

Noise Feasibility Study

Proposed Residential Development

Diam Property

North Oakville, Ontario

Prepared for:

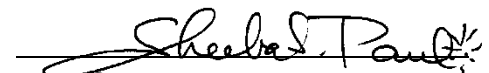
Argo (Joshua Creek) Developments Ltd.
4585 Palladium Way
Burlington, Ontario, L7M 0W9



Prepared by


Victor Garcia, PEng

Reviewed by


Sheeba Paul, MEng, PEng

December 16, 2019

HGC Project No. 01900216

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1 Introduction and Summary

HGC Engineering was retained by Argo (Joshua Creek) Developments Ltd. to perform a noise feasibility study for a proposed residential development located on Dundas Street between Eighth Line and Ninth Line, in the Town of Oakville, Ontario. The proposed development will include single detached dwellings, townhouses, rear lane townhouses, urban core space, mixed use block, storm water management pond, along with associated roadways. The study is required by the Town of Oakville as part of the approvals process.

Road traffic data was obtained through correspondence with the Region of Halton and the Town of Oakville. The data was used to predict future traffic sound levels at the proposed dwellings. The predicted sound levels were compared to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP), the Region of Halton and the Town of Oakville.

The sound level predictions indicate that sound levels will be within MECP guidelines inside the proposed dwellings. There are no specific acoustic requirements for the proposed site.



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2 Site Description and Sources of Sound

Figure 1 shows a key plan which identifies the location of the proposed development. The residential development is located on Dundas Street East between Eighth Line and Ninth Line, in the Town of Oakville, Ontario. The proposed concept plan prepared by Gerrard Design dated December 11, 2019 is included as Figure 2, also showing the prediction locations. The proposed development will include single detached dwellings, townhouses, rear lane townhouses, urban core space, mixed use block, storm water management pond, along with associated roadways.

HGC Engineering personnel visited the site in the month of March 2019. The surrounding lands to the north east and west are primarily future residential lands. To the south side of Dundas Street East are existing residential lands. The development land is fairly flat. The primary source of noise is road traffic noise from Dundas Street East. Dundas Street East is a 6-lane roadway (3 lanes in each direction) in this area. There are no significant sources of stationary noise within 500 m of the subject site.

3 Criteria for Acceptable Sound Levels

3.1 Road Traffic Noise Criteria

Guidelines for acceptable levels of road traffic noise impacting residential developments are given 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 Noise Criteria

	Daytime $L_{EQ}(16 \text{ hour})$	Nighttime $L_{EQ}(8 \text{ hour})$
Outdoor Living Areas	50 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, children's playground or other area where passive recreation is expected to occur.

The guidelines in the MECP publication allow the sound level limit in an OLA to be exceeded by up to 5 dBA, without mitigation, if warning clauses are placed in the property agreements, offers of purchase and sale and rental agreements to the properties. Where future 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. The Region of Halton's minimum noise barrier height is 2.4 m and the maximum is 3.5 m. the remainder of the barrier height can be made up with an earth berm. The Region of Halton has recently requested barriers for sound levels between 55 and 60 dBA.

A central air conditioning system as an alternative means of ventilation to open windows is required for dwellings where future nighttime sound levels outside bedroom windows will exceed 60 dBA or future daytime sound levels outside living/dining/bedroom windows will exceed 65 dBA. Forced-air ventilation with ducts sized to accommodate the future installation of air conditioning is required when nighttime sound levels at bedroom windows will be in the range of 51 to 60 dBA or when daytime sound levels at living/dining/bedroom windows will be 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 nighttime plane of window sound level will be greater than 60 dBA or the daytime plane of window sound level will be greater than 65 dBA. The use of warning clauses to notify future residents of possible excesses is also required.

4 Traffic Sound Level Assessment

4.1 Road Traffic Data

Ultimate road traffic information for Dundas Street East was obtained from the Region of Halton personnel and is provided in Appendix A. A speed limit of 70 km/h was used for Dundas Street East. A commercial vehicle percentage of 3.3% was used for Dundas Street East, split into 2.1% medium



trucks and 1.2% heavy trucks, along with a day-night split of 90%/10%. Table 2 summarizes the traffic data used in the analysis.

