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TO:	**CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON JANUARY 21, 2013**
FROM:	**EDWARD SOLDO, P.ENG. DIRECTOR, ROADS AND TRANSPORTATION**
SUBJECT	**VETERANS MEMORIAL PARKWAY NOISE STUDY**

RECOMMENDATION

That on the recommendation of the Director, Roads and Transportation, this report **BE RECEIVED** for information.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

- 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 and
- Environment and Transportation Committee, April 28, 2003 – Environmental Study Report Airport Road Widening – Highway 401 to Oxford Street East.

BACKGROUND

Purpose:

This report is in response to noise level concerns raised by the community along Veterans Memorial Parkway between Dundas Street and Trafalgar Street.

Context:

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."* Sound barriers would also be considered where the daytime sound exposures in the rear yard amenity areas are greater than 60 dBA.

Two previous noise studies have been conducted along Veterans Memorial Parkway. The first study conducted by Delcan, measured sound levels before and after the 2005 construction at several locations along Veterans Memorial Parkway between Dundas Street and Trafalgar Street. The results of this study showed sound levels decreased by approximately 2 dBA from pre-construction levels to post-construction levels at all locations. A noise barrier wall was not warranted at that time. A report was presented to the Environment and Transportation Committee on January 15, 2007.

A second study was conducted by Valcoustics Canada Ltd. and completed in February 2011. The second study showed noise levels similar to measurements taken after construction in 2006. The results of this assessment yielded sound levels within the study area of well under 60 dBA. A noise barrier wall was not warranted at that time. A report was presented to the Built and Natural Environment Committee on March 28, 2011.

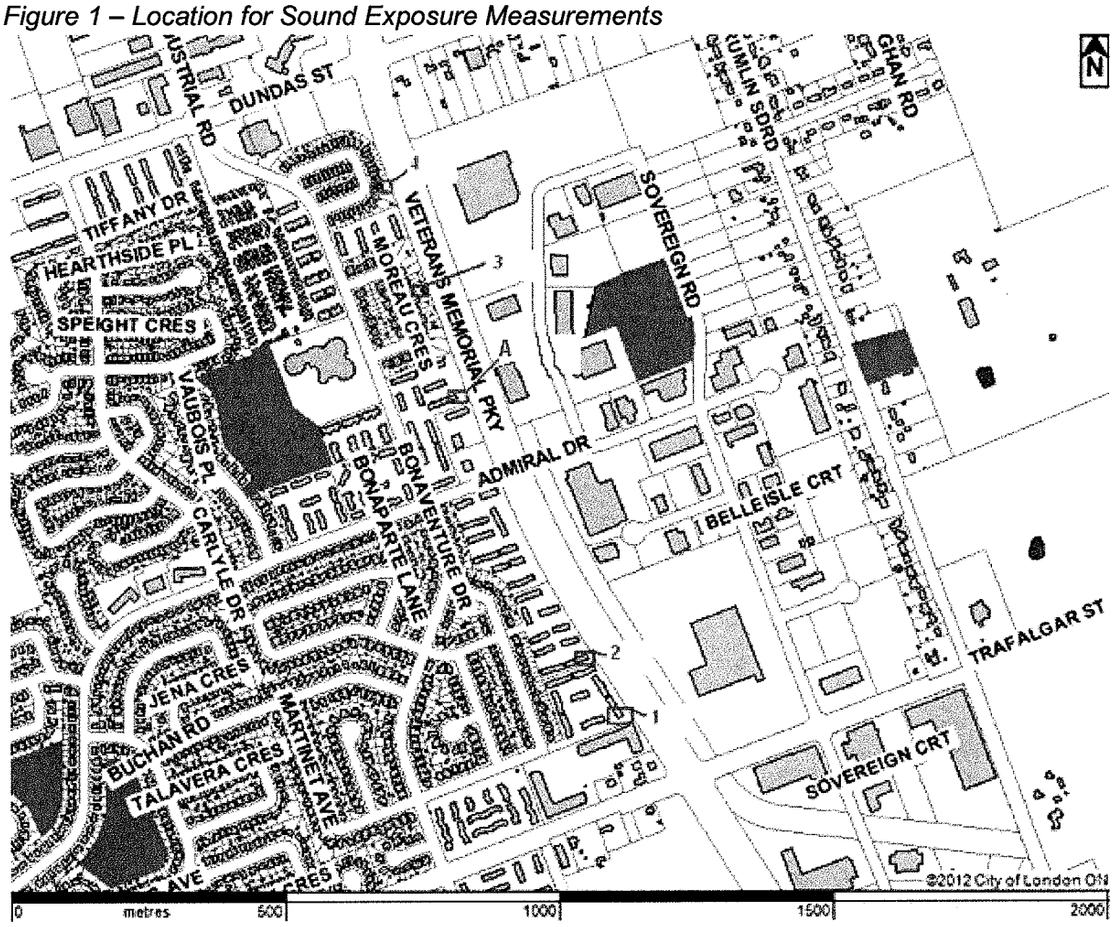
Following Valcoustics' presentation to BNEC on March 28, 2011, there was some concerns raised over the location of where the measurements were taken and their validity. The noise study included measurements of the existing sound levels in front of a townhouse block in one location (166 Bonaventure Drive). This measurement was for the purpose of calibrating the noise model and to confirm that the model accurately took into account the screening provided by the homes along the roadway. The measurements at three other locations were taken behind the homes at a setback from the roadway that was representative of a rear yard amenity area. As a result measurements were not taken in individual homeowners' backyards.

