Environmental Noise Feasibility Study

28-60 Bronte Street North

Proposed Mixed-use Development

Town of Milton

November 8, 2018
Project: 118-0109

Prepared for

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VALCOUSTICS

Canada Ltd.

Version History

Version #	Date	Comments
1.0	November 8, 2018	Issued to Client

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Environmental Noise Feasibility Study

28-60 Bronte Street North

Proposed Mixed-use Development

Town of Milton

EXECUTIVE SUMMARY

Valcoustics Canada Ltd. (VCL) was retained to prepare an Environmental Noise Feasibility Study for the proposed mixed-use development as part of the Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) submissions to the Town of Milton and the Regional Municipality of Halton.

The development consists of two buildings (Buildings A and B). Building A will have 6-storey podium with a 13-storey residential tower above. Building B will have a 6-storey podium with a 15-storey residential tower above. There will be a 1-storey retail area on the east side of Building A and a 1-storey indoor amenity area on the east side of Building B. Outdoor amenity space will be located atop the podiums of both buildings. The development will be provided with two levels of underground parking beneath the entire site as well as grade-level parking spaces at the west side of the site.

The significant transportation noise source in the vicinity is road traffic on Main Street North and Bronte Street, as well as rail traffic on the Canadian National Railway (CN) Halton Subdivision. There are no stationary noise sources in the vicinity that are expected to have a significant impact at the subject site.

The sound levels on site have been determined and compared with the applicable Ministry of the Environment, Conservation and Parks (MECP) noise guideline limits to determine the need for noise mitigation.

To meet the applicable transportation noise source guideline limits:

- All residential suites in Buildings A and B require mandatory air conditioning;
- Both buildings require brick veneer or masonry equivalent exterior wall construction meeting Sound Transmission Class (STC) 54 and exterior windows with STC ratings as high as STC 43;
- Minimum 1.1 m high parapet sound barriers are required at the outdoor amenity areas at the podiums of Buildings A and B; and

- The final requirements should be checked once building plans are available.

1.0 INTRODUCTION

VCL was retained to prepare an Environmental Noise Feasibility Study for the proposed development in support of the OPA and ZBA application submissions to the Town of Milton and the Regional Municipality of Halton. The potential sound levels and noise mitigation measures needed for the proposed development to comply with the MECP, Regional Municipality of Halton and Town of Milton noise guideline requirements are outlined herein.

1.1 SITE AND SURROUNDINGS

The site is located to the northwest of the intersection of Bronte Street North and Main Street West in the Town of Milton. The site is bounded by;

- Vacant land (the future Phase 2 of the development), with existing commercial/industrial development beyond, to the north;
- Bronte Street North, with a mix of existing commercial and residential uses beyond, to the east;
- Main Street West, with a mix of existing commercial and residential uses beyond, to the south; and
- The CN Halton Subdivision rail line, with existing residential dwellings beyond, to the west.

Figure 1 shows a Key Plan. The analysis is based on the Site Plan, prepared by KNYMH Inc., received October 2, 2018. The Site Plan is shown as Figure 2.

2.0 NOISE SOURCES

2.1 TRANSPORTATION NOISE SOURCES

The transportation noise sources with the potential to impact the site are road traffic on Bronte Street North and Main Street West as well as rail traffic on the CN Halton Subdivision.

Traffic volumes on the other roadways in the vicinity of the site are anticipated to be minor and are not expected to have a significant noise impact at the subject site. Thus, these roadways have not been considered further in the assessment.

The Canadian Pacific Railway (CPR) Galt Subdivision is located approximately 480 m to the northeast of the subject site. Due to the distance separation, rail traffic on the CPR Galt Subdivision is not expected to have a significant noise impact at the subject site. Thus, this rail line has not been considered further in this assessment.

The road and rail traffic data are included as Appendix A.

2.1.1 Road Traffic

Road traffic volumes for Bronte Street and Main Street (year 2017) were obtained from the Town of Milton in the form of a turning movement count (TMC). Afternoon peak hour counts were

converted to 24-hour volumes using a factor of 10. Future (year 2028) counts were obtained by projecting the current volumes at a rate of 2%, compounded annually. The truck percentages were calculated from the TMC. “Trucks” were assumed to be medium trucks and “heavys” were assumed to be heavy trucks. The day/night split for both roadways was assumed to be 90%/10%, as is typical for such roadways.

The speed limit on Main Street West is 60 km/h to the west of Whitmer Street (to the southwest of the site) and 50 km/h to the east of Whitmer Street. To be conservative, a speed of 60 km/h was applied to the entire stretch of Main Street (i.e. on both sides of Whitmer Street) in this assessment.

The road traffic data is summarized in Table 1A.

2.1.2 Rail Traffic

Current (year 2018) traffic volumes for the CN Halton Subdivision were obtained directly from CN. Rail traffic in the vicinity of the site consists of freight trains. The CN rail traffic data was escalated to the year 2028 at a rate of 2.5% annually. This escalation rate is suggested by the railway authorities when preparing environmental noise studies.

The rail traffic data is summarized in Table 1B.

2.2 STATIONARY NOISE SOURCES

There is an existing truck parking area approximately 100 m to the north of the site. The trucks do not appear to be associated with the neighbouring commercial uses. A preliminary assessment was done based on the assumption that the drivers arrive on the site in their personal vehicles, briefly idle their truck engines, depart the site in the morning, and then arrive back in the evening. Preliminary modelling indicated that the sound levels associated with these activities are expected to be below the noise guideline limits at the subject site. Thus, the truck parking area was not considered further in this assessment.

The Aspire Climbing indoor climbing gym is located approximately 240 m to the north of the subject site, at 104 Bronte Street North. The main noise source associated with the climbing gym would be the rooftop HVAC equipment. Based on aerial imagery, there only appears to be one small unit toward the north side of the building. No other noise sources were observed during a site visit by VCL staff. Due to distance separation and the small size of the HVAC unit, noise from the climbing gym is not expected to have a significant impact at the subject site and thus has not been considered further in this assessment.

An existing commercial/office building is located to the northeast of the site, at 97 Bronte Street North. The main noise sources associated with the commercial building at the rooftop HVAC units. Due to distance separation and ambient road traffic noise from Bronte Street, the HVAC units are not expected to have a significant noise impact at the subject site. The building also has a loading dock at the northeast side of the building that is currently fenced off and not in use. Thus, significant noise impact from this facility is not anticipated.

There is in existing transformer station to the north of the site. The transformer station no longer appears to be in use, and therefore will not have a noise impact at the subject site.

There is an existing gas bar at the northeast corner of the intersection of Bronte Street and Main Street with an oil change facility, a convenience store and a car wash. The main noise sources associated with this development would be the car wash dryer fans. The car wash building is located at the east side of the commercial site, with entrance and exit doors that face north and south, respectively (i.e. not the direction of the subject site). Due to the distance separation, the orientation of the building relative to the subject site and the ambient road traffic noise from Bronte Street and Main Street, noise from the car wash is not expected to have a significant impact at the subject site. Thus, the gas bar site has not been considered further in this assessment.

There are a number of the existing low-rise commercial developments to the south of the site, on the south side of Main Street West. The main noise sources associated with these uses is expected to the HVAC equipment. Due to distance separation and the presence of the intervening roadway, the commercial uses are not expected to have a significant noise impact at the subject site. This was confirmed during a site visit by VCL staff, when the uses were reviewed, and no noise was audible over the ambient road traffic.

3.0 ENVIRONMENTAL NOISE GUIDELINES

3.1 MECP PUBLICATION NPC-300

The applicable noise guidelines for new residential development are those in MECP Publication NPC-300, “Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning”.

The environmental noise guidelines of the MECP, as provided in Publication NPC-300, are discussed briefly below and summarized in Appendix C.

