized intersection worsens from LOS level D to level E for AM peak hours when comparing to existing conditions. The v/c ratio, and delay for this shared turning movement is slightly above the city's threshold value. The 95th percentile queue is less than the storage length.

All movements for the unsignalized intersections are performing at a good LOS of level B, or better for both AM and PM peak hours. No recommendations are required.

6.5 Future Background 2032

The traffic volumes of the Future Background 2032 were generated by applying the growth rate to the Existing Conditions volumes. The Future Background TMC diagram is shown in **Figure 6**.



n Engineering Inc
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.258.9741
E: info@narchitecture.com
www.narchitecture.com

PROJECT:

CONDOMINIUM
233,249,261
COLDWATER ROAD, WEST,
ORILIA

DRAWING TITLE:

FB2032

DRAWN BY: GJ	DATE: 20 APRIL 2022
CHECKED BY: AZ	SCALE: NTS
PROJECT NO.: **21-23**	DRAWING NO.: **FIG-6**

N
(GEODETIC NORTH)
PROJECT NORTH

6.6 Intersection Capacity Analysis – Future Background Condition (2032)

The Future Background 2032 Intersection Capacity analysis for the Weekday AM and PM Peak Hours are summarized in **Table 6** and **Table 7** for 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 the *City of Orillia Engineering Design Criteria*. The signal timing plans were obtained from the Transportation Department at the City of Orillia. The signal timing reports from Synchro and signal timing plans are both provided in **Appendix D**. The detailed future background condition Synchro reports are provided in **Appendix E**.

Table 6 - Future Background 2032 Signalized Intersection Capacity Analysis

Signalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)	
Coldwater Rd W & Collegiate Dr/ Petro Driveway	Overall	-	**C**	31.1	-	-	**C**	24.2	-	
	EBL	0.50	C	20.5	58.7	0.56	C	25.7	75.5	62.0
	EBTR	0.20	A	8.3	51.3	0.33	A	9.1	52.9	
	WBL	0.02	C	22.7	2.2	0.04	C	25.8	10.6	55.0
	WBTR	0.31	C	22.9	28.8	0.76	D	35.0	55.2	
	NBLTR	0.40	D	37.1	15.9	0.22	C	22.8	19.5	
	SBL	0.09	C	20.5	16.9	0.04	B	19.9	10.0	50.0
	SBTR	0.99	E	71.8	44.2	0.61	C	29.6	34.6	

Table 7 - Future Background 2032 Unsignalized Intersection Capacity Analysis

Unsignalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour			
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)
Site Entrance & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	--
	WBL	-	A	0	0	-	A	0	0
	NBL	-	A	0	-	-	A	0	-
Emily St & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	-
	WBTL	0.002	A	8.4	0	0.005	A	8.9	0
	NBLR	0.046	B	12	0.1	0.078	C	15.3	0.3

As per the overall analysis, the signalized intersection continues to operate with a LOS level C for both Weekday AM and PM peak hours with residual capacity at all movements for existing conditions.

The SBTR critical movement for the signalized intersection worsens from LOS level D to level E for AM peak hours when comparing to existing conditions. The v/c ratio, and delay for this shared turning movement is slightly above the city's threshold value. The 95th percentile queue continues to increase but is still less than the existing storage length.

All movements for the unsignalized intersections are performing at a LOS of level C, or better for both AM and PM peak hours. The NBLR movement at unsignalized intersection of Emily St & Coldwater Rd W for PM peak hours has worsened from LOS level B to level C. However, this is not enough for it to become a critical movement. Therefore, no recommendations are required.

7 Multi Modal Transportation

The City of Orillia has provided the *Multi-Modal Transportation Master Plan* (MTMP) report, dated November 2019. The potential mode split for future operational analysis has been produced in MTMP report. The partial change scenario mode split will be applied for future generated trips for our proposed development. This means a decrease in future auto trips and an increase in active transportation methods. **Figure 7** below shows the mode split and description.

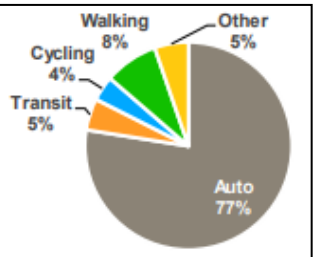
2 - Partial Change	This scenario partially shifts auto drivers onto active transportation and micro-mobility for trips under 3 km, and transit for trips under 6km at a rate of 1% per year until 2036 resulting in a mode split of 77% for automobile, 4% for cycling, 8% for walking, 5% for transit, and 5% for other emerging solutions as visualized in the figure to the right. This scenario would likely involve minor roadway improvements to enhance auto movement in key areas throughout the city, along with filling in key active transportation gaps in the existing network with connections to transit stops and facilities. This may involve micro-mobility or bikeshare solutions in specific areas of the City such as Downtown or other densely populated areas of the city.	

Figure 7 - Mode Split Excerpt from MTMP

8 Trip Generation

The trip generation rates from the ITE Trip Generation Manual (10th Edition) were used for the Weekday PM and Weekday AM Peak Hour Periods of the proposed development.

- Land use codes for Multifamily Housing (Mid-Rise) (LUC 221) was used for the proposed development. The total estimated trips for this proposed land use were rounded up before applying the inbound and outbound directional split.

Table 8 below shows the necessary calculations required to generate trips for each property type.

Table 8 - ITE Trip Generation from Proposed Development

Multifamily Housing* (Mid-Rise)(221)	AM Peak Hour			PM Peak Hour		
	Average rate*	IN (%)	OUT (%)	Average rate*	IN (%)	OUT (%)
8-Storey, 225 Units	0.36	26	74	0.44	61	39
Trips	81	**21**	**60**	99	**60**	**39**

*Weekday Peak Hour of Adjacent Street Traffic

8.1 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. **Table 9** below shows the percent of trips based on the direction of travel for AM and PM peak hours.

Table 9 - Trip Distribution for AM & PM Peak Hours

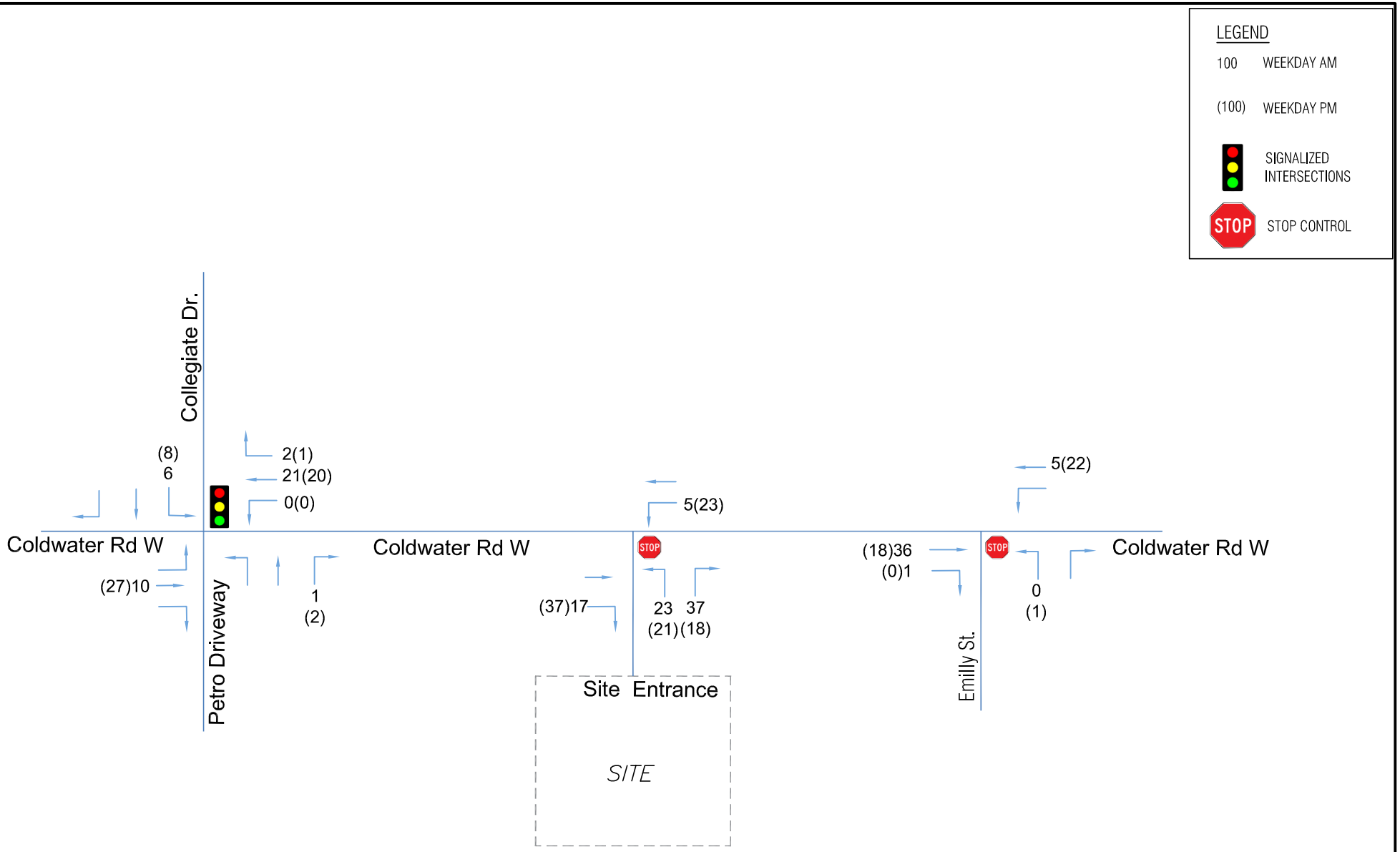
Direction of Travel	AM		PM	
	IN (%)	OUT (%)	IN (%)	OUT (%)
Northbound on Petro Driveway	2.71	2.99	2.98	3.21
Southbound on Collegiate Dr	27.12	0.06	14.03	0.00
Eastbound on Coldwater Rd W	46.95	60.06	45.13	49.87
Westbound on Coldwater Rd W	21.69	34.91	36.50	45.23
Northbound on Emily St	1.53	0.00	1.37	0.00
Southbound on Emily St	0.00	1.41	0.00	1.16
Total	100	100	100	100

Table 10 below shows the number of trips assigned in the all directions entering and exiting the proposed site development.

Table 10 - Trip Assignment

Direction of Travel	AM		PM	
	IN	OUT	IN	OUT
Northbound on Petro Driveway	1	2	2	1
Southbound on Collegiate Dr	6	0	8	0
Eastbound on Coldwater Rd W	10	36	27	18
Westbound on Coldwater Rd W	5	21	22	20
Northbound on Emily St	0	0	1	0
Southbound on Emily St	0	0	0	1
Total	**22**	**59**	**60**	**40**

The site generated trips are distributed and shown in **Figure 8**.



n Engineering Inc
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.258.9741
E: info@narchitecture.com
www.narchitecture.com

PROJECT:

CONDOMINIUM
233,249,261
COLDWATER ROAD, WEST,
ORILIA

DRAWING TITLE:

SITE TRIPS GENERATED

DRAWN BY: GJ	DATE: 20 APRIL 2022
CHECKED BY: AZ	SCALE: NTS
PROJECT NO.: **21-23**	DRAWING NO.: **FIG-8**

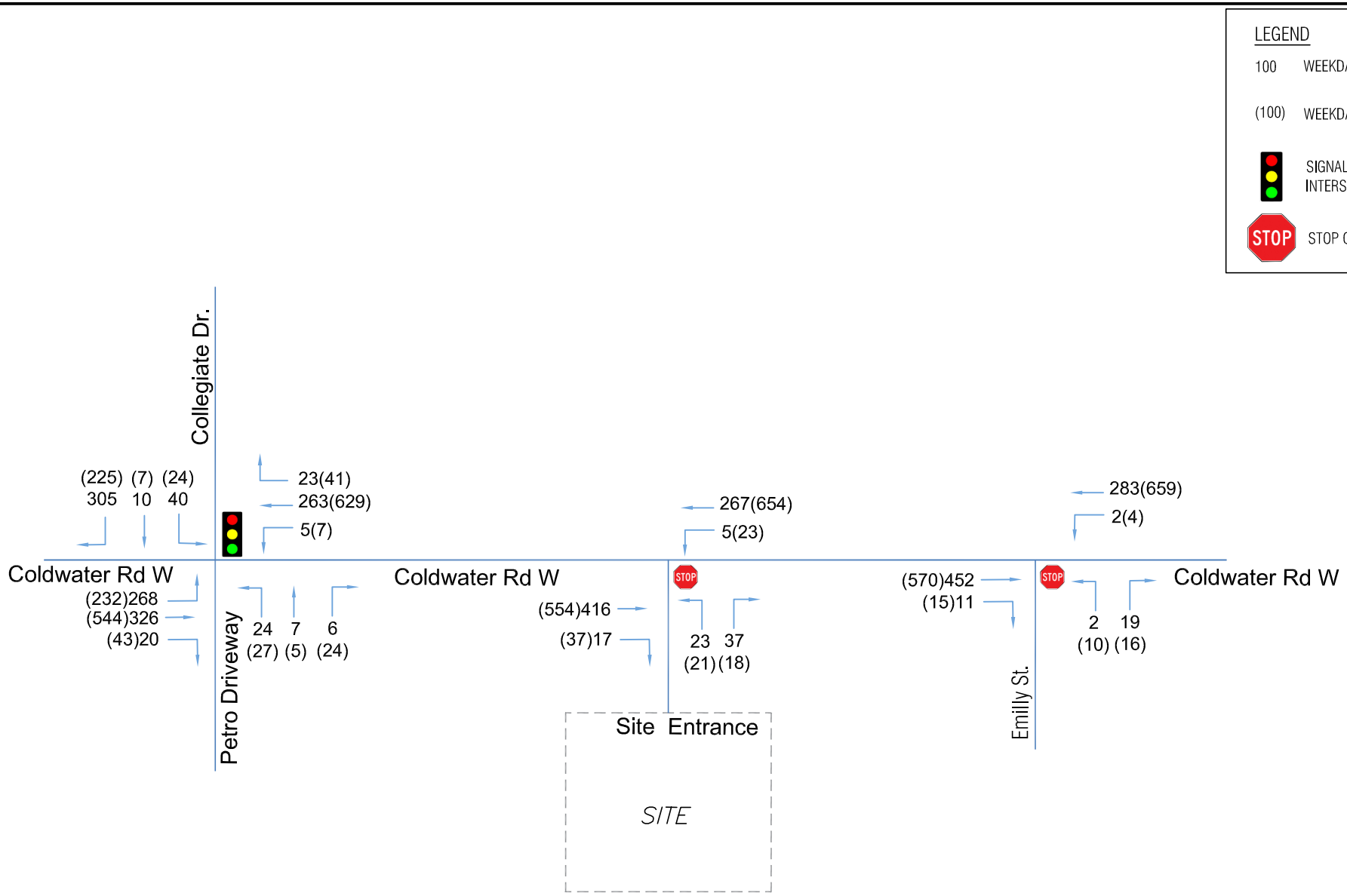
N
(GEODETIC NORTH)
PROJECT NORTH

9 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.

9.1 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 9**.



n Engineering Inc
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.258.9741
E: info@narchitecture.com
www.narchitecture.com

PROJECT:

CONDOMINIUM
233,249,261
COLDWATER ROAD, WEST,
ORILIA

DRAWING TITLE:

FT2027

DRAWN BY: GJ	DATE: 20 APRIL 2022
CHECKED BY: AZ	SCALE: NTS
PROJECT NO.: **21-23**	DRAWING NO.: **FIG-9**

N
(GEODETIC NORTH)
PROJECT NORTH

9.2 Intersection Capacity Analysis – Future Total Condition (2027)

The Future Total 2027 Intersection Capacity analysis for the Weekday AM and PM peak hour periods are summarized in **Table 11** and **Table 12** for 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 the *City of Orillia Engineering Design Criteria*. The signal timing plans were obtained from the Transportation Department at the City of Orillia. The signal timing reports from Synchro and signal timing plans are both provided in **Appendix D**. The detailed future total condition Synchro reports are provided in **Appendix E**.

Table 11 - Future Total 2027 Signalized Intersection Capacity Analysis

Signalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)	
Coldwater Rd W & Collegiate Dr/ Petro Driveway	Overall	-	**C**	26.3	-	-	**C**	22.9	-	
	EBL	0.46	C	20.0	58.4	0.50	C	24.5	52.3	62.0
	EBTR	0.19	A	8.2	50.8	0.32	A	9.0	63.7	
	WBL	0.02	C	22.5	5.0	0.03	C	25.4	7.2	55.0
	WBTR	0.31	C	22.9	25.0	0.72	C	33.0	58	
	NBLTR	0.28	C	27.7	13.0	0.19	C	21.9	18.3	
	SBL	0.10	C	20.7	20.0	0.06	C	20.2	13.8	50.0
	SBTR	0.91	E	55.1	40.3	0.57	C	28.2	30.5	

Table 12 - Future Total 2027 Unsignalized Intersection Capacity Analysis

Unsignalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour			
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)
Site Entrance & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	-
	WBL	0.005	A	8.3	0	0.027	A	8.9	0.1
	NBL	0.119	B	12.5	0.4	0.118	C	16.4	0.4
Emily St & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	-
	WBTL	0.002	A	8.4	0	0.005	A	8.8	0
	NBLR	0.042	B	11.9	0.1	0.072	B	14.8	0.2

As per the overall analysis, the signalized intersection continues to operate with a LOS level C for both Weekday AM and PM peak hours with residual capacity at all movements for existing conditions.

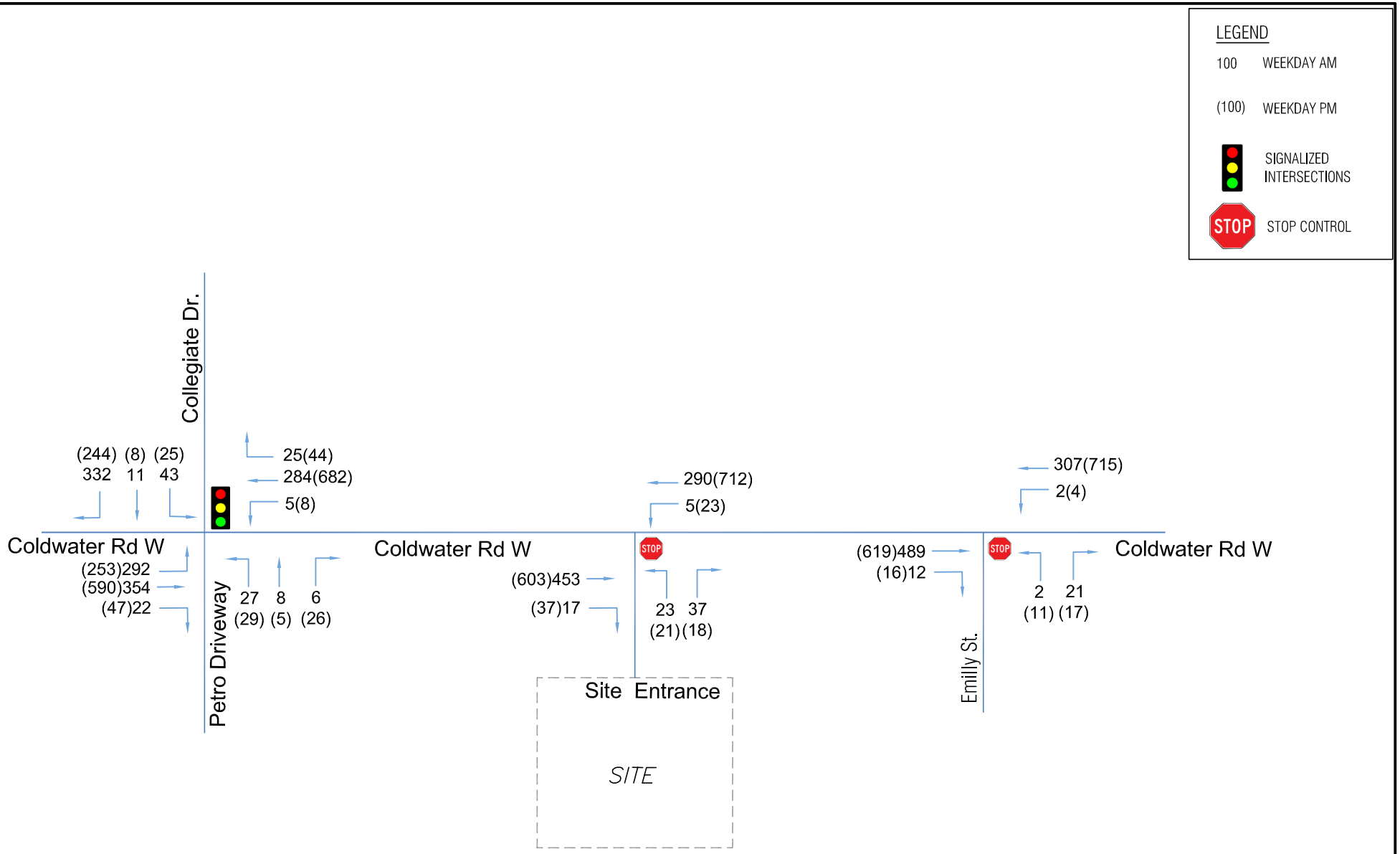
The SBTR critical movement for the signalized intersection continues to operate at a LOS of level E for AM peak hours when comparing to future background 2027 conditions. The v/c ratio and control delay for this shared turning movement remains to be greater than the city's threshold value. The 95th percentile queue is remains to be less than the storage length for both AM and PM peak hours.

All movements for the unsignalized intersections are performing at an acceptable LOS of level C, or better for both AM and PM peak hours. With the addition of the proposed site generated trips, the NBLR movement for the unsignalized intersection of the Site Entrance & Coldwater Rd W changes from LOS level A to B for both AM and PM peak hours. However, this does not become a critical movement as v/c ratio, control delay and 95th percentile queue criteria are met. Therefore, no recommendations are required for these conditions.

The Synchro Intersection Capacity Analysis indicates that the road conditions do not worsen or negatively impact traffic in the area with the addition of the proposed development.

9.3 Future Total Condition (2032)

The Future Total traffic volumes for 2032 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 10**.



n Engineering Inc
9120 Leslie Street, Suite-208
Richmond Hill, Ontario, L4B 3J9
T: 416.258.9741
E: info@narchitecture.com
www.narchitecture.com

PROJECT:

CONDOMINIUM
233,249,261
COLDWATER ROAD, WEST,
ORILIA

DRAWING TITLE:

FT2032

DRAWN BY: GJ	DATE: 20 APRIL 2022
CHECKED BY: AZ	SCALE: NTS
PROJECT NO.: **21-23**	DRAWING NO.: **FIG-10**

N
(GEODETIC NORTH)
PROJECT NORTH

9.4 Intersection Capacity Analysis – Future Total Condition (2032)

The Future Total 2032 Intersection Capacity analysis for the Weekday AM and PM peak hour periods are summarized in **Table 13** and **Table 14** for 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 the *City of Orillia Engineering Design Criteria*. The signal timing plans were obtained from the Transportation Department at the City of Orillia. The signal timing reports from Synchro and signal timing plans are both provided in **Appendix D**. The detailed future total condition Synchro reports are provided in **Appendix E**.

Table 13 - Future Total 2032 Signalized Intersection Capacity Analysis

Signalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)	
Coldwater Rd W & Collegiate Dr/ Petro Driveway	Overall	-	**C**	30.9	-	-	**C**	24.6	-	
	EBL	0.51	C	20.9	54.4	0.56	C	26.0	51.9	62.0
	EBTR	0.20	A	8.3	45.9	0.34	A	9.2	63.5	
	WBL	0.02	C	22.8	5.1	0.04	C	26.1	7.9	55.0
	WBTR	0.34	C	23.3	32.6	0.78	D	36.4	66.5	
	NBLTR	0.41	D	36.5	15.6	0.22	C	22.6	19.8	
	SBL	0.11	C	20.8	21.1	0.06	C	20.2	16.7	50.0
	SBTR	0.99	E	71.8	45.2	0.61	C	29.6	28.4	

Table 14 - Future Total 2032 Unsignalized Intersection Capacity Analysis

Unsignalized Intersection	Turning Movement/ Approach	AM Peak Hour				PM Peak Hour			
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	V/C	LOS	Delay (s/veh)	95th% Queue (m)
Site Entrance & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	-
	WBL	0.005	A	8.4	0	0.028	A	9.1	0.1
	NBL	0.125	B	12.9	0.4	0.128	C	17.5	0.4
Emily St & Coldwater Rd W	EBTR	-	-	-	-	-	-	-	-
	WBTL	0.002	A	8.5	0	0.005	A	9	0
	NBLR	0.049	B	12.3	0.2	0.084	C	15.8	0.3

As per the overall analysis, the signalized intersection continues to operate with a LOS level C for both Weekday AM and PM peak hours with residual capacity at all movements for existing conditions.

The SBTR critical movement for the signalized intersection continues to operate at a LOS of level E for AM peak hours when comparing to future background 2032 conditions. The v/c ratio and control delay for this shared turning movement remains to be greater than the city's threshold value. The 95th percentile queue is remains to be less than the storage length for both AM and PM peak hours.

All movements for the unsignalized intersections are performing at an acceptable LOS of level C, or better for both AM and PM peak hours. No recommendations are required.

With the addition of the proposed site generated trips, the NBLR movement for the unsignalized intersection of the Site Entrance & Coldwater Rd W worsens from LOS level B to C. However, this does not become a critical movement as v/c ratio, control delay and 95th percentile queue criteria are met. Therefore, no recommendations are required for these conditions.

The Synchro Intersection Capacity Analysis indicates that the road conditions do not worsen or negatively impact traffic in the area with the addition of the proposed development.

10 Signal Optimization Plan

A signal optimization plan is being provided in order to improve the LOS, v/c ratio and decrease the approach delay at the signalized intersection of Coldwater Rd W & Collegiate Dr.

The number of vehicles for the SBTR movement at this intersection are high and there is an unacceptable LOS of level E with a v/c ratio that is greater than 0.85. As this is a semi-actuated signalized intersection the signals will change to the side street when a vehicle or pedestrian is detected. During AM peak hours the side street (Collegiate Dr) becomes heavily congested. This is due to trips generated from drivers going to work and the two public schools that are in the area.

The signal optimization was done for the Future Total 2032 AM (FT2032 AM) conditions. The signal optimization required an increase in green time for the SB approach from 19 to 30 seconds. This also meant an increase in green time for the NB approach from 15 to 30 seconds to avoid lag time. This results in an increase in the overall cycle length. With this change to the LOS has improved from E to C for the SBTR critical movement. Refer to **Appendix G** for the Synchro Reports of the intersection with the optimization of the traffic signal.

Table 15 shows the intersection capacity analysis for the intersection of Coldwater Rd W & Collegiate Dr/ Petro Driveway after the optimization plan has been applied to the FT2023 AM conditions. It is noticed that no critical movements exist as the LOS, v/c ratio and 95th Percentile Queue have all improved.

Table 15 - Optimization Plan at Signalized Intersection FT2023 AM

Signalized Intersection	Turning Movement/ Approach	AM Peak Hour				Existing Storage (m)
		V/C	LOS	Delay (s/veh)	95th% Queue (m)	
Coldwater Rd W & Collegiate Dr/ Petro Driveway	Overall	-	**C**	25.8	-	
	EBL	0.63	C	30.9	70.5	47.6
	EBTR	0.24	B	14.1	75.8	
	WBL	0.02	C	31.1	6.8	55.0
	WBTR	0.4	C	31.5	36.1	
	NBLTR	0.16	C	22.7	17.1	
	SBL	0.08	B	17.4	16.2	50.0
	SBTR	0.71	C	30.5	41.8	

11 Critical Movement Summary

Table 16 below shows how the SBTR movement worsens from analysis periods of 2022 to 2032 at the signalized intersection of Coldwater Rd W & Collegiate Dr intersection.

Table 16 - Critical Movement SBTR Analysis

Intersection	Analysis Period	Movement	v/c	LOS	95th% Queue (m)	Storage Length (m)
	AM Peak Hours					
Coldwater Rd W & Collegiate Dr	EX2022 AM	SBTR	0.75	D	37.0	-
	FB2027 AM	SBTR	0.91	E	46.0	-
	FT2027 AM	SBTR	0.91	E	40.3	-
	FB2032 AM	SBTR	0.99	E	44.2	-
	FT2032 AM	SBTR	0.99	E	45.2	-
	FT2032 AM Optimized	SBTR	0.71	C	41.8	-

It is noticed that the LOS does not change with the addition of the proposed development when comparing future background and future total conditions for AM peak hours. However, the SBTR critical movement begins to worsen through each analysis period. A signal optimization

plan for the signalized intersection has been provided and improves the LOS level of the critical movement from E to C and the v/c ratio decreases from 0.99 to acceptable 0.71.

