Jade Acoustics Inc. | Consulting Engineers | 411 Confederation Parkway, Unit 19, Concord, Ontario, L4K 0A8 | Tel: (905) 660-2444 | Fax: (905) 660-4110

PRELIMINARY ENVIRONMENTAL NOISE REPORT

PROPOSED RESIDENTIAL DEVELOPMENT
WATERSAND
MCKAY ROAD WEST AND VETERANS DRIVE
CITY OF BARRIE

JADE ACOUSTICS

PREPARED FOR
Watersand Construction Ltd.

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SUMMARY

The proposed residential development is located on the south side of McKay Road West and west of Veterans Drive and is subject to road traffic noise from McKay Road West, Veterans Drive and Street "2". Additionally, potential noise from future commercial, institutional and industrial developments have been evaluated.

The environmental noise guidelines of the City of Barrie, County of Simcoe and the Ministry of the Environment and Climate Change (MOECC) set out sound level limits for both indoor and outdoor space. Sound levels due to the adjacent roads were determined using ORNAMENT, the noise prediction model of the MOECC for road traffic.

Using the road traffic data provided by the City of Barrie, the County of Simcoe and BA Group, the sound levels for various locations in the residential development were determined.

It was found that with appropriate mitigative measures, all residential lots and blocks (units) in the development will meet the noise guidelines.

Lots and blocks (units) in the vicinity of McKay Road West and Veterans Drive require either central air conditioning or forced air heating systems sized to accommodate central air conditioning at a later date if noise becomes a concern. Table 3 and Figure 2 show the central air conditioning requirements.

Lots and blocks (units) in the vicinity of McKay Road West and Veterans Drive require acoustic barriers up to 2.4 m in height. Table 3 and Figure 2 show the acoustic barrier requirements.

Where minor excesses exist or mitigation is required, future occupants will be advised through the use of warning clauses.

Based on the preliminary analysis, window and exterior wall construction that comply with standard construction practices are satisfactory for all lots and blocks (units).

Purchasers/tenants will be advised through a warning clause that the dwelling unit is in proximity to existing and future commercial and future industrial developments, whose activities may at times be audible. See text and Figure 2 for details.

1.0 INTRODUCTION

Jade Acoustics Inc. was retained to prepare a Preliminary Environmental Noise Report to investigate the potential impact of noise on the proposed development to the satisfaction of the City of Barrie and County of Simcoe.

This report has been prepared in support of the Draft Plan Approval for the proposed residential development.

The proposed site is identified as:

Plan: 51R-24826
Part of the north half of Lot 3,
All of the north half of Lots 4 and
Part of Lot 5
Concession 9
(Geographic Township of Innisfil)
City of Barrie
County of Simcoe

The proposed development is bounded by McKay Road West to the north, Veterans Drive to the east, existing agricultural lands to the south and other lands owned by the applicants which are not part of this application, to the west.

The proposed development is comprised of: detached and townhouse dwellings; stormwater management pond blocks; a commercial block; a school block; a park block; open space blocks; buffer blocks; valley lands; and new internal roads.

The analysis is based on the following:

- Site visit conducted by Jade Acoustics Inc. staff on January 14, 2016;
- Preliminary draft plan prepared by KLM Planning Partners Inc., received September 28, 2016; and
- Traffic data provided by the City of Barrie, the County of Simcoe and BA Group (including reports from Accu-Traffic Inc. and Spectrum Traffic).

The proposed development is shown in Figure 2.

2.0 NOISE SOURCES

2.1 Transportation Sources

The major ground transportation noise source of potential impact on the proposed development is the road traffic on McKay Road West, Veterans Drive and new internal roads.

Ultimate road traffic data was calculated based on turning movement count data provided by BA Group; truck percentages for Veterans Drive were determined using these turning movement counts, as ultimate truck percentage traffic data were not available. The ultimate forecasted truck percentage on McKay Road West was provided by the City of Barrie.

The new internal roads were considered in the analysis. Based on forecasted traffic volumes from the turning movement count data provided by BA Group, the new internal roads are predicted to be acoustically insignificant and were not analyzed further.

The road traffic information is summarized in Table 1 and correspondence regarding road traffic volumes is included in Appendix A.

The site is not affected by rail or air traffic.

2.2 Stationary Sources

The Barrie Equine Clinic is located north of the proposed development on the north side of McKay Road West. No external noise sources were observed at this facility at the time of the site visit conducted by Jade Acoustics Inc. staff. This facility is not expected to be acoustically significant at the subject site and was not considered further.

A neighbourhood commercial block is proposed at the northeast corner of the proposed residential development. Detailed information regarding noise sources associated with the block is not available at this stage of the project. Once the specific uses are determined and the site plan is available, a detailed noise analysis should be prepared by the proponents of these uses to ensure that the applicable noise guidelines are met at the proposed residential development.

A future elementary school is proposed on the northeast corner of Street “2” and Street “3”. Detailed information regarding noise sources associated with the proposed school is not available at this stage of the project. Once the specific information is determined and the site plan is available, a detailed noise analysis should be prepared by the proponent of the school to ensure that the applicable guidelines are met at the proposed residential development.

Other lands owned by the applicant, which are not part of this application, are located directly west of the proposed development. Detailed information regarding site plan for this future development is not available at this stage of the project. Once the above information is available, a detailed environmental noise report should be prepared by the proponent of this development to ensure that the applicable noise guidelines are met at the proposed residential development.

Future industrial/business park lands are located to the east of the subject site; a future mixed-use node is located directly north of the site on the north side of McKay Road West. Detailed information with regard to noise sources associated with the proposed uses is not available at this stage of the project. Once the specific information is available, a detailed environmental noise report should be prepared by the proponent of each of these uses to ensure that the applicable noise guidelines are met at the proposed development.

3.0 ENVIRONMENTAL NOISE CRITERIA

The environmental noise criteria used for residential developments in the City of Barrie, the County of Simcoe and the MOECC environmental noise criteria are contained in Appendix B and summarized below.

The most recent environmental noise guidelines (NPC-300) of the Ontario Ministry of the Environment and Climate Change (MOECC) were used for this report.

The MOECC document "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", dated August, 2013, released October 21, 2013 (updated final version # 22) replaces the MOECC documents LU-131 and NPC-205. NPC-300 introduced updates to the stationary and transportation source criteria. A brief summary of the NPC-300 guidelines is given in Appendix B. The guidelines are also summarized below.

3.1 Transportation Sources (Noise)

3.1.1 Indoors

If the nighttime (11:00 p.m. to 7:00 a.m.) sound level in terms of Leq at the exterior face of a bedroom or living/dining room window is greater than 60 dBA and/or if the daytime (7:00 a.m. to 11:00 p.m.) sound level in terms of Leq at the exterior face of a bedroom or living/dining room window is greater than 65 dBA, means must be provided so that windows can be kept closed for noise control purposes and central air conditioning is required. For nighttime sound levels (LeqNight) greater than 50 dBA to less than or equal to 60 dBA on the exterior face of a bedroom or living/dining room window or daytime sound levels (LeqDay) greater than 55 dBA to less than or equal to 65 dBA on the exterior face of a bedroom or living/dining room window, there need only be the provision for adding central air conditioning by the occupant at a later date. This typically involves a ducted heating system sized to accommodate the addition of central air conditioning by the occupant at a later date. A warning clause advising the occupant of the potential interference with some activities is also required.

In all cases, air cooled condenser units must not exceed an AHRI sound rating of 7.6 bels. The air cooled condenser units must be sited in accordance with the zoning by-laws with respect to setbacks as well as location.

As required by the MOECC, indoor noise criteria for road traffic noise is 40 dBA (Leq8hour) for the bedrooms during nighttime hours, 45 dBA (Leq8hour) for living/dining rooms during nighttime hours and 45 dBA (Leq16hour) for the living/dining rooms and bedrooms during daytime hours. These criteria are used to determine the architectural requirements.

3.1.2 Outdoors

For the outdoor amenity areas (Outdoor Living Area – OLA), a design goal of 55 dBA for the daytime period between 7:00 a.m. to 11:00 p.m. is used for road and rail traffic. In some cases an excess not exceeding 5 dBA is considered acceptable. Where the unmitigated sound levels during the day exceed 55 dBA (Leq16hour, daytime) but are equal to or less than 60 dBA (Leq16hour, daytime), a warning clause is required and mitigation should be considered. Where the unmitigated sound levels exceed 60 dBA, mitigation measures and a warning clause are required.

The definition of outdoor amenity area as defined by the MOECC is given below.

"Outdoor Living Area (OLA)

> (applies to impact assessments of transportation sources) means that part of a noise sensitive land use that is:
>
> - intended and designed for the quiet enjoyment of the outdoor environment; and
> - readily accessible from the building.

The OLA includes:

- backyards, front yards, gardens, terraces or patios;
- balconies and elevated terraces (e.g. rooftops), with a minimum depth of 4 metres, that are not enclosed, provided they are the only outdoor living area (OLA) for the occupant; or
- common outdoor living areas (OLAs) associated with high-rise multi-unit buildings."

For both the indoor and outdoor conditions where the acoustical criteria are exceeded, warning clauses must be placed in offers of purchase and sale, lease agreements, and included in the condominium agreement.

3.2 Stationary Sources

MOECC Noise Guidelines

The guidelines of the Ontario Ministry of the Environment and Climate Change (MOECC) for stationary sources are to be used for commercial/industrial facilities.

The MOECC has recently published the document NPC-300 titled “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning”.

The MOECC also has vibration guidelines with respect to stationary sources, NPC-207. These guidelines require that the peak vibration velocities not exceed 0.3 mm/s at the point of reception during the day or night.

The MOECC recognizes the need for back-up beepers/alarms as safety devices and as such does not have any guidelines or criteria to address these sources.

It should be noted that the MOECC guidelines do not require that the source be inaudible, but rather that specific sound level limits be achieved.

With respect to stationary sources of noise in urban areas, the MOECC guidelines require that the sound level due to the stationary source at the building façade and outdoor amenity spaces not exceed the sound level due to road traffic and in certain situations due to rail traffic in any hour of source operation, subject to specific exclusions. Tables C-5, C-6, C-7 and C-8 of NPC-300 included in Appendix B provided the exclusion limit values of one-hour equivalent sound level (Leq,dBA) and impulsive sound level (L_{LM},dBAI).

In general, if the criteria for a stationary source of noise are exceeded, the MOECC recommends that control be implemented at the source rather than at the receiver. Alternatively, if the receiver is set back from the source or if a physical barrier is constructed so that the criteria can be met at the receiver, no additional mitigative measures are required. Treatment of the receptor building by the use of suitable wall and window construction and central air conditioning to keep windows closed is not an acceptable solution to the MOECC in Class 1 and 2 areas (urban). In addition, a warning clause in offers of purchase and sale and/or lease agreement noting the proximity of dwellings to such a source should be considered.

3.3 City of Barrie Noise Control By-law

The City of Barrie has a by-law to prohibit or regulate unusual noises likely to disturb the inhabitants of the town; Noise Control By-law Number 2006-140. The by-law does not provide specific sound level limits, but rather provides qualitative information with respect to sources and provides prohibitions by time and place.

4.0 NOISE IMPACT ASSESSMENT

4.1 Road Traffic

For road traffic noise, the sound levels in terms of Leq, the energy equivalent continuous sound levels for both day (16 hours) and night (8 hours), were predicted using ORNAMENT, the MOECC Traffic Noise Prediction Model for road traffic. Shielding provided by the buildings has also been accounted for in the analysis. As specific dwelling locations are unknown at this time, these have been assumed as part of the preliminary analysis.

Table 2 provides a summary of predicted sound levels due to road traffic at selected locations without any mitigative measures. Appendix C gives sample calculations.

For Lot 958 at the southeast corner of the subject site and flanking Veterans Drive, the daytime and nighttime sound levels are predicted to be 66 dBA and 59 dBA, respectively at the side wall. The unmitigated sound level in the rear yard is predicted to be 62 dBA.

For Block 716 (east unit) fronting McKay Road West, the unmitigated sound levels at the side wall of the dwelling are predicted to be 62 dBA (daytime) and 59 dBA (nighttime). The unmitigated rear yard sound level is predicted to be 57 dBA.

For Block 1097 (east unit) flanking Veterans Drive, the unmitigated sound levels at the side wall of the dwelling are predicted to be 67 dBA (daytime) and 61 dBA (nighttime). The unmitigated rear yard sound level is predicted to be 65 dBA.

All lots and blocks (units) located within 90 m of the centreline of Veterans Drive and within 80 m of the centreline of McKay Road West would experience daytime sound levels of higher than 55 dBA at the building façades. Therefore, all dwellings within these distances not requiring mandatory air conditioning require the provision for central air conditioning and warning clauses.

For blocks (units) with the first two rows of dwellings adjacent McKay Road West, rear lane access with detached garages is proposed. For units flanking the internal roads, a rear yard sound level greater than 55 dBA is possible. As the proposed configuration is unknown at this time, the need for acoustic fences at these dwellings will be evaluated once the information is available.

For Block 14 and Lots 16 to 18, the unmitigated rear yard sound level is predicted to be between 59 dBA and 64 dBA; the unmitigated rear yard daytime sound level for Lot 654 is predicted to be 58 dBA.

Where the sound level limits are expected to be exceeded, mitigative measures and warning clauses are required.

4.2 Stationary Sources

Based on the nature of noise sources identified during the site visit conducted by Jade Acoustics Inc. staff, the nearby Barrie Equine Clinic is not considered to be acoustically significant at the subject site and was not considered further.

5.0 NOISE ABATEMENT REQUIREMENTS

The noise mitigation requirements for both the indoor and outdoor locations are detailed below. Table 3 and Figure 2 provide a summary of the acoustical mitigative requirements for the residential units in this development.

5.1 Transportation Sources

5.1.1 Indoors

As required, indoor sound level criteria for road traffic can be achieved in all cases by using appropriate architectural elements for external walls, windows, exterior doors, and roof construction. The indoor limit for road traffic noise is 40 dBA for the bedrooms during nighttime hours and 45 dBA for the living/dining rooms during daytime and nighttime hours, as well as for bedrooms during daytime hours. These criteria have been used in this analysis. The characteristic spectrum for road traffic has been accounted for in the determination of the architectural components. Appendix D contains a sample calculation of the architectural component selection.

In determining the architectural requirements, for the units adjacent to Veterans Drive and McKay Road West, it is assumed that the living room located on the first floor will be the worst case room receptor because the day/night traffic split results in more than 5 dBA difference between the predicted daytime and nighttime sound levels. This difference is more than the difference between the MOECC indoor criteria for road traffic for daytime and nighttime hours; therefore, the living room with calculated daytime sound level was used for the analysis. For the dwellings that are flanking the roadways, the exterior walls would be 55% of the associated floor area; the windows would be 25% of the associated floor area.

The worst case location is Block 1097 (east unit), with exposure to McKay Road West and Veterans Drive having a corner living/dining room. Based on the analysis, windows need to be up to STC 28 and exterior walls need to be up to STC 36. An STC rating of 28 for windows and an STC rating of 36 for exterior walls are typically satisfied by using window and exterior wall construction which complies with the minimum structural and safety requirements of standard construction.

Where the sound level from road traffic is greater than 60 dBA (at night) at the outside face of a bedroom window or greater than 65 dBA (during the day) on the outside face of a living room window, the indoor noise criteria would not be met with open windows and provisions must be made to permit the windows to remain closed. The MOECC requires central air conditioning. In addition, a warning clause is needed. See Table 3 and Figure 2 for the lots and blocks (units) which require central air conditioning.

