

To: Bob Koziol
 From: Bill Hoogeveen / Felipe Vernaza
 Subject: Lower Yonge Precinct, MCEA
 Noise Assessment for the Preferred
 Transportation Network

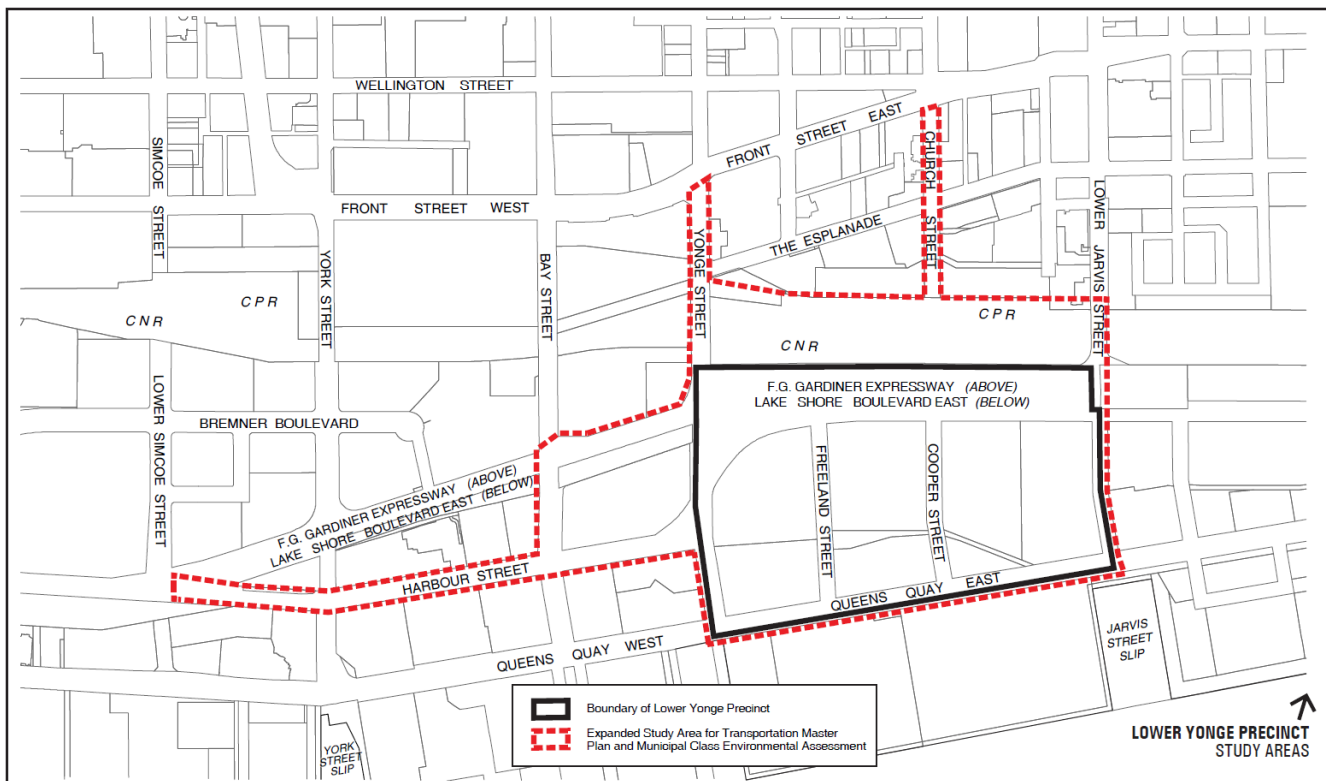
Date: May 18, 2017
 Job No.: 1615113-001
 CC: Sandy Nairn
 Meghan Bratt

Introduction

This memo documents our assessment of the noise impacts of the Preferred Option for the Lower Yonge Precinct Municipal Class Environmental Assessment.

Figure 1 below shows the study area for the MCEA Study and Lower Yonge Precinct Area.

Figure 1 Lower Yonge Precinct Boundaries and Study Area



Preferred Option

Under the Preferred Transportation Network, Harbour Street will consist of a three-lane cross section from York Street to Lower Jarvis Street, with two eastbound lanes and one westbound lane. Yonge Street will feature a three-lane cross section from Queens Quay to Harbour, with one northbound lane and two southbound lanes. North of Harbour Street, Yonge Street will consist of a four-lane cross section, with two northbound and southbound lanes. Freeland Street and the 'New Street' will consist of one northbound and one southbound lane, whereas Cooper Street will consist of a three-lane cross section, with one northbound lane and two southbound lanes. Moreover, Cooper Street is proposed to be

connected to Church Street via a tunnel. For further details, please refer to the attached Preferred Option plan.

Basis of Assessment

Our analysis is based on the Noise Sensitive Areas (NSA) identified in our existing conditions inventory, represented by noise receptors 1 to 5, and on future NSAs within the Precinct, represented by noise receptors 6 and 7. Receptor 6 represents the proposed development at 1 Yonge Street and is deemed representative of any future NSAs along Harbour Street and Queens Quay East, south of Harbour Street. Receptor 7 represents the proposed development at 55 Lake Shore Boulevard and is deemed representative of any future NSAs along Harbour Street and Lake Shore Boulevard, north of Harbour Street. **Figure 2** shows the identified noise receptors in the vicinity of the Study Area.

