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<b>TO:</b>	<b>CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON APRIL 22, 2013</b>
<b>FROM:</b>	<b>EDWARD SOLDI, P.ENG. DIRECTOR, ROADS AND TRANSPORTATION</b>
<b>SUBJECT:</b>	<b>VETERANS MEMORIAL PARKWAY NOISE STUDY</b>

<b>RECOMMENDATION</b>
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That on the recommendation of the Director, Roads and Transportation, the following actions **BE TAKEN** in respect to the Veterans Memorial Parkway Noise Improvements:

- a) Civic Administration **BE DIRECTED** to introduce a 2014 budget item for the Veterans Memorial Parkway Noise Berm Improvements in the amount of \$300,000.

<b>PREVIOUS REPORTS PERTINENT TO THIS MATTER</b>
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- Civic Works Committee, January 21, 2013 – Veterans Memorial Parkway Noise Study
- Built and Natural Environment Committee, September 26, 2011 – Veterans Memorial Parkway Noise Study
- Built and Natural Environment Committee, May 16, 2011 – Public Participation Meeting - Veterans Memorial Parkway and Highbury Avenue Noise Study
- Built and Natural Environment Committee, March 28, 2011 – Veterans Memorial Parkway Noise Study
- Environment and Transportation Committee, January 15, 2007 – Veterans Memorial Parkway Noise Study
- Environment and Transportation Committee, April 28, 2003 – Environmental Study Report Airport Road Widening – Highway 401 to Oxford Street East.

<b>BACKGROUND</b>
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**Purpose:**

This report responds to Council’s request to report back on possible options and associated costs related to the implementation of noise attenuation measures to improve noise levels for landowners adjacent to the Veterans Memorial Parkway, including an identification of the Civic Administration’s recommended option.

The public has an opportunity for input at the public participation meeting.

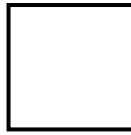
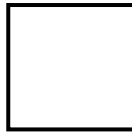
<b>DISCUSSION</b>
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**Policy:**

The installation of noise attenuation is typically triggered by two mechanisms, during initial land development or adjacent road widenings.

Developments are required to mitigate noise where necessary. Section 19.9.6 of the Official Plan applies to residential land uses adjacent to arterial roads and requires that new developments attempt to avoid the use of noise walls with land use planning or alternative subdivision designs. If noise attenuation is required, it is designed to keep daytime sound exposures in rear yard amenity areas to within 60 dBA.

For road widenings, City of London Policy 25(12) states that *“the installation of noise barrier walls is intended to ensure that the existing residential backyards backing onto arterial roads which are widened to four lanes or greater are not subjected to significant noise level increases*



*from levels that exist in the design year.*" This policy recognizes that a typical arterial road widening moves the noise source, the travelled lane, closer to the receiver.

The development policies are intended to provide long-term noise attenuation designed for future expected road widenings. The road widening policy is not intended to replace previously installed development noise attenuation.

#### **Noise Attenuation:**

Noise barriers adjacent to residential lands can take different forms. Appendix A provides a comparison between earth berms and noise walls.

An earth berm provides a noise barrier above the existing roadway, but it is utilized less frequently in urban areas because of the increased space requirement. The berm provides the best noise mitigation for the least cost of construction and longer term maintenance. Use of a berm offers an extra 1-3dB of noise mitigation (FHWA Noise Barrier Handbook). The slope is typically restored with natural grasses and trees and is typically well received by the community because it does blend in with the area.

A noise wall provides a noise barrier above the ground surface to reduce the noise from the roadway passing into the rear yards of residential properties. The noise wall is typically utilized where space is limited. The typical wall will provide noise mitigation for the rear yards, but the costs are higher to construct and to maintain over time. The City has also found these walls to be a location where graffiti is encountered. Based on the walls around the City, the expected life of a noise wall would be the 40 to 50 year range. The replacement would be expensive and could be disruptive to the residential rear yards after improvements and vegetation are established during the 50 years after the originally placement.

