REPORT

Manors of Belfountain

Shaw Creek Road, Caledon

Noise Impact Study

SACL #SW17308A0

December 19, 2017

Submitted to:

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Reviewed by:

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1. Introduction

This document is a Noise Impact Study for a proposed residential development located on Shaw Creek Road in Caledon, Ontario (Project). The legal location of the Project is part of east half and west half of Lot 9, Concession 5 W.H.S. (Hamlet of Belfountain) in the Town of Caledon. We understand that the study is required by the Town of Caledon for approval of a draft plan of subdivision.

The proposed residential development consists of 67 single family residential units. The site plan is shown in Figure 1. The objective of this study is to determine if the proposed development can meet the requirements of the Town of Caledon, using criteria developed by the Ontario Ministry of the Environment and Climate Change (MOECC). Noise control recommendations are summarised in Section 7.

2. Site

The Project is located on the east side of Shaw Creek Road, between Bush Street and The Grange Side Road. An aerial photo of the area is provided in Figure 2. The Project is surrounded by residential land use and agricultural land use except the Belfountain Public School immediately north of the Project.

The proposed residential develop consists of 67 single family residential units. The existing woodlot and valley on the east side of the site will remain. Two blocks will be designated as open space. As it is still in the early stage of design, a typical layout of the residential lots is not available yet. It is assumed that the designated outdoor living area will be the backyard of each of the houses. It is also assumed that the frontage of houses on Lot 1, Lot 2, Lot 5 and Lot 6 will be oriented towards Shaw Creek Road. The rest of the houses will have frontage oriented towards local streets.

3. Noise Source

A site visit was conducted on December 13, 2017. The major noise source that may impact the site is the road traffic along Shaw Creek Road. The nearby Bush Street to the north and Mississauga Road to the east are more than 200 m from the nearest houses in the Project; therefore, the traffic on these roads are not considered significant noise sources.

There are two rooftop units near the main entrance of the Belfountain Public School. Noise from the rooftop units was not audible during the site visit. As these rooftop units are about 160 m from the north property line of the Project, they are not considered significant stationary noise sources. According to the personnel in the school, school buses pick up and drop off students at the main entrance. The school buses may idle for about 10 minutes near the main entrance but they do not park or idle at the parking lot located on the south side of the school property. As the main entrance is about 160 m from the north property line of the Project, school bus movement and

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idling are not considered significant stationary noise sources. Therefore, there are no significant noise sources associated with the Belfountain Public School.

4. Critical Noise Receptors

Critical Noise Receptors are those receptors likely to be most affected by the identified noise sources. The critical indoor noise receptors in the proposed development are the proposed houses along Shaw Creek Road. The critical outdoor noise receptors are the backyards of these proposed houses. A receptor farther away from Shaw Creek Road is also included to verify the extent of noise control requirements. The locations of the critical receptors are summarised in Table 1 and shown in Figure 1.

Table 1: Critical Noise Receptors

Receptor ID	*Receptor Location*	*Height (m)*
POR1	House on Lot 1	4.5
POR2	House on Lot 9	4.5
OLA1	Backyard of Lot 1	1.5
OLA2	Backyard of Lot 8	1.5

The outdoor living areas (OLA1 and OLA2) are selected to represent different orientations of the house. OLA1 represents backyards of houses facing Shaw Creek Road and is shielded by the house itself. OLA2 represents backyards of houses along Shaw Creek Road facing local roads such that the backyard is exposed to Shaw Creek Road directly. It is assumed that the minimum setback of the house is 6 m from the west property line along Shaw Creek Road regardless of the orientation of the house.

5. Sound Levels

Traffic volume data for Shaw Creek Road was obtained from NexTrans Consulting Engineers. The traffic data are provided in Appendix A. Existing or ultimate AADT for this road is not available. The AADT was estimated by multiplying the morning peak hour traffic volume by a factor of 12.05. A 2.5% per year increase for road traffic volume from 2017 to 2037, that is 20 years, was assumed. The traffic data are summarised in Table 2.

Table 2: Summary of Traffic Data

Parameter	*Shaw Creek Road*
Morning Peak Hour 7:30-8:30 in 2017	68
Estimated AADT	819

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Parameter	*Shaw Creek Road*
Annual increase	2.5%
Medium truck % of total volume	19%
Heavy truck % of total volume	3%
Estimated day (16 hrs) % of total volume	90%
Estimated night (8 hrs) % of total volume	10%
Posted Speed Limit	60 km/h
Gradient	3.5%

According to the Town of Caledon Development Standards, Policies & Guidelines Version 4 – January 2009, the traffic speed for noise impact analysis should be 10 km/hr over the posted speed limit. Therefore the speed limit used in our traffic noise prediction model is 70 km/h.

