

Noise Feasibility Study

Proposed Mixed-Use Development

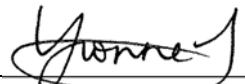
Di Poce Subdivision

Barrie, Ontario

Prepared for:

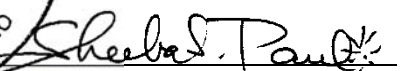
Di Poce (Innisfil) Inc.
175 Sun Pac Boulevard, Unit 1A
Brampton, Ontario
L6S 5Z6

Prepared by



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and



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January 14, 2019

HGC Project File: 01700899

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1 Introduction and Summary

HGC Engineering was retained by Di Poce (Innisfil) Inc. to conduct a noise feasibility study for a proposed mixed-use/residential development to be located on the east side of County Road 27, north of Salem Road in the City of Barrie, Ontario. The study is required by the municipality as part of their planning and approvals process.

Road traffic on County Road 27 and Salem Road was obtained from Simcoe County and the City of Barrie, respectively. This data was used to predict future traffic sound levels at the proposed dwellings and in the outdoor living areas. The predicted sound levels were evaluated in accordance with the Ministry of the Environment, Conservation and Parks' (MECP) noise guidelines.

Predicted sound levels exceed MECP guideline limits at the dwelling units closest to County Road 27. Central air conditioning and upgraded building constructions are required for the proposed medium density residential building adjacent to County Road 27. Forced air ventilation systems with ductwork sized for the future installation of central air conditioning by the occupant will be required for the medium density residential building with some exposure to County Road 27. For the remaining dwelling units, any exterior wall, and double glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide sufficient sound insulation. The MECP guidelines require that warning clauses be used to inform future residents of the traffic noise impacts, proximity to existing and proposed commercial uses, and to address sound level excesses.

When siting information is available for the medium density residential blocks, a detailed noise study should be performed to determine the impact of road traffic noise on the proposed buildings, outdoor amenity areas and refine the acoustic requirements. When siting information is available for the future commercial block, a noise study should be performed to determine the impact of its activities on existing and future residential uses nearby.



2 Site Description and Noise Sources

Figure 1 is a key plan showing the location of the proposed development. The site is located on the east side of County Road 27 and north of Salem Road in the City of Barrie, Ontario. Figure 2 shows the proposed draft plan of subdivision dated October 29, 2018. The proposed development will consist of blocks of townhouses, single detached units, a commercial block, a storm water management pond, medium density residential blocks and associated roadways.

The primary sources of sound are vehicular traffic on County Road 27 and Salem Road. The site is currently vacant. There are existing residences to the north and proposed residential uses to the east. A future school and park are proposed at the east end of the site. There is a commercial block proposed east of County Road 27 at the west end of the site. The proposed commercial uses are not known at this time. Further south of the site and south of Salem Road is the Unilock Factory Outlet. Noise from the facility was not heard at the time of the site visit, nonetheless, a warning clause is recommended to inform future occupants of the development of the proximity to existing and proposed commercial uses and that sounds may be audible, as included in Section 5.4. There are no other sources of stationary noise within 500 m of the subject site.

3 Sound Level Criteria

Guidelines for acceptable levels of road traffic noise impacting residential developments are outlined in the MECP publication NPC-300 “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”, Part C release date October 21, 2013 and are listed in Table 1 below. The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted decibels [dBA].

Table 1: Road Traffic Sound Level Criteria

Area	Daytime L_{EQ} (16 hour) Road	Night-time L_{EQ} (8 hour) Road
Outdoor Living Area	55 dBA	--
Inside Living/Dining Rooms	45 dBA	45 dBA
Inside Bedrooms	45 dBA	40 dBA

Daytime refers to the period between 07:00 and 23:00. Nighttime refers to the time period between 23:00 and 07:00. The term Outdoor Living Area (OLA) is used in reference to an outdoor patio, backyard, terrace, or other area where passive recreation is expected to occur.

The MECP guidelines allow the sound levels in an OLA be exceeded by up to 5 dBA (i.e. up to 60 dBA), without mitigation, if warning clauses are placed in the purchase and rental agreements to the property. Where OLA sound levels exceed 60 dBA, physical mitigation is required to reduce the OLA sound level to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where nighttime sound levels outside bedroom or living/dining room windows are greater than 60 dBA and where daytime sound levels outside bedroom or living/dining room windows are 65 dBA or greater. Forced-air ventilation with ducts sized to accommodate the future installation of central air conditioning is required when nighttime sound levels at bedroom or living/dining room windows are in the range of 51 to 60 dBA or when daytime sound levels at bedroom or living/dining room windows are in the range of 56 to 65 dBA.

Building components such as walls, windows and doors must be designed to achieve indoor sound level criteria when the plane of window nighttime sound level is greater than 60 dBA or the daytime sound level is greater than 65 dBA. The use of warning clauses to notify future residents of possible excesses is also required.

4 Traffic Noise Assessment

4.1 Road Traffic Data

Road traffic data for County Road 27 and Salem Road were obtained from Simcoe County and the City of Barrie, respectively. Data was provided in the form of current Annual Average Daily Traffic (AADT) volumes, and are provided in Appendix A. The traffic volumes were grown to the year 2029 using a growth rate of 2.5% per year. A commercial vehicle percentage for Salem Road of 3% was obtained and split into 1.2% medium trucks and 1.8% heavy trucks. A commercial vehicle percentage for County Road 27 of 14% medium trucks and 5% heavy trucks was applied. A day/night split of 90%/10% was used in the analysis. A speed limit of 80 km/h and 60 km/h was used for County Road 27 and Salem Road, respectively. Table 2 summarizes the road traffic data used in the analysis. Essa Road has been excluded from the analysis as it only has an AADT volume of 400 vehicles per day, is further from the site compared to County Road 27 and Salem Road, and is expected to have minimal noise impacts on the proposed dwelling units.

Table 2: Projected Road Traffic Data to 2029

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
County Road 27	Daytime	13 756	2 378	849	16 982
	Nighttime	1 528	264	94	1 887
	Total	15 284	2 642	943	18 869
Salem Road	Daytime	8 018	99	149	8 266
	Nighttime	891	11	17	918
	Total	8 908	110	165	9 185

4.2 Traffic Noise Predictions

To assess the levels of road traffic noise which will impact the site in the future, predictions were made using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B.

Predictions of the traffic sound levels were made at various dwellings in the proposed development. The results of these predictions are summarized in Table 3. The acoustic requirements may be subject to modifications if the site plan is changed significantly.

Sound levels were predicted at the plane of the windows of the proposed dwelling units during the daytime and nighttime to investigate ventilation and building façade construction requirements. Sound levels were also predicted in the rear yard outdoor living areas of the townhouse units to investigate the need for acoustic barriers.

Table 3: Future Road Traffic Sound Levels, [dBA], Without Mitigation

Prediction Location	Block	Description	Daytime in OLA L _{EQ-16 hr}	Daytime at Façade L _{EQ-16 hr}	Nighttime at Façade L _{EQ-8 hr}
[A]	41	Medium density residential block adjacent to County Road 27+	--	69	63
[B]	1	Townhouse unit with some exposure to County Road 27	<55	55	<50
[C]	8	Townhouse unit with some exposure to County Road 27	<55	55	<50
[D]	39	Medium density residential block with some exposure to County Road 27+	--	62	55
[E]	33	Townhouse unit with flanking exposure to Salem Road	<55	<55	<50

Note: + 6th storey used in the analysis, as per correspondence with MHBC personnel. The height of the building is subject to change and should be confirmed when siting information becomes available.

5 Discussion and Recommendations

The predictions indicate that the future traffic sound levels during the daytime and nighttime at the proposed dwellings closest to County Road 27 will exceed MECP guidelines. The following discussion outlines recommendations for ventilation requirements, building façade constructions, and warning clauses to achieve the noise criteria stated in Table 1.

5.1 Outdoor Living Areas

The predicted daytime sound levels in the rear yard of all the townhouse units (prediction locations [B], [C] and [E]) will be less than 55 dBA. Physical mitigation in the form of an acoustic barrier will not be required.

Outdoor amenity areas are not indicated in the medium density residential blocks but is recommended to be located on the east side of the buildings such that shielding may be provided from the building itself. When siting and lotting information is available, detailed noise studies should be conducted for individual medium density residential blocks to determine specific barrier requirements including the height and extent of the barriers.