Discussion:

Staff was requested to complete an additional noise study in order to address the concerns raised by the community. For this study, readings were taken from within the backyards on June 26, 27 & 28th, 2012. The four locations were chosen based on interested property owners and distribution along the corridor. The four locations were:

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



Development of residential properties along the west side of Veterans Memorial Parkway included a requirement for a 3.0 m berm by the developers. The berm was intended to raise the rear lots and provide protection for the rear yard amenity areas. Our field surveys did confirm the berm is in place with a height generally of about 3.0 m for most locations.

The noise level study conducted in the four rear yards was completed and the sound exposure measurements were reviewed. While noise levels in excess of 60 dBA were not anticipated to be encountered based on the previous work, they were recorded at 151 Martinet Avenue and 248 Simpson Crescent.

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).

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 2.86m and does not break the line of sight between the source (traffic) and the receiver (standing height in backyard).

The noise levels at the other two locations (2, 3) were below 60 dBA and similar to the anticipated values in the earlier report.

Due to these two deficient locations, the entire length of the berm was reviewed, and one other area was found to be inadequate similar to #1.

A. 126 Bonaventure Drive, Unit 33 – Similar to 151 Martinet Avenue, the berm does not extend far enough to southern limit of property. (location shown on Figure 1 as A).

See *Appendix 'A'* for more in depth discussions on problem areas.

Conclusion:

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 at 126 Bonaventure Drive have been observed and mitigation is required to lessen existing sound exposure levels to within City of London and MOE noise guideline limits.

Design recommendations to obtain necessary sound reductions within the problem areas are as follows:

1. 151 Martinet Avenue – Increase / extend the sound barrier berm southward to the southern limit of the 151 Martinet Avenue property such that the top of barrier elevation is 267.88 m. This will reduce the sound exposure level to 59 dBA.
Estimated Construction Value = $ 55,000 +HST

4. 248 Simpson Crescent – Increase the sound barrier berm height within the section spanning from 244 Simpson Crescent to 272 Simpson Crescent by 0.5 m. This will reduce the sound exposure levels to under 60 dBA.
Estimated Construction Value = $ 205,000 +HST

A. 126 Bonaventure Drive – Increase / extend the sound barrier berm southward to the southern limit of the 126 Bonaventure Drive property such that the top of barrier elevation is 270.90m. This will reduce the sound exposure level to 50 dBA.
Estimated Construction Value = $ 40,000 +HST

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 could be completed within Veterans Memorial Parkway right-of-way. For the other 2 locations, the berm could be extended, but grading of the slopes may extend onto private property. Work on private property may be an issue given the permission of the property owners is required and it may affect existing mature trees. If this concept is rejected, a noise wall in the two areas (#1 and A) may be the appropriate choice because its impact would be contained within Veterans Memorial Parkway right of way.

