

**95 Cook Street,
103 & 107 Napier Street
City of Barrie**

**Traffic Brief for
2556055 Ontario Inc.**

Type of Document:
Final Report

Project Number:
JDE – 21161

Date Submitted:
December 20th, 2022



John Northcote, P.Eng.
Professional License #: 100124071



ENGINEERING

JD Northcote Engineering Inc.
86 Cumberland Street
Barrie, ON
705.725.4035
www.JDEngineering.ca

Legal Notification

This report was prepared by **JD Northcote Engineering Inc.** for the account of **2556055 Ontario Inc.**

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. **JD Northcote Engineering Inc.** accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

Executive Summary

This report summarizes the traffic brief prepared for the proposed residential redevelopment located at 95 Cook Street, 103 and 107 Napier Street, in the in the City of Barrie [City]. The report assesses the impact of traffic related to the development on the adjacent roadway and provides recommendations to accommodate this traffic in a safe and efficient manner.

The proposed redevelopment is anticipated to include 35 townhouse units. The existing single-detached homes on 103 and 107 Napier Street will remain. The existing church building will be reduced to 378 sq.m. (4,068sq.ft.) and repurposed as a permitted use within the City's zoning by-law.

Access to the development is proposed via a full-movement driveway onto Cook Street [Site Access].

The scope of this analysis includes a review of the following intersections:

- Cook Street / Site Access.

Conclusions

1. The proposed development is expected to generate a total of 58 AM and 63 PM peak hour trips.
2. Detailed mid-block counts were conducted on Cook Street from 07:00-09:00 and 16:00-18:30 on Tuesday December 13th, 2022 and from 07:00-09:00 and 15:00-18:00 on Wednesday December 14th, 2022
3. A midblock capacity analysis was completed on Cook Street, using the existing and background (2025 & 2030) traffic volumes. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed development. No improvements are recommended within the study area.
4. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area intersection.
5. An intersection operation analysis was completed under total (2025 & 2030) traffic volumes with the proposed development operational at the study area intersection. No geometric improvements are recommended at the study area intersection as a result of the proposed development.
6. The proposed Site Access will operate efficiently with one-way stop control for egress movements. A single lane for ingress and egress movements will provide the necessary capacity to convey the traffic volume generated by the proposed development.
7. The sight distance available for the proposed Site Access is suitable for the intended use.
8. The location of the Site Access is considered appropriate based on detailed traffic operations review and in context with the Transportation Association of Canada Design Guide for Canadian Roads (2017) guidelines.
9. The proposed parking supply meets the minimum parking requirement identified in the City Zoning By-Law.
10. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network. The study area road network is considered well equipped to facilitate future growth, above and beyond the proposed development.

Table of Contents

1	Introduction.....	1
1.1	Background.....	1
1.2	Study Area	1
1.3	Study Scope and Objectives	2
1.4	Horizon Year and Analysis Periods	3
2	Information Gathering.....	3
2.1	Street and Intersection Characteristics	3
2.2	Transit Access	4
2.3	Active Transportation Infrastructure	5
2.4	Other Developments within the Study Area	5
2.5	Background Traffic Growth.....	6
2.6	Traffic Counts	6
2.7	Existing Traffic Volumes	6
2.8	Horizon Year Traffic Volumes.....	7
3	Intersection Operation without Proposed Development.....	10
3.1	Introduction	10
3.2	Existing and Background Road Section Operations	11
4	Proposed Development	11
4.1	Traffic Generation.....	11
4.2	Traffic Assignment.....	12
4.3	Total Horizon Year Traffic Volumes with the Proposed Development	14
5	Future Operations	16
5.1	Total (2025) Intersection Operation.....	16
5.2	Total (2030) Intersection Operation.....	16
5.3	Site Access	17
5.4	Parking.....	17
5.5	Sight Distance Review.....	17
5.6	Construction Staging	18
6	Summary	18

List of Tables

Table 1 – Traffic Count Data	6
Table 2 – Level of Service Criteria for Intersections.....	11
Table 3 – Estimated Traffic Generation of Proposed Development.....	12
Table 4 – Proposed Development Traffic Distribution.....	12
Table 5 – Total (2025) LOS	16
Table 6 – Total (2030) LOS	16
Table 7 - Zoning By-law Parking Requirements	17

List of Figures

Figure 1 – Proposed Site Location and Study Area	2
Figure 2 – Existing (2023) Intersection Spacing and Lane Configuration with in Study Area.....	4
Figure 3 – Study Area Transit Routes	5
Figure 4 – Existing (2023) Traffic Volumes	7
Figure 5 – Background (2025) Traffic Volumes.....	8
Figure 6 – Background (2030) Traffic Volumes.....	9
Figure 7 – Site Traffic Assignment	13
Figure 8 – Total (2025) Traffic Volumes	14
Figure 9 – Total (2030) Traffic Volumes	15

List of Appendices

APPENDIX A – Site Plan
APPENDIX B – Traffic Count Data
APPENDIX C – Synchro Analysis Output – Existing Traffic Volumes
APPENDIX D – Synchro Analysis Output – Background Traffic Volumes
APPENDIX E – Synchro Analysis Output – Total Traffic Volumes

1 Introduction

1.1 Background

2556055 Ontario Inc. [The Developer] is proposing a redevelopment of a site located at 95 Cook Street, 103 and 107 Napier Street, in the in the City of Barrie.

The proposed redevelopment is anticipated to include 35 townhouse units. The existing single-detached homes on 103 and 107 Napier Street will remain. The existing church building will be reduced to 378 sq.m. (4,068 sq.ft.) and repurposed as a permitted use within the City's zoning by-law.

Access to the development is proposed via a full-movement driveway onto Cook Street [Site Access].

The Developer has retained **JD Northcote Engineering Inc.** [JD Engineering] to prepare this traffic brief in support of the proposed development.

1.2 Study Area

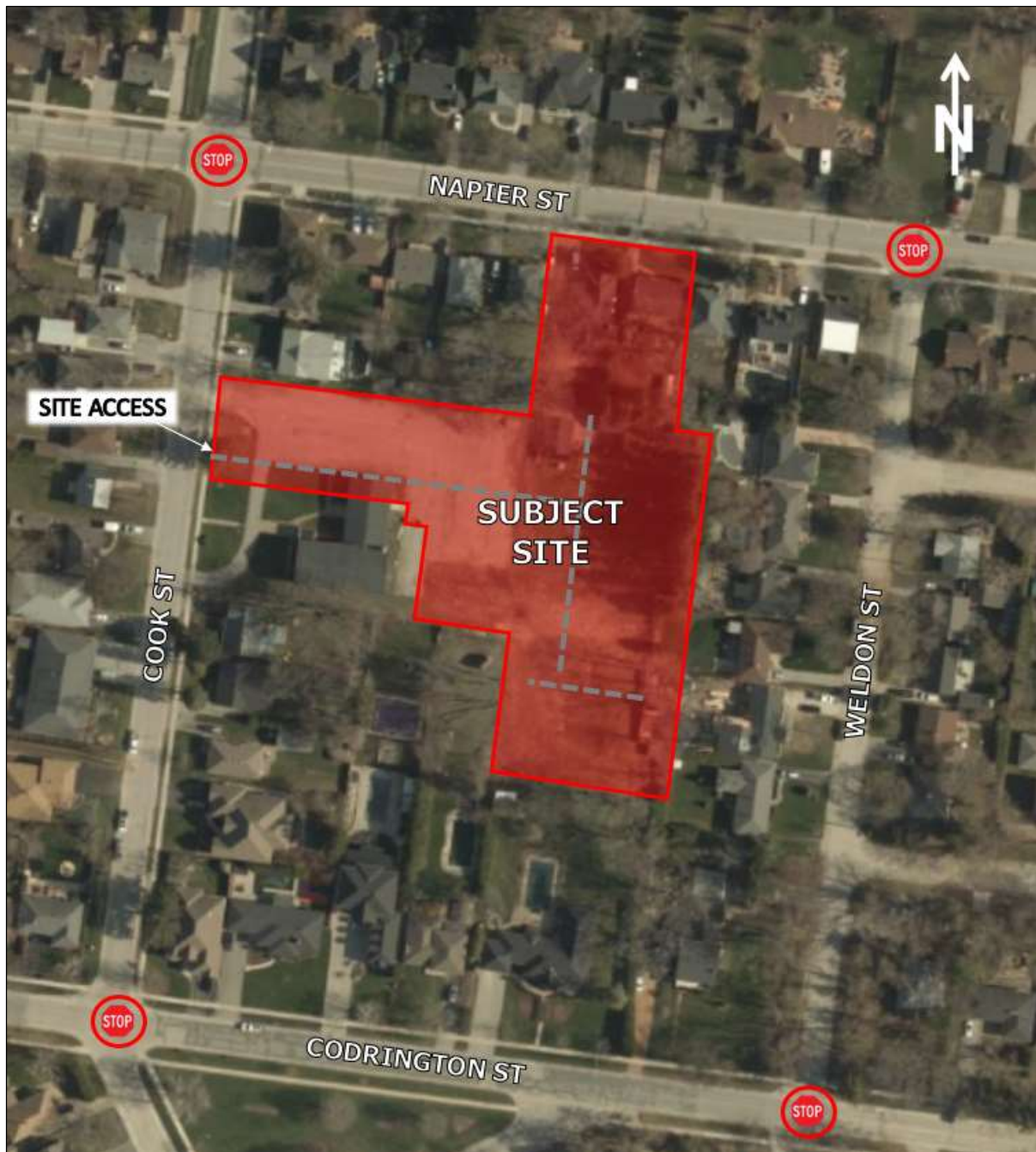
Figure 1 shows the location of the subject site and study area intersections in relation to the surrounding area. The Site Plan by Architecture Unfolded is provided in **Appendix A**.