3.1.1 Architectural Elements

In the daytime, the indoor criterion for road noise is $L_{eq\ Day}$ of 45 dBA for sensitive spaces such as living/dining rooms, dens and bedrooms. At night, the indoor criterion for road noise is $L_{eq\ Night}$ of 45 dBA for sensitive spaces such as living/dining rooms and dens and 40 dBA for bedrooms. The indoor criteria for rail noise are 5 dBA more stringent than those for the road; that is 40 dBA for living/dining rooms, dens and bedrooms during the daytime and nighttime periods except for bedrooms where the nighttime indoor criterion is 35 dBA.

The architectural design of the building envelope (walls, windows, etc.) must provide adequate sound isolation to achieve these indoor sound level limits, based on the applicable outdoor sound level on the facades.

In addition, the MECP requires brick veneer exterior wall construction or masonry equivalent from the foundation to the rafters for the first row of dwellings within 100 m of the rail line, when the $L_{eq\ 24}$ is greater than 60 dBA.

3.1.2 Ventilation

In accordance with the MECP noise guidelines for road traffic sources, if the daytime sound energy level, $L_{eq\ Day,}$ at the exterior face of a noise sensitive 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 daytime sound levels between 56 dBA and 65 dBA inclusive, there need only be the provision for adding air conditioning at a later date. A warning clause advising the occupant of the potential interference with some activities is also required. At nighttime, air conditioning would be required when the sound level exceeds 60 dBA ($L_{eq\ Night}$) at a noise sensitive window (provision for adding air conditioning is required when greater than 50 dBA).

3.1.3 Outdoors

For outdoor amenity areas ("Outdoor Living Area's" - OLA's), the guideline is 55 dBA $L_{eq\ Day}$, with an excess not exceeding 5 dBA considered acceptable if it is technically not practicable to achieve the 55 dBA objective, providing warning clauses are registered on title. Note that for road traffic sources, a balcony is not considered an OLA, unless it is the only OLA for the occupant and it is:

- at least 4 m in depth; and
- unenclosed.

3.2 FEDERATION OF CANADIAN MUNICIPALITIES AND RAILWAY ASSOCIATION OF CANADA

The applicable guidelines for developments adjacent to rail lines are those of the FCM and RAC indicated in Reference 4. CN has adopted the use of these guidelines.

The standard mitigation requirements of the FCM/RAC suggest a dwelling setback of 30 m for a residential development adjacent to a principal main line, if in combination with a safety berm at least 2.5 m above the property line grade. A 5.5 m high sound barrier is also suggested (e.g., 3.0 m high acoustic fence atop a 2.5 m high safety berm).

Warning clauses specific to the railway for all dwellings within 300 m of the right-of-way are recommended.

Aside from "standard" requirements regarding the setback of dwellings and safety berm/sound barrier configuration, the sound level design objectives of FCM/RAC are similar to those of the MECP.

4.0 NOISE IMPACT ASSESSMENT

Using the road traffic data in Tables 1A and 1B, the sound levels, in terms of equivalent continuous sound pressure level over the daytime and nighttime periods ($L_{eq\ Day}$ and $L_{eq\ Night}$), were determined using STAMSON V5.04 – ORNAMENT/STEAM, the computerized road and rail traffic noise prediction model of the MECP.

The daytime and nighttime sound levels at the building facades were calculated at a height of 59.5 m and 66 m above grade for Buildings A and B, respectively, representing the top floor bedroom and living room windows. The daytime OLA sound levels at the common outdoor amenity terrace atop the podiums were calculated at a height of 1.5 m above the floor slab, at the centre of the terrace.

Note, the rail line is elevated in the vicinity of the site. The site grading has not yet been developed. For the OLA calculations, the rail line was assumed to be 4 m above the site grade.

Inherent acoustical screening of each building due to its orientation to the noise source was taken into account.

At the building facade, the highest unmitigated daytime/nighttime sound levels of 71 dBA/70 dBA are predicted to occur on the exterior plane of windows of on the west facade of Building B, in the direction of the rail line.

The highest unmitigated daytime OLA sound level of 63 dBA is predicted to occur at the amenity terrace at the north side of Building B.

Table 2 summarizes the unmitigated daytime and nighttime sound level predictions.

5.0 NOISE ABATEMENT REQUIREMENTS

The noise control measures can generally be classified into two categories which are interrelated, but which the designer can treat separately for the most part:

a) Architectural elements to achieve acceptable indoor noise guidelines;

b) Design features to protect the OLA's.

Noise control requirements to meet the applicable noise criteria are summarized in Table 3 and the notes to Table 3.

5.1 ARCHITECTURAL ELEMENTS

The indoor noise guidelines can be achieved by using appropriate construction for exterior walls, windows and doors. In determining the worst-case architectural requirements, the wall and windows areas were each assumed to 50% percent of associated floor area, on each facade of a corner room.

As the development is located adjacent to the rail line, based on the MECP guideline, the exterior wall construction must be brick veneer or masonry equivalent (minimum STC rating of 54).

Based on the wall construction above, the exterior window requirement for Buildings A and B would be:

- Up to STC 45 at northwest and southwest corner suites;
- Up to STC 42 at suites on the west facade;
- Up to STC 39 at suites on the north and south facades; and
- Windows meeting the minimum non-acoustical requirements of the Ontario Building Code (OBC) on all other suites on the east facade.

Note that the STC requirements above are based on worst-case assumptions for the room dimensions and orientation relative to the noise sources, as detailed plans are currently not available. Design measures can be used to reduce the STC requirements and should be considered during the detailed design stages of the project. Consideration should be given to:

- Reducing the size of the windows or ensuring that the exterior window area is small relative to floor area of the associated space.
- Designing the spaces so that the rooms at the corners of the buildings have windows on only one facade.
- Designing the spaces so that there are living rooms instead of bedrooms at the corners of the building.
- Having non-noise sensitive space, such as walk in closets or washrooms at the corners of the building.
- Improving the exterior wall construction (to reduce window STC requirements).

The final sound isolation requirements should be reviewed when architectural plans are developed. Wall and window construction should also be reviewed at this point to ensure that they will meet the required sound isolation performance. This is typically required by the City at the time of building permit application.

Note, the window frames themselves must also be designed to ensure that the overall sound isolation performance for the entire window unit meets the sound isolation requirement. This should be confirmed by the window manufacturer through the submission of acoustical test data.

5.2 VENTILATION REQUIREMENTS

Based on the predicted daytime and nighttime sound levels, all residential suites within the development require mandatory air conditioning to allow windows to remain closed for noise control purposes.

5.3 OUTDOORS

The unmitigated daytime OLA sound levels at the outdoor amenity terraces are predicted to exceed 60 dBA. Thus, sound barriers are required. To mitigate the daytime OLA sound levels to the 55 dBA design objective, the following parapet sound barriers around the perimeters of the terraces would be required:

- 2.2 m high at the Building A and southerly Building B amenity terrace; and
- 3.0 m high at the northerly Building B amenity terrace.

These sound barriers are significant and may not be feasible to implement. Sound barriers 1.1 m in height (a standard safety parapet height) would mitigate the daytime OLA sound levels to 60 dBA or lower. This within the 5 dB leeway permitted under the MECP guidelines when it is not feasible to meet 55 dBA.

The sound barrier heights should be confirmed once grading information is available.

It is assumed that all other terraces are balconies are less than 4 m in depth and therefore do not qualify as OLA's under the guidelines. Sound barriers would therefore not be required at these locations.

If larger balconies and terraces are included, the analysis should be updated to include these spaces.

Sound barriers must be of solid construction with no gaps, cracks or holes and must have a minimum surface density of 20 kg/m^2. A variety of materials are available, including glass, wood, masonry, composite material, or a combination of the above.

