

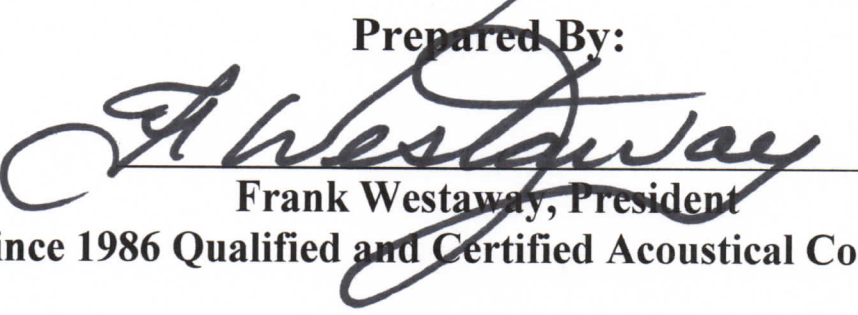
# **ENVIRONMENTAL NOISE IMPACT STUDY**

**“609 & 615 HAMILTON STREET NORTH  
& 3 NISBET BOULEVARD  
WATERDOWN, ON”  
Now the City of Hamilton**

**Prepared For:**

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**Since 1986 Qualified and Certified Acoustical Consultant**

**May 2016**

**OUR FILE NO: 2016-1017**

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**1.0 INTRODUCTION**

dBA Environmental Services Inc., has conducted a noise impact study for the proposed “609 & 615 Hamilton St., North & 3 Nisbet Blvd Residential Subdivision Waterdown, ON.,” now in the City of Hamilton, Ontario.

The purpose of the study is to determine the noise impact from Hamilton Street North traffic as required for site plan approval in the City of Hamilton. Proposed for the development are sixty-one (61) total units consisting of two (2) semi-detached two storey residential dwellings and eight (8) two storey residential townhouse units, five (5) three storey residential townhouse units, forty-six (46) three storey back-back residential units. This study will detail noise impact relative to the site plan and recommend noise control measures necessary (if applicable) to meet MOE Publication-300 entitled “Stationary and Transportation Sources-Approval & Planning, while satisfying the planning requirements of the City of Hamilton. Vibration is not considered as there are no heavy industrial buildings or rail located in the immediate area. Aircraft is not a concern as there are no airports in the area.

**2.0 SITE DESCRIPTION**

The proposed development is located on the west side of Hamilton Street North and south of Parkside Dr, Hamilton On and is situated in an existing Residential Zone. To the north, west and east and south of the proposed development is a relatively new subdivision under construction owned by the applicant. To the east of Centre Rd are established residential homes. Key Plan attached as Figure 1. Site Plan attached as Figure 2.

Hamilton Street North, is a 2-lane road and the main road noise source located approximately 20m to the east facade of the closest Receptor and running north and south of the proposed development. Parkside Rd running east to west is a 2-lane road located approximately 300m from the proposed development and completely shielded by existing residential 3 storey townhouse units. The posted speed for Hamilton Street North is 50 km/hr. Noise impact was not considered for the area traffic roads due to low traffic volumes.

**3.0 NOISE IMPACT ASSESSMENT**

**3.1 NOISE CRITERIA**

The Ministry of Environment (MOE) specifies limits for road noise relative to new residential developments. MOE Publication-300 entitled “Stationary and Transportation Sources-Approval & Planning, specifies the criteria, summarized as follows:

<b>TABLE 1 - Road Traffic Sound Levels Limits</b>	
<b>Time Period</b>	<b>Leq (dBA)</b>
07:00 – 23:00 (16 hr.)	55 Outdoor Living Area (OLA)
23:00 – 07:00 (8 hr.)	50 Plane of Bedroom Window (POW)

*The OLA refers to an outdoor patio, a backyard, a terrace or other area where outdoor passive recreation is expected to occur on the residential property. As this is considered a daytime use (07:00 - 23:00) noise levels are calculated at the upper storey bedroom window to represent night time (23:00 - 07:00) periods.*

Where noise levels estimated in the Outdoor Living Area (OLA) and at an upper storey window (POW) are equal to or less than the values listed in Table 1, no noise control measures are required. Where noise levels exceed Table 1 values, the following action is required:

TABLE 2 - Noise Control Requirements		
Time Period	Noise Level L <sub>eq</sub> (dBA)	Action Required
07:00 - 23:00 Daytime (OLA)	55 to 60	Barrier or Warning Clause A
	>60	Barrier and Warning Clause B
07:00 - 23:00 Daytime (POW)	>55	Provision for A/C, Warning Clause C
	>65	Central A/C, Warning Clause D
	>65	Building Component Specification
23:00 to 07:00 Nighttime (POW)	50 to 60	Provision for A/C, Warning Clause C
	>60	Building Component Specification
	>60	Central A/C, Warning Clause D

Where nighttime noise levels exceed 60 dBA, building components must be designed to meet Table 3 indoor sound level limits.