The Precinct is located in a very complex acoustic environment due to the large variety of dominant noise sources, such as the elevated Gardiner Expressway structure and Lake Shore Boulevard located beneath it, and more complex noise sources including the Metrolinx Rail Corridor to the north, and Redpath Sugar to the south. Also, the Precinct is surrounded by various structures that act as reflectors and noise barriers, including the nearby high-rise towers, the elevated Gardiner Expressway and the elevated Metrolinx Rail Corridor. This complicated geometry, along with the abovementioned noise sources are not easily modelled, and such a model may not yield accurate results. However, a very conservative assessment of the noise impacts of the Preferred Option can be obtained by calculating the sound level changes due to increases in road traffic only.

When compared to the Baseline scenario, the noise impacts of the Preferred Option on the identified noise receptors are largely limited to traffic volume changes on a few roads within the Lower Yonge Precinct Area. The noise impacts of the land uses within the Precinct are expected to be minimal as they would only consist of rooftop Heating, Ventilation, and Air Conditioning (HVAC) units and other stationary noise sources such as receiving bays that would be built as part of the future structures within the Precinct. The noise impacts of any future development proposals would be addressed at the site plan approval stage, if required.

Given that volume changes dictate the noise impacts of the Preferred Option of the Precinct on the nearby noise sensitive areas, the following assessment is based on the noise impacts of traffic volume changes only and does not require a detailed noise model of the area. As noted above, this approach yields conservative results.

Noise Guidelines

The Ministry of the Environment and Climate Change (MOECC) has various guidelines to deal with noise due to traffic noise impacts. The most applicable document for municipal road improvements is *A Protocol for Dealing with Noise Concerns during the Preparation, Review and Evaluation of Provincial Highway's Environmental Assessments* (the Noise Protocol) prepared by MOECC/MTO, dated February 1986. The following criteria are documented in the Noise Protocol:

- If the daytime traffic sound levels in the outdoor living areas **are less than or equal to 55 dBA** and the impact is **less than or equal to 5 dBA** over baseline sound levels, noise mitigation measures **will not be required**.
- If the daytime traffic sound levels in the outdoor living areas **are greater than 55 dBA** and the impact is **less than or equal to 5 dBA** over baseline sound levels, noise mitigation measures are not **normally** required.
- If the daytime traffic sound levels in the outdoor living areas **are greater than 55 dBA** and the impact exceeds **5 dBA** over ambient sound levels, noise mitigation measures should be investigated within the right-of-way and if mitigation is warranted, attempts should be made to reduce the noise impacts as much as possible, **within the constraints of administrative, aesthetic, economic and technical feasibility**.

Therefore, the following assessment will determine whether traffic sound levels in the identified outdoor living areas are expected to increase by more than 5 decibels when the Preferred Option is compared to the “Baseline” scenario.

Noise Assessment

The sound level changes due to volume changes were estimated using the volume adjustment method contained in MOECC’s *Ontario Road Noise Analysis Method for Environment and Transportation* (ORNAMENT) dated October 1989.

The resulting sound level changes of the Preferred Option compared with the Baseline scenario are presented in **Table 1**.

Table 1 – Noise Impacts of the Precinct’s Preferred Option on the Nearby Noise Receptors

Receptor 1						
Noise Source	Harbour Street (Bay St. to Yonge St.)	Harbour Street (Yonge St. to Lower Jarvis St.)	Yonge Street	--	--	--
Baseline Scenario AADT⁽¹⁾	13,900	11,500	17,200	--	--	--
Preferred Option AADT⁽¹⁾	15,000	11,800	22,000	--	--	--
Sound Level Change	0.3 dB	0.1 dB	1.1 dB	--	--	--
Receptor 2						
Noise Source	Harbour Street (Bay St. to Yonge St.)	Yonge Street	Queens Quay (Bay St. to Yonge St.)	Queens Quay (Yonge St. to Lower Jarvis	--	--

				St.)		
Baseline Case AADT⁽¹⁾	13,900	17,200	6,900	7,900	--	--
Preferred Option AADT⁽¹⁾	15,000	22,000	10,800	10,800	--	--
Sound Level Change	0.3 dB	1.1 dB	1.9 dB	1.4 dB	--	--
Receptor 3						
Noise Source	Queens Quay (Yonge St. to Lower Jarvis St.)	--	--	--	--	--
Baseline Case AADT⁽¹⁾	7,900	--	--	--	--	--
Preferred Option AADT⁽¹⁾	10,800	--	--	--	--	--
Sound Level Change	1.4 dB	--	--	--	--	--
Receptor 6						
Noise Source	Yonge Street	Queens Quay (Yonge St. to Lower Jarvis St.)	Harbour Street (Yonge St. to Lower Jarvis St.)	Freeland St.	Lower Jarvis Street (Queens Quay to Lake Shore Blvd.)	--
Baseline Case AADT⁽¹⁾	17,200	7,900	11,500	5,000	13,500	--
Preferred Option AADT⁽¹⁾	22,000	10,800	11,800	6,700	12,800	--
Sound Level Change	1.1 dB	1.4 dB	0.1 dB	1.3 dB	-0.2 dB	--
Receptor 7						
Noise Source	Lake Shore Boulevard (Yonge St. to Lower Jarvis St.)	Harbour Street	Freeland St.	Cooper Street (Queens Quay to Lake Shore Blvd.)	Lower Jarvis Street (Queens Quay to Lake Shore Blvd.)	Yonge Street
Baseline Case AADT⁽¹⁾	26,700	11,500	5,000	7,900	13,500	17,200
Preferred Option AADT⁽¹⁾	20,000	11,800	6,700	7,700	12,800	22,000
Sound Level Change	-1.3 dB	0.1 dB	1.3 dB	-0.1 dB	-0.2 dB	1.1 dB

(1) Traffic data obtained from the MMM traffic model for full build-out conditions.