#### **Existing Conditions:**

Residential lands have developed along the west side of Veterans Memorial Parkway from Dundas Street to Trafalgar Street primarily with a combination of condominiums and single family residential properties. It appears development of the lands adjacent to the Veterans Memorial Parkway started in the early 1990s. The most recent development was Simpson Crescent near Dundas Street in 1997 with single family residential lots. Each development was responsible for the extension of the berm, at 3.0m height above the roadway, to serve as noise attenuation.

Veterans Memorial Parkway (formerly Airport Road) is a four lane divided expressway with a 60 metre right-of-way width. Veterans Memorial Parkway was widened from 2 lanes to 4 lanes in 2005 and the additional lanes were provided on the east side of the roadway. The effects of the road widening on noise levels in the adjacent residential properties were minimized by moving the noise source (the additional lanes) further from the west side residential developments. The AADT is 25,000 vehicles per day. There are no plans to further expand the road in the 20-year horizon.

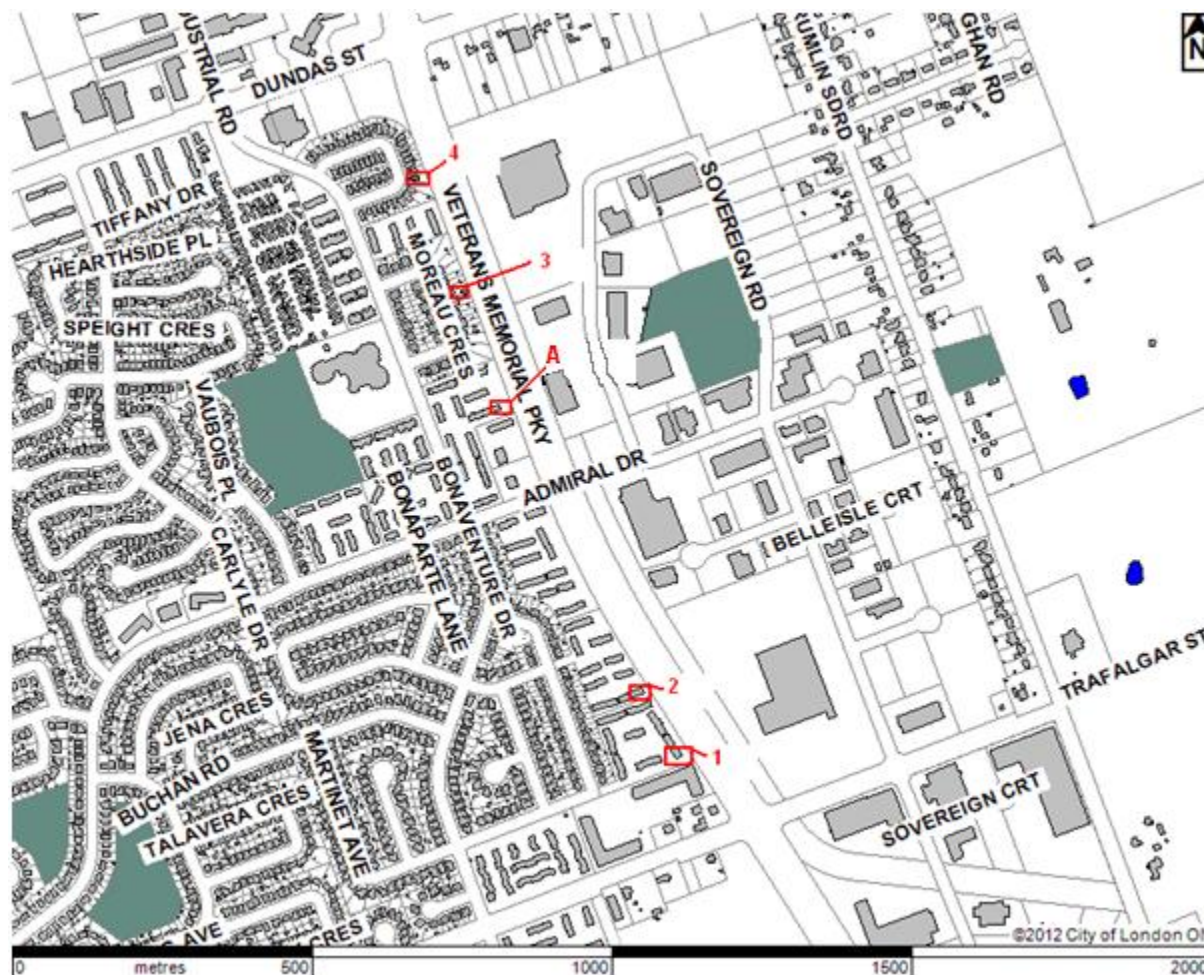
#### **Recent Study:**

As noted in the January 21, 2013 report to Civic Works Committee, a noise study was completed in response to community concerns and readings were taken from within backyards on June 26, 27 & 28, 2012. Four locations were chosen along Veterans Memorial Parkway based on property owner interest and distribution along the corridor. The four locations were as listed and shown on Figure 1:

1. 151 Martinet Avenue, Unit 9
2. 217 Martinet Avenue, Unit 27
3. 35 Moreau Crescent
4. 248 Simpson Crescent



Figure 1 – Location for Sound Exposure Measurements



In general, the noise attenuation berm is performing as designed. The noise levels at Locations 2 and 3 were below 60 dBA. However noise levels slightly in excess of 60 dBA were encountered at 151 Martinet Avenue and 248 Simpson Crescent due to substandard earth berm construction. A description of the earth berm deficiencies is as follows:

Location 1, 151 Martinet Avenue

This location recorded sound exposure levels of 62-63 dBA. The existing 3.0 m berm reduces in height and stops at the southern lot line, which leaves a significant portion of the backyard exposed to the source (traffic). A similar condition was visually identified at 126 Bonaventure Drive, Unit 33 (Location A on Figure 1).

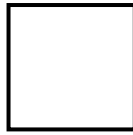
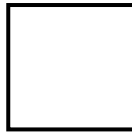
Location 4, 248 Simpson Crescent