Calculations of traffic sound levels were performed using STAMSON 5.04, the traffic (and railway) noise prediction model developed and accepted by MOECC. The calculated sound levels are as follows:

Table 3: Calculated Outdoor Sound Level

Receptor ID	*Calculated Sound Level (dBA)*	
	Day Leq (16 hrs)	*Night Leq (8 hs)*
POR1	59	53
POR2	49	41
OLA1	49	-
OLA2	52	-

A sample calculation report for traffic noise predictions is attached as Appendix B. As the traffic volume for Shaw Creek Road is too low to be input into the STAMSON calculation model, the traffic volume and resultant sound level have been adjusted by a factor of 10, resulting in calculated levels being 10 dB higher. The levels reported in Table 3 are thus 10 dB lower than the levels calculated and presented in Appendix B.

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6. Sound Level Limits

Guidelines for acceptable sound levels of road traffic on residential developments are given in Part C of the MOE publication NPC-300 "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning" dated 2013.

6.1 Outdoor Sound Level Limits

The MOECC outdoor sound level limit for traffic noise is as follows:

Table 4: MOECC Outdoor Sound Level Limit

Time Period	*Sound Level (Leq)*
Day-time (07:00 - 23:00)	55

In addition to the above outdoor levels, the MOECC has a sliding scale to determine the need for outdoor noise reduction measures depending on outdoor sound levels:

Table 5: MOECC Noise Control Requirements for Outdoor Receptors

Outdoor Sound Level (Day-time Leq)	*Need for Noise Reduction Measures*
56 to 60 dBA	Noise control measures may be implemented. If no noise control measures are planned, a warning clause must be included in the unit title or lease agreement.
Above 60 dBA	Control measures (barriers) required to reduce the Leq to below 60 dBA and as close to 55 dBA as technically, economically and administratively feasible. A warning clause is required if resultant Leq exceeds 55 dBA.

6.2 Indoor Sound Level Limits

The indoor sound levels limits developed by MOECC for road sources are as follows:

Table 6: MOECC Indoor Sound Level Limit

Room	*Time Period*	*Road Sound Level (Leq)*
Living rooms	Day-time (07:00 - 23:00)	45 dBA
	Night-time (23:00 - 07:00)	45 dBA

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Room	*Time Period*	*Road Sound Level (Leq)*
Bedrooms	Day-time (07:00 - 23:00)	45 dBA
	Night-time (23:00 - 07:00)	40 dBA

In addition to the above indoor levels, the MOECC has a sliding scale to determine the need for noise reduction measures depending on the outdoor sound level:

Table 7: Combination of Road and Rail Noise, Ventilation and Warning Clause Requirements

ASSESSMENT LOCATION	*Leq*	*VENTILATION REQUIREMENTS*	*WARNING CLAUSE*
PLANE OF BEDROOM, LIVING ROOM WINDOW (07:00-23:00)	Greater than 55 dBA to less than or equal to 65 dBA.	Forced air heating with provision for central air conditioning.	Required
	Greater than 65 dBA.	Central air conditioning	Required
PLANE OF BEDROOM, LIVING ROOM WINDOW (07:00-23:00)	Greater than 50 dBA to less than or equal to 60 dBA.	Forced air heating with provision for central air conditioning.	Required
	Greater than 60 dBA	Central air conditioning	Required

Table 8: Road Noise Building Component Requirements

ASSESSMENT LOCATION	*Leq*	*BUILDING COMPONENT REQUIREMENTS*
PLANE OF BEDROOM, LIVING ROOM WINDOW (07:00-23:00)	Less than or equal to 65 dBA	Building compliant with the Ontario Building Code.
	Greater than 65 dBA	Building components must be designed to achieve indoor sound level criteria.

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ASSESSMENT LOCATION	***Leq***	***BUILDING COMPONENT REQUIREMENTS***
PLANE OF BEDROOM, LIVING ROOM WINDOW (23:00-07:00)	Less than or equal to 60 dBA	Building compliant with the Ontario Building Code.
	Greater than 60 dBA	Building components must be designed to achieve indoor sound level criteria

6.3 Town of Caledon Requirements

In addition to the MOECC requirements, the Town of Caledon has the following sound level limits in their Development Standards, Policies & Guidelines Version 4 – January 2009:

- "The Town of Caledon will NOT accept sound levels in excess of the following levels, unless design features exceed standard detail.
- For outdoor areas the equivalent sound level Leq from 7:00 a.m. to 11:00 p.m. is 55 dBA.
- For indoor areas such as living rooms during the day the Leq is 45 dBA for roads and 40 dBA for rail.
- For bedrooms at night the Leq is 40 dBA for road and 35 dBA for rail."

7. Noise Control Measures

Noise control recommendations for the critical receptors are summarized in Table 9 and discussed in the subsequent sections.

Table 9: Noise Control Measures

Receptor	***Noise Barrier***	***Ventilation***	***Building Components***	***Warning Clause***
POR1	N/A	Forced air heating with provision for central air conditioning.	Ontario Building Code	Yes, Type C
POR2	N/A	None	Ontario Building Code	No
OLA1	No	N/A	N/A	No
OLA2	No	N/A	N/A	No

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7.1 Outdoor Amenity Area

Since the predicted daytime sound levels at OLA1 and OLA2 are below 55 dBA, no noise control is required for outdoor amenity areas.