Table 2: Ultimate Road Traffic Data

Road Name		Cars	Medium Trucks	Heavy Trucks	Total
Dundas Street East <i>Ultimate</i>	Daytime	47 866	1 040	594	49 500
	Nighttime	5 318	116	66	5 500
	Total	53 184	1 156	660	55 000

4.2 Road Traffic Noise Predictions

Future traffic sound levels were predicted using STAMSON version 5.04, a computer algorithm developed by the MECP. Sample STAMSON output is included in Appendix B.

Sound levels were predicted at the plane of the living/dining room/bedrooms windows during the daytime and at the plane of the bedroom/living/dining room windows during nighttime hours to investigate ventilation requirements. The results of these predictions, without mitigation, are summarized in Table 3.

Table 3: Predicted Sound Levels, Without Mitigation, [dBA]

Prediction Location	Description	Daytime – in the OLA L _{EQ-16 hr}	Daytime – at the Façade L _{EQ-16 hr}	Night-time – at the Façade L _{EQ-8 hr}
[A]	Dwellings with flanking exposure to Dundas	<55	55	<50
[B]	Dwellings with some backing exposure to Dundas	<55	<55	<50
[C]	Lane based townhouses with some exposure to Dundas	--	55	<50
[D]	Dwellings with some backing exposure to Dundas	<55	<55	<50

5 Traffic Noise Recommendations

The predictions indicate that the future traffic sound levels will exceed MECP guidelines at the facades with exposure to Dundas Street East. Recommendations to address these excesses are discussed below.

5.1 Outdoor Living Areas

The predicted sound level in the rear yards of all of the dwelling units will be 55 dBA or less and physical mitigation is not required.

a) Urban Core

The siting information and details for the Urban Core lands are not known at this time. Any outdoor amenity areas for the units should be placed on the shielded side of the buildings to reduce the need for high noise barriers. When siting, lotting and grading information is available, detailed noise studies should be conducted for the Urban Core lands to determine the specific barrier requirements, heights and extents, requirements for ventilation and building envelope construction. The development of the Urban Cores and requirements for noise mitigation will be reviewed in a future site plan approval application.

5.2 Indoor Living Areas

The predicted future sound levels outside the top storey living room/bedroom windows of dwellings with exposure to Dundas Street East will be 55 dBA or less during the daytime hours and 50 dBA or less during the night. There are no specific ventilation requirements for the proposed development.

5.3 Building Façade Constructions

All of the proposed dwellings within the development will have daytime and nighttime sound levels less than 65 and 60 dBA respectively. 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.



Urban Core

Since the details of the siting, density and height of the buildings are not known, a detailed noise study will be required for the Urban Core lands to determine the acoustic requirements (acoustic barriers, ventilation and building façade construction) when siting, grading, building elevations and floor plans are available.

6 Summary and Recommendations

In summary, HGC Engineering has reviewed the preliminary development plan and performed calculations to determine the potential road traffic noise impact on the proposed residential buildings with respect to MECP guidelines. The sound level predictions indicate that there are no specific acoustic requirements for the proposed site.



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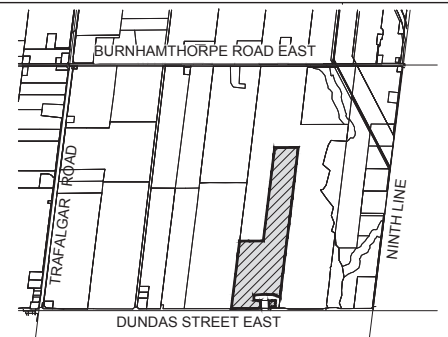


Figure 1 - Key Plan

DRAFT PLAN OF SUBDIVISION 24T- Argo (Joshua Creek) Limited

PART OF LOT 8
CONCESSION 1, NORTH OF DUNDAS STREET

GEOGRAPHIC TOWNSHIP OF TRAFALGAR
NOW IN THE
TOWN OF OAKVILLE
REGIONAL MUNICIPALITY OF HALTON



KEY MAP Subject Lands

OWNER'S AUTHORIZATION

I HEREBY AUTHORIZE KORSIAK URBAN PLANNING TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE TOWN OF OAKVILLE FOR APPROVAL.