Where the sound level limit is exceeded by 1 dB to 10 dB (i.e. LeqNight greater than 50 dBA to less than or equal to 60 dBA and LeqDay greater than 55 dBA to less than or equal to 65 dBA), the provision for adding central air conditioning by the occupants and a warning clause is required. See Table 3 and Figure 2 for the lots and blocks (units) which require the provision for adding central air conditioning.

The outdoor air conditioning condensing units must also meet the applicable sound level limits (AHRI sound rating of 7.6 bels) and be sited in accordance with the City of Barrie's zoning by-laws.

Warning clauses will also be required to be placed in offers of purchase and sale, lease agreements and included in the subdivision development agreement for all relevant lots/blocks (units) to make future occupants aware of the potential noise situation.

5.1.2 Outdoors

The outdoor amenity area is required to be exposed to sound levels of no more than 55 dBA during the day. A 5 dB increase is considered acceptable in certain situations. Typically, if the sound level is above 55 dBA, some form of mitigation and a warning clause are needed.

Sound barrier requirements are given in Table 3 and discussed below.

For lots and blocks (units) flanking Veterans Drive (except Block 1097), using a 2.4 m high acoustic fence, the daytime sound level at the rear yard is predicted to be 56 dBA or less. The 2.4 m high acoustic fence should be installed along the side property line and returned to the side wall of the dwellings. For Lots 956 to 958, the 2.4 m high acoustic fence should be returned along the rear property line. For Block 1097 (east unit), due to the exposure to both Veterans Drive and McKay Road West, a 2.4 m high acoustic fence would result in a predicted rear yard sound level of 58 dBA or less.

For Lots 1098 to 1102, a 2.4 m high acoustic fence would result in a daytime rear yard predicted sound level of less than 55 dBA; a 2.0 m high acoustic barrier at Lot 1103 would achieve a daytime predicted rear yard sound level of less than 55 dBA.

For lots and blocks (units) flanking Street "25" with exposure to McKay Road West and Veterans Drive, a 2.0 m high acoustic fence would achieve a rear yard daytime predicted sound level of less than 55 dBA.

With respect to Lot 654 to the east of the existing valley lands, a rear yard daytime predicted sound level of less than 55 dBA would be achieved with the installation of a 2.0 m high acoustic fence. With a 2.4 m high acoustic fence, the daytime rear yard predicted sound levels at Lots 15 to 18 would be 55 dBA or less and 58 dBA at the northern units of Block 14.

As mentioned in Section 4.1, sound barriers were omitted from the two north most rows of townhouse blocks adjacent McKay Road West as information with respect to the configuration of detached garages and specific locations of the amenity areas are currently unknown.

The locations and heights of the required acoustic barriers are shown on Figure 2. A sample calculation of the sound barrier analysis is enclosed as Appendix E.

The final sound barrier configurations will be determined once detailed grading plans are available.

Generally, if a sound barrier is to be used, the sound barrier may be a fence, made of any one or a combination of various materials, berm, or a berm/fence combination. The sound barrier should be of continuous construction, with no gaps and should have a minimum surface density of 20 kg/m^2 or more. Appropriate treatment of the sound barrier at all discontinuities and points of termination would be required to ensure that the sound barrier is effective. This would involve extending the sound barrier to the front property line; returning to the side wall of the house or extending the sound barrier for a minimum of three times the distance between the side wall and the sound barrier, past the rear wall of the house. An acoustic gate of 20 kg/m^2 is very heavy. Therefore, if a gate is required, provided that it is of continuous construction with no gaps between the boards, it may have a surface density of between 10 kg/m^2 and 20 kg/m^2. In addition, any gaps at the bottom of the gate should be kept to a minimal height.

Gaps at the bottom of the acoustic fence are discouraged. If drainage gaps are necessary, special design techniques to create interrupted line of sight under the acoustic fence are required.

Where an excess will remain or where mitigation is required, a warning clause should be placed in offers of purchase and sale or lease agreements and the development agreement.

6.0 CONCLUSIONS

With the incorporation of the items discussed (see Table 3, Notes to Table 3 and Figure 2), the sound levels will be within the appropriate environmental noise criteria. In accordance with City and Ministry implementation guidelines, where mitigation is required, future occupants will be advised through the use of warning clauses.

A detailed environmental noise report will need to be prepared once a final site plan and grading plan are available to ensure the applicable environmental noise criteria are achieved.

Prior to issuance of building permits, the acoustical requirements should be reviewed by a qualified acoustical consultant to ensure compliance with the applicable guidelines.

Prior to issuance of occupancy permits, a qualified acoustical consultant shall confirm that the acoustical requirements are in compliance with the noise report.

Once information becomes available for the proposed commercial block within the site, a noise report should be completed by a qualified acoustical consultant to ensure that the sound level limits will be achieved.

Respectfully submitted,

JADE ACOUSTICS INC.

Per: _____
Michael Bechbache, E.I.T.

Per: _____
Dalila C. Giusti, P.Eng.

LICENSED PROFESSIONAL ENGINEER
Oct 17/16
D.C. GIUSTI
16267304
PROVINCE OF ONTARIO

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7.0 REFERENCES

1. "Model Municipal Noise Control By-Law" Final Report, by the Ontario Ministry of the Environment, August, 1978.

2. "ORNAMENT – Ontario Road Noise Analysis Method for Environment and Transportation", Ontario Ministry of the Environment, October, 1989.

3. "Building Practice Note No. 56: Controlling Sound Transmission into Buildings", by J.D. Quirt, Division of Building Research, National Research Council of Canada, September, 1985.

4. "Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning", Ontario Ministry of the Environment and Climate Change, Publication NPC-300, August, 2013 (updated final version # 22).

5. City of Barrie Noise Control By-law Number 2006-140.

TABLE 1

PROPOSED RESIDENTIAL DEVELOPMENT

WATERSAND

MCKAY ROAD WEST AND VETERANS DRIVE

CITY OF BARRIE

SUMMARY OF ROAD TRAFFIC DATA

Road	McKay Road West	Veterans Drive	Street "2"
Ultimate AADT*	21,500	24,900	2,350
Speed (km/hr)	80	80	40
Medium Trucks (%)	2	2**	1
Heavy Trucks (%)	2	2**	1
Day/Night Split (%)	80/20	90/10**	90/10***

* Ultimate AADT: Average Annual Daily Traffic (2031).
** Calculated based on traffic data provided to Jade Acoustics Inc.
*** Assumed.

TABLE 2

PROPOSED RESIDENTIAL DEVELOPMENT

WATERSAND

MCKAY ROAD WEST AND VETERANS DRIVE

CITY OF BARRIE

SUMMARY OF PREDICTED SOUND LEVELS
OUTDOORS DUE TO ROAD TRAFFIC

Lots and Blocks (Units)	Location*	Source	Distance (m)	Leq (dBA)			
				Day		Night	
				Separate	Combined	Separate	Combined
Lot 17	Rear Yard	McKay Road West	57	--	59	--	--
Lot 648	Rear Yard	McKay Road West	187	--	52	--	--
Lot 654	Rear Yard	McKay Road West	97	--	58	--	--
Lot 958	Rear Yard	Veterans Drive	39	62	--	--	
	Side Wall	Veterans Drive McKay Road West	31 323	65 45	66	59 42	59
Block 14 (north unit)	Rear Yard	McKay Road West	36	--	64	--	--
Block 706 (west unit)	Rear Yard	McKay Road West	62	--	56	--	--
Block 707 (west unit)	Rear Yard	McKay Road West	42	--	56	--	--
Block 716 (east unit)	Rear Yard	McKay Road West Veterans Drive	42 289	56 52	57	-- --	--
	Side Wall	McKay Drive West Veterans Drive	32 288	61 53	62	58 47	59

* Rear yard location taken 3 m from rear wall and 1.5 m above grade. Wall location taken at 4.5 m above grade for the second floor.

TABLE 2 - Continued

PROPOSED RESIDENTIAL DEVELOPMENT

WATERSAND

MCKAY ROAD WEST AND VETERANS DRIVE

CITY OF BARRIE

SUMMARY OF PREDICTED SOUND LEVELS
OUTDOORS DUE TO ROAD TRAFFIC

Lots/Blocks (Units)	Location*	Source	Distance (m)	Leq (dBA)			
				Day		Night	
				Separate	Combined	Separate	Combined
Block 717 (east unit)	Rear Yard	McKay Road West	59	58	59	--	--
		Veterans Drive	280	52		--	
Block 779 (east unit)	Side Wall	McKay Road West	117	56	57	53	53
		Veterans Drive	271	52		46	
Block 1097 (east unit)	Rear Yard	Veterans Drive	32	65	65	--	--
		McKay Road West	217	54		--	
	Side Wall	Veterans Drive	26	67	67	60	61
		McKay Road West	228	49		47	
Block 1102	Rear Yard	Veterans Drive	123	56	58	--	--
		McKay Road West	218	54		--	
Block 1108 (east unit)	Rear Yard	Veterans Drive	230	52	55	--	--
		McKay Road West	219	53		--	

* Rear yard location taken 3 m from rear wall and 1.5 m above grade. Wall location taken at 4.5 m above grade for the second floor.

TABLE 3

PROPOSED RESIDENTIAL DEVELOPMENT

WATERSAND

MCKAY ROAD WEST AND VETERANS DRIVE

CITY OF BARRIE

SUMMARY OF MINIMUM NOISE ABATEMENT MEASURES

Lots and Blocks (Units)	Air Conditioning (1)	Exterior Wall (2)*	Window STC Rating (3)*	Acoustic Fence (4)	Warning Clause (5)
Lots 958, 959, 1038 and 1039 and Blocks 985 (east unit), 1010 (east unit), 1068 (east unit) and 1097 (all units)	Mandatory	Standard	Standard	2.4 m**	A, B, D, E
Blocks 14 (north unit)	Mandatory	Standard	Standard	2.4 m**	A, B, D
Lots 956, 957, 1098 to 1102	Provision for adding	Standard	Standard	2.4 m**	A, C, D, E
Lots 16 to 18	Provision for adding	Standard	Standard	2.4 m**	A, C, D
Block 716 (east unit)	Mandatory	Standard	Standard	2.0 m***	A, B, D, E
Lots 780 and 1103 and Blocks 717 (east unit) and 779 (east unit)	Provision for adding	Standard	Standard	2.0 m***	A, C, D, E
Lot 654	Provision for adding	Standard	Standard	2.0 m***	A, C, D
Blocks 1 (all units) to 7 (all units), 14 (all units except north unit), 707 (all units) to 715 (all units), 716 (all units except east unit), 985 (all units except east unit), 1010 (all units except east unit) and 1068 (all units except east unit)	Mandatory	Standard	Standard	No	A, B

* Based on preliminary calculations. See Section 5.1.1 for details.

** 2.4 m high acoustic fence. See Section 5.1.2 and Figure 2 for details.

*** 2.0 m high acoustic fence. See Section 5.1.2 and Figure 2 for details.

See Notes to Table 3 on following pages and Figure 2 for details.

TABLE 3 - Continued

PROPOSED RESIDENTIAL DEVELOPMENT

WATERSAND

MCKAY ROAD WEST AND VETERANS DRIVE

CITY OF BARRIE

SUMMARY OF MINIMUM NOISE ABATEMENT MEASURES

Lots and Blocks (Units)	Air Conditioning (1)	Exterior Wall (2)*	Window STC Rating (3)*	Acoustic Fence (4)	Warning Clause (5)
Lots 802 to 804, 807, 952 to 955, 960 to 965, 982 to 984, 986 to 988, 1006 to 1008, 1011 to 1013, 1032 to 1037, 1040 to 1045, 1065 to 1067, 1070 to 1072 and 1094 to 1096 and 1104 to 1107 and Block 1009 (all units), 1068 (east unit), 1069 (all units) and 1108	Provision for adding	Standard	Standard	No	A, C, E
Lots 15 and 19 and Blocks 8 (all units) to 13 (all units), 704 (all units) to 706 (all units), 717 (all units except east unit) and 718 (all units) to 723 (all units)	Provision for addition	Standard	Standard	No	A, C
All other lots and blocks	No special requirements				

* Based on preliminary calculations. See Section 5.1.1 for details.

** 2.4 m high acoustic fence. See Section 5.1.2 and Figure 2 for details.

*** 2.0 m high acoustic fence. See Section 5.1.2 and Figure 2 for details.

See Notes to Table 3 on following pages and Figure 2 for details.

NOTES TO TABLE 3

1. Means must be provided to allow windows to remain closed for noise control purposes. For all air cooled condenser units, the AHRI sound rating must not exceed 7.6 bels. The air cooled condenser units shall be placed in a noise insensitive location which complies with municipal by-laws.

   Provision for adding central air conditioning would involve a ducted heating system sized to accommodate the addition of central air conditioning by the occupant at a later date. The air cooled condenser unit AHRI sound rating must not exceed 7.6 bels and should be placed in a noise insensitive location which complies with municipal by-laws.

2. STC – Sound Transmission Class Rating (Reference ASTM-E413). Values shown are based on preliminary calculations using standard assumptions. See text for details.

3. STC – Sound Transmission Class Rating (Reference ASTM-E413). Values shown are based on preliminary calculations using standard assumptions. See text for details. A sliding glass walkout door should be considered as a window and be included in the percentage of glazing.

4. Sound barriers must be of solid construction with no gaps and have a minimum surface density of 20kg/m^2. Earthen berms, solid walls/fences of adequate density or combinations of berms and walls/fences may be used. An acoustic gate with a density of less than 20kg/m^2 will be acceptable provided the minimum surface density is greater than 10kg/m^2.

5. Suggested warning clauses to be included in the subdivision agreement and to be included in offers of purchase and sale or lease agreements on designated lots and blocks (units):

   A. "Purchasers/tenants are advised that despite the inclusion of noise control features in this development area and within the building units, noise due to increasing road traffic may continue to be of concern, occasionally interfering with some activities of the dwelling occupants as the noise level may exceed the noise criteria of the Municipality and the Ministry of the Environment and Climate Change, I the purchaser hereby agree to place this clause in all subsequent offers of purchase and sale when I sell the property."