7.2 Ventilation

Since the predicted sound levels for POR1 on Shaw Creek Road are between 55 dBA and 60 dBA during daytime and between 50 dBA and 55 dBA during night-time, dwellings on Lot 1 to Lot 8 should be designed with forced air heating with provision for installation of central air conditioning in the future.

7.3 Building Components

Since the predicted sound levels are below 65 dBA during daytime and below 60 dBA during night-time, building components that meet the Ontario Building Codes will be sufficient to meet the indoor sound level limits.

7.4 Warning Clauses

Since forced air heating with provision for central air conditioning is required for Lot 1 to Lot 8 along Shaw Creek Road, the following Type C warning clause should be inserted in all development agreements of each of these dwellings:

> "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 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."

8. Concluding Comments

With the incorporation of the noise control measures as presented in Section 7 of this report, the noise impact from the transportation noise sources on the proposed residential development will meet the MOECC criteria. There are no significant stationary noise sources near the project.

The proposed residential development Manors of Belfountain located at part of east half and west half of Lot 9, Concession 5 W.H.S. (Hamlet of Belfountain) in the Town of Caledon should therefore be approved from the noise aspect.

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Figures

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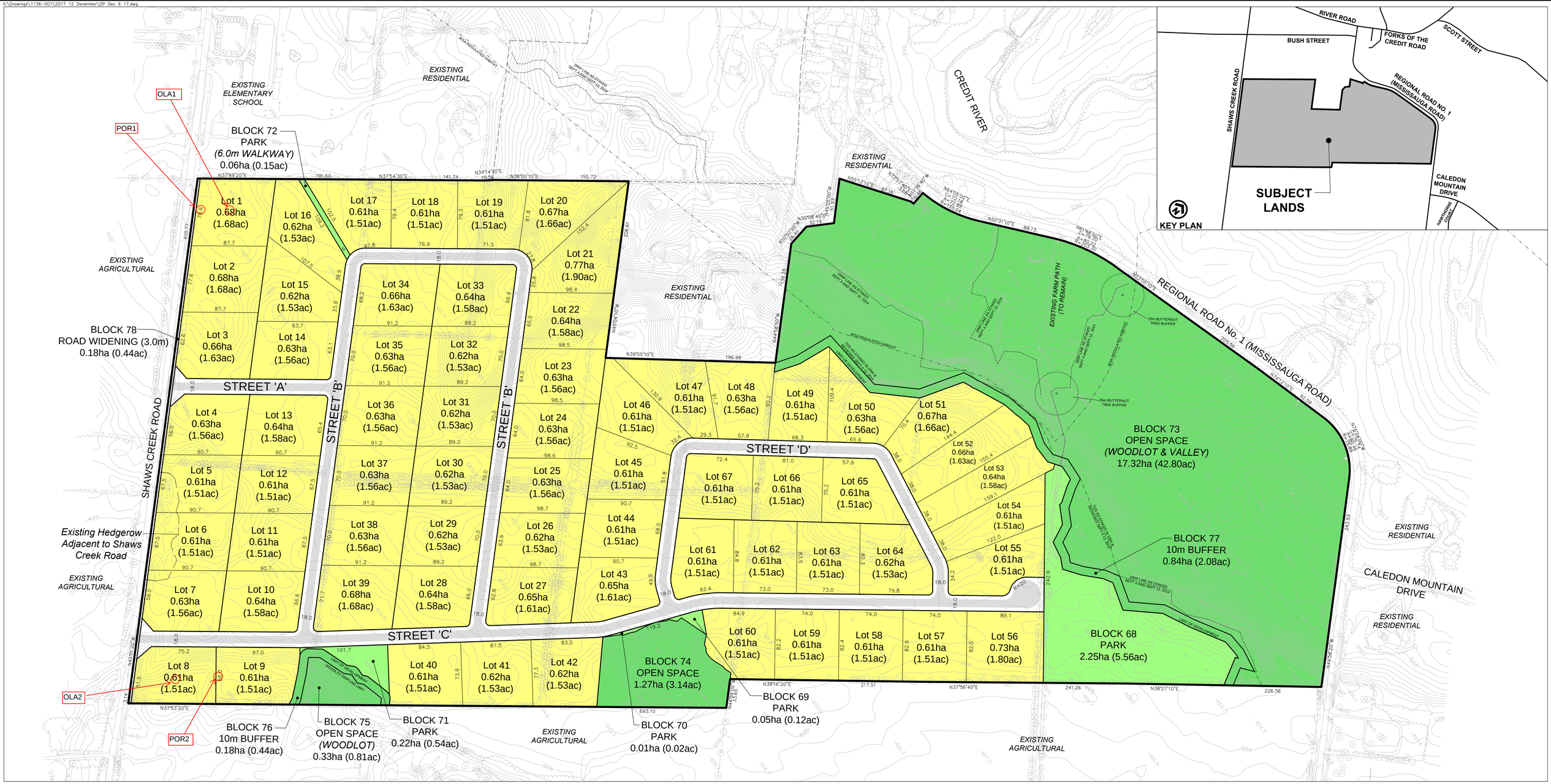

DRAFT PLAN OF SUBDIVISION
MANORS OF BELFOUNTAIN CORP.