This location recorded sound exposure levels up to 61 dBA. Through the length between 244 and 272 Simpson Crescent, the berm averages a height of 2.86 m and does not break the line of sight between the source (traffic) and the receiver (standing height in backyard).

**Noise Attenuation Deficiency Improvements:**

The current noise berm along the west side of Veterans Memorial Parkway does address most of the development noise attenuation requirements between Dundas Street and Trafalgar Street. However, two deficiencies were found and the following improvements are proposed as illustrated in Appendix B:

1. Extend the length of the noise berm at 151 Martinet Avenue and 126 Bonaventure Drive to fully serve the properties; and,
2. Increase the height of the noise berm between 244 and 272 Simpson Crescent by 0.5 m. The noise berm adjacent to Simpson Crescent can be modified by increasing the height of the berm by 0.5 m with a new crest slightly to the east of the existing crest. This improvement can be completed within Veterans Memorial Parkway right-of-way as shown in Appendix B.



This is the most cost-effective improvement and is consistent with the noise mitigation designed and constructed with the development. The estimated construction value of this improvement is \$300,000 plus HST.

**Noise Attenuation Enhancements:**

As requested by Council, additional options were developed that would reduce noise levels of all properties in the study area. The following options install a noise wall on top of the current noise berm along the entire residential development. The limits are shown in Appendix C and extend from Simpson Crescent (near Dundas Street) southerly to near Trafalgar Street with openings at Admiral Drive for the commercial area and the intersection.

The identified cost estimates include the recommended extension of the noise berm at two locations as identified as Improvement Item 1 above.

Enhancement Option #1:

Place a 0.6 m noise wall on top the current berm (minimum height increase to bring the entire residential length to a consistent height of 3.0 m or more)

Estimated Construction Value = \$675,000 + HST

Enhancement Option #2:

Place a 1.8 m noise wall on top the current berm (match height of most privacy fences already present)

Estimated Construction Value = \$1.5M + HST

Enhancement Option #3:

Place a 2.4 m noise wall on top the current berm (typical noise wall height seen in the City)

Estimated Construction Value = \$1.7M + HST

Parks Planning and Design Division has some tree planting planned along Veterans Memorial Parkway, and they are aware of potential improvements to the noise attenuation. Any modifications to the noise attenuation will be coordinated with future tree planting to minimize disruption in the area.