12 Site Access Review

This section will review the site access proposed in conjunction with the criteria provided in the City of Orillia's Engineering Design Criteria, Ontario Traffic Manuals, and Transportation Association of Canada (TAC) Guidelines Manual. This section follows *The City of Orillia Terms of Reference for Entrance Analysis*.

12.1 Access Spacing

There is one proposed site access that allows full movements. **Figure 11** below shows the spacing distance of the access driveway from the nearest main intersection and the nearest driveways.

Figure 11 - Site Access Analysis

The proposed site access is 48.17 m away from the closest existing driveway. The site entrance is able to clear 15 m minimum corner clearance from the proposed access. Therefore, the TAC GDGCR minimum requirements are satisfied.

There are single detached homes directly across the street from the proposed site. However as there is a two way left turn lane (TWLTL) on Coldwater Rd W, there will not be any foreseen conflicts for the proposed site entrance and the residential property entrances across the street.

12.2 Sight Distance Analysis

The conceptual site plan by n Architecture Inc. continues to use the existing access into the proposed development coming off of Coldwater Road. The available sight lines at these 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)*

Table 17 below outlines the sight distance analysis for the proposed site entrance.

Table 17 - Sight Distance Analysis

Feature	Right Turn Site Access	Left Turn at Site Access
Access Type	Full Movement	Full Movement
Intersection Control	Stop (Driveway)	Stop (Driveway)
Case	B2	B1
Design Speed of the Major Road V_{major}	60 km/h	60 km/h
Time Gap for Minor Road Vehicle to Enter Major Road t_g	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)	130.0	130.0
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*

The minimum sight distance measurements for the proposed site entrance off of Coldwater Rd W were collected by a surveyor. The total station was set to a height of 1.0 m to imitate the driver's eye height. The height of the object being captured was below a metre to imitate the headlight of approaching cars. The minimum required sight distances were exceeded and captured by the total station.

There are no physical obstructions in the way of the proposed location for the site entrance when analyzing the left sight distance triangle. The right sight distance triangle shows a physical obstruction of two hydro poles. However, during the site visit the hydro poles do not interfere with the sight distance analysis when the vehicle approaches closer to the edge of the road.

Refer to **Appendix H** for the Sight Distance Survey pictures and for the diagram C-5 for the sight distance triangles drawn according to the TAC Manual.

12.3 Internal Site Circulation

Detailed vehicle maneuvering diagrams (VMD) for a fire truck has been provided in **Appendix I,** Drawing A-1.2, to illustrate that site/turning movements for design vehicles are accommodated for based on the proposed site geometry.

The internal site circulation review confirms no projected concerns or conflicts for design vehicles within the proposed development.

13 Parking Review

As per the City of Orillia Zoning By-law 2014-44 for the zone Residential Five, the proposed development requires 338 parking spaces including barrier free.

Parking calculations provided on the site plan dated September 28th, 2022 are shown in **Table 18** exhibits that 265 (including barrier free) parking spots have been provided.

Table 18 - Parking Statistics

Parking Calculation		
	Required	**Proposed**
Residential Units - 225 Units 1.5 Spaces per Unit (2.7 m x 6.0 m)	338	265
Accessible Parking Space (Type A - 3.4 m x 6.0 m)	4	4
Accessible Parking Space (Type B - 2.4 m x 6.0 m)	5	5
Total Parking Spaces	**338 (incl 9 B/F)**	**265 (incl 9 B/F)**
Visitor Parking (25% of Parking Spaces)	85	23
Bicycle Parking 1/10 Parking Spaces	34	34

338 parking spaces are required based on the ZBL and the site plan is providing 265 parking spaces including barrier free. The minimum parking requirements have not been met. There is a parking space reduction of 21.6%.

A Parking Justification Report is suggested to provide engineering techniques and various justification reasons in why a reduction of parking spaces is appropriate. Refer to **Appendix J** for the Parking Study created by n Engineering Inc.

14 Summary and Recommendations

This Traffic Impact Study (TIS) evaluates the traffic impact of the residential development at 233, 249, 261 Coldwater Road, Orillia, ON. The proposed development consists of an 8-storey 225 unit condominium building with a GFA of 22008.67 m^2.

One signalized intersection and two unsignalized intersections were analysed at Weekday AM and PM peak hours under Existing Condition (2022), Future Background Condition (2027 and 2032) and Future Total Condition (2027 and 2032). Synchro 11 was utilized with HCM 6 and SimTraffic was applied to analyze intersections in the study area. Level of service, v/c ratio, control delay and 95th percentile queue were evaluated as per the *City of Orillia Engineering Design Criteria*.

Based on the Synchro analysis results under Existing and Future conditions, the overall LOS analysis for the signalized intersections operates under an acceptable LOS C. As per the Synchro analysis, there was an output of one critical movement in the signalized intersection. The SBTR

shared movement has a LOS level of E for both future background and future total conditions. However, it is noticed that the LOS does not change with the addition of the proposed development when comparing future background and future total conditions for AM peak hours. A signal optimization plan for the signalized intersection has been provided and improved the SBTR shared movement in becoming acceptable according to the City's guidelines.

The sight distance assessment, site access spacing, site access intersection capacity, and vehicle manoeuvring diagrams requested by the City have all been analysed and meet their specific standards.

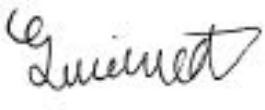
As per Zoning By-law, 338 parking spaces are required for the proposed development. In total, the site plan shows that 265 parking spaces are provided. A Parking Justification Study Report is provided and helps prove why the parking deficiency is sufficient.

We trust that this study adequately addresses the requirements for the City of Orillia. Should you have any questions, please contact the undersigned.

Respectfully submitted,

(Report Prepared by)

Gurminder Jagjait EIT, B. Eng.
Transportation Analyst
n Engineering Inc.



(Report Reviewed by)

Abu S Ziauddin P. Eng. M.Eng
Project Manager
n Engineering Inc.

BLANK PAGE

APPENDIX A
Email Correspondence & Approved Terms of Reference

From:	Lisa Dobson
To:	gj@nengineering.com
Cc:	Wesley Cyr
Subject:	RE: n2123 | Condo Coldwater Rd, Orillia
Date:	April 6, 2022 2:23:29 PM
Attachments:	image001.png image002.png image003.png image004.png image005.png image006.png Orillia TOR for Entrance Analysis.docx Coldwater Rd West at Collegiate Drive.doc.pdf

---

Hi Gurminder,
Please see the below for our review of your proposed TIS scope:

1. Proposed intersections are acceptable
2. Time Periods are acceptable
3. Horizon years are acceptable
4. Growth rate – Please us the Historical and Forecast Population Growth Table City's Land Needs Assessment (pg 101)
5. No Future Developments in the area
6. Signal Timing for Coldwater Rd West at Collegiate Drive is attached
7. We do not have any available traffic counts for this area that are less than two years old

Additional comments:

- Review and provide recommendations for multi modal transportation in coordination with the City's MTMP
- Entrance Analysis is required – TOR is attached

Please let me know if you have any other questions,
Lisa

ORILLIA

Lisa V. Dobson, *P.Eng*. | Transportation Technologist
Development Services and Engineering Department
Engineering and Transportation Division
T: 705-326-4132
orillia.ca

orillia.ca/COVID-19

From: Wesley Cyr <WCyr@orillia.ca>
Sent: 2022/04/05 8:11 AM
To: Lisa Dobson <LDobson@orillia.ca>
Subject: FW: n2123 | Condo Coldwater Rd, Orillia

Hi Lisa,

Could you review this?

Thanks,

ORILLIA

Wesley Cyr I Manager of Engineering and Transportation
Development Services and Engineering
Engineering Division
T: 705-325-2211 I **C:** 705-826-2347
orillia.ca

orillia.ca/COVID-19

From: Gurminder Jagjait | nEngineering Inc <gj@nengineering.com>
Sent: April-05-22 8:05 AM
To: Wesley Cyr <WCyr@orillia.ca>
Cc: 'Abu Ziauddin | nEngineering Inc' <az@nengineering.com>
Subject: n2123 | Condo Coldwater Rd, Orillia

Hello,

I am working on the Traffic Impact Study (TIS) for the proposed development.

I have attached a Terms of Reference for the Traffic Impact Study for review and approval.

Could you please forward it to the correct person/department for review. I hope to hear from you soon. Thank You!

Regards,

n Engineering Inc

Gurminder Jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

n Engineering Inc

Terms of Reference-TIS

9120 Leslie Street, Suite 208, Richmond Hill, Ontario. L4B 3J9 I T: 416.303.4821 I F: 1.866.340.5265 I E: info@nengineering.com

Date: April 1st, 2022

RE: n2123|233, 249, 261 Coldwater Road, Orillia, ON.

Subject: Terms of Reference for Traffic Impact Study

n Engineering Inc. was retained by the owner to provide a Traffic Impact Study Report in support of the proposed additions to the existing commercial development. The subject site is at 233, 249, and 261 Coldwater Road, Orillia, Ontario. The TIS is to comply with MTO TIS Guidelines, the Terms of Reference are listed below. Please review and recommend.

Proposed Development

As per conceptual site plan, the proposed development consists of the following:

- 8 –Storey Apartment with GFA 21754.14 m^2,
- 294 Parking spaces, 9 Parking spaces for barrier free,
- Proposed Full Movement Site Entrance at Coldwater Road.

As per Zoning By-law 2014-44, the proposed Zoning is Residential Five (R5) for the development. n Architecture Inc. is proposing 294 parking spaces (including 9 barrier free parking).

Terms Requiring Approval

1. The following intersections in the study area illustrated in Figure 1 will be analyzed for the TIS:

A. Collegiate Drive & Coldwater Road W (Signalized)
B. Coldwater Road W & Emily Street (Unsignalized)
C. Site Access to Subject Development & Coldwater Road (Unsignalized)

9120 Leslie Street, Suite 208, Richmond Hill, Ontario. L4B 3J9 I T: 416.303.4821 I F: 1.866.340.5265 I E: info@nengineering.com

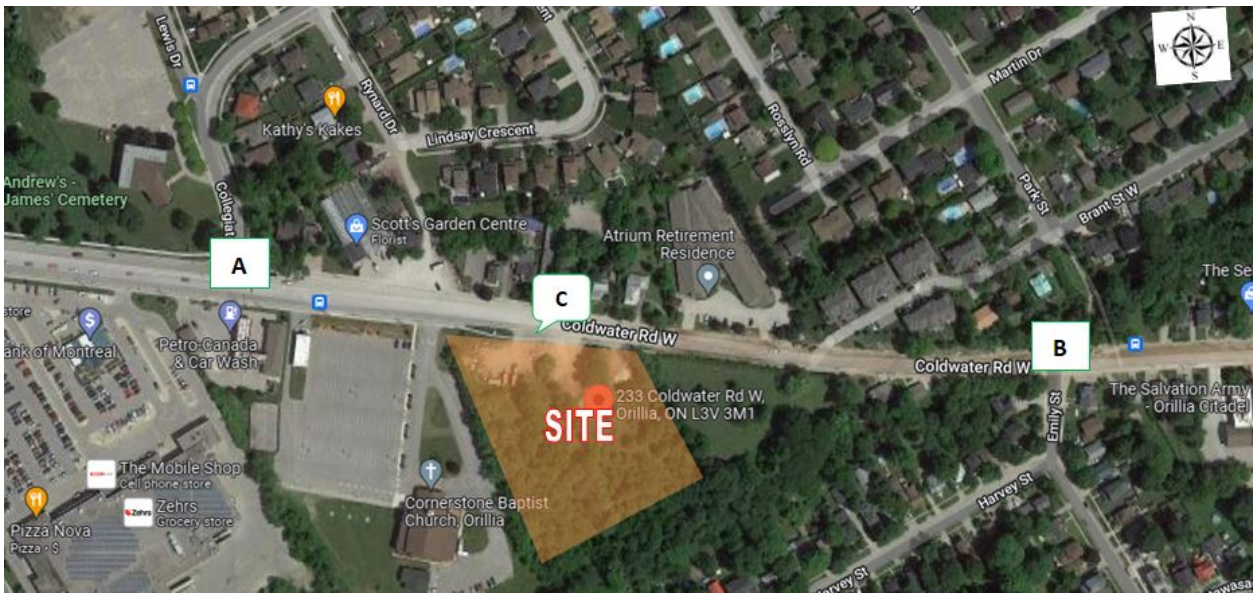


Figure 1 - Study Area

2. The Time Periods of Weekday AM Peak Hour & Weekday PM Peak will be analyzed for traffic impacts.

3. Horizon Year of **2027** & **2032** (Opening Year and 5 years from the date of the TIS).

4. Is the Growth Rate Factor of **2%** okay to use for calculating future volumes?

Data Request

5. Are there any future proposed developments in the vicinity that we should include in our TIS, if so please provide the TIS reports for them!

6. I require the Signal timing plan for the intersection of Coldwater Rd & Collegiate Dr?

7. Do you have any traffic counts that are not older than two years for the intersections selected in the site area?

Trip Generation and Distribution

ITE Trip Generation 10th Edition will be used to estimated Trip generated by proposed development.

- Land Use Code for the property will be Multifamily Housing (Mid-Rise) (LUC 221).

9120 Leslie Street, Suite 208, Richmond Hill, Ontario. L4B 3J9 I T: 416.303.4821 I F: 1.866.340.5265 I E: info@nengineering.com

Trip distribution assumptions will be applied the following:

- Existing/anticipated travel patterns,
- Transportation Tomorrow Survey 2016, or
- Output from the city's Travel Demand Forecasting Model

Modal Split

Please advise if model split or auto occupancy objectives are necessary for this report.

Capacity Analysis

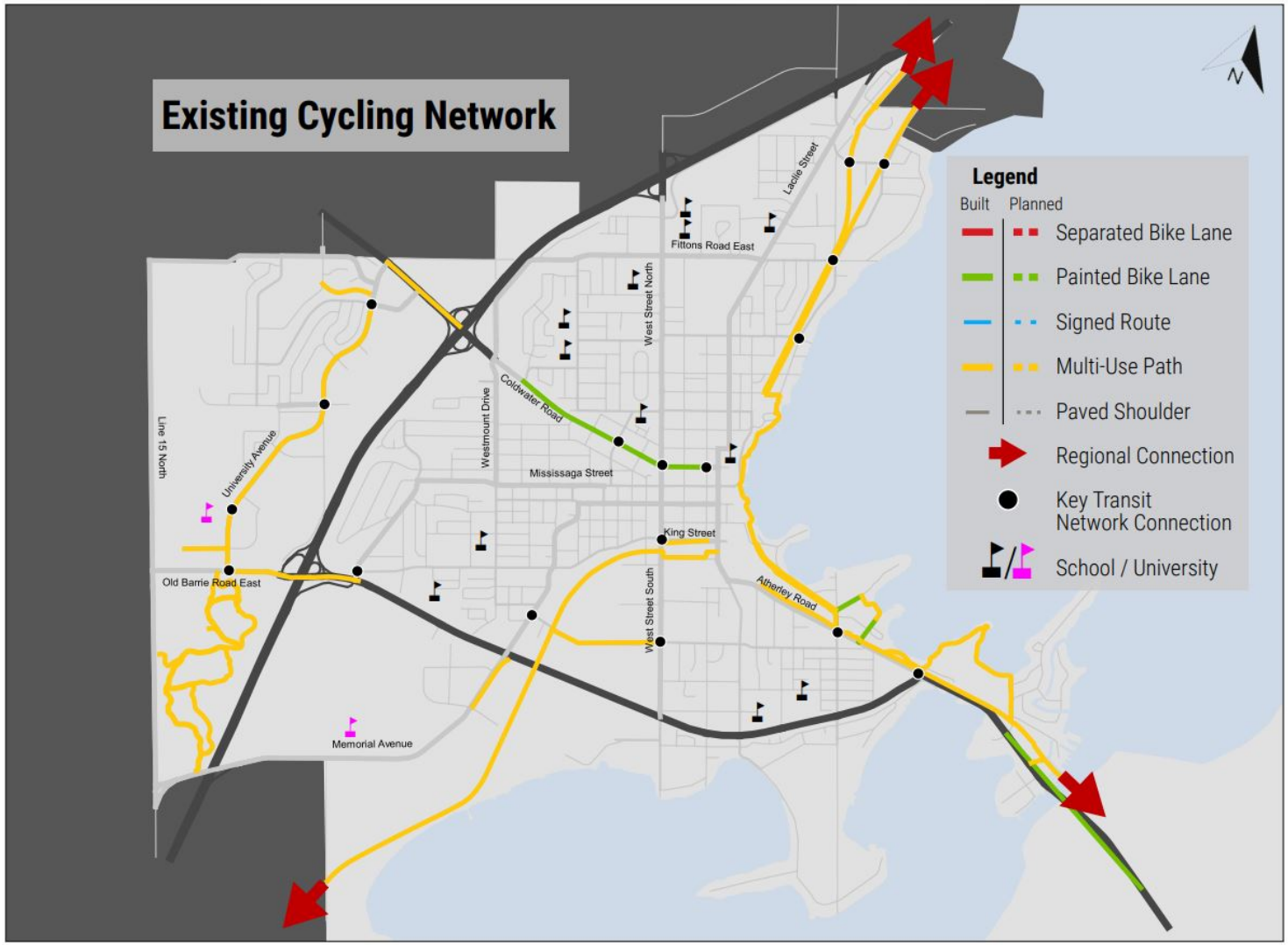
Capacity analysis will comply with the document named *County of Simcoe TIS Study Guidelines*

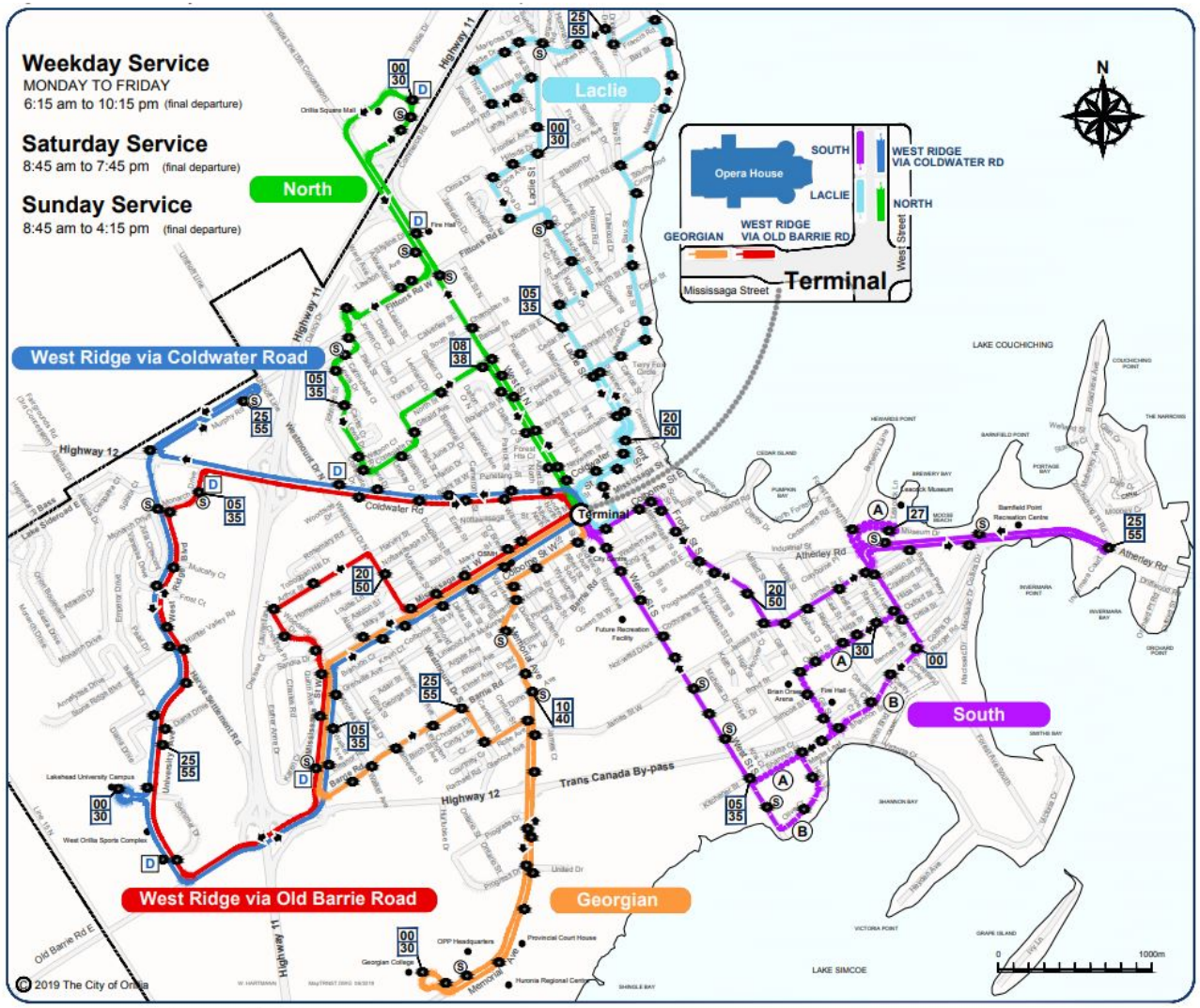
For Synchro analysis, the City's Guidelines for Using Synchro 11.0 will be followed. Synchro 11.0 utilized with HCM 6th Edition will be used. SimTraffic will be used to achieve 95th percentile queue length.

Safety Concerns

The site entrance access will be analyzed in Synchro simulation and with sight line guidelines according to TAC to ensure any safety concerns are addressed.

APPENDIX B
MTMP Report Excerpts


Existing Cycling Network
N
Legend
Built
Planned
Separated Bike Lane
Painted Bike Lane
Signed Route
Multi-Use Path
Paved Shoulder
Regional Connection
Key Transit Network Connection
School / University
Fiftons Road East
Laclie Street
West Street North
Coldwater Road
Westmount Drive
Line 15 North
University Avenue
Mississaga Street
King Street
Old Barrie Road East
West Street South
Atherley Road
Memorial Avenue



Orillia Transit

North Route | South Route
Laclie Route | Georgian Route
West Ridge via Coldwater Road
West Ridge via Old Barrie Road

Each route departs the terminal at 15 and 45 minutes past the hour providing half hourly service to each stop on all routes. Except, hourly service is provided on the SOUTH route at (A) departing terminal at 15 minutes and (B) departing terminal at 45 minutes past the hour.

Half Hourly Service
Departs terminal 15 and 45 minutes after the hour.

Hourly Service
Departs terminal 15 minutes after the hour.

Hourly Service
Departs terminal 45 minutes after the hour.

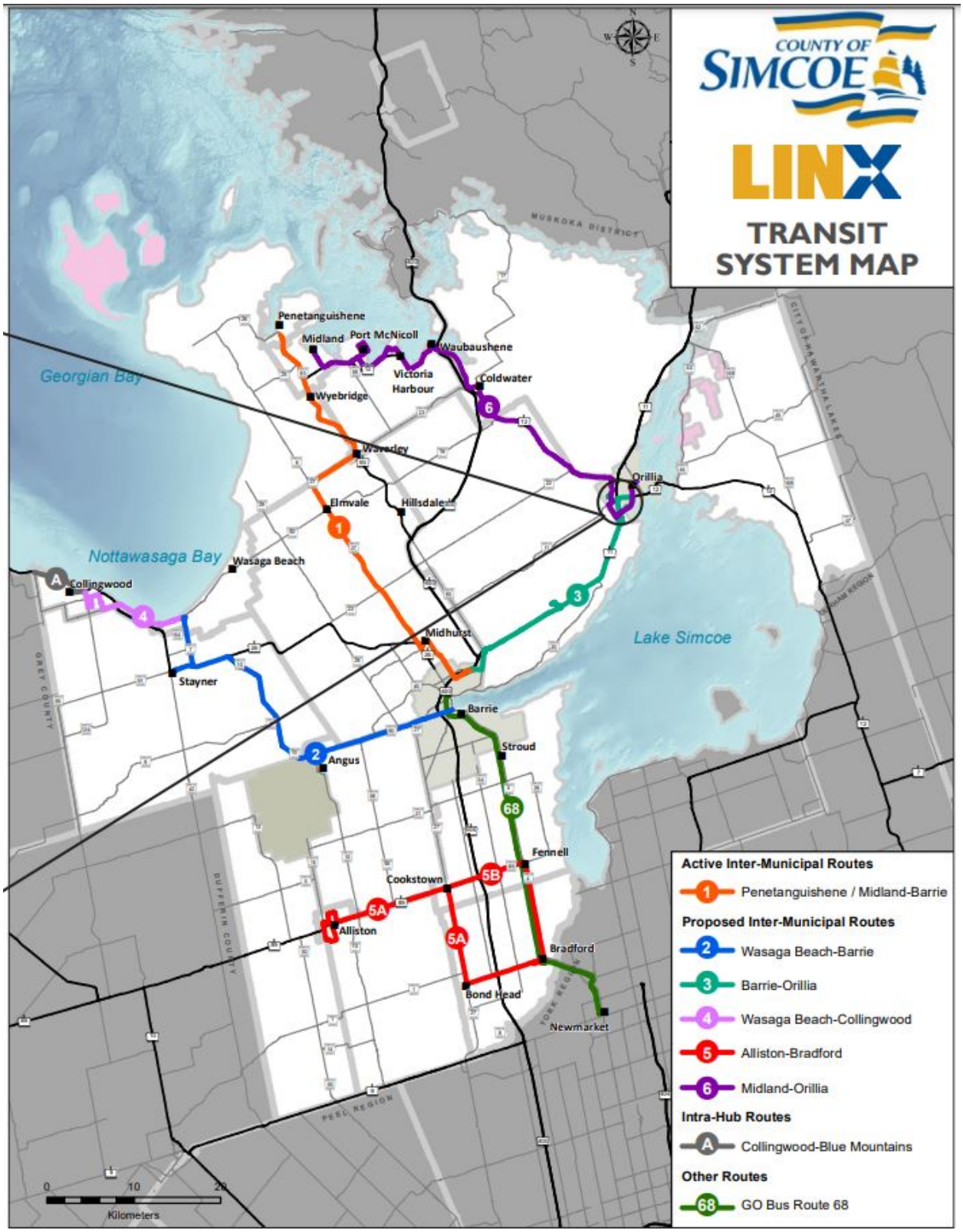
Bus Stop
Terminal Transit Terminal
Bus Shelter
Bus arrival times at stops noted in minutes after the hour
Dash Stop

Orillia Transit
BUS ROUTES
and Schedule

ORILLIA

Effective January 2, 2019

Information: 326-8300


COUNTY OF SIMCOE
LINX
TRANSIT SYSTEM MAP
Georgian Bay
Nottawasaga Bay
Lake Simcoe
Penetanguishene
Midland
Port McNicoll
Waubaushene
Victoria Harbour
Coldwater
Wyebridge
Waverley
Elmvale
Hillsdale
Orillia
Wasaga Beach
Collingwood
Stayner
Midhurst
Barrie
Angus
Stroud
Fennell
Cookstown
Alliston
Bradford
Bond Head
Newmarket
MUSKOKA DISTRICT
GREY COUNTY
DUFFERIN COUNTY
PEEL REGION
YORK REGION
0
10
20
Kilometers
Active Inter-Municipal Routes
1 Penetanguishene / Midland-Barrie
Proposed Inter-Municipal Routes
2 Wasaga Beach-Barrie
3 Barrie-Orillia
4 Wasaga Beach-Collingwood
5 Alliston-Bradford
6 Midland-Orillia
Intra-Hub Routes
A Collingwood-Blue Mountains
Other Routes
68 GO Bus Route 68

APPENDIX C
TMC Data 2022 Collected by Accu-Traffic Inc.