6.0 EFFECT OF THE BUILDING ON THE SURROUNDING ENVIRONMENT

The main source of noise associated with this development, with the potential for significant impact on surrounding buildings, is the mechanical equipment.

Mechanical equipment interfacing to the outdoors must comply with the MECP noise guideline limits in NPC-300. By proper engineering design, all requirements can be met and no significant noise impact would be created for surrounding uses. Appropriate choice of location, equipment type, and noise control features should be considered during detailed design for such items as rooftop equipment and air intakes and exhausts, including underground parking garage ventilation systems. Any parking garage air shafts located immediately adjacent to residential uses may need special noise control treatment such as choice of fan type, acoustically lining the shaft, providing silencers or adding carbon monoxide (CO) sensors to the fans. (With CO sensors, the fans operate much less frequently. The lesser operation reduces the possibility of noise impact.)

For any emergency generators, appropriate steps should be taken to ensure that the equipment placement, treatment, and the routine testing schedule will not generate adverse noise impact on neighbouring properties. The generator will require silencers on the intake and exhaust cooling air paths, as well as a muffler on the combustion exhaust.

7.0 CONCLUSIONS

With appropriate acoustical design of the development, a suitable acoustical environment can be provided and the applicable MECP noise guideline requirements met. Wall and window requirements should be reviewed once the architectural plans are finalized.

8.0 REFERENCES

1. PC STAMSON 5.04, “Computer Program for Road Traffic Noise Assessment”, Ontario Ministry of the Environment and Climate Change.

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

3. MECP Publication NPC-300, “Stationary and Transportation Sources - Approval and Planning” Ontario Ministry of the Environment and Climate Change, August 2013.

4. "Guidelines for New Development in Proximity to Railway Operations", Prepared for The Federation of Canadian Municipalities and the Railway Association of Canada (FCM/RAC), May 2013.

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TABLE 1A ROAD TRAFFIC DATA

Roadway	24-Hour Volumes	% Trucks[2]		Day/Night Split (%)	Speed Limit (kph)
		Medium	Heavy		
Main Street West[2]	14 520 (18 054)	1.0	0.1	90/10	60[2]
Bronte Street North[2]	10 020 (12 459)	2.0	0.1	90/10	50

Notes:

1. Based on a year 2017 turning movement count data obtained from the Town of Milton. Peak hour counts were converted to 24-hour volumes using a factor of 10. Values shown in brackets have been extrapolated to the year 2028 design condition using a 2 % growth rate, compounded annually.
2. The speed limit changes from 60 km/h to 50 km/h to the southwest of the site. To be conservative, a speed limit of 60 km/h was applied to the entire stretch of Main Street in this assessment.

TABLE 1B RAIL TRAFFIC

Track	Period	Train Type	Maximum # of Trains	Maximum # of Cars per Train	Maximum # of Locomotives per Train	Maximum Speed (kph)
CN Halton Subdivision	Daytime (0700-2300 Hours)	Freight	13 (16.6) [1]	140	4	80
	Nighttime (2300-0700 Hours)	Freight	5 (6.4)[1]	140	4	80

Notes:

- Data obtained was from CN for the year 2018. Values shown in brackets have been extrapolated to the year 2028 design condition using a 2.5 % growth rate, compounded annually.

TABLE 2 PREDICTED UNMITIGATED SOUND LEVELS OUTDOORS

Location[1]	Source	Distance (m)[2]	Leq Day (dBA)	Leq Night (dBA)
Building A Southwest Corner (West Façade)	Main Street West	42	58	51
	CN Halton Subdivision	55	70	69
	TOTAL	**-**	**71**	**69**
Building A Southwest Corner (South Facade)	Main Street West	42	61	54
	Bronte Street North	47	54	47
	CN Halton Subdivision	55	67	66
	TOTAL	**-**	**68**	**67**
Building A Southeast Corner (East Facade)	Main Street West	40	58	51
	Bronte Street North	19	61	54
	TOTAL	**-**	**63**	**56**
Building A Northwest Corner (North Facade)	Bronte Street North	47	52	46
	CN Halton Subdivision	53	67	66
	TOTAL	**-**	**68**	**66**
Building A Outdoor Amenity Terrace	Main Street West	77	46	-
	Bronte Street North	30	39	-
	CN Halton Subdivision	70	62	-
	TOTAL	**-**	**62**	**-**
Building B Southwest Corner (West Facade)	Main Street West	134	53	46
	CN Halton Subdivision	51	71	70
	TOTAL	**-**	**71**	**70**
Building B Southwest Corner (South Facade)	Main Street West	134	55	48
	Bronte Street North	48	52	45
	CN Halton Subdivision	51	68	67
	TOTAL	**-**	**68**	**67**
Building B Southeast Corner (East Facade)	Main Street West	130	53	46
	Bronte Street North	16	62	55
	TOTAL	**-**	**62**	**56**
Building B Northwest Corner (North Facade)	Bronte Street North	46	54	47
	CN Halton Subdivision	51	68	67
	TOTAL	**-**	**68**	**67**
Building B South Outdoor Amenity Terrace	Main Street West	119	49	-
	Bronte Street North	31	39	-
	CN Halton Subdivision	69	62	-
	TOTAL	**-**	**62**	**-**
Building B North Outdoor Amenity Terrace	Bronte Street North	35	42	**-**
	CN Halton Subdivision	63	63	**-**
	TOTAL	**-**	**63**	**-**

Notes:

(1) See Figure 2.

(2) Distance indicated is taken from the centreline of the noise source to the point of reception.

TABLE 3 NOISE CONTROL REQUIREMENTS

Location	Air Conditioning(1)	Exterior Wall(2)	Exterior Window(3)	Sound Barriers(4)	Warning Clauses(5)
Buildings A and B	Mandatory	Brick veneer or masonry equivalent	Up to STC 45 for corner suites Up to STC 42 for non-corner suites	Minimum 1.1 m high parapet sound barriers at outdoor amenity terraces	A + B + C

Notes:

(1) Where means must be provided to allow windows to remain closed for noise control purposes, a commonly used technique is that of air conditioning.

(2) STC – Sound Transmission Class (Reference ASTM E413). The STC ratings are based on assumed wall area to associated indoor floor area ratios. The final requirements should be confirmed when floor plans are available for the residential suites.

(3) STC – Sound Transmission Class (Reference ASTM E413). A sliding/swing glass walkout door should be considered as a window and included in the percentage of glazing. The ratings shown are based on assumed window area to indoor floor area ratios. The final requirements should be confirmed when floor plans are available. Methods to reduce the window STC requirements are discussed in Section 5.1.

(4) Sound barriers must be of solid construction having a minimum face density of 20 kg/m^2 with no gaps, cracks or holes.