5.2 Indoor Living Areas and Ventilation Requirements

Central Air Conditioning

The predicted daytime sound level at the façades of the proposed medium density residential building adjacent to County Road 27 (prediction location [A]) will be greater than 65 dBA. To address these excesses, the MECP guidelines recommend that the proposed building be equipped with central air conditioning systems, so that the windows can be kept closed.

Provision for the Future Installation of Air Conditioning

The predicted sound levels at the façades of the proposed medium density residential building with some exposure to County Road 27 (prediction location [D]) will be between 56 and 65 dBA during the daytime hours and between 51 and 60 dBA during the nighttime hours. This building requires the provision for the future installation of central air conditioning systems. This requirement is typically satisfied through the installation of forced air ventilation systems with ductwork sized for the future installation of central air conditioning by the occupant.

Figure 3 shows the ventilation requirements for the development. Window or through-the-wall air conditioning units are not recommended for any residential unit because of the noise they produce and because the units penetrate through the exterior wall which degrades the overall noise insulating properties of the envelope. The location, installation and sound ratings of the outdoor air conditioning devices should minimize noise impacts and comply with criteria of MECP publication NPC-300.



5.3 Building Façade Constructions

Future sound levels at the façades of the proposed medium density residential building (prediction location [A]) adjacent to County Road 27 will exceed 65 dBA during the daytime hours. MECP guidelines recommend that the windows, walls and doors be designed so that the indoor sound levels comply with MECP noise criteria.

Floor plans and building elevations were not available at the time of this study. The required building components are selected based on the Acoustical Insulation Factor (AIF) value for road traffic. To do so, calculations were performed to determine the acoustical insulation factors to maintain indoor sound levels within MECP guidelines. The calculation methods were developed by the National Research Council (NRC). They are based on the predicted future sound levels at the building facades, and the anticipated area ratios of the facade components (windows and walls) and the floor area of the adjacent room.

The minimum necessary specification for the proposed medium density residential building adjacent to County Road 27 (prediction location [A]) is AIF-29 for bedrooms/living/dining/family rooms, based on the possibility of sound entering the buildings through windows and walls. Any well sealed thermopane unit having a Sound Transmission Class (STC) rating of 30, that is two 3 mm panes and a 13 mm inter-pane gap will provide sufficient noise insulation as long as the window to floor area ratio is less than 32% for bedrooms/living/dining/family rooms. If sliding patio doors are to be used in the dwellings, they must be included in the window area.

The remaining units within the development will have daytime and nighttime sound levels that are less than 65 and 60 dBA respectively. For these units, any exterior wall, and double glazed window construction meeting the minimum requirements of the Ontario Building Code (OBC) will provide adequate sound insulation for the dwelling units.

Further Analysis

When siting information, detailed floor plans and building elevations are available for the proposed medium density residential block (prediction location [A]) adjacent to County Road 27, a detailed noise study should be performed to specify wall and window requirements for the building based on



actual window to floor area ratios.

Commercial Block

A commercial block is proposed on the west side of the site (Block 42). Proposed uses are not known at this time and some dwellings near this block may be impacted by its activities. Typically, noisy sources such as rooftop mechanical equipment, compressor or condenser units, rooftop cooling towers or trucking activities will need to be considered. A noise study is required when siting information is available for the commercial block to ensure that the noise emissions from the commercial/business facilities comply with MECP guidelines limits contained in NPC-300.

5.4 Warning Clauses

The MECP guidelines recommend that warning clauses be included in the property and tenancy agreements for all lots with anticipated traffic sound level excesses. Examples are provided below.

Suggested wording for future dwellings with sound level excesses is given below:

Type A:

Purchasers and tenants are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels activities exceed the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria.

A suggested wording for future dwellings requiring central air conditioning systems is given below.

Type B:

This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of Environment, Conservation and Parks.



A suggested wording for future dwellings requiring forced air ventilation systems is given below.

Type C:

This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment, Conservation and Parks.

Suitable wording for dwellings near future and existing commercial facilities.

Type D:

Purchasers/tenants are advised that due to the proximity of proposed and existing commercial uses, sound levels from these facilities may at times be audible.

These sample clauses are provided by the MECP as examples and can be modified by the Municipality as required.

6 Summary of Recommendations

In summary, HGC Engineering has reviewed the draft plan and performed calculations to determine the potential road traffic noise impact on the residential properties with respect to MECP guidelines. The following are the recommendations.

1. Central air conditioning is required for the proposed medium density residential building adjacent to County Road 27. Forced air ventilation systems with ductwork sized for the future installation of central air conditioning will be required for the medium density residential building with some exposure to County Road 27. The location, installation and sound ratings of the air conditioning devices should comply with NPC-300, as applicable.
2. Upgraded building and glazing constructions are required for the medium density residential building adjacent to County Road 27. When detailed siting information, floor plans and building elevations are available, an acoustical consultant should provide revised glazing STC ratings based on actual window to floor area ratios. Building constructions meeting the minimum requirements of the Ontario Building Code will provide sufficient acoustical insulation for the indoor spaces of the remaining dwelling units.



3. When siting and lotting information is available for the medium density blocks, detailed noise studies should be conducted to determine specific barrier requirements and revise acoustic recommendations based on the siting of the buildings on the site.
4. When details such as siting plans, building elevations and potential uses are available for the future commercial block, a noise study should be performed to determine the impact of its activities on the existing and future residential uses nearby. Typically, noisy sources such as rooftop mechanical equipment, compressor or condenser units, rooftop cooling towers or trucking activities will need to be considered. The noise study is required to ensure that the noise emissions from the facilities complies with MECP guidelines limits contained in NPC-300.
5. Warning clauses should be used to inform future residents of the traffic noise excesses.

Table 4: Summary of Noise Control Requirements and Noise Warning Clauses

Prediction Location	Block	Acoustic Barrier	Ventilation Requirements**	Type of Warning Clause	Required AIF
[A]#	41	--	Central A/C	A, B, D	LRDR: AIF-29+ BR: AIF-29+
[B]	1	--	--	--	OBC
[C]	8	--	--	--	OBC
[D]#	39	--	Forced Air	A, C, D	OBC
[E]	33	--	--	--	OBC
--	42*	--	--	--	--
Remaining Units	--	--	--	--	OBC

Notes:

-- no specific requirement

OBC – meeting the minimum requirements of the Ontario Building Code

* When siting information is known, a detailed noise study should be performed on the commercial block to determine the noise impacts on adjacent residential uses and determine appropriate mitigation.

When siting information is known, a detailed noise study should be performed for the medium density block which indicates the building envelope and any outdoor amenity areas.

**The location, installation and sound rating of the air conditioning condensers must be compliant with MECP Guideline NPC-300, as applicable.

+ When detailed floor plans and elevations are available, an acoustical consultant should provide revised glazing constructions based on actual window to floor area ratios.