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

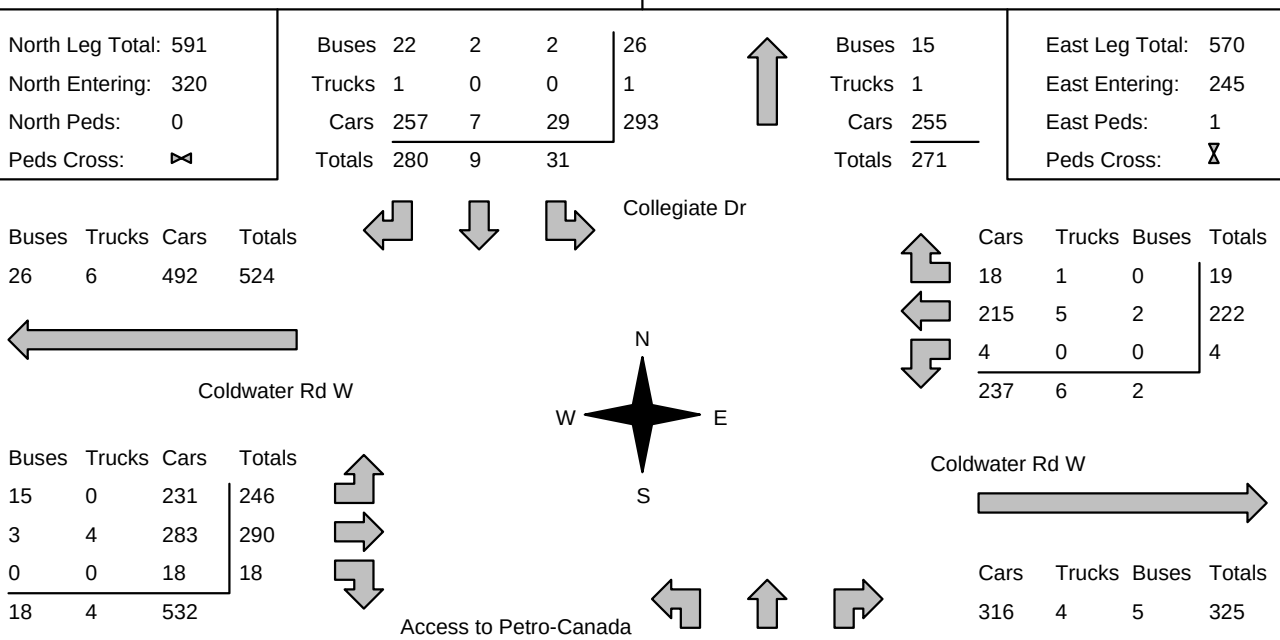
Municipality: Orillia
Site #: 2205800001
Intersection: Coldwater Rd W & Collegiate Dr
TFR File #: 1
Count date: 13-Apr-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Coldwater Rd W runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:00:00
To: 17:00:00

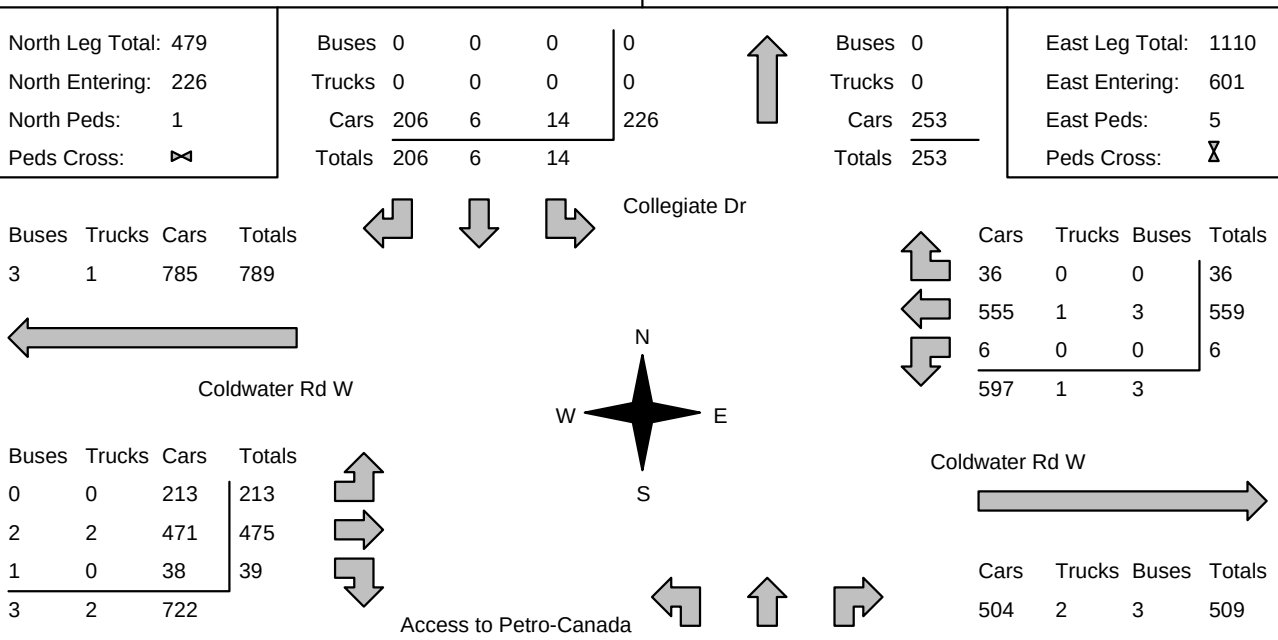
Municipality: Orillia
Site #: 2205800001
Intersection: Coldwater Rd W & Collegiate Dr
TFR File #: 1
Count date: 13-Apr-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Coldwater Rd W runs W/E



Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

Municipality: Orillia
Site #: 2205800001
Intersection: Coldwater Rd W & Collegiate Dr
TFR File #: 1
Count date: 13-Apr-22

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Coldwater Rd W runs W/E

North Leg Total: 2454
North Entering: 1231
North Peds: 2
Peds Cross: ⋈

Buses	34	2	3	39
Trucks	2	0	0	2
Cars	1023	38	129	1190
Totals	1059	40	132	

Buses	23
Trucks	3
Cars	1197
Totals	1223

East Leg Total: 4861
East Entering: 2379
East Peds: 24
Peds Cross: ⋈

Collegiate Dr

Buses	Trucks	Cars	Totals
51	20	3314	3385

Coldwater Rd W

Cars	Trucks	Buses	Totals
148	2	0	150
2157	17	15	2189
40	0	0	40
2345	19	15	

N
W E
S

Buses	Trucks	Cars	Totals
23	1	1022	1046
14	16	2241	2271
1	0	159	160
38	17	3422	

Coldwater Rd W

Cars	Trucks	Buses	Totals
2448	16	18	2482

Access to Petro-Canada

Peds Cross: ⧗
West Peds: 67
West Entering: 3477
West Leg Total: 6862

Cars	237
Trucks	0
Buses	3
Totals	240

Cars	134	27	78	239
Trucks	1	0	0	1
Buses	2	0	1	3
Totals	137	27	79	

Peds Cross: ⋈
South Peds: 36
South Entering: 243
South Leg Total: 483

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: Coldwater Rd W & Collegiate Dr | **Count Date:** 13-Apr-22 | **Municipality:** Orillia

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*25*	*8*	*219*	*252*	*0*
9:00:00	*31*	*6*	*193*	*230*	*0*
10:00:00	*26*	*12*	*128*	*166*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*25*	*6*	*181*	*212*	*1*
17:00:00	*14*	*6*	*206*	*226*	*1*
18:00:00	*11*	*2*	*132*	*145*	*0*
Totals:	132	40	1059	1231	2

North/South Total Approaches: 1474

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*19*	*3*	*7*	*29*	*1*
9:00:00	*15*	*5*	*10*	*30*	*1*
10:00:00	*27*	*3*	*11*	*41*	*3*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*26*	*4*	*15*	*45*	*15*
17:00:00	*24*	*4*	*20*	*48*	*4*
18:00:00	*26*	*8*	*16*	*50*	*12*
S Totals:	137	27	79	243	36

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*3*	*183*	*20*	*206*	*0*
9:00:00	*3*	*227*	*17*	*247*	*1*
10:00:00	*8*	*289*	*14*	*311*	*2*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*10*	*425*	*32*	*467*	*8*
17:00:00	*6*	*559*	*36*	*601*	*5*
18:00:00	*10*	*506*	*31*	*547*	*8*
Totals:	40	2189	150	2379	24

East/West Total Approaches: 5856

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*238*	*214*	*18*	*470*	*3*
9:00:00	*121*	*368*	*18*	*507*	*12*
10:00:00	*109*	*303*	*20*	*432*	*17*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*181*	*446*	*27*	*654*	*6*
17:00:00	*213*	*475*	*39*	*727*	*23*
18:00:00	*184*	*465*	*38*	*687*	*6*
W Totals:	1046	2271	160	3477	67

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*10:00*	*15:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*0*	*55*	*65*	*84*	*0*	*71*	*72*	*59*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 13-Apr-22 Site #: 2205800001

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
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	1	1	0	0	17	17	0	0	0	0	0	0	0	0	0	0	1	1	0	0
7:30:00	9	8	1	1	47	30	0	0	0	0	0	0	0	0	0	0	1	0	0	0
7:45:00	12	3	3	2	91	44	0	0	0	0	0	0	1	1	1	1	18	17	0	0
8:00:00	23	11	6	3	195	104	0	0	0	0	1	1	2	1	2	1	23	5	0	0
8:15:00	30	7	8	2	265	70	0	0	0	0	1	0	2	0	2	0	23	0	0	0
8:30:00	38	8	8	0	304	39	0	0	0	0	1	0	2	0	2	0	23	0	0	0
8:45:00	48	10	11	3	332	28	0	0	0	0	1	0	2	0	2	0	24	1	0	0
9:00:00	54	6	12	1	384	52	0	0	0	0	1	0	2	0	2	0	27	3	0	0
9:15:00	58	4	16	4	421	37	0	0	0	0	1	0	2	0	2	0	27	0	0	0
9:30:00	63	5	21	5	453	32	0	0	0	0	1	0	2	0	2	0	27	0	0	0
9:45:00	72	9	22	1	489	36	0	0	0	0	1	0	3	1	2	0	27	0	0	0
10:00:00	79	7	24	2	512	23	0	0	0	0	1	0	3	0	2	0	27	0	0	0
10:15:00	79	0	24	0	512	0	0	0	0	0	1	0	3	0	2	0	27	0	0	0
15:00:00	79	0	24	0	512	0	0	0	0	0	1	0	3	0	2	0	27	0	0	0
15:15:00	89	10	26	2	556	44	0	0	0	0	1	0	3	0	2	0	27	0	0	0
15:30:00	93	4	28	2	595	39	0	0	0	0	1	0	3	0	2	0	30	3	0	0
15:45:00	96	3	29	1	648	53	0	0	0	0	1	0	3	0	2	0	34	4	1	1
16:00:00	104	8	30	1	686	38	0	0	0	0	1	0	3	0	2	0	34	0	1	0
16:15:00	108	4	33	3	756	70	0	0	0	0	1	0	3	0	2	0	34	0	2	1
16:30:00	114	6	34	1	804	48	0	0	0	0	1	0	3	0	2	0	34	0	2	0
16:45:00	116	2	34	0	850	46	0	0	0	0	1	0	3	0	2	0	34	0	2	0
17:00:00	118	2	36	2	892	42	0	0	0	0	1	0	3	0	2	0	34	0	2	0
17:15:00	119	1	38	2	930	38	0	0	0	0	2	1	3	0	2	0	34	0	2	0
17:30:00	121	2	38	0	968	38	0	0	0	0	2	0	3	0	2	0	34	0	2	0
17:45:00	125	4	38	0	1003	35	0	0	0	0	2	0	3	0	2	0	34	0	2	0
18:00:00	129	4	38	0	1023	20	0	0	0	0	2	0	3	0	2	0	34	0	2	0
18:15:00	129	0	38	0	1023	0	0	0	0	0	2	0	3	0	2	0	34	0	2	0
18:15:15	129	0	38	0	1023	0	0	0	0	0	2	0	3	0	2	0	34	0	2	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 13-Apr-22 Site #: 2205800001

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
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	36	36	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	71	35	5	4	0	0	1	0	1	1	0	0	1	1	0	0	0	0
7:45:00	1	1	122	51	8	3	0	0	3	2	2	1	0	0	1	0	0	0	0	0
8:00:00	3	2	178	56	18	10	0	0	3	0	2	0	0	0	2	1	0	0	0	0
8:15:00	4	1	235	57	20	2	0	0	4	1	2	0	0	0	2	0	0	0	0	0
8:30:00	4	0	286	51	23	3	0	0	6	2	2	0	0	0	3	1	0	0	1	1
8:45:00	5	1	333	47	31	8	0	0	7	1	2	0	0	0	3	0	0	0	1	0
9:00:00	6	1	398	65	35	4	0	0	7	0	2	0	0	0	5	2	0	0	1	0
9:15:00	9	3	457	59	39	4	0	0	9	2	2	0	0	0	5	0	0	0	2	1
9:30:00	11	2	516	59	42	3	0	0	9	0	2	0	0	0	6	1	0	0	3	1
9:45:00	14	3	581	65	43	1	0	0	10	1	2	0	0	0	6	0	0	0	3	0
10:00:00	14	0	682	101	49	6	0	0	10	0	2	0	0	0	7	1	0	0	3	0
10:15:00	14	0	682	0	49	0	0	0	10	0	2	0	0	0	7	0	0	0	3	0
15:00:00	14	0	682	0	49	0	0	0	10	0	2	0	0	0	7	0	0	0	3	0
15:15:00	17	3	777	95	55	6	0	0	11	1	2	0	0	0	7	0	0	0	7	4
15:30:00	18	1	890	113	60	5	0	0	11	0	2	0	0	0	8	1	0	0	10	3
15:45:00	24	6	1007	117	72	12	0	0	12	1	2	0	0	0	9	1	0	0	10	0
16:00:00	24	0	1100	93	81	9	0	0	14	2	2	0	0	0	10	1	0	0	11	1
16:15:00	26	2	1257	157	94	13	0	0	14	0	2	0	0	0	10	0	0	0	11	0
16:30:00	28	2	1387	130	101	7	0	0	14	0	2	0	0	0	12	2	0	0	14	3
16:45:00	29	1	1530	143	109	8	0	0	15	1	2	0	0	0	12	0	0	0	14	0
17:00:00	30	1	1655	125	117	8	0	0	15	0	2	0	0	0	13	1	0	0	16	2
17:15:00	32	2	1807	152	128	11	0	0	15	0	2	0	0	0	13	0	0	0	16	0
17:30:00	34	2	1944	137	139	11	0	0	16	1	2	0	0	0	14	1	0	0	16	0
17:45:00	36	2	2057	113	145	6	0	0	17	1	2	0	0	0	14	0	0	0	20	4
18:00:00	40	4	2157	100	148	3	0	0	17	0	2	0	0	0	15	1	0	0	24	4
18:15:00	40	0	2157	0	148	0	0	0	17	0	2	0	0	0	15	0	0	0	24	0
18:15:15	40	0	2157	0	148	0	0	0	17	0	2	0	0	0	15	0	0	0	24	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 13-Apr-22 Site #: 2205800001

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
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	5	2	1	1	5	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45:00	11	6	2	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:00:00	18	7	3	1	7	1	0	0	0	0	0	0	1	1	0	0	0	0	1	0
8:15:00	23	5	4	1	7	0	0	0	0	0	0	0	2	1	0	0	0	0	1	0
8:30:00	25	2	7	3	9	2	0	0	0	0	0	0	2	0	0	0	0	0	2	1
8:45:00	30	5	8	1	13	4	0	0	0	0	0	0	2	0	0	0	0	0	2	0
9:00:00	32	2	8	0	17	4	0	0	0	0	0	0	2	0	0	0	0	0	2	0
9:15:00	33	1	8	0	18	1	0	0	0	0	0	0	2	0	0	0	0	0	2	0
9:30:00	46	13	9	1	23	5	0	0	0	0	0	0	2	0	0	0	0	0	2	0
9:45:00	52	6	11	2	24	1	0	0	0	0	0	0	2	0	0	0	0	0	5	3
10:00:00	59	7	11	0	28	4	0	0	0	0	0	0	2	0	0	0	0	0	5	0
10:15:00	59	0	11	0	28	0	0	0	0	0	0	0	2	0	0	0	0	0	5	0
15:00:00	59	0	11	0	28	0	0	0	0	0	0	0	2	0	0	0	0	0	5	0
15:15:00	64	5	11	0	29	1	0	0	0	0	0	0	2	0	0	0	0	0	11	6
15:30:00	71	7	13	2	35	6	1	1	0	0	0	0	2	0	0	0	0	0	17	6
15:45:00	77	6	15	2	38	3	1	0	0	0	0	0	2	0	0	0	0	0	19	2
16:00:00	84	7	15	0	43	5	1	0	0	0	0	0	2	0	0	0	0	0	20	1
16:15:00	92	8	16	1	46	3	1	0	0	0	0	0	2	0	0	0	0	0	24	4
16:30:00	100	8	16	0	52	6	1	0	0	0	0	0	2	0	0	0	0	0	24	0
16:45:00	105	5	18	2	56	4	1	0	0	0	0	0	2	0	0	0	1	1	24	0
17:00:00	108	3	19	1	62	6	1	0	0	0	0	0	2	0	0	0	1	0	24	0
17:15:00	114	6	20	1	72	10	1	0	0	0	0	0	2	0	0	0	1	0	25	1
17:30:00	120	6	21	1	75	3	1	0	0	0	0	0	2	0	0	0	1	0	25	0
17:45:00	127	7	24	3	77	2	1	0	0	0	0	0	2	0	0	0	1	0	28	3
18:00:00	134	7	27	3	78	1	1	0	0	0	0	0	2	0	0	0	1	0	36	8
18:15:00	134	0	27	0	78	0	1	0	0	0	0	0	2	0	0	0	1	0	36	0
18:15:15	134	0	27	0	78	0	1	0	0	0	0	0	2	0	0	0	1	0	36	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 13-Apr-22 Site #: 2205800001

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
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	16	16	39	39	3	3	0	0	2	2	0	0	1	1	1	1	0	0	1	1
7:30:00	58	42	84	45	10	7	0	0	3	1	0	0	1	0	1	0	0	0	2	1
7:45:00	130	72	135	51	15	5	0	0	4	1	0	0	14	13	2	1	0	0	2	0
8:00:00	222	92	207	72	18	3	0	0	5	1	0	0	16	2	2	0	0	0	3	1
8:15:00	265	43	275	68	21	3	0	0	5	0	0	0	16	0	4	2	0	0	6	3
8:30:00	289	24	367	92	28	7	0	0	7	2	0	0	16	0	4	0	0	0	10	4
8:45:00	321	32	452	85	33	5	0	0	9	2	0	0	19	3	5	1	0	0	14	4
9:00:00	340	19	567	115	36	3	0	0	9	0	0	0	19	0	6	1	0	0	15	1
9:15:00	368	28	639	72	39	3	0	0	10	1	0	0	19	0	7	1	0	0	18	3
9:30:00	394	26	696	57	47	8	0	0	11	1	0	0	19	0	7	0	0	0	25	7
9:45:00	423	29	769	73	53	6	0	0	11	0	0	0	19	0	8	1	0	0	32	7
10:00:00	449	26	866	97	56	3	0	0	11	0	0	0	19	0	8	0	0	0	32	0
10:15:00	449	0	866	0	56	0	0	0	11	0	0	0	19	0	8	0	0	0	32	0
15:00:00	449	0	866	0	56	0	0	0	11	0	0	0	19	0	8	0	0	0	32	0
15:15:00	488	39	959	93	63	7	1	1	12	1	0	0	22	3	9	1	0	0	33	1
15:30:00	528	40	1078	119	69	6	1	0	12	0	0	0	22	0	9	0	0	0	34	1
15:45:00	564	36	1190	112	73	4	1	0	12	0	0	0	23	1	10	1	0	0	34	0
16:00:00	625	61	1308	118	83	10	1	0	13	1	0	0	23	0	10	0	0	0	38	4
16:15:00	676	51	1427	119	90	7	1	0	13	0	0	0	23	0	11	1	0	0	51	13
16:30:00	731	55	1553	126	102	12	1	0	13	0	0	0	23	0	11	0	1	1	55	4
16:45:00	775	44	1664	111	112	10	1	0	14	1	0	0	23	0	12	1	1	0	60	5
17:00:00	838	63	1779	115	121	9	1	0	15	1	0	0	23	0	12	0	1	0	61	1
17:15:00	892	54	1895	116	136	15	1	0	16	1	0	0	23	0	13	1	1	0	62	1
17:30:00	936	44	2039	144	142	6	1	0	16	0	0	0	23	0	13	0	1	0	63	1
17:45:00	985	49	2134	95	149	7	1	0	16	0	0	0	23	0	14	1	1	0	63	0
18:00:00	1022	37	2241	107	159	10	1	0	16	0	0	0	23	0	14	0	1	0	67	4
18:15:00	1022	0	2241	0	159	0	1	0	16	0	0	0	23	0	14	0	1	0	67	0
18:15:15	1022	0	2241	0	159	0	1	0	16	0	0	0	23	0	14	0	1	0	67	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:15:00
To: 9:15:00

Municipality: Orillia
Site #: 2205800002
Intersection: Coldwater Rd W & Emily St
TFR File #: 1
Count date: 13-Apr-22

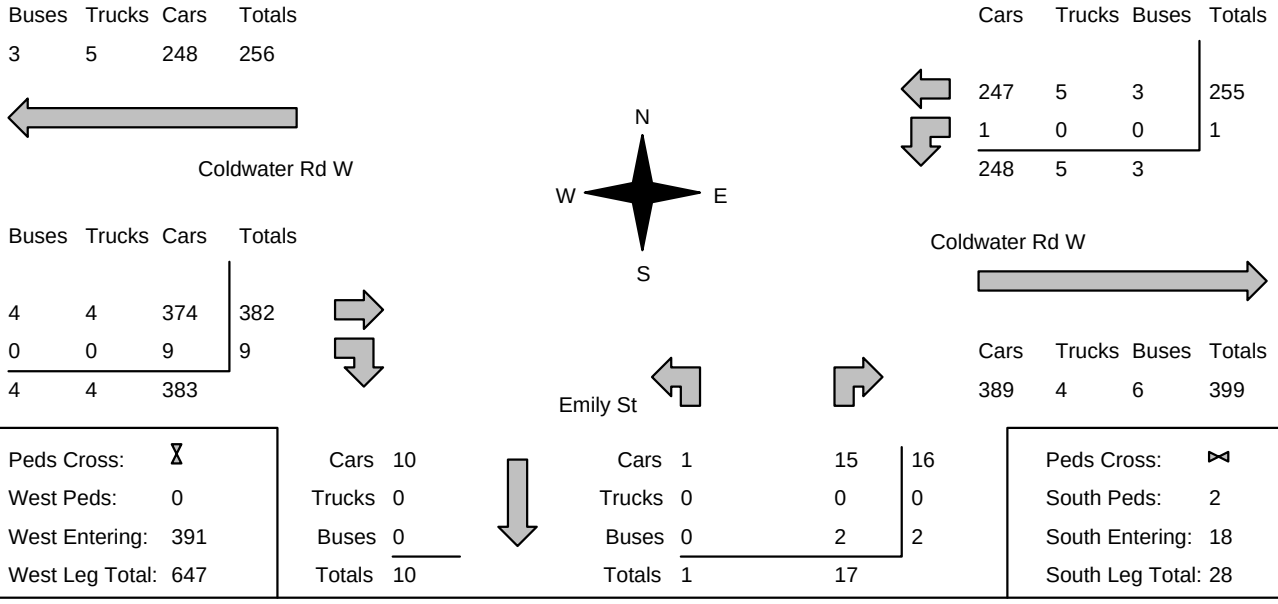
Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Coldwater Rd W runs W/E

East Leg Total: 655
East Entering: 256
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 391
West Leg Total: 647

Cars 10
Trucks 0
Buses 0
Totals 10

Cars 1 15 16
Trucks 0 0 0
Buses 0 2 2
Totals 1 17

Peds Cross: ⋈
South Peds: 2
South Entering: 18
South Leg Total: 28

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Orillia
Site #: 2205800002
Intersection: Coldwater Rd W & Emily St
TFR File #: 1
Count date: 13-Apr-22

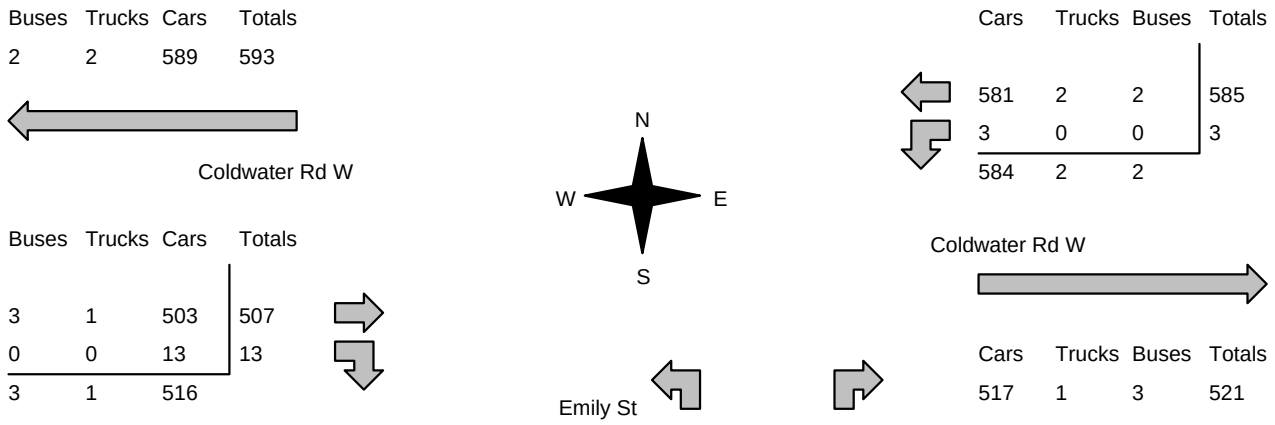
Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Coldwater Rd W runs W/E

East Leg Total: 1109
East Entering: 588
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 520
West Leg Total: 1113

Cars 16
Trucks 0
Buses 0
Totals 16

Cars 8 14 22
Trucks 0 0 0
Buses 0 0 0
Totals 8 14

Peds Cross: ⋈
South Peds: 6
South Entering: 22
South Leg Total: 38

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Total Count Diagram

Municipality: Orillia
Site #: 2205800002
Intersection: Coldwater Rd W & Emily St
TFR File #: 1
Count date: 13-Apr-22

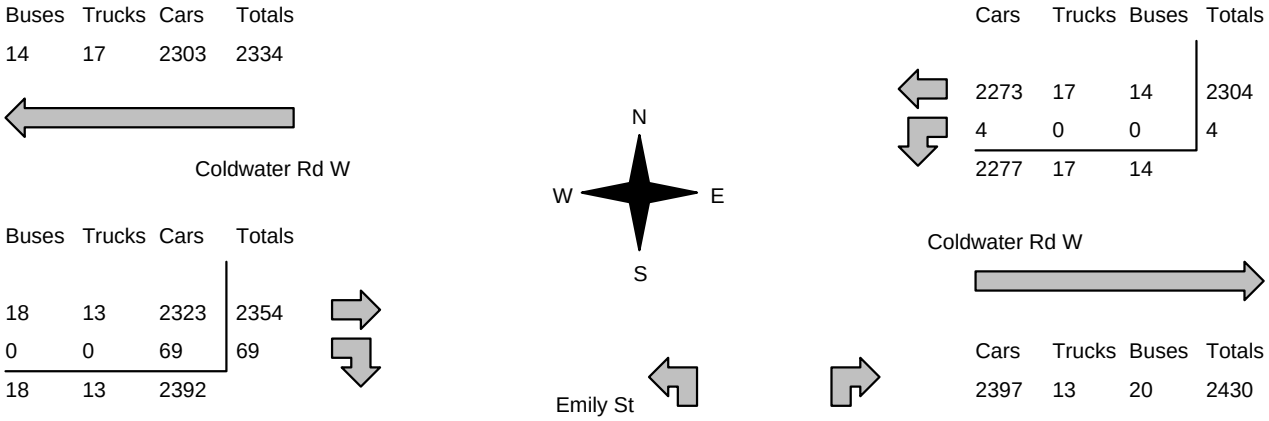
Weather conditions:

Person counted:
Person prepared:
Person checked:

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

Major Road: Coldwater Rd W runs W/E

East Leg Total: 4738
East Entering: 2308
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 2423
West Leg Total: 4757

Cars 73
Trucks 0
Buses 0
Totals 73

Cars 30 74 104
Trucks 0 0 0
Buses 0 2 2
Totals 30 76

Peds Cross: ⋈
South Peds: 23
South Entering: 106
South Leg Total: 179

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Traffic Count Summary

Intersection: Coldwater Rd W & Emily St | **Count Date:** 13-Apr-22 | **Municipality:** Orillia

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*0*	*0*	*0*	*0*
9:00:00	*0*	*0*	*0*	*0*	*0*
10:00:00	*0*	*0*	*0*	*0*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*0*	*0*	*0*	*0*
17:00:00	*0*	*0*	*0*	*0*	*0*
18:00:00	*0*	*0*	*0*	*0*	*0*
Totals:	0	0	0	0	0