The subject site encompasses the existing St. Giles Church Lands, 103 and 107 Napier Street lots, and is surrounded by Cook Street the west and existing residential lands to the north, south and east.

Through consultation with the City, a review of the operations at the following intersection is included in the Traffic Brief:

- Cook Street / Site Access.

Figure 1 – Proposed Site Location and Study Area



1.3 Study Scope and Objectives

The purpose of this study is to identify the potential impacts to traffic flow at the site access and on the surrounding roadway network. The analysis includes the following tasks:

- Consult with the City to address any traffic-related issues or concerns they have with the proposed development;

- Determine existing traffic volumes and circulation patterns;
- Estimate future traffic volumes if the proposed development was not constructed, including the impact of additional proposed developments in the area;
- Complete level-of-service [LOS] analysis of horizon year (without the proposed development) traffic conditions and identify operational deficiencies;
- Estimate the amount of traffic that would be generated by the proposed development and assign to the roadway network;
- Complete LOS analysis of horizon year (with the proposed development) traffic conditions and identify additional operational deficiencies;
- Identify improvement options to address operational deficiencies;
- Review the suitability of the study area road network to accommodate future development growth;
- Complete a review of the proposed Site Access in context with City standards;
- Review the proposed intersection spacing and driveway configuration;
- Complete a sight distance review for the proposed Site Access; and
- Review the proposed parking supply and assess the suitability for the proposed development; and
- Document findings and recommendations in a final report.

1.4 Horizon Year and Analysis Periods

Traffic scenarios for the existing year, buildout horizon year (2025) and 5-year horizon (2023) were selected for analysis of traffic operations in the study area. The weekday morning [AM] and weekday afternoon [PM] peak hours have been selected as the analysis periods for this study.

2 Information Gathering

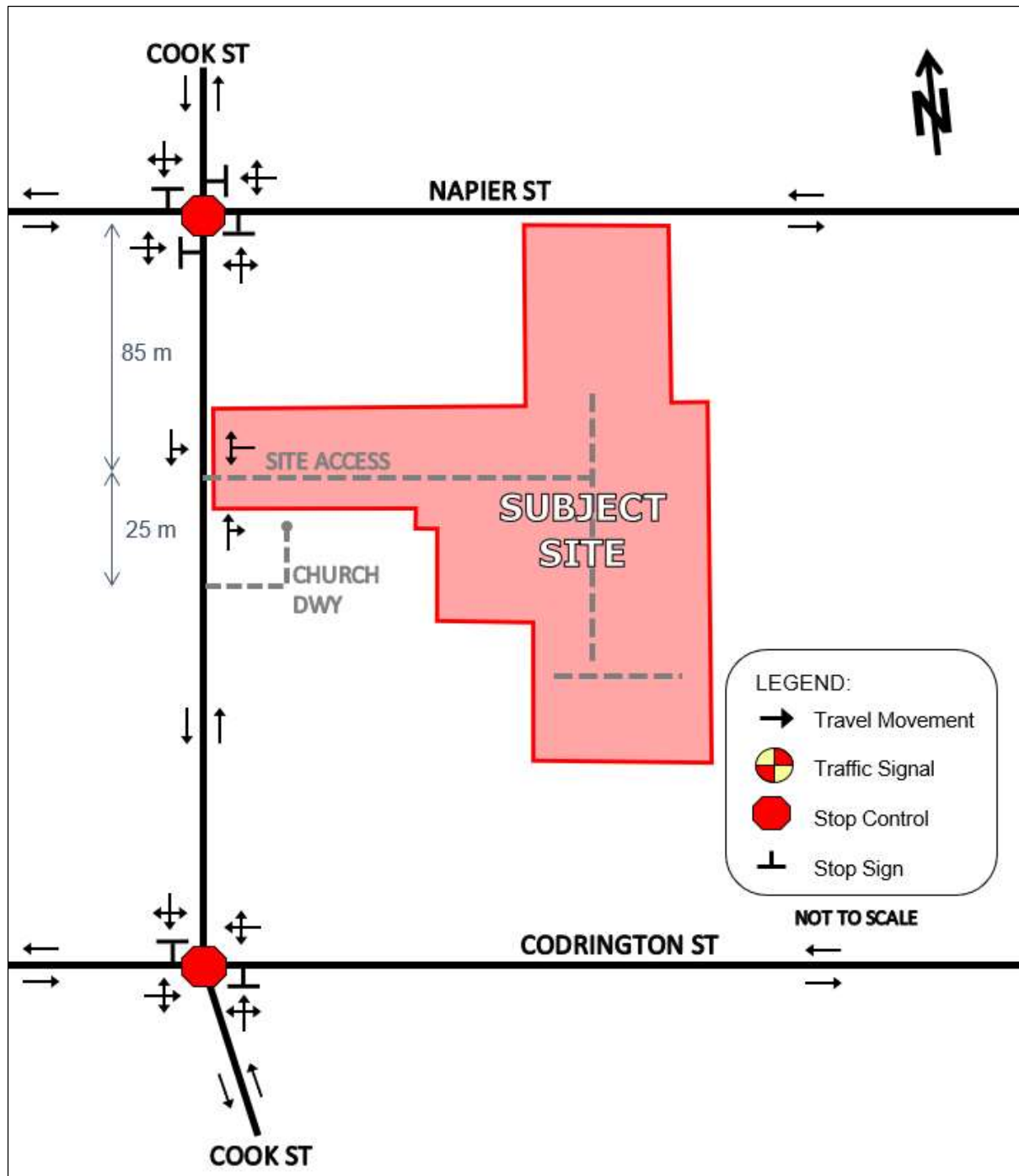
2.1 Street and Intersection Characteristics

Cook Street a two-lane local road with an urban cross-section and a sidewalk on the east side of the road. Cook Street has an unposted (assumed) speed limit of 50km/h and is under the jurisdiction of the City.

Napier Street a two-lane local road with an urban cross-section and a sidewalk on the south side of the road. Napier Street has an unposted (assumed) speed limit of 50km/h and is under the jurisdiction of the City.

The existing intersection spacing and lane configuration within the study area is illustrated in **Figure 2**.

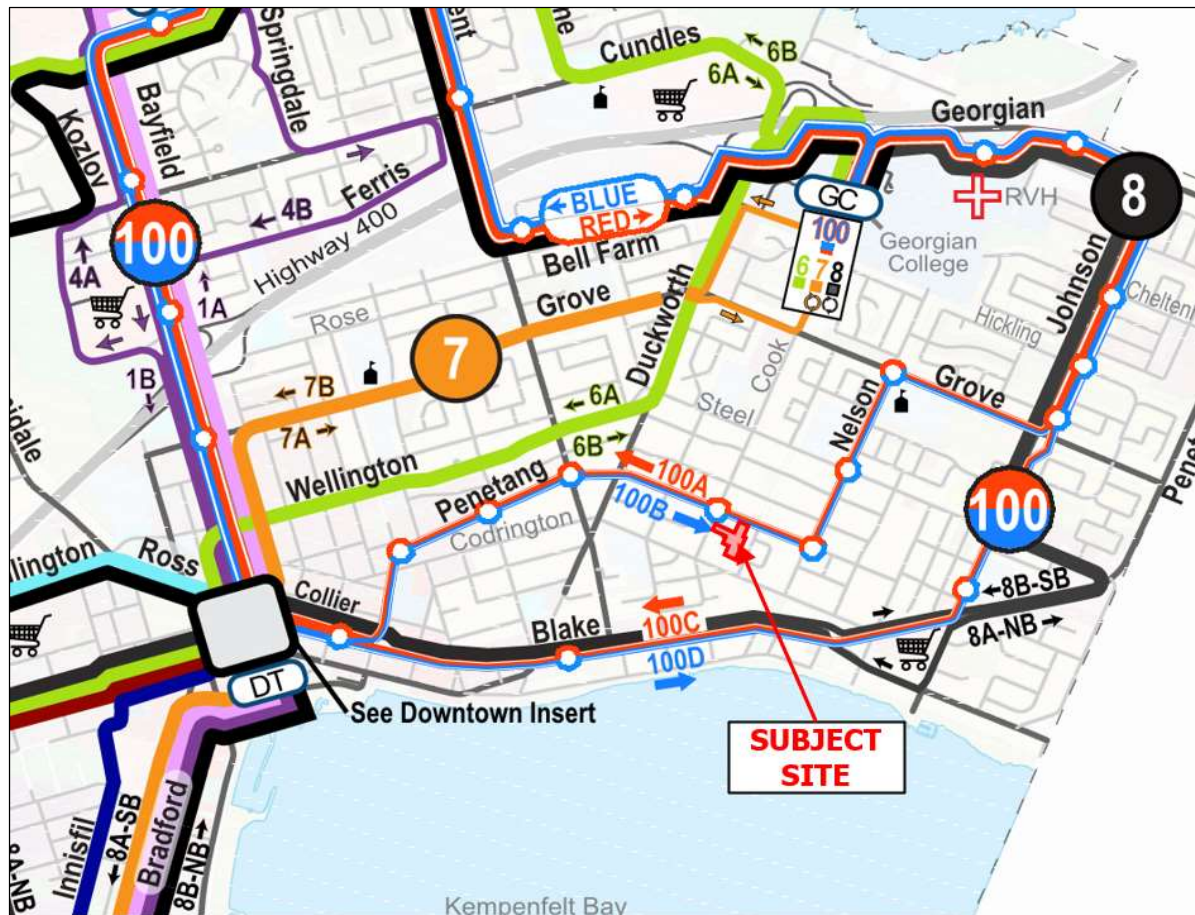
Figure 2 – Existing (2023) Intersection Spacing and Lane Configuration with in Study Area