LRDR – living room/dining room

BR – bedroom

6.1 Implementation

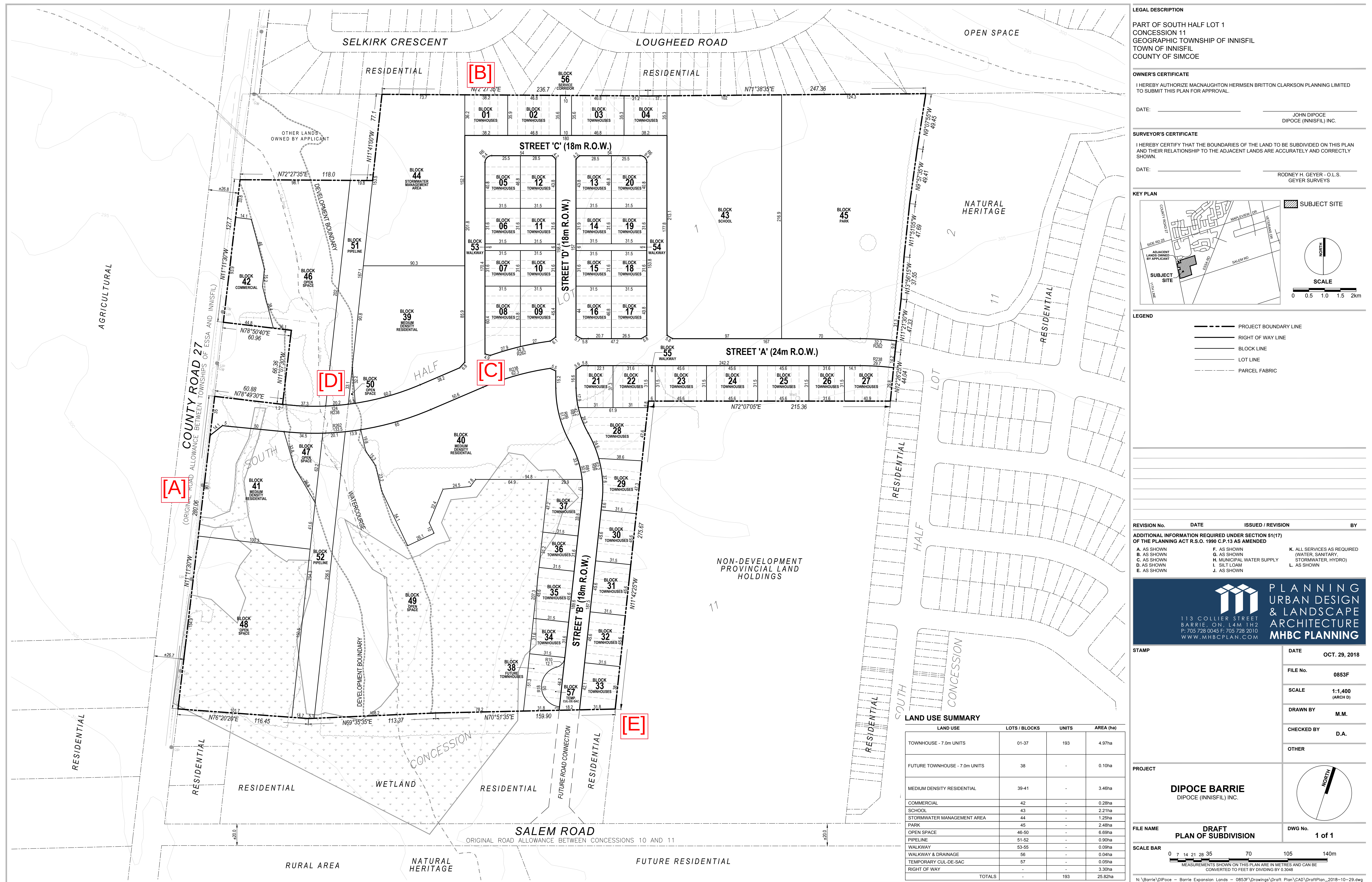
To ensure that the noise recommendations outlined above are fully implemented, it is recommended that:

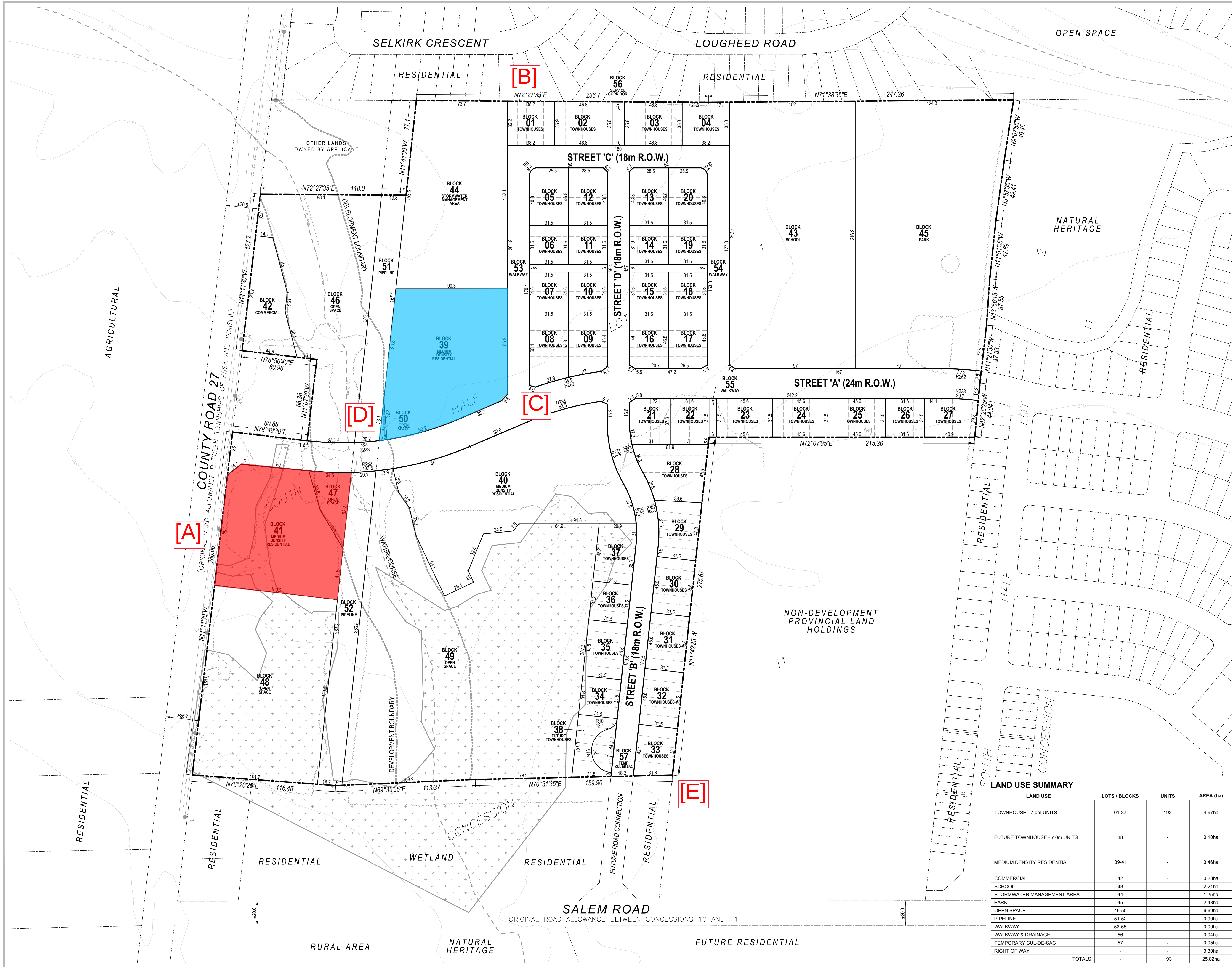
1. A detailed noise study should be conducted when siting information is available for the medium density blocks to determine the impact of road traffic noise on the proposed buildings and to refine the acoustic requirements.
2. When architectural plans are available for the medium density residential block (Block 41) adjacent to County Road 27, an acoustical consultant should review the plans to determine appropriate window and wall constructions.
3. Prior to the issuance of building permits for this development, the Municipality's building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly incorporated.
4. When siting plans, building elevations and potential uses are available to determine the acoustical requirements for the commercial portion of the development, a noise study should be performed to determine the impact of its activities on existing and future residences nearby. Typically, noisy sources such as rooftop mechanical equipment, compressor, or condenser units, rooftop cooling towers or trucking activities will need to be considered. The noise study is required to ensure that the noise emissions from the facilities complies with MECP guideline limits contained in NPC-300.
5. Prior to assumption, the Municipality's building inspector or a Professional Engineer qualified to perform acoustical engineering services in the Province of Ontario should certify that the noise control measures have been properly installed and constructed.





Figure 1: Key Plan





LEGAL DESCRIPTION

PART OF SOUTH HALF LOT 1
CONCESSION 11
GEOGRAPHIC TOWNSHIP OF INNISFIL
TOWN OF INNISFIL
COUNTY OF SIMCOE

OWNER'S CERTIFICATE

I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED TO SUBMIT THIS PLAN FOR APPROVAL.

DATE: _____ JOHN DIPOCE
DIPOCE (INNISFIL) INC.

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

DATE: _____ RODNEY H. GEYER - O.L.S.
GEYER SURVEYS

KEY PLAN

LEGEND

- PROJECT BOUNDARY LINE
- RIGHT OF WAY LINE
- BLOCK LINE
- LOT LINE
- PARCEL FABRIC

REVISION No. **DATE** **ISSUED / REVISION** **BY**

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17) OF THE PLANNING ACT R.S.O. 1990 C.P.13 AS AMENDED

A. AS SHOWN	F. AS SHOWN	K. ALL SERVICES AS REQUIRED
B. AS SHOWN	G. AS SHOWN	(WATER, SANITARY, STORMWATER, HYDRO)
C. AS SHOWN	H. MUNICIPAL WATER SUPPLY	L. AS SHOWN
D. AS SHOWN	I. SILT LOAM	
E. AS SHOWN	J. AS SHOWN	

PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE
MHBC PLANNING

113 COLLIER STREET
BARRIE, ON, L4M 1H2
P: 705.728.0045 F: 705.728.2010
WWW.MHBCPLAN.COM

STAMP

DATE: OCT. 29, 2018

FILE No. 0853F

SCALE: 1:1,400 (ARCH D)

DRAWN BY: M.M.