<b>CONCLUSIONS</b>
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Sound level monitoring completed at four locations along the Veterans Memorial Parkway between Dundas Street and Trafalgar Street confirm the existing daytime sound exposure levels are acceptable with the existing berm at most locations. Deficiencies in the sound berm at the southern and northern ends, as well as along Simpson Crescent have been observed and mitigation is required to lessen existing sound exposure levels to within City of London noise guideline limits. These locations are localized, and they could be addressed through localized improvements to the existing berm. Additional improvements to the existing berm are possible, but they are not required for noise attenuation to meet the City's Policy.

**Recommendation:**

Based on the field measurements in the rear yards and the related cost estimates, Civic Administration recommends localized improvements to the earth berm. Staff proposes to introduce a 2014 budget item for the improvements to be implemented in the order of \$300,000.

In the summer of 2013, Transportation staff will initiate some engineering surveys and consult with the community further to confirm the work program to improve noise levels in the area.

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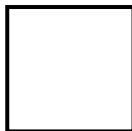
**Acknowledgements:**

This report was prepared with assistance from Greg Corbiere, Engineering Intern and Karl Grabowski, Transportation Design Engineer in the Transportation Planning and Design Division.

<b>PREPARED BY:</b>	<b>RECOMMENDED BY:</b>
<b>DOUG MACRAE, P. ENG DIVISION MANAGER, TRANSPORTATION PLANNING &amp; DESIGN</b>	<b>EDWARD SOLDI, P. ENG. DIRECTOR, ROADS AND TRANSPORTATION</b>
<b>REVIEWED &amp; CONCURRED BY:</b>	
<b>JOHN BRAAM, P. ENG. MANAGING DIRECTOR, ENVIRONMENTAL &amp; ENGINEERING SERVICES &amp; CITY ENGINEER</b>	

Attach: Appendix 'A' - Comparison of Earth Berms and Noise Walls  
 Appendix 'B' - Recommended Improvements  
 Appendix 'C' - Enhancement Options

c: Councilor B. Armstrong



## APPENDIX 'A' Comparison of Earth Berms and Noise Walls

**APPENDIX 'A'**

Comparison of an Earth Berm vs. a Noise Wall

Please note that this comparison is a **general comparison** and is not related to the Veterans Memorial Parkway situation

Description of Alternative	General Cross Section	Noise Mitigation	Cost	Privacy	Security	Safety	Maintenance	Aesthetics	Comments
Earth Berm	1	Best – 1-3dB quieter than a noise wall of similar height	Best – smallest construction and maintenance costs	Good – difficult to see over berm. Better if privacy fence is present as well	Poor – because of open landscape	Some Risk – of playing on berm, even though prohibited	Least – regular mowing, no graffiti or damage	Natural hill, grass and trees; clean look	Best noise reduction, smallest cost, least maintenance
Noise Wall (located at property line)	2	Worst – due to large distance between wall and noise source	Poor – high construction costs, maintenance costs	Best – Cannot see roadway over wall	Good – no space between wall and property line	Some Risk – of climbing on/falling off wall	High – graffiti management on 1 side, panel replacements	Plain grey wall, target for graffiti/vandalism	Poor noise reduction, high cost, high maintenance
Noise Wall (located off property line)	3	Good – because of proximity to noise source	Poor – high construction costs, maintenance costs	Good – Difficult to see roadway over wall	Poor – because of space between property line and wall	No Risk – Unlikely to climb/fall off wall	Highest – graffiti management on both sides, panel replacements, poor City maintenance access to ROW	Plain grey wall, target for graffiti/vandalism	Good noise reduction, high cost, high maintenance