SIGNED _____ DATE _____

Gord Buck
Argo (Joshua Creek) Limited
4900 Palladium Way, Suite 105
Burlington, Ontario L7M 0W7

SURVEYOR'S CERTIFICATE

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

SIGNED DATE August 20, 2019

Ross DenBroeder, Ontario Land Surveyor
RPE Surveying LTD.
ONTARIO LAND SURVEYORS
643 CHRISLEA ROAD, SUITE 7, WOODBRIDGE, ONTARIO L4L 8A3
Tel: (416) 635-5000 Fax: (416) 635-5001

ADDITIONAL INFORMATION (UNDER SECTION 51 (17) OF THE PLANNING ACT)

- A) SHOWN ON PLAN
- B) SHOWN ON PLAN
- C) SHOWN ON PLAN
- D) SHOWN ON PLAN
- E) SHOWN ON PLAN
- F) SHOWN ON PLAN
- G) SHOWN ON PLAN
- H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
- I) CLAY LOAM
- J) SHOWN ON PLAN
- K) SANITARY AND STORM SEWERS TO BE PROVIDED
- L) SHOWN ON PLAN

LAND USE SCHEDULE

Land Use	Lots/Blocks	Block Total	Area (ha)	Units
Single Detached (15.24m)	1-12	12	0.65	12
Single Detached (13.72m)	13-23, 25-29, 54-56, 79, 80, 85-91, 101-104, 116-119, 129-133, 154-156, 166, 167, 177, 185-191, 216	55	2.19	55
Single Detached (12.80m)	24, 34-37, 47, 48, 51-53, 57, 62, 63, 70-73, 78, 82-84, 92-94, 98-100, 105-108, 114, 115, 120, 126-128, 134-148, 157, 164, 165, 168, 169, 175, 176, 178, 179, 184, 192-200, 213-215, 217	75	2.67	75
Single Detached (11.60m)	30-33, 38-46, 49, 50, 58-61, 64-69, 74-77, 81, 95-97, 109-113, 121-125, 149-153, 158-163, 170-174, 180-183, 201-212, 218-222	80	2.74	80
Street Townhouses	223-245	23	2.74	131
Rear Lane Townhouses	246-265	20	1.57	101
Back-to-Back Townhouses	266-277	12	1.43	146
Mixed Use	278	1	0.44	
Dundas Urban Core (DUC)	279, 280	2	2.35	
Neighbourhood Park	281	1	1.60	
Village Square	282	1	0.03	
Open Space	283	1	0.04	
Walkway (3m)	284	1	0.01	
Servicing Block	285	1	0.11	
Natural Heritage System (NHS)	286-290	5	7.95	
SWM Pond	291	1	2.61	
Residential Reserve	292-318	27	0.96	
0.3m Reserve	319-336	18	0.00	
Road Widening	337, 338	2	0.07	
7.5m ROW (423m)			0.33	
17m ROW (3,074m)			5.26	
19m ROW (411m)			0.79	
22m ROW (815m)			1.80	
27.8-22m ROW (54m)			0.14	
Totals	338	338	38.48	600

24T- SDE CALCULATIONS

Unit Type	Blocks	Units	SDE*
Single Detached	1-222	222	222
Townhouse	223-265	232	176.3
Back-to-Back Townhouse	266-277	146	65.7
Total	277	600	464.0

* SDE Factors:
Detached - 1.00
Townhouse - 0.76
Back-to-Back - 0.45

Dec 11, 2019	Original Submission	A	SP
DATE	REVISION	DWG	BY

NOTES:

- Pavement illustration is diagrammatic
- Connector or Avenue to Arterial daylight triangle = 15m
- Connector or Avenue to Connector or Avenue daylight triangle = 7.5m
- All other daylight triangles = 3.5m