2.2 Transit Access

Barrie Transit provides bus service within the study area. **Figure 3** illustrates the location of the subject site in relation to local transit routes.

Figure 3 – Study Area Transit Routes



The closest transit stop to the Subject Site is located approximately 85 metres to the north at the intersection of Cook Street and Napier Street (Route 100 – RED/BLOCK Express).

2.3 Active Transportation Infrastructure

As previously noted, Cook Street has a sidewalk on the east side of the road, providing direct pedestrian connection to the Subject Site.

Bicycle lanes are not available within the immediate area. However, the Subject Site is located within 700 metres of the Waterfront Multi-use Trail which provides access around Kempfenfelt Bay and connection opportunities to the City's active transportation infrastructure.

2.4 Other Developments within the Study Area

Based on our correspondence with City staff, no additional developments are anticipated within the study area.

2.5 Background Traffic Growth

Based on our correspondence with City staff, a growth rate of 2.0% per annum has been assumed within the study area.

2.6 Traffic Counts

Detailed midblock traffic and pedestrian counts were conducted by JD Engineering on Cook Street, adjacent the Subject Site. **Table 1** summarizes the traffic count data.

Table 1 – Traffic Count Data

Roadway	Count Date	AM Peak Hour	PM Peak Hour	Source
Cook Street	Tuesday & Wednesday December 13 & 14, 2022	08:00 – 09:00	16:00 – 17:00	JD Eng.

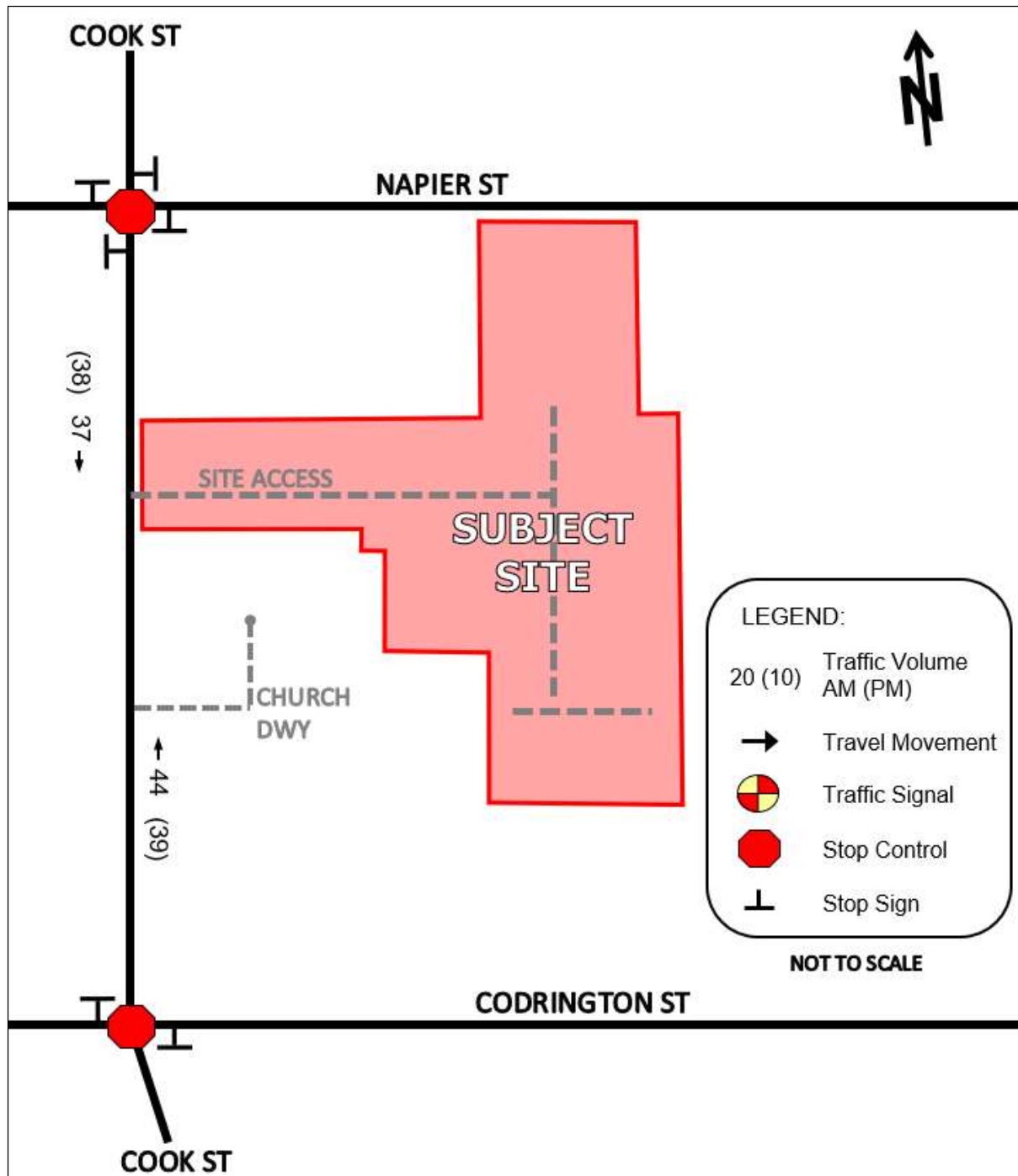
Detailed traffic count data can be found in **Appendix B**.

2.7 Existing Traffic Volumes

The 2023 existing AM and PM peak hour traffic volumes through the study area have been established based on the conducted traffic counts, in addition to the background growth rate discussed in Section 2.4.

The existing (2023) AM and PM peak hour traffic volumes are illustrated in **Figure 4**.

Figure 4 – Existing (2023) Traffic Volumes



2.8 Horizon Year Traffic Volumes

The background (2025 and 2030) horizon year traffic volumes without the proposed development were estimated using the background growth rate discussed in Section 2.4.

The background (2025 and 2030) horizon year traffic volumes are illustrated in **Figure 5**.