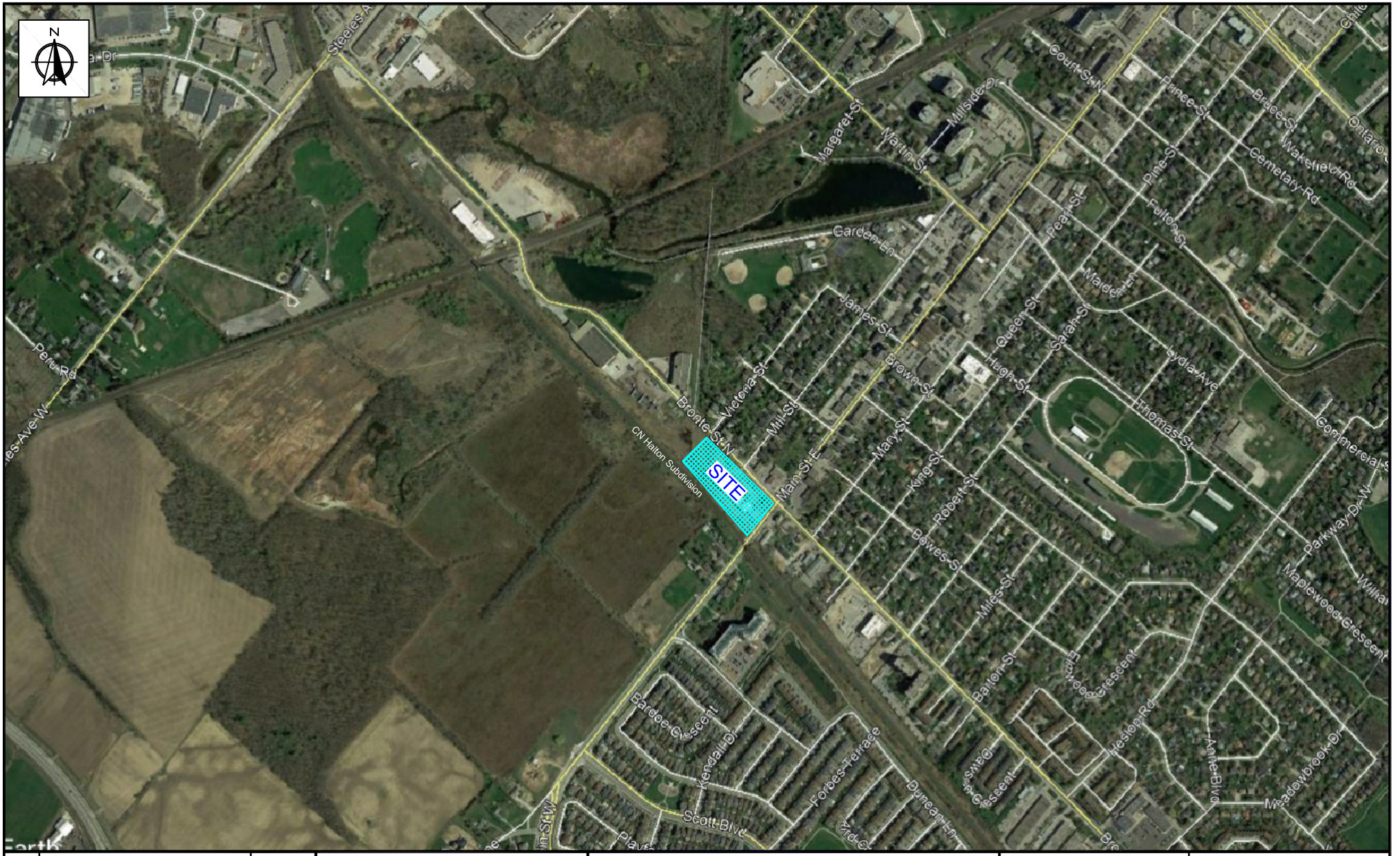
(5) Warning clauses to be included in Occupancy Agreements:

A. "Purchasers are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road and rail traffic may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

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

C. "Canadian National Railways or its affiliated railway companies has or have a railway right-of-way within 300 m from this dwelling unit. There may be alterations to or expansions of the railway facilities of such right-of-way in the future, including the possibility that Canadian National Railways or its affiliated railway companies as aforesaid, or their assigns or successors may expand their business operations. Such expansion may affect the living and business environment of the residents, tenants and their visitors, employees, customers and patients in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating features in the design of the development. Canadian National Railways, its affiliated railway companies and their successors and assigns will not be responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way."

(6) All exterior doors shall be fully weather stripped.



No.	Revision/Issue	Date

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Title
Key Plan

Project No.
118-0109

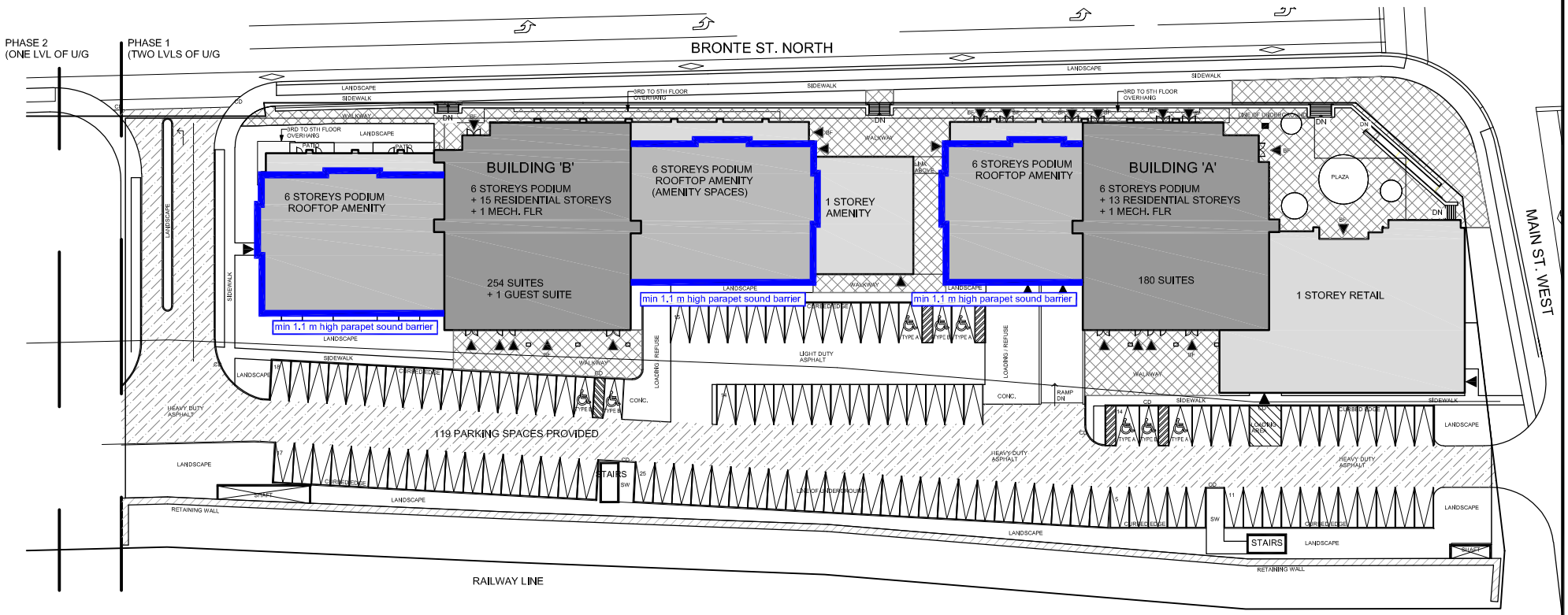
Date
Oct. 17, 2018

Project Name
28-60 Bronte Street North, Milton

Scale
N.T.S.

Figure
1

Air conditioning is mandatory for all dwellings in the development



BASE DRAWING BY KNYMH INC.

No.	Revision/Issue	Date

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Title	Project No.	Date
Site Plan	118-0109	Oct. 17, 2018
Project Name	**Scale**	**Figure**
28-60 Bronte Street North, Milton	N.T.S.	2

APPENDIX A

ROAD AND RAIL TRAFFIC DATA

Ontario Traffic Inc.