FILE # 21T-91015C

PART OF EAST HALF AND WEST HALF LOT 9,
CONCESSION 5, W.H.S.
(HAMLET OF BELFOUNTAIN),
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL

OWNERS CERTIFICATE

I HEREBY AUTHORIZE GLEN SCHNARR & ASSOCIATES INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE TOWN OF CALEDON FOR APPROVAL.

SIGNED _____ DATE: _____

JOHN SPINA, ASO
MANORS OF BELFOUNTAIN CORP.

SURVEYORS 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: _____

ALISTER SANKEY, OLS
DAVID B. SEARLES SURVEYING LTD.
4255 SHERWOODTOWNE BLVD. SUITE 206
MISSISSAUGA, ON, L4Z 1Y5
PHONE: 905-273-6840
EMAIL: info@dbsearles.ca

ADDITIONAL INFORMATION

(UNDER SECTION 51(17) OF THE PLANNING ACT) INFORMATION REQUIRED BY CLAUSES A,B,C,D,E,F,G, & J ARE SHOWN ON THE DRAFT AND KEY PLANS.

H) MUNICIPAL AND PIPED WATER TO BE PROVIDED
I) SANDY LOAM AND CLAY LOAM
K) SANITARY AND STORM SEWERS TO BE PROVIDED

NOTES

- Local to local radii - 5.0
- Streets 'A' & 'C' to Shaws Creek Rd. daylight triangles - 15.0 x 15.0
- Pavement illustration is diagrammatic only

LAND USE SCHEDULE

LAND USE	LOTS / BLOCKS	AREA (ha)	AREA (ac)	UNITS
ESTATE RESIDENTIAL	1-67	42.24	104.38	67
PARK	68-72	2.60	6.42	
OPEN SPACE	73-75	18.92	46.75	
10m BUFFER	76, 77	1.02	2.52	
ROAD WIDENING	78	0.18	0.44	
18.0m ROW - (2,886m LENGTH)		5.32	13.15	
TOTAL	**78**	**70.28**	**173.67**	**67**

Figure 1 Site Plan

Scale 1:2000
(24 x 36)
December 5, 2017

GLEN SCHNARR & ASSOCIATES INC.
URBAN & REGIONAL PLANNERS, LAND DEVELOPMENT CONSULTANTS
SUITE 700 10 KINGSBRIDGE GARDEN CIRCLE,
MISSISSAUGA, ONTARIO, L5R 3K6
TEL (905) 568-8888 FAX (905) 568-8894 www.gsai.ca

Figure 2 Aerial Photo

Appendices

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Appendix A: Traffic Data

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NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

Turning Movement Count (1 . SHAWS CREEK RD & BUSH ST)

Start Time	N Approach SHAWS CREEK RD						E Approach BUSH ST						S Approach SHAWS CREEK RD						W Approach BUSH ST						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	0	4	9	0	0	13	3	13	2	0	0	18	1	0	1	0	0	2	3	29	1	0	0	33	66	
07:15:00	2	1	12	0	0	15	0	15	2	0	0	17	2	1	0	0	0	3	1	35	0	0	0	36	71	
07:30:00	0	3	9	0	0	12	3	10	0	0	0	13	2	1	0	0	0	3	4	39	2	0	0	45	73	
07:45:00	1	6	13	0	0	20	4	16	2	0	0	22	0	1	1	0	0	2	3	33	1	0	0	37	81	291
08:00:00	0	5	13	0	0	18	2	10	2	0	0	14	0	2	1	0	0	3	3	20	0	0	0	23	58	283
08:15:00	1	4	6	0	0	11	3	14	7	0	0	24	9	4	4	0	0	17	4	22	1	0	0	27	79	291
08:30:00	0	2	8	0	0	10	3	14	1	0	0	18	1	1	1	0	0	3	1	10	0	0	0	11	42	260
08:45:00	1	0	9	0	0	10	2	7	1	0	0	10	1	0	1	0	0	2	1	14	2	0	0	17	39	218
09:00:00	2	2	6	0	0	10	1	13	2	0	0	16	1	2	0	0	0	3	1	9	0	0	0	10	39	199
09:15:00	0	1	3	0	0	4	3	9	0	0	0	12	0	0	1	0	0	1	1	16	3	0	0	20	37	157
09:30:00	1	0	3	0	0	4	4	10	0	0	0	14	0	3	0	0	0	3	0	15	2	0	0	17	38	153
09:45:00	0	2	4	0	0	6	2	3	0	0	0	5	0	0	1	0	0	1	1	6	1	0	0	8	20	134
BREAK																										
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17:15:00	0	0	2	0	0	2	17	38	1	0	0	56	1	3	2	0	0	6	1	20	2	0	0	23	87	327
17:30:00	0	3	6	0	0	9	14	29	0	0	0	43	3	1	0	0	0	4	0	21	2	0	0	23	79	333
17:45:00	1	0	1	0	0	2	13	30	1	0	0	44	0	1	1	0	0	2	0	9	1	0	0	10	58	296
18:00:00	2	0	5	0	0	7	7	17	1	0	0	25	1	2	1	0	0	4	0	12	0	0	0	12	48	272
18:15:00	0	1	0	0	0	1	9	19	1	0	0	29	0	0	0	0	0	0	0	10	1	0	0	11	41	226
18:30:00	3	1	3	0	0	7	10	8	0	0	0	18	0	1	1	0	0	2	0	15	3	0	0	18	45	192
18:45:00	0	3	1	0	0	4	3	9	1	0	0	13	0	0	1	0	0	1	0	8	0	0	0	8	26	160
Grand Total	16	44	132	0	1	192	161	466	32	0	0	659	34	31	27	0	0	92	26	412	38	0	0	476	**1419**	-
Approach%	8.3%	22.9%	68.8%	0%		-	24.4%	70.7%	4.9%	0%		-	37%	33.7%	29.3%	0%		-	5.5%	86.6%	8%	0%		-	-	-
Totals %	1.1%	3.1%	9.3%	0%		13.5%	11.3%	32.8%	2.3%	0%		46.4%	2.4%	2.2%	1.9%	0%		6.5%	1.8%	29%	2.7%	0%		33.5%	-	-
Heavy	1	4	5	0		-	2	9	6	0		-	4	4	2	0		-	3	6	1	0		-	-	-
Heavy %	6.3%	9.1%	3.8%	0%		-	1.2%	1.9%	18.8%	0%		-	11.8%	12.9%	7.4%	0%		-	11.5%	1.5%	2.6%	0%		-	-	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