**Definitions**

**Noise Mitigation:** Ability to reduce/deflect sound created by the nearby traffic

**Privacy:** Backyard privacy for homeowners (privacy from roadway)

**Security:** Freedom from danger, risk, crime, attack, etc.

**Safety:** Freedom from the risk of injury, danger, etc.

**Maintenance:** Care, upkeep, etc.

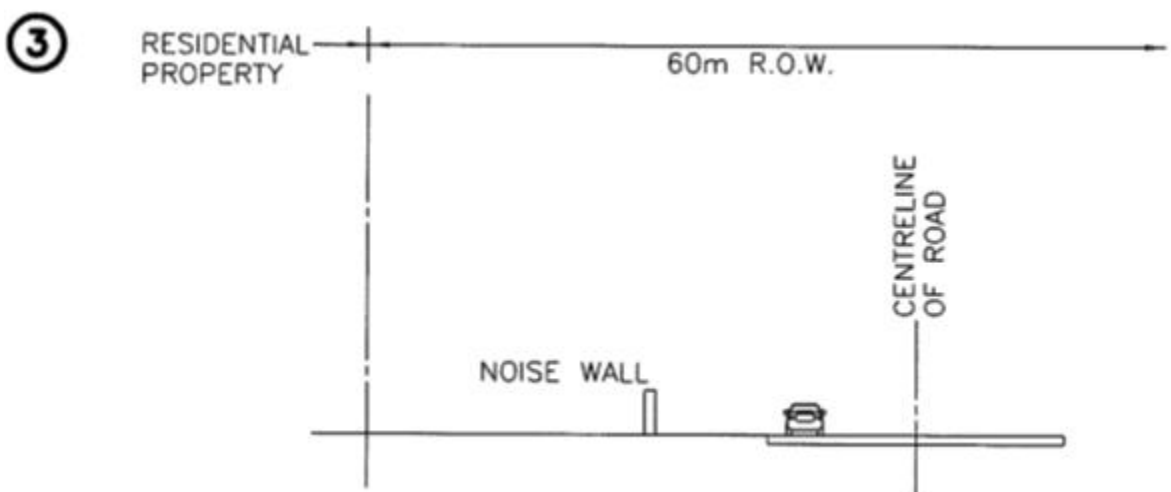
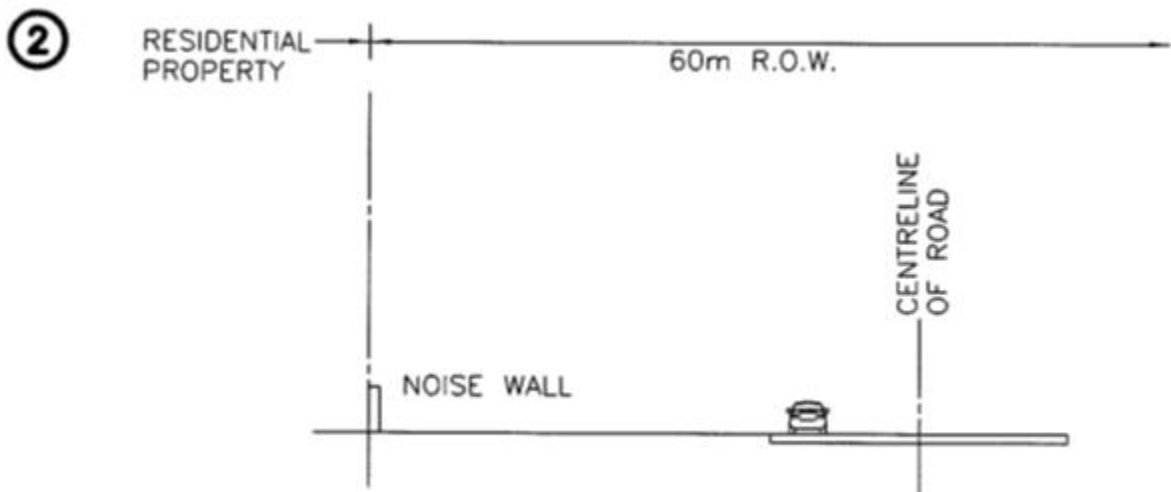
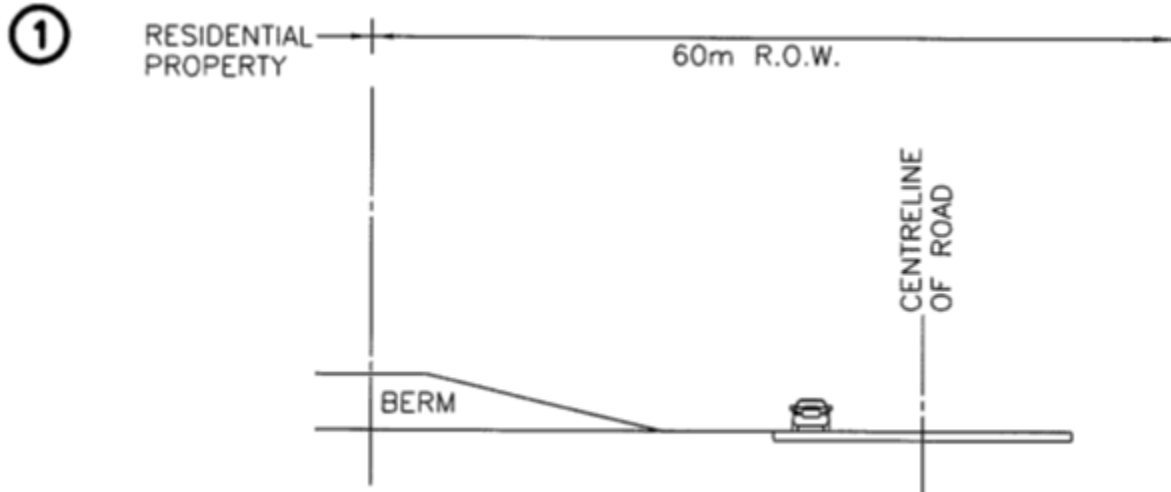
**Aesthetics:** How it ties in with the area, how it looks, etc.