The road noise sources in Table 1 were selected on the basis of closest proximity and largest angle of exposure for each noise receptor.

We note that the sound level increases noted below are based on the conservative assumption that the noise receptors would experience noise from the sources shown in Table 1 only. In reality, more significant sources of noise, including the Gardiner Expressway, the Metrolinx Rail Corridor and Redpath Sugar contribute to the overall sound levels. The contribution of additional noise due to traffic volume increases on the roads shown in Table 1 to the overall sound levels is likely to be significantly lower than the sound level changes described below.

Receptor 1

Sound level changes from the increases in traffic volumes for the roads in Table 1 are projected to range from 0.1 dB to 1.1 dB. We note that Yonge Street is projected to carry the highest AADT of the three noise sources in Table 1 by a significant amount and therefore will be the dominant source of noise at Receptor 1. Consequently, we conservatively expect that Receptor 1 will experience a sound level change no greater than 1.1 dB, which is well below the Noise Protocol 5 dB increase criterion.

Receptor 2

Sound level changes from the increases in volumes for the roads in Table 1 are projected to range from 0.3 dB to 1.9 dB. Although noise contributions from Queens Quay are expected to increase by 1.4 to 1.9 dBA, Yonge Street is expected to carry significantly higher AADTs. As such, Yonge Street will be the dominant source of noise Receptor 2. Thus, its corresponding sound level increase of 1.1 dB is more representative of the overall sound level increase at Receptor 2. This is well below the Noise Protocol 5 dB increase criterion.

Receptor 3

Sound level increases are projected to be no greater than 1.4 dB at Receptor 3 due to increases traffic at Queens Quay, which is well below the Noise Protocol 5 dB increase criterion.

Receptors 4 and 5

Receptors 4 and 5 do not experience any significant noise increase from increased vehicular volume at Harbour Street and the revised Gardiner Expressway off-ramp since the noise sensitive areas these receptors represent lie on podiums which shielded are by the tower-on-podium structure and by the nearby condominium towers. Queens Quay is therefore the dominant source of noise. However, no significant vehicular volume changes are expected at these locations on Queens Quay given that they are relatively far from the Precinct. Therefore, sound level changes are expected to be negligible at Receptors 4 and 5.

Receptor 6 and future NSAs along Harbour Street and Queens Quay

Sound level changes from the increases in volumes for the roads in Table 1 are projected to range from -0.2 dB to 1.4 dB. Although noise contributions from Queens Quay are expected to increase by 1.4 dB, Yonge Street is expected to carry significantly higher AADTs. As such, Yonge Street will be the dominant source of noise at Receptor 6. Thus, its corresponding sound level increase of 1.1 dB is more representative of the overall sound level increase at Receptor 6. This is well below the Noise Protocol 5 dB increase criterion.

We note that given to its proximity to Yonge Street, this noise receptor represents the worst-case for all NSAs south of Harbour Street within the Precinct.

Receptor 7 and future NSAs along Harbour Street and Lake Shore Boulevard

Sound level changes from the increases in volumes for the roads in Table 1 are projected to range from -1.3 dB to 1.3 dB. Yonge Street and Lake Shore Boulevard are expected to carry significantly higher AADTs than the other assessed roads and are thus considered the dominant sources of noise at Receptor 7. As can be seen in Table 1, Lake Shore Boulevard is expected to experience a 0.2 dB decrease in sound levels and Yonge Street is expected to experience a 1.1 dB increase in sound levels. Thus, we conservatively expect that any future NSAs along Lake Shore Boulevard will experience a sound level change no greater than 1.1 dB, which is well below the Noise Protocol 5 dB increase criterion.

We note that given to its proximity to Yonge Street, this noise receptor represents the worst-case for all NSAs north of Harbour Street within the Precinct. Nearer to Lower Jarvis Street, a slight decrease in sound levels is expected for all future NSAs with exposure to Lake Shore Boulevard noise.

Other Considerations

It is likely that the receptors close to the Gardiner Expressway and the Metrolinx Rail Corridor will experience sound levels exceeding 55 dBA. However, these sound levels are not attributed to the Precinct nor any roads within the study area, but rather to existing operations on the Gardiner Expressway and the Metrolinx Rail Corridor.

Any mitigation aimed at achieving a 5 dB reduction will not be technically feasible given that all identified receptors represent outdoor living areas on condominium podiums and are high above ground level.

It is important to note that in general, sound level increases of less than 3 dB represent an imperceptible difference in human hearing.