Morning Peak Diagram

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

One Hour Peak
From: 7:45:00
To: 8:45:00

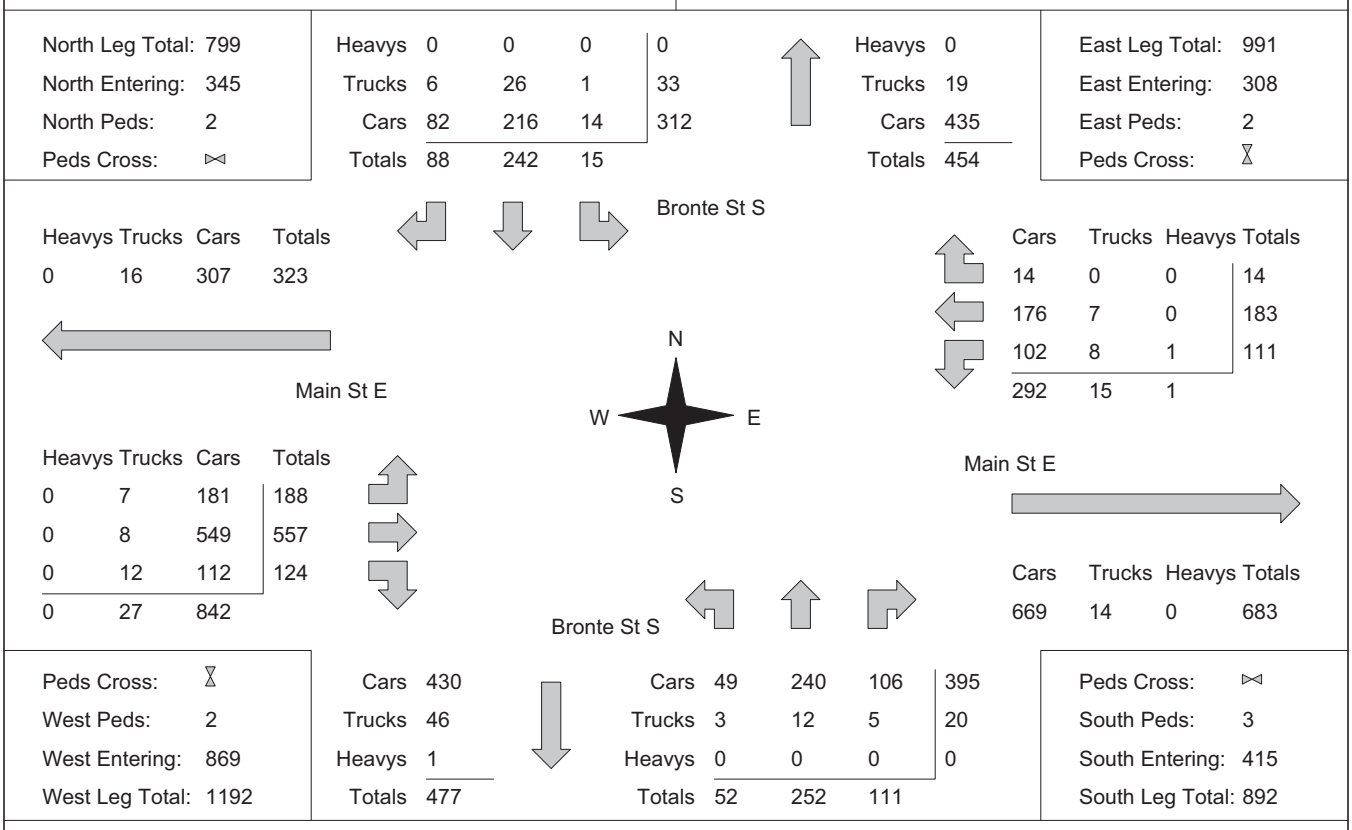
Municipality: Milton
Site #: 1718400001
Intersection: Main St E & Bronte St S
TFR File #: 7
Count date: 15-Jun-17

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 17:00:00
To: 18:00:00

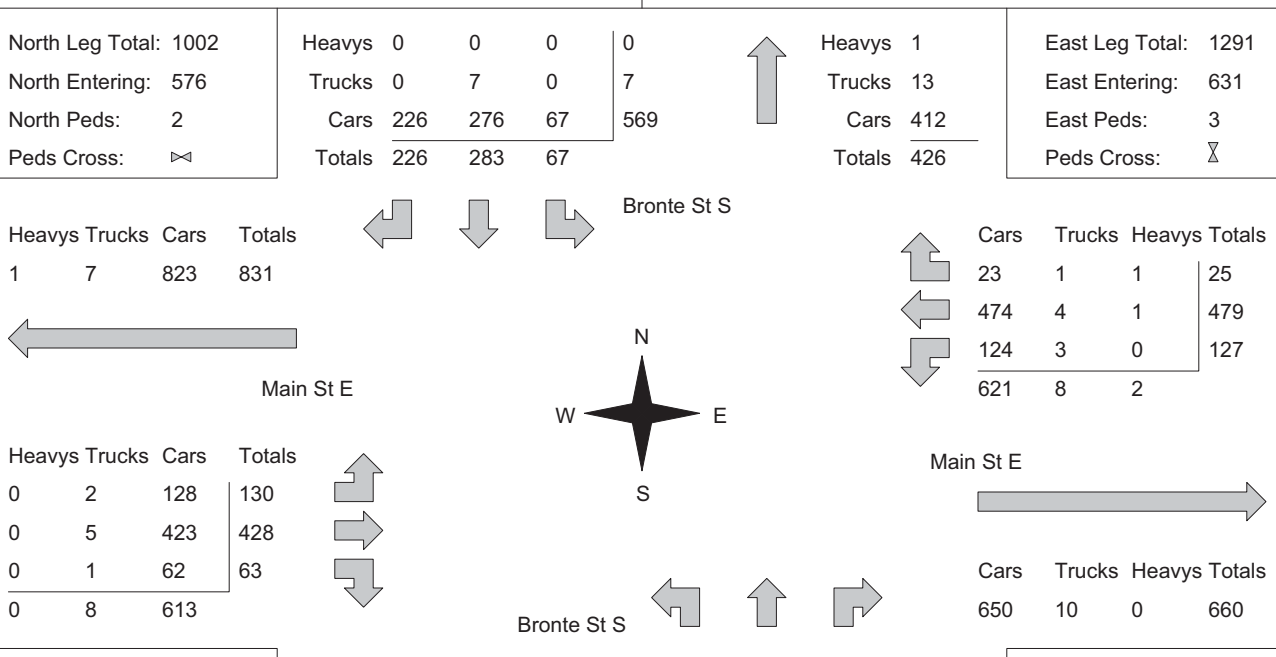
Municipality: Milton
Site #: 1718400001
Intersection: Main St E & Bronte St S
TFR File #: 7
Count date: 15-Jun-17

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Ontario Traffic Inc.