Figure 5 – Background (2025) Traffic Volumes

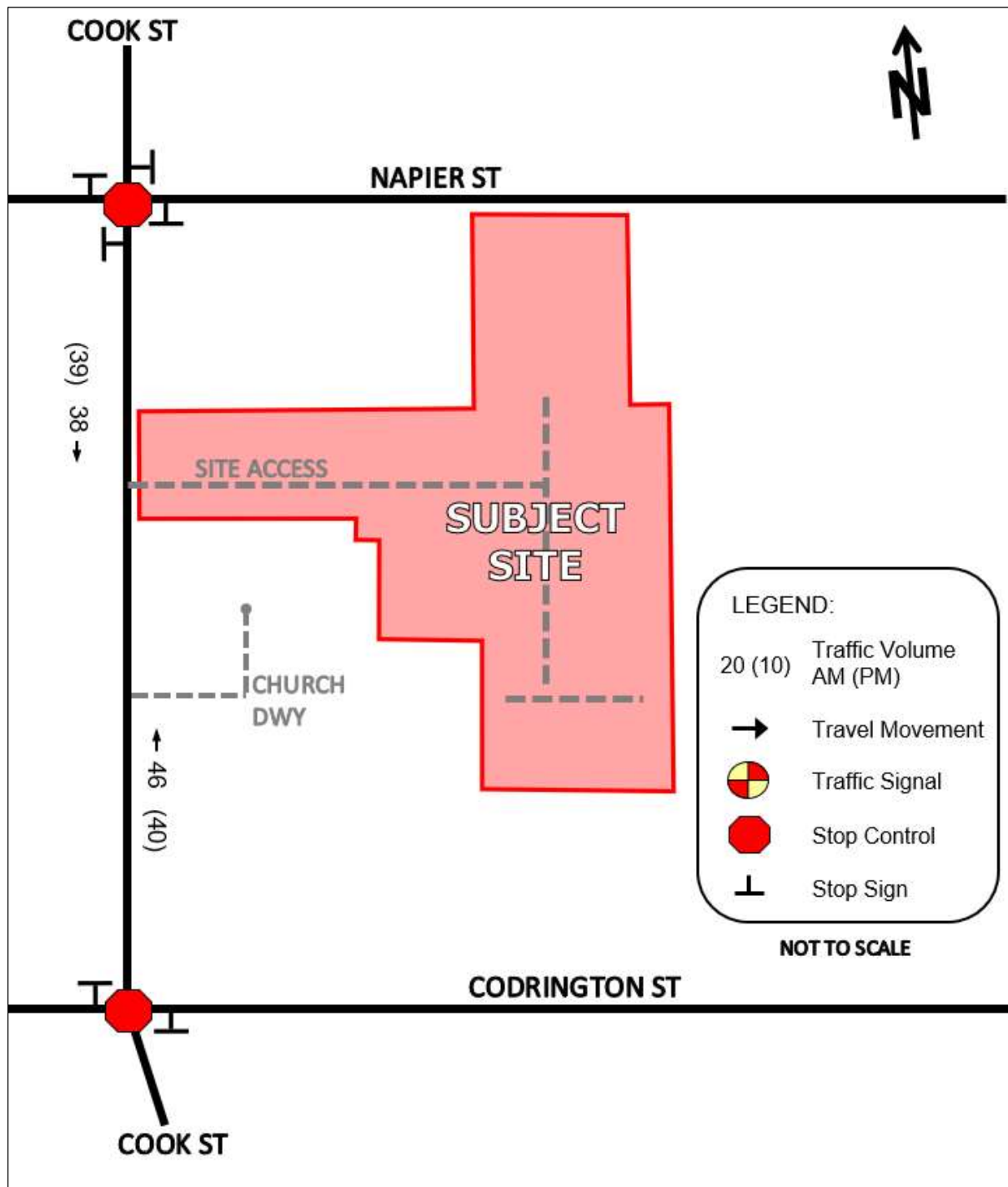
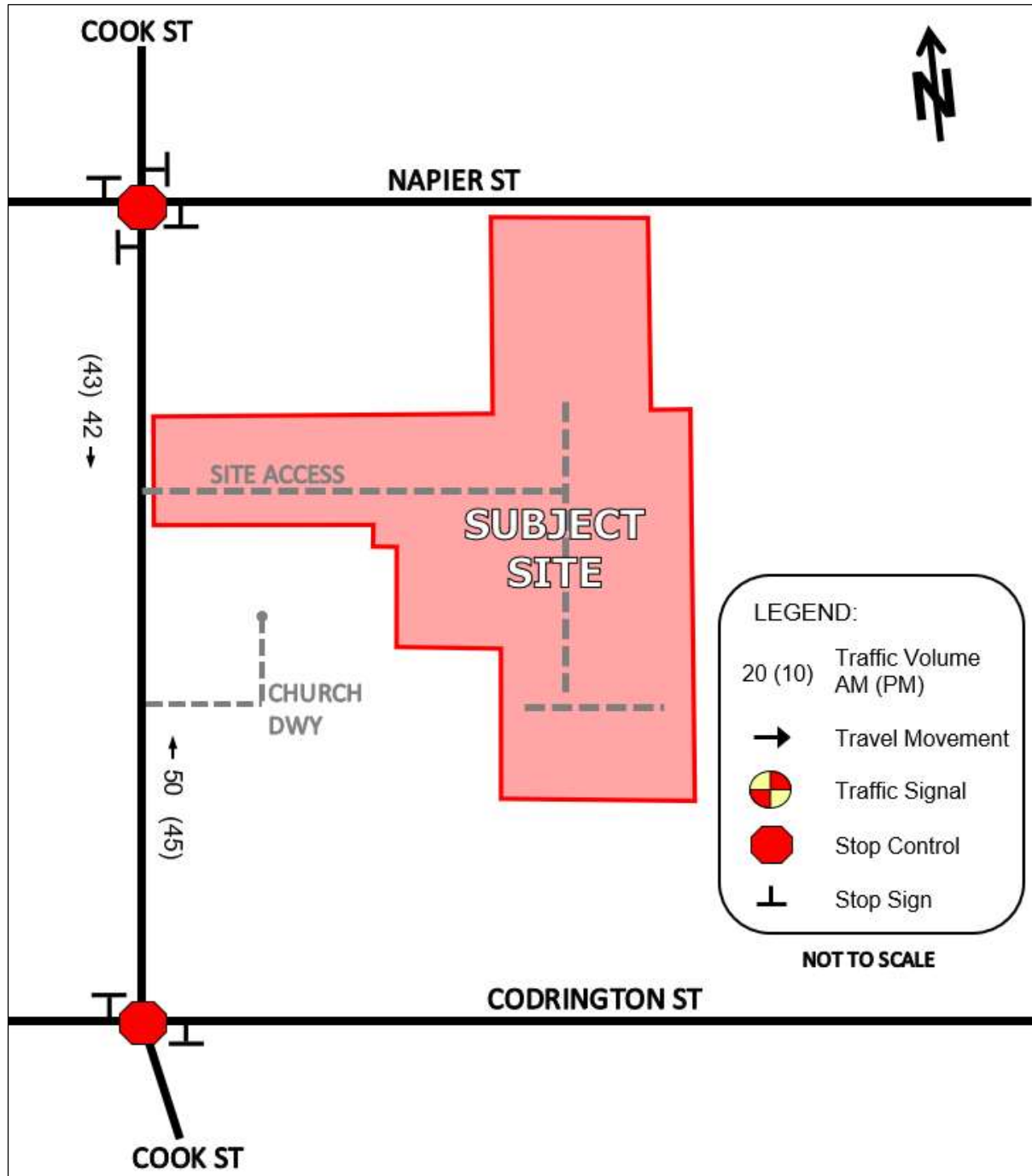


Figure 6 – Background (2030) Traffic Volumes



3 Intersection Operation without Proposed Development

3.1 Introduction

Existing and background horizon operational conditions were established to determine how the street network within the study area is currently functioning without the proposed development. This provides a base case scenario to compare with future development scenarios. Traffic operations within the study area were evaluated using the existing and future background traffic volumes with the existing road configuration and traffic control. The intersection performance was measured using the traffic analysis software, Synchro 11, a deterministic model that employs Highway Capacity Manual and Intersection Capacity Utilization methodologies for analyzing intersection operations. These procedures are accepted by provincial and municipal agencies throughout North America.

Synchro 11 enables the study area to be graphically defined in terms of streets and intersections, along with their geometric and traffic control characteristics. The user is able to evaluate both signalized and unsignalized intersections in relation to each other, thus not only providing level of service for the individual intersections, but also enabling an assessment of the impact the various intersections in a network have on each other in terms of spacing, traffic congestion, delay, and queuing.

The intersection operations were also evaluated in terms of the LOS. LOS is a common measure of the quality of performance at an intersection and is defined in terms of vehicular delay. This delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS is expressed on a scale of A through F, where LOS A represents very little delay (i.e. less than 10 seconds per vehicle) and LOS F represents very high delay (i.e. greater than 50 seconds per vehicle for a stop sign controlled intersection and greater than 80 seconds per vehicle for a signalized intersection).

The LOS criteria for signalized and stop sign-controlled intersections are shown in **Table 2**. A description of traffic performance characteristics is included for each LOS.

Table 2 – Level of Service Criteria for Intersections

LOS	LOS Description	Control Delay (seconds per vehicle)	
		Signalized Intersections	Stop Controlled Intersections
A	Very low delay; most vehicles do not stop (Excellent)	less than 10.0	less than 10.0
B	Higher delay; more vehicles stop (Very Good)	between 10.0 and 20.0	between 10.0 and 15.0
C	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping (Good)	between 20.0 and 35.0	between 15.0 and 25.0
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop (Satisfactory)	between 35.0 and 55.0	between 25.0 and 35.0
E	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of acceptable delay	between 55.0 and 80.0	between 35.0 and 50.0
F	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection (Unacceptable)	greater than 80.0	greater than 50.0

3.2 Existing and Background Road Section Operations

Recognizing that the existing and background road network, without the proposed development, does not include any intersection movements, the operations have been limited to a review of the midblock traffic volumes. As per **Figure 4** through **6**, traffic volumes on Cook Street, adjacent the Subject Site, are in the range of 38 to 44 and 43 to 50 vehicles per lane during the AM and PM peak hours, respectively. In context with the capacity of a typical local (400 vehicles per hour per lane), Cook Street is projected to operate at 13% capacity or less through the 2030 horizon year.

As such, no improvements are necessary to facilitate the existing conditions.