**References**

1. FHWA Highway Noise Barrier Design Handbook
2. *Earth Berms vs. Noise Walls – Pros and Cons*. Utah Transit Authority (RIDEUTA)

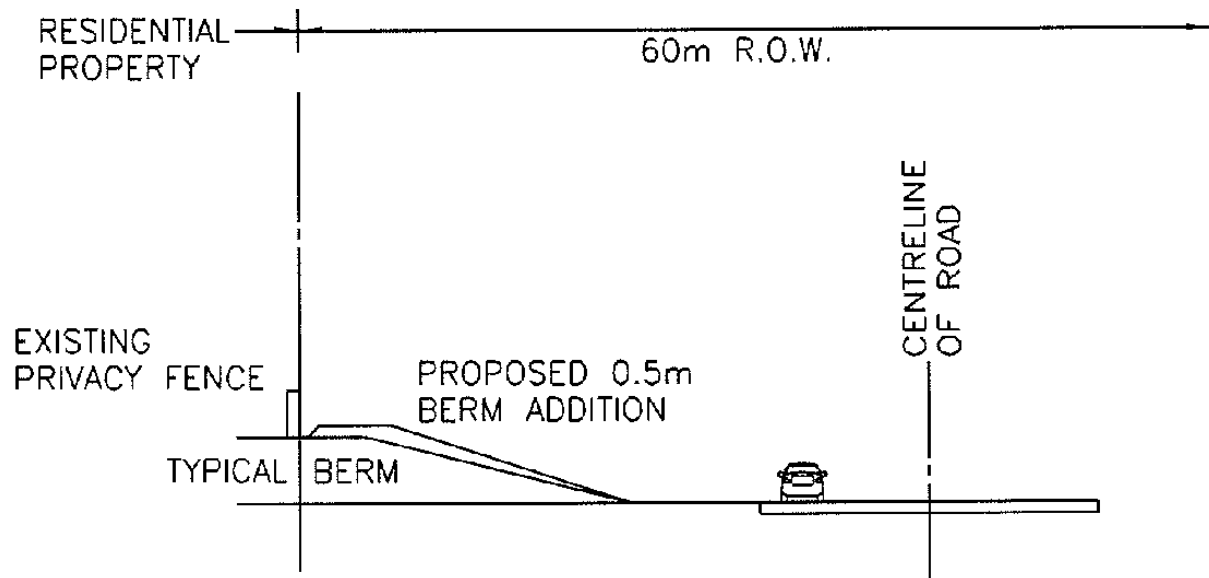
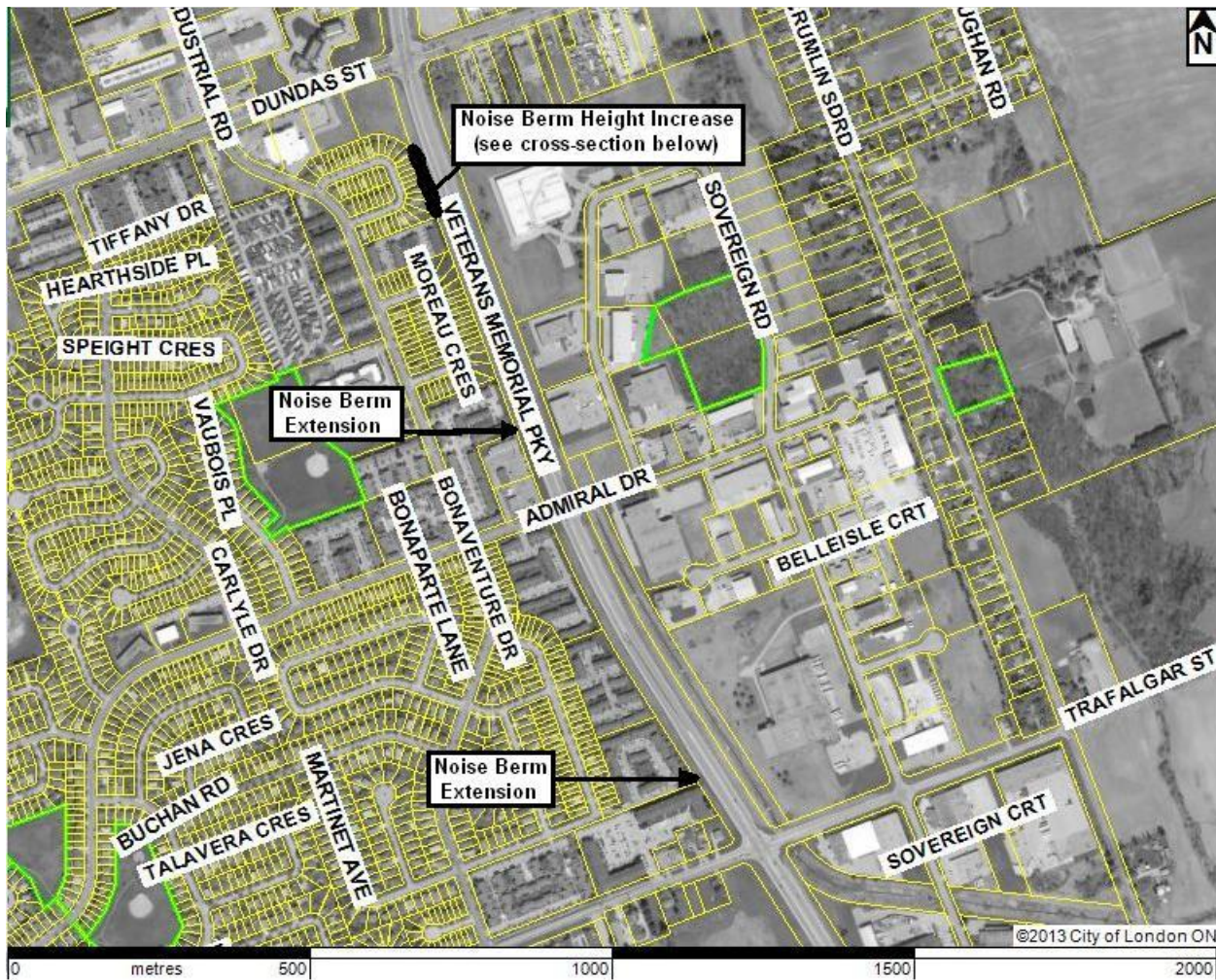
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**APPENDIX 'A'**  
**Comparison Cross-Sections**