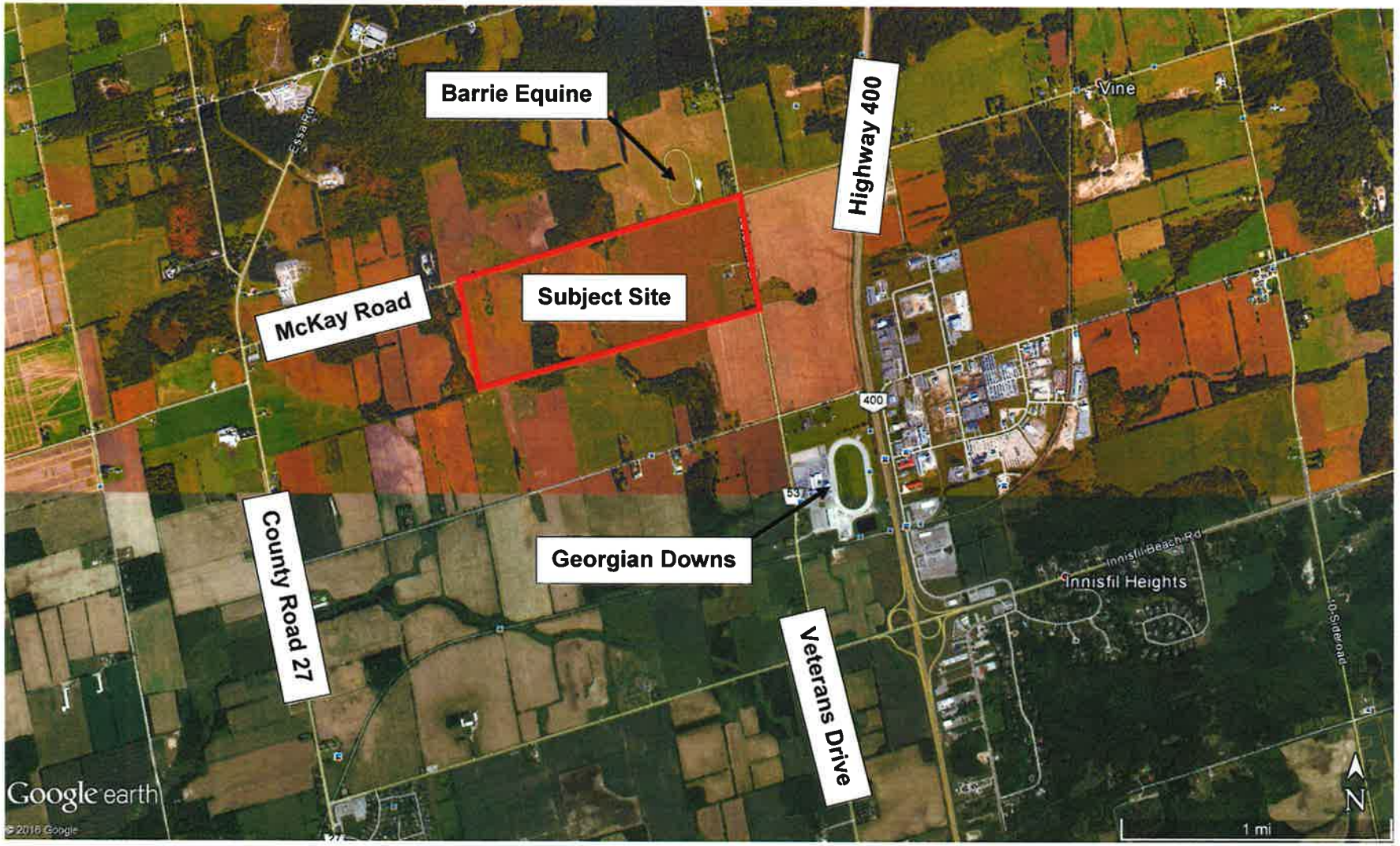
   B. "Purchasers/tenants are advised that this dwelling unit was fitted with a forced air heating system including a central air conditioning system in order to permit closing of windows for noise control. (Note: locate air cooled condenser unit in a noise insensitive area and ensure the unit has an AHRI sound rating not exceeding 7.6 bels.)

C. "Purchasers/tenants are advised that this dwelling unit was fitted with a forced air heating system and the ducting, etc. sized to accommodate central air conditioning unit. Air conditioning can be installed at the owners' option and costs. (Note: locate air cooled condenser unit in a noise insensitive area and ensure the unit has an AHRI sound rating not exceeding 7.6 bels)."

D. "Purchasers/tenants are advised that the acoustical berm and/or barrier as installed shall be maintained, repaired or replaced by the owner. Any maintenance, repair or replacement shall be with the same material, to the same standards, and have the same colour and appearance as the original."

E. “Purchasers/tenants are advised that the dwelling unit is in proximity to existing and future commercial facilities, a future institutional facility and future industrial facilities, whose activities may at times be audible.”

6. Conventional ventilated attic roof construction meeting typical construction techniques is satisfactory in all cases.



N.T.S.

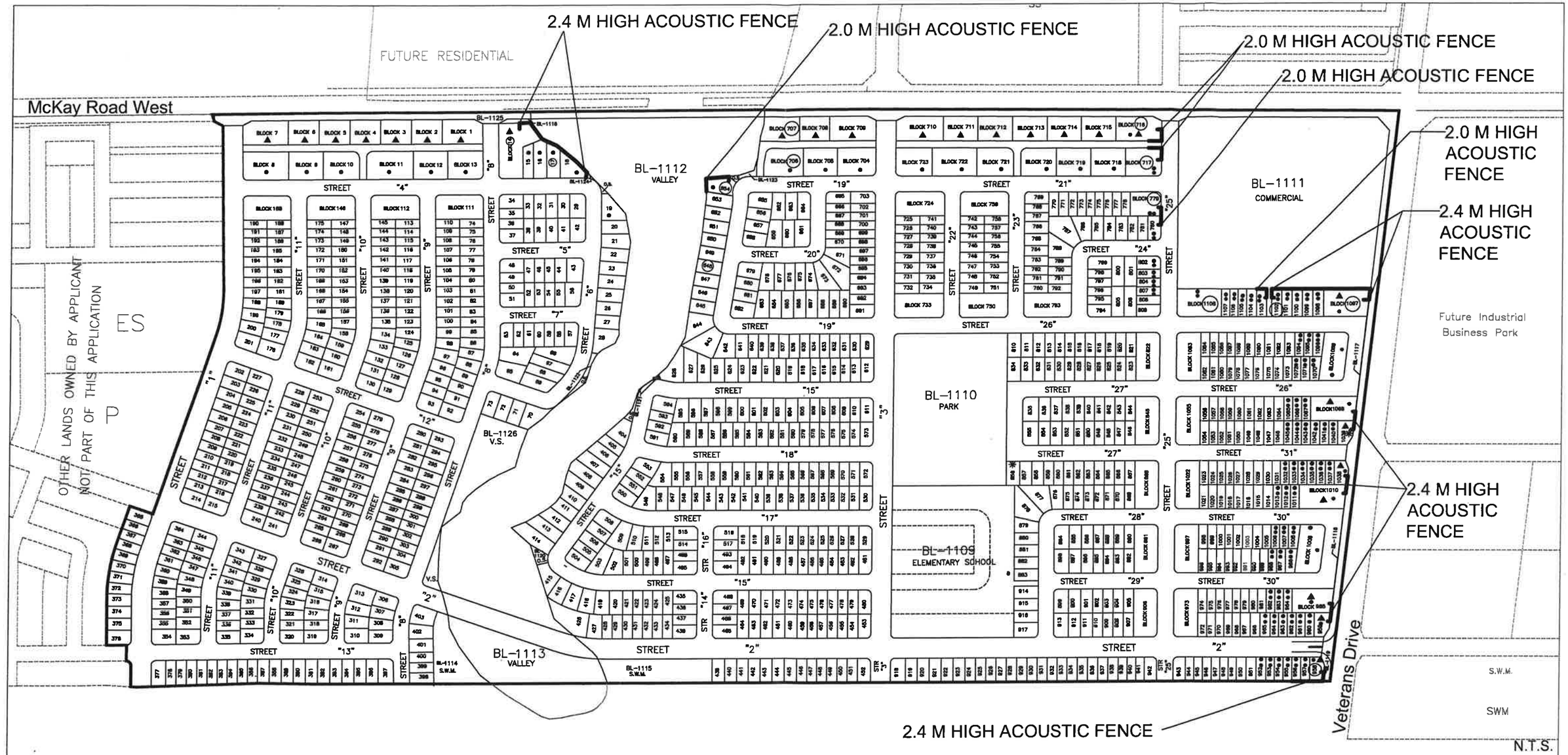
Proposed Residential Development
Watersand
McKay Road West and Veterans Drive
City of Barrie

Date: October 2016 **File: 15-121**

KEY PLAN

FIGURE 1

JADE ACOUSTICS



Legend:

- ▲ Mandatory Central Air Conditioning and Warning Clause (See text, Table 3 and Notes to Table 3)
- ● Provision for Adding Central Air Conditioning and Warning Clause (See text, Table 3 and Notes to Table 3)
- ✳ Proximity Warning Clause (See text for details)
- ◯ Analyzed Units

Proposed Residential Development
Watersand
McKay Road West and Veterans Drive
City of Barrie

Date: October 2016 Our File: 15-121

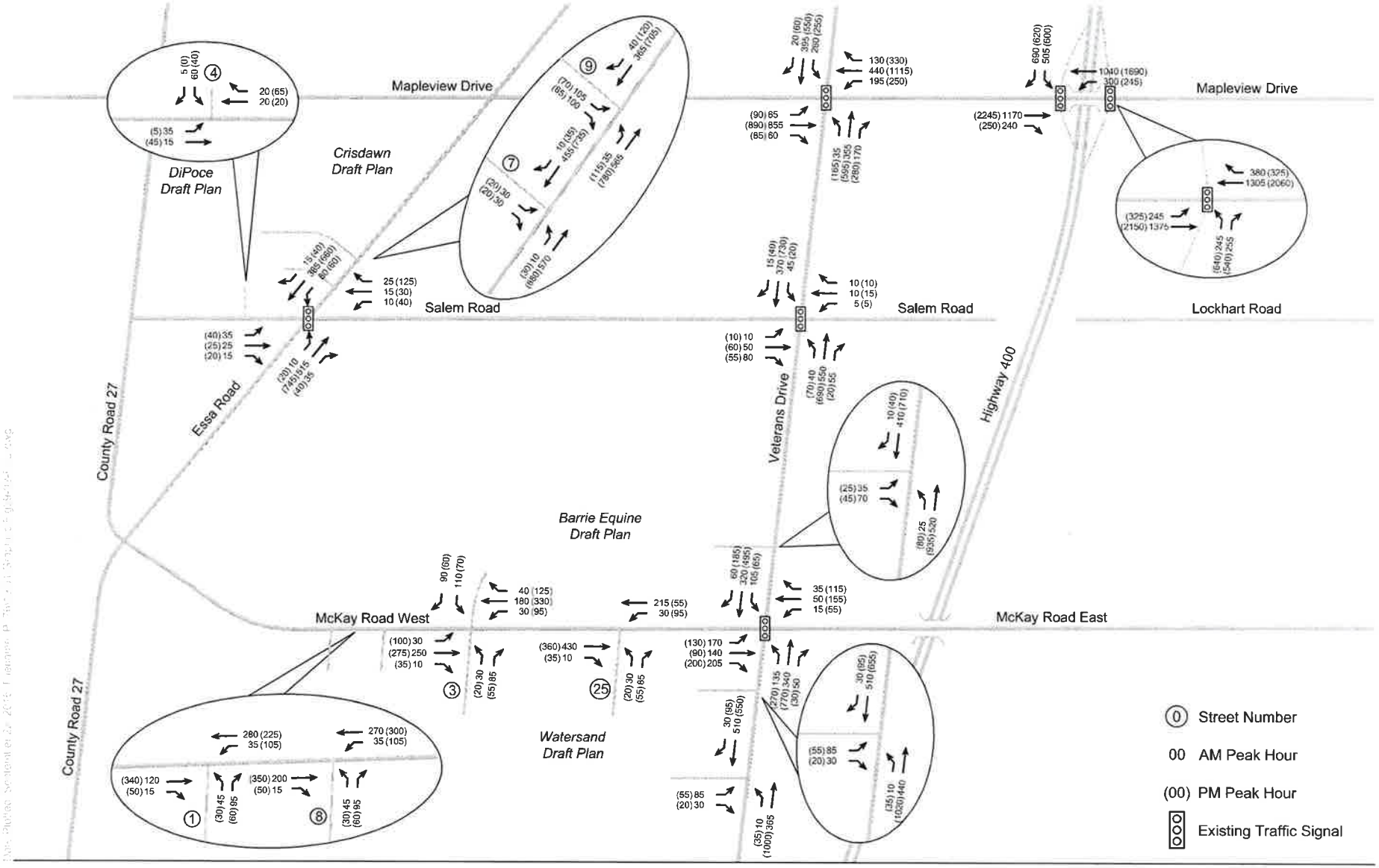
JADE ACOUSTICS

SITE PLAN SHOWING NOISE ABATEMENT MEASURES

FIGURE 2

APPENDIX A

CORRESPONDENCE REGARDING ROAD TRAFFIC DATA



FUTURE TOTAL TRAFFIC VOLUMES
ULTIMATE SCENARIO (2022)

BA Group

Barrie Salem Secondary Plan
7619-01 September 2016

Figure 9

Spectrum

Turning Movement Count
Location Name: MCKAY RD & VETERANS DR
Date: Fri, Sep 09, 2016 Deployment Lead: Chris Koukaras

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Turning Movement Count (4 . MCKAY RD & VETERANS DR)

Start Time	N Approach VETERANS DR						E Approach MCKAY RD						S Approach VETERANS DR						W Approach MCKAY RD						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		
06:00:00	2	31	0	0	0	33	0	0	0	0	0	0	0	16	1	0	0	17	3	0	2	0	0	5	55	
06:15:00	1	39	0	0	0	40	0	0	0	0	0	0	0	20	0	0	0	20	3	0	1	0	0	4	64	
06:30:00	1	41	1	0	0	43	0	0	0	0	0	0	0	29	1	0	0	30	2	0	4	0	0	6	79	
06:45:00	7	32	0	0	0	39	0	0	0	0	0	0	2	28	3	0	0	33	4	0	4	0	0	8	80	278
07:00:00	2	37	0	0	0	39	0	0	1	0	0	1	0	36	5	0	0	41	1	0	6	0	0	7	88	311
07:15:00	2	47	0	0	0	49	0	0	1	0	0	1	1	45	3	0	0	49	0	0	5	0	0	5	104	351
07:30:00	3	50	0	0	0	53	0	0	1	0	1	1	0	44	5	1	0	50	4	0	7	0	0	11	115	387
07:45:00	1	59	0	0	0	60	0	0	0	0	0	0	0	60	3	0	0	63	4	0	8	0	0	12	135	442
08:00:00	1	50	0	0	0	51	0	0	0	0	0	0	0	49	4	0	0	53	1	0	3	0	0	4	108	462
08:15:00	3	47	0	0	0	50	0	0	0	0	0	0	0	58	2	0	0	60	3	0	5	0	0	8	118	476
08:30:00	2	43	0	0	0	45	0	0	0	0	0	0	1	71	2	0	0	74	2	0	6	0	0	8	127	488
08:45:00	1	45	0	0	0	46	0	0	0	0	0	0	0	76	3	0	0	79	3	0	4	0	0	7	132	485
BREAK																										
16:00:00	5	69	0	0	0	74	0	0	0	0	1	0	0	134	11	0	0	145	5	0	7	0	0	12	231	
16:15:00	9	62	0	0	0	71	0	0	0	0	0	0	0	151	15	0	0	166	3	0	9	0	0	12	249	
16:30:00	2	89	1	0	0	92	1	0	0	0	0	1	0	133	11	0	0	144	6	0	11	0	0	17	254	
16:45:00	3	80	0	0	0	83	0	0	0	0	0	0	0	158	8	0	0	166	1	0	9	0	0	10	259	993
17:00:00	7	95	0	0	0	102	0	0	0	0	0	0	0	154	8	0	0	162	2	0	4	0	0	6	270	1032
17:15:00	4	87	0	0	0	91	0	0	0	0	0	0	0	165	10	0	0	175	7	0	7	0	0	14	280	1063
17:30:00	6	81	0	0	0	87	0	0	0	0	0	0	0	133	7	0	0	140	4	0	5	0	0	9	236	1045
17:45:00	4	64	0	0	0	68	0	0	0	0	0	0	0	103	12	0	0	115	4	0	4	0	0	8	191	977
18:00:00	5	61	0	0	0	66	0	0	0	0	0	0	0	97	10	0	0	107	4	0	8	0	0	12	185	892
18:15:00	6	62	0	0	0	68	0	0	0	0	0	0	0	113	3	0	0	116	6	0	7	0	0	13	197	809
18:30:00	3	52	0	0	0	55	0	0	0	0	0	0	0	104	2	0	0	106	3	0	6	0	0	9	170	743
18:45:00	7	50	0	0	0	57	0	0	0	0	0	0	0	70	8	0	0	78	3	0	6	0	0	9	144	696
Grand Total	87	1373	2	0	0	1462	1	0	3	0	2	4	4	2047	137	1	0	2189	78	0	138	0	0	216	3671	-
Approach%	6%	93.9%	0.1%	0%		-	25%	0%	75%	0%		-	0.2%	93.5%	6.3%	0%		-	36.1%	0%	63.9%	0%		-	-	-
Totals %	2.2%	35.5%	0.1%	0%		37.8%	0%	0%	0.1%	0%		0.1%	0.1%	52.9%	3.5%	0%		56.5%	2%	0%	3.6%	0%		5.6%	-	-
Heavy	0	33	0	0		-	0	0	0	0		-	0	29	0	0		-	1	0	1	0		-	-	-
Heavy %	0%	2.4%	0%	0%		-	0%	0%	0%	0%		-	0%	1.4%	0%	0%		-	1.3%	0%	0.7%	0%		-	-	-
Bicycles	0	2	0	0		-	0	0	0	0		-	0	1	0	0		-	0	0	1	0		-	-	-
Bicycle %	0%	0.1%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0.7%	0%		-	-	-