The total construction value for the three locations is estimated at $300,000 +HST.

The existence of the 3.0 m noise berm along the west side of Veterans Memorial Parkway does address most of the needs along the length between Dundas Street and Trafalgar Street. The above noted modifications will meet the City's goals for noise level reductions along a roadway. While some members of the community would prefer to have a noise wall installed, use of a berm does provide better long term benefits for the City. Where locations do not have the space necessary for the placement of the berm, a noise wall is utilized. Use of a berm provides cost saving for the initial investment, as well as the longer term maintenance required.

A few members of the community have been requesting the placement of a noise barrier wall along the limits between Dundas Street and Trafalgar Street. The placement of a 2.44m wall along the top of the berm would go beyond the City's required sound reduction, and it will have an estimated cost in the order of $1,700,000 + HST.

Recommendation

Based on the recommendations received from Valcoustics following the field measurements in the rear yards and the related cost estimates, Civic Administration will introduce a 2014 budget item for the improvements to be implemented in the order of $300,000. In the spring of 2013, Transportation staff will initiate some surveys and consult with the community further to confirm the work program to improve noise levels in the area.

Acknowledgements:

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

PREPARED BY:	RECOMMENDED BY:
KARL GRABOWSKI, P. ENG. TRANSPORTATION PLANNING & DESIGN, ENVIRONMENTAL AND ENGINEERING SERVICES	EDWARD SOLDO, P. ENG. DIRECTOR, ROADS AND TRANSPORTATION

REVIEWED & CONCURRED BY:
JOHN BRAAM, P. ENG. MANAGING DIRECTOR, ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER

Cc: Councilor B. Armstrong
John Braam
John Emeljanow, Valcoustics Canada Ltd
Mark John - 151 Martinet Avenue, Unit 9
Marie VanderWyngaard - 217 Martinet Avenue, Unit 27
Doreen Gregory - 35 Moreau Crescent
Colette Dodds - 248 Simpson Crescent

Attach:
Appendix 'A' – Sound Exposure Level Monitoring Results Veterans Memorial Parkway between Dundas Street and Trafalgar Street by Valcoustics Canada Ltd. (8 pages)

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Appendix 'A'

Sound Exposure Level Monitoring Results
Veterans Memorial Parkway between
Dundas Street and Trafalgar Street

VALCOUSTICS
Canada Ltd.
Sound solutions to acoustical challenges

30 Wertheim Court, Unit 25
Richmond Hill, Ontario, Canada L4B 1B9

email • solutions@valcoustics.com
web • www.valcoustics.com
telephone • 905 764 5223
fax • 905 764 6813

December 13, 2012

City of London
Transportation Planning & Design
P. O. Box 5035
300 Dufferin Avenue
London, Ontario
N6A 4L9

Attention: Mr. Karl Grabowski
kgrabowski@london.ca

Re: Sound Exposure Level Monitoring Results
Veterans Memorial Parkway between
Dundas Street and Trafalgar Avenue
Our File No.: 110-343-100

VIA E-MAIL

Dear Mr. Grabowski:

We have completed our analysis of the sound level measurements performed along the above noted section of the Veterans Memorial Parkway. Our findings and recommendations are outlined herein.

The sound level measurements were completed to determine the need for a sound barrier along the Veterans Memorial Parkway to protect the existing residential receptors from road traffic noise. The assessment is part of the commitment to assess sound levels once the widening of the Veterans Memorial Parkway from two for four lanes was completed.