CHECKED BY: D.A.

OTHER:

PROJECT

DIPOCE BARRIE
DIPOCE (INNISFIL) INC.

FILE NAME **DRAFT PLAN OF SUBDIVISION** **DWG No.** **1 of 1**

SCALE BAR

0 7 14 21 28 35 70 105 140m

MEASUREMENTS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

N:\Barrie\DiPocce - Barrie Expansion Lands - 0853F\Drawings\Draft Plan\CAD\DraftPlan_2018-10-29.dwg

Figure 3: Proposed Site Plan Showing Ventilation Requirements

APPENDIX A

Road Traffic Data

Yvonne Lo

From: Justin MacDonald <Justin.MacDonald@barrie.ca>
Sent: August 27, 2018 12:43 PM
To: Yvonne Lo
Subject: RE: Road Traffic Data Request - Salem Road and Country Road 27

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Sorry for the confusion:

Essa Road – 7,000 vehicles per day with 3% commercial and heavy vehicles with a growth rate of 2% compounded yearly.

Thanks,

Justin MacDonald, C.E.T.,
Senior Transportation Operations Technologist
Roads, Parks & Fleet



City of Barrie: Barrie Operations Centre, 165 Ferndale Drive North, Barrie ON, L4N 9V9
Office: 705-739-4220 5178

From: Yvonne Lo [mailto:ylo@hgcengineering.com]
Sent: Monday, August 27, 2018 9:19 AM
To: Justin MacDonald <Justin.MacDonald@barrie.ca>
Subject: RE: Road Traffic Data Request - Salem Road and Country Road 27

Hi Justin,

I just checked the original data request; can you please confirm whether there is traffic data for Essa Road within the vicinity of this site?

Thank you again.

Best,

Yvonne Lo, BASc, EIT
Project Consultant

HGC Engineering NOISE | VIBRATION | ACOUSTICS
Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044 e: ylo@hgcengineering.com
Visit our website: www.hgcengineering.com Follow Us – [LinkedIn](#) | [Twitter](#) | [YouTube](#)

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From: Yvonne Lo
Sent: August-27-18 8:22 AM
To: 'Justin MacDonald'
Subject: RE: Road Traffic Data Request - Salem Road and Country Road 27

Thank you for the information Justin.

Best,

Yvonne Lo, BASc, EIT
Project Consultant

HGC Engineering [NOISE](#) | [VIBRATION](#) | [ACOUSTICS](#)
Howe Gastmeier Chapnik Limited
2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7
t: 905.826.4044 e: ylo@hgcengineering.com
Visit our website: www.hgcengineering.com Follow Us – [LinkedIn](#) | [Twitter](#) | [YouTube](#)

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From: Justin MacDonald [<mailto:Justin.MacDonald@barrie.ca>]
Sent: August-27-18 8:18 AM
To: Yvonne Lo
Subject: RE: Road Traffic Data Request - Salem Road and Country Road 27

Good morning,

Staff do not have traffic volumes for County Road 27.

The current traffic volume for Salem Road is 400 vehicles per day. The growth rate is 6% compounded yearly to a horizon year of 2031.

Thanks,

Justin MacDonald, C.E.T.,
Senior Transportation Operations Technologist
Roads, Parks & Fleet



City of Barrie: Barrie Operations Centre, 165 Ferndale Drive North, Barrie ON, L4N 9V9
Office: 705-739-4220 5178

From: Yvonne Lo [<mailto:ylo@hgcengineering.com>]
Sent: Tuesday, August 21, 2018 2:39 PM
To: Justin MacDonald <Justin.MacDonald@barrie.ca>
Subject: RE: Road Traffic Data Request - Salem Road and Country Road 27

Hi Justin,

Just checking on my traffic data request from earlier last week. Do you have any updates on this?

Thank you.

Best,

Yvonne Lo, BASc, EIT
Project Consultant

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Howe Gastmeier Chapnik Limited

2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7

t: 905.826.4044 e: ylo@hgcengineering.com

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From: Yvonne Lo
Sent: August-15-18 4:25 PM
To: 'Justin MacDonald'
Subject: Road Traffic Data Request - Salem Road and Country Road 27

Hi Justin,

HGC Engineering is conducting a noise feasibility study for a proposed residential development on the east side of Country Road 27, north of Salem Road. The location is indicated in the link below:

<https://goo.gl/maps/HQ9MezzQRNP2>

We are requesting road traffic information for Country Road 27, Salem Road and Essa Road (volumes and commercial truck percentages). Can you please let me know if this information is available.

Thank you.

Best,

Yvonne Lo, BASc, EIT
Project Consultant

HGC Engineering [NOISE](#) | [VIBRATION](#) | [ACOUSTICS](#)

Howe Gastmeier Chapnik Limited

2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7

t: 905.826.4044 e: ylo@hgcengineering.com

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County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transportation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

Date Start: 22-Aug-16

Date End: 26-Aug-16

SB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/22/16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
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07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	0	248	67	6	50	2	0	6	1	0	0	0	0	14	394
13:00	6	248	73	2	50	3	0	6	0	0	0	0	0	13	401
14:00	3	177	87	2	53	1	0	8	1	0	0	0	0	17	349
15:00	7	228	109	2	46	2	0	5	0	0	0	0	0	15	414
16:00	6	301	111	1	49	6	0	8	0	0	0	0	0	25	507
17:00	7	311	108	8	85	1	0	6	0	0	0	0	0	28	554
18:00	10	214	85	1	52	0	0	2	0	0	0	0	0	13	377
19:00	5	154	60	0	27	0	0	1	1	0	0	0	0	6	254
20:00	5	147	58	0	38	1	0	0	0	0	0	0	0	4	253
21:00	3	124	29	0	18	0	0	1	0	0	0	0	0	4	179
22:00	2	74	12	0	9	0	0	1	0	0	0	0	0	1	99
23:00	3	48	8	0	7	0	0	1	0	0	0	0	0	0	67
Total	57	2274	807	22	484	16	0	45	3	0	0	0	0	140	3848
Percent	1.5%	59.1%	21.0%	0.6%	12.6%	0.4%	0.0%	1.2%	0.1%	0.0%	0.0%	0.0%	0.0%	3.6%	

AM
Peak
Vol.

PM
Peak
Vol.

18:00	17:00	16:00	17:00	17:00	16:00		14:00	12:00			17:00	17:00
10	311	111	8	85	6		8	1			28	554

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transportation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

Date Start: 22-Aug-16

Date End: 26-Aug-16

SB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/23/16	0	17	6	0	2	0	0	1	0	0	0	0	0	0	26
01:00	0	10	1	0	3	0	0	0	0	0	0	0	0	0	14
02:00	0	10	3	0	3	0	0	0	0	0	0	0	0	0	16
03:00	0	4	1	0	0	0	0	0	0	0	0	0	1	0	6
04:00	1	14	11	0	6	0	0	0	0	0	0	0	0	0	32
05:00	1	52	34	0	30	0	0	1	0	0	0	0	0	1	119
06:00	1	130	43	4	45	0	0	2	0	1	0	0	0	5	231
07:00	4	163	86	7	62	1	0	7	3	1	0	0	0	14	348
08:00	6	249	100	12	70	4	0	11	3	0	0	0	0	7	462
09:00	0	167	130	5	66	3	0	8	0	0	0	0	0	7	386
10:00	3	191	98	9	39	2	0	11	0	0	0	0	0	9	362
11:00	5	208	103	7	52	7	0	12	2	0	0	0	0	12	408
12 PM	8	189	116	5	46	5	0	10	1	1	0	0	0	7	388
13:00	7	202	88	8	55	10	0	6	1	0	0	0	0	9	386
14:00	4	203	101	6	50	7	0	5	0	0	0	0	0	15	391
15:00	5	179	132	8	53	6	0	8	1	0	0	0	0	16	408
16:00	6	265	124	8	74	4	0	7	0	0	0	0	0	30	518
17:00	6	295	131	6	77	6	0	0	0	0	0	0	0	26	547
18:00	7	222	103	4	58	2	0	2	0	0	0	0	0	16	414
19:00	5	179	69	1	45	2	0	4	0	0	0	0	0	7	312
20:00	6	155	70	0	30	1	0	3	0	1	0	0	0	5	271
21:00	1	124	61	0	19	0	0	1	0	0	0	0	0	4	210
22:00	1	74	27	0	10	0	0	1	0	0	0	0	0	1	114
23:00	1	36	16	0	5	0	0	0	0	0	0	0	0	0	58
Total	78	3338	1654	90	900	60	0	100	11	4	0	0	1	191	6427
Percent	1.2%	51.9%	25.7%	1.4%	14.0%	0.9%	0.0%	1.6%	0.2%	0.1%	0.0%	0.0%	0.0%	3.0%	
AM Peak	08:00	08:00	09:00	08:00	08:00	11:00		11:00	07:00	06:00			03:00	07:00	08:00
Vol.	6	249	130	12	70	7		12	3	1			1	14	462
PM Peak	12:00	17:00	15:00	13:00	17:00	13:00		12:00	12:00	12:00				16:00	17:00
Vol.	8	295	132	8	77	10		10	1	1				30	547