Spectrum

Turning Movement Count
Location Name: SHAWS CREEK RD & BUSH ST
Date: Wed, Nov 15, 2017 Deployment Lead: Theo Daglis

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

Peak Hour: 07:30 AM - 08:30 AM Weather: Mostly Cloudy (1.6 °C)

Start Time	N Approach SHAWS CREEK RD						E Approach BUSH ST						S Approach SHAWS CREEK RD						W Approach BUSH ST						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:30:00	0	3	9	0	0	12	3	10	0	0	0	13	2	1	0	0	0	3	4	39	2	0	0	45	73
07:45:00	1	6	13	0	0	20	4	16	2	0	0	22	0	1	1	0	0	2	3	33	1	0	0	37	81
08:00:00	0	5	13	0	0	18	2	10	2	0	0	14	0	2	1	0	0	3	3	20	0	0	0	23	58
08:15:00	1	4	6	0	0	11	3	14	7	0	0	24	9	4	4	0	0	17	4	22	1	0	0	27	79
Grand Total	2	18	41	0	0	61	12	50	11	0	0	73	11	8	6	0	0	25	14	114	4	0	0	132	**291**
Approach%	3.3%	29.5%	67.2%	0%		-	16.4%	68.5%	15.1%	0%		-	44%	32%	24%	0%		-	10.6%	86.4%	3%	0%		-	**-**
Totals %	0.7%	6.2%	14.1%	0%		21%	4.1%	17.2%	3.8%	0%		25.1%	3.8%	2.7%	2.1%	0%		8.6%	4.8%	39.2%	1.4%	0%		45.4%	**-**
PHF	0.5	0.75	0.79	0		0.76	0.75	0.78	0.39	0		0.76	0.31	0.5	0.38	0		0.37	0.88	0.73	0.5	0		0.73	**-**
Heavy	0	1	1	0		2	2	2	4	0		8	3	4	1	0		8	2	2	0	0		4	**-**
Heavy %	0%	5.6%	2.4%	0%		3.3%	16.7%	4%	36.4%	0%		11%	27.3%	50%	16.7%	0%		32%	14.3%	1.8%	0%	0%		3%	**-**
Lights	2	17	40	0		59	10	48	7	0		65	8	4	5	0		17	12	112	4	0		128	**-**
Lights %	100%	94.4%	97.6%	0%		96.7%	83.3%	96%	63.6%	0%		89%	72.7%	50%	83.3%	0%		68%	85.7%	98.2%	100%	0%		97%	**-**
Single-Unit Trucks	0	0	0	0		0	1	0	0	0		1	0	0	1	0		1	1	0	0	0		1	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	8.3%	0%	0%	0%		1.4%	0%	0%	16.7%	0%		4%	7.1%	0%	0%	0%		0.8%	**-**
Buses	0	1	1	0		2	1	2	4	0		7	2	4	0	0		6	0	2	0	0		2	**-**
Buses %	0%	5.6%	2.4%	0%		3.3%	8.3%	4%	36.4%	0%		9.6%	18.2%	50%	0%	0%		24%	0%	1.8%	0%	0%		1.5%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	1	0	0	0		1	1	0	0	0		1	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	9.1%	0%	0%	0%		4%	7.1%	0%	0%	0%		0.8%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