CITY OF LONDON REQUIREMENTS

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*".

Sound barriers would also be considered where the daytime sound exposures in the rear yard amenity areas are greater than 60 dBA. The 60 dBA daytime sound exposure objective is the maximum sound exposure level permitted by the Ministry of the Environment (MOE) and the City of London in the outdoor amenity areas of new residential developments.

Where noise mitigation is warranted, the mitigation must provide at least 5 dBA of attenuation. This is consistent with the Ministry of Transportation (MTO) requirements for roadway improvement projects. If at least 5 dBA of sound reduction is not provided, the sound barrier will not provide a noticeable reduction in the rear yard sound exposures.

SOUND LEVEL MONITORING

Sound exposure measurements were done at four locations from the morning of Monday, June 25, 2012 to the evening of Friday, June 29, 2012. The sound monitoring was done at:

- 151 Martinet Avenue, Unit 9;
- 217 Martinet Avenue, Unit 27;
- 35 Moreau Crescent; and
- 248 Simpson Crescent.

Sound level meters were set up in the rear yard amenity areas of the above four locations, in accordance with where the noise guideline limits are applicable. The measurement location was generally atop a deck at the rear of the dwellings except for 35 Moreau Crescent where the measurement was done at-grade.

At all of the measurement locations, sound levels were monitored continuously over the measurement duration. The sound level meters were left unattended. However, in addition to monitoring sound levels, audio recordings were also made over the entire measurement duration. Thus, if unusual results were obtained, it would be possible to listen to the actual sounds that were being monitored to try to determine the source of the unusual result.

In accordance with MOE requirements, the sound level meters were calibrated before and after the measurements.

NOISE MONITORING RESULTS

Table 1 below shows the results of the sound level measurements. L_{eqDay} is the energy average sound exposure level for the daytime period which extends from 0700 to 2300 hours. L_{24} is the energy average sound exposure level for the entire 24-hour period.

Table 1 – Measured Sound Exposure Levels

Date	151 Martinet Avenue		217 Martinet Avenue		35 Moreau Crescent		248 Simpson Crescent	
	$L_{eq\ Day}$	L_{24}	$L_{eq\ Day}$	L_{24}	$L_{eq\ Day}$	L_{24}	$L_{eq\ Day}$	L_{24}
06/26/12	63	62	57	56	54	53	61	60
06/27/12	63	62	56	55	52	52	61	60
06/28/12	62	61	56	55	54	53	60	59

From the above table, the L_{24} is consistently lower than the $L_{eq\ Day}$ since there is significantly less traffic at night.

Results are not provided for 25 June 2012 or for 29 June 2012 since the noise monitoring only captured a portion of these two days. Thus, it is not possible to calculate the $L_{eq\ Day}$ or the L_{24} from the measurement data. However, time histories for all of the measurement days are included in

Appendix A to this letter report. Review of the time histories indicates that the sound exposure levels were consistent with the other days for the Monday and the Friday.

There was some indication that the sound exposure levels were greatest during the early evening on Fridays as there is more traffic during this period. Even though it is likely true that there is more traffic during this time period, the noise generation is likely offset by there being significantly fewer heavy trucks. Heavy trucks produce higher sound levels than an automobile.

The MOE guidelines require that sound monitoring not be done during periods of precipitation or when wind speeds exceed 20 kph as these weather conditions will produce artificially high sound levels. Weather data for the measurement period obtained from the Environment Canada Climate Centre as observed at the London International Airport are included as Appendix B to this letter report. There was no precipitation during the monitoring period. There were some periods where the wind speeds were above 20 kph. However, review of the sound level results indicates that wind did not significantly impact the measurement data. Thus, no data was excluded from our assessment due to weather.

There also appear to be some time periods where the homeowners used their rear yards and produced sounds that were audible at the measurement location. For example, between 1900 and 2000 hours on June 27, 2012 at 248 Simpson Crescent, listening to the audio recording confirmed that people and dog barks were audible at the measurement location. However, as the results were very consistent over the measurement duration, it does not appear that these sounds impacted the results. Thus, no data was excluded from our assessment due to people or other activity in the rear yards.