Construction Noise

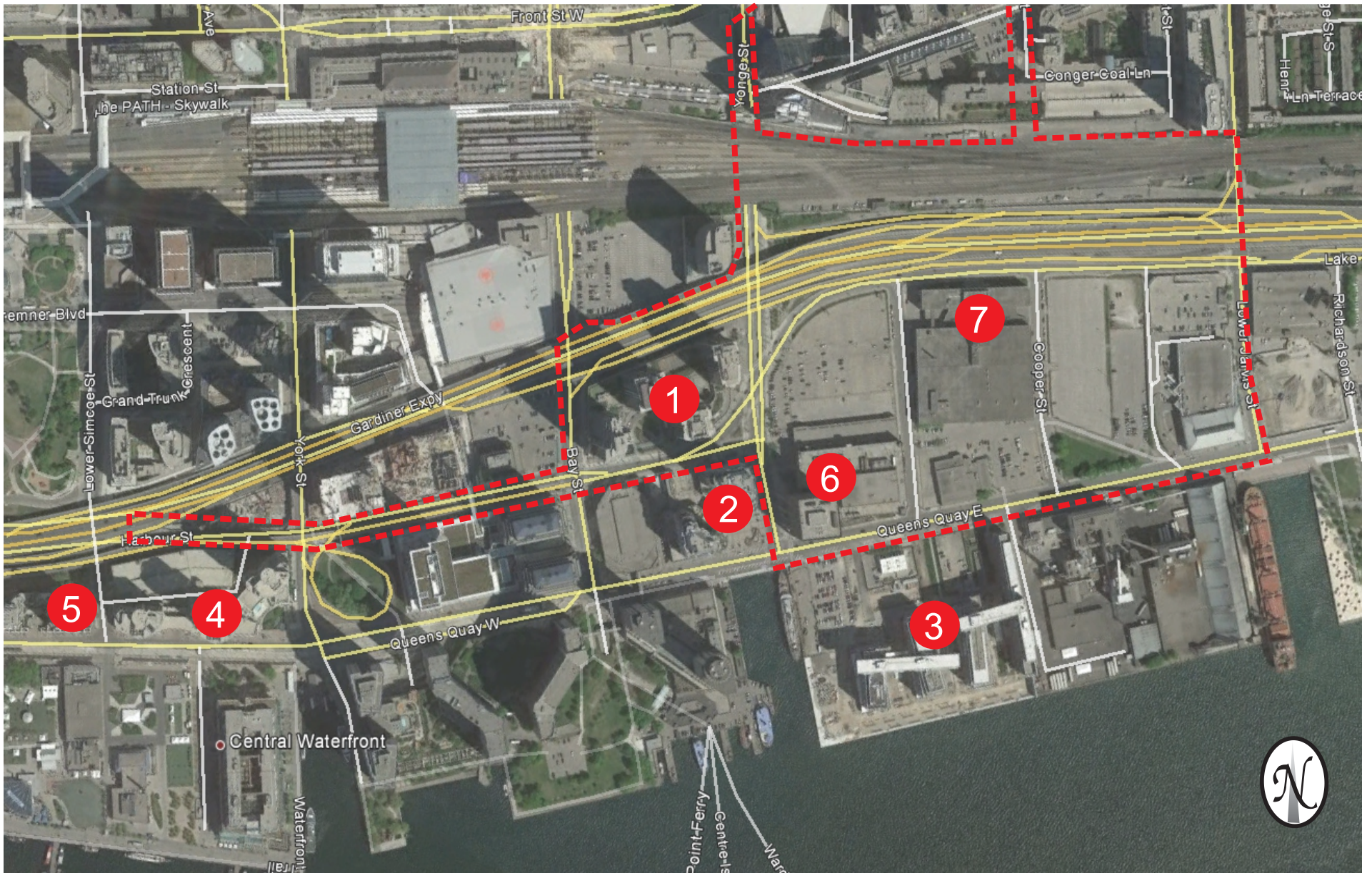
With respect to the noise impacts that may result during construction, the following should be noted and adhered to during construction.

1. All noise-sensitive areas must be identified.

2. Noise is enforced through the City of Toronto Municipal Code on Noise (Chapter 591), specifically 591-2.1 B and 591-3, which outlines restrictions on noise as a result of construction-related activities. Construction activities will have to adhere to the applicable Bylaw and requirements.
3. If construction is to occur beyond the Bylaw permissible times, consultation will be conducted with the local community and the local Councillor's office.
4. MOECC's Publications *NPC-115* and *NPC-118* list equipment and heavy vehicle operation sound level criteria. These sound level criteria must be adhered to at all times during construction.
5. A persistent complaint will require the Contractor to comply with the City of Toronto's sound level criteria for construction equipment contained in MOECC's Publications *NPC-115* and *NPC-118*. Subject to the results of the field investigation, alternative noise control measures will be required, where these are reasonably available.
6. The Contractor shall comply with all City noise Bylaws. In addition, the Contractor shall ensure the following
 - a. Ensuring that all equipment is well maintained and in good condition;
 - b. Soundproofing housings or enclosures for noise producing machinery such as compressors, pumps, motors, generators;
 - c. Ensuring that construction equipment prone to noise are operated as far as possible from any noise sensitive areas; and
 - d. Maintaining truck/equipment access roads to minimize the formation of potholes.
 - e. – Maintain equipment in an operating condition that prevents unnecessary noise, including but not limited to proper muffler systems, properly secured components and the lubrication of all moving parts; and
 - f. - Idling of equipment shall be restricted to the minimum necessary for the proper performance of the specified work.
 - g. - Apply for all noise Bylaw exemptions as required pertaining to the work.

Conclusion

A noise assessment of the Preferred Option was completed. The forecasted sound level changes due to the implementation of the Preferred Option are well below the 5 dB sound level increase criterion from the Noise Protocol. No further mitigation measures are required.