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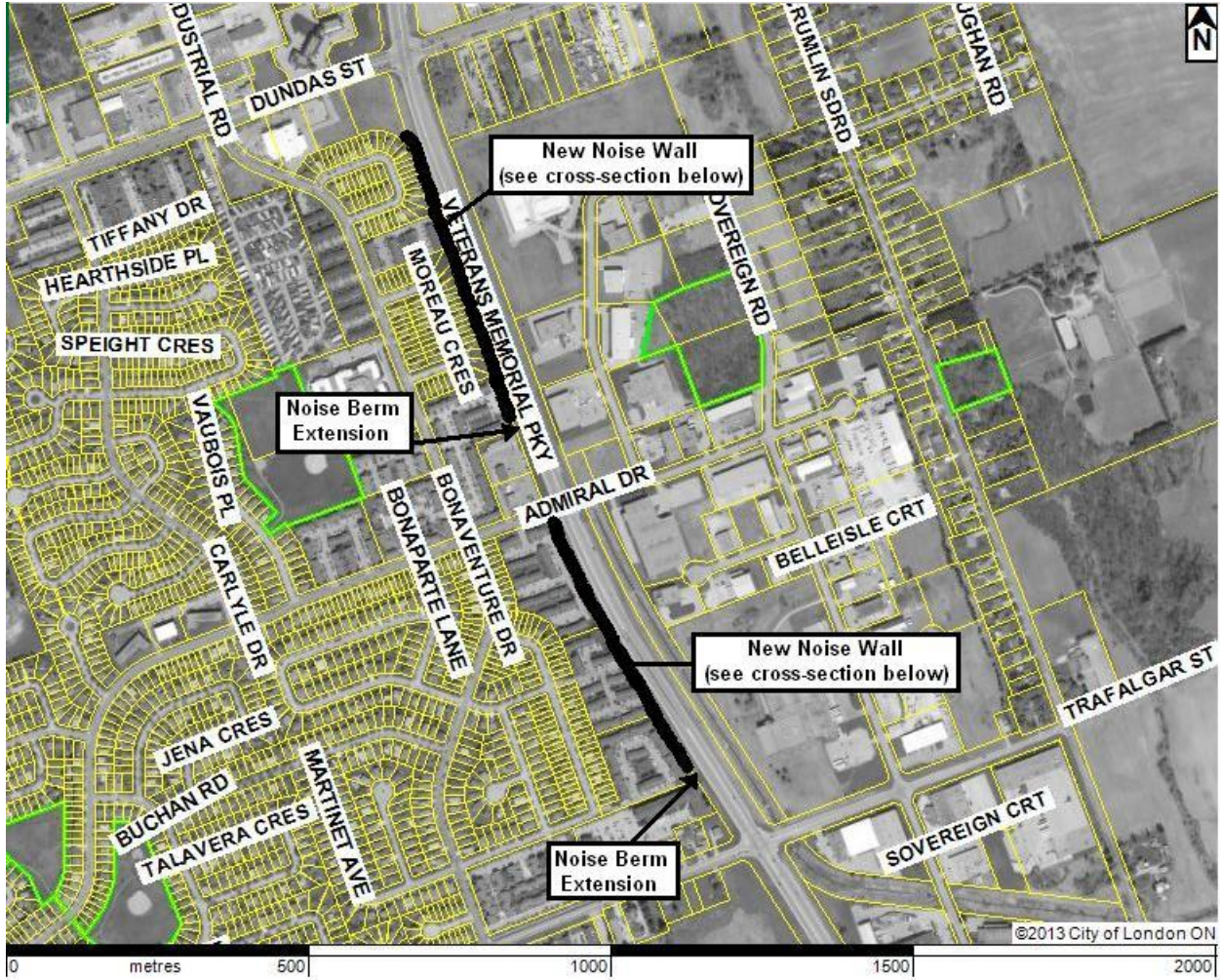
### APPENDIX 'B' Recommended Improvements







### APPENDIX 'C' Enhancement Options



Note: The Noise Berm Extensions in this case could be either earth extensions or new wall sections.