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transportation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

Date Start: 22-Aug-16

Date End: 26-Aug-16

SB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/24/16	0	13	7	0	4	0	0	0	0	0	0	0	0	0	24
01:00	0	9	0	0	4	0	0	0	0	0	0	0	0	0	13
02:00	0	11	5	0	2	0	0	0	0	0	0	0	0	0	18
03:00	0	9	1	0	1	0	0	0	0	0	0	0	0	0	11
04:00	0	12	8	0	6	0	0	0	0	0	0	0	1	0	27
05:00	1	69	33	0	25	0	0	0	0	0	0	0	0	2	130
06:00	4	119	51	4	56	0	0	0	1	1	0	0	0	1	237
07:00	6	170	69	2	54	0	0	10	1	0	0	0	0	7	319
08:00	4	223	81	3	67	3	0	5	2	0	0	0	0	12	400
09:00	5	198	112	2	66	2	0	4	2	1	0	0	0	10	402
10:00	6	176	115	1	58	0	0	13	0	0	0	0	0	15	384
11:00	2	207	123	3	62	1	0	8	2	0	0	0	0	9	417
12 PM	2	181	100	3	41	3	0	6	3	0	0	0	0	11	350
13:00	6	187	101	4	54	0	0	3	0	0	0	0	0	8	363
14:00	2	214	77	4	69	0	0	5	2	0	0	0	0	12	385
15:00	11	172	138	9	77	0	0	5	0	0	0	0	0	10	422
16:00	9	249	143	6	71	3	0	5	0	0	0	0	0	28	514
17:00	17	257	113	3	67	0	0	4	1	0	0	0	0	66	528
18:00	7	257	94	1	54	1	0	4	0	0	0	0	0	14	432
19:00	11	168	114	1	38	0	0	3	0	0	0	0	0	11	346
20:00	17	172	68	1	36	1	0	1	0	0	0	0	0	5	301
21:00	2	118	52	0	23	0	0	2	0	0	0	0	0	2	199
22:00	2	65	28	1	14	1	0	0	0	0	0	0	0	2	113
23:00	0	37	11	0	6	1	0	0	0	0	0	0	0	0	55
Total	114	3293	1644	48	955	16	0	78	14	2	0	0	1	225	6390
Percent	1.8%	51.5%	25.7%	0.8%	14.9%	0.3%	0.0%	1.2%	0.2%	0.0%	0.0%	0.0%	0.0%	3.5%	
AM Peak	07:00	08:00	11:00	06:00	08:00	08:00		10:00	08:00	06:00			04:00	10:00	11:00
Vol.	6	223	123	4	67	3		13	2	1			1	15	417
PM Peak	17:00	17:00	16:00	15:00	15:00	12:00		12:00	12:00					17:00	17:00
Vol.	17	257	143	9	77	3		6	3					66	528

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transporation and Engineering Department
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Site Code: 027 05

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Date End: 26-Aug-16

SB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/25/16	0	18	12	0	2	0	0	0	0	0	0	0	0	1	33
01:00	0	12	3	0	5	0	0	0	0	0	0	0	0	0	20
02:00	0	6	4	0	4	0	0	0	0	0	0	0	0	0	14
03:00	0	6	5	0	0	0	0	0	0	0	0	0	2	0	13
04:00	0	8	14	0	4	1	0	1	0	0	0	0	0	3	31
05:00	1	64	32	1	26	0	0	0	0	0	0	0	0	1	125
06:00	3	121	45	3	35	0	0	1	1	0	0	0	0	3	212
07:00	1	191	78	3	66	1	0	7	0	1	0	0	0	8	356
08:00	0	198	89	6	65	2	0	5	2	0	0	0	0	11	378
09:00	1	207	102	2	55	2	0	4	0	0	0	0	2	8	383
10:00	2	204	112	3	54	1	0	4	0	0	0	0	0	8	388
11:00	2	219	90	4	48	6	0	2	0	1	0	0	0	11	383
12 PM	3	238	106	2	55	0	0	6	0	0	0	0	0	11	421
13:00	2	196	85	4	50	2	0	5	2	0	0	0	0	17	363
14:00	1	192	104	8	55	2	0	5	0	1	0	0	0	18	386
15:00	6	209	75	5	49	1	0	2	1	0	0	0	1	14	363
16:00	4	320	123	3	69	5	0	6	0	3	0	0	0	23	556
17:00	4	292	114	3	74	5	0	4	0	1	0	0	0	28	525
18:00	6	225	74	2	54	1	0	4	0	0	0	0	0	13	379
19:00	4	196	74	2	53	0	0	1	0	0	0	0	0	9	339
20:00	4	161	50	0	33	0	0	0	0	0	0	0	0	2	250
21:00	1	117	50	0	23	1	0	1	0	0	0	0	0	2	195
22:00	0	95	25	0	16	0	0	1	0	0	0	0	0	1	138
23:00	0	50	14	0	9	0	0	1	0	0	0	0	0	0	74
Total	45	3545	1480	51	904	30	0	60	6	7	0	0	5	192	6325
Percent	0.7%	56.0%	23.4%	0.8%	14.3%	0.5%	0.0%	0.9%	0.1%	0.1%	0.0%	0.0%	0.1%	3.0%	
AM Peak Vol.	06:00	11:00	10:00	08:00	07:00	11:00		07:00	08:00	07:00			03:00	08:00	10:00
PM Peak Vol.	15:00	16:00	16:00	14:00	17:00	16:00		12:00	13:00	16:00			15:00	17:00	16:00
	3	219	112	6	66	6		7	2	1			2	11	388
	6	320	123	8	74	5		6	2	3			1	28	556

County of Simcoe

County Road 27 - Summer 2016
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Transporation and Engineering Department
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Date End: 26-Aug-16

SB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/26/16	0	23	9	0	7	0	0	1	0	0	0	0	0	0	40
01:00	7	16	6	0	3	3	0	0	0	0	0	0	0	1	36
02:00	0	14	5	0	0	0	0	0	0	0	0	0	0	0	19
03:00	0	4	3	0	0	0	0	0	0	0	0	0	1	0	8
04:00	2	15	10	0	8	1	0	0	0	0	0	0	0	0	36
05:00	2	38	31	0	25	0	0	0	0	0	0	0	0	1	97
06:00	4	110	45	6	40	1	0	2	2	0	0	0	0	2	212
07:00	6	170	68	2	65	1	0	8	1	0	0	0	0	11	332
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	21	390	177	8	148	6	0	11	3	0	0	0	1	15	780
Percent	2.7%	50.0%	22.7%	1.0%	19.0%	0.8%	0.0%	1.4%	0.4%	0.0%	0.0%	0.0%	0.1%	1.9%	
AM Peak	01:00	07:00	07:00	06:00	07:00	01:00		07:00	06:00				03:00	07:00	07:00
Vol.	7	170	68	6	65	3		8	2				1	11	332
PM Peak															
Vol.															
Grand Total	315	12840	5762	219	3391	128	0	294	37	13	0	0	8	763	23770
Percent	1.3%	54.0%	24.2%	0.9%	14.3%	0.5%	0.0%	1.2%	0.2%	0.1%	0.0%	0.0%	0.0%	3.2%	

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transportation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