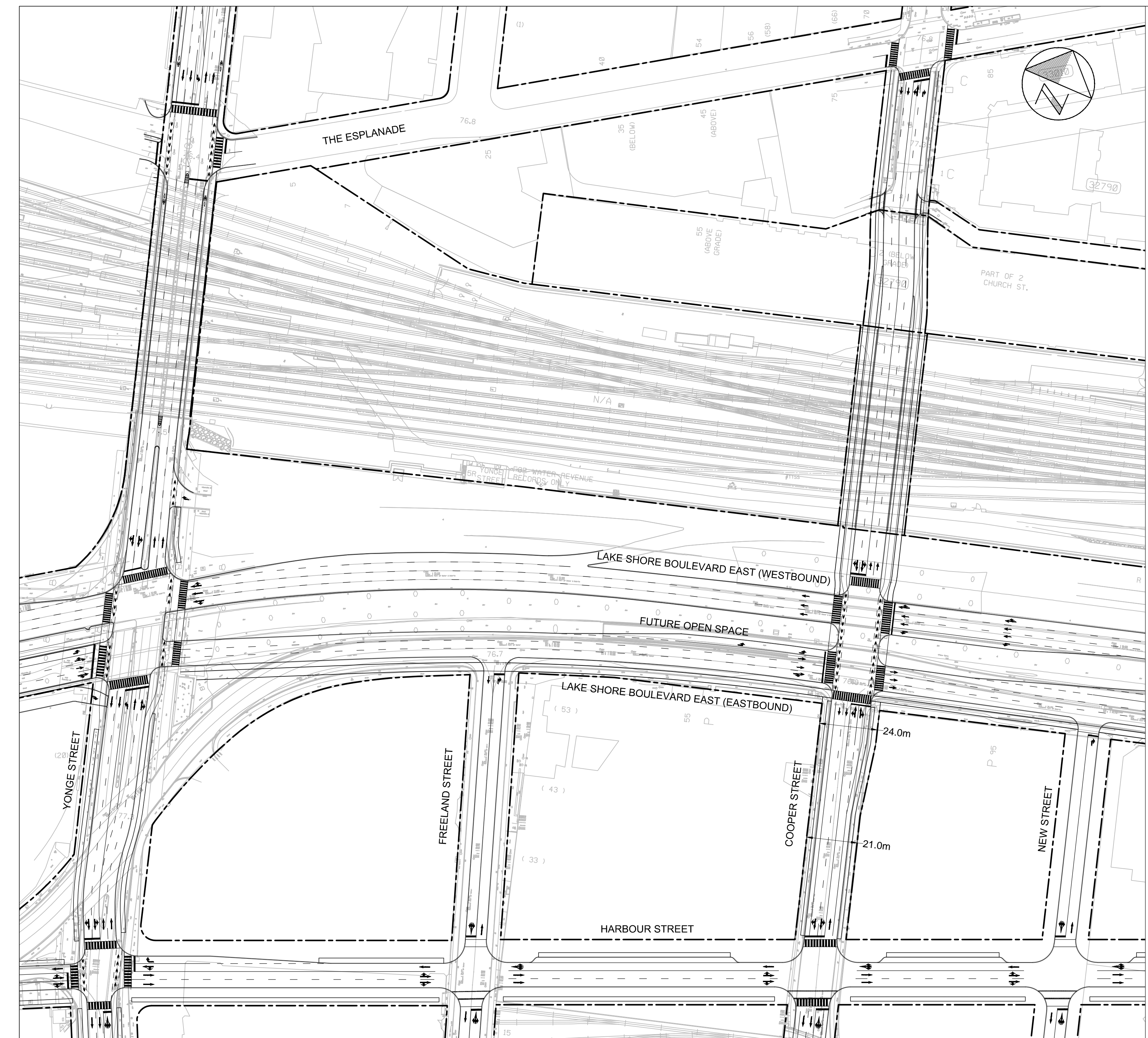
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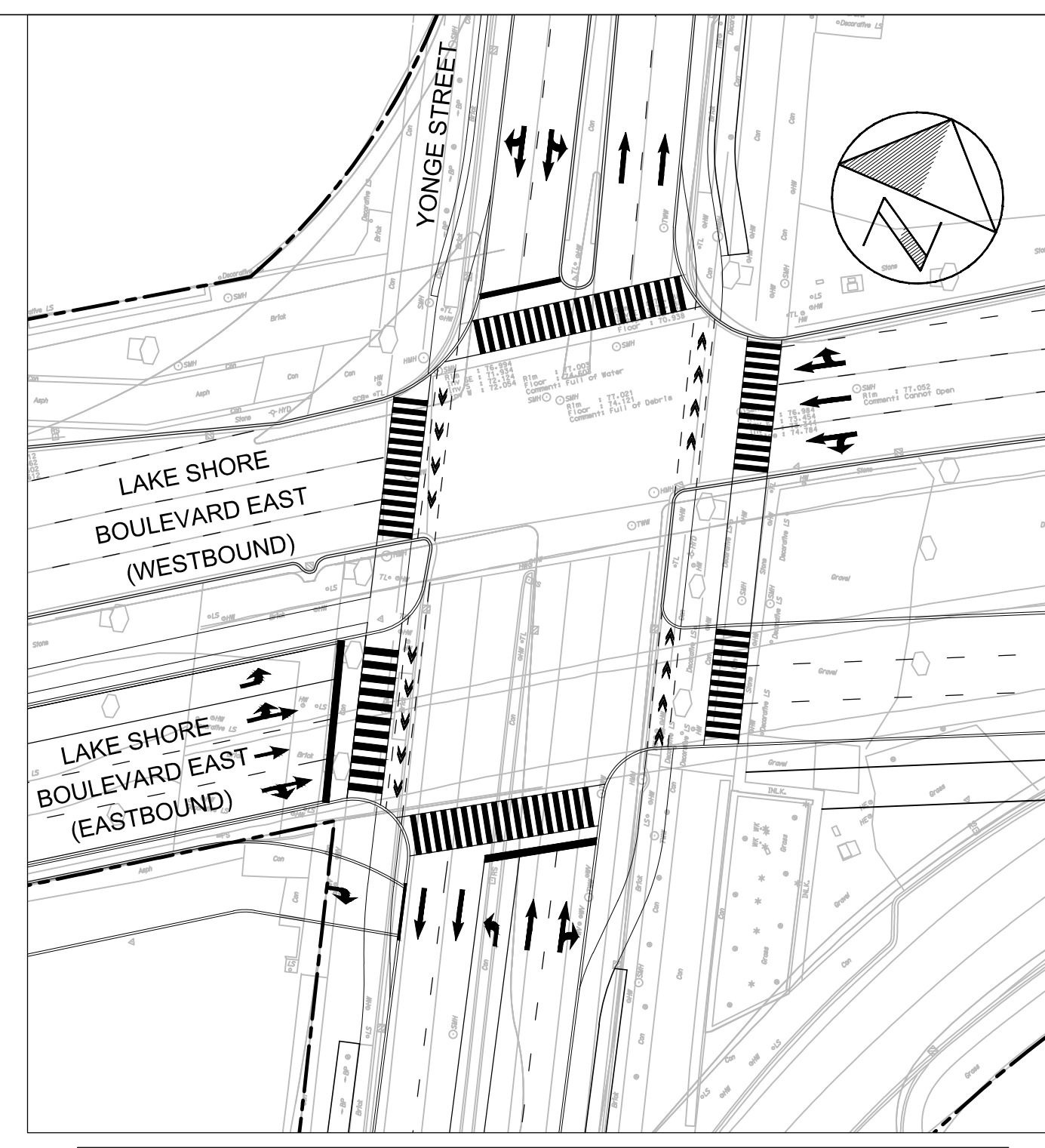
Legend