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Spectrum

Turning Movement Count
Location Name: MCKAY RD & VETERANS DR
Date: Fri, Sep 09, 2016 Deployment Lead: Chris Koukaras

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Peak Hour: 07:45 AM - 08:45 AM **Weather: Mist (19.1 °C)**

Start Time	N Approach VETERANS DR						E Approach MCKAY RD						S Approach VETERANS DR						W Approach MCKAY RD						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	
07:45:00	1	59	0	0	0	60	0	0	0	0	0	0	0	60	3	0	0	63	4	0	8	0	0	12	135
08:00:00	1	50	0	0	0	51	0	0	0	0	0	0	0	49	4	0	0	53	1	0	3	0	0	4	108
08:15:00	3	47	0	0	0	50	0	0	0	0	0	0	0	58	2	0	0	60	3	0	5	0	0	8	118
08:30:00	2	43	0	0	0	45	0	0	0	0	0	0	1	71	2	0	0	74	2	0	6	0	0	8	127
Grand Total	7	199	0	0	0	206	0	0	0	0	0	0	1	238	11	0	0	250	10	0	22	0	0	32	488
Approach%	3.4%	96.6%	0%	0%		-	0%	0%	0%	0%		-	0.4%	95.2%	4.4%	0%		-	31.3%	0%	68.8%	0%		-	-
Totals %	1.4%	40.8%	0%	0%		42.2%	0%	0%	0%	0%		0%	0.2%	48.8%	2.3%	0%		51.2%	2%	0%	4.5%	0%		6.6%	-
PHF	0.58	0.84	0	0		0.86	0	0	0	0		0	0.25	0.84	0.69	0		0.84	0.63	0	0.69	0		0.67	-
Heavy	0	10	0	0		10	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	-
Heavy %	0%	5%	0%	0%		4.9%	0%	0%	0%	0%		0%	0%	2.1%	0%	0%		2%	0%	0%	0%	0%		0%	-
Lights	7	189	0	0		196	0	0	0	0		0	1	233	11	0		245	10	0	22	0		32	-
Lights %	100%	95%	0%	0%		95.1%	0%	0%	0%	0%		0%	100%	97.9%	100%	0%		98%	100%	0%	100%	0%		100%	-
Single-Unit Trucks	0	8	0	0		8	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	-
Single-Unit Trucks %	0%	4%	0%	0%		3.9%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.8%	0%	0%	0%	0%		0%	-
Buses	0	1	0	0		1	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	-
Buses %	0%	0.5%	0%	0%		0.5%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.8%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	-
Articulated Trucks %	0%	0.5%	0%	0%		0.5%	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.4%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Spectrum

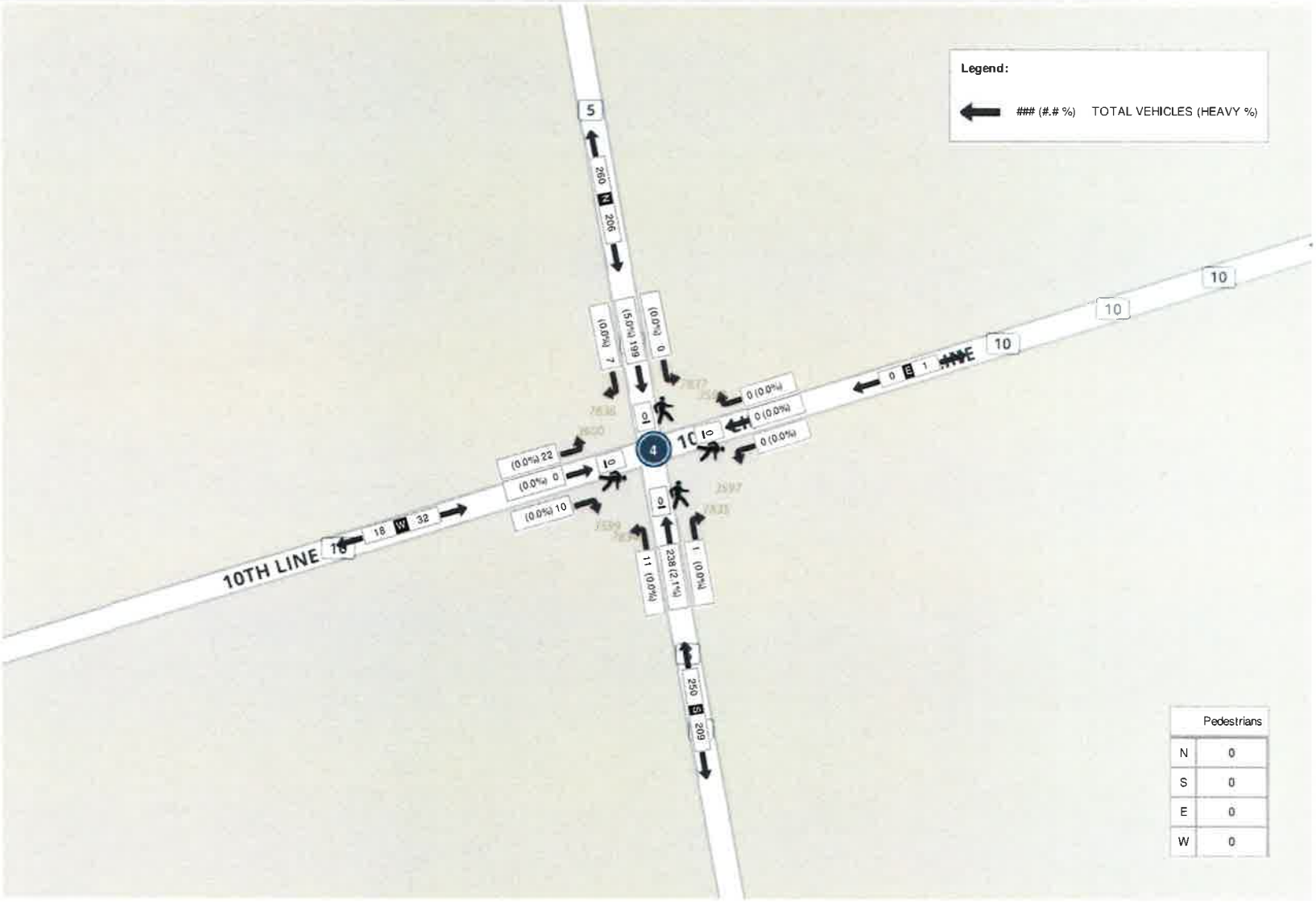
Turning Movement Count
Location Name: MCKAY RD & VETERANS DR
Date: Fri, Sep 09, 2016 Deployment Lead: Chris Koukaras

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

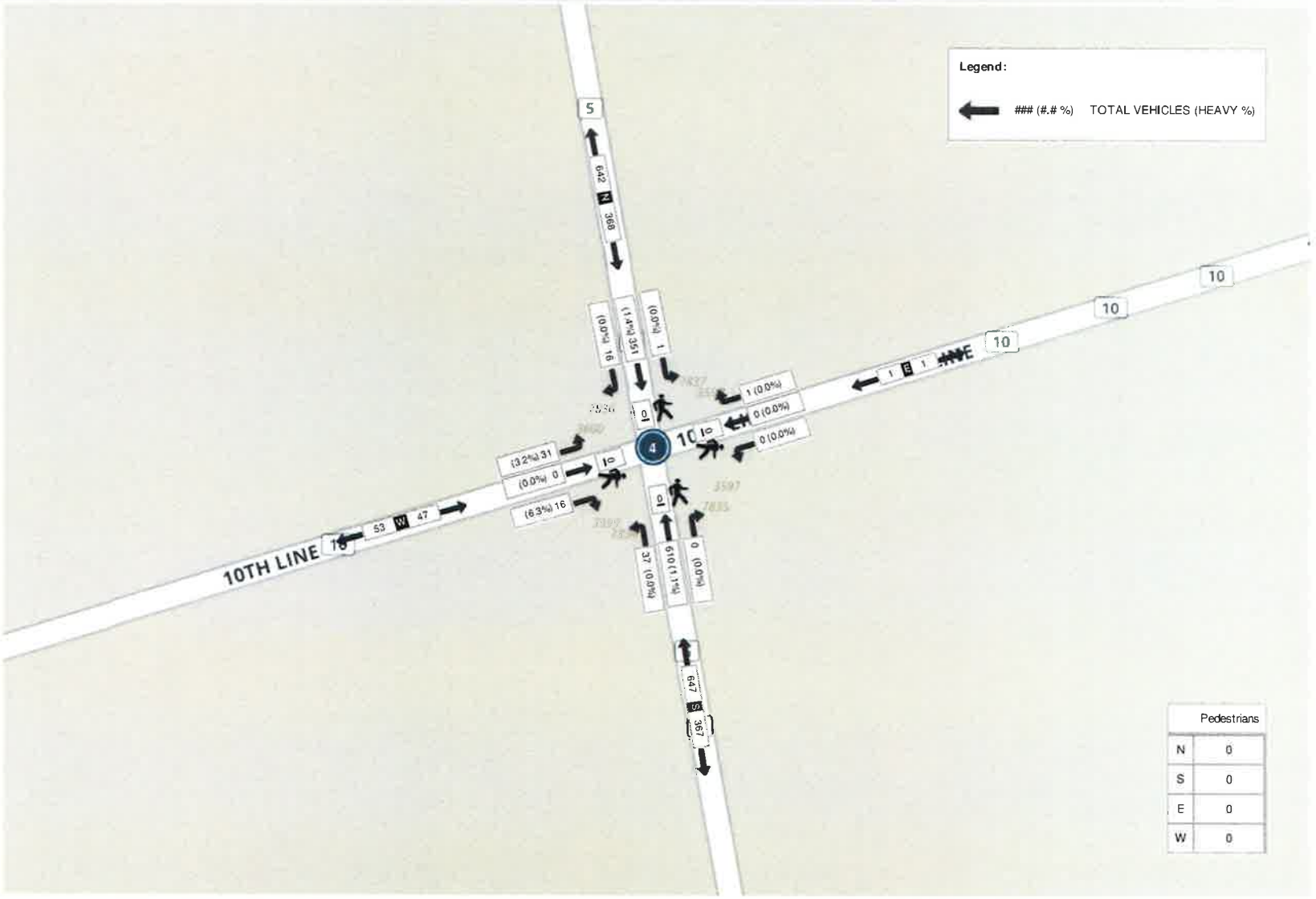
Peak Hour: 04:30 PM - 05:30 PM **Weather: Clear (23.8 °C)**

Start Time	N Approach VETERANS DR						E Approach MCKAY RD						S Approach VETERANS DR						W Approach MCKAY RD						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	
16:30:00	2	89	1	0	0	92	1	0	0	0	0	1	0	133	11	0	0	144	6	0	11	0	0	17	254
16:45:00	3	80	0	0	0	83	0	0	0	0	0	0	0	158	8	0	0	166	1	0	9	0	0	10	259
17:00:00	7	95	0	0	0	102	0	0	0	0	0	0	0	154	8	0	0	162	2	0	4	0	0	6	270
17:15:00	4	87	0	0	0	91	0	0	0	0	0	0	0	165	10	0	0	175	7	0	7	0	0	14	280
Grand Total	**16**	**351**	**1**	**0**	**0**	**368**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**610**	**37**	**0**	**0**	**647**	**16**	**0**	**31**	**0**	**0**	**47**	**1063**
Approach%	4.3%	95.4%	0.3%	0%		-	100%	0%	0%	0%		-	0%	94.3%	5.7%	0%		-	34%	0%	66%	0%		-	-
Totals %	1.5%	33%	0.1%	0%		34.6%	0.1%	0%	0%	0%		0.1%	0%	57.4%	3.5%	0%		60.9%	1.5%	0%	2.9%	0%		4.4%	-
PHF	0.57	0.92	0.25	0		0.9	0.25	0	0	0		0.25	0	0.92	0.84	0		0.92	0.57	0	0.7	0		0.69	-
Heavy	0	5	0	0		5	0	0	0	0		0	0	7	0	0		7	1	0	1	0		2	-
Heavy %	0%	1.4%	0%	0%		1.4%	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		1.1%	6.3%	0%	3.2%	0%		4.3%	-
Lights	16	346	1	0		363	1	0	0	0		1	0	603	37	0		640	15	0	30	0		45	-
Lights %	100%	98.6%	100%	0%		98.6%	100%	0%	0%	0%		100%	0%	98.9%	100%	0%		98.9%	93.8%	0%	96.8%	0%		95.7%	-
Single-Unit Trucks	0	4	0	0		4	0	0	0	0		0	0	6	0	0		6	1	0	0	0		1	-
Single-Unit Trucks %	0%	1.1%	0%	0%		1.1%	0%	0%	0%	0%		0%	0%	1%	0%	0%		0.9%	6.3%	0%	0%	0%		2.1%	-
Buses	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	-
Buses %	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	1	0		1	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	3.2%	0%		2.1%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Road	0	1	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	0	0	1	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Peak Hour: 07:45 AM - 08:45 AM **Weather: Mist (19.1 °C)**



Peak Hour: 04:30 PM - 05:30 PM Weather: Clear (23.8 °C)



Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

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

Municipality: Barrie
Site #: 1500200005
Intersection: Veterans Dr & McKay Rd
TFR File #: 1
Count date: 30-Apr-15

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Veterans Dr runs N/S

North Leg Total:	538				
North Entering:	235				
North Peds:	0				
Peds Cross:					
Cyclists	0	0	0	0	
Trucks	0	6	0	6	
Cars	5	162	62	229	
Totals	5	168	62		
Cyclists	0				
Trucks	5				
Cars	298				
Totals	303				
East Leg Total:	358				
East Entering:	221				
East Peds:	0				
Peds Cross:					

Veterans Dr

Cyclists	Trucks	Cars	Totals
0	2	61	63

Cars	Trucks	Cyclists	Totals
133	2	0	135
47	2	0	49
37	0	0	37
217	4	0	

McKay Rd

N
W E
S

Cyclists	Trucks	Cars	Totals
0	0	13	13
0	1	60	61
0	1	11	12
0	2	84	

McKay Rd

Cars	Trucks	Cyclists	Totals
134	3	0	137

Veterans Dr

Peds Cross:					
West Peds:	0				
West Entering:	86				
West Leg Total:	149				
Cars	210				
Trucks	7				
Cyclists	0				
Totals	217				
Cars	9	152	12	173	
Trucks	0	3	2	5	
Cyclists	0	0	0	0	
Totals	9	155	14		
Peds Cross:					
South Peds:	0				
South Entering:	178				
South Leg Total:	395				

Comments

Accu-Traffic Inc.