Date Start: 22-Aug-16

Date End: 26-Aug-16

NB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/22/16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	4	269	56	7	24	6	0	5	2	2	0	0	0	20	395
13:00	2	285	79	3	20	3	0	4	1	0	0	0	0	30	427
14:00	0	248	92	5	49	3	0	9	1	0	0	0	0	19	426
15:00	7	354	95	7	34	6	0	2	0	1	0	0	0	28	534
16:00	9	453	131	4	52	4	0	7	0	1	0	0	0	38	699
17:00	4	481	152	1	44	4	1	4	0	0	0	0	0	47	738
18:00	3	375	108	2	32	4	0	2	0	0	0	0	0	19	545
19:00	4	261	80	1	31	0	0	1	0	0	0	0	0	10	388
20:00	4	238	58	1	12	0	0	1	0	0	0	0	0	11	325
21:00	4	173	45	0	19	0	0	0	0	0	0	0	0	4	245
22:00	1	82	17	0	4	1	0	0	0	0	0	0	0	1	106
23:00	2	65	7	1	3	0	0	0	0	0	0	0	0	0	78
Total	44	3284	920	32	324	31	1	35	4	4	0	0	0	227	4906
Percent	0.9%	66.9%	18.8%	0.7%	6.6%	0.6%	0.0%	0.7%	0.1%	0.1%	0.0%	0.0%	0.0%	4.6%	
AM Peak Vol.															
PM Peak Vol.	16:00	17:00	17:00	12:00	16:00	12:00	17:00	14:00	12:00	12:00				17:00	17:00
	9	481	152	7	52	6	1	9	2	2				47	738

County of Simcoe

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08/23/16	0	37	3	0	5	0	0	0	0	0	0	0	0	0	45
01:00	0	26	8	0	2	0	0	0	0	0	0	0	0	0	36
02:00	1	16	2	0	4	0	0	0	0	0	0	0	0	0	23
03:00	0	13	4	0	0	0	0	0	0	0	0	0	1	0	18
04:00	1	23	3	0	9	0	0	0	2	0	0	0	0	0	38
05:00	1	27	13	1	13	1	0	0	0	0	0	0	0	1	57
06:00	3	113	34	6	30	1	1	1	0	0	0	0	1	5	195
07:00	8	223	57	6	47	3	0	6	0	0	0	0	0	13	363
08:00	5	204	63	8	54	3	0	7	1	0	0	0	0	20	365
09:00	1	156	75	5	38	4	0	8	1	1	0	0	0	14	303
10:00	3	221	60	5	19	6	0	12	1	0	0	0	0	13	340
11:00	6	232	67	6	29	5	0	6	0	0	0	0	0	26	377
12 PM	2	267	84	5	42	7	0	7	0	0	0	0	0	17	431
13:00	0	270	77	6	40	7	0	6	1	0	0	0	0	18	425
14:00	0	295	67	8	39	6	0	9	0	0	0	0	0	27	451
15:00	8	357	100	6	56	4	0	6	1	1	0	0	0	32	571
16:00	6	427	132	6	61	4	0	9	1	1	0	0	0	50	697
17:00	7	490	123	1	59	2	0	4	1	0	0	0	0	41	728
18:00	6	362	92	4	49	2	0	3	0	0	0	0	0	25	543
19:00	1	267	75	0	28	1	0	1	0	1	0	0	0	10	384
20:00	0	249	62	1	25	1	0	1	1	0	0	0	0	6	346
21:00	4	184	55	0	14	0	0	3	0	0	0	0	0	6	266
22:00	1	133	27	0	8	0	0	0	0	0	0	0	0	1	170
23:00	1	64	13	1	8	0	0	2	0	0	0	0	0	0	89
Total	65	4656	1296	75	679	57	1	91	10	4	0	0	2	325	7261
Percent	0.9%	64.1%	17.8%	1.0%	9.4%	0.8%	0.0%	1.3%	0.1%	0.1%	0.0%	0.0%	0.0%	4.5%	
AM Peak	07:00	11:00	09:00	08:00	08:00	10:00	06:00	10:00	04:00	09:00			03:00	11:00	11:00
Vol.	8	232	75	8	54	6	1	12	2	1			1	26	377
PM Peak	15:00	17:00	16:00	14:00	16:00	12:00		14:00	13:00	15:00				16:00	17:00
Vol.	8	490	132	8	61	7		9	1	1				50	728

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transportation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

Date Start: 22-Aug-16

Date End: 26-Aug-16

NB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/24/16	0	49	16	0	2	0	0	0	0	0	0	0	0	0	67
01:00	1	24	6	0	2	0	0	0	0	0	0	0	0	0	33
02:00	1	15	4	0	2	0	0	0	0	0	0	0	0	0	22
03:00	0	8	3	0	0	0	0	0	0	0	0	0	0	0	11
04:00	1	15	6	1	8	0	0	0	0	0	0	0	0	1	32
05:00	0	41	16	0	13	0	0	0	1	0	0	0	0	2	73
06:00	2	113	25	2	27	8	0	2	1	0	0	0	0	2	182
07:00	5	228	62	7	49	10	0	3	0	0	0	0	0	12	376
08:00	5	214	57	5	46	5	1	3	0	0	0	0	0	19	355
09:00	2	190	58	1	29	4	0	3	0	0	0	0	0	10	297
10:00	4	215	65	3	36	5	0	5	1	1	0	0	0	17	352
11:00	1	273	84	4	44	2	0	7	0	0	0	0	0	14	429
12 PM	0	260	84	3	30	6	0	1	0	1	0	0	0	17	402
13:00	5	275	86	2	37	3	0	3	1	0	0	0	0	22	434
14:00	1	284	85	8	47	9	0	4	1	0	0	0	1	21	461
15:00	3	302	111	4	65	2	0	5	0	0	0	0	0	24	516
16:00	7	432	124	4	75	5	0	4	1	2	0	0	0	46	700
17:00	17	441	122	2	61	4	1	3	0	1	0	0	0	104	756
18:00	9	397	103	1	33	3	0	5	1	0	0	0	0	22	574
19:00	19	280	70	1	25	1	0	1	0	0	0	0	0	15	412
20:00	9	223	51	0	13	1	0	0	1	0	0	0	0	13	311
21:00	1	186	49	0	10	1	0	2	0	0	0	0	0	6	255
22:00	0	97	23	0	15	0	0	0	0	0	0	0	0	2	137
23:00	2	71	19	0	8	0	0	1	0	0	0	0	0	0	101
Total	95	4633	1329	48	677	69	2	52	8	5	0	0	1	369	7288
Percent	1.3%	63.6%	18.2%	0.7%	9.3%	0.9%	0.0%	0.7%	0.1%	0.1%	0.0%	0.0%	0.0%	5.1%	
AM Peak	07:00	11:00	11:00	07:00	07:00	07:00	08:00	11:00	05:00	10:00				08:00	11:00
Vol.	5	273	84	7	49	10	1	7	1	1				19	429
PM Peak	19:00	17:00	16:00	14:00	16:00	14:00	17:00	15:00	13:00	16:00			14:00	17:00	17:00
Vol.	19	441	124	8	75	9	1	5	1	2			1	104	756

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transportation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

Date Start: 22-Aug-16

Date End: 26-Aug-16

NB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/25/16	0	45	12	0	3	0	0	1	0	0	0	0	0	1	62
01:00	0	22	3	0	2	0	0	0	0	0	0	0	0	0	27
02:00	0	10	7	0	1	0	0	0	0	0	0	0	0	0	18
03:00	0	8	5	0	0	0	0	0	0	0	0	0	0	1	14
04:00	0	23	4	0	13	1	0	0	0	0	0	0	0	0	41
05:00	0	30	14	0	6	0	0	0	0	0	0	0	0	0	50
06:00	3	116	36	3	23	6	0	1	0	0	0	0	0	7	195
07:00	3	212	65	6	21	3	0	3	2	0	0	0	0	12	327
08:00	6	208	83	4	39	2	1	2	0	0	0	0	0	10	355
09:00	1	151	53	2	20	4	0	6	2	1	0	0	0	8	248
10:00	6	191	84	4	19	1	0	4	0	0	0	0	0	9	318
11:00	5	229	80	2	27	1	0	1	1	1	0	0	0	17	364
12 PM	2	269	69	3	30	3	0	4	1	0	0	0	0	16	397
13:00	2	284	95	1	32	1	0	6	0	0	0	0	0	23	444
14:00	4	299	90	3	33	2	0	5	0	0	0	0	2	14	452
15:00	8	345	137	2	41	2	0	4	2	0	0	0	0	35	576
16:00	5	423	118	3	34	4	0	5	0	1	0	0	0	47	640
17:00	6	525	138	2	37	2	0	7	1	0	0	0	0	52	770
18:00	0	389	112	1	29	1	0	0	0	0	0	0	0	24	556
19:00	1	301	83	0	26	2	0	2	0	0	0	0	0	7	422
20:00	4	270	64	0	22	0	0	1	0	0	0	0	0	8	369
21:00	4	204	58	0	10	0	0	0	0	0	0	0	0	5	281
22:00	1	117	19	0	3	0	0	0	0	0	0	0	0	2	142
23:00	0	76	15	0	6	0	0	0	0	0	0	0	0	1	98
Total	61	4747	1444	36	477	35	1	52	9	3	0	0	2	299	7166
Percent	0.9%	66.2%	20.2%	0.5%	6.7%	0.5%	0.0%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	4.2%	
AM Peak	08:00	11:00	10:00	07:00	08:00	06:00	08:00	09:00	07:00	09:00				11:00	11:00
Vol.	6	229	84	6	39	6	1	6	2	1				17	364
PM Peak	15:00	17:00	17:00	12:00	15:00	16:00		17:00	15:00	16:00			14:00	17:00	17:00
Vol.	8	525	138	3	41	4		7	2	1			2	52	770