- Noise Receptor
- Study Area

FIGURE 2
Noise Receptors
Lower Yonge Precinct
Municipal Class EA



FUTURE COOPER ST. TUNNEL
SUBJECT TO FURTHER
DISCUSSIONS WITH STAKEHOLDERS



YONGE ST. - LAKE SHORE BLVD. INTERSECTION



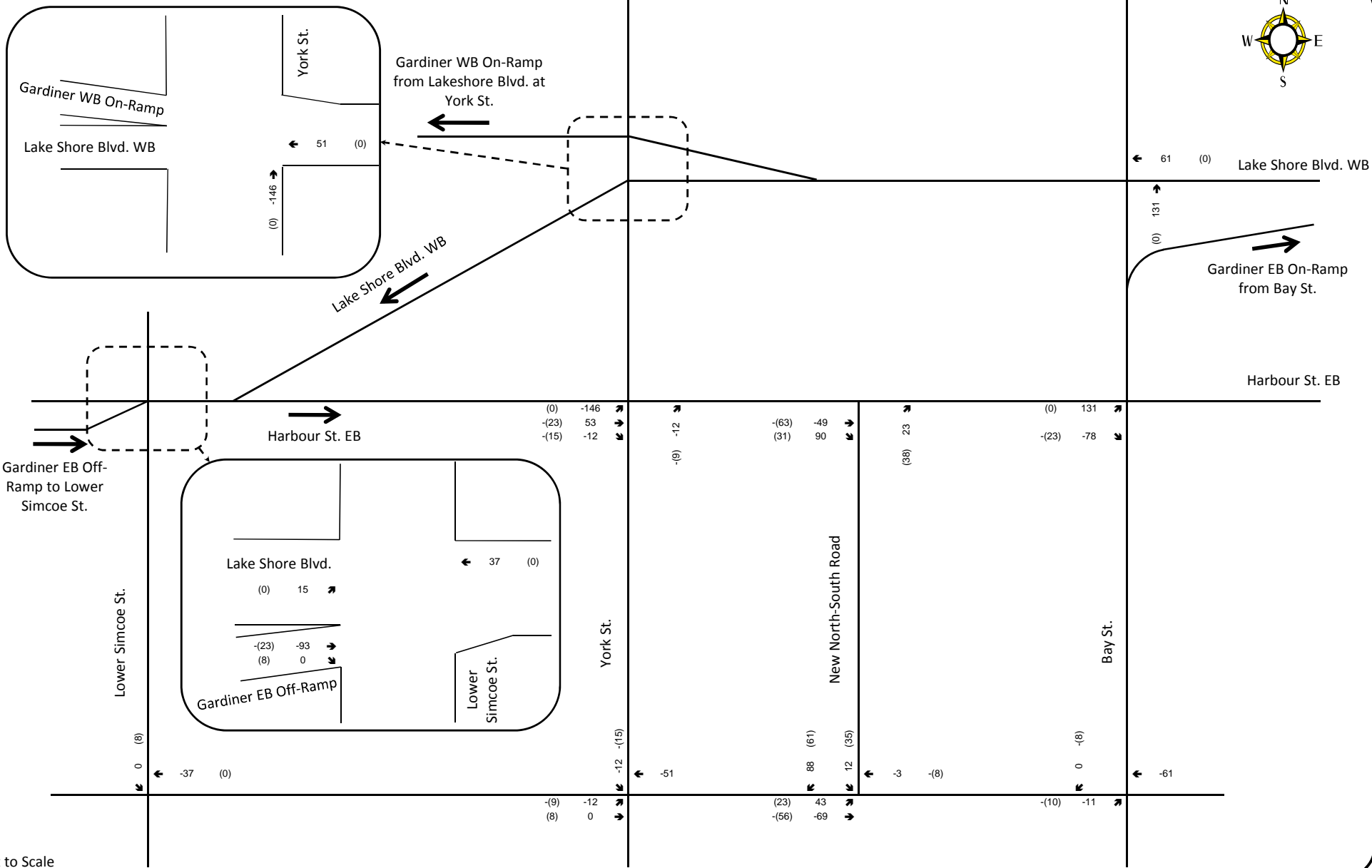
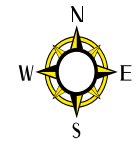
NOTE:
SOUTHBOUND LEFT TURN MAY BE
RESTRICTED DURING PEAK PERIODS