Total Count Diagram

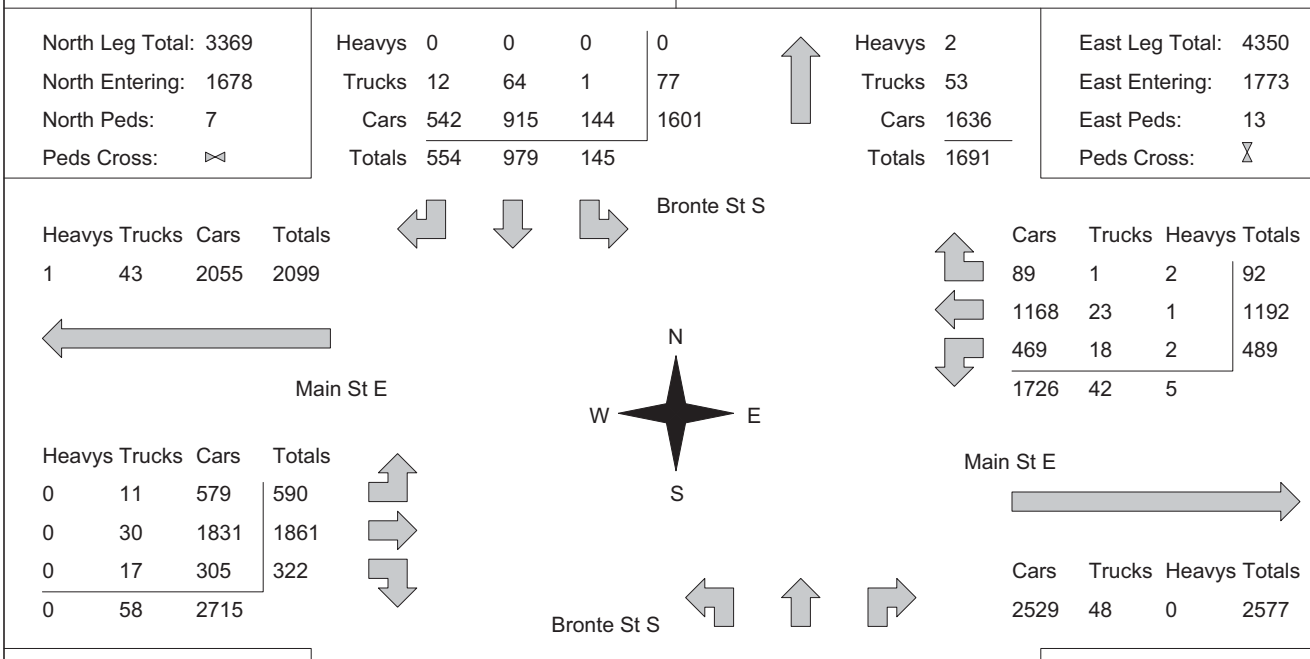
Municipality: Milton
Site #: 1718400001
Intersection: Main St E & Bronte St S
TFR File #: 7
Count date: 15-Jun-17

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Main St E runs W/E



Comments

Ontario Traffic Inc.
Traffic Count Summary

Intersection: Main St E & Bronte St S | **Count Date:** 15-Jun-17 | **Municipality:** Milton

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
7:00:00	0	3	2	5	0	6
8:00:00	9	213	76	298	1	659
9:00:00	18	242	84	344	2	766
16:00:00	4	7	4	15	0	19
17:00:00	47	231	162	440	2	1023
18:00:00	67	283	226	576	2	1134
Totals:	145	979	554	1678	7	3607

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	0	1	1	0
8:00:00	21	226	114	361	3
9:00:00	60	240	122	422	5
16:00:00	0	1	3	4	0
17:00:00	146	271	166	583	7
18:00:00	125	269	164	558	6
Totals:	352	1007	570	1929	21

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
7:00:00	0	0	0	0	0	2
8:00:00	86	109	11	206	2	986
9:00:00	127	191	18	336	2	1142
16:00:00	2	10	2	14	0	21
17:00:00	147	403	36	586	6	1143
18:00:00	127	479	25	631	3	1246
Totals:	489	1192	92	1773	13	4540

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
7:00:00	0	2	0	2	0
8:00:00	170	523	87	780	1
9:00:00	178	521	107	806	2
16:00:00	1	5	1	7	0
17:00:00	111	382	64	557	2
18:00:00	129	424	62	615	1
Totals:	589	1857	321	2767	6

Calculated Values for Traffic Crossing Major Street

Hours Ending:	0:00	0:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	0	3	259	324	11	472	479

Ontario Traffic Inc.

Count Date: 15-Jun-17 Site #: 1718400001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - 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	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0
7:15:00	3	3	31	29	11	9	0	0	6	5	0	0	0	0	0	0	0	0	0	0
7:30:00	6	3	75	44	32	21	0	0	12	6	0	0	0	0	0	0	0	0	1	1
7:45:00	6	0	122	47	60	28	0	0	19	7	0	0	0	0	0	0	0	0	1	0
8:00:00	8	2	190	68	75	15	1	1	26	7	3	3	0	0	0	0	0	0	1	0
8:15:00	14	6	237	47	98	23	1	0	33	7	4	1	0	0	0	0	0	0	2	1
8:30:00	16	2	278	41	118	20	1	0	39	6	5	1	0	0	0	0	0	0	2	0
8:45:00	20	4	338	60	142	24	1	0	45	6	6	1	0	0	0	0	0	0	3	1
9:00:00	26	6	408	70	156	14	1	0	50	5	6	0	0	0	0	0	0	0	3	0
9:00:06	26	0	409	1	156	0	1	0	50	0	6	0	0	0	0	0	0	0	3	0
16:00:00	30	4	415	6	160	4	1	0	50	0	6	0	0	0	0	0	0	0	3	0
16:15:00	38	8	465	50	191	31	1	0	53	3	8	2	0	0	0	0	0	0	4	1
16:30:00	52	14	528	63	236	45	1	0	55	2	9	1	0	0	0	0	0	0	4	0
16:45:00	60	8	582	54	279	43	1	0	55	0	11	2	0	0	0	0	0	0	5	1
17:00:00	77	17	639	57	316	37	1	0	57	2	12	1	0	0	0	0	0	0	5	0
17:15:00	92	15	702	63	356	40	1	0	59	2	12	0	0	0	0	0	0	0	5	0
17:30:00	113	21	764	62	409	53	1	0	59	0	12	0	0	0	0	0	0	0	5	0
17:45:00	129	16	838	74	477	68	1	0	61	2	12	0	0	0	0	0	0	0	5	0
18:00:00	144	15	915	77	542	65	1	0	64	3	12	0	0	0	0	0	0	0	7	2
18:00:09	144	0	915	0	542	0	1	0	64	0	12	0	0	0	0	0	0	0	7	0
18:15:00	144	0	915	0	542	0	1	0	64	0	12	0	0	0	0	0	0	0	7	0
18:15:15	144	0	915	0	542	0	1	0	64	0	12	0	0	0	0	0	0	0	7	0

Ontario Traffic Inc.

Count Date: 15-Jun-17 Site #: 1718400001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - 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	9	9	18	18	2	2	1	1	0	0	0	0	0	0	0	0	0	0	1	1
7:30:00	29	20	48	30	6	4	1	0	1	1	0	0	0	0	0	0	0	0	1	0
7:45:00	57	28	74	26	8	2	2	1	2	1	0	0	0	0	0	0	0	0	1	0
8:00:00	83	26	105	31	11	3	3	1	4	2	0	0	0	0	0	0	0	0	2	1
8:15:00	104	21	148	43	13	2	6	3	6	2	0	0	0	0	0	0	0	0	2	0
8:30:00	122	18	204	56	17	4	9	3	6	0	0	0	1	1	0	0	0	0	2	0
8:45:00	159	37	250	46	22	5	10	1	9	3	0	0	1	0	0	0	0	0	3	1
9:00:00	199	40	289	39	29	7	13	3	11	2	0	0	1	0	0	0	0	0	4	1
9:00:06	199	0	289	0	29	0	13	0	11	0	0	0	1	0	0	0	0	0	4	0
16:00:00	200	1	299	10	30	1	13	0	11	0	0	0	2	1	0	0	1	1	4	0
16:15:00	236	36	388	89	43	13	15	2	12	1	0	0	2	0	0	0	1	0	5	1
16:30:00	274	38	490	102	50	7	15	0	16	4	0	0	2	0	0	0	1	0	8	3
16:45:00	320	46	568	78	57	7	15	0	19	3	0	0	2	0	0	0	1	0	10	2
17:00:00	345	25	694	126	66	9	15	0	19	0	0	0	2	0	0	0	1	0	10	0
17:15:00	386	41	805	111	74	8	16	1	20	1	1	1	2	0	1	1	2	1	11	1
17:30:00	408	22	932	127	78	4	16	0	22	2	1	0	2	0	1	0	2	0	11	0
17:45:00	437	29	1049	117	83	5	18	2	22	0	1	0	2	0	1	0	2	0	11	0
18:00:00	469	32	1168	119	89	6	18	0	23	1	1	0	2	0	1	0	2	0	13	2
18:00:09	469	0	1168	0	89	0	18	0	23	0	1	0	2	0	1	0	2	0	13	0
18:15:00	469	0	1168	0	89	0	18	0	23	0	1	0	2	0	1	0	2	0	13	0
18:15:15	469	0	1168	0	89	0	18	0	23	0	1	0	2	0	1	0	2	0	13	0

Ontario Traffic Inc.