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transporation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

Date Start: 22-Aug-16
Date End: 26-Aug-16

NB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/26/16	0	59	7	0	6	0	0	1	0	0	0	0	0	1	74
01:00	0	35	5	0	2	0	0	0	0	0	0	0	0	1	43
02:00	0	12	3	0	0	1	0	1	0	0	0	0	0	0	17
03:00	0	11	4	0	1	0	0	0	0	0	0	0	0	0	16
04:00	1	29	5	0	8	0	0	0	0	0	0	0	0	1	45
05:00	0	24	14	1	20	1	0	1	1	0	0	0	0	0	62
06:00	2	107	31	4	28	9	0	2	0	0	0	0	0	5	188
07:00	6	199	59	4	33	2	0	1	0	1	0	0	0	7	312
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	9	476	128	9	98	13	0	6	1	1	0	0	1	15	757
Percent	1.2%	62.9%	16.9%	1.2%	12.9%	1.7%	0.0%	0.8%	0.1%	0.1%	0.0%	0.0%	0.1%	2.0%	
AM Peak	07:00	07:00	07:00	06:00	07:00	06:00		06:00	05:00	07:00			04:00	07:00	07:00
Vol.	6	199	59	4	33	9		2	1	1			1	7	312
PM Peak															
Vol.															
Grand Total	274	17796	5117	200	2255	205	5	236	32	17	0	0	6	1235	27378
Percent	1.0%	65.0%	18.7%	0.7%	8.2%	0.7%	0.0%	0.9%	0.1%	0.1%	0.0%	0.0%	0.0%	4.5%	

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transporation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

Date Start: 22-Aug-16
Date End: 26-Aug-16

SB, NB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/22/16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	4	517	123	13	74	8	0	11	3	2	0	0	0	34	789
13:00	8	533	152	5	70	6	0	10	1	0	0	0	0	43	828
14:00	3	425	179	7	102	4	0	17	2	0	0	0	0	36	775
15:00	14	582	204	9	80	8	0	7	0	1	0	0	0	43	948
16:00	15	754	242	5	101	10	0	15	0	1	0	0	0	63	1206
17:00	11	792	260	9	129	5	1	10	0	0	0	0	0	75	1292
18:00	13	589	193	3	84	4	0	4	0	0	0	0	0	32	922
19:00	9	415	140	1	58	0	0	2	1	0	0	0	0	16	642
20:00	9	385	116	1	50	1	0	1	0	0	0	0	0	15	578
21:00	7	297	74	0	37	0	0	1	0	0	0	0	0	8	424
22:00	3	156	29	0	13	1	0	1	0	0	0	0	0	2	205
23:00	5	113	15	1	10	0	0	1	0	0	0	0	0	0	145
Total	101	5558	1727	54	808	47	1	80	7	4	0	0	0	367	8754
Percent	1.2%	63.5%	19.7%	0.6%	9.2%	0.5%	0.0%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	4.2%	
AM Peak Vol.															
PM Peak Vol.	16:00	17:00	17:00	12:00	17:00	16:00	17:00	14:00	12:00	12:00				17:00	17:00
	15	792	260	13	129	10	1	17	3	2				75	1292

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
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Transporation and Engineering Department
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Date End: 26-Aug-16

SB, NB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/23/16	0	54	9	0	7	0	0	1	0	0	0	0	0	0	71
01:00	0	36	9	0	5	0	0	0	0	0	0	0	0	0	50
02:00	1	26	5	0	7	0	0	0	0	0	0	0	0	0	39
03:00	0	17	5	0	0	0	0	0	0	0	0	0	2	0	24
04:00	2	37	14	0	15	0	0	0	2	0	0	0	0	0	70
05:00	2	79	47	1	43	1	0	1	0	0	0	0	0	2	176
06:00	4	243	77	10	75	1	1	3	0	1	0	0	1	10	426
07:00	12	386	143	13	109	4	0	13	3	1	0	0	0	27	711
08:00	11	453	163	20	124	7	0	18	4	0	0	0	0	27	827
09:00	1	323	205	10	104	7	0	16	1	1	0	0	0	21	689
10:00	6	412	158	14	58	8	0	23	1	0	0	0	0	22	702
11:00	11	440	170	13	81	12	0	18	2	0	0	0	0	38	785
12 PM	10	456	200	10	88	12	0	17	1	1	0	0	0	24	819
13:00	7	472	165	14	95	17	0	12	2	0	0	0	0	27	811
14:00	4	498	168	14	89	13	0	14	0	0	0	0	0	42	842
15:00	13	536	232	14	109	10	0	14	2	1	0	0	0	48	979
16:00	12	692	256	14	135	8	0	16	1	1	0	0	0	80	1215
17:00	13	785	254	7	136	8	0	4	1	0	0	0	0	67	1275
18:00	13	584	195	8	107	4	0	5	0	0	0	0	0	41	957
19:00	6	446	144	1	73	3	0	5	0	1	0	0	0	17	696
20:00	6	404	132	1	55	2	0	4	1	1	0	0	0	11	617
21:00	5	308	116	0	33	0	0	4	0	0	0	0	0	10	476
22:00	2	207	54	0	18	0	0	1	0	0	0	0	0	2	284
23:00	2	100	29	1	13	0	0	2	0	0	0	0	0	0	147
Total	143	7994	2950	165	1579	117	1	191	21	8	0	0	3	516	13688
Percent	1.0%	58.4%	21.6%	1.2%	11.5%	0.9%	0.0%	1.4%	0.2%	0.1%	0.0%	0.0%	0.0%	3.8%	
AM Peak Vol.	07:00	08:00	09:00	08:00	08:00	11:00	06:00	10:00	08:00	06:00			03:00	11:00	08:00
PM Peak Vol.	15:00	17:00	16:00	13:00	17:00	13:00		12:00	13:00	12:00				16:00	17:00
	12	453	205	20	124	12	1	23	4	1			2	38	827
	13	785	256	14	136	17		17	2	1				80	1275

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
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Transporation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