TABLE 3 - Indoor Road Sound Levels Limits	
Indoor Location	Leq (dBA)
	Road
Living/Dining 7:00 - 23:00	45
Bedroom 23:00 - 07:00	40

### 3.2 ROAD NOISE PREDICTION

Predicted road traffic noise levels were calculated for Hamilton Street North, the major road noise source in the site area. Traffic information for Hamilton Road dated 2013, was provided from the City of Hamilton Engineering Department Website. (See Appendix "A"). The MOE computer program STAMSON version 5.04 was used to carry out prediction calculations. Traffic data is summarized in Table 4.

The daytime/nighttime volume ratio relative to Hamilton Street North is typically calculated using an 90/10 split, as required by the MOE. The maximum posted speeds for all vehicles utilizing Hamilton Street North are 50 km/hr.

The percentage of annual growth for Hamilton Street North was figured at 2.0% over 14 years. Hamilton Street North is considered a heavy truck route. The AADT (Annual Average Daily Traffic) volumes were used and are reflective of the worst-case scenario.

Trucks make up 6% of the total truck volumes and were factored at 3% medium and 3% heavy of the total vehicle volumes for Hamilton Street North.

TABLE 4– Future Road Traffic Volumes			
Hamilton Street North	Forecasted Volume – 12203 Vehicles		
	Cars	Medium Trucks	Heavy Trucks
Day	5278	168	168
Night	586	19	19

The future traffic noise levels were predicted using the aforementioned data, and the MOE computer prediction program, Stamson 5.04.

Two receptors were modelled which represents worst-case impact from road traffic noise. (see Figure 3). Table 5 summarizes the “free field” traffic noise prediction results of Hamilton Street North, modeled at the two receptor locations representative of outdoor amenity space and building facade of the proposed development. Back-to-back townhouses do not have outdoor amenity spaces however they have standard balconies.

Table 5 –Predicted Future Traffic Noise (dBA)		
Receptor	07:00-23:00 $L_{eq}$	23:00-07:00 $L_{eq}$
R1-East Façade	61	56
R2	51	45

<sup>(1)</sup> 1.5m receiver height    <sup>(2)</sup> 7.0m receiver height

#### 4.0 RECOMMENDATIONS - NOISE CONTROL

##### 4.1 OUTDOOR LIVING AREAS

Calculated road noise levels do not exceed the 55 dBA criteria outlined in Table 1 for outdoor amenity space for R2. The draft plan for the proposed development includes outdoor living areas for specific lots. Noise mitigation measures are not required as shielding by existing and proposed units provide ample shielding from area traffic noise.

##### 4.2 INDOOR NOISE LEVELS

Calculated road noise levels at the Plane of Window (POW) for R2 exceed the 50 dBA criteria outlined in Table 1 for indoor space for specific units. Specific building components (walls, windows, doors etc.) are required and confirmed using the AIF/STC (Acoustic Insulation Factor & Sound Transmission Class) method.

Building design specifications were not made available during report writing included therefore, AIF/STC calculations summarized in Table 6 following with minimum window door and wall construction specified for each floor.

The AIF/STC values were calculated for each room type, based on typical acoustically tested window to floor ratios of 20% for bedrooms and 30% for living areas. A maximum of two components were factored per room. Receptor locations are labelled on Figure 3.

TABLE 6 – Recommended Wall and Window Construction			
LOCATION	AIF/STC Acoustically Tested	Wall Construction	Window Glazing* Example
<b>R-1 East Front Facade</b>			
Bedroom	28/26	OBC	3mm (16mm) 3mm
Living room	23/21	OBC	3mm (16mm) 3mm
<b>All Other Units</b>			
Bedroom	31/	OBC	3mm (16mm) 3mm
Living room	31/	OBC	3mm (16mm) 3mm

\* Double pane windows - first number denotes glass thickness, followed by spacing, and thickness of second pane, OBC denotes minimum requirements of the Ontario Building Code will suffice. Recommendations assume windows are well-fitted, weather-stripped units that can be opened.