North/South Total Approaches: 106

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*7*	*0*	*7*	*14*	*2*
9:00:00	*2*	*0*	*20*	*22*	*2*
10:00:00	*2*	*0*	*8*	*10*	*1*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*4*	*0*	*15*	*19*	*9*
17:00:00	*8*	*0*	*9*	*17*	*5*
18:00:00	*7*	*0*	*17*	*24*	*4*
S Totals:	30	0	76	106	23

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*195*	*0*	*195*	*0*
9:00:00	*0*	*252*	*0*	*252*	*0*
10:00:00	*1*	*304*	*0*	*305*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*460*	*0*	*460*	*0*
17:00:00	*0*	*565*	*0*	*565*	*0*
18:00:00	*3*	*528*	*0*	*531*	*0*
Totals:	4	2304	0	2308	0

East/West Total Approaches: 4731

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Buses				Total Peds
	Left	Thru	Right	Grand Total	
7:00:00	*0*	*0*	*0*	*0*	*0*
8:00:00	*0*	*232*	*5*	*237*	*0*
9:00:00	*0*	*383*	*6*	*389*	*0*
10:00:00	*0*	*315*	*8*	*323*	*0*
15:00:00	*0*	*0*	*0*	*0*	*0*
16:00:00	*0*	*475*	*20*	*495*	*0*
17:00:00	*0*	*477*	*13*	*490*	*0*
18:00:00	*0*	*472*	*17*	*489*	*0*
W Totals:	0	2354	69	2423	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	*7:00*	*8:00*	*9:00*	*10:00*	*15:00*	*16:00*	*17:00*	*18:00*
Crossing Values:	*0*	*7*	*2*	*2*	*0*	*4*	*8*	*7*

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 13-Apr-22 Site #: 2205800002

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
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 13-Apr-22 Site #: 2205800002

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
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	32	32	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	73	41	0	0	0	0	3	1	0	0	0	0	1	1	0	0	0	0
7:45:00	0	0	127	54	0	0	0	0	5	2	0	0	0	0	1	0	0	0	0	0
8:00:00	0	0	188	61	0	0	0	0	5	0	0	0	0	0	2	1	0	0	0	0
8:15:00	0	0	247	59	0	0	0	0	6	1	0	0	0	0	2	0	0	0	0	0
8:30:00	0	0	304	57	0	0	0	0	8	2	0	0	0	0	3	1	0	0	0	0
8:45:00	0	0	359	55	0	0	0	0	9	1	0	0	0	0	3	0	0	0	0	0
9:00:00	0	0	433	74	0	0	0	0	9	0	0	0	0	0	5	2	0	0	0	0
9:15:00	1	1	494	61	0	0	0	0	11	2	0	0	0	0	5	0	0	0	0	0
9:30:00	1	0	563	69	0	0	0	0	11	0	0	0	0	0	6	1	0	0	0	0
9:45:00	1	0	627	64	0	0	0	0	12	1	0	0	0	0	6	0	0	0	0	0
10:00:00	1	0	732	105	0	0	0	0	12	0	0	0	0	0	7	1	0	0	0	0
10:15:00	1	0	732	0	0	0	0	0	12	0	0	0	0	0	7	0	0	0	0	0
15:00:00	1	0	732	0	0	0	0	0	12	0	0	0	0	0	7	0	0	0	0	0
15:15:00	1	0	836	104	0	0	0	0	12	0	0	0	0	0	7	0	0	0	0	0
15:30:00	1	0	950	114	0	0	0	0	12	0	0	0	0	0	8	1	0	0	0	0
15:45:00	1	0	1079	129	0	0	0	0	12	0	0	0	0	0	9	1	0	0	0	0
16:00:00	1	0	1187	108	0	0	0	0	14	2	0	0	0	0	10	1	0	0	0	0
16:15:00	1	0	1347	160	0	0	0	0	14	0	0	0	0	0	10	0	0	0	0	0
16:30:00	1	0	1476	129	0	0	0	0	14	0	0	0	0	0	11	1	0	0	0	0
16:45:00	1	0	1623	147	0	0	0	0	15	1	0	0	0	0	11	0	0	0	0	0
17:00:00	1	0	1749	126	0	0	0	0	15	0	0	0	0	0	12	1	0	0	0	0
17:15:00	1	0	1914	165	0	0	0	0	15	0	0	0	0	0	12	0	0	0	0	0
17:30:00	4	3	2057	143	0	0	0	0	16	1	0	0	0	0	13	1	0	0	0	0
17:45:00	4	0	2176	119	0	0	0	0	17	1	0	0	0	0	13	0	0	0	0	0
18:00:00	4	0	2273	97	0	0	0	0	17	0	0	0	0	0	14	1	0	0	0	0
18:15:00	4	0	2273	0	0	0	0	0	17	0	0	0	0	0	14	0	0	0	0	0
18:15:15	4	0	2273	0	0	0	0	0	17	0	0	0	0	0	14	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 13-Apr-22 Site #: 2205800002

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
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	2	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45:00	5	3	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:00:00	7	2	0	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	2	1
8:15:00	9	2	0	0	11	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:30:00	9	0	0	0	15	4	0	0	0	0	0	0	0	0	0	0	2	2	2	0
8:45:00	9	0	0	0	21	6	0	0	0	0	0	0	0	0	0	0	2	0	3	1
9:00:00	9	0	0	0	25	4	0	0	0	0	0	0	0	0	0	0	2	0	4	1
9:15:00	10	1	0	0	26	1	0	0	0	0	0	0	0	0	0	0	2	0	4	0
9:30:00	10	0	0	0	26	0	0	0	0	0	0	0	0	0	0	0	2	0	4	0
9:45:00	10	0	0	0	31	5	0	0	0	0	0	0	0	0	0	0	2	0	5	1
10:00:00	11	1	0	0	33	2	0	0	0	0	0	0	0	0	0	0	2	0	5	0
10:15:00	11	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	2	0	5	0
15:00:00	11	0	0	0	33	0	0	0	0	0	0	0	0	0	0	0	2	0	5	0
15:15:00	12	1	0	0	37	4	0	0	0	0	0	0	0	0	0	0	2	0	6	1
15:30:00	13	1	0	0	41	4	0	0	0	0	0	0	0	0	0	0	2	0	10	4
15:45:00	14	1	0	0	43	2	0	0	0	0	0	0	0	0	0	0	2	0	11	1
16:00:00	15	1	0	0	48	5	0	0	0	0	0	0	0	0	0	0	2	0	14	3
16:15:00	18	3	0	0	51	3	0	0	0	0	0	0	0	0	0	0	2	0	14	0
16:30:00	19	1	0	0	53	2	0	0	0	0	0	0	0	0	0	0	2	0	16	2
16:45:00	19	0	0	0	54	1	0	0	0	0	0	0	0	0	0	0	2	0	17	1
17:00:00	23	4	0	0	57	3	0	0	0	0	0	0	0	0	0	0	2	0	19	2
17:15:00	24	1	0	0	60	3	0	0	0	0	0	0	0	0	0	0	2	0	20	1
17:30:00	27	3	0	0	67	7	0	0	0	0	0	0	0	0	0	0	2	0	22	2
17:45:00	29	2	0	0	69	2	0	0	0	0	0	0	0	0	0	0	2	0	22	0
18:00:00	30	1	0	0	74	5	0	0	0	0	0	0	0	0	0	0	2	0	23	1
18:15:00	30	0	0	0	74	0	0	0	0	0	0	0	0	0	0	0	2	0	23	0
18:15:15	30	0	0	0	74	0	0	0	0	0	0	0	0	0	0	0	2	0	23	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Count Date: 13-Apr-22 Site #: 2205800002

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
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	35	35	0	0	0	0	2	2	0	0	0	0	1	1	0	0	0	0
7:30:00	0	0	84	49	2	2	0	0	3	1	0	0	0	0	1	0	0	0	0	0
7:45:00	0	0	143	59	5	3	0	0	4	1	0	0	0	0	3	2	0	0	0	0
8:00:00	0	0	223	80	5	0	0	0	5	1	0	0	0	0	4	1	0	0	0	0
8:15:00	0	0	299	76	5	0	0	0	5	0	0	0	0	0	5	1	0	0	0	0
8:30:00	0	0	393	94	6	1	0	0	6	1	0	0	0	0	6	1	0	0	0	0
8:45:00	0	0	487	94	7	1	0	0	8	2	0	0	0	0	7	1	0	0	0	0
9:00:00	0	0	599	112	11	4	0	0	8	0	0	0	0	0	8	1	0	0	0	0
9:15:00	0	0	673	74	14	3	0	0	9	1	0	0	0	0	9	1	0	0	0	0
9:30:00	0	0	735	62	15	1	0	0	10	1	0	0	0	0	9	0	0	0	0	0
9:45:00	0	0	812	77	17	2	0	0	10	0	0	0	0	0	11	2	0	0	0	0
10:00:00	0	0	909	97	19	2	0	0	10	0	0	0	0	0	11	0	0	0	0	0
10:15:00	0	0	909	0	19	0	0	0	10	0	0	0	0	0	11	0	0	0	0	0
15:00:00	0	0	909	0	19	0	0	0	10	0	0	0	0	0	11	0	0	0	0	0
15:15:00	0	0	1012	103	25	6	0	0	11	1	0	0	0	0	12	1	0	0	0	0
15:30:00	0	0	1132	120	27	2	0	0	11	0	0	0	0	0	12	0	0	0	0	0
15:45:00	0	0	1248	116	32	5	0	0	12	1	0	0	0	0	13	1	0	0	0	0
16:00:00	0	0	1380	132	39	7	0	0	12	0	0	0	0	0	13	0	0	0	0	0
16:15:00	0	0	1496	116	42	3	0	0	12	0	0	0	0	0	14	1	0	0	0	0
16:30:00	0	0	1618	122	46	4	0	0	12	0	0	0	0	0	14	0	0	0	0	0
16:45:00	0	0	1739	121	50	4	0	0	12	0	0	0	0	0	16	2	0	0	0	0
17:00:00	0	0	1854	115	52	2	0	0	12	0	0	0	0	0	16	0	0	0	0	0
17:15:00	0	0	1974	120	57	5	0	0	13	1	0	0	0	0	17	1	0	0	0	0
17:30:00	0	0	2121	147	59	2	0	0	13	0	0	0	0	0	17	0	0	0	0	0
17:45:00	0	0	2220	99	63	4	0	0	13	0	0	0	0	0	18	1	0	0	0	0
18:00:00	0	0	2323	103	69	6	0	0	13	0	0	0	0	0	18	0	0	0	0	0
18:15:00	0	0	2323	0	69	0	0	0	13	0	0	0	0	0	18	0	0	0	0	0
18:15:15	0	0	2323	0	69	0	0	0	13	0	0	0	0	0	18	0	0	0	0	0

APPENDIX D
Signal Timing Plan & Synchro Timing Reports

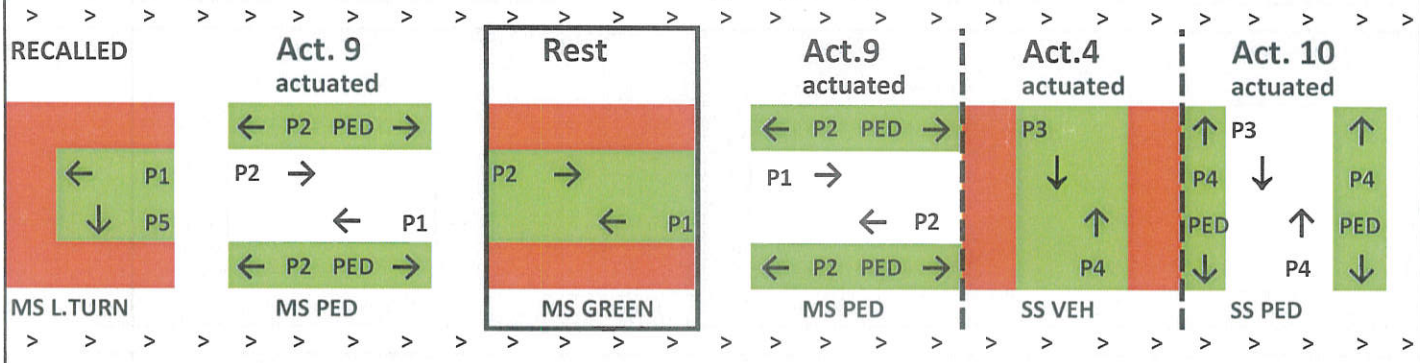
O'Neill Traffic

LMD-411 Traffic Controller Program

City: Orillia
Intersection: Coldwater @ Collegiate
Controller S/N:

Technician: Mike O'Neill
Company: O'Neill Traffic
Date: May 29/14

Phasing Sequence



PER UNIT DATA	
ADVANCE FLSH RATE	0
NUMBER OF INTERVALS	30
50 OR 60 Hz	60
MINIMUM FLASH	4

PER SIGNAL PLAN DATA								
SIGNAL PLAN	1	2	3	4	5	6	7	8
FLASH EXIT INTERV	7	7	7	7	7	7	7	7
DWELL INTERVAL	2	2	2	2	2	2	2	2
INITALIZE INTERVAL	7	7	7	7	7	7	7	7

Actuation Programming

0 = off
1 = memory off
2 = memory on
3 = recall

Act.9 =	2
Act.10 =	2
Act.3 =	n/a
Act.4 =	1

Pre-empt Programming

P.EMPT HI	1	Main st. Green D/W
P.EMPT HI	2	Side st. Green D/W
P.EMPT LOW	6	Main st. Green D/W

Controller Timing
CYC1 -SPLT 1

INTERVAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SECONDS	20	2	3	3	13	8	4	2	0	0	0	0	3	19	8

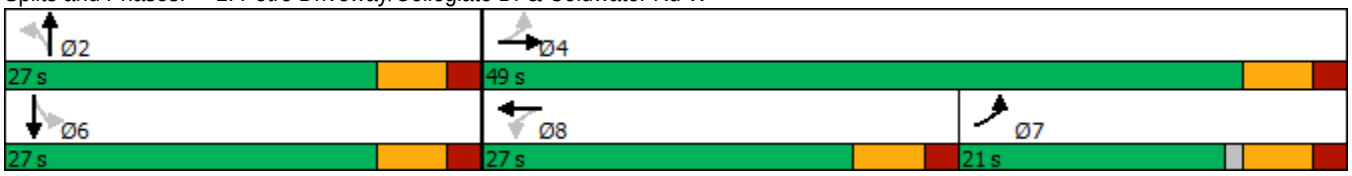
INTERVAL	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
SECONDS	15	0	0	0	0	0	4	2	3	3	2	3	3	13	8

NOTES:

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	246	290	4	222	22	6	31	9
Future Volume (vph)	246	290	4	222	22	6	31	9
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	15.0	35.0	20.0	20.0	15.0	15.0	19.0	19.0
Minimum Split (s)	21.0	49.0	27.0	27.0	27.0	27.0	27.0	27.0
Total Split (s)	21.0	49.0	27.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	27.6%	64.5%	35.5%	35.5%	35.5%	35.5%	35.5%	35.5%
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lag		Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	42.0	42.0	21.0	21.0		21.0	21.0	21.0
Actuated g/C Ratio	0.56	0.56	0.28	0.28		0.28	0.28	0.28
v/c Ratio	0.37	0.17	0.01	0.27		0.10	0.09	0.46
Control Delay	11.8	7.9	19.8	20.9		19.2	20.9	6.2
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	11.8	7.9	19.8	20.9		19.2	20.9	6.2
LOS	B	A	B	C		B	C	A
Approach Delay		9.6		20.9		19.3		7.8
Approach LOS		A		C		B		A

Intersection Summary	
Cycle Length: 76	
Actuated Cycle Length: 75	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 11.9	Intersection LOS: B
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

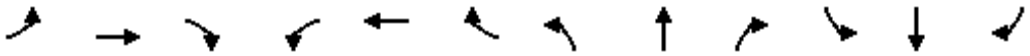


APPENDIX E

Synchro Analysis Reports

Intersection Capacity Analysis Output

- Existing Traffic Conditions 2022
- Future Background Conditions 2027
- Future Background Conditions 2032
- Future Total Conditions 2027
- Future Total Conditions 2032



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	246	290	18	4	222	19	22	6	4	31	9	248
Future Volume (veh/h)	246	290	18	4	222	19	22	6	4	31	9	248
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1870	1870	1856	1826	1767	1870	1870	1811	1574	1781
Adj Flow Rate, veh/h	267	315	20	4	241	21	24	7	4	34	10	270
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
Percent Heavy Veh, %	6	2	2	2	3	5	9	2	2	6	22	8
Cap, veh/h	652	1900	120	342	920	80	158	42	15	456	13	362
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1725	3394	214	1045	3283	284	275	151	55	1359	48	1293
Grp Volume(v), veh/h	267	164	171	4	128	134	35	0	0	34	0	280
Grp Sat Flow(s),veh/h/ln	1725	1777	1832	1045	1763	1804	481	0	0	1359	0	1341
Q Serve(g_s), s	0.0	3.4	3.4	0.2	4.2	4.3	0.6	0.0	0.0	0.0	0.0	14.2
Cycle Q Clear(g_c), s	0.0	3.4	3.4	3.6	4.2	4.3	14.8	0.0	0.0	1.5	0.0	14.2
Prop In Lane	1.00		0.12	1.00		0.16	0.69		0.11	1.00		0.96
Lane Grp Cap(c), veh/h	652	994	1025	342	494	506	216	0	0	456	0	376
V/C Ratio(X)	0.41	0.17	0.17	0.01	0.26	0.26	0.16	0.00	0.00	0.07	0.00	0.75
Avail Cap(c_a), veh/h	653	1020	1051	342	494	506	216	0	0	456	0	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.2	8.0	8.0	22.0	20.9	21.0	22.3	0.0	0.0	20.0	0.0	24.5
Incr Delay (d2), s/veh	0.4	0.1	0.1	0.1	1.3	1.3	1.6	0.0	0.0	0.3	0.0	12.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.0	0.7	0.7	0.3	0.0	0.0	0.2	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	8.1	8.1	22.1	22.2	22.2	23.9	0.0	0.0	20.3	0.0	37.1
LnGrp LOS	B	A	A	C	C	C	C	A	A	C	A	D
Approach Vol, veh/h		602			266			35			314	
Approach Delay, s/veh		12.7			22.2			23.9			35.3	
Approach LOS		B			C			C			D	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		47.9		27.0	20.9	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		16.8		5.4		16.2	2.0	6.3				
Green Ext Time (p_c), s		0.0		2.5		0.9	0.9	1.4				

Intersection Summary												
HCM 6th Ctrl Delay			21.0									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	41.4	41.8	7.4	0.8	25.3	18.9	12.8	13.4	35.5
Average Queue (m)	27.6	26.2	2.8	0.2	15.8	10.5	5.4	6.7	20.0
95th Queue (m)	47.6	56.6	11.6	2.1	29.4	24.7	15.7	16.4	37.0
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)		0							
Queuing Penalty (veh)		0							
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	0	0							0
Queuing Penalty (veh)	0	0							0

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	382	0	0	245	0	0
Future Vol, veh/h	382	0	0	245	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	3	2	2
Mvmt Flow	415	0	0	266	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	415	0	681	415
Stage 1	-	-	-	-	415	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1144	-	416	637
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	779	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1144	-	416	637
Mov Cap-2 Maneuver	-	-	-	-	515	-
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	779	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1144	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

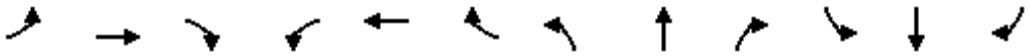
Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	382	9	1	255	1	17
Future Vol, veh/h	382	9	1	255	1	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	12
Mvmt Flow	415	10	1	277	1	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	425	0	699	420
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	279	-
Critical Hdwy	-	-	4.12	-	6.42	6.32
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.408
Pot Cap-1 Maneuver	-	-	1134	-	406	612
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1134	-	406	612
Mov Cap-2 Maneuver	-	-	-	-	508	-
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	767	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	605	-	-	1134	-
HCM Lane V/C Ratio	0.032	-	-	0.001	-
HCM Control Delay (s)	11.1	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	213	475	39	6	559	36	24	4	20	14	6	206
Future Volume (veh/h)	213	475	39	6	559	36	24	4	20	14	6	206
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1856	1870	1870	1870	1870	1870	1826	1870	1870	1870
Adj Flow Rate, veh/h	232	516	42	7	608	39	26	4	22	15	7	224
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
Percent Heavy Veh, %	2	2	3	2	2	2	2	2	5	2	2	2
Cap, veh/h	526	1862	151	266	951	61	179	43	110	451	14	433
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1781	3328	270	851	3391	217	380	154	391	1385	48	1544
Grp Volume(v), veh/h	232	275	283	7	318	329	52	0	0	15	0	231
Grp Sat Flow(s),veh/h/ln	1781	1777	1822	851	1777	1831	925	0	0	1385	0	1592
Q Serve(g_s), s	0.7	6.0	6.1	0.5	11.8	11.8	0.3	0.0	0.0	0.0	0.0	9.1
Cycle Q Clear(g_c), s	0.7	6.0	6.1	6.6	11.8	11.8	9.4	0.0	0.0	0.7	0.0	9.1
Prop In Lane	1.00		0.15	1.00		0.12	0.50		0.42	1.00		0.97
Lane Grp Cap(c), veh/h	526	994	1019	266	498	514	332	0	0	451	0	447
V/C Ratio(X)	0.44	0.28	0.28	0.03	0.64	0.64	0.16	0.00	0.00	0.03	0.00	0.52
Avail Cap(c_a), veh/h	528	1020	1046	266	498	514	332	0	0	451	0	447
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.9	8.6	8.6	24.2	23.6	23.6	20.3	0.0	0.0	19.6	0.0	22.7
Incr Delay (d2), s/veh	0.6	0.1	0.1	0.2	6.2	6.0	1.0	0.0	0.0	0.1	0.0	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	0.1	2.3	2.3	0.3	0.0	0.0	0.1	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	8.8	8.8	24.4	29.8	29.6	21.3	0.0	0.0	19.8	0.0	26.9
LnGrp LOS	C	A	A	C	C	C	C	A	A	B	A	C
Approach Vol, veh/h		790			654			52			246	
Approach Delay, s/veh		13.1			29.6			21.3			26.5	
Approach LOS		B			C			C			C	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		47.9		27.0	20.9	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		11.4		8.1		11.1	2.7	13.8				
Green Ext Time (p_c), s		0.1		4.4		1.2	0.7	2.6				

Intersection Summary												
HCM 6th Ctrl Delay			21.4									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	41.9	50.6	27.2	4.5	48.3	47.9	12.8	9.6	27.7
Average Queue (m)	27.9	35.7	8.7	1.5	31.3	29.5	6.9	3.0	18.3
95th Queue (m)	48.0	55.4	31.6	6.8	52.4	53.6	17.0	10.1	31.1
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	0	0			0				
Queuing Penalty (veh)	0	0			0				

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	509	0	0	601	0	0
Future Vol, veh/h	509	0	0	601	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	553	0	0	653	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	553	0	1206	553
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	653	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1017	-	203	533
Stage 1	-	-	-	-	576	-
Stage 2	-	-	-	-	518	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1017	-	203	533
Mov Cap-2 Maneuver	-	-	-	-	341	-
Stage 1	-	-	-	-	576	-
Stage 2	-	-	-	-	518	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1017	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

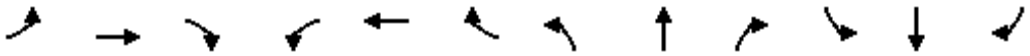
Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	507	13	3	585	8	14
Future Vol, veh/h	507	13	3	585	8	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	551	14	3	636	9	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	565	0	1200	558
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	642	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1007	-	204	529
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	524	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1007	-	203	529
Mov Cap-2 Maneuver	-	-	-	-	341	-
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	521	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	441	-	-	1007	-
HCM Lane V/C Ratio	0.054	-	-	0.003	-
HCM Control Delay (s)	13.6	-	-	8.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	316	20	5	242	21	24	7	5	34	10	305
Future Volume (veh/h)	268	316	20	5	242	21	24	7	5	34	10	305
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1870	1870	1856	1826	1767	1870	1870	1811	1574	1781
Adj Flow Rate, veh/h	291	343	22	5	263	23	26	8	5	37	11	332
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
Percent Heavy Veh, %	6	2	2	2	3	5	9	2	2	6	22	8
Cap, veh/h	642	1899	121	330	919	80	106	29	8	438	12	363
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1725	3392	217	1017	3282	285	93	105	29	1357	43	1297
Grp Volume(v), veh/h	291	179	186	5	140	146	39	0	0	37	0	343
Grp Sat Flow(s),veh/h/ln	1725	1777	1831	1017	1763	1804	227	0	0	1357	0	1340
Q Serve(g_s), s	0.0	3.7	3.7	0.3	4.7	4.7	0.9	0.0	0.0	0.0	0.0	18.6
Cycle Q Clear(g_c), s	0.0	3.7	3.7	4.0	4.7	4.7	19.4	0.0	0.0	1.7	0.0	18.6
Prop In Lane	1.00		0.12	1.00		0.16	0.67		0.13	1.00		0.97
Lane Grp Cap(c), veh/h	642	995	1025	330	494	505	144	0	0	438	0	375
V/C Ratio(X)	0.45	0.18	0.18	0.02	0.28	0.29	0.27	0.00	0.00	0.08	0.00	0.91
Avail Cap(c_a), veh/h	643	1019	1050	330	494	505	144	0	0	438	0	375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	8.1	8.1	22.3	21.1	21.1	23.9	0.0	0.0	20.0	0.0	26.1
Incr Delay (d2), s/veh	0.5	0.1	0.1	0.1	1.4	1.4	4.6	0.0	0.0	0.4	0.0	29.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.0	0.8	0.8	0.4	0.0	0.0	0.2	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.6	8.2	8.2	22.4	22.5	22.6	28.6	0.0	0.0	20.4	0.0	55.1
LnGrp LOS	B	A	A	C	C	C	C	A	A	C	A	E
Approach Vol, veh/h		656			291			39			380	
Approach Delay, s/veh		13.2			22.6			28.6			51.7	
Approach LOS		B			C			C			D	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0	21.0	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		21.4		5.7		20.6	2.0	6.7				
Green Ext Time (p_c), s		0.0		2.7		0.1	1.0	1.6				

Intersection Summary												
HCM 6th Ctrl Delay			26.4									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	38.7	40.1	11.7	1.8	25.3	24.0	9.6	14.7	41.7
Average Queue (m)	27.2	24.5	2.8	0.5	16.9	13.5	4.4	5.5	25.8
95th Queue (m)	44.4	43.2	15.6	3.5	29.3	28.8	12.4	16.4	46.0
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)		0							0
Queuing Penalty (veh)		0							0

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	416	0	0	267	0	0
Future Vol, veh/h	416	0	0	267	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	3	2	2
Mvmt Flow	452	0	0	290	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	452	0	742	452
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	290	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1109	-	383	608
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	759	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1109	-	383	608
Mov Cap-2 Maneuver	-	-	-	-	489	-
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	759	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1109	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