SCALE 1:2000 December 11, 2019

DRAWN BY: SP CHECKED BY: KC

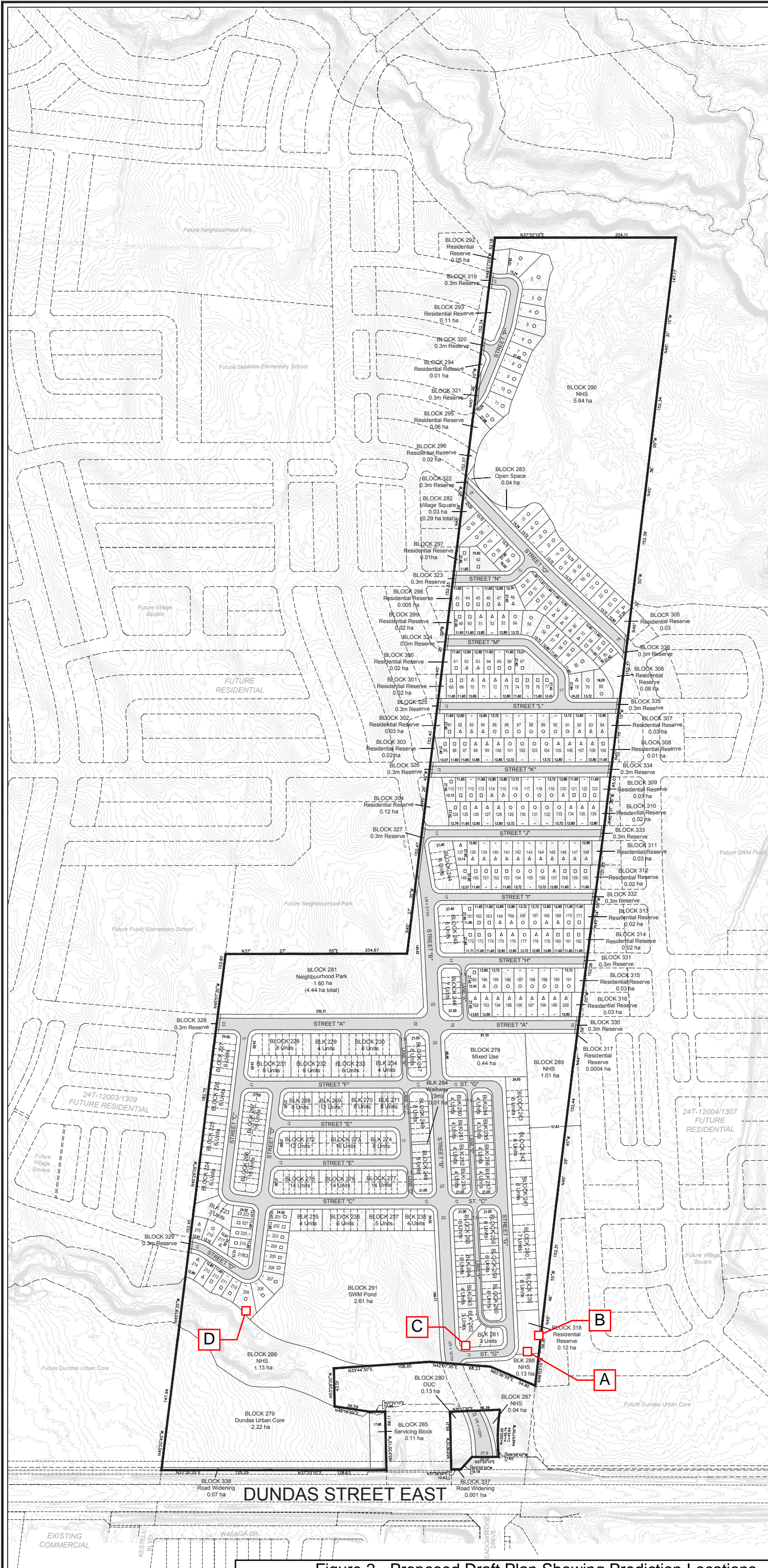


Figure 2 - Proposed Draft Plan Showing Prediction Locations

APPENDIX A

Road Traffic Data



ACOUSTICS



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VIBRATION

Victor Garcia

From: Krusto, Matt <Matt.Krusto@halton.ca>
Sent: October-23-17 1:35 PM
To: Victor Garcia
Subject: RE: Road Traffic Data Request Oakville

Hi Victor,

Please use the following data:

Dundas Street:

- AADT (ultimate 2031) = 55,000
- Medium Trucks = 8%
- Heavy Trucks = 5%
- Number of Lanes = 6
- Posted Speed Limit = 70 km/h
- Day/Night split = 90%/10%

Neyagawa Boulevard:

- AADT (ultimate 2031) = 35,000
- Medium Trucks = 5%
- Heavy Trucks = 3%
- Number of Lanes = 4
- Posted Speed Limit = 60 km/h
- Day/Night split = 90%/10%

Matt

Matt Krusto

Transportation Planning Coordinator

Infrastructure Planning & Policy

Public Works

Halton Region

905-825-6000, ext. 7225 | 1-866-442-5866



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From: Victor Garcia [mailto:vgarcia@hgcengineering.com]
Sent: Monday, October 23, 2017 1:16 PM

Victor Garcia

From: Papiez-Lopata, Brittany <Brittany.Papiez-Lopata@halton.ca>
Sent: November 21, 2019 8:52 AM
To: Victor Garcia
Subject: RE: Commercial Traffic Volumes - Dundas St E, east of Eighth Line

Hi Victor,
Perfect, the AADT 53,826. Let me know if you have any more questions.