### 5.0 VENTILATION / WARNING CLAUSES

Ventilation and warning clause requirements for all units are presented in Table 7 following. It is recommended that the appropriate warning clauses be inserted into all Offers and Agreements of Purchase and Sale or Lease. Minimum building component requirements of the Ontario Building Code will satisfy the MOE criterion for noise control relative to indoor living space.

TABLE 7 - Ventilation and Warning Clause Requirements		
LOCATION	VENTILATION	WARNING CLAUSE
All Units Throughout Development	Forced Air Heating with Provisions for A/C	Type “ “A” and C”

The following warning clause may be used individually or in combination:

**TYPE A:**

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

TYPE C:

“This dwelling unit had been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the Municipality’s and the Ministry of the Environment’ noise criteria.

(Note: The location and installation of the outdoor air conditioning device should be done so as to comply with noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.)”

It is recommended that a Qualified Acoustical Consultant certify that the required noise control measures have been incorporated into the builder’s plans prior to issuance of a building permit.

Prior to issuance of an occupancy permit, it is recommended the Qualified Acoustical Consultant certify that the approved noise control measures have been properly installed.

## 6.0 SUMMARY OF RECOMMENDATIONS

The following are recommendations required for the subdivision:

- OBC is recommended in Section 4.2. to ensure MOE compliance.
- Appropriate ventilation requirements and warning clauses are inserted into all Offers and Agreements of Purchase and Sale or Lease. (Section 5)

It recommended that a Qualified Acoustical Consultant certify that the required noise control measures have been incorporated into the builder’s plans prior to issuance of a building permit.

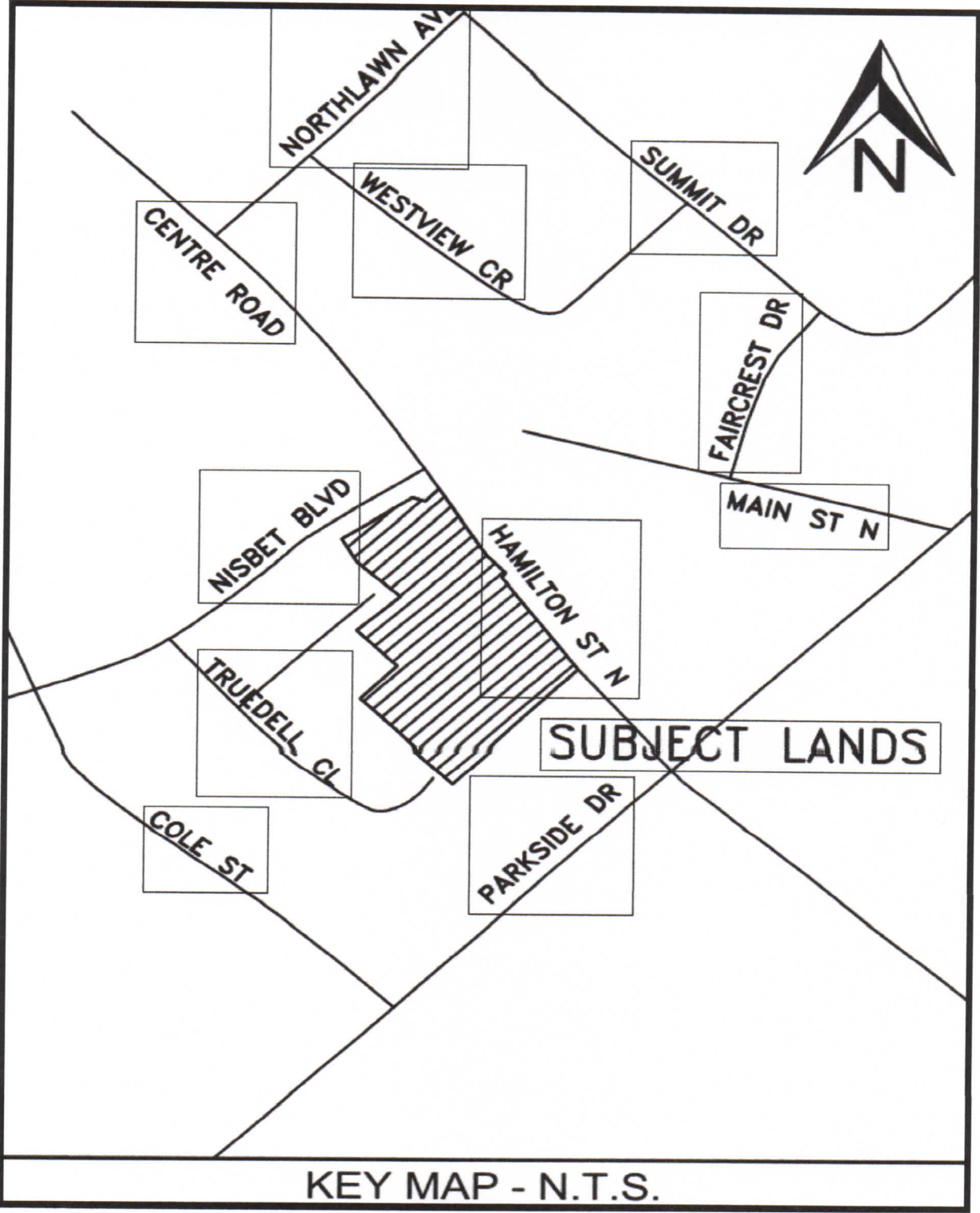
Prior to issuance of an occupancy permit, it is recommended the Qualified Acoustical Consultant certify that the approved noise control measures have been properly installed.