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Date End: 26-Aug-16

SB, NB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/24/16	0	62	23	0	6	0	0	0	0	0	0	0	0	0	91
01:00	1	33	6	0	6	0	0	0	0	0	0	0	0	0	46
02:00	1	26	9	0	4	0	0	0	0	0	0	0	0	0	40
03:00	0	17	4	0	1	0	0	0	0	0	0	0	0	0	22
04:00	1	27	14	1	14	0	0	0	0	0	0	0	1	1	59
05:00	1	110	49	0	38	0	0	0	1	0	0	0	0	4	203
06:00	6	232	76	6	83	8	0	2	2	1	0	0	0	3	419
07:00	11	398	131	9	103	10	0	13	1	0	0	0	0	19	695
08:00	9	437	138	8	113	8	1	8	2	0	0	0	0	31	755
09:00	7	388	170	3	95	6	0	7	2	1	0	0	0	20	699
10:00	10	391	180	4	94	5	0	18	1	1	0	0	0	32	736
11:00	3	480	207	7	106	3	0	15	2	0	0	0	0	23	846
12 PM	2	441	184	6	71	9	0	7	3	1	0	0	0	28	752
13:00	11	462	187	6	91	3	0	6	1	0	0	0	0	30	797
14:00	3	498	162	12	116	9	0	9	3	0	0	0	1	33	846
15:00	14	474	249	13	142	2	0	10	0	0	0	0	0	34	938
16:00	16	681	267	10	146	8	0	9	1	2	0	0	0	74	1214
17:00	34	698	235	5	128	4	1	7	1	1	0	0	0	170	1284
18:00	16	654	197	2	87	4	0	9	1	0	0	0	0	36	1006
19:00	30	448	184	2	63	1	0	4	0	0	0	0	0	26	758
20:00	26	395	119	1	49	2	0	1	1	0	0	0	0	18	612
21:00	3	304	101	0	33	1	0	4	0	0	0	0	0	8	454
22:00	2	162	51	1	29	1	0	0	0	0	0	0	0	4	250
23:00	2	108	30	0	14	1	0	1	0	0	0	0	0	0	156
Total	209	7926	2973	96	1632	85	2	130	22	7	0	0	2	594	13678
Percent	1.5%	57.9%	21.7%	0.7%	11.9%	0.6%	0.0%	1.0%	0.2%	0.1%	0.0%	0.0%	0.0%	4.3%	
AM Peak	07:00	11:00	11:00	07:00	08:00	07:00	08:00	10:00	06:00	06:00			04:00	10:00	11:00
Vol.	11	480	207	9	113	10	1	18	2	1			1	32	846
PM Peak	17:00	17:00	16:00	15:00	16:00	12:00	17:00	15:00	12:00	16:00			14:00	17:00	17:00
Vol.	34	698	267	13	146	9	1	10	3	2			1	170	1284

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
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Site Code: 027 05

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Date End: 26-Aug-16

SB, NB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/25/16	0	63	24	0	5	0	0	1	0	0	0	0	0	2	95
01:00	0	34	6	0	7	0	0	0	0	0	0	0	0	0	47
02:00	0	16	11	0	5	0	0	0	0	0	0	0	0	0	32
03:00	0	14	10	0	0	0	0	0	0	0	0	0	2	1	27
04:00	0	31	18	0	17	2	0	1	0	0	0	0	0	3	72
05:00	1	94	46	1	32	0	0	0	0	0	0	0	0	1	175
06:00	6	237	81	6	58	6	0	2	1	0	0	0	0	10	407
07:00	4	403	143	9	87	4	0	10	2	1	0	0	0	20	683
08:00	6	406	172	10	104	4	1	7	2	0	0	0	0	21	733
09:00	2	358	155	4	75	6	0	10	2	1	0	0	2	16	631
10:00	8	395	196	7	73	2	0	8	0	0	0	0	0	17	706
11:00	7	448	170	6	75	7	0	3	1	2	0	0	0	28	747
12 PM	5	507	175	5	85	3	0	10	1	0	0	0	0	27	818
13:00	4	480	180	5	82	3	0	11	2	0	0	0	0	40	807
14:00	5	491	194	11	88	4	0	10	0	1	0	0	2	32	838
15:00	14	554	212	7	90	3	0	6	3	0	0	0	1	49	939
16:00	9	743	241	6	103	9	0	11	0	4	0	0	0	70	1196
17:00	10	817	252	5	111	7	0	11	1	1	0	0	0	80	1295
18:00	6	614	186	3	83	2	0	4	0	0	0	0	0	37	935
19:00	5	497	157	2	79	2	0	3	0	0	0	0	0	16	761
20:00	8	431	114	0	55	0	0	1	0	0	0	0	0	10	619
21:00	5	321	108	0	33	1	0	1	0	0	0	0	0	7	476
22:00	1	212	44	0	19	0	0	1	0	0	0	0	0	3	280
23:00	0	126	29	0	15	0	0	1	0	0	0	0	0	1	172
Total	106	8292	2924	87	1381	65	1	112	15	10	0	0	7	491	13491
Percent	0.8%	61.5%	21.7%	0.6%	10.2%	0.5%	0.0%	0.8%	0.1%	0.1%	0.0%	0.0%	0.1%	3.6%	
AM Peak	10:00	11:00	10:00	08:00	08:00	11:00	08:00	07:00	07:00	11:00			03:00	11:00	11:00
Vol.	8	448	196	10	104	7	1	10	2	2			2	28	747
PM Peak	15:00	17:00	17:00	14:00	17:00	16:00		13:00	15:00	16:00			14:00	17:00	17:00
Vol.	14	817	252	11	111	9		11	3	4			2	80	1295

County of Simcoe

County Road 27 - Summer 2016
County Road 30 to
County Road 90

Transporation and Engineering Department
Midhurst, Ontario
(705) 726-9300

Site Code: 027 05

Date Start: 22-Aug-16
Date End: 26-Aug-16

SB, NB

Start Time	Bikes	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classe	Total
08/26/16	0	82	16	0	13	0	0	2	0	0	0	0	0	1	114
01:00	7	51	11	0	5	3	0	0	0	0	0	0	0	2	79
02:00	0	26	8	0	0	1	0	1	0	0	0	0	0	0	36
03:00	0	15	7	0	1	0	0	0	0	0	0	0	1	0	24
04:00	3	44	15	0	16	1	0	0	0	0	0	0	1	1	81
05:00	2	62	45	1	45	1	0	1	1	0	0	0	0	1	159
06:00	6	217	76	10	68	10	0	4	2	0	0	0	0	7	400
07:00	12	369	127	6	98	3	0	9	1	1	0	0	0	18	644
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	30	866	305	17	246	19	0	17	4	1	0	0	2	30	1537
Percent	2.0%	56.3%	19.8%	1.1%	16.0%	1.2%	0.0%	1.1%	0.3%	0.1%	0.0%	0.0%	0.1%	2.0%	
AM Peak Vol.	07:00	07:00	07:00	06:00	07:00	06:00		07:00	06:00	07:00			03:00	07:00	07:00
PM Peak Vol.	12	369	127	10	98	10		9	2	1			1	18	644
Grand Total	589	30636	10879	419	5646	333	5	530	69	30	0	0	14	1998	51148
Percent	1.2%	59.9%	21.3%	0.8%	11.0%	0.7%	0.0%	1.0%	0.1%	0.1%	0.0%	0.0%	0.0%	3.9%	

APPENDIX B

Sample STAMSON 5.04 Output

Filename: a.te Time Period: Day/Night 16/8 hours
 Description: **Predicted daytime and nighttime sound levels at the medium density residential block adjacent to County Road 27, prediction location [A].**

Road data, segment # 1: County Rd 27 (day/night)

```
-----
Car traffic volume   : 13756/1528   veh/TimePeriod   *
Medium truck volume : 2378/264    veh/TimePeriod   *
Heavy truck volume  : 849/94     veh/TimePeriod   *
Posted speed limit  : 80 km/h
Road gradient       : 0 %
Road pavement       : 1 (Typical asphalt or concrete)
```

* Refers to calculated road volumes based on the following input:

```
24 hr Traffic Volume (AADT or SADT): 13688
Percentage of Annual Growth         : 2.50
Number of Years of Growth           : 13.00
Medium Truck % of Total Volume      : 14.00
Heavy Truck % of Total Volume       : 5.00
Day (16 hrs) % of Total Volume      : 90.00
```

Data for Segment # 1: County Rd 27 (day/night)

```
-----
Angle1   Angle2       : -90.00 deg   90.00 deg
Wood depth : 0          (No woods.)
No of house rows : 0 / 0
Surface     : 1          (Absorptive ground surface)
Receiver source distance : 35.00 / 35.00 m
Receiver height : 1.50 / 1.50 m
Topography    : 3          (Elevated; no barrier)
Elevation     : 15.00 m
Reference angle : 0.00
```

Results segment # 1: County Rd 27 (day)

Source height = 1.50 m

ROAD (0.00 + 69.27 + 0.00) = 69.27 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.21	74.28	0.00	-4.45	-0.56	0.00	0.00	0.00	69.27

Segment Leq : 69.27 dBA

Total Leq All Segments: 69.27 dBA

Results segment # 1: County Rd 27 (night)

Source height = 1.49 m

ROAD (0.00 + 62.73 + 0.00) = 62.73 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.21	67.74	0.00	-4.45	-0.56	0.00	0.00	0.00	62.73

Segment Leq : 62.73 dBA

Total Leq All Segments: 62.73 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.27
(NIGHT): 62.73



ACOUSTICS



NOISE



VIBRATION