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 13:00:00
To: 14:00:00

Municipality: Barrie
Site #: 1500200005
Intersection: Veterans Dr & McKay Rd
TFR File #: 1
Count date: 30-Apr-15

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Veterans Dr runs N/S

North Leg Total: 575
North Entering: 283
North Peds: 0
Peds Cross: ⋊

Cyclists	0	0	0	0
Trucks	0	5	1	6
Cars	15	190	72	277
Totals	15	195	73	

Cyclists	1
Trucks	5
Cars	286
Totals	292

East Leg Total: 292
East Entering: 158
East Peds: 0
Peds Cross: ⋉

Veterans Dr

Cyclists	Trucks	Cars	Totals
0	2	64	66

McKay Rd

Cyclists	Trucks	Cars	Totals
0	0	19	19
0	2	32	34
0	1	9	10
0	3	60	

N
W E
S

Cars	Trucks	Cyclists	Totals
76	1	0	77
38	2	0	40
41	0	0	41
155	3	0	

McKay Rd

Cars	Trucks	Cyclists	Totals
131	3	0	134

Veterans Dr

Peds Cross: ⋉
West Peds: 0
West Entering: 63
West Leg Total: 129

Cars	240
Trucks	6
Cyclists	0
Totals	246

Cars	11	191	27	229
Trucks	0	4	0	4
Cyclists	0	1	0	1
Totals	11	196	27	

Peds Cross: ⋊
South Peds: 1
South Entering: 234
South Leg Total: 480

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

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

One Hour Peak
From: 16:45:00
To: 17:45:00

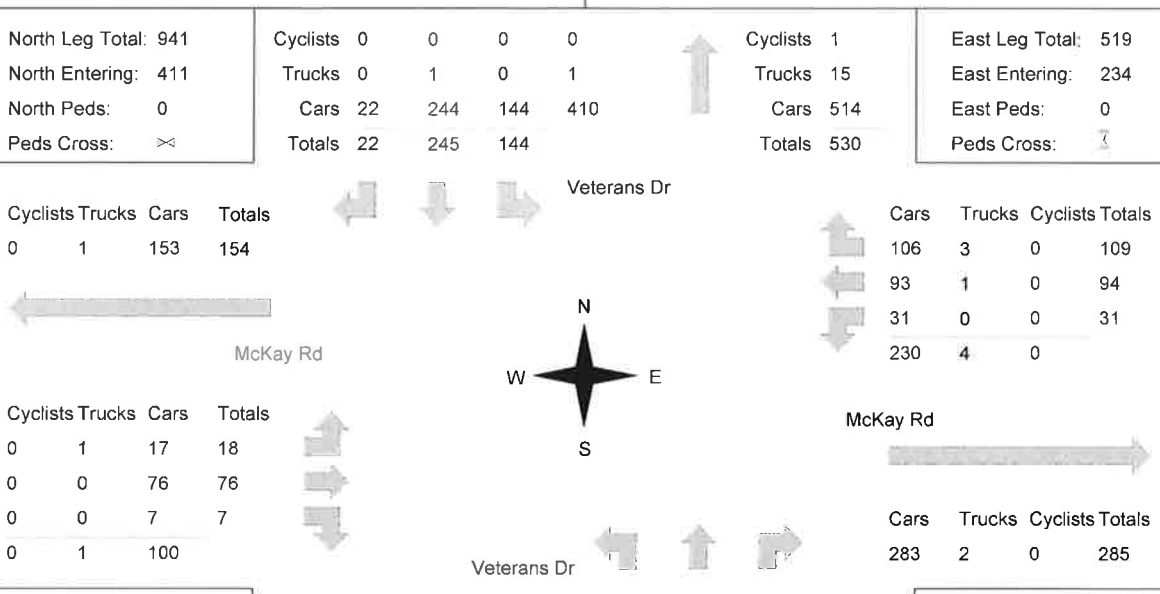
Municipality: Barrie
Site #: 1500200005
Intersection: Veterans Dr & McKay Rd
TFR File #: 1
Count date: 30-Apr-15

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Veterans Dr runs N/S



Comments

Accu-Traffic Inc.

Total Count Diagram

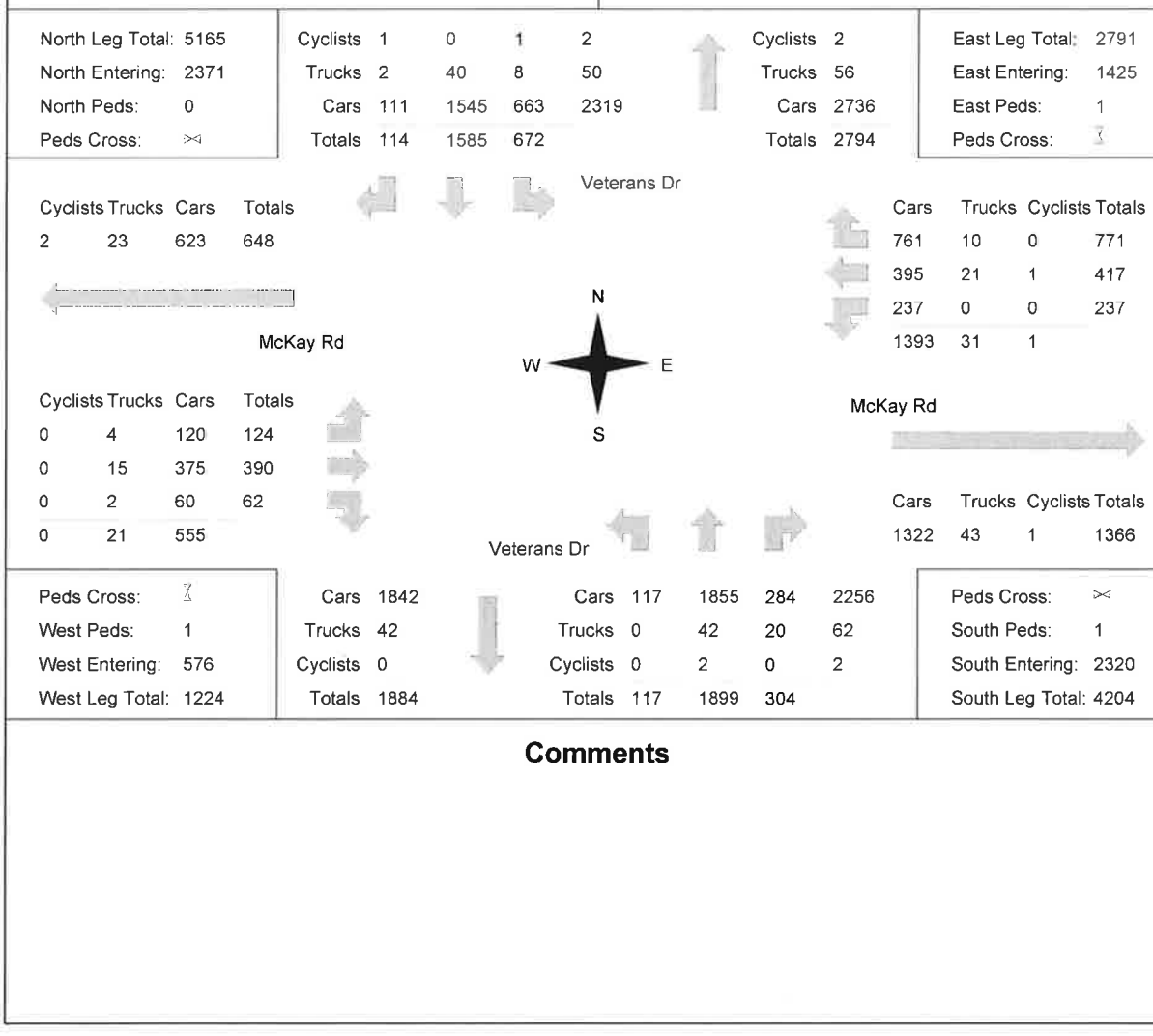
Municipality: Barrie
Site #: 1500200005
Intersection: Veterans Dr & McKay Rd
TFR File #: 1
Count date: 30-Apr-15

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Veterans Dr runs N/S



Comments

Accu-Traffic Inc.
Traffic Count Summary

Intersection: Veterans Dr & McKay Rd | **Count Date:** 30-Apr-15 | **Municipality:** Barrie

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	2	0	2	0	2
8:00:00	49	177	2	228	0	384
9:00:00	61	173	11	245	0	415
11:00:00	0	0	0	0	0	0
12:00:00	65	166	14	245	0	441
13:00:00	71	183	11	265	0	495
14:00:00	73	195	15	283	0	517
15:00:00	0	0	0	0	0	0
16:00:00	85	242	20	347	0	746
17:00:00	136	229	23	388	0	866
18:00:00	132	218	18	368	0	825
Totals:	672	1585	114	2371	0	4691

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	8	134	14	156	0
9:00:00	7	151	12	170	0
11:00:00	0	0	0	0	0
12:00:00	5	169	22	196	0
13:00:00	10	198	22	230	0
14:00:00	11	196	27	234	1
15:00:00	0	0	0	0	0
16:00:00	16	319	64	399	0
17:00:00	20	373	85	478	0
18:00:00	40	359	58	457	0
Totals:	117	1899	304	2320	1

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	0
8:00:00	30	63	106	199	0	268
9:00:00	28	36	132	196	1	272
11:00:00	0	0	0	0	0	0
12:00:00	27	34	72	133	0	176
13:00:00	28	34	75	137	0	175
14:00:00	41	40	77	158	0	221
15:00:00	0	0	0	0	0	0
16:00:00	34	64	84	182	0	270
17:00:00	20	60	116	196	0	306
18:00:00	29	86	109	224	0	313
Totals:	237	417	771	1425	1	2001

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Cyclists: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	0	0	0
8:00:00	11	46	12	69	0
9:00:00	12	57	7	76	1
11:00:00	0	0	0	0	0
12:00:00	9	28	6	43	0
13:00:00	7	27	4	38	0
14:00:00	19	34	10	63	0
15:00:00	0	0	0	0	0
16:00:00	22	54	12	88	0
17:00:00	29	76	5	110	0
18:00:00	15	68	6	89	0
Totals:	124	390	62	576	1

Calculated Values for Traffic Crossing Major Street

Hours Ending:	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00
Crossing Values:	104	97	70	69	101	120	125	130

Accu-Traffic Inc.

Count Date: 30-Apr-15 Site #: 1500200005

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Cyclists - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	6	6	41	39	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0
7:30:00	20	14	95	54	1	1	0	0	6	3	0	0	0	0	0	0	0	0	0	0
7:45:00	28	8	142	47	1	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0
8:00:00	49	21	170	28	2	1	0	0	9	2	0	0	0	0	0	0	0	0	0	0
8:15:00	66	17	213	43	3	1	0	0	10	1	0	0	0	0	0	0	0	0	0	0
8:30:00	82	16	257	44	6	3	0	0	12	2	0	0	0	0	0	0	0	0	0	0
8:45:00	95	13	300	43	9	3	0	0	15	3	0	0	0	0	0	0	0	0	0	0
9:00:00	110	15	336	36	12	3	0	0	16	1	1	1	0	0	0	0	0	0	0	0
9:15:00	110	0	336	0	12	0	0	0	16	0	1	0	0	0	0	0	0	0	0	0
11:00:00	110	0	336	0	12	0	0	0	16	0	1	0	0	0	0	0	0	0	0	0
11:15:00	128	18	367	31	17	5	0	0	16	0	1	0	0	0	0	0	0	0	0	0
11:30:00	144	16	417	50	21	4	0	0	19	3	1	0	0	0	0	0	0	0	0	0
11:45:00	159	15	457	40	24	3	0	0	22	3	1	0	0	0	0	0	0	0	0	0
12:00:00	175	16	495	38	26	2	0	0	23	1	1	0	0	0	0	0	0	0	0	0
12:15:00	199	24	544	49	28	2	0	0	26	3	1	0	0	0	0	0	0	0	0	0
12:30:00	218	19	586	42	30	2	0	0	26	0	1	0	0	0	0	0	0	0	0	0
12:45:00	232	14	629	43	32	2	1	1	26	0	1	0	0	0	0	0	0	0	0	0
13:00:00	245	13	675	46	37	5	1	0	26	0	1	0	0	0	0	0	0	0	0	0
13:15:00	270	25	726	51	42	5	1	0	27	1	1	0	0	0	0	0	0	0	0	0
13:30:00	280	10	768	42	45	3	1	0	28	1	1	0	0	0	0	0	0	0	0	0
13:45:00	299	19	820	52	50	5	2	1	30	2	1	0	0	0	0	0	0	0	0	0
14:00:00	317	18	865	45	52	2	2	0	31	1	1	0	0	0	0	0	0	0	0	0
14:15:00	317	0	865	0	52	0	2	0	31	0	1	0	0	0	0	0	0	0	0	0
15:00:00	317	0	865	0	52	0	2	0	31	0	1	0	0	0	0	0	0	0	0	0
15:15:00	340	23	923	58	56	4	3	1	32	1	2	1	0	0	0	0	0	0	0	0
15:30:00	363	23	974	51	64	8	3	0	34	2	2	0	0	0	0	0	0	0	0	0
15:45:00	377	14	1035	61	66	2	5	2	36	2	2	0	1	1	0	0	0	0	0	0
16:00:00	397	20	1102	67	71	5	6	1	36	0	2	0	1	0	0	0	0	0	0	0
16:15:00	431	34	1149	47	74	3	6	0	37	1	2	0	1	0	0	0	0	0	0	0
16:30:00	461	30	1204	55	79	5	8	2	38	1	2	0	1	0	0	0	0	0	0	0
16:45:00	493	32	1262	58	86	7	8	0	38	0	2	0	1	0	0	0	1	1	0	0
17:00:00	531	38	1329	67	93	7	8	0	38	0	2	0	1	0	0	0	1	0	0	0
17:15:00	566	35	1382	53	97	4	8	0	39	1	2	0	1	0	0	0	1	0	0	0
17:30:00	610	44	1443	61	104	7	8	0	39	0	2	0	1	0	0	0	1	0	0	0
17:45:00	637	27	1506	63	108	4	8	0	39	0	2	0	1	0	0	0	1	0	0	0
18:00:00	663	26	1545	39	111	3	8	0	40	1	2	0	1	0	0	0	1	0	0	0
18:15:00	663	0	1545	0	111	0	8	0	40	0	2	0	1	0	0	0	1	0	0	0
18:15:15	663	0	1545	0	111	0	8	0	40	0	2	0	1	0	0	0	1	0	0	0

Accu-Traffic Inc.