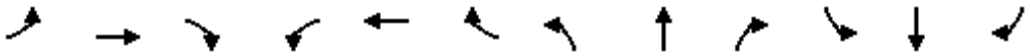
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	416	10	2	278	2	19
Future Vol, veh/h	416	10	2	278	2	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	12
Mvmt Flow	452	11	2	302	2	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	463	0	764	458
Stage 1	-	-	-	-	458	-
Stage 2	-	-	-	-	306	-
Critical Hdwy	-	-	4.12	-	6.42	6.32
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.408
Pot Cap-1 Maneuver	-	-	1098	-	372	583
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1098	-	371	583
Mov Cap-2 Maneuver	-	-	-	-	481	-
Stage 1	-	-	-	-	637	-
Stage 2	-	-	-	-	746	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	571	-	-	1098	-
HCM Lane V/C Ratio	0.04	-	-	0.002	-
HCM Control Delay (s)	11.6	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	232	517	43	7	609	40	27	5	22	16	7	225
Future Volume (veh/h)	232	517	43	7	609	40	27	5	22	16	7	225
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1856	1870	1870	1870	1870	1870	1826	1870	1870	1870
Adj Flow Rate, veh/h	252	562	47	8	662	43	29	5	24	17	8	245
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
Percent Heavy Veh, %	2	2	3	2	2	2	2	2	5	2	2	2
Cap, veh/h	509	1858	155	251	950	62	168	44	99	440	14	432
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1781	3320	277	812	3388	220	343	156	352	1381	50	1542
Grp Volume(v), veh/h	252	300	309	8	347	358	58	0	0	17	0	253
Grp Sat Flow(s),veh/h/ln	1781	1777	1820	812	1777	1831	852	0	0	1381	0	1593
Q Serve(g_s), s	2.3	6.7	6.7	0.6	13.1	13.1	0.4	0.0	0.0	0.0	0.0	10.2
Cycle Q Clear(g_c), s	2.3	6.7	6.7	7.3	13.1	13.1	10.6	0.0	0.0	0.9	0.0	10.2
Prop In Lane	1.00		0.15	1.00		0.12	0.50		0.41	1.00		0.97
Lane Grp Cap(c), veh/h	509	994	1019	251	498	513	311	0	0	440	0	446
V/C Ratio(X)	0.49	0.30	0.30	0.03	0.70	0.70	0.19	0.00	0.00	0.04	0.00	0.57
Avail Cap(c_a), veh/h	511	1020	1045	251	498	513	311	0	0	440	0	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.6	8.7	8.8	24.8	24.1	24.1	20.5	0.0	0.0	19.7	0.0	23.1
Incr Delay (d2), s/veh	0.7	0.2	0.2	0.2	7.8	7.7	1.3	0.0	0.0	0.2	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	0.1	2.7	2.7	0.4	0.0	0.0	0.1	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.3	8.9	8.9	25.0	32.0	31.8	21.9	0.0	0.0	19.9	0.0	28.2
LnGrp LOS	C	A	A	C	C	C	C	A	A	B	A	C
Approach Vol, veh/h		861			713			58			270	
Approach Delay, s/veh		13.4			31.8			21.9			27.7	
Approach LOS		B			C			C			C	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		47.9		27.0	20.9	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		12.6		8.7		12.2	4.3	15.1				
Green Ext Time (p_c), s		0.1		4.9		1.2	0.8	2.4				

Intersection Summary												
HCM 6th Ctrl Delay			22.6									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	48.4	55.7	32.6	12.2	45.6	45.0	14.2	6.1	27.6
Average Queue (m)	30.8	36.3	10.0	3.0	34.5	31.2	8.3	2.4	18.5
95th Queue (m)	52.6	63.6	39.1	17.7	50.7	48.1	17.0	9.3	30.3
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)							0		
Queuing Penalty (veh)							0		
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	0	1			0				
Queuing Penalty (veh)	0	2			0				

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	554	0	0	654	0	0
Future Vol, veh/h	554	0	0	654	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	602	0	0	711	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	602	0	1313	602
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	711	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	975	-	175	500
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	487	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	975	-	175	500
Mov Cap-2 Maneuver	-	-	-	-	315	-
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	487	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	975	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

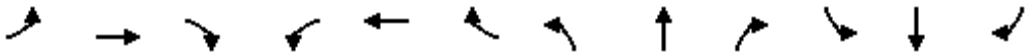
Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	552	15	4	637	9	16
Future Vol, veh/h	552	15	4	637	9	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	600	16	4	692	10	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	616	0	1308	608
Stage 1	-	-	-	-	608	-
Stage 2	-	-	-	-	700	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	964	-	176	496
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	493	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	964	-	175	496
Mov Cap-2 Maneuver	-	-	-	-	315	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	490	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	411	-	-	964	-
HCM Lane V/C Ratio	0.066	-	-	0.005	-
HCM Control Delay (s)	14.4	-	-	8.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	344	22	5	263	23	27	8	5	37	11	332
Future Volume (veh/h)	292	344	22	5	263	23	27	8	5	37	11	332
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1870	1870	1856	1826	1767	1870	1870	1811	1574	1781
Adj Flow Rate, veh/h	317	374	24	5	286	25	29	9	5	40	12	361
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
Percent Heavy Veh, %	6	2	2	2	3	5	9	2	2	6	22	8
Cap, veh/h	631	1899	121	318	919	80	82	21	3	439	12	363
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1725	3391	217	987	3282	285	7	77	11	1355	43	1297
Grp Volume(v), veh/h	317	195	203	5	153	158	43	0	0	40	0	373
Grp Sat Flow(s),veh/h/ln	1725	1777	1831	987	1763	1804	95	0	0	1355	0	1340
Q Serve(g_s), s	0.0	4.1	4.1	0.3	5.1	5.2	0.2	0.0	0.0	0.0	0.0	20.8
Cycle Q Clear(g_c), s	0.0	4.1	4.1	4.4	5.1	5.2	21.0	0.0	0.0	1.8	0.0	20.8
Prop In Lane	1.00		0.12	1.00		0.16	0.67		0.12	1.00		0.97
Lane Grp Cap(c), veh/h	631	995	1025	318	494	505	107	0	0	439	0	375
V/C Ratio(X)	0.50	0.20	0.20	0.02	0.31	0.31	0.40	0.00	0.00	0.09	0.00	0.99
Avail Cap(c_a), veh/h	632	1019	1050	318	494	505	107	0	0	439	0	375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	8.2	8.2	22.6	21.3	21.3	26.2	0.0	0.0	20.1	0.0	26.9
Incr Delay (d2), s/veh	0.6	0.1	0.1	0.1	1.6	1.6	10.9	0.0	0.0	0.4	0.0	44.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.0	0.8	0.9	0.5	0.0	0.0	0.2	0.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	8.3	8.3	22.7	22.9	22.9	37.1	0.0	0.0	20.5	0.0	71.8
LnGrp LOS	C	A	A	C	C	C	D	A	A	C	A	E
Approach Vol, veh/h		715			316			43			413	
Approach Delay, s/veh		13.7			22.9			37.1			66.8	
Approach LOS		B			C			D			E	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0	21.0	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		23.0		6.1		22.8	2.0	7.2				
Green Ext Time (p_c), s		0.0		3.0		0.0	1.2	1.7				

Intersection Summary												
HCM 6th Ctrl Delay			31.1									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	52.8	46.0	26.0	0.9	25.9	23.9	12.1	14.0	39.5
Average Queue (m)	34.1	26.9	7.9	0.2	17.8	14.5	5.7	6.9	27.7
95th Queue (m)	58.7	51.3	33.0	2.2	28.8	28.5	15.9	16.9	44.2
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	1	0							0
Queuing Penalty (veh)	2	1							0

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	453	0	0	290	0	0
Future Vol, veh/h	453	0	0	290	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	3	2	2
Mvmt Flow	492	0	0	315	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	492	0	807	492
Stage 1	-	-	-	-	492	-
Stage 2	-	-	-	-	315	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1071	-	351	577
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	740	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1071	-	351	577
Mov Cap-2 Maneuver	-	-	-	-	464	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	740	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1071	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

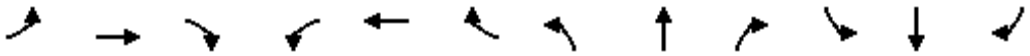
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	453	11	2	302	2	21
Future Vol, veh/h	453	11	2	302	2	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	12
Mvmt Flow	492	12	2	328	2	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	504	0	830	498
Stage 1	-	-	-	-	498	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	-	-	4.12	-	6.42	6.32
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.408
Pot Cap-1 Maneuver	-	-	1061	-	340	553
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	727	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1061	-	339	553
Mov Cap-2 Maneuver	-	-	-	-	455	-
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	726	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	543	-	-	1061	-
HCM Lane V/C Ratio	0.046	-	-	0.002	-
HCM Control Delay (s)	12	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	563	47	8	662	43	29	5	24	17	8	244
Future Volume (veh/h)	253	563	47	8	662	43	29	5	24	17	8	244
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1856	1870	1870	1870	1870	1870	1826	1870	1870	1870
Adj Flow Rate, veh/h	275	612	51	9	720	47	32	5	26	18	9	265
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
Percent Heavy Veh, %	2	2	3	2	2	2	2	2	5	2	2	2
Cap, veh/h	493	1859	155	235	949	62	159	40	89	431	15	432
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1781	3321	276	772	3386	221	311	143	319	1378	52	1541
Grp Volume(v), veh/h	275	327	336	9	378	389	63	0	0	18	0	274
Grp Sat Flow(s),veh/h/ln	1781	1777	1821	772	1777	1831	772	0	0	1378	0	1593
Q Serve(g_s), s	4.1	7.4	7.5	0.7	14.6	14.6	0.6	0.0	0.0	0.0	0.0	11.2
Cycle Q Clear(g_c), s	4.1	7.4	7.5	8.2	14.6	14.6	11.8	0.0	0.0	0.9	0.0	11.2
Prop In Lane	1.00		0.15	1.00		0.12	0.51		0.41	1.00		0.97
Lane Grp Cap(c), veh/h	493	995	1019	235	498	513	289	0	0	431	0	446
V/C Ratio(X)	0.56	0.33	0.33	0.04	0.76	0.76	0.22	0.00	0.00	0.04	0.00	0.61
Avail Cap(c_a), veh/h	494	1019	1045	235	498	513	289	0	0	431	0	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.3	8.9	8.9	25.5	24.7	24.7	21.1	0.0	0.0	19.8	0.0	23.5
Incr Delay (d2), s/veh	1.4	0.2	0.2	0.3	10.4	10.1	1.7	0.0	0.0	0.2	0.0	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.1	0.1	0.1	3.2	3.3	0.4	0.0	0.0	0.1	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	9.1	9.1	25.8	35.0	34.8	22.8	0.0	0.0	19.9	0.0	29.6
LnGrp LOS	C	A	A	C	D	C	C	A	A	B	A	C
Approach Vol, veh/h		938			776			63			292	
Approach Delay, s/veh		14.0			34.8			22.8			29.0	
Approach LOS		B			C			C			C	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0	21.0	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		13.8		9.5		13.2	6.1	16.6				
Green Ext Time (p_c), s		0.1		5.4		1.2	0.8	2.1				

Intersection Summary												
HCM 6th Ctrl Delay			24.2									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	48.8	63.5	49.3	9.5	50.6	47.6	16.9	8.4	32.4
Average Queue (m)	33.2	42.0	17.9	3.9	38.5	36.3	8.9	3.0	20.8
95th Queue (m)	57.4	75.5	52.9	10.6	55.2	53.2	19.5	10.0	34.6
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)		0							
Queuing Penalty (veh)		0							
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	0	1			1				0
Queuing Penalty (veh)	1	3			0				0

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	603	0	0	712	0	0
Future Vol, veh/h	603	0	0	712	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	655	0	0	774	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	655	0	1429	655
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	774	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	932	-	149	466
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	455	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	932	-	149	466
Mov Cap-2 Maneuver	-	-	-	-	289	-
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	455	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	932	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

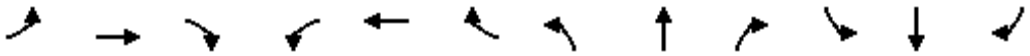
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	601	15	4	693	10	17
Future Vol, veh/h	601	15	4	693	10	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	653	16	4	753	11	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	669	0	1422	661
Stage 1	-	-	-	-	661	-
Stage 2	-	-	-	-	761	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	921	-	150	462
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	461	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	921	-	149	462
Mov Cap-2 Maneuver	-	-	-	-	289	-
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	458	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	378	-	-	921	-
HCM Lane V/C Ratio	0.078	-	-	0.005	-
HCM Control Delay (s)	15.3	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	268	326	20	5	263	23	24	7	6	40	10	305
Future Volume (veh/h)	268	326	20	5	263	23	24	7	6	40	10	305
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1870	1870	1856	1826	1767	1870	1870	1811	1574	1781
Adj Flow Rate, veh/h	291	354	22	5	286	25	26	8	7	43	11	332
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
Percent Heavy Veh, %	6	2	2	2	3	5	9	2	2	6	22	8
Cap, veh/h	631	1903	118	326	919	80	104	31	12	424	12	363
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1725	3399	210	1007	3282	285	90	110	41	1354	43	1297
Grp Volume(v), veh/h	291	184	192	5	153	158	41	0	0	43	0	343
Grp Sat Flow(s),veh/h/ln	1725	1777	1832	1007	1763	1804	241	0	0	1354	0	1340
Q Serve(g_s), s	0.0	3.8	3.9	0.3	5.1	5.2	0.7	0.0	0.0	0.0	0.0	18.6
Cycle Q Clear(g_c), s	0.0	3.8	3.9	4.1	5.1	5.2	19.3	0.0	0.0	2.1	0.0	18.6
Prop In Lane	1.00		0.11	1.00		0.16	0.63		0.17	1.00		0.97
Lane Grp Cap(c), veh/h	631	995	1026	326	494	505	146	0	0	424	0	375
V/C Ratio(X)	0.46	0.19	0.19	0.02	0.31	0.31	0.28	0.00	0.00	0.10	0.00	0.91
Avail Cap(c_a), veh/h	632	1019	1051	326	494	505	146	0	0	424	0	375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.5	8.1	8.1	22.4	21.3	21.3	22.9	0.0	0.0	20.2	0.0	26.1
Incr Delay (d2), s/veh	0.5	0.1	0.1	0.1	1.6	1.6	4.7	0.0	0.0	0.5	0.0	29.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.0	0.8	0.9	0.4	0.0	0.0	0.3	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	8.2	8.2	22.5	22.9	22.9	27.7	0.0	0.0	20.7	0.0	55.1
LnGrp LOS	C	A	A	C	C	C	C	A	A	C	A	E
Approach Vol, veh/h		667			316			41			386	
Approach Delay, s/veh		13.4			22.9			27.7			51.3	
Approach LOS		B			C			C			D	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0	21.0	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		21.3		5.9		20.6	2.0	7.2				
Green Ext Time (p_c), s		0.0		2.8		0.1	1.0	1.7				

Intersection Summary												
HCM 6th Ctrl Delay			26.3									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	49.0	43.6	14.4	4.2	22.2	19.0	10.2	16.4	36.3
Average Queue (m)	31.1	24.7	4.5	0.8	13.4	11.0	4.8	8.5	23.0
95th Queue (m)	58.4	50.8	18.4	5.0	25.0	21.7	13.0	20.0	40.3
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	1								0
Queuing Penalty (veh)	2								0

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	416	17	5	267	23	37
Future Vol, veh/h	416	17	5	267	23	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	3	2	2
Mvmt Flow	452	18	5	290	25	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	470	0	761	461
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	300	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1092	-	373	600
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	752	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1092	-	371	600
Mov Cap-2 Maneuver	-	-	-	-	480	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	748	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	548	-	-	1092	-
HCM Lane V/C Ratio	0.119	-	-	0.005	-
HCM Control Delay (s)	12.5	-	-	8.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

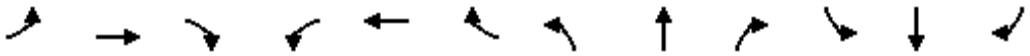
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	452	11	2	283	2	19
Future Vol, veh/h	452	11	2	283	2	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	12
Mvmt Flow	491	12	2	308	2	21

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	503	0	809	497
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.12	-	6.42	6.32
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.408
Pot Cap-1 Maneuver	-	-	1061	-	350	553
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	742	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1061	-	349	553
Mov Cap-2 Maneuver	-	-	-	-	462	-
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	741	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	543	-	-	1061	-
HCM Lane V/C Ratio	0.042	-	-	0.002	-
HCM Control Delay (s)	11.9	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	232	544	43	7	629	41	27	5	24	24	7	225
Future Volume (veh/h)	232	544	43	7	629	41	27	5	24	24	7	225
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1856	1870	1870	1870	1870	1870	1826	1870	1870	1870
Adj Flow Rate, veh/h	252	591	47	8	684	45	29	5	26	26	8	245
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
Percent Heavy Veh, %	2	2	3	2	2	2	2	2	5	2	2	2
Cap, veh/h	503	1866	148	243	949	62	165	44	105	437	14	432
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1781	3335	265	790	3385	223	333	157	375	1378	50	1542
Grp Volume(v), veh/h	252	314	324	8	359	370	60	0	0	26	0	253
Grp Sat Flow(s),veh/h/ln	1781	1777	1823	790	1777	1830	866	0	0	1378	0	1593
Q Serve(g_s), s	2.6	7.1	7.1	0.6	13.6	13.7	0.4	0.0	0.0	0.0	0.0	10.2
Cycle Q Clear(g_c), s	2.6	7.1	7.1	7.7	13.6	13.7	10.6	0.0	0.0	1.4	0.0	10.2
Prop In Lane	1.00		0.15	1.00		0.12	0.48		0.43	1.00		0.97
Lane Grp Cap(c), veh/h	503	994	1020	243	498	513	314	0	0	437	0	446
V/C Ratio(X)	0.50	0.32	0.32	0.03	0.72	0.72	0.19	0.00	0.00	0.06	0.00	0.57
Avail Cap(c_a), veh/h	504	1020	1046	243	498	513	314	0	0	437	0	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.8	8.8	8.8	25.1	24.3	24.3	20.6	0.0	0.0	19.9	0.0	23.1
Incr Delay (d2), s/veh	0.8	0.2	0.2	0.3	8.7	8.5	1.3	0.0	0.0	0.3	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.1	0.1	2.9	2.9	0.4	0.0	0.0	0.1	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.5	9.0	9.0	25.4	33.0	32.8	21.9	0.0	0.0	20.2	0.0	28.2
LnGrp LOS	C	A	A	C	C	C	C	A	A	C	A	C
Approach Vol, veh/h		890			737			60			279	
Approach Delay, s/veh		13.4			32.8			21.9			27.5	
Approach LOS		B			C			C			C	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		47.9		27.0	20.9	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		12.6		9.1		12.2	4.6	15.7				
Green Ext Time (p_c), s		0.2		5.1		1.2	0.8	2.3				

Intersection Summary												
HCM 6th Ctrl Delay			22.9									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	49.4	57.9	30.4	7.1	52.5	52.0	14.7	11.6	28.1
Average Queue (m)	29.7	38.8	9.6	1.7	37.5	37.1	8.1	5.0	18.2
95th Queue (m)	52.3	63.7	32.6	7.2	56.9	58.0	18.3	13.8	30.5
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)							0		
Queuing Penalty (veh)							0		
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	1	0			1				
Queuing Penalty (veh)	2	1			0				

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	554	37	23	654	21	18
Future Vol, veh/h	554	37	23	654	21	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	602	40	25	711	23	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	642	0	1383	622
Stage 1	-	-	-	-	622	-
Stage 2	-	-	-	-	761	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	943	-	158	487
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	461	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	943	-	154	487
Mov Cap-2 Maneuver	-	-	-	-	292	-
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	449	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	358	-	-	943	-
HCM Lane V/C Ratio	0.118	-	-	0.027	-
HCM Control Delay (s)	16.4	-	-	8.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

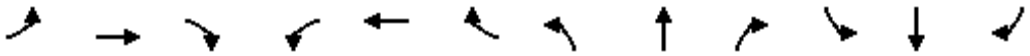
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	570	15	4	659	10	16
Future Vol, veh/h	570	15	4	659	10	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	620	16	4	716	11	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	636	0	1352	628
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	724	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	947	-	165	483
Stage 1	-	-	-	-	532	-
Stage 2	-	-	-	-	480	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	947	-	164	483
Mov Cap-2 Maneuver	-	-	-	-	304	-
Stage 1	-	-	-	-	532	-
Stage 2	-	-	-	-	477	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	394	-	-	947	-
HCM Lane V/C Ratio	0.072	-	-	0.005	-
HCM Control Delay (s)	14.8	-	-	8.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	354	22	5	284	25	27	8	6	43	11	332
Future Volume (veh/h)	292	354	22	5	284	25	27	8	6	43	11	332
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1870	1870	1856	1826	1767	1870	1870	1811	1574	1781
Adj Flow Rate, veh/h	317	385	24	5	309	27	29	9	7	47	12	361
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
Percent Heavy Veh, %	6	2	2	2	3	5	9	2	2	6	22	8
Cap, veh/h	621	1903	118	314	919	80	81	23	5	424	12	363
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1725	3398	211	977	3282	285	7	83	17	1353	43	1297
Grp Volume(v), veh/h	317	201	208	5	165	171	45	0	0	47	0	373
Grp Sat Flow(s),veh/h/ln	1725	1777	1832	977	1763	1804	106	0	0	1353	0	1340
Q Serve(g_s), s	0.0	4.2	4.2	0.3	5.6	5.6	0.2	0.0	0.0	0.0	0.0	20.8
Cycle Q Clear(g_c), s	0.0	4.2	4.2	4.5	5.6	5.6	21.0	0.0	0.0	2.3	0.0	20.8
Prop In Lane	1.00		0.12	1.00		0.16	0.64		0.16	1.00		0.97
Lane Grp Cap(c), veh/h	621	995	1026	314	494	505	109	0	0	424	0	375
V/C Ratio(X)	0.51	0.20	0.20	0.02	0.33	0.34	0.41	0.00	0.00	0.11	0.00	0.99
Avail Cap(c_a), veh/h	621	1019	1051	314	494	505	109	0	0	424	0	375
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.2	8.2	8.2	22.7	21.4	21.5	25.3	0.0	0.0	20.2	0.0	26.9
Incr Delay (d2), s/veh	0.7	0.1	0.1	0.1	1.8	1.8	11.2	0.0	0.0	0.5	0.0	44.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.0	0.9	1.0	0.5	0.0	0.0	0.3	0.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	8.3	8.3	22.8	23.3	23.3	36.5	0.0	0.0	20.8	0.0	71.8
LnGrp LOS	C	A	A	C	C	C	D	A	A	C	A	E
Approach Vol, veh/h		726			341			45			420	
Approach Delay, s/veh		13.8			23.3			36.5			66.1	
Approach LOS		B			C			D			E	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0	21.0	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		23.0		6.2		22.8	2.0	7.6				
Green Ext Time (p_c), s		0.0		3.1		0.0	1.2	1.8				

Intersection Summary												
HCM 6th Ctrl Delay			30.9									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	47.3	39.6	6.8	3.5	28.3	27.0	12.1	19.8	40.6
Average Queue (m)	30.7	22.6	1.8	0.9	18.9	15.4	6.9	8.2	27.7
95th Queue (m)	54.4	45.9	7.7	5.1	32.6	28.9	15.6	21.1	45.2
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	1								0
Queuing Penalty (veh)	1								0

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	453	17	5	290	23	37
Future Vol, veh/h	453	17	5	290	23	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	2	2	3	2	2
Mvmt Flow	492	18	5	315	25	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	510	0	826	501
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	325	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1055	-	342	570
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	732	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1055	-	340	570
Mov Cap-2 Maneuver	-	-	-	-	455	-
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	728	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	520	-	-	1055	-
HCM Lane V/C Ratio	0.125	-	-	0.005	-
HCM Control Delay (s)	12.9	-	-	8.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

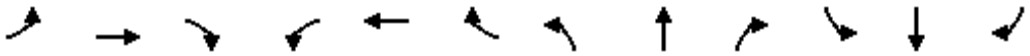
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	489	12	2	307	2	21
Future Vol, veh/h	489	12	2	307	2	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	12
Mvmt Flow	532	13	2	334	2	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	545	0	877	539
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	338	-
Critical Hdwy	-	-	4.12	-	6.42	6.32
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.408
Pot Cap-1 Maneuver	-	-	1024	-	319	524
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	722	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1024	-	318	524
Mov Cap-2 Maneuver	-	-	-	-	437	-
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	721	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	515	-	-	1024	-
HCM Lane V/C Ratio	0.049	-	-	0.002	-
HCM Control Delay (s)	12.3	-	-	8.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	590	47	8	682	44	29	5	26	25	8	244
Future Volume (veh/h)	253	590	47	8	682	44	29	5	26	25	8	244
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1856	1870	1870	1870	1870	1870	1826	1870	1870	1870
Adj Flow Rate, veh/h	275	641	51	9	741	48	32	5	28	27	9	265
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
Percent Heavy Veh, %	2	2	3	2	2	2	2	2	5	2	2	2
Cap, veh/h	487	1866	148	228	949	61	156	40	95	428	15	432
Arrive On Green	0.20	0.56	0.56	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1781	3334	265	752	3388	219	303	144	338	1376	52	1541
Grp Volume(v), veh/h	275	341	351	9	388	401	65	0	0	27	0	274
Grp Sat Flow(s),veh/h/ln	1781	1777	1823	752	1777	1831	785	0	0	1376	0	1593
Q Serve(g_s), s	4.4	7.8	7.9	0.7	15.1	15.1	0.5	0.0	0.0	0.0	0.0	11.2
Cycle Q Clear(g_c), s	4.4	7.8	7.9	8.6	15.1	15.1	11.7	0.0	0.0	1.4	0.0	11.2
Prop In Lane	1.00		0.15	1.00		0.12	0.49		0.43	1.00		0.97
Lane Grp Cap(c), veh/h	487	995	1020	228	498	513	292	0	0	428	0	446
V/C Ratio(X)	0.56	0.34	0.34	0.04	0.78	0.78	0.22	0.00	0.00	0.06	0.00	0.61
Avail Cap(c_a), veh/h	488	1019	1046	228	498	513	292	0	0	428	0	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.5	9.0	9.0	25.8	24.9	24.9	20.9	0.0	0.0	19.9	0.0	23.5
Incr Delay (d2), s/veh	1.5	0.2	0.2	0.3	11.5	11.2	1.8	0.0	0.0	0.3	0.0	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.1	0.1	0.1	3.4	3.5	0.4	0.0	0.0	0.2	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.0	9.2	9.2	26.1	36.4	36.1	22.6	0.0	0.0	20.2	0.0	29.6
LnGrp LOS	C	A	A	C	D	D	C	A	A	C	A	C
Approach Vol, veh/h		967			798			65			301	
Approach Delay, s/veh		14.0			36.1			22.6			28.8	
Approach LOS		B			D			C			C	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0		48.0		27.0	21.0	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		21.0		43.0		21.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		13.7		9.9		13.2	6.4	17.1				
Green Ext Time (p_c), s		0.2		5.7		1.3	0.8	1.9				

Intersection Summary												
HCM 6th Ctrl Delay			24.6									
HCM 6th LOS			C									

Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	47.6	56.8	25.1	5.8	57.6	56.7	16.6	13.0	24.3
Average Queue (m)	31.1	37.6	9.1	1.8	41.0	40.6	8.6	6.6	16.5
95th Queue (m)	51.9	63.5	30.3	7.9	65.9	66.5	19.8	16.7	28.4
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)							0		
Queuing Penalty (veh)							0		
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	0	0			3				
Queuing Penalty (veh)	0	1			0				

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	603	37	23	712	21	18
Future Vol, veh/h	603	37	23	712	21	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	30	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	655	40	25	774	23	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	695	0	1499	675
Stage 1	-	-	-	-	675	-
Stage 2	-	-	-	-	824	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	901	-	135	454
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	431	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	901	-	131	454
Mov Cap-2 Maneuver	-	-	-	-	268	-
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	419	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	330	-	-	901	-
HCM Lane V/C Ratio	0.128	-	-	0.028	-
HCM Control Delay (s)	17.5	-	-	9.1	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	619	16	4	715	11	17
Future Vol, veh/h	619	16	4	715	11	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	673	17	4	777	12	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	690	0	1467	682
Stage 1	-	-	-	-	682	-
Stage 2	-	-	-	-	785	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	905	-	141	450
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	449	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	905	-	140	450
Mov Cap-2 Maneuver	-	-	-	-	279	-
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	445	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	363	-	-	905	-
HCM Lane V/C Ratio	0.084	-	-	0.005	-
HCM Control Delay (s)	15.8	-	-	9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

APPENDIX F
MCR Land Needs Assessment Excerpts

4. SUMMARY OF LAND NEED

Based on the Land Needs Assessment set out above the City of Orillia requires additional land to accommodate long-term population and employment growth to 2051 established by Schedule 3 to the Growth Plan.

The Community Area Land Needs Assessment demonstrates that the City requires an additional 120 hectares of developable land as designated greenfield area in order to meeting the needs associated with housing growth to 2051. This land need will enable the City to provide a market-based supply of housing while achieving Growth Plan housing policies.

The Employment Area Land Needs Assessment demonstrates that the City requires an additional 56.5 hectares of developable land in order to meet the long-term needs of Schedule 3 employment growth to 2051.

A. COMMUNITY AREA LAND NEEDS FOR ANNEXATION PURPOSES

The Schedule 3 forecasts are minimums and the City is permitted to establish higher forecasts through its MCR. Given the likely need for the City to annex land the Community Area and Employment Area Land Needs Assessment also analyzes long-term land needs under a “high growth” scenario. This scenario represents much higher growth than anticipated by Schedule 3. However, given the potentially lengthy and complex process required to annex land, the City should understand the long-term growth associated with new lands that could exceed the land requirements to accommodate the Schedule 3 forecasts.