PRELIMINARY PREFERRED ALTERNATIVE
INTERIM CONFIGURATION
SUBJECT TO FURTHER
DISCUSSIONS WITH STAKEHOLDERS



TITLE LOWER YONGE PRECINCT
CLASS EA
SITE PLAN

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 Layout: 36 - 48 Date: Aug 03, 2016 - 4:03pm EdtBy: jdelakky



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xx A.M. Peak Hour Traffic
 (xx) P.M. Peak Hour Traffic

Figure 7.16
 Preferred Option 2 Diversion Volumes



Appendix D

Noise Assessment

To: Gardiner York/Bay/Yonge Ramps Project Team Date: May 7, 2010
From: Job No.: 16-09007
Subject: Noise Assessment - Preferred Alternative CC:

Introduction

This memo presents the noise assessment findings for the F. Gardiner Expressway's York/Bay/Yonge Eastbound off-ramps (YBY Ramps) reconfiguration project. The noise assessment is based on the Class EA process for the preferred alternative design (eg. Option 2 – Connection to Lower Simcoe Street). In summary, the preferred option is to replace the YBY Ramps with a single off-ramp linking to Lower Simcoe Street. The noise assessment has been prepared in support of the overall environmental assessment study. Details of the proposed project undertaking can be found in the environmental study report.

Noise Guidelines

The Ontario Ministry of Transportation's (MTO) approach for the assessment of noise impacts is documented in the "Environmental Guide for Noise", October 2006, prepared by MTO, when examining the noise impacts of road improvements on residential areas. The general methodology based on Group 'B' projects and projects commencing in preliminary design stage, for assessing the noise impacts within the study area is as follows:

- Identify noise-sensitive areas (eg. specific land-uses with an Outdoor Living Area)
- Predict future ambient and future sound levels with project undertaking
- Evaluate noise impacts and significance
- Consider preliminary noise control mitigation
- Document the noise impact assessment

Should there be no noise-sensitive areas located within the study area and should no noise analysis need be undertaken, then the noise assessment documentation will include a rationale for not carrying out any noise analysis.

Study Area

The adjacent area through the project route corridor is urban in nature. Due to the urban environment and complex building landscape potentially influencing the ambient noise levels,

the area of investigation was considered to be a perpendicular distance of 600-metres from the closest edge of pavement. The general noise investigation study area is shown in **Figure 1**. The southern limit of the study area was truncated to extend to the lake front since there are no designated land-uses south of the lake front.

Noise Investigation

The MTO noise guideline provides definitions relating to noise assessment during the planning and design of new transportation corridor alignments or the reconstruction of existing corridors. Some main definitions in the context of this study are shown below:

Noise Sensitive Areas (NSAs): means the following land uses, with an Outdoor Living Area (OLA) associated with them:

- Private homes such as single family residences (owned or rental)
- Townhouses (owned or rental)
- Multiple unit buildings, such as apartments with OLA's for use by all occupants
- Hospitals, nursing homes for the aged, where there are OLA's for the patients

NSA's must have an OLA. Land uses listed below do NOT qualify as NSA's:

- Apartment balconies above ground floor
- Churches
- Cemeteries
- Parks and picnic areas which are not inherently part of a NSA
- All commercial
- All industrial

Outdoor Living Area (OLA): means an area at ground level, adjacent to a NSA and accommodating outdoor living activities. The area may be situated on any side of the NSA. Paved areas for multiple dwelling residential units may not be defined as an OLA.

A review of the noise investigation study area was completed to examine the various land-uses. MMM identified ten residential complexes (eg. condominium developments) within the study area that *could* be considered noise-sensitive areas. These residential areas are marked on Figure 1. Based on further review and inspection of the ten residential complexes, it was observed that none of these developments have suitable *ground level* amenity areas accommodating outdoor living activities.

A number of municipal parks within the study area were also identified and shown on Figure 1. Some of these parks are situated adjacent to or near some of the residential complexes. However, these parks are not inherently part of any of the ten residential developments. As such, the investigated residential complexes are considered to have no Outdoor Living Areas. Therefore, the investigated residential complexes are not considered Noise-Sensitive Areas because they do not have a ground level Outdoor Living Area associated with them.

Furthermore, future road transportation sound levels are expected to be stable with or without the construction of the YBY ramps reconfiguration since the future ambient noise levels are expected to be dominated by daily road traffic noise from the F. Gardiner Expressway main-line and other surrounding roads. In addition, the general noise environment within the noise investigation study area will also be influenced by the normal daily urban hum, which includes all natural and man-made sound from near and afar.