Count Date: 30-Apr-15 Site #: 1500200005

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Cyclists - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	5	5	14	14	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	9	4	34	20	36	21	0	0	0	0	1	1	0	0	1	1	0	0	0	0
7:45:00	17	8	50	16	65	29	0	0	0	0	2	1	0	0	1	0	0	0	0	0
8:00:00	30	13	62	12	104	39	0	0	0	0	2	0	0	0	1	0	0	0	0	0
8:15:00	40	10	66	4	135	31	0	0	1	1	3	1	0	0	1	0	0	0	0	0
8:30:00	46	6	81	15	169	34	0	0	2	1	3	0	0	0	1	0	0	0	0	0
8:45:00	52	6	88	7	203	34	0	0	2	0	3	0	0	0	1	0	0	0	1	1
9:00:00	58	6	96	8	235	32	0	0	2	0	3	0	0	0	1	0	0	0	1	0
9:15:00	58	0	96	0	235	0	0	0	2	0	3	0	0	0	1	0	0	0	1	0
11:00:00	58	0	96	0	235	0	0	0	2	0	3	0	0	0	1	0	0	0	1	0
11:15:00	67	9	107	11	249	14	0	0	3	1	3	0	0	0	1	0	0	0	1	0
11:30:00	70	3	115	8	262	13	0	0	4	1	3	0	0	0	1	0	0	0	1	0
11:45:00	78	8	121	6	286	24	0	0	4	0	4	1	0	0	1	0	0	0	1	0
12:00:00	85	7	126	5	306	20	0	0	6	2	4	0	0	0	1	0	0	0	1	0
12:15:00	92	7	135	9	322	16	0	0	6	0	4	0	0	0	1	0	0	0	1	0
12:30:00	100	8	146	11	343	21	0	0	9	3	4	0	0	0	1	0	0	0	1	0
12:45:00	107	7	151	5	365	22	0	0	9	0	4	0	0	0	1	0	0	0	1	0
13:00:00	113	6	156	5	381	16	0	0	10	1	4	0	0	0	1	0	0	0	1	0
13:15:00	123	10	169	13	401	20	0	0	11	1	5	1	0	0	1	0	0	0	1	0
13:30:00	133	10	180	11	420	19	0	0	11	0	5	0	0	0	1	0	0	0	1	0
13:45:00	143	10	184	4	441	21	0	0	12	1	5	0	0	0	1	0	0	0	1	0
14:00:00	154	11	194	10	457	16	0	0	12	0	5	0	0	0	1	0	0	0	1	0
14:15:00	154	0	194	0	457	0	0	0	12	0	5	0	0	0	1	0	0	0	1	0
15:00:00	154	0	194	0	457	0	0	0	12	0	5	0	0	0	1	0	0	0	1	0
15:15:00	163	9	205	11	473	16	0	0	14	2	6	1	0	0	1	0	0	0	1	0
15:30:00	170	7	218	13	490	17	0	0	16	2	6	0	0	0	1	0	0	0	1	0
15:45:00	180	10	239	21	514	24	0	0	17	1	6	0	0	0	1	0	0	0	1	0
16:00:00	188	8	253	14	540	26	0	0	17	0	6	0	0	0	1	0	0	0	1	0
16:15:00	191	3	264	11	572	32	0	0	18	1	6	0	0	0	1	0	0	0	1	0
16:30:00	196	5	275	11	602	30	0	0	19	1	7	1	0	0	1	0	0	0	1	0
16:45:00	202	6	292	17	633	31	0	0	20	1	7	0	0	0	1	0	0	0	1	0
17:00:00	208	6	310	18	655	22	0	0	20	0	7	0	0	0	1	0	0	0	1	0
17:15:00	215	7	334	24	686	31	0	0	20	0	9	2	0	0	1	0	0	0	1	0
17:30:00	221	6	360	26	719	33	0	0	20	0	10	1	0	0	1	0	0	0	1	0
17:45:00	233	12	385	25	739	20	0	0	21	1	10	0	0	0	1	0	0	0	1	0
18:00:00	237	4	395	10	761	22	0	0	21	0	10	0	0	0	1	0	0	0	1	0
18:15:00	237	0	395	0	761	0	0	0	21	0	10	0	0	0	1	0	0	0	1	0
18:15:15	237	0	395	0	761	0	0	0	21	0	10	0	0	0	1	0	0	0	1	0

Accu-Traffic Inc.

Count Date: 30-Apr-15 Site #: 1500200005

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Cyclists - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	2	2	28	28	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	3	1	58	30	9	6	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:45:00	5	2	84	26	13	4	0	0	2	1	0	0	0	0	0	0	0	0	0	0
8:00:00	8	3	131	47	14	1	0	0	3	1	0	0	0	0	0	0	0	0	0	0
8:15:00	8	0	166	35	20	6	0	0	3	0	1	1	0	0	0	0	0	0	0	0
8:30:00	12	4	210	44	21	1	0	0	4	1	2	1	0	0	0	0	0	0	0	0
8:45:00	14	2	246	36	21	0	0	0	4	0	2	0	0	0	0	0	0	0	0	0
9:00:00	15	1	280	34	23	2	0	0	5	1	3	1	0	0	0	0	0	0	0	0
9:15:00	15	0	280	0	23	0	0	0	5	0	3	0	0	0	0	0	0	0	0	0
11:00:00	15	0	280	0	23	0	0	0	5	0	3	0	0	0	0	0	0	0	0	0
11:15:00	18	3	326	46	27	4	0	0	6	1	4	1	0	0	0	0	0	0	0	0
11:30:00	20	2	362	36	28	1	0	0	9	3	4	0	0	0	0	0	0	0	0	0
11:45:00	20	0	407	45	35	7	0	0	10	1	4	0	0	0	0	0	0	0	0	0
12:00:00	20	0	443	36	43	8	0	0	11	1	5	1	0	0	0	0	0	0	0	0
12:15:00	24	4	489	46	50	7	0	0	12	1	5	0	0	0	0	0	0	0	0	0
12:30:00	25	1	540	51	57	7	0	0	12	0	6	1	0	0	0	0	0	0	0	0
12:45:00	29	4	592	52	59	2	0	0	14	2	7	1	0	0	0	0	0	0	0	0
13:00:00	30	1	635	43	63	4	0	0	17	3	7	0	0	0	0	0	0	0	0	0
13:15:00	34	4	686	51	68	5	0	0	17	0	7	0	0	0	0	0	0	0	1	1
13:30:00	36	2	733	47	73	5	0	0	18	1	7	0	0	0	0	0	0	0	1	0
13:45:00	39	3	775	42	79	6	0	0	19	1	7	0	0	0	0	0	0	0	1	0
14:00:00	41	2	826	51	90	11	0	0	21	2	7	0	0	0	1	1	0	0	1	0
14:15:00	41	0	826	0	90	0	0	0	21	0	7	0	0	0	1	0	0	0	1	0
15:00:00	41	0	826	0	90	0	0	0	21	0	7	0	0	0	1	0	0	0	1	0
15:15:00	45	4	900	74	99	9	0	0	21	0	7	0	0	0	1	0	0	0	1	0
15:30:00	49	4	960	60	119	20	0	0	23	2	8	1	0	0	1	0	0	0	1	0
15:45:00	52	3	1032	72	138	19	0	0	24	1	8	0	0	0	1	0	0	0	1	0
16:00:00	57	5	1140	108	151	13	0	0	26	2	10	2	0	0	1	0	0	0	1	0
16:15:00	61	4	1231	91	170	19	0	0	26	0	13	3	0	0	1	0	0	0	1	0
16:30:00	68	7	1318	87	188	18	0	0	28	2	15	2	0	0	1	0	0	0	1	0
16:45:00	73	5	1396	78	208	20	0	0	31	3	18	3	0	0	1	0	0	0	1	0
17:00:00	77	4	1504	108	226	18	0	0	34	3	20	2	0	0	2	1	0	0	1	0
17:15:00	83	6	1599	95	240	14	0	0	39	5	20	0	0	0	2	0	0	0	1	0
17:30:00	93	10	1689	90	255	15	0	0	42	3	20	0	0	0	2	0	0	0	1	0
17:45:00	111	18	1787	98	271	16	0	0	42	0	20	0	0	0	2	0	0	0	1	0
18:00:00	117	6	1855	68	284	13	0	0	42	0	20	0	0	0	2	0	0	0	1	0
18:15:00	117	0	1855	0	284	0	0	0	42	0	20	0	0	0	2	0	0	0	1	0
18:15:15	117	0	1855	0	284	0	0	0	42	0	20	0	0	0	2	0	0	0	1	0

Accu-Traffic Inc.

Count Date: 30-Apr-15 Site #: 1500200005

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Cyclists - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	9	9	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	1	1	19	10	4	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0
7:45:00	8	7	33	14	8	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0
8:00:00	10	2	45	12	11	3	1	0	1	0	1	1	0	0	0	0	0	0	0	0
8:15:00	10	0	64	19	15	4	1	0	1	0	1	0	0	0	0	0	0	0	0	0
8:30:00	14	4	79	15	15	0	1	0	2	1	1	0	0	0	0	0	0	0	0	0
8:45:00	19	5	93	14	16	1	1	0	3	1	1	0	0	0	0	0	0	0	0	0
9:00:00	22	3	100	7	18	2	1	0	3	0	1	0	0	0	0	0	0	0	1	1
9:15:00	22	0	100	0	18	0	1	0	3	0	1	0	0	0	0	0	0	0	1	0
11:00:00	22	0	100	0	18	0	1	0	3	0	1	0	0	0	0	0	0	0	1	0
11:15:00	24	2	108	8	20	2	1	0	3	0	1	0	0	0	0	0	0	0	1	0
11:30:00	26	2	117	9	21	1	1	0	4	1	1	0	0	0	0	0	0	0	1	0
11:45:00	28	2	121	4	22	1	1	0	4	0	1	0	0	0	0	0	0	0	1	0
12:00:00	31	3	127	6	24	2	1	0	4	0	1	0	0	0	0	0	0	0	1	0
12:15:00	33	2	132	5	25	1	2	1	5	1	1	0	0	0	0	0	0	0	1	0
12:30:00	35	2	140	8	26	1	2	0	5	0	1	0	0	0	0	0	0	0	1	0
12:45:00	37	2	146	6	27	1	2	0	6	1	1	0	0	0	0	0	0	0	1	0
13:00:00	37	0	152	6	28	1	2	0	6	0	1	0	0	0	0	0	0	0	1	0
13:15:00	40	3	158	6	31	3	2	0	6	0	2	1	0	0	0	0	0	0	1	0
13:30:00	47	7	169	11	35	4	2	0	7	1	2	0	0	0	0	0	0	0	1	0
13:45:00	50	3	176	7	37	2	2	0	7	0	2	0	0	0	0	0	0	0	1	0
14:00:00	56	6	184	8	37	0	2	0	8	1	2	0	0	0	0	0	0	0	1	0
14:15:00	56	0	184	0	37	0	2	0	8	0	2	0	0	0	0	0	0	0	1	0
15:00:00	56	0	184	0	37	0	2	0	8	0	2	0	0	0	0	0	0	0	1	0
15:15:00	58	2	200	16	39	2	2	0	10	2	2	0	0	0	0	0	0	0	1	0
15:30:00	65	7	208	8	42	3	3	1	11	1	2	0	0	0	0	0	0	0	1	0
15:45:00	68	3	222	14	46	4	3	0	11	0	2	0	0	0	0	0	0	0	1	0
16:00:00	77	9	235	13	49	3	3	0	11	0	2	0	0	0	0	0	0	0	1	0
16:15:00	81	4	255	20	50	1	3	0	11	0	2	0	0	0	0	0	0	0	1	0
16:30:00	91	10	265	10	51	1	3	0	12	1	2	0	0	0	0	0	0	0	1	0
16:45:00	99	8	286	21	53	2	3	0	14	2	2	0	0	0	0	0	0	0	1	0
17:00:00	105	6	308	22	54	1	4	1	14	0	2	0	0	0	0	0	0	0	1	0
17:15:00	108	3	331	23	57	3	4	0	14	0	2	0	0	0	0	0	0	0	1	0
17:30:00	114	6	343	12	58	1	4	0	14	0	2	0	0	0	0	0	0	0	1	0
17:45:00	116	2	362	19	60	2	4	0	14	0	2	0	0	0	0	0	0	0	1	0
18:00:00	120	4	375	13	60	0	4	0	15	1	2	0	0	0	0	0	0	0	1	0
18:15:00	120	0	375	0	60	0	4	0	15	0	2	0	0	0	0	0	0	0	1	0
18:15:15	120	0	375	0	60	0	4	0	15	0	2	0	0	0	0	0	0	0	1	0

County of Simcoe

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

County Road 53 - Summer 2013
McKay Road to
County Road 21

Site Code: 053 04

Date Start: 06-Aug-13
Date End: 09-Aug-13

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
08/06/13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	0	145	22	0	15	1	0	4	0	1	0	1	0	16	205
12 PM	0	137	46	0	21	3	0	2	0	2	0	0	0	13	224
13:00	0	170	52	0	16	0	0	2	2	0	0	1	0	25	268
14:00	0	162	50	1	22	0	0	1	1	0	0	0	0	29	266
15:00	1	151	43	6	23	1	0	3	0	0	0	0	0	62	290
16:00	1	174	59	1	35	2	0	1	1	0	0	0	0	33	307
17:00	2	170	50	0	19	0	0	4	0	0	0	1	0	26	272
18:00	2	140	40	0	16	1	0	2	0	0	0	0	0	12	213
19:00	1	146	36	0	9	0	0	0	0	0	0	0	0	4	196
20:00	1	92	20	0	15	0	0	0	0	0	0	0	0	3	131
21:00	0	72	22	0	9	0	0	0	2	0	0	0	0	2	107
22:00	0	47	10	0	3	0	0	0	0	0	0	0	0	0	60
23:00	0	26	12	0	1	0	0	0	0	0	0	0	0	1	40
Total	8	1632	462	8	204	8	0	19	6	3	0	3	0	226	2579
Percent	0.3%	63.3%	17.9%	0.3%	7.9%	0.3%	0.0%	0.7%	0.2%	0.1%	0.0%	0.1%	0.0%	8.8%	
AM Peak		11:00	11:00		11:00	11:00		11:00		11:00		11:00		11:00	11:00
Vol.		145	22		15	1		4		1		1		16	205
PM Peak	17:00	16:00	16:00	15:00	16:00	12:00		17:00	13:00	12:00		13:00		15:00	16:00
Vol.	2	174	59	6	35	3		4	2	2		1		62	307

County of Simcoe

Transporation and Engineering Department
Midhurst, Ontario
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County Road 53 - Summer 2013
McKay Road to
County Road 21