The high growth scenario is predicated on the City requiring 257 hectares of additional developable land in the DGA, slightly more than double the land needed to meet housing needs under Schedule 3 population growth. The population growth required to accommodate such a land need is shown in Table 22. The annual growth rate under the high growth scenario is 1.7% and results in approximately 9,300 more people in the City by 2051 than under the Schedule 3 forecast (see Table 1).

Table 22

High Growth Scenario Population Growth			
Year	Total Population	Growth	
		Net Change	Annual Growth Rate
1986	24,890		
1991	26,800	1,910	1.5%
1996	28,780	1,980	1.4%
2001	30,140	1,360	0.9%
2006	31,310	1,170	0.8%
2011	31,390	80	0.1%
2016	32,010	620	0.4%
2021	35,090	3,080	1.9%
2026	40,748	5,658	3.0%
2031	44,321	3,574	1.7%
2036	47,913	3,591	1.6%
2041	51,648	3,735	1.5%
2046	54,814	3,166	1.2%
2051	58,749	3,935	1.4%
1991-2021		**8,290**	**0.9%**
2021-2051		**23,659**	**1.7%**

Source: Hemson Consulting

Table 23 compares the adequacy of the housing supply in each policy area to meet the housing demand by type required to achieve the 257 hectare additional land need. The housing mix has been adjusted for the built-up area (from Table 13) to account for the higher demand.

Within the built-up area, the identified supply is insufficient to satisfy the anticipated demand for rowhouses and apartments. However, the potential for intensification on sites that are currently occupied and may be redeveloped over the next 30 years may offset the supply shortfall.

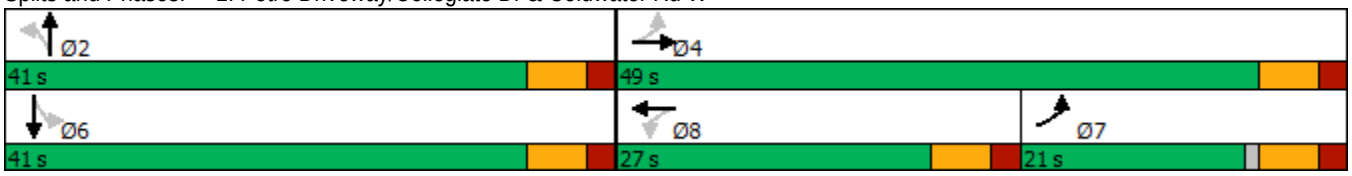
The DGA exhibits a shortfall of supply equivalent to 2,616 single/semi-detached units and 728 rowhouse units.

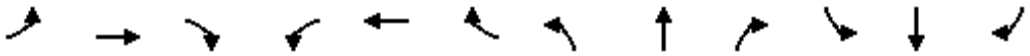
APPENDIX G
Signal Optimization for FT2032 Synchro Reports

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	292	354	5	284	27	8	43	11
Future Volume (vph)	292	354	5	284	27	8	43	11
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	15.0	35.0	20.0	20.0	30.0	30.0	30.0	30.0
Minimum Split (s)	21.0	49.0	27.0	27.0	41.0	41.0	41.0	41.0
Total Split (s)	21.0	49.0	27.0	27.0	41.0	41.0	41.0	41.0
Total Split (%)	23.3%	54.4%	30.0%	30.0%	45.6%	45.6%	45.6%	45.6%
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	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lead/Lag	Lag		Lead	Lead				
Lead-Lag Optimize?								
Recall Mode	None	None	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	42.0	42.0	21.0	21.0		35.0	35.0	35.0
Actuated g/C Ratio	0.47	0.47	0.24	0.24		0.39	0.39	0.39
v/c Ratio	0.56	0.25	0.02	0.41		0.09	0.09	0.46
Control Delay	23.8	14.2	26.6	29.7		15.6	17.7	4.5
Queue Delay	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	23.8	14.2	26.6	29.7		15.6	17.7	4.5
LOS	C	B	C	C		B	B	A
Approach Delay		18.4		29.7		15.6		5.9
Approach LOS		B		C		B		A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 89	
Natural Cycle: 90	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 17.4	Intersection LOS: B
Intersection Capacity Utilization 86.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	292	354	22	5	284	25	27	8	6	43	11	332
Future Volume (veh/h)	292	354	22	5	284	25	27	8	6	43	11	332
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1870	1870	1870	1856	1826	1767	1870	1870	1811	1574	1781
Adj Flow Rate, veh/h	317	385	24	5	309	27	29	9	7	47	12	361
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
Percent Heavy Veh, %	6	2	2	2	3	5	9	2	2	6	22	8
Cap, veh/h	507	1603	100	245	774	67	188	57	33	568	17	510
Arrive On Green	0.17	0.47	0.47	0.24	0.24	0.24	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1725	3398	211	977	3282	285	310	145	84	1353	43	1297
Grp Volume(v), veh/h	317	201	208	5	165	171	45	0	0	47	0	373
Grp Sat Flow(s),veh/h/ln	1725	1777	1832	977	1763	1804	538	0	0	1353	0	1340
Q Serve(g_s), s	3.0	6.0	6.0	0.4	7.0	7.1	1.2	0.0	0.0	0.0	0.0	20.8
Cycle Q Clear(g_c), s	3.0	6.0	6.0	6.4	7.0	7.1	22.0	0.0	0.0	2.3	0.0	20.8
Prop In Lane	1.00		0.12	1.00		0.16	0.64		0.16	1.00		0.97
Lane Grp Cap(c), veh/h	507	838	865	245	416	426	278	0	0	568	0	527
V/C Ratio(X)	0.63	0.24	0.24	0.02	0.40	0.40	0.16	0.00	0.00	0.08	0.00	0.71
Avail Cap(c_a), veh/h	507	859	885	245	416	426	278	0	0	568	0	527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.5	14.0	14.0	30.9	28.7	28.7	21.5	0.0	0.0	17.1	0.0	22.7
Incr Delay (d2), s/veh	2.4	0.1	0.1	0.2	2.8	2.8	1.2	0.0	0.0	0.3	0.0	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.4	0.5	0.1	1.7	1.8	0.3	0.0	0.0	0.3	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	14.1	14.1	31.1	31.5	31.5	22.7	0.0	0.0	17.4	0.0	30.5
LnGrp LOS	C	B	B	C	C	C	C	A	A	B	A	C
Approach Vol, veh/h		726			341			45			420	
Approach Delay, s/veh		21.5			31.5			22.7			29.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		41.0		48.0		41.0	21.0	27.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	6.0				
Max Green Setting (Gmax), s		35.0		43.0		35.0	15.0	21.0				
Max Q Clear Time (g_c+I1), s		24.0		8.0		22.8	5.0	9.1				
Green Ext Time (p_c), s		0.1		3.0		2.6	1.0	1.7				

Intersection Summary												
HCM 6th Ctrl Delay			25.8									
HCM 6th LOS			C									

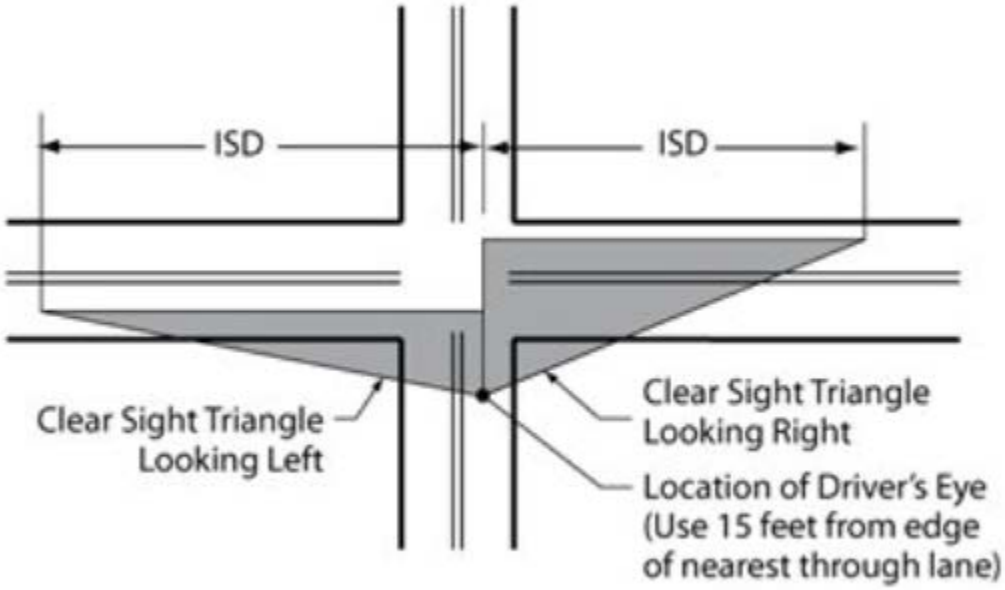
Intersection: 1: Petro Driveway/Collegiate Dr & Coldwater Rd W

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LTR	L	TR
Maximum Queue (m)	61.2	64.3	30.0	4.4	32.3	32.4	15.2	13.6	38.2
Average Queue (m)	43.6	42.9	11.3	1.4	23.8	19.4	7.2	6.0	22.8
95th Queue (m)	70.5	75.8	40.4	6.8	36.1	36.1	17.1	16.2	41.8
Link Distance (m)		102.2	102.2		106.2	106.2	32.3		97.2
Upstream Blk Time (%)		1							
Queuing Penalty (veh)		0							
Storage Bay Dist (m)	62.0			55.0				50.0	
Storage Blk Time (%)	3	0							0
Queuing Penalty (veh)	5	1							0

APPENDIX H
Sight Distance Analysis Pictures & Diagram

Sight Distance Analysis

The following pictures were taken on August 12, 2022 when a site visit was completed:



Source: https://safety.fhwa.dot.gov/local_rural/training/fhwasa1108/ch3.cfm

Figure 1 - Sight Distance Reference Diagram

Figure 2 - Apparatus for Sight Distance Analysis

Figure 3 - Sightlines Looking Right (East) at the Proposed Entrance on Coldwater Rd

Figure 4 - Object Pointed at for Sightline Availability (Right Side)

Figure 5 - Sightlines Looking Left (West) at the Proposed Entrance on Coldwater Rd

Figure 6 - Object Pointed at for Sightline Availability (Left Side)

NOTE

SIGHT TRIANGLES AS PER TAC MANUAL.

2 KEY PLAN
A-1.0 SCALE -NTS

SIGHT DISTANCE TABLE

SIGHT TRIANGLE	DISTANCE TYPE	DISTANCE
LEFT TURN	a_1	7.57m
	b_1	130.00m
RIGHT TURN	a_2	19.57m
	b_2	130.00m

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@narchitecture.com
www.narchitecture.com

LICENSED PROFESSIONAL ENGINEER
A.S.ZIAUDDIN
100233432
30SEP.2022
PROVINCE OF ONTARIO

N
DEGREES NORTH
PROJECT NORTH

No.	Date	Version	Dwn.

PROJECT:

CONDOMINIUM 233,249,261 COLDWATER ROAD, WEST, ORILLIA

DRAWING TITLE:

SIGHT DISTANCE ANALYSIS

DRAWN BY: EH	DATE: 28 SEP. 2022
CHECKED BY: AZ	SCALE:
PROJECT NO.: 21-23	DRAWING NO.: C5

LEGAL DESCRIPTION

PART OF LOT 7, CONCESSION 4 (FORMERLY IN THE TOWNSHIP OF SOUTH ORILLIA) CITY OF ORILLIA COUNTY OF SIMCOE

BEARING NOTE

BEARINGS ARE UTM GRID, BY REAL TIME NETWORK (TOPNET) OBSERVATIONS, UTM ZONE 17, NAD83 (ORIGINAL) (1997.0).

BENCHMARK NOTE

ELEVATIONS HEREON ARE GEODETIC IN ORIGIN AND WERE DERIVED FROM FIRE HYDRANT NO. 212 HAVING A VALUE OF 275.647 FROM INFORMATION SUPPLIED BY THE CITY OF ORILLIA ENGINEERING DEPARTMENT.

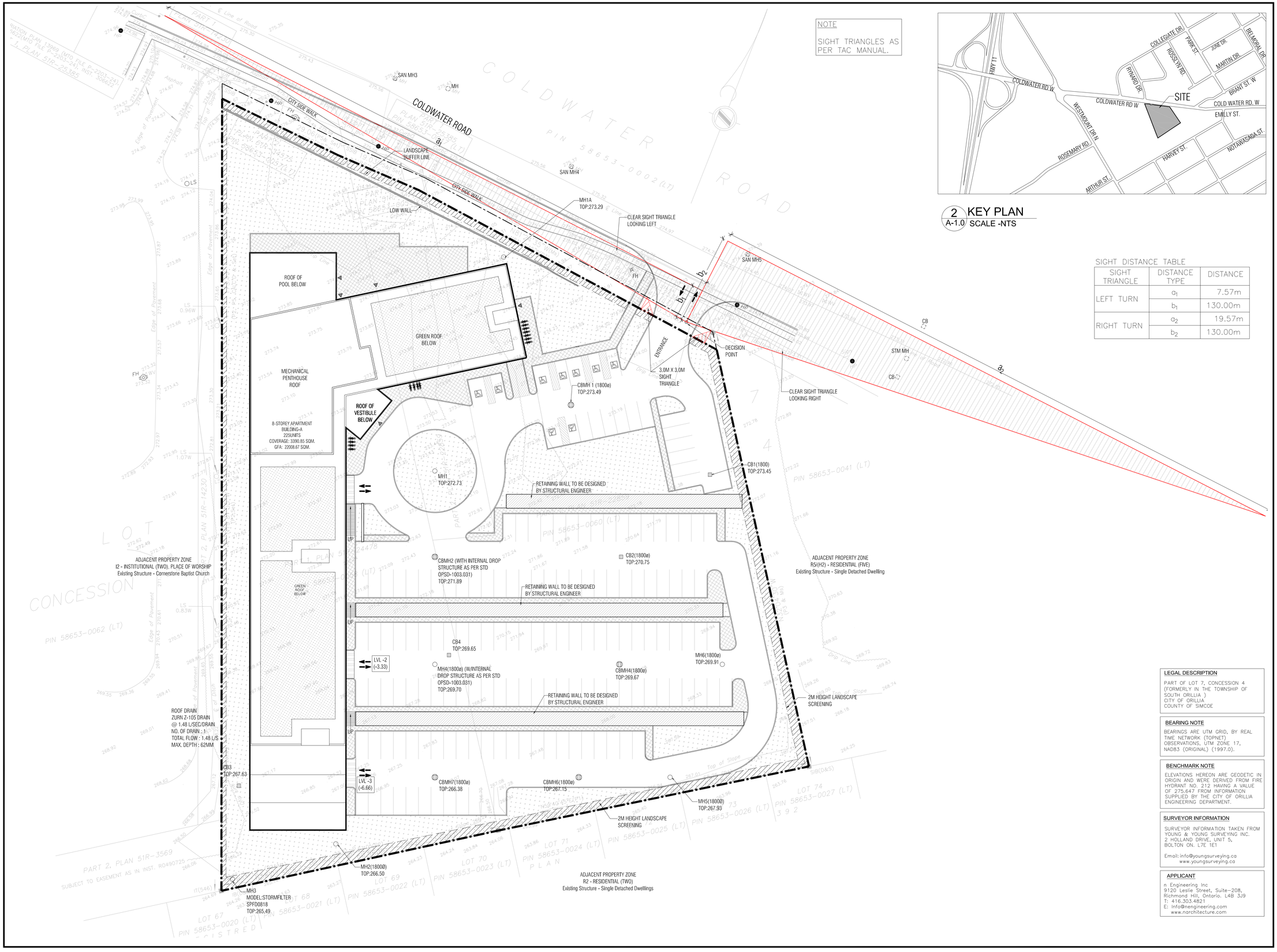
SURVEYOR INFORMATION

SURVEYOR INFORMATION TAKEN FROM YOUNG & YOUNG SURVEYING INC.
2 HOLLAND DRIVE, UNIT 5,
BOLTON, ON, L7E 1E1

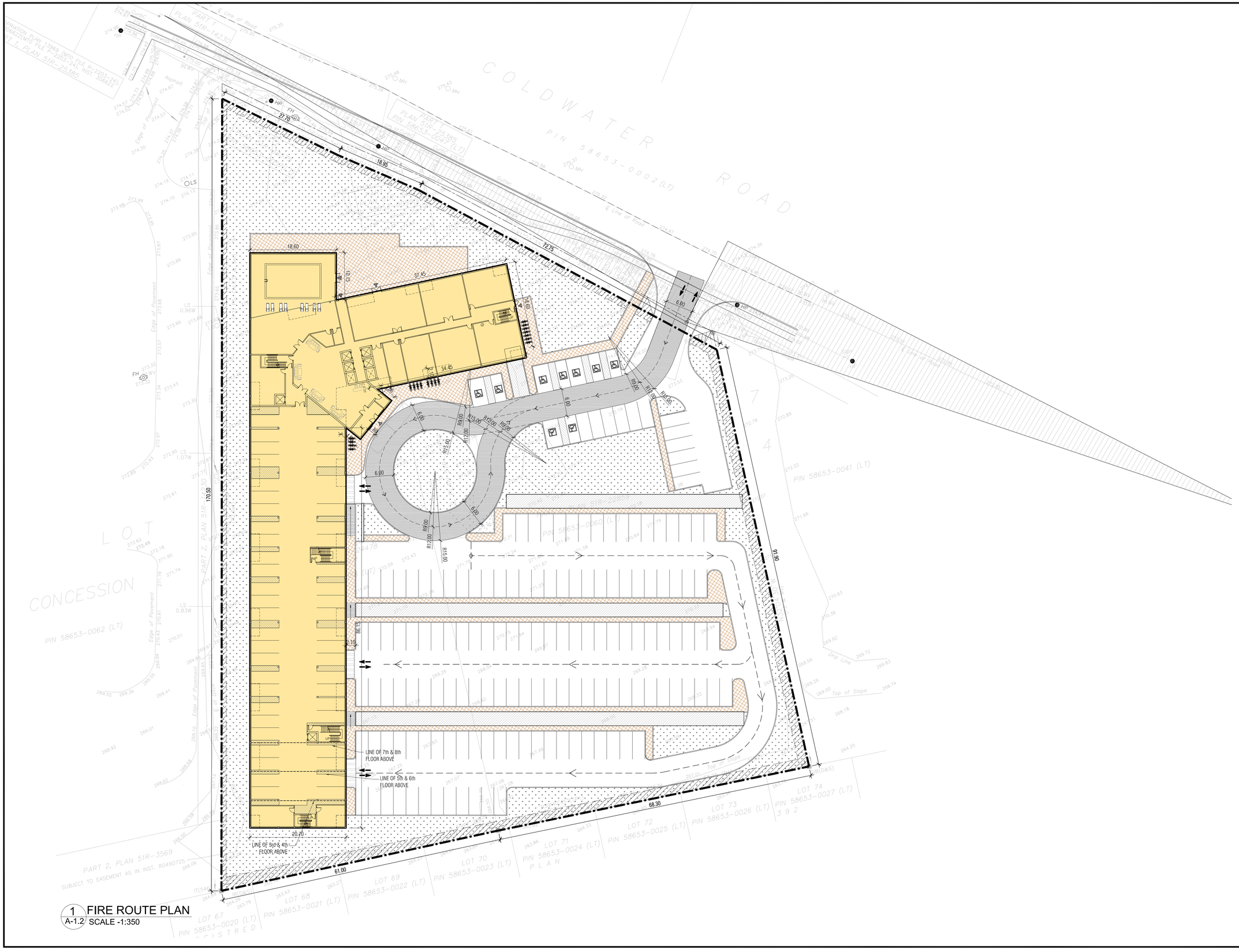
Email: info@youngsurveying.ca
www.youngsurveying.ca

APPLICANT

n Engineering Inc
9120 Leslie Street, Suite-208,
Richmond Hill, Ontario. L4B 3J9
T: 416.303.4821
E: Info@nengineering.com
www.narchitecture.com



APPENDIX I
Design Vehicle Turning Movement Diagrams



1 FIRE ROUTE PLAN
A-1.2 SCALE -1:350

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

N
GEODETIC NORTH
PROJECT NORTH

9th AUGUST 2022
ISSUED FOR SPA 1

No.	Date	Version	Dwn.
1.	2022-05-13	ISSUED FOR SPA 1	NG.

PROJECT:

CONDOMINIUM 233,249,261 COLDWATER ROAD, WEST, ORILIA

DRAWING TITLE:

FIRE ROUTE PLAN

DRAWN BY: NG	DATE: 15 FEBRUARY 2021
CHECKED BY: NM	SCALE: AS NOTED
PROJECT NO.: **21-23**	DRAWING NO.: **A-1.2**

APPENDIX J
Parking Justification Study

PROPOSED CONDOMINIUM
233, 249, 261 COLDWATER ROAD WEST
ORILLIA, ONTARIO

PARKING JUSTIFICATION STUDY

PROJECT NO. n2123

Prepared By:

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

September 23, 2022

Table of Contents

List of Figures

List of Tables

Appendices

1 Introduction

n Engineering Inc. is pleased to submit this parking justification study in regards to the parking reduction for the proposed development. This study reviews the following main aspects of the proposed residential development from a transportation engineering perspective:

- The City of Orillia minimum parking requirements for the proposed development;
- Parking Analysis of a Proxy Site to compare supply and demand;
- The suitable commercial uses that can be accommodated by the proposed parking supply.

The purpose of this study was to review several potential uses for the development and make recommendations for the most appropriate uses based on parking requirements, as well as frequency of visits. A Terms of Reference (TOR) was approved by the City to follow for the study as the guideline criteria. Refer to Appendix A for email correspondence.

2 Site Description and Assessments

The site is located at 233,249 and 261 Coldwater Road, Orillia, Ontario. Coldwater Road is the major arterial road that runs east to west and is located at north of the proposed site. There are existing residential and commercial properties in the east, west and north directions of the proposed development. The location is illustrated from Google Map in Figure 1.

Figure 1 - Site Location

The subject property is zoned as Residential Five (R5) as per Zoning By-Law (ZBL) No. 2014-44.

The existing subject property consists of a grass land. Figure 2 shows the existing street view conditions.

Figure 2 - Existing Conditions Street View via Google Maps

3 Proposed Development

As per the site plan prepared by n Architecture Inc., the proposed commercial development details are as follows:

- A proposed condominium building consists of 225 units with a gross floor area of 22008.67 m^2
- Proposed total 265 parking spaces
- One full movement entrance from Coldwater Road West.

The proposed site plan dated August 09th, 2022 prepared by n Architecture Inc. is attached in Appendix E.

As per the site plan, proposed parking space calculations following City's Zoning By-Law are summarized in Table 1.

Table 1 - Parking Space Calculations

Parking Calculation		
	Required	**Proposed**
Residential Units - 225 Units 1.5 Spaces per Unit (2.7 m x 6.0 m)	338	265
Accessible Parking Space (Type A - 3.4 m x 6.0 m)	4	4
Accessible Parking Space (Type B - 2.4 m x 6.0 m)	5	5
Total Parking Spaces	**338 (inch 9 B/F)**	**265 (inch 9 B/F)**
Visitor Parking (25% of Parking Spaces)	85	23
Bicycle Parking 1/10 Parking Spaces	34	34

Table 1 show that a minimum 338 parking spaces are required and 265 are being provided. Therefore there is a deficiency of 73 parking spaces (21.5%). The following sections in this report will provide detailed explanations based on real parking survey data to justify the number of provided parking spaces will be sufficient to meet the demand for the proposed development.

4 Parking Survey Methodology

As per the approved Terms of Reference, this parking study included a proxy site parking survey at the existing Condominium building to determine the parking occupancy rate. This proxy site is 4 km away from the site area of the proposed development. It has similar building and site layout. This proxy site was confirmed with the staff at the parking review committee for the City of Orillia.

Further investigation was required to meet Zoning by-law requirements.

A qualified staff member from n Engineering Inc. conducted a two day parking survey. The member was on site at Panoramic Point - 354 Atherley Rd, Orillia, Ontario. The details of the parking surveys are described below:

Parking Survey for the Proxy Site: Condominium Building:

- Address: Panoramic Point - 354 Atherley Road, Orillia, Ontario;
- An 8 storey Condominium building with 98 dwelling units;
- Available parking spaces: 152;
- Wednesday, September 14th, 2022 and Saturday, September 17th, 2022 from the times 6 AM to 11PM for both days. This will ensure the AM, PM and off-peak periods are analyzed;
- If the peak does not decrease within the specified hours, counts will be taken until the peak drops;
- Cars in parking spots will be counted every 30 minute interval;
- Observed parking data will be collected that includes legal, curbside and employee parking.

Comparing the proxy site location with the proposed development's location, the proxy site is anticipated to have very similar trips generation for the proposed development due to close proximity of both sites and same zoning.

Figure 3 - Proxy Site Location

5 Parking Survey Results

Parking survey was conducted on proxy site for the following days:

- Two days of surveying for site on the following days:
    1. Wednesday September 14, 2022 from 6:00 AM to 11:00 PM
    2. Saturday September 17, 2022 from 6:00 AM to 11:00 PM
- Survey data was observed and collected every 30-minute interval;
- The survey indicated maximum parking occupancy was 97 out of 152 (64%);
- Parking supply rate was 0.99 per unit ;
- Wednesday, September 14th , 2022 had the highest number of parking occupancy recorded at multiple time intervals and the number was 97;
- Saturday, September 17th , 2022 the highest number of parking occupancy recorded at multiple time intervals and the number was 93;
- The results of the on-site parking utilization is summarized and presented in Appendix B;
- Parking Survey summary table for the day with the highest occupancy is presented in Table 2.

Table 2 - Parking Occupancy Survey Summary

Proxy Site		Survey Date: 14th September 2022
Time	Number of Parking Sports Occupied	Illegal Parked Cars
6:00	97	0
6:30	97	0
7:00	96	0
7:30	94	0
8:00	91	0
8:30	90	0
9:00	85	0
9.:30	81	0
10:00	79	0
10:30	82	0
11:00	84	0
11:30	87	0
12:00	88	0
12:30	76	0
13:00	69	0
16:30	72	0
17:00	74	0
17:30	77	0
18:00	85	0
18:30	80	0
19:00	82	0
19:30	82	0
20:00	82	0
20:30	87	0
21:00	88	0
21:30	90	0
22:00	95	0
22:30	95	0
23:00	95	0
MAX	**64%**	**0%**

Table 3 - Parking Occupancy Survey Summary

Proxy Site		Survey Date: 17th September 2022
Time	Number of Parking Sports Occupied	Illegal Parked Cars
6:00	91	0
6:30	91	0
7:00	91	0
7:30	91	0
8:00	91	0
8:30	90	0
9:00	90	0
9.:30	85	0
10:00	84	0
10:30	81	0
11:00	79	0
11:30	79	0
12:00	78	0
12:30	77	0
13:00	74	0
16:00	80	0
16:30	81	0
17:00	80	0
17:30	82	0
18:00	84	0
18:30	85	0
19:00	87	0
19:30	87	0
20:00	88	0
20:30	90	0
21:00	91	0
21:30	91	0
22:00	92	0
22:30	93	0
23:00	93	0
MAX	**61%**	**0%**

Figure 4 below shows the trend line of the parking occupancy survey on the busiest day for the Condominium building.