Construction Noise

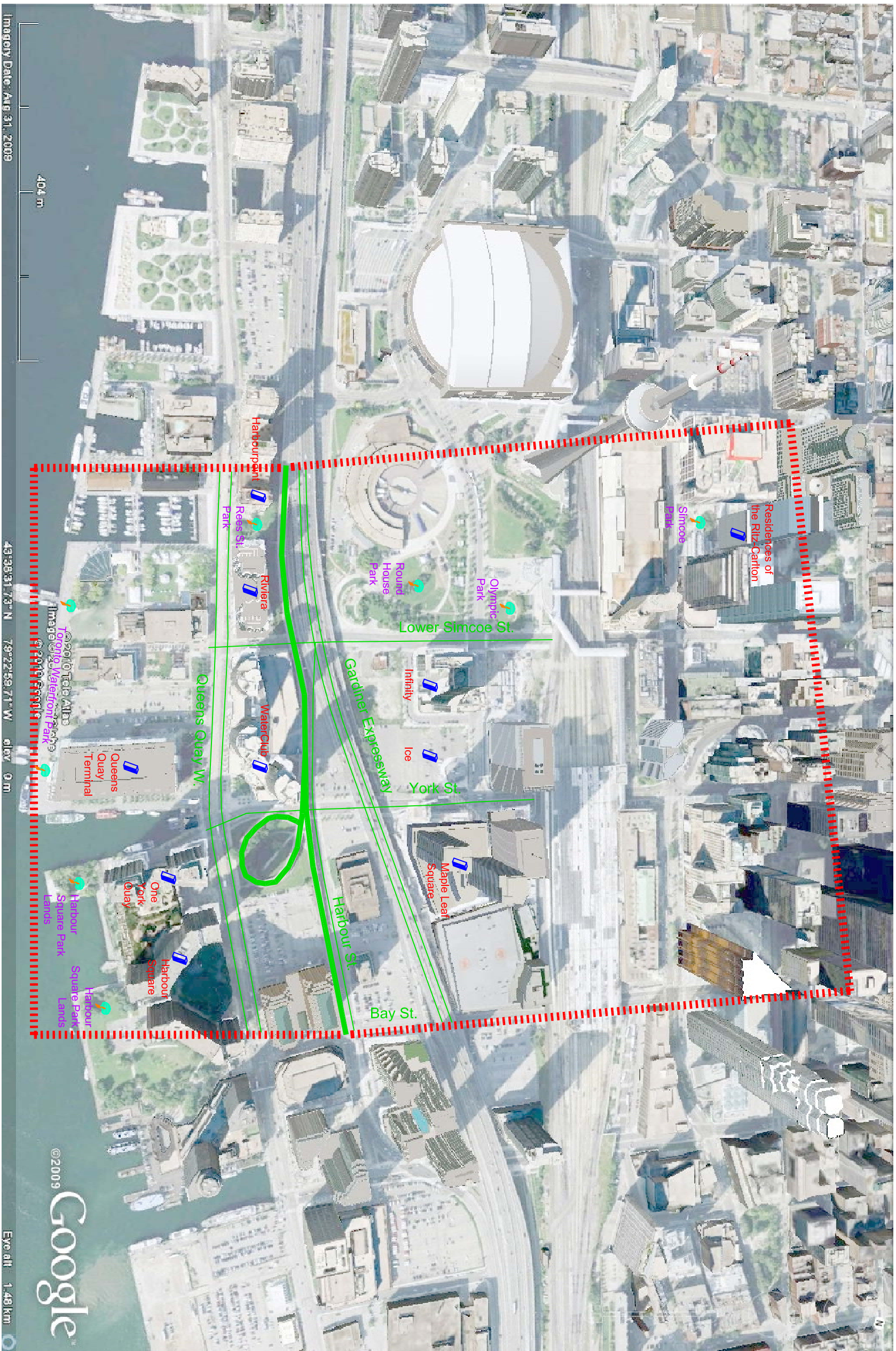
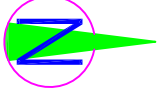
With respect to the noise impacts that may result during the reconstruction of the YBY ramps, the following should be noted and adhered to during the EA process and construction.

1. All noise-sensitive areas must be identified.
2. All applicable municipal and regional noise control by-laws must be identified and the Contractor must commit to obeying them. Where timing constraints or any other municipal by-law may cause hardship to the City of Toronto, an explanation of this will be outlined in the environmental assessment document and an exemption from such by-laws will be sought directly from the municipality.
3. General noise control measures (not sound level criteria) will be referred to, or placed into the contract documents.
4. Any initial complaint from the public will require verification by the City of Toronto to determine if the general noise control measures agreed to, are in effect. The City of Toronto will investigate any noise concerns, warn the Contractor of any problems and enforce the contract.
5. A persistent complaint will require the Contractor to comply with the City of Toronto's sound level criteria for construction equipment contained in the MOE Model Municipal Noise Control By-law. Subject to the results of the field investigation, alternative noise control measures will be required, where these are reasonably available.

6. In selecting the appropriate construction noise control mitigation measures, considerations will be given to the technical, administrative and economic feasibility of the various alternatives.





Conclusions

A noise assessment of the preferred option to replace the YBY Ramps with a single off-ramp linking to Lower Simcoe Street was completed. Based on the MTO Environmental Guide for Noise, no noise sensitive areas with ground level outdoor living areas were identified within the defined study area. As such, further noise analysis was not undertaken during the noise assessment. Accordingly, the noise study findings show that noise mitigation is not warranted for the reconfiguration of the YBY Ramps.



Not to Scale

Legend

-  Condominium Apartment / Complex
-  Study Area Limit
-  Designated Park
-  Gardiner Ramp Re-Configuration Section



MMM GROUP

FIGURE 1
Study Area