Site Code: 053 04

Date Start: 06-Aug-13
Date End: 09-Aug-13

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
08/07/13	0	25	8	0	1	0	0	0	0	0	0	0	0	1	35
01:00	0	3	1	0	0	1	0	0	0	0	0	0	0	0	5
02:00	0	5	1	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	30	5	0	0	0	0	0	0	0	0	0	0	1	36
05:00	0	85	19	0	9	0	0	0	0	0	0	0	0	2	115
06:00	0	141	25	0	17	0	0	1	0	0	0	0	0	3	187
07:00	0	138	30	1	9	1	0	0	0	0	0	0	0	3	182
08:00	0	114	28	2	22	0	0	1	1	0	0	0	0	4	172
09:00	0	119	26	0	21	2	0	2	1	0	0	0	0	12	183
10:00	0	107	21	1	14	2	0	2	0	0	0	0	0	5	152
11:00	1	123	35	4	14	0	0	2	2	1	0	0	0	6	188
12 PM	0	136	47	3	17	0	0	0	0	1	0	0	0	8	212
13:00	1	153	51	3	18	0	0	1	1	0	0	0	0	16	244
14:00	2	192	56	1	28	0	0	3	0	0	0	0	0	20	302
15:00	0	159	58	0	22	1	0	1	1	0	0	0	0	30	272
16:00	1	153	38	0	26	0	0	1	0	0	0	0	0	27	246
17:00	1	176	42	1	18	1	0	3	0	1	0	0	0	15	258
18:00	0	125	35	0	9	1	0	1	0	0	0	0	0	10	181
19:00	1	104	42	0	20	0	0	1	0	0	0	0	0	7	175
20:00	0	79	22	0	11	0	0	0	0	0	0	0	0	1	113
21:00	1	73	24	0	10	0	0	0	1	0	0	0	0	3	112
22:00	0	53	10	1	7	0	0	0	0	0	0	0	0	0	71
23:00	0	25	8	0	3	0	0	0	0	0	0	0	0	0	36
Total	8	2321	633	17	296	9	0	19	7	3	0	0	0	174	3487
Percent	0.2%	66.6%	18.2%	0.5%	8.5%	0.3%	0.0%	0.5%	0.2%	0.1%	0.0%	0.0%	0.0%	5.0%	
AM Peak	11:00	06:00	11:00	11:00	08:00	09:00		09:00	11:00	11:00				09:00	11:00
Vol.	1	141	35	4	22	2		2	2	1				12	188
PM Peak	14:00	14:00	15:00	12:00	14:00	15:00		14:00	13:00	12:00				15:00	14:00
Vol.	2	192	58	3	28	1		3	1	1				30	302

County of Simcoe

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Midhurst, Ontario
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County Road 53 - Summer 2013
McKay Road to
County Road 21

Site Code: 053 04

Date Start: 06-Aug-13
Date End: 09-Aug-13

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
08/08/13	0	14	6	0	0	0	0	0	0	0	0	0	0	0	20
01:00	0	10	2	0	0	0	0	0	0	0	0	0	0	0	12
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	5	1	0	0	0	0	0	0	0	0	0	0	0	6
04:00	0	22	5	0	3	0	0	0	0	0	0	0	0	0	30
05:00	1	85	11	0	7	0	0	0	0	0	0	0	0	3	107
06:00	0	117	26	1	9	0	0	0	0	1	0	0	0	4	158
07:00	1	149	27	1	19	1	0	2	1	1	0	0	0	3	205
08:00	1	128	26	1	23	1	0	4	1	1	0	0	0	8	194
09:00	0	127	29	0	17	0	0	1	1	0	0	0	0	7	182
10:00	1	109	42	1	20	0	0	1	0	0	0	0	0	9	183
11:00	0	132	39	0	13	4	0	3	1	1	0	0	0	28	221
12 PM	0	129	30	0	21	2	0	0	2	0	0	0	0	25	209
13:00	1	133	37	2	19	0	0	1	0	0	0	0	0	48	241
14:00	0	144	55	3	15	1	0	2	1	0	0	0	0	44	265
15:00	1	147	35	1	24	1	0	2	0	0	0	0	0	56	267
16:00	2	127	49	2	19	0	0	1	0	0	0	0	0	39	239
17:00	1	174	48	1	17	0	0	1	0	0	0	0	0	29	271
18:00	0	121	30	0	11	0	0	2	0	0	0	0	0	16	180
19:00	0	113	26	0	11	0	0	1	0	0	0	0	0	14	165
20:00	0	104	33	0	11	0	0	0	0	0	0	0	0	9	157
21:00	0	88	23	0	7	0	0	0	0	0	0	0	0	2	120
22:00	1	59	14	0	5	1	0	0	0	0	0	0	0	1	81
23:00	0	31	10	0	1	0	0	1	0	0	0	0	0	0	43
Total	10	2274	604	13	272	11	0	22	7	4	0	0	0	345	3562
Percent	0.3%	63.8%	17.0%	0.4%	7.6%	0.3%	0.0%	0.6%	0.2%	0.1%	0.0%	0.0%	0.0%	9.7%	
AM Peak	05:00	07:00	10:00	06:00	08:00	11:00		08:00	07:00	06:00				11:00	11:00
Vol.	1	149	42	1	23	4		4	1	1				28	221
PM Peak	16:00	17:00	14:00	14:00	15:00	12:00		14:00	12:00					15:00	17:00
Vol.	2	174	55	3	24	2		2	2					56	271

County of Simcoe

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County Road 53 - Summer 2013
McKay Road to
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Site Code: 053 04

Date Start: 06-Aug-13
Date End: 09-Aug-13

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
08/09/13	0	12	5	0	1	1	0	0	0	0	0	0	0	1	20
01:00	0	8	2	0	1	0	0	0	0	0	0	0	0	0	11
02:00	0	8	0	0	1	0	0	0	0	0	0	0	0	0	9
03:00	0	4	2	0	0	0	0	0	0	0	0	0	0	0	6
04:00	0	22	7	0	0	0	0	0	0	0	0	0	0	0	29
05:00	0	78	17	0	9	0	0	0	0	0	0	0	0	4	108
06:00	0	108	19	1	22	1	0	4	0	1	0	0	0	2	158
07:00	0	137	35	0	10	1	0	1	0	1	0	0	0	10	195
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	0	377	87	1	44	3	0	5	0	2	0	0	0	17	536
Percent	0.0%	70.3%	16.2%	0.2%	8.2%	0.6%	0.0%	0.9%	0.0%	0.4%	0.0%	0.0%	0.0%	3.2%	
AM Peak		07:00	07:00	06:00	06:00	00:00		06:00		06:00				07:00	07:00
Vol.		137	35	1	22	1		4		1				10	195
PM Peak															
Vol.															
Grand Total	26	6604	1786	39	816	31	0	65	20	12	0	3	0	762	10164
Percent	0.3%	65.0%	17.6%	0.4%	8.0%	0.3%	0.0%	0.6%	0.2%	0.1%	0.0%	0.0%	0.0%	7.5%	

County of Simcoe

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County Road 53 - Summer 2013
McKay Road to
County Road 21

Site Code: 053 04

Date Start: 06-Aug-13
Date End: 09-Aug-13

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
08/06/13	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	0	138	43	1	5	2	0	2	1	2	0	0	1	11	206
12 PM	4	140	53	1	10	3	0	1	1	1	0	0	0	7	221
13:00	2	170	31	2	11	1	0	1	0	0	0	0	0	4	222
14:00	3	173	49	3	4	1	0	2	0	2	0	0	0	17	254
15:00	3	246	66	2	17	4	0	1	1	0	0	0	0	18	358
16:00	4	335	83	3	8	4	0	0	0	1	0	0	0	23	461
17:00	6	334	92	0	20	1	0	2	0	0	0	0	0	18	473
18:00	5	237	56	0	21	2	0	2	0	0	0	0	0	9	332
19:00	0	143	41	0	2	0	0	1	0	0	0	0	0	1	188
20:00	1	92	21	0	4	1	0	0	0	0	0	0	0	3	122
21:00	0	83	23	0	3	0	0	0	0	0	0	0	0	1	110
22:00	0	90	21	0	2	0	0	0	0	0	0	0	0	0	113
23:00	0	76	14	0	1	0	0	0	0	0	0	0	0	1	92
Total	28	2257	593	12	108	19	0	12	3	6	0	0	1	113	3152
Percent	0.9%	71.6%	18.8%	0.4%	3.4%	0.6%	0.0%	0.4%	0.1%	0.2%	0.0%	0.0%	0.0%	3.6%	
AM Peak		11:00	11:00	11:00	11:00	11:00		11:00	11:00	11:00			11:00	11:00	11:00
Vol.		138	43	1	5	2		2	1	2			1	11	206
PM Peak	17:00	16:00	17:00	14:00	18:00	15:00		14:00	12:00	14:00				16:00	17:00
Vol.	6	335	92	3	21	4		2	1	2				23	473

County of Simcoe

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

County Road 53 - Summer 2013
McKay Road to
County Road 21

Site Code: 053 04

Date Start: 06-Aug-13
Date End: 09-Aug-13

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
08/07/13	1	25	8	0	1	0	0	0	0	0	0	0	0	0	35
01:00	0	35	10	0	1	0	0	0	1	0	0	0	0	0	47
02:00	0	11	2	0	0	0	0	0	0	0	0	0	0	0	13
03:00	0	11	2	0	0	1	0	0	0	0	0	0	0	0	14
04:00	0	11	1	0	0	0	0	0	0	0	0	0	0	0	12
05:00	0	31	3	0	0	0	0	0	0	0	0	0	0	0	34
06:00	0	42	25	0	2	4	0	0	0	1	0	0	0	1	75
07:00	1	104	29	2	2	0	0	0	0	0	0	0	0	3	141
08:00	0	119	37	0	3	4	0	3	1	0	0	0	0	4	171
09:00	0	124	34	1	7	3	0	0	0	1	0	0	0	4	174
10:00	0	118	29	1	8	0	0	3	0	0	0	0	0	5	164
11:00	0	124	33	1	6	0	0	3	0	0	0	0	0	3	170
12 PM	1	168	45	2	12	1	0	1	0	0	0	0	0	4	234
13:00	2	162	61	2	3	1	0	2	0	0	0	0	0	3	236
14:00	2	187	71	1	15	7	0	1	0	0	0	0	0	5	289
15:00	0	292	78	0	15	1	0	1	0	0	0	0	0	18	405
16:00	2	332	91	1	14	2	0	2	0	0	0	0	0	15	459
17:00	1	356	90	2	18	1	0	0	0	0	0	0	0	13	481
18:00	0	273	60	0	11	1	0	0	1	0	0	0	0	6	352
19:00	2	192	40	0	5	0	0	0	0	0	0	0	0	1	240
20:00	0	103	19	0	3	0	0	0	0	0	0	0	0	0	125
21:00	1	73	19	0	1	0	0	1	0	0	0	0	0	2	97
22:00	0	61	24	1	0	0	0	0	0	0	0	0	0	0	86
23:00	0	50	9	0	1	0	0	0	0	0	0	0	0	0	60
Total	13	3004	820	14	128	26	0	17	3	2	0	0	0	87	4114
Percent	0.3%	73.0%	19.9%	0.3%	3.1%	0.6%	0.0%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	2.1%	
AM Peak	00:00	09:00	08:00	07:00	10:00	06:00		08:00	01:00	06:00				10:00	09:00
Vol.	1	124	37	2	8	4		3	1	1				5	174
PM Peak	13:00	17:00	16:00	12:00	17:00	14:00		13:00	18:00					15:00	17:00
Vol.	2	356	91	2	18	7		2	1					18	481

County of Simcoe

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County Road 21

Site Code: 053 04

Date Start: 06-Aug-13
Date End: 09-Aug-13

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
08/08/13	0	35	11	0	0	0	0	0	0	0	0	0	0	0	46
01:00	0	35	13	0	0	0	0	0	0	0	0	0	0	0	48
02:00	0	20	2	0	0	0	0	0	0	0	0	0	0	0	22
03:00	0	15	1	0	0	0	0	0	0	0	0	0	0	0	16
04:00	0	12	0	0	0	0	0	0	0	0	0	0	0	0	12
05:00	0	21	8	0	1	0	0	0	0	1	0	0	0	0	31
06:00	1	47	22	0	1	0	0	1	1	0	0	0	0	0	73
07:00	0	107	33	0	7	0	0	2	1	0	0	0	0	4	154
08:00	1	128	38	0	5	2	0	3	1	0	0	0	0	5	183
09:00	0	108	43	0	3	2	0	1	0	0	0	0	0	6	163
10:00	2	122	31	4	9	1	0	5	0	1	0	0	0	10	185
11:00	0	142	40	0	5	2	0	0	1	0	0	0	0	9	199
12 PM	2	171	53	1	8	2	0	7	2	0	0	0	0	16	262
13:00	1	183	63	2	13	2	0	1	1	0	0	0	0	20	286
14:00	1	211	76	1	13	3	0	4	1	3	0	0	0	16	329
15:00	1	260	66	0	9	8	0	6	1	1	0	0	0	27	379
16:00	2	374	92	0	13	6	0	1	1	0	0	0	0	23	512
17:00	3	370	93	1	19	2	0	2	0	0	0	0	0	26	516
18:00	0	261	68	1	7	0	0	1	0	0	0	0	0	3	341
19:00	5	166	39	2	2	0	0	1	0	0	0	0	0	2	217
20:00	3	126	25	0	2	1	0	1	0	0	0	0	0	6	164
21:00	2	83	16	0	3	0	0	0	0	0	0	0	0	1	105
22:00	1	83	23	0	3	0	0	0	0	0	0	0	0	2	112
23:00	0	67	8	0	0	0	0	0	0	0	0	0	0	0	75
Total	25	3147	864	12	123	31	0	36	10	6	0	0	0	176	4430
Percent	0.6%	71.0%	19.5%	0.3%	2.8%	0.7%	0.0%	0.8%	0.2%	0.1%	0.0%	0.0%	0.0%	4.0%	
AM Peak	10:00	11:00	09:00	10:00	10:00	08:00		10:00	06:00	05:00				10:00	11:00
Vol.	2	142	43	4	9	2		5	1	1				10	199
PM Peak	19:00	16:00	17:00	13:00	17:00	15:00		12:00	12:00	14:00				15:00	17:00
Vol.	5	374	93	2	19	8		7	2	3				27	516

County of Simcoe

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County Road 53 - Summer 2013
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County Road 21

Site Code: 053 04

Date Start: 06-Aug-13
Date End: 09-Aug-13

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
08/09/13	1	36	6	0	1	0	0	1	0	0	0	0	0	1	46
01:00	0	41	6	0	0	0	0	0	0	0	0	0	0	0	47
02:00	1	16	10	0	0	0	0	0	0	0	0	0	0	1	28
03:00	0	18	2	0	0	0	0	0	0	0	0	0	0	0	20
04:00	0	16	1	0	0	0	0	0	0	0	0	0	0	0	17
05:00	0	16	11	0	0	0	0	0	0	0	0	0	0	0	27
06:00	0	41	20	0	0	0	0	0	0	1	0	0	0	0	62
07:00	1	90	42	0	3	2	0	3	0	1	0	0	0	9	151
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	3	274	98	0	4	2	0	4	0	2	0	0	0	11	398
Percent	0.8%	68.8%	24.6%	0.0%	1.0%	0.5%	0.0%	1.0%	0.0%	0.5%	0.0%	0.0%	0.0%	2.8%	
AM Peak	00:00	07:00	07:00		07:00	07:00		07:00		06:00				07:00	07:00
Vol.	1	90	42		3	2		3		1				9	151
PM Peak Vol.															
Grand Total	69	8682	2375	38	363	78	0	69	16	16	0	0	1	387	12094
Percent	0.6%	71.8%	19.6%	0.3%	3.0%	0.6%	0.0%	0.6%	0.1%	0.1%	0.0%	0.0%	0.0%	3.2%	

APPENDIX B

ENVIRONMENTAL NOISE CRITERIA

ONTARIO MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE (MOECC)

Reference: "Environmental Noise Guidelines Stationary and Transportation Sources – Approval and Planning", Publication NPC-300, August, 2013, released October 21, 2013 (updated final version # 22).