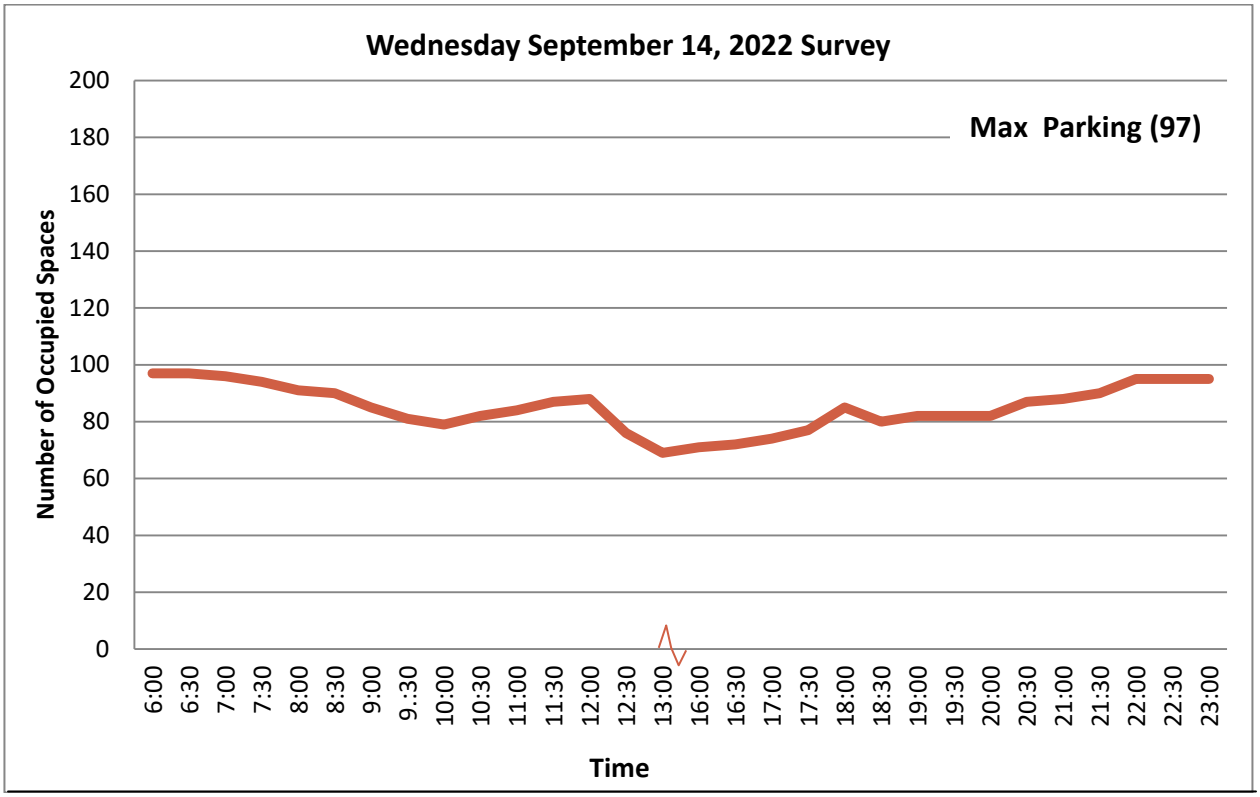


Figure 4 - Occupancy Graph for September 14, 2022

5.1 Site Parking Usage

Proxy Site Condominium Building Parking Usage:

The existing condominium building parking spaces users are residential and visitor. During the survey it was observed that residents would park their car on their own parking spaces and enters to the building with no time limit and visitor would park their car and enter to the building and return back for an average of 1 hour.

6 Analysis

The proxy site's infrastructure and neighborhood is very similar to the subject site for the proposed development. Zoning Maps of the proxy site location and proposed development location are provided in Appendix C. Based on analysis of survey data, it can be concluded that the parking rate for the proxy site will be applicable for the proposed development site.

The proxy site survey results indicated that the highest percentage of parking occupancy for the condominium building is 64%.

Table 4 provides a parking summary with the specific justification reasons for the building.

Table 4 - Parking Requirements Summary

Building	Unit	City Zoning by-Law Rate	Required based on ZBL	Required based on Justification	Provided	Justification
8-Storey Apartment Building	22008.67 m^2 (225 Units)	1.5 paces per unit for residential	338	**216**	265	On-Site Survey, 64% Occupancy
		25% of Parking Spaces	85	**54**	23	On-Site Survey, 64% Occupancy
		Accessible parking TYPE A (3.4 m* 6m)	4	**3**	4	On-Site Survey, 64% Occupancy
		Accessible parking TYPE B (2.4m*6m)	5	**3**	5	On-Site Survey, 64% Occupancy
Total			338	**216**	**265**	
Excess Parking			**49**			

Based on the parking survey, the majority of parking spaces were used by the residents and visitors. The maximum parking space occupancy rate was found to be 64%. Using this parking occupancy rate means the required parking spaces for residents and visitors is 216 which is less than the proposed parking spaces of 265.

The proxy site parking rate creates a total of 216 required parking spaces when applied to the proposed development. As there are 265 parking spaces being provided for the proposed apartment building, the parking study showcases that there will be 49 excess parking spaces that can be used by visitors and residential users.

7 Policy Context

Section 6.2.7 of the City of Orillia's ZBL provides the minimum number of barrier free parking regulations. As there are 265 parking spaces provided, type A and type B barrier free parking must be provided. As per parking survey justification study 64% occupancy in proxy site based on that a minimum of 3 Type A and type B barriers free parking are required. In the site plan there are 4 types A and 5 type B barrier free parking spaces provided which meets the required accessible parking.

Vehicle maneuvering diagrams have been provided in Appendix D. The diagram of A-1.2 confirms that the requirements are met without compromising parking capacity in accordance to the ZBL.

8 Potential Parking Strategies

Additional parking strategies, such as unbundled residential parking may also be implemented to further reduce the required parking supply. By proposing unbundled parking, residents have the options of renting a parking space for an additional fee or rendering a parking space if not needed. Rather than providing each unit with a space, unbundled parking ensures that only those residents requiring a space have access to one; whereas residents who do not require a space save on their monthly rental costs.

Unbundled parking is considered a fair approach as only those requiring parking will pay for the space, rather than having the cost of parking shared to all residents regardless of use. This can reduce the total amount of parking required to support the needs of the development.

Furthermore, the site area has a separate bike lane present on Coldwater Road; this can also help in reduction of parking demand by providing cycling route maps and safety towards bikers. Resident bike parking racks have already been provided.

9 Summary & Conclusion

There is a deficit of 73 parking spaces for the proposed development calculated as per the City's Zoning By-law.

n Engineering Inc. conducted an investigation on the parking demand using a proxy site with similar conditions that was within a 4 km radius of the proposed development site area.

The parking survey was completed for a proxy site at Panoramic Point - 354 Atherley Road, Orillia, Ontario. The maximum parking occupancy seen at this condominium building was 64% of the minimum required parking based on the ZBL. The total parking spaces for the proposed apartment building will be 216 parking spaces based on the proxy site parking occupancy rate. This means there will be an excess of 49 parking spaces as 265 parking spaces are provided via the site plan.

Therefore, the proposed apartment building parking demand and proxy site parking survey justifies the proposed number of parking spaces as per site plan will satisfy the City of Orillia minimum requirements.

Furthermore, a separate bicycle parking is already provided on Coldwater Rd W, that helps in additional reduce of parking rates by encouraging residents and commuters to use the alternative mode of travel. Furthermore, based on the discussion above it can be concluded that the proposed parking spaces will be sufficient for the proposed development.

We trust that this study will provide appropriate information regarding parking demand for future development as proposed.

Respectfully Submitted,

n Engineering Inc.

Prepared by:

Lekhnath Upadhyaya, EIT, M. Eng

MUNICIPAL PROJECT DESIGNER

Reviewed by:

Abu. S. Ziauddin M. Eng, P. Eng.

MUNICIPAL ENGINEER / PROJECT MANAGER

BLANK PAGE

APPENDIX A
Email Correspondence & Approved Terms of Reference

From: Steven Murphy
To: Gurminder Jagjait | nEngineering Inc
Cc: "Abu Ziauddin | NEngineering Inc"; "Natalie Gervasio"; Lisa Dobson
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia
Date: September 9, 2022 3:53:06 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png

Hello Gurminder

Me and my colleague Lisa Dobson would like to see the count spread to a more of a middle week and weekend such as a Wednesday and Saturday

Thanks,

ORILLIA

Steven Murphy, P.Eng, P.M.P | Project Engineer - Transportation
Development Services and Engineering Department
Engineering Division
T: 705-418-3550
orillia.ca

From: Gurminder Jagjait | nEngineering Inc <gj@nengineering.com>
Sent: September 9, 2022 3:33 PM
To: Steven Murphy <smurphy@orillia.ca>
Cc: 'Abu Ziauddin | NEngineering Inc' <az@nengineering.com>; 'Natalie Gervasio' <ng@narchitecture.com>
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Hello Steven,

Thank you for the help. I will give them a call.

We are looking to complete the two day parking survey at 354 Atherley Rd on Friday September 16, 2022 and Saturday September 17,2022. Please advise if this it suitable.

Regards,

n Engineering Inc

gurminder jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

From: Steven Murphy [mailto:smurphy@orillia.ca]
Sent: September 9, 2022 3:26 PM
To: Gurminder Jagjait | nEngineering Inc
Cc: 'Abu Ziauddin | NEngineering Inc'; 'Natalie Gervasio'
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Hello Gurminder,

I spoke with some more people and we do not have a contact for this building. At one point we had a document with a fair amount of contacts but that seems to have been lost in our transition to SharePoint. I would suggest calling the property to find out who is the current Condominium Corporation President and arrange with them your site access.

Thanks,

ORILLIA

Steven Murphy, P.Eng, P.M.P | Project Engineer - Transportation
Development Services and Engineering Department
Engineering Division
T: 705-418-3550
orillia.ca

From: Gurminder Jagjait | nEngineering Inc <gj@nengineering.com>
Sent: September 9, 2022 1:32 PM
To: Steven Murphy <smurphy@orillia.ca>
Cc: 'Abu Ziauddin | NEngineering Inc' <az@nengineering.com>; 'Natalie Gervasio' <ng@narchitecture.com>
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Hello Steven,

I hope you are well.

This is just a follow up email. I was hoping you can provide the contact details of 354 Atherley Rd (Panoramic Point Condominium) so that they are aware we will be on-site for the parking study and so that we can access their underground parking without obstruction

Regards,

n Engineering Inc

gurminder jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

---

From: Gurminder Jagjait | nEngineering Inc [mailto:gj@nengineering.com]
Sent: September 6, 2022 10:50 AM
To: 'Steven Murphy'

Cc: 'Abu Ziauddin | NEngineering Inc'; 'Natalie Gervasio'
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Good Morning Steven,

We have decided to complete the parking study at the proxy site of Panoramic Point Condominium Building at 354 Atherley Rd as it is the most similar to our proposed development.

Would you be able to provide the contact details of 354 Atherley Rd so that they are aware we will be on-site for the parking study and so that we can access their underground parking without obstruction.

I hope to hear from you soon. Thank you.

Regards,

gurminder jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

*****Office Hours for Summer of 2022 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 6th September 2022. *****

From: Steven Murphy [mailto:smurphy@orillia.ca]
Sent: August 23, 2022 8:57 AM
To: Gurminder Jagjait | nEngineering Inc
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Hello Gurminder,

I have spoken with our planning group and other transportation engineers. They do not know of any other buildings that could be used other than the ones suggested, however the thought of completing the study on both buildings might be the best way to get a more "average" count.

Thanks,

ORILLIA
Steven Murphy, P.Eng, P.M.P | Project Engineer - Transportation
Development Services and Engineering Department
Engineering Division
T: 705-418-3550
orillia.ca

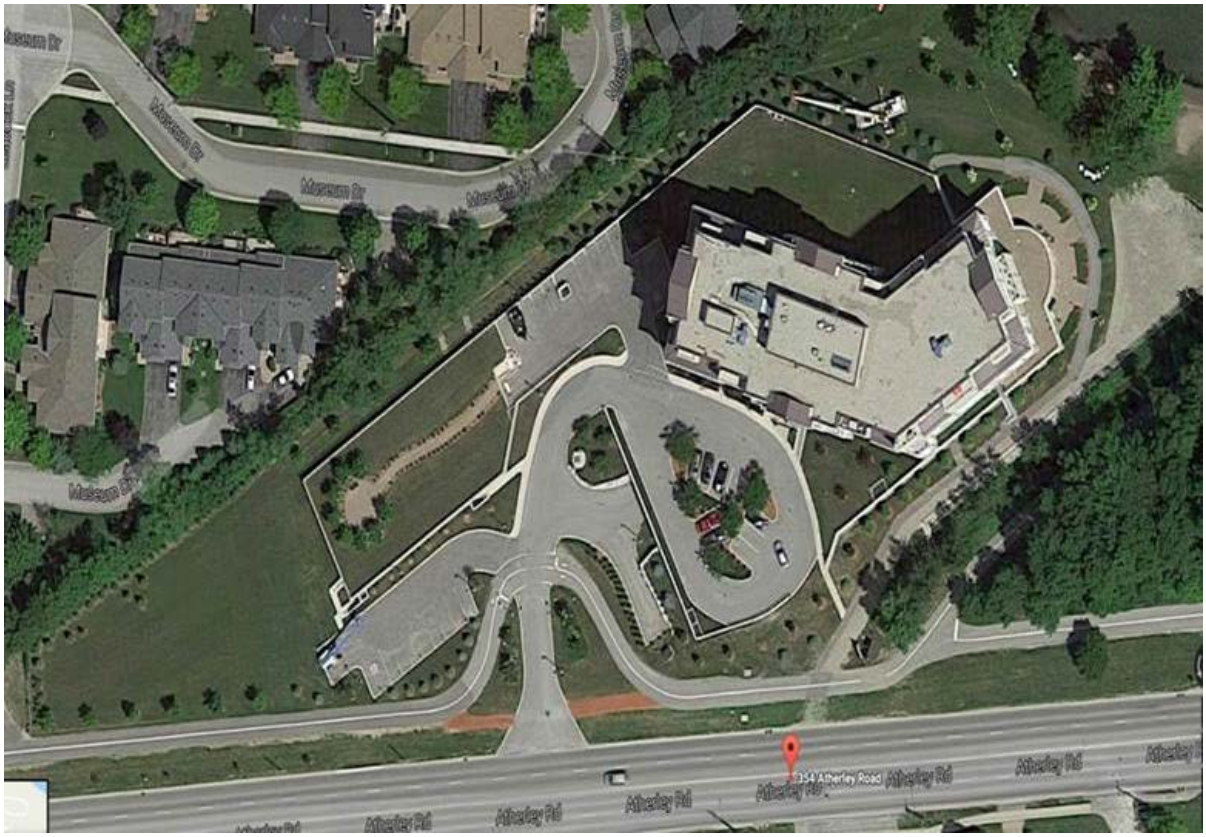
From: Gurminder Jagjait | nEngineering Inc <gj@nengineering.com>

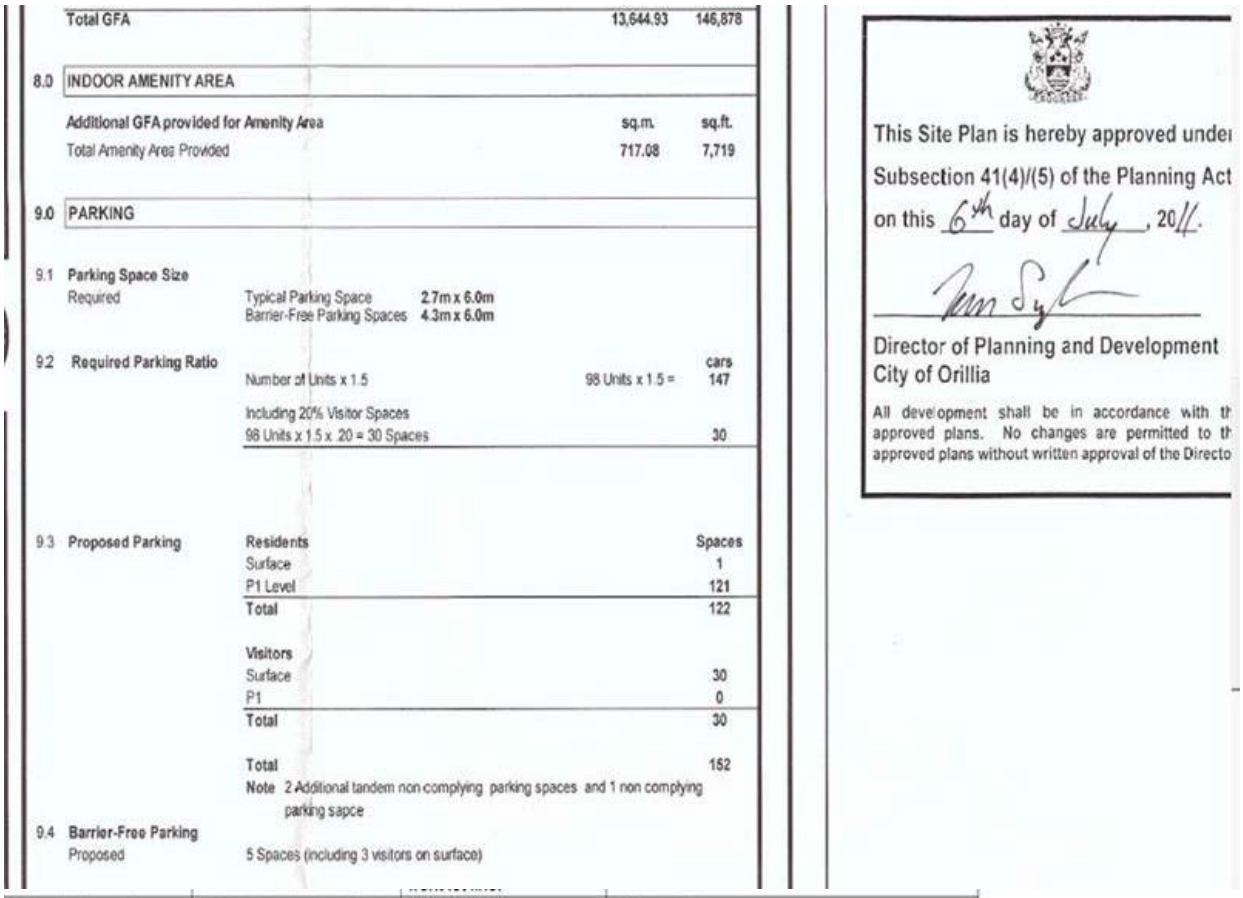
From: Steven Murphy
To: Gurminder Jagjait | nEngineering Inc
Cc: "Abu Ziauddin | nEngineering Inc."
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia
Date: August 15, 2022 10:48:29 AM
Attachments: image004.png
image006.png
image007.png
image008.png
image009.png

Hello Gurminder,

Please see the comments below from our planning group

Phase 1 of Panoramic Point building has currently been constructed with 8 storeys and 98 dwelling unit. The property currently has 152 parking spaces, which have been designed and allocated for the primary use of the existing building.





	Total GFA	13,644.93	146,878
8.0	INDOOR AMENITY AREA		
	Additional GFA provided for Amenity Area	sq.m.	sq.ft.
	Total Amenity Area Provided	717.08	7,719
9.0	PARKING		
9.1	Parking Space Size Required	Typical Parking Space 2.7m x 6.0m Barrier-Free Parking Spaces 4.3m x 6.0m	
9.2	Required Parking Ratio		cars
	Number of Units x 1.5	98 Units x 1.5 =	147
	Including 20% Visitor Spaces 98 Units x 1.5 x .20 = 30 Spaces		30
9.3	Proposed Parking	Residents	Spaces
	Surface		1
	P1 Level		121
	Total		122
	Visitors		
	Surface		30
	P1		0
	Total		30
	Total		152
	Note 2 Additional tandem non-complying parking spaces and 1 non complying parking sapce		
9.4	Barrier-Free Parking Proposed	5 Spaces (including 3 visitors on surface)	

This Site Plan is hereby approved under Subsection 41(4)/(5) of the Planning Act on this 6th day of July, 20[illegible].

Director of Planning and Development
City of Orillia

All development shall be in accordance with the approved plans. No changes are permitted to the approved plans without written approval of the Director

S.3.16.1.2 - # of parking spaces (total)	1.5 spaces per dwelling unit of which 20% shall be for visitor parking Phase 1: 147 of which 30 visitor of which 2 disabled	152 spaces	* Meets ZBL * 98 units * 121 spaces proposed under P1 of Phase 1 (all for residents) plus 3 non-compliant parking spaces * 31 surface parking space (of which 1 space is for a resident) = 30 surface visitor parking spaces
S. 3.16.1.1 - # of disabled parking spaces	1% of required parking = 2 disabled spaces	5 disabled spaces	* Meets ZBL * The spaces are required to be sized, signed and reserved for the disabled * 2 disabled spaces underground (for residents) plus 3 disabled parking spaces on

H:\D11 Site Plan Control\2007\D11-129 Panoramic Point_354 Atherley Road\Site Plan Amendment_Received June 18 2010_Revised Site Works & Underground Parking\Zoning Compliance Check_Site Plan Amendment_October 2010.doc

36 Parking Spaces will be required to be constructed as per Zoning Exception R5-3i, for the Development of Phase 2 as an Apartment Dwelling with a proposed 24 units of those 36 parking spaces 20% will have to be devoted to visitor parking (8 Parking Spaces). – Phase 2 has not been constructed and the lands to which it was to be developed were sold, so its likely this design will change.

From: Gurminder Jagjait | nEngineering Inc <gj@nengineering.com>
Sent: August 15, 2022 8:31 AM
To: Steven Murphy <smurphy@orillia.ca>
Cc: 'Abu Ziauddin | nEngineering Inc.' <az@nengineering.com>

Subject: FW: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Hello Steven,

This is a follow-up on the email sent by me last week. I hope to hear from you soon.

Regards,

n Engineering Inc

gurminder jagjait |EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

*****Office Hours for Summer of 2022 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 6th September 2022. *****

From: Gurminder Jagjait | nEngineering Inc [mailto:gj@nengineering.com]
Sent: August 11, 2022 10:19 AM
To: 'Steven Murphy'
Cc: 'Abu Ziauddin | nEngineering Inc.'; 'Wesley Cyr'; 'Lisa Dobson'
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Hello Steven,

The previous proxy site chosen for a parking study for the proposed development at 233 Coldwater Rd, Orillia (8-storey, 225 units) was the apartment Noble Towers at 391 Barrie Rd, Orillia. This site has 84 parking spots and 82 units.

I believe a more suitable proxy site would be the condominium Panoramic Point at 354 Atherley Rd, Orillia which is an 8-storey, 98 unit condo.

Would you be able to help me obtain more information about the new possible proxy site including the number of parking spaces and confirming the number of units.

I hope to hear from you soon. Thank you.

Regards,

n Engineering Inc

gurminder jagjait |EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

*****Office Hours for Summer of 2022 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 6th September 2022. *****

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: Steven Murphy [mailto:smurphy@orillia.ca]
Sent: August 2, 2022 4:13 PM
To: Gurminder Jagjait | nEngineering Inc
Cc: 'Abu Ziauddin | nEngineering Inc.'; Wesley Cyr; Lisa Dobson
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Thank you for the updates.

From: Gurminder Jagjait | nEngineering Inc <gj@nengineering.com>
Sent: August 2, 2022 9:01 AM
To: Steven Murphy <smurphy@orillia.ca>
Cc: 'Abu Ziauddin | nEngineering Inc.' <az@nengineering.com>; Wesley Cyr <WCyr@orillia.ca>; Lisa Dobson <LDobson@orillia.ca>
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Good Morning Steven,

I hope you enjoyed the long weekend. The comments to your questions are provided below in red.

If you any other questions, please do not hesitate to contact me. Thank you.

Regards,

n Engineering Inc

gurminder jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

*****Office Hours for Summer of 2022 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 6th September 2022. *****

From: Steven Murphy [mailto:smurphy@orillia.ca]
Sent: July 29, 2022 2:16 PM
To: Gurminder Jagjait | nEngineering Inc
Cc: 'Abu Ziauddin | nEngineering Inc.'; Wesley Cyr; Lisa Dobson
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Thank you for the response.

- To summarize you will be completing two counts, one weekday and one weekend.
  - Are there specific days of the week you suggest?

[n Eng] – There will be two counts completed, the days will be Friday and Saturday to ensure weekday and weekends are accounted for.

- The count will start at 6am
  - Weekday or Weekend?
    - If the weekend count starts and ends differently what are the suggested hours?
    - Will the weekend count be equal duration to the weekday?

[n Eng] – The weekday and weekend count timings will be the same.

- With the expected peak being around 9pm to 11pm, the 13hr window originally planned for will not include those hours

- Maybe a split day count 6am to 1pm and 4pm to 11pm or 12am?

[n Eng] – A split day count for both the weekday and weekend will be completed. The timings from 6am to 1pm and 4 pm to 11pm are agreed upon. (14 hrs of parking survey data for each day).

Thanks and have a good weekend.

ORILLIA

Steven Murphy, P.Eng, P.M.P | Project Engineer - Transportation
Development Services and Engineering Department
Engineering Division
T: 705-418-3550
orillia.ca

From: Gurminder Jagjait | nEngineering Inc <gj@nengineering.com>
Sent: July 28, 2022 8:52 AM
To: Steven Murphy <smurphy@orillia.ca>
Cc: 'Abu Ziauddin | nEngineering Inc.' <az@nengineering.com>; Wesley Cyr <WCyr@orillia.ca>; Lisa Dobson <LDobson@orillia.ca>
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Hello Steven,

The response to your questions are provided in red below.

If you require any more information. Please do not hesitate to contact. Thank you.

Regards,

n Engineering Inc

gurminder jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

*****Office Hours for Summer of 2022 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 6th September 2022. *****

From: Steven Murphy [mailto:smurphy@orillia.ca]
Sent: July 26, 2022 4:31 PM
To: Lisa Dobson; Gurminder Jagjait | nEngineering Inc
Cc: 'Abu Ziauddin | nEngineering Inc.'; Wesley Cyr
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Hello Gurminder,

I have few questions for you regarding the parking survey.

Do you predict there will be a difference in parking volume/activity from weekday to weekend?

[n Eng] – We do predict there will be a difference in parking activity from the weekday to weekend. That being said, we will also include Saturday Midday for the parking survey.

Do you believe an 8 AM survey start time accounts for "morning parkers" or will the volume be reduced by people already leaving for work?

[n Eng] – We believe 8 AM may be too late for a start time. This will be changed to 6 AM to account for the early morning parkers.

Within the 13hr survey widow do you predict the peak to be around 5-6pm?

[n Eng] – 5-6pm will not be the peak time during the parking survey as residents may still be at work or away from home. We predict the later hours around 9 to 11 PM will be the peak occupancy hours as residents will return home.

Thanks,

ORILLIA

Steven Murphy, P.Eng, P.M.P | Project Engineer - Transportation
Development Services and Engineering Department
Engineering Division
T: 705-418-3550
orillia.ca

From: Lisa Dobson <LDobson@orillia.ca>
Sent: July 26, 2022 8:39 AM
To: Gurminder Jagjait | nEngineering Inc <gj@nengineering.com>
Cc: 'Abu Ziauddin | nEngineering Inc.' <az@nengineering.com>; Wesley Cyr <WCyr@orillia.ca>; Steven Murphy <smurphy@orillia.ca>
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Good morning Gurminder,
This project is now being managed by our Project Engineer – Transportation, Steven Murphy, copied on this email.
Thank you,
Lisa

From: Gurminder Jagjait | nEngineering Inc <gj@nengineering.com>
Sent: 2022/07/25 5:04 PM
To: Lisa Dobson <LDobson@orillia.ca>
Cc: 'Abu Ziauddin | nEngineering Inc.' <az@nengineering.com>; Wesley Cyr <WCyr@orillia.ca>
Subject: RE: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Good afternoon Lisa,

This is a follow-up email for the Terms of Reference (ToR) to be reviewed for the Parking Justification Study for the proposed development at 233, 249, 261 Condo Coldwater Rd, Orillia.

Regards,

n Engineering Inc

gurminder jagjait |EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

*****Office Hours for Summer of 2022 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 6th September 2022. *****

From: Gurminder Jagjait | nEngineering Inc [mailto:gj@nengineering.com]
Sent: July 18, 2022 3:00 PM
To: 'Lisa Dobson'
Cc: 'Abu Ziauddin | nEngineering Inc.'; 'Wesley Cyr'
Subject: n2123 | 233, 249, 261 Condo Coldwater Rd, Orillia

Hello Lisa,

I hope you had a great weekend. I will be working on a Parking Justification Study for the proposed development at 233, 249, 261 Condo Coldwater Rd, Orillia.

I have attached a Terms of Reference (ToR) and site plan for review and approval for the parking study.

Would you please be able to have this TOR reviewed and provide recommendations for us to move forward with the study. Thank you.

Regards,

n Engineering Inc

gurminder jagjait |EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

*****Office Hours for Summer of 2022 : Mon to Thursday : 8 am to 5:30 pm | Friday : 8am to 12 pm | We will be back to the Regular Office Hours from 6th September 2022. *****

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.

CAUTION: This email originated from outside of the City of Orillia email system. Do not open attachments or click links you were not specifically expecting, even from known

From:	Lisa Johnston
To:	Gurminder Jagjait | nEngineering Inc
Cc:	panoramicpoint@hotmail.com; "Abu Ziauddin | NEngineering Inc"
Subject:	RE: n2123 | Permission to Access Panoramic Point Parking
Date:	September 12, 2022 11:36:58 AM
Attachments:	image001.png image002.png

You may proceed. You can visit the concierge desk after 8 a.m. who can provide a set of keys to access the building. Unfortunately no one is available until 8 a.m. on Wednesday but you will have unfettered access on Thursday. Once you're finished with the keys they can be left at the concierge desk. Angela, the onsite admin will give you further direction.