Based on the results presented in Table 1, the measured sound exposures are below where a sound barrier is needed at 217 Martinet Avenue and 35 Moreau Crescent but the measured sound exposures are above where a sound barrier is needed at 151 Martinet Avenue and 248 Simpson Crescent.

DISCUSSION AND RECOMMENDATIONS

Since the criteria where a sound barrier is needed is exceeded at 151 Martinet Avenue and at 248 Simpson Crescent, investigation as to why the sound exposure levels were higher than expected was also done.

151 Martinet Avenue

At 151 Martinet Avenue, there is a berm constructed along the Veterans Memorial Parkway that is intended to provide attenuation. The sound barrier berm is reducing in height and stops at the southern lot line of this location. The sound barrier berm does not extend further south nor does it return. Thus, the rear yard has a significant view of road traffic on the Veterans Memorial Parkway and only receives partial sound barrier screening from the existing berm.

Accounting for the partial acoustical screening provided by the sound barrier berm, a daytime sound exposure of 62 dBA is predicted in the rear yard amenity area of Unit 9. This is considered with the measured daytime sound exposure levels of 62 to 63 dBA.

To maximize the effectiveness of the sound barrier, complete acoustical screening of the road traffic on the Veterans Memorial Parkway is needed. Increasing the sound barrier southward to the southern limit of the 151 Martinet Avenue property such that the top of barrier elevation is at least 267.58 m will mitigate the daytime sound exposure to 60 dBA. Increasing the minimum height to 267.88 m will mitigate the daytime sound exposure to 59 dBA.

The additional height can be provided by adding to the berm. However, this will be problematic at the end as grading will extend onto the adjacent private property. Thus, it is likely that some sound barrier fencing will need to be provided.

248 Simpson Crescent

Review of the sound barrier berm at 248 Simpson Crescent indicates that it does not have adequate height. As noted above, to be effective acoustically, a sound barrier must break the line of sight between the source (traffic on the Veterans Memorial Parkway) and the receiver (1.5 m standing height in the rear yard amenity area). It is possible to see traffic on the Veterans Memorial Parkway from the rear yard over the berm through the privacy fence.

Our analysis of the sound barrier berm indicates that it is too low between 244 Simpson Court and 272 Simpson Court. Increasing the height of the sound barrier by 0.5 m will result in daytime sound exposures below the 60 dBA limit.

The height of the sound barrier can be increased by increasing the height of the berm. The additional height can be provided on the east side of the existing privacy fence. Alternatives would be to construct a fence atop the berm, either to the east of the existing privacy fence or it could replace the privacy fence.

With the increased height, the sound barrier will break the line of sight between the source and the receptor locations. A sound barrier breaking the line of sight will provide at least 5 dBA of sound attenuation.

Other Locations

As part of this exercise, we have reviewed the entire sound barrier berm along this stretch of the Veterans Memorial Parkway. The sound barrier at 126 Bonaventure Drive, Unit 33 was also identified as being deficient. Similar to the sound barrier at 151 Martinet Avenue, the sound barrier at this location is reducing in height and there is no return along the south property line.

Increasing the sound barrier southward to the southern limit of the 126 Bonaventure Drive property such that the top of sound barrier elevation is at least 270.90 m will mitigate the daytime sound exposure to 50 dBA. Extending the sound barrier further south will result in lower resultant sound exposures.

The additional height can be provided by adding to the berm. However, this may be problematic as grading will need to extend onto the adjacent private property. Thus, it is likely that some sound barrier fencing will need to be provided.

Our review of the remainder of the study area indicates that there do not appear to be any deficiencies at any other receptor locations.