SOUND LEVEL CRITERIA FOR ROAD AND RAIL NOISE

TABLE C-1

Sound Level Limit for Outdoor Living Areas

Road and Rail

Time Period	L_{eq} (16) (dBA)
16 hr, 07:00 - 23:00	55

TABLE C-2

Indoor Sound Level Limits
Road and Rail

Type of Space	Time Period	L_{eq} (dBA)	
		Road	Rail
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	07:00 – 23:00	45	40
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	23:00 – 07:00	45	40
Sleeping quarters	07:00 – 23:00	45	40
	23:00 – 07:00	40	35

SOUND LEVEL CRITERIA FOR AIRCRAFT NOISE

TABLE C-3

Outdoor Aircraft Noise Limit

Time Period	NEF/NEP
24-hour	30

TABLE C-4

Indoor Aircraft Noise Limit
(Applicable over 24-hour period)

Type of Space	Indoor NEF/NEP*
Living/dining/den areas of residences, hospitals, nursing/retirement homes, schools, daycare centres, etc.	5
Sleeping Quarters	0

* The indoor NEF/NEP values in Table C-4 are used to determine acoustical insulation requirements based on the NEF/NEP contour maps.

SOUND LEVEL CRITERIA FOR STATIONARY SOURCES

TABLE C-5

Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{eq}, dBA)
Outdoor Points of Reception

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	55
19:00 – 23:00	50	45	40	55

TABLE C-6

Exclusion Limit Values of One-Hour Equivalent Sound Level (L_{eq}, dBA)
Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 19:00	50	50	45	60
19:00 – 23:00	50	50	40	60
23:00 – 07:00	45	45	40	55

TABLE C-7

Exclusion Limit Values for Impulsive Sound Level (L_{LM}, dBAI)
Outdoor Points of Reception

Time of Day	Actual Number of Impulses in Period of One-Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 23:00	9 or more	50	50	45	55
	7 to 8	55	55	50	60
	5 to 6	60	60	55	65
	4	65	65	60	70
	3	70	70	65	75
	2	75	75	70	80
	1	80	80	75	85

TABLE C-8

Exclusion Limit Values of Impulsive Sound Level (L_{LM}, dBAI)
Plane of Window - Noise Sensitive Spaces (Day/Night)

Actual Number of Impulses in Period of One-Hour	Class 1 Area (07:00-23:00) / (23:00-07:00)	Class 2 Area (07:00-23:00) / (23:00-07:00)	Class 3 Area (07:00-19:00) / (19:00-07:00)	Class 4 Area (07:00-23:00) / (23:00-07:00)
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

SUPPLEMENTARY SOUND LEVEL LIMITS

Indoor limits for transportation sources applicable to noise sensitive land uses are specified in Table C-2 and Table C-4. Table C-9 and Table C-10 are expanded versions of Table C-2 and Table C-4, and present guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The specified values are maximum sound levels and apply to the indicated indoor spaces with the windows and doors closed. The sound level limits in Table C-9 and Table C-10 are presented as information, for good-practice design objectives.

TABLE C-9

Supplementary Indoor Sound Level Limits
Road and Rail

Type of Space	Time Period	L_{eq} (Time Period) (dBA)	
		Road	Rail
General offices, reception areas, retail stores, etc.	16 hours between 07:00 – 23:00	50	45
Living/dining areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	16 hours between 07:00 – 23:00	45	40
Sleeping quarters of hotels/motels	8 hours between 23:00 – 07:00	45	40
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	8 hours between 23:00 – 07:00	40	35

TABLE C-10

Supplementary Indoor Aircraft Noise Limit
(Applicable over 24-hour period)

Type of Space	Indoor NEF/NEP*
General offices, reception areas, retail stores, etc.	15
Individual or semi-private offices, conference rooms, etc.	10
Living/dining areas of residences, sleeping quarters of hotels/motels, theatres, libraries, schools, daycare centres, places of worship, etc.	5
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	0

* The indoor NEF/NEP values in Table C-10 are not obtained from NEF/NEP contour maps. The values are representative of the indoor sound levels and are used as assessment criteria for the evaluation of acoustical insulation requirements.

APPENDIX C

SAMPLE CALCULATION OF PREDICTED SOUND LEVELS

APPENDIX C-1
SAMPLE CALCULATION OF PREDICTED SOUND LEVELS

FILE: 15-121
NAME: McKay Road West and Veterans Drive
REFERENCE DRAWINGS: Preliminary Site Plan
LOCATION: Lot 958, 2.5 m above grade, side wall

Noise Source:	McKay Road West	Veterans Drive
Time Period:	16 hr. (day)	16 hr. (day)
Segment Angle:	0 to 90	-90 to 90
Distance (m):	323	31

CALCULATION OF SOUND LEVELS*

Reference Leq (dBA)*:	70.86	72.01
Distance Correction (dBA):	-21.85	-5.11
Finite Element Correction (dBA):	-4.43	-1.42
Allowance for Screening (dBA):	0.00	0.00
Allowance for Future Growth (dBA):	incl.	incl.
LeqDay (dBA):	44.57	65.47
Combined LeqDay (dBA)	65.51	

* Leq determined using the computerized model of the Ministry of the Environment and Climate Change Noise Assessment Guidelines, STAMSON Version 5.04 (ORNAMENT). See attached printouts.

APPENDIX C-2
SAMPLE CALCULATION OF PREDICTED SOUND LEVELS

FILE: 15-121
NAME: McKay Road West and Veterans Drive
REFERENCE DRAWINGS: Preliminary Site Plan
LOCATION: Lot 958, 4.5 m above grade, side wall

Noise Source:	McKay Road West	Veterans Drive
Time Period:	8 hr. (night)	8 hr. (night)
Segment Angle:	0 to 90	-90 to 90
Distance (m):	323	31

CALCULATION OF SOUND LEVELS*

Reference Leq (dBA)*:	67.85	65.48
Distance Correction (dBA):	-21.05	-4.92
Finite Element Correction (dBA):	-4.33	-1.32
Allowance for Screening (dBA):	0.00	0.00
Allowance for Future Growth (dBA):	incl.	incl.
LeqNight (dBA):	42.46	59.24
Combined LeqNight (dBA)	59.33	

* Leq determined using the computerized model of the Ministry of the Environment and Climate Change Noise Assessment Guidelines, STAMSON Version 5.04 (ORNAMENT). See attached printouts.

```
STAMSON 5.0        NORMAL REPORT        Date: 28-09-2016 18:31:24
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 958br.te             Time Period: Day/Night 16/8 hours
Description: Lot 958 Building Requirement


Road data, segment # 1: MCKAY (day/night)
-----------------------------------------
Car traffic volume  : 16512/4128  veh/TimePeriod  *
Medium truck volume :   344/86    veh/TimePeriod  *
Heavy truck volume  :   344/86    veh/TimePeriod  *
Posted speed limit  :    80 km/h
Road gradient       :     2 %
Road pavement       :     1 (Typical asphalt or concrete)

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

    24 hr Traffic Volume (AADT or SADT):  21500
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  80.00

Data for Segment # 1: MCKAY (day/night)
---------------------------------------
Angle1   Angle2           :   0.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  : 323.00 / 323.00 m
Receiver height           :   2.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00


Road data, segment # 2: VETERANS (day/night)
--------------------------------------------
Car traffic volume  : 21514/2390  veh/TimePeriod  *
Medium truck volume :   448/50    veh/TimePeriod  *
Heavy truck volume  :   448/50    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):  24900
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 2: VETERANS (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  :  30.75 / 30.75  m
Receiver height           :   2.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00
```

```
Results segment # 1: MCKAY (day)
---------------------------------

Source height = 1.19 m

ROAD (0.00 + 44.57 + 0.00) = 44.57 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.64  70.86   0.00 -21.85  -4.43   0.00   0.00   0.00  44.57
-------------------------------------------------------------------------------

Segment Leq : 44.57 dBA


Results segment # 2: VETERANS (day)
-----------------------------------

Source height = 1.19 m

ROAD (0.00 + 65.47 + 0.00) = 65.47 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.64  72.01   0.00  -5.11  -1.42   0.00   0.00   0.00  65.47
-------------------------------------------------------------------------------

Segment Leq : 65.47 dBA

Total Leq All Segments: 65.51 dBA


Results segment # 1: MCKAY (night)
----------------------------------

Source height = 1.19 m

ROAD (0.00 + 42.46 + 0.00) = 42.46 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.58  67.85   0.00 -21.05  -4.33   0.00   0.00   0.00  42.46
-------------------------------------------------------------------------------

Segment Leq : 42.46 dBA


Results segment # 2: VETERANS (night)
-------------------------------------

Source height = 1.19 m

ROAD (0.00 + 59.24 + 0.00) = 59.24 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.58  65.48   0.00  -4.92  -1.32   0.00   0.00   0.00  59.24
-------------------------------------------------------------------------------

Segment Leq : 59.24 dBA

Total Leq All Segments: 59.33 dBA


TOTAL Leq FROM ALL SOURCES (DAY): 65.51
                           (NIGHT): 59.33
```

APPENDIX C-3
SAMPLE CALCULATION OF PREDICTED SOUND LEVEL

FILE: 15-121
NAME: McKay Road West and Veterans Drive
REFERENCE DRAWINGS: Preliminary Site Plan
LOCATION: Lot 958, 1.5 m above grade, rear yard

Noise Source:	Veterans Drive
Time Period:	16 hr. (day)
Segment Angle:	-25 to 90
Distance (m):	38.5

CALCULATION OF SOUND LEVELS*

Reference Leq (dBA)*:	72.01
Distance Correction (dBA):	-6.80
Finite Element Correction (dBA):	-3.07
Allowance for Screening (dBA):	0.00
Allowance for Future Growth (dBA):	incl.
LeqDay (dBA):	62.14

* Leq determined using the computerized model of the Ministry of the Environment and Climate Change Noise Assessment Guidelines, STAMSON Version 5.04 (ORNAMENT). See attached printouts.

```
STAMSON 5.0        NORMAL REPORT        Date: 28-09-2016 18:32:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 958ry.te             Time Period: Day/Night 16/8 hours
Description: Lot 958 Rear Yard (Unmitigated)


Road data, segment # 1: VETERANS (day/night)
-------------------------------------------
Car traffic volume  : 21514/2390  veh/TimePeriod  *
Medium truck volume :   448/50    veh/TimePeriod  *
Heavy truck volume  :   448/50    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):  24900
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: VETERANS (day)
-----------------------------------
Angle1   Angle2           : -25.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  38.50 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -25.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :  13.25 m
Source elevation          : 310.00 m
Receiver elevation        : 310.00 m
Barrier elevation         : 310.00 m
Reference angle           :   0.00


Results segment # 1: VETERANS (day)
-----------------------------------

Source height = 1.19 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.19 !        1.50 !        1.39 !       311.39

ROAD (0.00 + 62.14 + 0.00) = 62.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -25     90   0.66  72.01   0.00  -6.80  -3.07   0.00   0.00  -0.64  61.50*
   -25     90   0.66  72.01   0.00  -6.80  -3.07   0.00   0.00   0.00  62.14
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 62.14 dBA

Total Leq All Segments: 62.14 dBA
```

APPENDIX D

SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION

APPENDIX D-1
SAMPLE CALCULATION OF ARCHITECTURAL COMPONENT SELECTION*

FILE: 15-121
NAME: McKay Road West and Veterans Drive
REFERENCE DRAWINGS: Preliminary Site Plan
LOCATION: Block 1097 (east unit), first storey corner living/dining room (daytime)

ROAD

Wall area as a percentage of floor area:	Front:	55%
	Side:	55%
Window area as a percentage of floor area:	Front:	25%
	Side:	25%

Number of components:	4	
Outdoor Leq:	Side:	67 (+3 for reflections) = 70 dBA
	Front:	64 (+3 for reflections) = 67 dBA
Indoor Leq:	45	
Noise Reduction (dBA):	Side:	25
	Front:	22
Noise Spectrum:	Mixed Road Traffic	Angle Correction: 0
Absorption:	Medium	

APPROPRIATE ELEMENTS

		Configuration	STC Rating
Wall	Side	Standard	STC 36
	Front	Standard	STC 33
Window	Side	Standard	STC 28
	Front	Standard	STC 25

* Based upon "Controlling Sound Transmission into Buildings", Building Practice Note 56 by National Research Council of Canada, September, 1985.

APPENDIX E

SAMPLE CALCULATION OF SOUND BARRIER ANALYSIS

```
STAMSON 5.0        NORMAL REPORT        Date: 28-09-2016 18:32:21
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: 958ry.te             Time Period: Day/Night 16/8 hours
Description: Lot 958 Rear Yard (Unmitigated)


Road data, segment # 1: VETERANS (day/night)
----------------------------------------------
Car traffic volume  : 21514/2390  veh/TimePeriod  *
Medium truck volume :   448/50    veh/TimePeriod  *
Heavy truck volume  :   448/50    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):  24900
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   0.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   2.00
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: VETERANS (day)
-------------------------------------
Angle1   Angle2           : -25.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  38.50 m
Receiver height           :   1.50 m
Topography                :      2       (Flat/gentle slope; with barrier)
Barrier angle1            : -25.00 deg   Angle2 : 90.00 deg
Barrier height            :   0.00 m
Barrier receiver distance :  13.25 m
Source elevation          : 310.00 m
Receiver elevation        : 310.00 m
Barrier elevation         : 310.00 m
Reference angle           :   0.00


Results segment # 1: VETERANS (day)
-----------------------------------

Source height = 1.19 m

Barrier height for grazing incidence
------------------------------------
Source      ! Receiver    ! Barrier     ! Elevation of
Height  (m) ! Height  (m) ! Height  (m) ! Barrier Top  (m)
------------+-------------+-------------+--------------
       1.19 !        1.50 !        1.39 !       311.39

ROAD (0.00 + 62.14 + 0.00) = 62.14 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -25     90   0.66  72.01   0.00  -6.80  -3.07   0.00   0.00  -0.64  61.50*
   -25     90   0.66  72.01   0.00  -6.80  -3.07   0.00   0.00   0.00  62.14
-------------------------------------------------------------------------------

 * Bright Zone !

Segment Leq : 62.14 dBA

Total Leq All Segments: 62.14 dBA
```

Barrier table for segment # 1: VETERANS (day)

Barrier Height	Elev of Barr Top	Road dBA	Tot Leq dBA
1.50	311.50	57.55	57.55
1.60	311.60	57.52	57.52
1.70	311.70	57.44	57.44
1.80	311.80	57.33	57.33
1.90	311.90	57.18	57.18
2.00	312.00	57.01	57.01
2.10	312.10	56.81	56.81
2.20	312.20	56.59	56.59
2.30	312.30	56.35	56.35
2.40	312.40	56.11	56.11
2.50	312.50	55.85	55.85
2.60	312.60	55.59	55.59
2.70	312.70	55.33	55.33
2.80	312.80	55.07	55.07
2.90	312.90	54.81	54.81
3.00	313.00	54.55	54.55
3.10	313.10	54.30	54.30
3.20	313.20	54.05	54.05
3.30	313.30	53.81	53.81
3.40	313.40	53.57	53.57