4 Proposed Development

4.1 Traffic Generation

The traffic generation for the subject site has been based on the ITE Trip Generation Manual. For the purpose of this study, the existing church building has been assumed to be repurposed as a child care facility, consistent with the permitted uses for an institutional zone within the City's zoning by-law.

The following ITE land use has been applied to estimate the traffic from the proposed development:

- ITE land use 220 (Multifamily Housing (Low-Rise)) – General Urban/Suburban Setting; and
- ITE land use 565 (Day Care Center) – General Urban/Suburban Setting.

The AM and PM peak hour traffic generation for the proposed development do not exactly align with the AM and PM peak hour in the traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual. The estimated trip generation for the proposed development is illustrated below in **Table 3**.

Table 3 – Estimated Traffic Generation of Proposed Development

Land Use	Trip Rate / Size	AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Multifamily Housing (Low-Rise) ITE Land Use: 220	rate (units)	0.10	0.30	0.40	0.32	0.19	0.51
Day Care Center ITE Land Use: 565	rate (1000 sq.ft. GFA)	3.22	2.86	6.08	5.23	5.89	11.12
Subject Site	35 units	3	11	14	11	7	18
	4,068 sq.ft.	23	21	44	21	24	45
Total		26	32	58	32	21	63

As shown, the proposed redevelopment is expected to generate 58 AM and 63 PM peak hour trips.

4.2 Traffic Assignment

For the purposes of this study, it has been assumed that all traffic generated by the proposed development will be new traffic and would not be in the study area if the development was not constructed. In order to remain conservative, no reduction has been applied to the existing church traffic volumes on site.

The ITE data provides the anticipated percentage of new traffic entering and exiting during the peak hour. The traffic distribution for the development has been estimated based on the existing directional distribution on Cook Street.

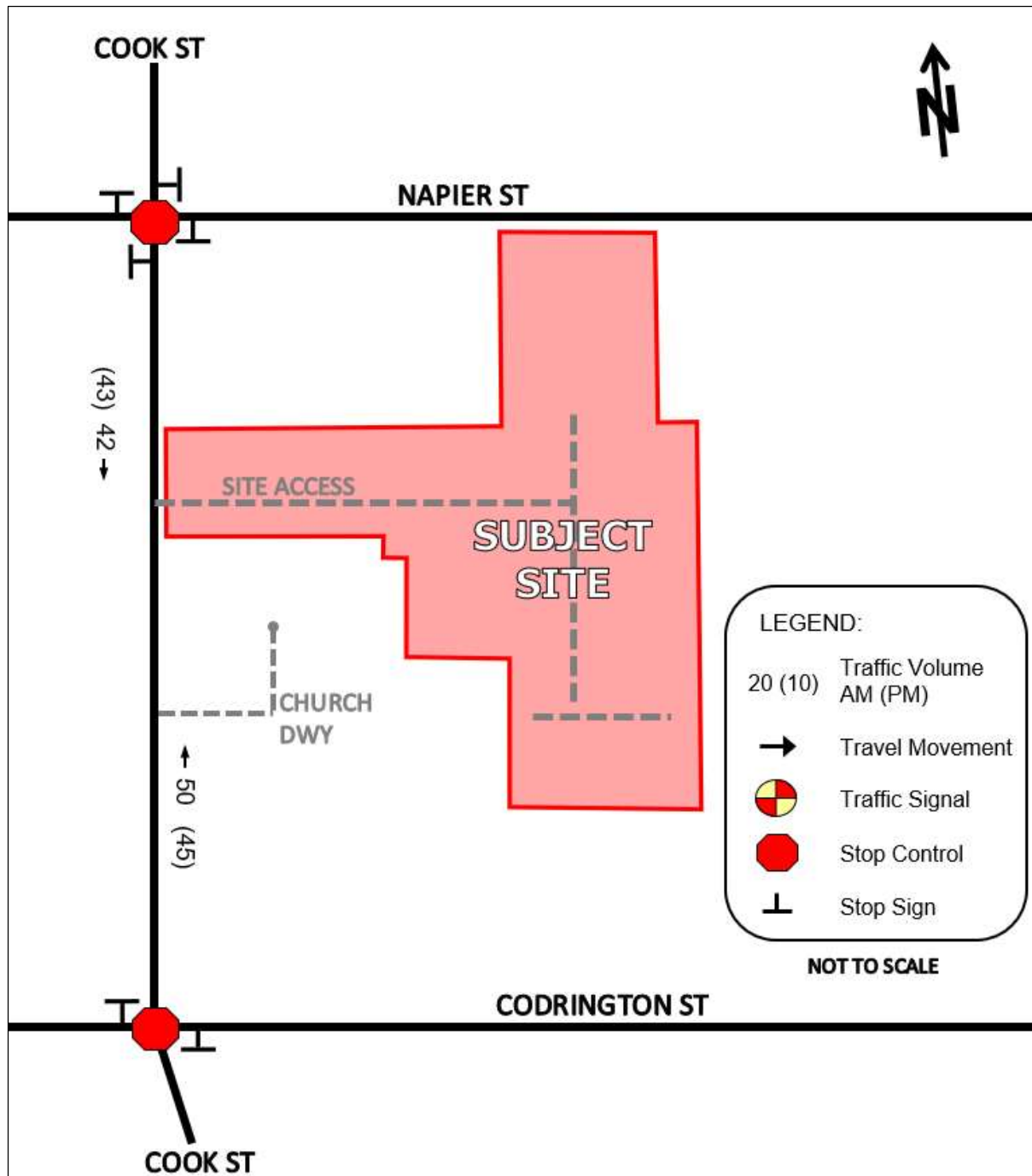
The distribution of trips is illustrated in **Table 4** using the methodology outlined above.

Table 4 – Proposed Development Traffic Distribution

Travel Direction (to / from)	Percent of Total Traffic Generation	
	AM Peak Hour	PM Peak Hour
North via Cook Street	46%	49%
South via Cook Street	54%	51%
TOTAL	100%	100%

The site traffic assignment for buildout of the proposed development during the AM and PM peak hour is illustrated in **Figure 7**.

Figure 7 – Site Traffic Assignment



4.3 Total Horizon Year Traffic Volumes with the Proposed Development

For the total (2025 and 2030) horizon year traffic volumes, the proposed development traffic was added to the background (2025 and 2030) traffic volumes. The resulting total (2025 and 2030) horizon year traffic volume for the AM and PM peak hour are illustrated in **Figure 8** and **Figure 9**.