CONCLUSIONS

Sound level monitoring completed at four locations along the Veterans Memorial Parkway between Dundas Street and Trafalgar Avenue confirm that existing daytime sound exposure levels are acceptable with the existing berm at most locations. Deficiencies in the sound barrier at the southern and northern ends as well as at 126 Bonaventure Drive have been observed and need to be addressed to mitigate existing sound exposure levels to within City of London and MOE noise guideline limits.

If there are any questions or if additional information is needed, please do not hesitate to call.

Yours truly,

VALCOUSTICS CANADA LTD.

Per: **John Emeljanow, B.Eng., P.Eng.**

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Enclosures

cc Greg Corbiere, City of London Transportation Planning & Design Department (gcorbiere@london.ca)

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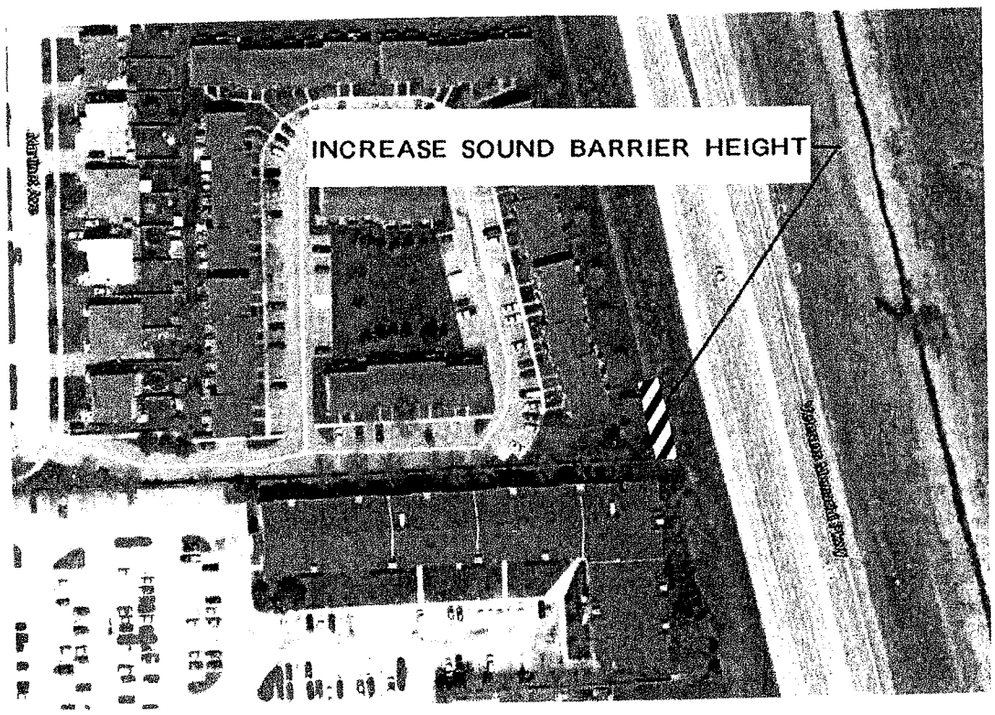