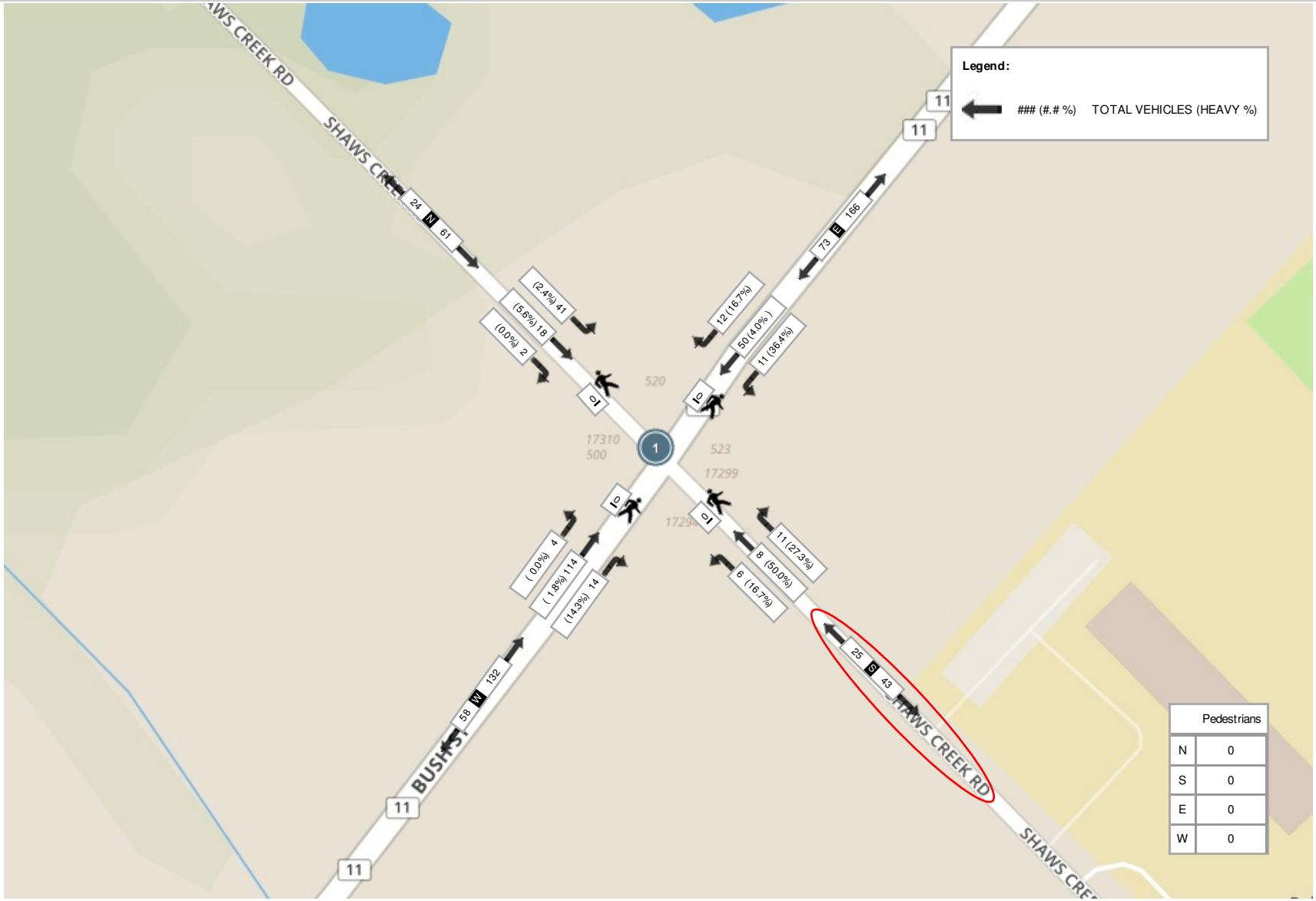
NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

Peak Hour: 04:45 PM - 05:45 PM Weather: Rain (2.8 °C)