Count Date: 15-Jun-17 Site #: 1718400001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - 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	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	54	54	29	28	0	0	3	3	1	1	0	0	0	0	0	0	0	0
7:30:00	8	8	110	56	60	31	0	0	4	1	2	1	0	0	0	0	0	0	0	0
7:45:00	13	5	158	48	87	27	0	0	5	1	3	1	0	0	0	0	0	0	2	2
8:00:00	21	8	220	62	110	23	0	0	6	1	5	2	0	0	0	0	0	0	3	1
8:15:00	40	19	278	58	135	25	1	1	10	4	6	1	0	0	0	0	0	0	4	1
8:30:00	48	8	349	71	160	25	2	1	15	5	7	1	0	0	0	0	0	0	4	0
8:45:00	62	14	398	49	193	33	3	1	17	2	8	1	0	0	0	0	0	0	5	1
9:00:00	78	16	445	47	228	35	3	0	21	4	9	1	0	0	0	0	0	0	8	3
9:00:06	78	0	445	0	228	0	3	0	21	0	9	0	0	0	0	0	0	0	8	0
16:00:00	78	0	446	1	231	3	3	0	21	0	9	0	0	0	0	0	0	0	8	0
16:15:00	114	36	510	64	277	46	4	1	24	3	9	0	0	0	0	0	0	0	13	5
16:30:00	151	37	569	59	316	39	5	1	25	1	11	2	0	0	0	0	0	0	13	0
16:45:00	191	40	635	66	364	48	5	0	27	2	12	1	0	0	0	0	0	0	13	0
17:00:00	222	31	707	72	394	30	5	0	31	4	12	0	0	0	0	0	0	0	15	2
17:15:00	245	23	765	58	437	43	5	0	33	2	12	0	0	0	0	0	0	0	18	3
17:30:00	280	35	840	75	474	37	6	1	37	4	15	3	0	0	0	0	0	0	18	0
17:45:00	315	35	901	61	512	38	6	0	39	2	16	1	0	0	0	0	0	0	18	0
18:00:00	344	29	966	65	553	41	8	2	41	2	17	1	0	0	0	0	0	0	21	3
18:00:09	345	1	968	2	554	1	8	0	41	0	17	0	0	0	0	0	0	0	21	0
18:15:00	345	0	968	0	554	0	8	0	41	0	17	0	0	0	0	0	0	0	21	0
18:15:15	345	0	968	0	554	0	8	0	41	0	17	0	0	0	0	0	0	0	21	0

Ontario Traffic Inc.

Count Date: 15-Jun-17 Site #: 1718400001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - 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	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	45	45	118	116	8	8	0	0	2	2	1	1	0	0	0	0	0	0	0	0
7:30:00	74	29	242	124	28	20	0	0	4	2	1	0	0	0	0	0	0	0	1	1
7:45:00	112	38	371	129	48	20	1	1	5	1	2	1	0	0	0	0	0	0	1	0
8:00:00	164	52	516	145	77	29	6	5	9	4	10	8	0	0	0	0	0	0	1	0
8:15:00	203	39	665	149	111	34	6	0	9	0	14	4	0	0	0	0	0	0	2	1
8:30:00	244	41	797	132	128	17	7	1	11	2	14	0	0	0	0	0	0	0	2	0
8:45:00	293	49	920	123	160	32	8	1	13	2	14	0	0	0	0	0	0	0	3	1
9:00:00	340	47	1029	109	180	20	8	0	17	4	14	0	0	0	0	0	0	0	3	0
9:00:06	340	0	1029	0	180	0	8	0	17	0	14	0	0	0	0	0	0	0	3	0
16:00:00	341	1	1034	5	181	1	8	0	17	0	14	0	0	0	0	0	0	0	3	0
16:15:00	367	26	1127	93	195	14	8	0	19	2	14	0	0	0	0	0	0	0	4	1
16:30:00	392	25	1216	89	219	24	9	1	21	2	14	0	0	0	0	0	0	0	4	0
16:45:00	425	33	1295	79	228	9	9	0	23	2	15	1	0	0	0	0	0	0	5	1
17:00:00	451	26	1408	113	243	15	9	0	25	2	16	1	0	0	0	0	0	0	5	0
17:15:00	486	35	1504	96	259	16	9	0	27	2	16	0	0	0	0	0	0	0	5	0
17:30:00	516	30	1616	112	277	18	10	1	28	1	16	0	0	0	0	0	0	0	6	1
17:45:00	542	26	1726	110	287	10	10	0	29	1	16	0	0	0	0	0	0	0	6	0
18:00:00	578	36	1827	101	304	17	11	1	30	1	17	1	0	0	0	0	0	0	6	0
18:00:09	579	1	1831	4	305	1	11	0	30	0	17	0	0	0	0	0	0	0	6	0
18:15:00	579	0	1831	0	305	0	11	0	30	0	17	0	0	0	0	0	0	0	6	0
18:15:15	579	0	1831	0	305	0	11	0	30	0	17	0	0	0	0	0	0	0	6	0

Date: 2018/06/14 Project Number: HAL – 35.62 – Main St E/Bronte St N Milton, ON

Dear Seema Nagaraj

Re: Train Traffic Data – CN Halton Subdivision near Main St E/Bronte St N in Milton, ON

The following is provided in response to Seema's 2018/05/30 request for information regarding rail traffic in the vicinity of Main St E/Bronte St N in Milton, ON at approximately Mile 35.62 on CN's Halton Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	13	140	50	4
Way Freight	0	25	50	4
Passenger	0	10	50	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	5	140	50	4
Way Freight	0	25	50	4
Passenger	0	10	50	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Halton Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are no at-grade crossing in the immediate vicinity of the study area at Mile 36.62 Main St E/Bronte St N. Anti-whistling bylaws are not in effect at this crossing. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The double mainline track is considered to be continuously welded rail throughout the study area.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

Michael Vallins P.Eng
Manager of Public Works
public_works_gld@cn.ca

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

APPENDIX B

ENVIRONMENTAL NOISE GUIDELINES

Ministry of the Environment, Conservation and Parks (MECP)

Reference: MECP Publication NPC-300, October 2013: *"Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning"*.