151 MARTINET AVENUE	FIGURE 1

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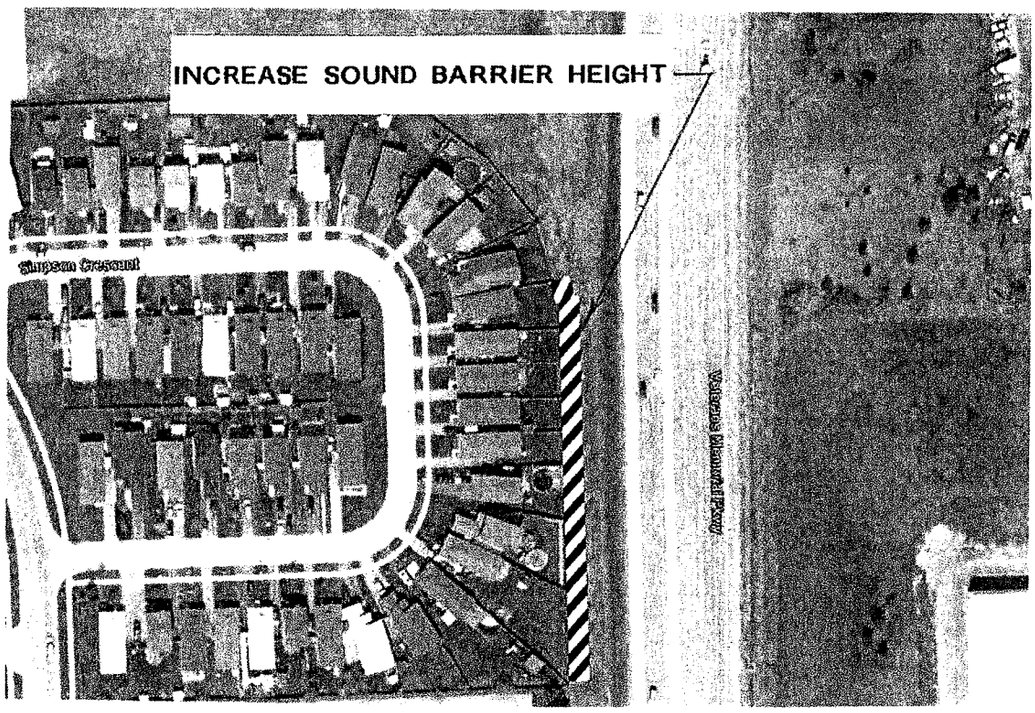

SIMPSON CRESCENT	FIGURE 2

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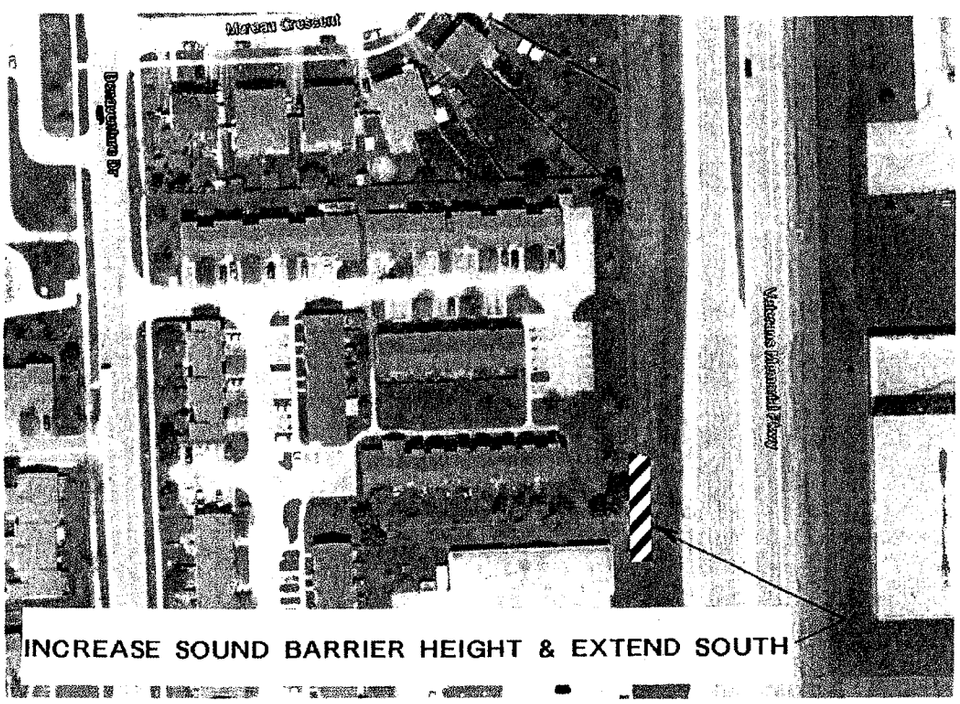

126 BONAVENTURE DRIVE	FIGURE 3