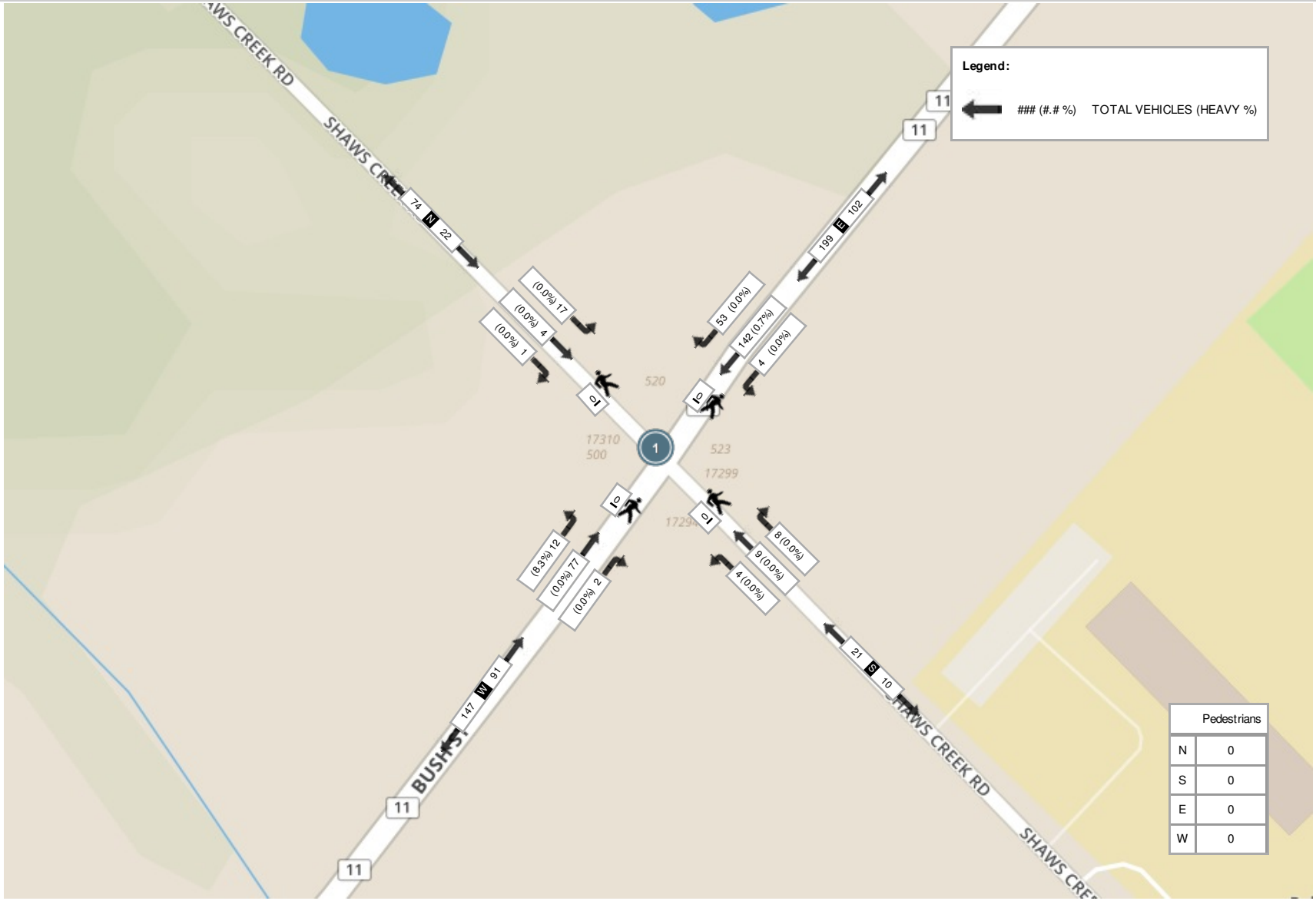
Start Time	N Approach SHAWS CREEK RD						E Approach BUSH ST						S Approach SHAWS CREEK RD						W Approach BUSH ST						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	1	1	6	0	0	8	12	44	1	0	0	57	3	4	2	0	0	9	1	16	4	0	0	21	95
17:00:00	0	0	3	0	0	3	10	31	2	0	0	43	1	1	0	0	0	2	0	20	4	0	0	24	72
17:15:00	0	0	2	0	0	2	17	38	1	0	0	56	1	3	2	0	0	6	1	20	2	0	0	23	87
17:30:00	0	3	6	0	0	9	14	29	0	0	0	43	3	1	0	0	0	4	0	21	2	0	0	23	79
Grand Total	1	4	17	0	0	22	53	142	4	0	0	199	8	9	4	0	0	21	2	77	12	0	0	91	**333**
Approach%	4.5%	18.2%	77.3%	0%		-	26.6%	71.4%	2%	0%		-	38.1%	42.9%	19%	0%		-	2.2%	84.6%	13.2%	0%		-	-
Totals %	0.3%	1.2%	5.1%	0%		6.6%	15.9%	42.6%	1.2%	0%		59.8%	2.4%	2.7%	1.2%	0%		6.3%	0.6%	23.1%	3.6%	0%		27.3%	-
PHF	0.25	0.33	0.71	0		0.61	0.78	0.81	0.5	0		0.87	0.67	0.56	0.5	0		0.58	0.5	0.92	0.75	0		0.95	-
Heavy	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	1	0		1	-
Heavy %	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.5%	0%	0%	0%	0%		0%	0%	0%	8.3%	0%		1.1%	-
Lights	1	4	17	0		22	53	141	4	0		198	8	9	4	0		21	2	77	11	0		90	-
Lights %	100%	100%	100%	0%		100%	100%	99.3%	100%	0%		99.5%	100%	100%	100%	0%		100%	100%	100%	91.7%	0%		98.9%	-
Single-Unit Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.5%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	1	0		1	-
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	8.3%	0%		1.1%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

NexTrans
4261-A14 Highway 7 East
Suite 489
Markham ON, CANADA, L3R 9W6

Peak Hour: 07:30 AM - 08:30 AM Weather: Mostly Cloudy (1.6 °C)



Peak Hour: 04:45 PM - 05:45 PM **Weather: Rain (2.8 °C)**



Appendix B: STAMSON Calculations

SWALLOW ACOUSTIC CONSULTANTS LTD.
Toronto: 366 Revus Ave., Unit 23 Mississauga, ON, Canada, L5G 4S5, 905-271-7888
Ottawa: 116 Albert Street, 3rd Floor, Ottawa, ON, Canada, K1P 5G3, 613-565-1800
acoustic@thorntontomasetti.com www.thorntontomasetti.com