Thank you,
Lisa

From: Gurminder Jagjait | nEngineering Inc [mailto:gj@nengineering.com]
Sent: Monday, September 12, 2022 11:13 AM
To: Lisa Johnston
Cc: panoramicpoint@hotmail.com; 'Abu Ziauddin | NEngineering Inc'
Subject: RE: n2123 | Permission to Access Panoramic Point Parking

Hello Lisa,

With your permission, we will be on site for Wednesday September 14, 2022 and Saturday September 17, 2022. On both days the times will be from 6am to 1pm and 4 pm to 11pm (14 hrs of parking survey data for each day).

Regards,

n Engineering Inc

gurminder jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

---

From: Lisa Johnston [mailto:ljohnston@bpmgmt.ca]
Sent: September 12, 2022 11:03 AM
To: Gurminder Jagjait | nEngineering Inc
Cc: panoramicpoint@hotmail.com; 'Abu Ziauddin | NEngineering Inc'
Subject: RE: n2123 | Permission to Access Panoramic Point Parking

Hi Gurminder,
What time and for how long will you be onsite?

From: Gurminder Jagjait | nEngineering Inc [mailto:gj@nengineering.com]
Sent: Monday, September 12, 2022 9:47 AM
To: Lisa Johnston
Cc: panoramicpoint@hotmail.com; 'Abu Ziauddin | NEngineering Inc'
Subject: RE: n2123 | Permission to Access Panoramic Point Parking

Hello,

This is for a developer, the City of Orillia is aware and approve of the parking study. However, I require permission and access from you.

Regards,

n Engineering Inc

gurminder jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

---

From: Lisa Johnston [mailto:ljohnston@bpmgmt.ca]
Sent: September 12, 2022 9:42 AM
To: Gurminder Jagjait | nEngineering Inc

Cc: panoramicpoint@hotmail.com; 'Abu Ziauddin | NEngineering Inc'
Subject: RE: n2123 | Permission to Access Panoramic Point Parking

Gurminder,
Is this for the City of Orillia or a developer?

From: Gurminder Jagjait | nEngineering Inc [mailto:gj@nengineering.com]
Sent: Monday, September 12, 2022 9:36 AM
To: Lisa Johnston
Cc: panoramicpoint@hotmail.com; 'Abu Ziauddin | NEngineering Inc'
Subject: RE: n2123 | Permission to Access Panoramic Point Parking

Good Morning,

The parking study includes counting cars parked at surface and underground parking at every 30 minute interval . to compare the parking rates with the zoning by law.

Would a personnel from n Engineering Inc be able to access underground parking at 354 Atherley Rd to count cars parked.

Regards,

n Engineering Inc

gurminder jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

---

From: Lisa Johnston [mailto:ljohnston@bpmgmt.ca]
Sent: September 12, 2022 9:29 AM
To: gj@nengineering.com
Cc: panoramicpoint@hotmail.com
Subject: FW: n2123 | Permission to Access Panoramic Point Parking
Importance: High

Good morning,
Any new development has no access to the underground or surface parking at 354 Atherley Road so access would not be required. To complete the parking study you can access the 354 Atherley property for the purpose of accessing the Phase 2 property.

Kind regards,
Lisa

From: Gurminder Jagjait | nEngineering Inc [mailto:gj@nengineering.com]
Sent: Monday, September 12, 2022 9:09 AM
To: Admin
Cc: 'Abu Ziauddin | NEngineering Inc'; 'Lekh Upadhyaya'
Subject: n2123 | Permission to Access Panoramic Point Parking
Importance: High

Hello,

We are looking to complete a parking study at 354 Atherley Rd, (Panoramic Point) for similar development.

We would require access to you underground parking and surface parking for counts.

I am asking for permission from the building owner to allow us to complete the parking study on site on Wed Sept 14 and Sat Sept 17.

If you have any questions, please do not hesitate to contact me. Thank you.

Regards,

n Engineering Inc

gurminder jagjait | EIT Transportation Analyst
9120 Leslie Street, Suite-208, Richmond Hill, Ontario. L4B3J9 T: 905-597-5937
http://nengineering.com/ | https://www.facebook.com/nArchitectureInc

APPENDIX B
Parking Occupancy Survey Data

Project: n2123 Condominium 233,249, 261 Cold Water Road, West Orillia, ON
Parking Study
Data Collector: Lekhnath Upadhyaya
Date: 14th September 2022
Proxy Site : 354 Atherley Rd, Orillia, ON

Available Parking Sports:	152	
Panoramic Point Condominium, Parking		
Time	Number of Parking Sports Occupied	Illegal Parked Cars
6:00	97	—
6:30	97	—
7:00	96	—
7:30	94	—
8:00	91	—
8:30	90	—
9:00	85	—
9.:30	81	—
10:00	79	—
10:30	82	—
11:00	84	—
11:30	87	—
12:00	88	—
12:30	76	—
13:00	69	—
13:30	—	—
14:00	—	—
14:30	—	—
15:00	—	—
15:30	—	—
16:00	71	—
16:30	72	—
17:00	74	—
17:30	77	—
18:00	85	—
18:30	80	—
19:00	82	—
19:30	82	—
20:00	82	—
20:30	87	—
21:00	88	—
22:30	90	—
22:00	95	—
22:30	95	—
23:00	95	—

Signature:

Date: 14/09/2022

Project: n2123 Condominium 233,249, 261 Cold Water Road, West Orillia, ON

Parking Study

Data Collector: Lekhnath Upadhyaya

Date: 17th september 2022

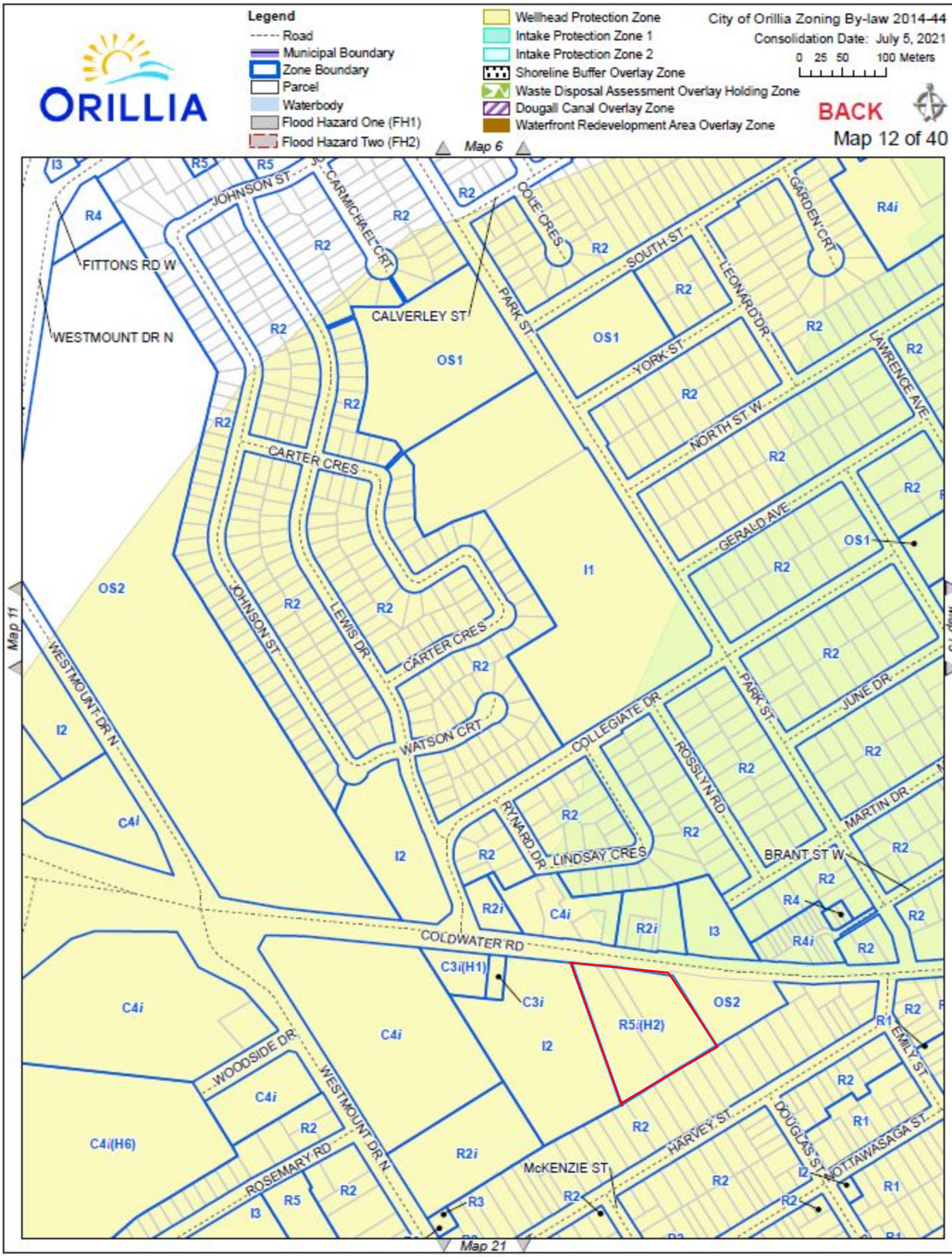
Proxy Site : 354 Atherley Rd, Orillia, ON

Available Parking Sports:	152	
Panoramic Point Condominium, Parking		
Time	Number of Parking Sports Occupied	Illegal Parked Cars
6:00	91	
6:30	91	
7:00	91	
7:30	91	
8:00	91	
8:30	90	
9:00	90	
9.:30	85	
10:00	84	
10:30	81	
11:00	79	
11:30	79	
12:00	78	
12:30	77	
13:00	74	
13:30	-	
14:00	-	
14:30	-	
15:00	-	
15:30	-	
16:00	80	
16:30	81	
17:00	80	
17:30	82	
18:00	84	
18:30	85	
19:00	87	
19:30	87	
20:00	88	
20:30	90	
21:00	91	
21:30	91	
22:00	92	
22:30	93	
23:00	93	

Signature:

Date: 17th sep 2022

APPENDIX C
Zoning By-Law Maps


ORILLIA
Legend
Road
Municipal Boundary
Zone Boundary
Parcel
Waterbody
Flood Hazard One (FH1)
Flood Hazard Two (FH2)
Wellhead Protection Zone
Intake Protection Zone 1
Intake Protection Zone 2
Shoreline Buffer Overlay Zone
Waste Disposal Assessment Overlay Holding Zone
Dougall Canal Overlay Zone
Waterfront Redevelopment Area Overlay Zone
City of Orillia Zoning By-law 2014-44
Consolidation Date: July 5, 2021
0 25 50 100 Meters
BACK
Map 12 of 40
Map 6
Map 11
Map 13
Map 21
JOHNSON ST
CARMICHAEL CRT
COLE CRES
SOUTH ST
GARDEN CRT
FITTONS RD W
WESTMOUNT DR N
CALVERLEY ST
PARK ST
LEONARD DR
YORK ST
LAWRENCE AVE
NORTH ST W
CARTER CRES
GERALD AVE
LEWIS DR
WATSON CRT
COLLEGIATE DR
ROSSLYN RD
JUNE DR
MARTIN DR
RAYNARD DR
LINDSAY CRES
BRANT ST W
COLDWATER RD
WOODSIDE DR
ROSEMARY RD
McKENZIE ST
HARVEY ST
DOUGLAS ST
EMILY ST
OTTAWASAGA ST
R4
R5
R2
R4i
OS1
OS2
I1
I2
I3
R2i
R3
R1
C4i
C4i(H6)
C3i
C3i(H1)
R5i(H2)

ORILLIA

Legend

- Road
- Municipal Boundary
- Zone Boundary
- Parcel
- Waterbody
- Flood Hazard One (FH1)
- Flood Hazard Two (FH2)
- Wellhead Protection Zone
- Intake Protection Zone 1
- Intake Protection Zone 2
- Shoreline Buffer Overlay Zone
- Waste Disposal Assessment Overlay Holding Zone
- Dougall Canal Overlay Zone
- Waterfront Redevelopment Area Overlay Zone

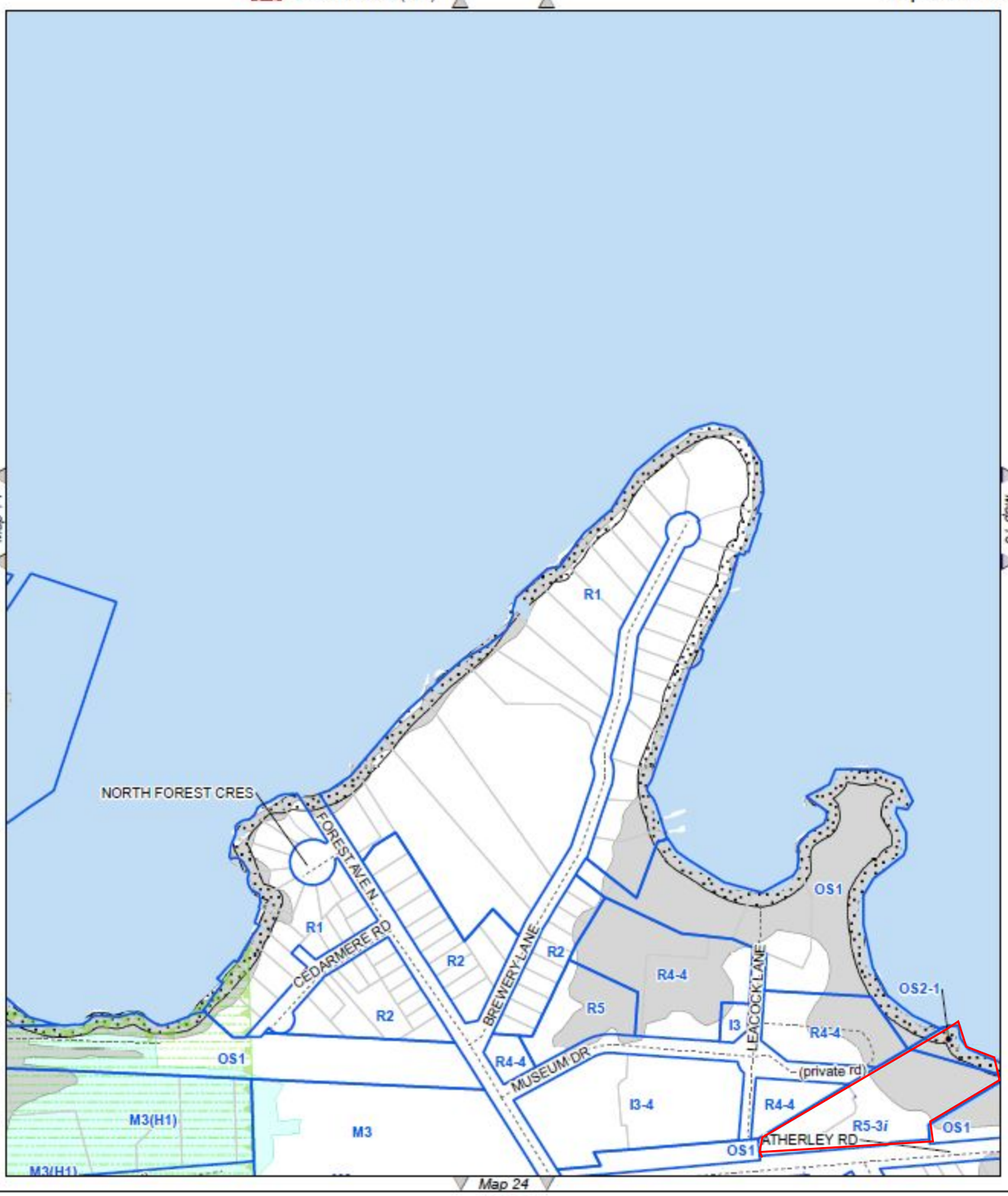
City of Orillia Zoning By-law 2014-44
Consolidation Date: July 5, 2021
0 25 50 100 Meters

BACK

Map 15 of 40

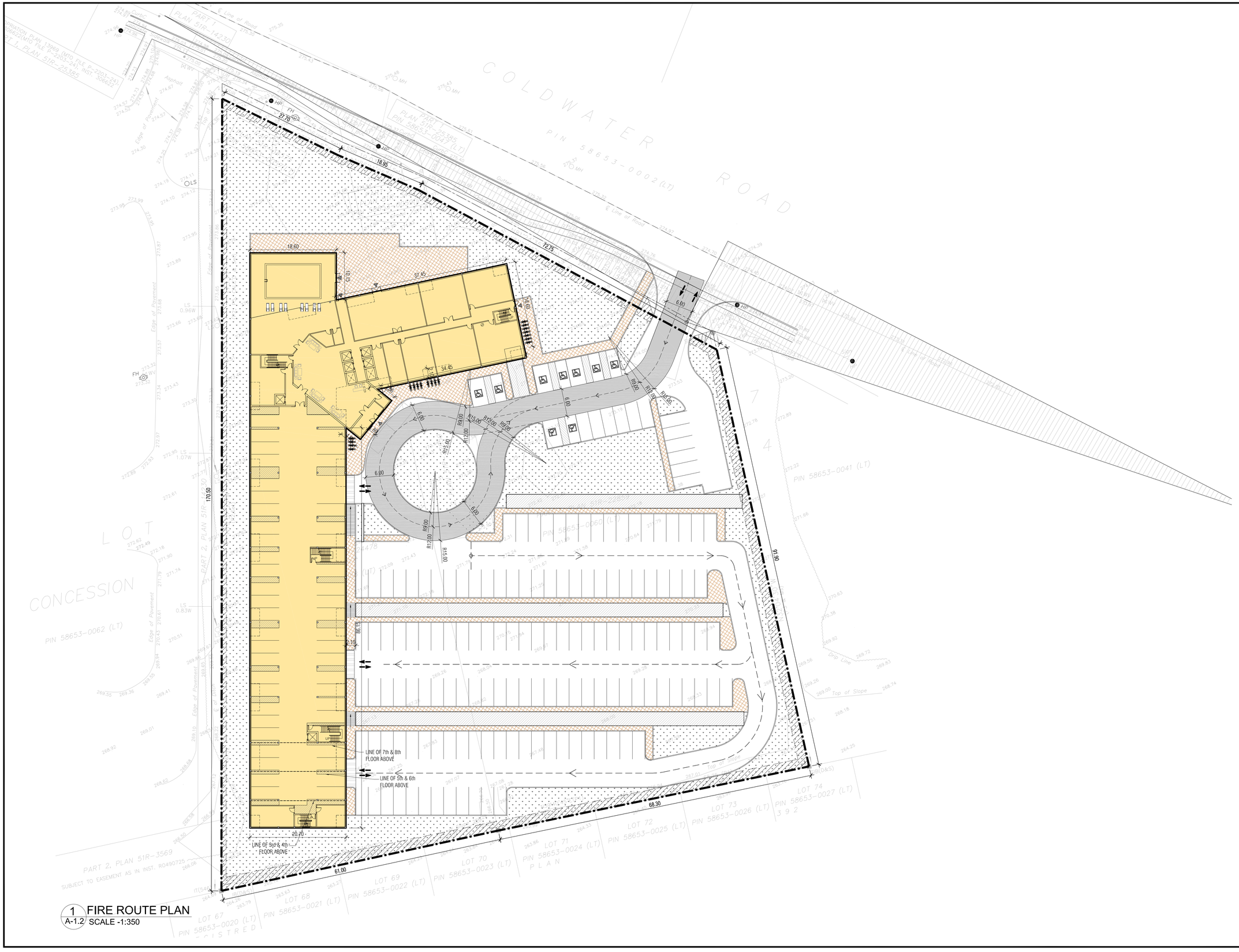
Map 14

Map 16



Map 24

APPENDIX D
Vehicle Manoeuvring Diagrams



1 FIRE ROUTE PLAN
A-1.2 SCALE -1:350

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

N
GEODETIC NORTH
PROJECT NORTH

9th AUGUST 2022
ISSUED FOR SPA 1

No.	Date	Version	Dwn.
1.	2022-05-13	ISSUED FOR SPA 1	NG.

PROJECT:

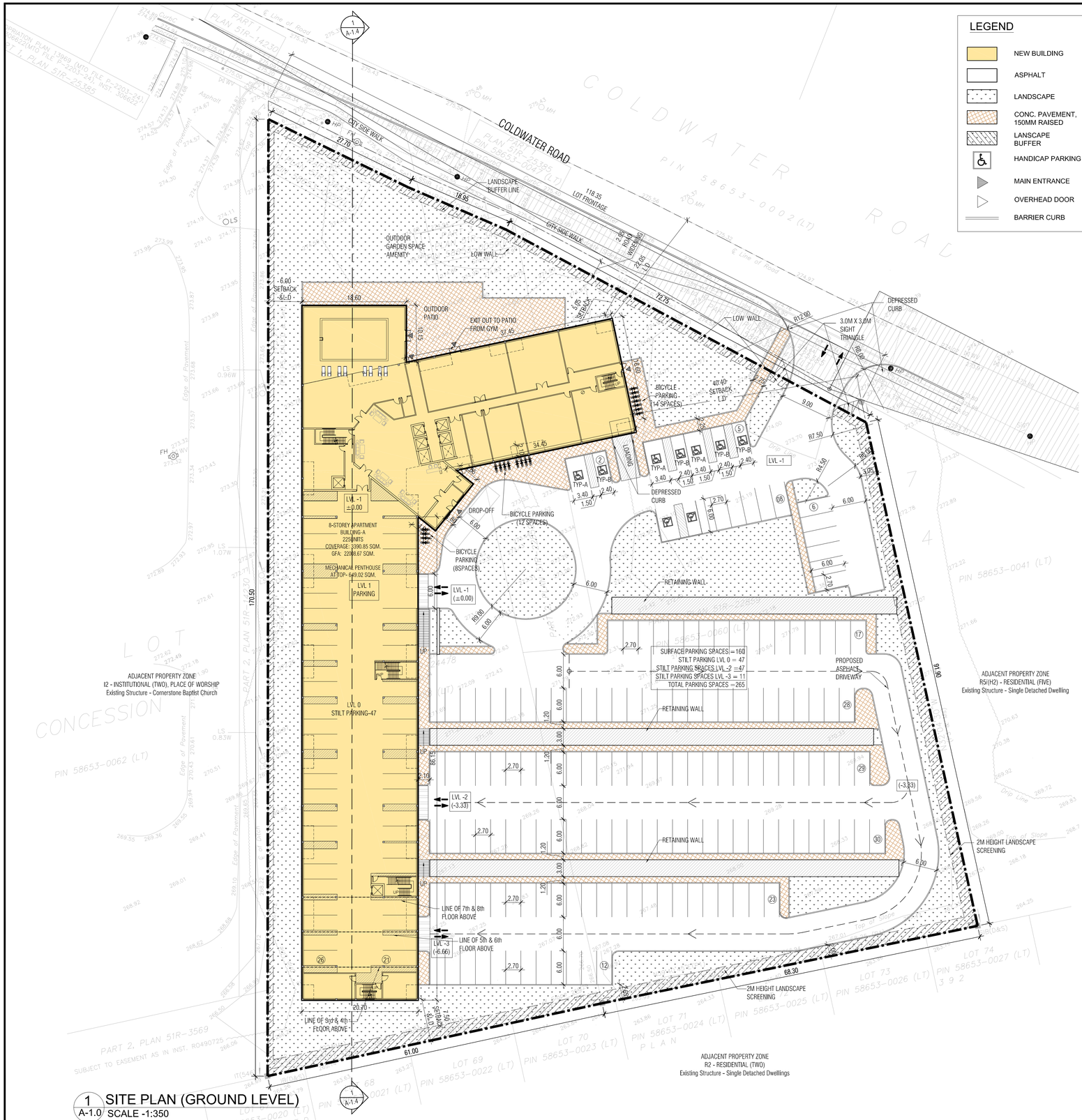
CONDOMINIUM 233,249,261 COLDWATER ROAD, WEST, ORILIA

DRAWING TITLE:

FIRE ROUTE PLAN

DRAWN BY: NG	DATE: 15 FEBRUARY 2021
CHECKED BY: NM	SCALE: AS NOTED
PROJECT NO.: **21-23**	DRAWING NO.: **A-1.2**

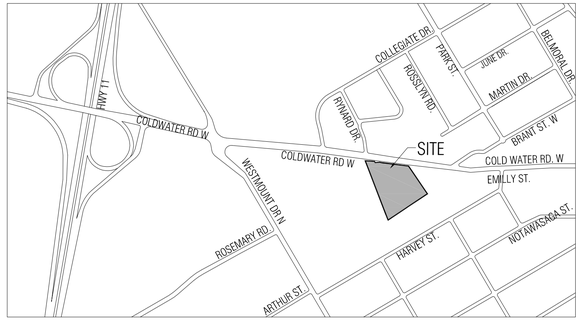
APPENDIX E
Site Plan



1 SITE PLAN (GROUND LEVEL)
A-1.0 SCALE -1:350

LEGEND

- NEW BUILDING
- ASPHALT
- LANDSCAPE
- CONC. PAVEMENT, 150MM RAISED
- LANSCAPE BUFFER
- HANDICAP PARKING
- MAIN ENTRANCE
- OVERHEAD DOOR
- BARRIER CURB



2 KEY PLAN
A-1.0 SCALE -NTS

PROJECT STATISTICS–

ADDRESS: 233, 249, 261 COLDWATER ROAD, ORILLIA, ON.

ZONING : R5i (H2)

	REQUIRED	PROVIDED
LOT(SITE) AREA (m^2)	1000 SQM.	15426.96 (3.81 ACRE)
ROAD WIDENING		350.78 SQM.
NET LOT AREA		15076.18 SQM. (3.72 ACRE)
LOT FRONTAGE MIN.	30.0 M.	118.35 M.
LOT DEPTH MIN.		93.80 M.
GROUND FLOOR AREA (m^2)		3390.85 SQM.
GROSS FLOOR AREA (m^2)	300.00 SQM.	22008.67 SQM.
BLDG. COVERAGE	60.0%	22.49%
BUILDING HT.	12.5 M. (MAX)	28.35 M.
PAVED AREA		1205.72 SQM
LANDSCAPE (MIN.)	40.0%	4142.87 SQM (35.7%)

BUILDING SETBACKS

	REQUIRED	PROVIDED
FRONT SETBACK (NORTH) (COLDWATER ROAD)	5.0 M.	5.05 M.
REAR SETBACK (SOUTH)	7.5 M.	7.50 M.
INT. SIDE SETBACK (WEST)	6.0 M.	6.0 M.
INT. SIDE SETBACK (EAST)	6.0 M.	40.40 M.

PARKING CALCULATION

	REQUIRED	PROVIDED
RESIDENTIAL UNITS – 225 UNITS 1.5 SPACES PER UNIT (2.7 M. X 6.0 M.)	338	265
ACCESSIBLE PARKING SPACE (TYPE A – 3.4 M X 6.0 M)	4	4
ACCESSIBLE PARKING SPACE (TYPE B – 2.4 M X 6.0 M)	5	5
TOTAL PARKING SPACES	338(INCL. 9 B/F)	265 (INCL. 9 B/F)
VISITOR PARKING (25% OF PARKING SPACES)	85	23
BICYCLE PARKING 1/10 PARKING SPACES	34	34

LOADING PROVISIONS

	REQUIRED	PROPOSED
LOADING SPACE (7.95 M X 3.4 M)	0	1

MUNICIPAL ADDRESS AND LEGAL DESCRIPTION
233, 249, 261 COLDWATER ROAD,
ORILLIA, ONTARIO
PART OF LOT 7, CONCESSION 4
CITY OF ORILLIA
COUNTY OF SIMCOE

SURVEY
YOUNG & YOUNG SURVEYING INC.
2 HOLLAND DRIVE, UNIT-5, BOLTON
ONTARIO L7E 1E1
T: 905.951.6000
E: info@youngsurveying.ca
W: www.youngsurveying.ca

APPLICANT
n Architecture Inc
208- 9120 LESLIE STREET,
RICHMOND HILL, ON., L4B 3J9
T: 416. 256. 9741
E: Info@narchitecture.com
www.narchitecture.com

OWNER:

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

N
GEODETIC NORTH
PROJECT NORTH

9th AUGUST 2022
ISSUED FOR SPA 1

No.	Date	Version	Dwn.
1.	2022-05-13	ISSUED FOR SPA 1	NG.

PROJECT:

CONDOMINIUM 233,249,261 COLDWATER ROAD, WEST, ORILLIA

DRAWING TITLE:

SITE PLAN (GROUND LEVEL)

DRAWN BY: NG	DATE: 15 FEBRUARY 2021
CHECKED BY: NM	SCALE: AS NOTED
PROJECT NO.: 21-23	DRAWING NO.: A-1.0

BLANK PAGE