SPACE	SOURCE	TIME PERIOD	CRITERION
Living/dining, den areas of residences, hospitals, nursing homes, schools, daycare centres, etc.	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Living/dining, den areas of residences, hospitals, nursing homes, etc. (except schools or daycare centres)	Road	23:00 to 07:00	45 dBA
	Rail	23:00 to 07:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 5
Sleeping quarters	Road	07:00 to 23:00	45 dBA
	Rail	07:00 to 23:00	40 dBA
	Aircraft	24-hour period	NEF/NEP 0
Sleeping quarters	Road	23:00 to 07:00	40 dBA
	Rail	23:00 to 07:00	35 dBA
	Aircraft	24-hour period	NEF/NEP 0
Outdoor Living Areas	Road and Rail	07:00 to 23:00	55 dBA
Outdoor Point of Reception	Aircraft	24-hour period	NEF/NEP 30#
	Stationary Source		
	Class 1 Area	07:00 to 19:00(1)	50* dBA
		19:00 to 23:00(1)	50* dBA
	Class 2 Area	07:00 to 19:00(2)	50* dBA
		19:00 to 23:00(2)	45* dBA
	Class 3 Area	07:00 to 19:00(3)	45* dBA
		19:00 to 23:00(3)	40* dBA
	Class 4 Area	07:00 to 19:00(4)	55* dBA
		19:00 to 23:00(4)	55* dBA

…./cont'd

SPACE	SOURCE	TIME PERIOD	CRITERION
Plane of a Window of Noise Sensitive Spaces	Stationary Source		
	Class 1 Area	07:00 to 19:00(1)	50* dBA
		19:00 to 23:00(1)	50* dBA
		23:00 to 07:00(1)	45* dBA
	Class 2 Area	07:00 to 19:00(2)	50* dBA
		19:00 to 23:00(2)	50* dBA
		23:00 to 07:00(2)	45* dBA
	Class 3 Area	07:00 to 19:00(3)	45* dBA
		19:00 to 23:00(3)	45* dBA
		23:00 to 07:00(3)	40* dBA
	Class 4 Area	07:00 to 19:00(4)	60* dBA
		19:00 to 23:00(4)	60* dBA
		23:00 to 07:00(4)	55* dBA

\# may not apply to in-fill or re-development.
* or the minimum hourly background sound exposure $L_{eq(1)}$, due to road traffic, if higher.
(1) Class 1 Area: Urban.
(2) Class 2 Area: Urban during day; rural-like evening and night.
(3) Class 3 Area: Rural.
(4) Class 4 Area: Subject to land use planning authority's approval.

Reference: MOE Publication ISBN 0-7729-2804-5, 1987: *"Environmental Noise Assessment in Land-Use Planning"*.

EXCESS ABOVE RECOMMENDED SOUND LEVEL LIMITS (dBA)	CHANGE IN SUBJECTIVE LOUDNESS ABOVE	MAGNITUDE OF THE NOISE PROBLEM	NOISE CONTROL MEASURES (OR ACTION TO BE TAKEN)
No excess (<55 dBA)	—	No expected noise problem	None
1 to 5 inclusive (56 to 60 dBA)	Noticeably louder	Slight noise impact	If no physical measures are taken, then prospective purchasers or tenants should be made aware by suitable warning clauses.
6 to 10 inclusive (61 - 65 dBA)	Almost twice as loud	Definite noise impact	Recommended.
11 to 15 inclusive (66 - 70 dBA)	Almost three times as loud	Serious noise impact	Strongly Recommended.
16 and over (>70 dBA)	Almost four times as loud	Very serious noise impact	Strongly Recommended (may be mandatory).

APPENDIX C

SAMPLE STAMSON CALCULATION

```
STAMSON 5.04        NORMAL REPORT        Date: 08-11-2018 10:18:30
MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS/ NOISE ASSESSMENT

Filename: a_sw_sf.te           Time Period: Day/Night 16/8 hours
Description: Building A - South Facade


Rail data, segment # 1: CN Halton (day/night)
-----------------------------------------------
Train            ! Trains      ! Speed !# loc !# Cars! Eng  !Cont
Type             !             !(km/h) !/Train!/Train! type !weld
-----------------+-------------+-------+------+------+------+----
* 1. Freight     !  16.6/6.4   !  80.0 !  4.0 !140.0 !Diesel! Yes

* The identified number of trains have been adjusted for
  future growth using the following parameters:

Train type:         ! Unadj. ! Annual % ! Years of !
 No  Name           ! Trains ! Increase !  Growth  !
--------------------+--------+----------+----------+
  1. Freight        !  13.0/5.0   !    2.50  !   10.00  !

Data for Segment # 1: CN Halton (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   0.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  55.00 / 55.00  m
Receiver height           :  59.50 / 59.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
No Whistle
Reference angle           :   0.00

Results segment # 1: CN Halton (day)
------------------------------------

LOCOMOTIVE (0.00 + 66.47 + 0.00) = 66.47 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.00  75.12  -5.64  -3.01   0.00   0.00   0.00  66.47
-------------------------------------------------------------------------

WHEEL (0.00 + 59.87 + 0.00) = 59.87 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.00  68.52  -5.64  -3.01   0.00   0.00   0.00  59.87
-------------------------------------------------------------------------

Segment Leq : 67.33 dBA

Total Leq All Segments: 67.33 dBA
```

```
Results segment # 1: CN Halton (night)
---------------------------------------

LOCOMOTIVE (0.00 + 65.34 + 0.00) = 65.34 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.00  74.00  -5.64  -3.01   0.00   0.00   0.00  65.34
-------------------------------------------------------------------------

WHEEL (0.00 + 58.74 + 0.00) = 58.74 dBA
Angle1 Angle2  Alpha RefLeq  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------
   -90      0   0.00  67.40  -5.64  -3.01   0.00   0.00   0.00  58.74
-------------------------------------------------------------------------

Segment Leq : 66.20 dBA

Total Leq All Segments: 66.20 dBA

Road data, segment # 1: Main St (day/night)
-------------------------------------------
Car traffic volume  : 16070/1786  veh/TimePeriod  *
Medium truck volume :   162/18    veh/TimePeriod  *
Heavy truck volume  :    16/2     veh/TimePeriod  *
Posted speed limit  :    60 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):  14520
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  11.00
    Medium Truck % of Total Volume     :   1.00
    Heavy Truck  % of Total Volume     :   0.10
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: Main St (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  :  42.00 / 42.00  m
Receiver height           :  59.50 / 59.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Road data, segment # 2: Bronte St (day/night)
---------------------------------------------
Car traffic volume  : 10977/1220  veh/TimePeriod  *
Medium truck volume :   224/25    veh/TimePeriod  *
Heavy truck volume  :    11/1     veh/TimePeriod  *
Posted speed limit  :    50 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):  10020
    Percentage of Annual Growth        :   2.00
    Number of Years of Growth          :  11.00
    Medium Truck % of Total Volume     :   2.00
    Heavy Truck  % of Total Volume     :   0.10
    Day (16 hrs) % of Total Volume     :  90.00
```

```
Data for Segment # 2: Bronte St (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  :  47.00 / 47.00  m
Receiver height           :  59.50 / 59.50  m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

Results segment # 1: Main St (day)
----------------------------------

Source height = 0.56 m

ROAD (0.00 + 60.61 + 0.00) = 60.61 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  65.09   0.00  -4.47   0.00   0.00   0.00   0.00  60.61
-------------------------------------------------------------------------------

Segment Leq : 60.61 dBA

Results segment # 2: Bronte St (day)
------------------------------------

Source height = 0.56 m

ROAD (0.00 + 53.84 + 0.00) = 53.84 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  61.81   0.00  -4.96  -3.01   0.00   0.00   0.00  53.84
-------------------------------------------------------------------------------

Segment Leq : 53.84 dBA

Total Leq All Segments: 61.44 dBA

Results segment # 1: Main St (night)
------------------------------------

Source height = 0.58 m

ROAD (0.00 + 54.11 + 0.00) = 54.11 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
   -90     90   0.00  58.58   0.00  -4.47   0.00   0.00   0.00   0.00  54.11
-------------------------------------------------------------------------------

Segment Leq : 54.11 dBA

Results segment # 2: Bronte St (night)
--------------------------------------

Source height = 0.53 m

ROAD (0.00 + 47.27 + 0.00) = 47.27 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
-------------------------------------------------------------------------------
     0     90   0.00  55.24   0.00  -4.96  -3.01   0.00   0.00   0.00  47.27
-------------------------------------------------------------------------------

Segment Leq : 47.27 dBA

Total Leq All Segments: 54.93 dBA
TOTAL Leq FROM ALL SOURCES (DAY): 68.33
                           (NIGHT): 66.51
```