Figure 8 – Total (2025) Traffic Volumes

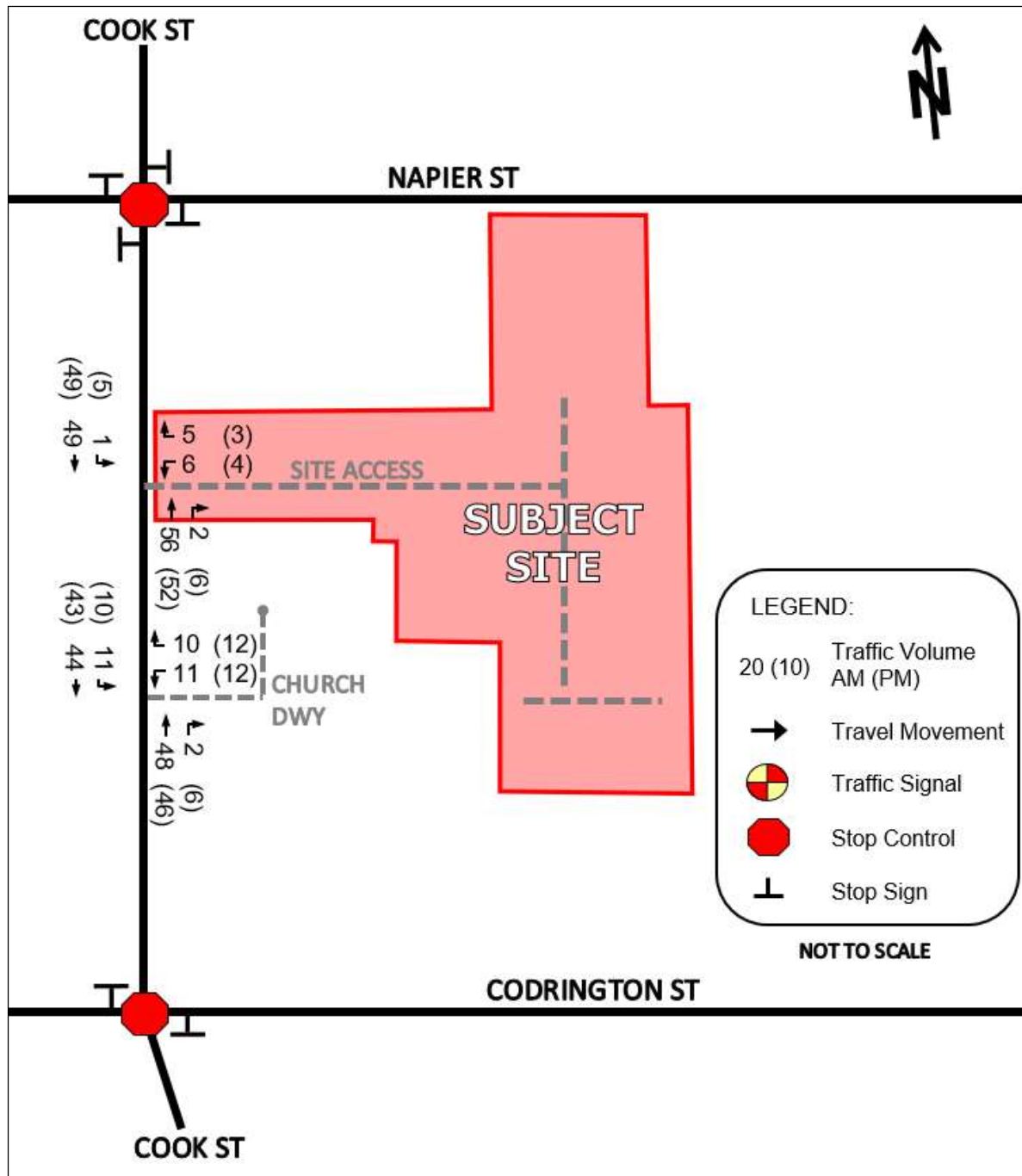
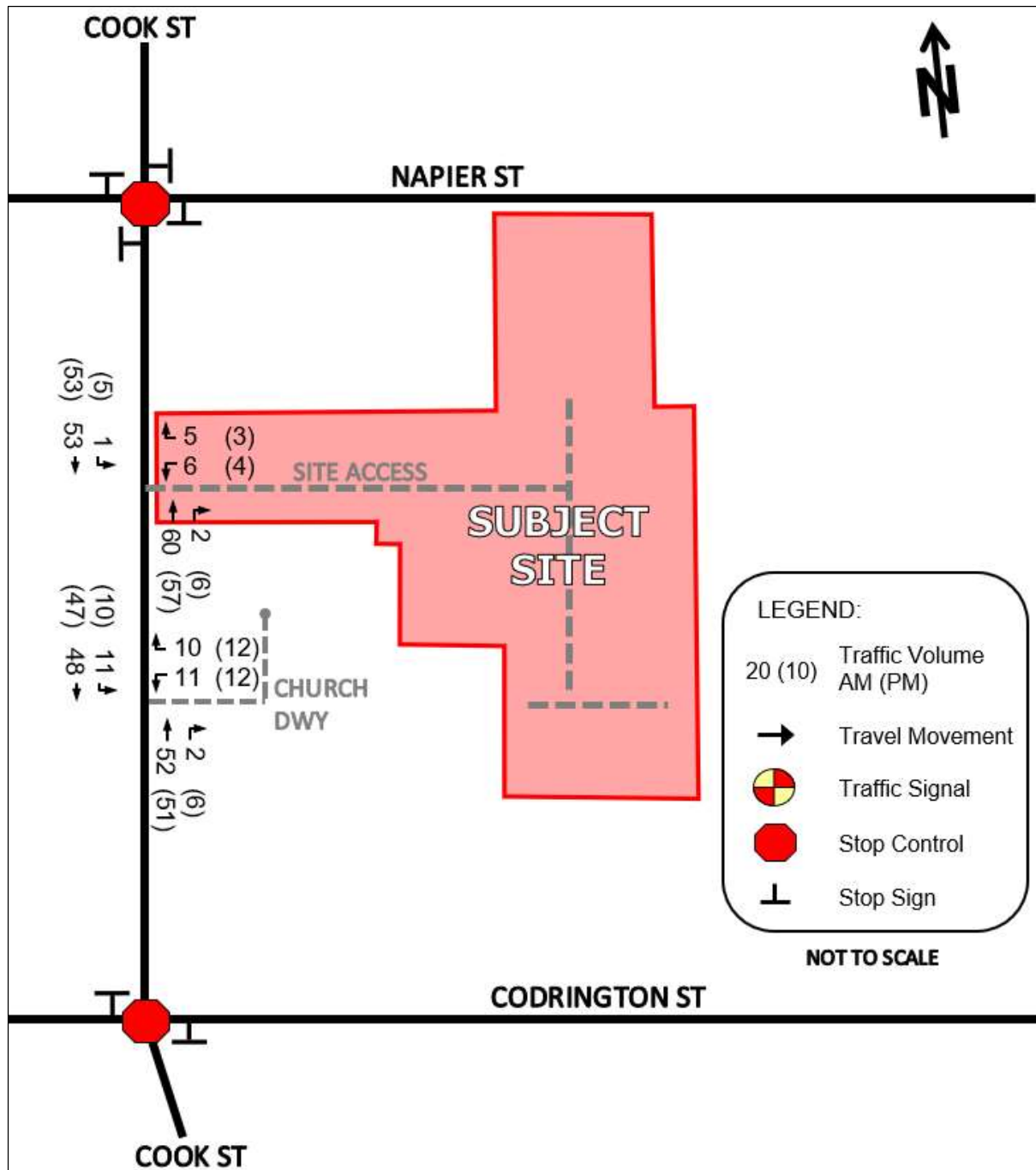


Figure 9 – Total (2030) Traffic Volumes



5 Future Operations

5.1 Total (2025) Intersection Operation

The results of the LOS analysis under total (2025) traffic volumes during the AM and PM peak hour can be found below in **Table 5**. Existing intersection geometry and traffic control have been utilized for this scenario, including stop control for the Site Access egress movement. Detailed output of the Synchro analysis can be found in **Appendix D**.

Table 5 – Total (2025) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour					Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)		V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model				Storage	Model
Cook Street / Site Access (unsignalized)	-	0.9	A	-	-	-	0.9	A	-	-
WB	0.02	9.2	A	-	1.0	0.01	9.2	A	-	1.0
NB	0.04	0.0	-	-	0.0	0.04	0.0	-	-	0.0
SB	0.00	0.1	A	-	0.0	0.00	0.7	A	-	1.0

The results of the LOS analysis indicate that the Site Access will operate within the typical design limits noted in Section 3.1.

Noting the satisfactory intersection operations and excess lane capacity, the study area road network is considered well equipped to facilitate future growth, above and beyond the proposed development.

No additional improvements are recommended within the study area.

5.2 Total (2030) Intersection Operation

The results of the LOS analysis under total (2030) traffic volumes during the AM and PM peak hour can be found below in **Table 6**. Existing intersection geometry and traffic control have been utilized for this scenario, including stop control for the Site Access egress movement. Detailed output of the Synchro analysis can be found in **Appendix D**.

Table 6 – Total (2030) LOS

Location (N-S Street / E-W Street)	Weekday AM Peak Hour					Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)		V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model				Storage	Model
Cook Street / Site Access (unsignalized)	-	0.9	A	-	-	-	0.8	A	-	-
WB	0.02	9.2	A	-	1.0	0.01	9.2	A	-	1.0
NB	0.05	0.0	-	-	0.0	0.05	0.0	-	-	0.0
SB	0.00	0.1	A	-	0.0	0.00	0.6	A	-	1.0

The results of the LOS analysis indicate that the Site Access will operate within the typical design limits noted in Section 3.1.

Noting the satisfactory intersection operations and excess lane capacity, the study area road network is considered well equipped to facilitate future growth, above and beyond the proposed development.

No additional improvements are recommended within the study area.

5.3 Site Access

The proposed spacing between the Site Access and its closest intersection to the north and south (65 metres and 125 metres, respectively – measured edge of driveway to edge of driveway) meets the minimum driveway spacing requirements as per the TAC Guidelines – Figure 8.8.2 (Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections) – 15 metres for unsignalized condition on a local road.

The proposed spacing between the Site Access and the Church Driveway to the south (7.5 metres – measured edge of driveway to edge of driveway) meets the minimum driveway spacing requirements as per the TAC Guidelines – Figure 8.9.2 (Driveway Spacing Guidelines – Locals and Collectors) – 1.0 metres for residential driveways.

As indicated in **Appendix A**, the entrance is proposed to provide a 6.0 metre paved width which is considered sufficient in context with TAC guidelines - Table 8.9.1 (Typical Driveway Dimensions). The parking aisles within the proposed parking lot provide two-way operations maintaining a minimum clear route width of 6.0 metres and internal centreline radii of 12.0 metres. This configuration is sufficient to accommodate the typical traffic movements for passenger vehicles, waste collection vehicles and emergency vehicles.

A review of the need for a secondary access was completed as part of this study. According to the National Fire Protection Association, a secondary emergency access is required for a development with more than 100 residential units. In this case, the number of units is significantly less than 100 and the traffic capacity for a single access can accommodate the traffic generated by the subject site; consequently, a secondary access for the residential development is not recommended.

5.4 Parking

The City's *Zoning By-law 2009-141* provides parking requirements for a variety of building types and land uses. The requirements for the repurposed church building will be reviewed upon confirmation of the proposed land use.