## 70 CONCLUSIONS

dBA Environmental Services Inc., has conducted a noise impact study for the proposed “609 & 615 Hamilton St., North & 3 Nisbet Blvd Residential Subdivision Waterdown, ON.,” now in the City of Hamilton, Ontario.

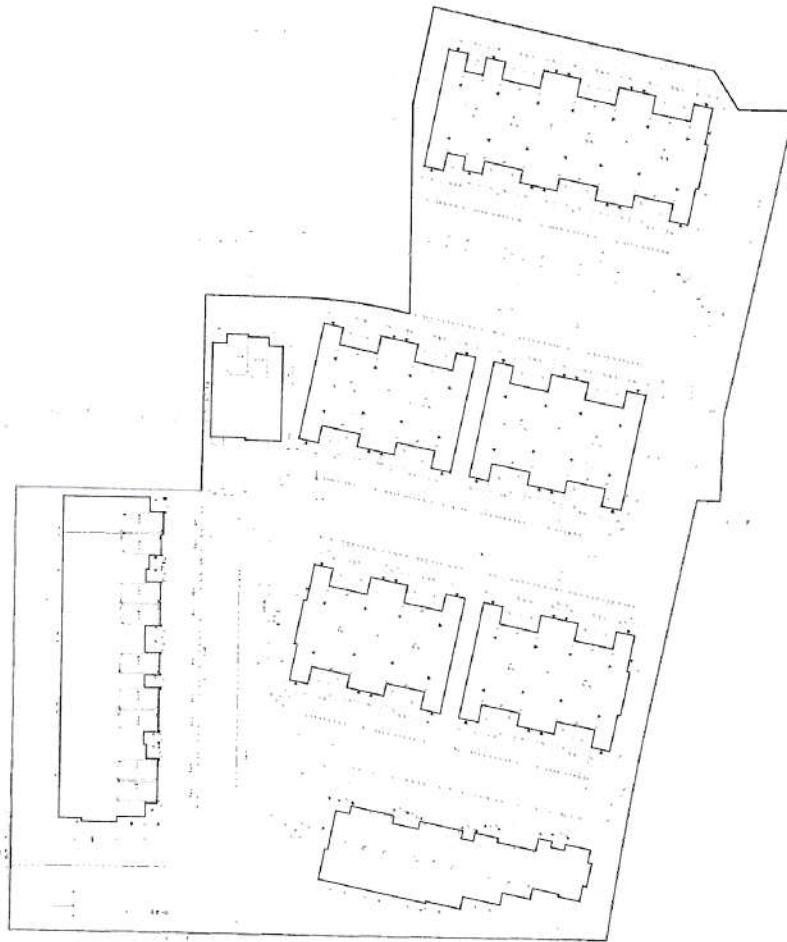
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**FIGURE 1  
KEY PLAN**