STAMSON 5.0 NORMAL REPORT Date: 19-12-2017 17:28:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por1.te Time Period: Day/Night 16/8 hours
Description: Predicted Sound Levels at POR1

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

Car traffic volume : 9421/1047 veh/TimePeriod *
Medium truck volume : 2295/255 veh/TimePeriod *
Heavy truck volume : 362/40 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 4 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8190
Percentage of Annual Growth : 2.50
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 19.00
Heavy Truck % of Total Volume : 3.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: ShawCreek (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 : 18.00 / 18.00 m
Receiver height : 4.50 / 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: ShawCreek (day)

Source height = 1.32 m

ROAD (0.00 + 69.14 + 0.00) = 69.14 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	71.70	0.00	-1.25	-1.31	0.00	0.00	0.00	69.14

Segment Leq : 69.14 dBA

Total Leq All Segments: 69.14 dBA

Results segment # 1: ShawCreek (night)

Source height = 1.31 m

ROAD (0.00 + 62.60 + 0.00) = 62.60 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.58	65.16	0.00	-1.25	-1.31	0.00	0.00	0.00	62.60

Segment Leq : 62.60 dBA

Total Leq All Segments: 62.60 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 69.14
(NIGHT): 62.60

STAMSON 5.0 NORMAL REPORT Date: 19-12-2017 17:29:14
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola1.te Time Period: Day/Night 16/8 hours
Description: Predicted Sound Level at OLA1

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

Car traffic volume : 9421/1047 veh/TimePeriod *
Medium truck volume : 2295/255 veh/TimePeriod *
Heavy truck volume : 362/40 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 4 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8190
Percentage of Annual Growth : 2.50
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 19.00
Heavy Truck % of Total Volume : 3.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: ShawCreek (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 : 36.00 / 36.00 m
Receiver height : 1.50 / 1.50 m
Topography : 2 (Flat/gentle slope; with barrier)
Barrier angle1 : -45.00 deg Angle2 : 45.00 deg
Barrier height : 6.00 m
Barrier receiver distance : 3.00 / 3.00 m
Source elevation : 0.00 m
Receiver elevation : 0.00 m
Barrier elevation : 0.00 m
Reference angle : 0.00

Results segment # 1: ShawCreek (day)

Source height = 1.32 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.32	1.50	1.48	1.48

ROAD (56.34 + 43.58 + 56.34) = 59.46 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.66	71.70	0.00	-6.31	-9.05	0.00	0.00	0.00	56.34
-45	45	0.31	71.70	0.00	-4.96	-3.15	0.00	0.00	-20.00	43.58
45	90	0.66	71.70	0.00	-6.31	-9.05	0.00	0.00	0.00	56.34

Segment Leq : 59.46 dBA

Total Leq All Segments: 59.46 dBA

Results segment # 1: ShawCreek (night)

Source height = 1.31 m

Barrier height for grazing incidence

Source Height (m)	Receiver Height (m)	Barrier Height (m)	Elevation of Barrier Top (m)
1.31	1.50	1.48	1.48

ROAD (49.80 + 37.04 + 49.80) = 52.92 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	-45	0.66	65.16	0.00	-6.31	-9.05	0.00	0.00	0.00	49.80
-45	45	0.31	65.16	0.00	-4.96	-3.15	0.00	0.00	-20.00	37.04
45	90	0.66	65.16	0.00	-6.31	-9.05	0.00	0.00	0.00	49.80

Segment Leq : 52.92 dBA

Total Leq All Segments: 52.92 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 59.46
(NIGHT): 52.92

STAMSON 5.0 NORMAL REPORT Date: 19-12-2017 17:29:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: ola2.te Time Period: Day/Night 16/8 hours
Description: Predicted Sound Level at OLA2

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

Car traffic volume : 9421/1047 veh/TimePeriod *
Medium truck volume : 2295/255 veh/TimePeriod *
Heavy truck volume : 362/40 veh/TimePeriod *
Posted speed limit : 70 km/h
Road gradient : 4 %
Road pavement : 1 (Typical asphalt or concrete)

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

24 hr Traffic Volume (AADT or SADT): 8190
Percentage of Annual Growth : 2.50
Number of Years of Growth : 20.00
Medium Truck % of Total Volume : 19.00
Heavy Truck % of Total Volume : 3.00
Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: ShawCreek (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 : 49.60 / 49.60 m
Receiver height : 1.50 / 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: ShawCreek (day)

Source height = 1.32 m

ROAD (0.00 + 61.62 + 0.00) = 61.62 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	71.70	0.00	-8.62	-1.46	0.00	0.00	0.00	61.62

Segment Leq : 61.62 dBA

Total Leq All Segments: 61.62 dBA

Results segment # 1: ShawCreek (night)

Source height = 1.31 m

ROAD (0.00 + 55.08 + 0.00) = 55.08 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.66	65.16	0.00	-8.62	-1.46	0.00	0.00	0.00	55.08

Segment Leq : 55.08 dBA

Total Leq All Segments: 55.08 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 61.62
(NIGHT): 55.08