Table 7 summarizes the parking requirement, according to the ZBL, for the proposed development.

Table 7 - Zoning By-law Parking Requirements

Category	Parking Standard	Size	Required	Provided	Net Parking Supply
Residential Building – containing more than 3 dwelling units	1.5 spaces per unit	35 units	53 spaces	70 resident + 8 visitor = 78 spaces	+ 25 spaces
TOTAL PARKING SPACES			53 spaces	78 spaces	+ 25 spaces

The proposed development will provide 78 total parking spaces, which exceeds with minimum parking requirement, according to the ZBL.

5.5 Sight Distance Review

A review of the available sight distances for the Site Access was completed as part of this analysis.

The sight distance to the north and south on Cook Street (measured at 200+ and 145 metres, respectively) are greater than both the minimum stopping sight distance (85 metres) and intersection sight distance (130 metres) requirements as identified in the TAC Guidelines for a design speed of 60km/h. Sight lines to the north extend through the Napier Street / Cook Street intersection. However, in this case, the vehicles approaching the Site Access will do so at a reduced speed, having just stopped at the Napier Street / Cook Street intersection. Consequently, the available sight lines are considered appropriate.

There are no issues with the sight distance available for the proposed Site Access.

5.6 Construction Staging

A review of the construction staging plan was completed as it relates to parking of trades people, delivery of construction material, maintenance of adjacent property access, pedestrian movements, City infrastructure, etc.

Access to the Subject Site will be provided via the existing driveway entrance onto Cook Street. The existing driveway will be the primary access throughout the entire construction period (i.e. demolition, site preparation, servicing and erection etc.).

Delivers and trades parking can be accommodated on-site, with any temporary overflow parking occurring on local roads (Cook Street). The expected construction staging plan is not expected to impede or prevent access to the neighbouring lots.

Construction activities within the site (including start-up and warm-up of equipment) will only occur between 07:00 and 19:00 on weekdays and Saturdays, per City of Barrie by-law. No construction activities will occur outside the above-noted periods without approval from the City.

Signage shall be posted at all site access as required, notifying visitors that check-in at the site office is mandatory. Signage will also be provided to identify the area as a 'construction site', requiring all visitors be equipped with personal protection equipment suitable for a construction zone (hard hat, footwear, high visibility gear). Signage will also be provided informing that access to the site is limited to authorized personnel only.

6 Summary

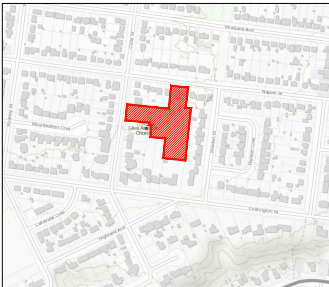
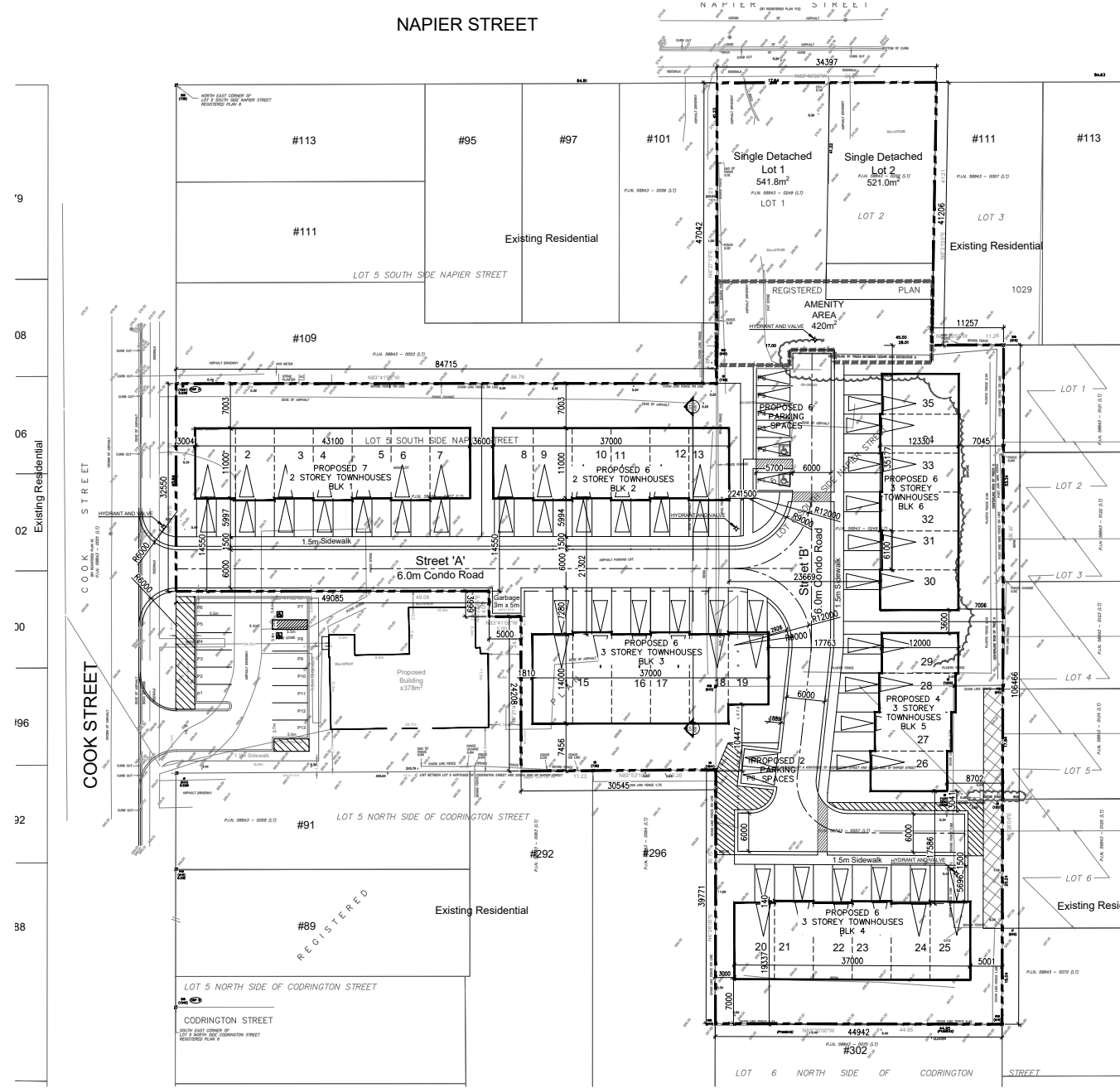
2556055 Ontario Inc. retained **JD Engineering** to prepare this traffic brief in support of the proposed residential redevelopment located at 95 Cook Street, 103 and 107 Napier Street, in the in the City of Barrie. The proposed Site Plan is shown in **Appendix A**. This chapter summarizes the conclusions and recommendations from the study.

1. The proposed development is expected to generate a total of 58 AM and 63 PM peak hour trips.
2. Detailed mid-block counts were conducted on Cook Street from 07:00-09:00 and 16:00-18:30 on Tuesday December 13th, 2022 and from 07:00-09:00 and 15:00-18:00 on Wednesday December 14th, 2022
3. A midblock capacity analysis was completed on Cook Street, using the existing and background (2025 & 2030) traffic volumes. This enabled a review of existing and future traffic deficiencies that would be present without the influence of the proposed development. No improvements are recommended within the study area.

4. An estimate of the amount of traffic that would be generated by the Subject Site was prepared and assigned to the study area intersection.
5. An intersection operation analysis was completed under total (2025 & 2030) traffic volumes with the proposed development operational at the study area intersection. No geometric improvements are recommended at the study area intersection as a result of the proposed development.
6. The proposed Site Access will operate efficiently with one-way stop control for egress movements. A single lane for ingress and egress movements will provide the necessary capacity to convey the traffic volume generated by the proposed development.
7. The sight distance available for the proposed Site Access is suitable for the intended use.
8. The location of the Site Access is considered appropriate based on detailed traffic operations review and in context with the Transportation Association of Canada Design Guide for Canadian Roads (2017) guidelines.
9. The proposed parking supply meets the minimum parking requirement identified in the City Zoning By-Law.
10. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network. The study area road network is considered well equipped to facilitate future growth, above and beyond the proposed development.

Appendix A – Site Plan

NAPIER STREET



2 context plan
A101 nts

The drawing is the property of Architecture unfolded. The drawing and all the information contained herein may not be reproduced in whole or in part without the written permission of the architect.

These Contract Documents are the property of the architect. The architect retains ownership of the design and all information contained herein. The architect reserves the right to reuse the design and all information contained herein for any other project without the written permission of the architect.

Any use of the design for construction without the written permission of the architect is strictly prohibited. The architect reserves the right to sue for damages and to seek an injunction to prevent such use.

These drawings are not to be used for construction unless noted below or issued by the architect.

All work to be carried out in accordance with the Code and bylaws of the applicable municipality.