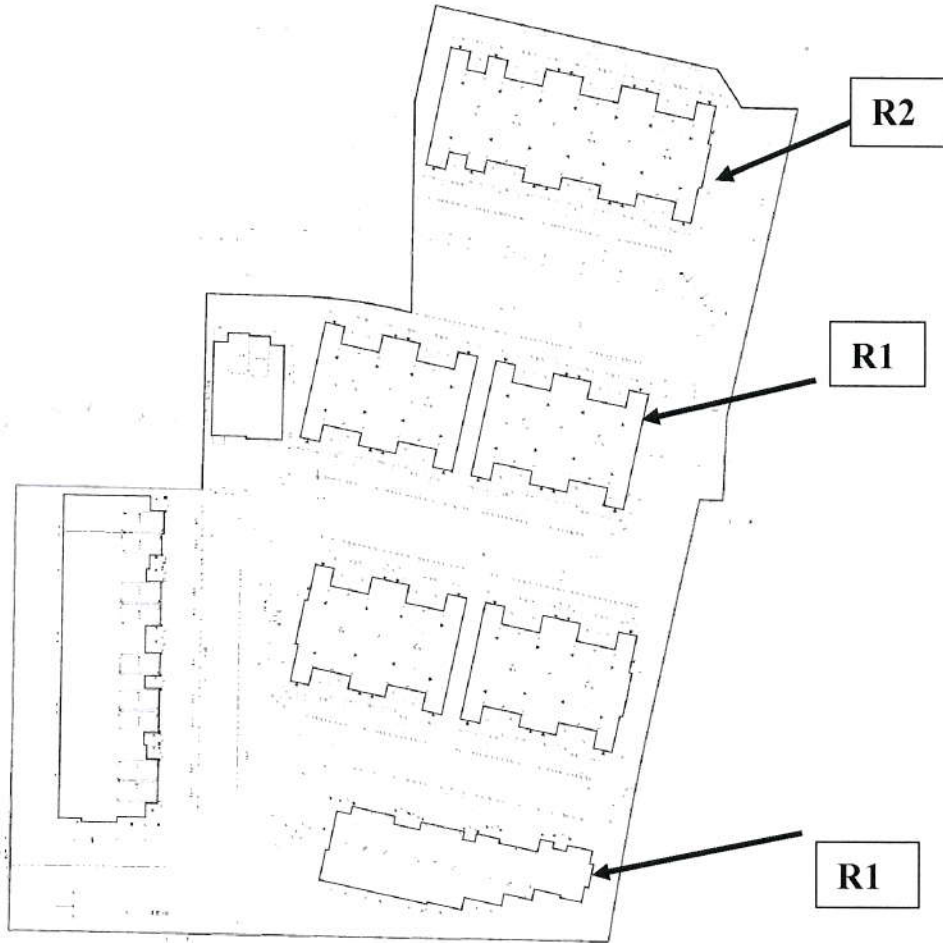




# FIGURE 2 SITE PLAN

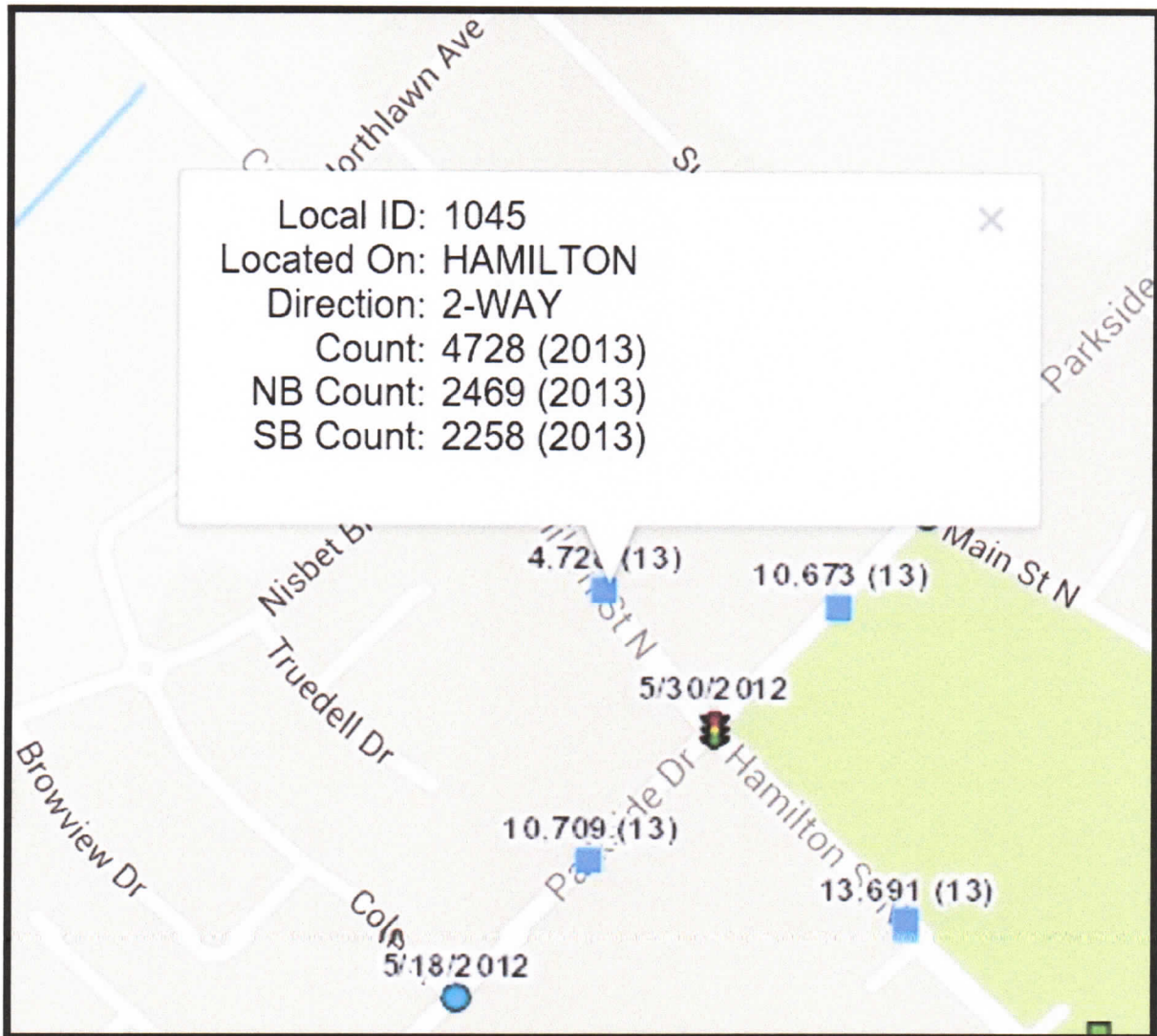


# FIGURE 3 RECEPTOR LOCATIONS



# APPENDIX "A"

# HAMILTON STREET NORTH 2013 TRAFFIC DATA





Filename: Hamln1.te                      Time Period: Day/Night 16/8 hours  
 Description: **R2 Rear OLA Free Field**

**TOTAL Leq FROM ALL SOURCES**                      **(DAY): 51.35 (OLA)**  
**(NIGHT): 45.43**

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

```
-----
Car traffic volume   : 5278/586   veh/TimePeriod  *
Medium truck volume : 168/19    veh/TimePeriod  *
Heavy truck volume  : 168/19    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): 4728
Percentage of Annual Growth       : 2.00
Number of Years of Growth         : 14.00
Medium Truck % of Total Volume    : 3.00
Heavy Truck % of Total Volume     : 3.00
Day (16 hrs) % of Total Volume    : 90.00
```

Data for Segment # 1: Hamilton N (day/night)

```
-----
Angle1  Angle2      : -0.00 deg  45.00 deg
Wood depth      : 0 (No woods.)
No of house rows : 0 / 0
Surface         : 1 (Absorptive ground surface)
Receiver source distance : 30.00 / 30.00 m
Receiver height  : 1.50 / 7.00 m
Topography      : 1 (Flat/gentle slope; no barrier)
Reference angle  : 0.00
```

Result summary (day)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----
1.Hamilton N ! 1.32 ! 51.35 ! 51.35
-----+-----+-----
Total 51.35 dBA
```

Result summary (night)

```
-----
! source ! Road ! Total
! height ! Leq ! Leq
! (m) ! (dBA) ! (dBA)
-----+-----+-----
1.Hamilton N ! 1.32 ! 45.43 ! 45.43
-----+-----+-----
Total 45.43 dBA
```