# sml trk	# med trk/bus	# hvy trk
597	543	618
%sml trk	% med trk/bu	% hvy trk
1.1%	1.0%	1.2%

Brittany

From: Victor Garcia <vgarcia@hgcengineering.com>
Sent: Thursday, November 21, 2019 8:45 AM
To: Papiez-Lopata, Brittany <Brittany.Papiez-Lopata@halton.ca>
Subject: RE: Commercial Traffic Volumes - Dundas St E, east of Eighth Line

Hi Britany,

Yes that would work.

Thanks,

Victor Garcia, P.Eng
HGC Engineering **NOISE / VIBRATION / ACOUSTICS**
Howe Gastmeier Chapnik Limited
t: 905.826.4044

From: Papiez-Lopata, Brittany <Brittany.Papiez-Lopata@halton.ca>
Sent: November 21, 2019 8:40 AM
To: Victor Garcia <vgarcia@hgcengineering.com>
Subject: RE: Commercial Traffic Volumes - Dundas St E, east of Eighth Line

Good morning Victor,
Yes I can, the only issue is the closest ATR I have to that location is Dundas Street - between Prince Michael Drive and Meadowridge Drive. Let me know if that works!

Brittany

Brittany Papiez-Lopata
Traffic Ops & Safety Co-Op Student
Waste Management & Road Operations

APPENDIX B

Sample STAMSON 5.04 Output



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Filename: a.te Time Period: Day/Night 16/8 hours

Description: Dwellings with flanking exposure to Dundas

Road data, segment # 1: Dundas (day/night)

```
-----
Car traffic volume : 23933/2659 veh/TimePeriod *
Medium truck volume : 520/58 veh/TimePeriod *
Heavy truck volume : 297/33 veh/TimePeriod *
Posted speed limit : 70 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): 27500
Percentage of Annual Growth : 0.00
Number of Years of Growth : 0.00
Medium Truck % of Total Volume : 2.10
Heavy Truck % of Total Volume : 1.20
Day (16 hrs) % of Total Volume : 90.00
```

Data for Segment # 1: Dundas (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 : 164.00 / 148.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: Dundas (day/night)

```
-----
Car traffic volume : 23933/2659 veh/TimePeriod *
Medium truck volume : 520/58 veh/TimePeriod *
Heavy truck volume : 297/33 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

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

A

24 hr Traffic Volume (AADT or SADT): 27500
 Percentage of Annual Growth : 0.00
 Number of Years of Growth : 0.00
 Medium Truck % of Total Volume : 2.10
 Heavy Truck % of Total Volume : 1.20
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Dundas (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 : 182.00 / 166.00 m
 Receiver height : 4.50 / 4.50 m
 Topography : 1 (Flat/gentle slope; no barrier)
 Reference angle : 0.00

Results segment # 1: Dundas (day)

 Source height = 1.05 m

ROAD (0.00 + 52.66 + 0.00) = 52.66 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	70.44	0.00	-16.45	-1.33	0.00	0.00	0.00	52.66

 Segment Leq : 52.66 dBA

Results segment # 2: Dundas (day)

 Source height = 1.05 m

ROAD (0.00 + 51.94 + 0.00) = 51.94 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	70.44	0.00	-17.17	-1.33	0.00	0.00	0.00	51.94

 Segment Leq : 51.94 dBA

Total Leq All Segments: 55.33 dBA

Results segment # 1: Dundas (night)

A

Source height = 1.05 m

ROAD (0.00 + 46.84 + 0.00) = 46.84 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	63.91	0.00	-15.74	-1.33	0.00	0.00	0.00	46.84

Segment Leq : 46.84 dBA

Results segment # 2: Dundas (night)

Source height = 1.05 m

ROAD (0.00 + 46.05 + 0.00) = 46.05 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	63.91	0.00	-16.53	-1.33	0.00	0.00	0.00	46.05

Segment Leq : 46.05 dBA

Total Leq All Segments: 49.47 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 55.33 dBA
(NIGHT): 49.47 dBA