The design of these plans and specifications given by architect is representation to the client that the architect is a duly licensed professional and that the design is in accordance with the applicable laws and regulations. The architect does not warrant the accuracy or completeness of the information provided by the client or the accuracy or completeness of the design. The architect is not responsible for the design of any other work not shown on these plans.

notes:

revisions:

architectureunfolded		388 dufferin st., toronto, on. m6h 1z6, m. (416) 601-6416	
STATISTICS - 99 Cook		2239	
September 22 2023			
		m2	ft2
ZONING		RM2	
SITE AREA		9,823.6	105,740
SALEABLE AREA		2,43	1.5
PROPOSED			
BLOCK 1		1,150.6	12,385
BLOCK 2		988.2	10,637
BLOCK 3		1,497.3	16,117
BLOCK 4		1,348.5	14,515
BLOCK 5		892.8	9,610
BLOCK 6		1,348.5	14,515
GRAND TOTAL		14,451.8	155,557.7
UNITS		38 + FAMILY RM (2 STOREY)	38 + FAMILY RM (3 STOREY)
PROPOSED		7	0
BLOCK 1		6	0
BLOCK 2		0	6
BLOCK 3		0	6
BLOCK 4		0	6
BLOCK 5		0	4
BLOCK 6		0	6
GRAND TOTAL		13	22
HEIGHT		10M	35
PERMITTED		<10M	
PARKING		15 parking per unit	53
PROPOSED			
RESIDENTIAL			
TH		70	(includes 7 BP spaces)
OPTIONAL 2ND P.		23	(not included in total)
Total		70	
VISITORS			
SURFACE		8	
Total		8	
GRAND TOTAL: residential/visitors		78	

architectural team :

mark zwicker

melina andriotto

planning:

structural:

electrical:

mechanical:

landscape:

site services:

owner:

project:

95 Cook St

toronto, ontario

site and context plan

oct. 21, 2022
as indicated

ma

drawn by:

Appendix B – Traffic Count Data

13-Dec	North Bound					South Bound					Total
	Cars	Trucks	Buses	Vehicles	Walkers	Cars	Trucks	Buses	Vehicles	Walkers	Vehicles
7:00 to 7:15	4			4		2			2	1	6
7:15 to 7:30	7			7	2	3			3	2	10
7:30 to 7:45	7			7		8			8	1	15
7:45 to 8:00	7			7	2	5		1	6		13
8:00 to 8:15	8			8		6			6		14
8:15 to 8:30	11			11	3	8			8		19
8:30 to 8:45	11	1		12	1	12			12	3	24
8:45 to 9:00	11	1		12	1	10			10	6	22
9:00 to 9:15	3			3		7			7		10
	71					62					133

13-Dec	North Bound					South Bound					Total
	Cars	Trucks	Buses	Vehicles	Walkers	Cars	Trucks	Buses	Vehicles	Walkers	Vehicles
4:00 to 4:15	8		1	9	3	16			16		25
4:15 to 4:30	12			12	3	6			6		18
4:30 to 4:45	8			8	1	5			5		13
4:45 to 5:00	9			9		10			10		19
5:00 to 5:15	5			5	1	9	1		10		15
5:15 to 5:30	11			11	1	8			8		19
5:30 to 5:45	4			4		7			7		11
5:45 to 6:00	6			6		7			7		13
6:00 to 6:15	8			8		4			4		12
6:15 to 6:30	6			6	1	4			4		10
	78					77					155

14-Dec	North Bound					South Bound					Total
	Cars	Trucks	Buses	Vehicles	Walkers	Cars	Trucks	Buses	Vehicles	Walkers	Vehicles
7:00 to 7:15	7			7	1	5			5		12
7:15 to 7:30	4			4		5			5		9
7:30 to 7:45	3			3	1	7			7		10
7:45 to 8:00	6			6		9		1	10		16
8:00 to 8:15	13			13	2	7			7		20
8:15 to 8:30	11			11	1	7			7		18
8:30 to 8:45	10			10	1	13			13		23
8:45 to 9:00	10			10		7			7		17
9:00 to 9:15	4			4		10			10		14
	68					71					139

14-Dec	North Bound					South Bound					Total
	Cars	Trucks	Buses	Vehicles	Walkers	Cars	Trucks	Buses	Vehicles	Walkers	Vehicles
3:00 to 3:15	6	1		7	1	10	1		11		18
3:15 to 3:30	8			8	4	10			10		18
3:30 to 3:45	4			4	7	6			6		10
3:45 to 4:00	4	1		5	1	13	1		14		19
4:00 to 4:15	7		1	8		8			8		16
4:15 to 4:30	4			4		10			10		14
4:30 to 4:45	9			9	2	6			6		15
4:45 to 5:00	10			10	1	8			8		18
5:00 to 5:15	9			9	2	9			9		18
5:15 to 5:30	6			6		6			6		12
5:30 to 5:45	8			8		4			4		12
5:45 to 6:00	9			9		11			11		20
6:00 to 6:15	8			8	1	7			7		15
	95					110					205

Appendix C – Synchro Analysis Output – Total Traffic Volumes

HCM Unsignalized Intersection Capacity Analysis

1: Cook Street & Site Access

95 Cook, 103 & 107 Napier

Total (2025) - AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	5	56	2	1	49
Future Volume (Veh/h)	6	5	56	2	1	49
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	8	6	70	2	1	61
Pedestrians	10		10			10
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	154	91			82	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	154	91			82	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	821	948			1501	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	14	72	62			
Volume Left	8	0	1			
Volume Right	6	2	0			
cSH	871	1700	1501			
Volume to Capacity	0.02	0.04	0.00			
Queue Length 95th (m)	0.4	0.0	0.0			
Control Delay (s)	9.2	0.0	0.1			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	0.1			
Approach LOS	A					
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		19.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

1: Cook Street & Site Access

95 Cook, 103 & 107 Napier

Total (2025) - PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	4	3	52	6	5	49
Future Volume (Veh/h)	4	3	52	6	5	49
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	5	4	65	8	6	61
Pedestrians	10		10			10
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	162	89			83	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	162	89			83	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	809	950			1499	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	9	73	67			
Volume Left	5	0	6			
Volume Right	4	8	0			
cSH	866	1700	1499			
Volume to Capacity	0.01	0.04	0.00			
Queue Length 95th (m)	0.2	0.0	0.1			
Control Delay (s)	9.2	0.0	0.7			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	0.7			
Approach LOS	A					
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		19.6%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

95 Cook, 103 & 107 Napier

1: Cook Street & Site Access

Total (2030) - AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	6	5	60	2	1	53
Future Volume (Veh/h)	6	5	60	2	1	53
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	8	6	75	2	1	66
Pedestrians	10		10			10
Lane Width (m)	3.7		3.7			3.7
Walking Speed (m/s)	1.1		1.1			1.1
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	164	96			87	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	164	96			87	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	810	942			1494	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	14	77	67			
Volume Left	8	0	1			
Volume Right	6	2	0			
cSH	862	1700	1494			
Volume to Capacity	0.02	0.05	0.00			
Queue Length 95th (m)	0.4	0.0	0.0			
Control Delay (s)	9.2	0.0	0.1			
Lane LOS	A		A			
Approach Delay (s)	9.2	0.0	0.1			
Approach LOS	A					
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		19.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

1: Cook Street & Site Access

95 Cook, 103 & 107 Napier
Total (2030) - PM

									
Movement	WBL	WBR	NBT	NBR	SBL	SBT			
Lane Configurations									
Traffic Volume (veh/h)	4	3	57	6	5	53			
Future Volume (Veh/h)	4	3	57	6	5	53			
Sign Control	Stop		Free			Free			
Grade	0%		0%			0%			
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80			
Hourly flow rate (vph)	5	4	71	8	6	66			
Pedestrians	10		10			10			
Lane Width (m)	3.7		3.7			3.7			
Walking Speed (m/s)	1.1		1.1			1.1			
Percent Blockage	1		1			1			
Right turn flare (veh)									
Median type			None			None			
Median storage veh									
Upstream signal (m)									
pX, platoon unblocked									
vC, conflicting volume	173	95			89				
vC1, stage 1 conf vol									
vC2, stage 2 conf vol									
vCu, unblocked vol	173	95			89				
tC, single (s)	6.4	6.2			4.1				
tC, 2 stage (s)									
tF (s)	3.5	3.3			2.2				
p0 queue free %	99	100			100				
cM capacity (veh/h)	798	943			1492				
Direction, Lane #	WB 1	NB 1	SB 1						
Volume Total	9	79	72						
Volume Left	5	0	6						
Volume Right	4	8	0						
cSH	856	1700	1492						
Volume to Capacity	0.01	0.05	0.00						
Queue Length 95th (m)	0.2	0.0	0.1						
Control Delay (s)	9.2	0.0	0.6						
Lane LOS	A		A						
Approach Delay (s)	9.2	0.0	0.6						
Approach LOS	A								
Intersection Summary									
Average Delay		0.8							
Intersection Capacity Utilization		19.8%	ICU Level of Service	A					
Analysis Period (min)		15							